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Coal Conversion by Electric Utilities: Reconciling Energy Independence and Environmental Protection

By William Foster Cockrell, Jr*

Introduction

Depletion of the nation's oil and gas resources and the resultant energy crisis has spurred increasing interest in the development of coal, our most secure and plentiful resource. Coal, however, is a relatively dirty fuel. When burned, it produces several pollutants, the most significant of which are particulates and sulfur oxides. Since an inexpensive technology to purify the emissions resulting from coal-generated power has not yet been developed, increased use of coal may prevent compliance with the nation's environmental laws controlling the emission of air pollutants.

Despite the problems presented by the use of coal, no other energy source offers substantial immediate relief from the energy crisis. The widespread use of solar power will not be technologically feasible for some time,¹ and the risks involved in the use of atomic energy have dampened enthusiasm for increased use of that fuel.² Given the problems connected with these energy sources, coal appears to be a more attractive alternative.

* J.D. 1969, University of Texas; M.B.A. 1972, Harvard University. Member of the District of Columbia and Texas Bars. Associated with the firm of Akin, Gump, Strauss, Hauer & Feld. The author gratefully acknowledges the assistance of Ms. Rebecca Westwood.

1. The FEA, for example, has stated that "[p]roduction from emerging technologies, such as solar, geothermal, and synthetic fuels, under business as usual conditions, is not expected to be significant by 1985." Federal Energy Administration, National Energy Outlook 38 (1976) [hereinafter cited as ENERGY OUTLOOK].

In view of this conclusion, government is presented with the urgent task of achieving a workable balance between two often conflicting objectives: developing coal and improving (or at least preventing further deterioration of) the air we breathe without imposing on the consumer the enormous costs of technology to control air pollution. That dilemma is most sharply confronted in governmental regulation of electric utilities, which consume most of the coal used for energy generation.

Regulation of electric utilities in general is crucial to a national energy policy, as these utilities distribute approximately 10 percent of the total "end use" energy in this nation and require nearly 27 percent of all the energy needed to generate electricity. During the twenty-year period prior to the 1973 oil embargo, electricity consumption grew at an annual rate of approximately 7 percent, nearly double the rate at which total energy demand increased. Moreover, the regulation of electric utilities is particularly significant with respect to a national policy emphasizing the increased use of coal. Electric utilities are very heavy coal users, accounting for 70 percent of the total coal consumption in the United States in 1974. Dependence upon coal by public utilities has been decreasing in recent years, however, while dependence on oil and gas has been increasing. This trend stems partially from the economic and technological difficulties of complying with the more stringent air quality control requirements which apply to coal-burning facilities. Nevertheless, the relative decrease in the percentage of coal used as primary fuel by the utilities is less pronounced than for the nation as a whole. Seventy-five years ago, the United States used coal to fulfill 90 percent of its energy needs; presently, coal use has declined to approximately 18.6 percent. In contrast, electric utilities were still using coal

4. See ENERGY OUTLOOK, supra note 1, at xxiv.
5. See CONGRESSIONAL RESEARCH SERVICE, 94TH CONG., 1ST SESS., FACTORS AFFECTING COAL SUBSTITUTION FOR OTHER FOSSIL FUELS IN ELECTRIC POWER PRODUCTION AND INDUSTRIAL USES 22 (Comm. Print 1975) [hereinafter cited as FACTORS AFFECTING COAL SUBSTITUTION].
6. Id.
7. Although coal's relative share as a fuel for the utilities market has decreased in recent years, the absolute amount of coal used by the electric utility industry has increased. At the end of World War II the industry consumed about 72 million tons of coal annually; in 1974, consumption was up to 391 million tons. Id.
8. This figure, however, represents a .6% increase in the share of energy produced from coal in 1975 over the previous year. Bureau of Mines, U.S. Dep't of the
to generate 44 percent of total electricity in 1974.⑨

That the United States now depends on its least abundant energy resources—oil and gas—to provide most of its energy needs is a matter of grave national concern. Resources of oil and gas in the United States are being rapidly depleted, and the National Academy of Sciences predicts that "[w]orld resources of petroleum and natural gas . . . will be substantially consumed by the first quarter of the twenty-first century if world trends of production and consumption continue."⑩

Due to the insufficient supply of oil and gas within the United States, the nation increasingly depends on foreign oil and gas sources. Oil and gas imports rose from 18 percent in 1960 to about 37 percent in 1975.⑪ Furthermore, approximately two-thirds of all oil and gas imports are now obtained from the Organization of Petroleum Exporting Countries.⑫ The memory of the 1973-74 OPEC embargo and the uncertainty of future action by OPEC have prompted the federal government to state:

Continuation of the trend toward increased oil imports can no longer be considered an acceptable means of satisfying domestic energy requirements. The national goal is to achieve energy self-sufficiency or, at a minimum, independence from less reliable suppliers of imported oil.⑬

In contrast to the insufficient supply of oil and gas, world resources of coal are considered sufficient for hundreds of years,⑭ and coal reserves in the United States are vast. The Federal Energy Administration (FEA) has estimated that there are 1.5 trillion tons of coal reserves in the United States, constituting 93 percent of all United States fuel reserves. Greater use of these plentiful domestic coal resources could free the nation from economic dependence on foreign countries exporting oil and gas. In recognition of these facts, the FEA has declared that "[c]oal, our most abundant fossil fuel, is one of the keys to making the

Interior News Release, Annual U.S. Energy Use Drops Again, April 15, 1976. Presently, oil and gas account for 75% of the nation's energy requirements. ENERGY OUTLOOK, supra note 1, at xxii.

⑨ In 1960, coal accounted for 52% of electricity generated, while oil and gas accounted for 27%; oil and gas accounted for 35% of electricity generated in 1974. FACTORS AFFECTING COAL SUBSTITUTION, supra note 5, at 22.

⑩ NATIONAL ACADEMY OF SCIENCES, MINERAL RESOURCES AND THE ENVIRONMENT 8 (1975) [hereinafter cited as MINERAL RESOURCES].

⑪ See ENERGY OUTLOOK, supra note 1, at 1.

⑫ Id.

⑬ Id.

⑭ OFFICE OF FUEL UTILIZATION, FEDERAL ENERGY ADMINISTRATION, FINAL ENVIRONMENTAL STATEMENT, COAL CONVERSION PROGRAM, at III-4 (1975) [hereinafter cited as ENVIRONMENTAL STATEMENT].

⑮ MINERAL RESOURCES, supra note 10, at 8.
Nation energy independent"; and Senator Henry M. Jackson has stated that "coal substitution for oil and natural gas as our nation's principal boiler fuel in electric utility and industrial applications presents a major potential for the achievement of energy self-sufficiency."

In an attempt to reverse the trend toward increased use of oil and gas and to initiate a trend to increased use of coal, Congress has enacted legislation providing for a certain degree of mandatory coal conversion, particularly by electric utilities. It is helpful to preface a discussion of this coal conversion program with a survey of the environmental laws applicable to coal use by electric utilities.

**Environmental Constraints**

**The Clean Air Act**

The only significant legal environmental constraint on the burning of coal by electric utilities is provided by the Clean Air Act. This act requires the Environmental Protection Agency to establish primary and secondary air quality standards for a number of pollutants adversely affecting ambient air. (Several of these pollutants are produced by coal-burning facilities.) Primary standards are defined as those which "in the judgment of the Administrator . . . allowing an adequate margin of safety, are requisite to protect the public health." Secondary standards are defined as those "requisite to protect the public welfare from any known or anticipated adverse effects . . .," and they have been described by the EPA as "generally more stringent than national primary standards." Specific primary and secondary standards have been adopted by the EPA for each of the "air quality control regions"
organized by the EPA for the purpose of implementing its responsibilities under the Clean Air Act.\textsuperscript{24}

In order to meet the primary and secondary standards established by the EPA, the Clean Air Act requires that each state submit an implementation and maintenance plan (SIP) to the EPA administrator within nine months of the adoption of such a standard by the EPA.\textsuperscript{25} Under the act, the EPA administrator has a four-month period within which to evaluate the SIP. The administrator is required to approve the SIP if, among other things, it meets eight general conditions.\textsuperscript{28} The most important of these conditions is that the plan provide for the attainment of the national primary standard "as expeditiously as practicable" but no later than three years from the date of the SIP's approval.\textsuperscript{27} The SIP must also provide for the achievement of secondary standards in a "reasonable time" (the specifics of this term are not identified by the act)\textsuperscript{28} and must also include emission limitations, schedules, and compliance timetables.\textsuperscript{29} "Emission limitations" regulate the composition of substances emitted into the ambient air from sources such as powerplants.

Although the Clean Air Act provides for a substantial federal role, the act provides that each state "shall have the primary responsibility for assuring air quality within the entire geographic area comprising such State . . . ."\textsuperscript{30} While the EPA sets the national ambient air standards, the agency assumes a secondary role in determining and enforcing the specific emission limitations applicable to each powerplant. States may adopt more "stringent" emission limitations and controls than are required to achieve the EPA standards.\textsuperscript{31} The EPA has no authority to question a state's choice of emission limitations if they are part of an SIP which satisfies the general conditions required.

In summary, the federal government prescribe the required condition of the air; each state prescribe the increments of particular pollutants which may be emitted by powerplants located within its jurisdiction.

Under the Clean Air Act, many states have set standards more

\begin{itemize}
\item \textsuperscript{24} 42 U.S.C. § 1857c-2(c) (1970).
\item \textsuperscript{25} Id. § 1857c-5(a)(1).
\item \textsuperscript{26} Id. § 1857c-5(a)(2).
\item \textsuperscript{27} Id. § 1857c-5(a)(2)(A)(i).
\item \textsuperscript{28} Id. § 1857c-5(a)(2)(A)(ii).
\item \textsuperscript{29} Id. § 1857c-5(a)(2)(B).
\item \textsuperscript{30} Id. § 1857c-2(a).
\item \textsuperscript{31} Id. § 1857d-1 (Supp. V, 1975).
\end{itemize}
stringent than the primary standards designed by the EPA which were promulgated on April 30, 1971. In view of this, it is important to note that there are several procedures allowing private parties flexibility in complying with Clean Air Act requirements. Compliance with the requirements of an SIP may be postponed for up to one year under certain carefully specified circumstances, including a finding by the EPA that "continued operation of such source is essential to national security or to the public health or welfare." Also, a two-year extension of the three-year deadline for achievement of national primary ambient air quality standards may be granted at the time the SIP is submitted to the EPA if "the necessary technology or other alternatives are not available or will not be available soon enough to permit compliance." Furthermore, the Clean Air Act provides that the EPA shall approve any "revision" of an SIP by a state, provided the revision is adequate to ensure the attainment and maintenance of primary ambient air quality standards. The Supreme Court has interpreted this statutory provision to permit the states continuing discretion to grant "revisions" to SIPs permitting specific powerplants more time to comply with emission limitations. These provisions providing for compliance flexibility are particularly significant considering the poor record by electric utilities in complying with the requirements of the Clean Air Act.

Significant Deterioration Requirements

The constraints of the Clean Air Act applicable to coal conversion have become even tighter as a result of recent litigation concerning the significant deterioration of air quality. A 1972 suit instituted by the Sierra Club and other environmental groups against the EPA challenged an EPA regulation permitting the deterioration of existing air quality provided ambient pollutant levels did not exceed an applicable second-

32. See Train v. Natural Resources Defense Council, Inc., 421 U.S. 60, 68-69 (1975) (discussion of state action with regard to effective dates for emission limitations). One commentator has complained that "[s]ome states have simply picked the worst area in the state as the basis for their implementation plans, so that facilities in relatively sparsely populated sections must meet emission limitations that are needed only in congested areas." Schroeder, The Impact of Current Air Pollution Legislation and Litigation on Energy Production, 54 Ore. L. Rev. 515, 518 (1975).
35. Id. § 1857c-5(e)(1)(A).
38. See notes 139-46 & accompanying text infra.
ary standard. The suit also challenged the EPA’s failure to promulgate regulations to prevent the significant deterioration of air quality. Finding that the legislative history of the Clean Air Act revealed the act to be “based in important part on a policy of non-degradation of existing clean air,” the United States District Court for the District of Columbia ruled for the plaintiffs in *Sierra Club v. Ruckelshaus*. The Court of Appeals for the District of Columbia Circuit affirmed this decision, and, in a per curiam decision, an evenly divided Supreme Court also affirmed.

As a result of the decision in the *Sierra Club* case, the EPA published final regulations concerning significant deterioration in December 1974, after extensive public participation and technical and economic analyses. The EPA’s regulations specify a pollution increment in the ambient air which may not be exceeded by any major new source or combination of major new sources of pollution. Area classifications, designed to correspond to each area’s overall land use, have also been established to reflect the amount of energy or industrial growth desired. The EPA regulations establish the following classifications:

Class I: Areas in which practically any air quality deterioration would be considered significant, thus allowing little or no major energy or industrial development.

Class II: Areas in which deterioration that would normally accompany moderate, well-controlled growth would not be considered significant.

Class III: Areas in which deterioration would be permitted to allow concentrated or very large scale energy or industrial development, as long as the national secondary ambient air quality standards are not exceeded.

EPA regulations initially designate all regions as Class II, subject to

43. See 40 C.F.R. §§ 52.01-2850 (1976).
44. See 1 *Environmental Protection Agency & Federal Energy Administra-
tion, An Analysis of the Impact on the Electric Utility Industry of Alter-
native Approaches to Significant Deterioration*, 4-8 (1975) [hereinafter cited as *IMPACT OF SIGNIFICANT DETERIORATION*].
45. 40 C.F.R. § 52.21(c)(2) (1976).
re designation as Class I or Class III by local or state initiative. As of October 1975, apparently no formal applications to reclassify regions had been made. Electric utilities have apparently experienced no inordinate difficulties as a result of this classification scheme. Construction of new powerplants without very expensive air pollution control equipment generally is permitted in Class II areas.

Initial Coal Conversions

Recent coal conversions by electric utilities were voluntary and began in response to requests by President Nixon and William E. Simon, the Federal Energy Office (FEO) administrator, during the OPEC embargo. In response to those requests, twenty-two boilers at eleven east coast generating stations were voluntarily converted as of March 1, 1974, from the use of oil and gas to coal. This resulted in the substitution of 13,000 tons of coal per day for 53,000 barrels of oil. The FEO reported that another fifteen plants with a total of thirty-three units were "willing to convert if and when environmental, technical, transportation, and supply problems are solved," while an additional twenty-two units at eight plants "await[ed] a Federal Order to convert, because of contract difficulties, etc."

When the embargo ended in mid-March 1974, pressure reflecting environmental concern reversed the trend of voluntary coal conversion. For example, in mid-April 1974, the Connecticut Department of Environmental Protection ordered the facilities owned by Northeast Utilities to reconvert to oil as soon as it had exhausted its coal supplies. By July 1974, seven of the eleven generating stations which had converted to coal had reverted back to oil.

A new mandatory program, limited in nature, was instituted by the federal government on November 27, 1973, when the Energy Policy Office of the Executive Office of the President issued EPO Regulation 2, effective December 7, 1973, under the authority of the Economic Stabilization Act of 1970. EPO Regulation 2 prohibited powerplants and

47. IMPACT OF SIGNIFICANT DETERIORATION, supra note 44, at 4.
48. The FEO was created by Executive Order No. 11748. See 3 C.F.R. 376 (1974).
51. See FACTORS AFFECTING COAL SUBSTITUTION, supra note 5, at 26.
large industrial installations from converting from high sulfur fuels (such as most coal then utilized) to low sulfur fuels. Upon the expiration of the Stabilization Act on April 30, 1974, the FEA, pursuant to authority under the Emergency Petroleum Allocation Act of 1973, promulgated part 215 of its regulations which elaborated on the requirements of EPO Regulation 2. Those regulations also provided for an "exceptions" process whereby an applicant might be excused from a particular regulatory requirement. More specifically, an exception was granted "automatically" when the use of petroleum products was certified by the appropriate state air pollution control agency to be essential in meeting the applicable primary ambient air quality standard. It was also provided that the FEA could make an exception if an applicant demonstrated that application of the regulatory requirement would "cause special hardship, inequity, or unfair distribution of burdens," or if fuels necessary for compliance were unavailable. During the period from May 1974 through June 1976, the FEA granted such relief and permitted conversion to oil and gas by eight electric utilities which were burning coal on December 7, 1973. As a result of this exceptions process, the FEA's effort to prevent conversion from coal to low sulphur fuel provided by part 215 was significantly reduced in scope.

Application of part 215 did not last long. In June 1976, the FEA exempted "middle distillates" (which include most residential heat-

55. See 10 C.F.R. §§ 215.1-7 (1976). Part 215 was revoked on July 1, 1976. 41 Fed. Reg. 24516 (1976). Section 215.3(a) of those regulations provided: "No petroleum product shall be sold or otherwise provided to or accepted by any firm for burning under power generators that were not using a petroleum product on December 7, 1973."
57. See 10 C.F.R. § 215.6(a) (1976).
58. Id. § 215.6(b).
60. See, e.g., Indianapolis Power & Light Co., 3 F.E.A. ¶ 83,165, at 83,627 (1976). Indianapolis Power is typical of the FEA's disposition of applications for exception to the requirements of part 215. In those cases, the FEA required a finding by the state certifying agency that an "undue economic hardship" would result to the utility or its customers if conversion from coal were not permitted.
ing oils and diesel fuel) from the Mandatory Petroleum Allocation and Price Regulations.\(^6\) This exemption required a technical conforming amendment to part 215 which, in effect, would have removed middle distillates from the list of fuels that could not be substituted for coal. Since middle distillates constituted the greatest part of the fuels subject to part 215, such an amendment would have rendered the section ineffective. Therefore, the FEA revoked part 215 at the same time it exempted middle distillates from the Mandatory Petroleum Allocation and Price Regulations.\(^6\) On June 22, 1974, however, legislation providing for a comprehensive coal conversion program was enacted: the Energy Supply and Environmental Coordination Act (ESECA).\(^6\) Its requirements are now beginning to be implemented.

**The Energy Supply and Environmental Coordination Act**

The FEA has described the purposes and basic thrust of ESECA as follows:

\[
\text{[ESECA] was structured to provide a short-term, environmentally acceptable, means for reducing dependence on imported energy. The precise aim of the Energy Supply and Environmental Coordination Act is to reduce our dependence on expensive, imported energy sources in a manner which is as consistent as practicable with the nation's environmental objectives. ESECA focuses on expanding the use of coal, recognizing that the U.S. reserves of coal are more than adequate, that the environmental consequences of using coal must be considered, and that, in some cases, previous environmental requirements may unnecessarily preclude the use of coal. Because of these potentially conflicting objectives, ESECA provides for closely coordinated and cooperative roles for the [FEA and the EPA].}^{64}\]

ESECA constitutes a more comprehensive coal-conversion program than the limited part 215 program, as will be demonstrated below.

**Basic Provisions**

ESECA includes the four following basic provisions:

\[1. \text{The FEA is empowered to issue "prohibition orders" re-}\]

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61. See 41 Fed. Reg. 24517 (1976). The Mandatory Petroleum Allocation and Price Regulations (10 C.F.R. §§ 210-12 (1976)) were also promulgated pursuant to the EPAA as a response to the 1973 oil embargo. As the title suggests, these regulations control the allocation and pricing of petroleum products.


64. ENVIRONMENTAL STATEMENT, *supra* note 13, at 1-2.
quiring existing powerplants and "major fuel burning installations" (MFBIs) to convert from oil and gas to coal as a primary energy source (provided that certain conditions are satisfied).  

(2) The EPA is empowered with some flexibility in reducing environmental requirements for powerplants which have been issued prohibition orders.

(3) The FEA is empowered to issue "construction orders" requiring that powerplants and MFBIs in the early planning stage have coal-burning capability (provided that certain determinations are made).  

(4) The FEA is empowered to issue "supply orders" in order to allocate coal to powerplants and MFBIs.  


In implementing the mandate of ESECA, the FEA and EPA have fashioned a complex regulatory scheme which deserves detailed review.

Prohibition Orders

ESECA empowers the FEA to prohibit any powerplant from burning oil or gas as its "primary energy source" if the powerplant had the "capability and necessary plant equipment" to burn coal on June 22, 1974, or was designed with or acquired such capability subsequent to that date. Part 305 of the FEA regulations provides, with respect to this threshold determination, that the FEA will evaluate

coal and ash handling facilities and appurtenances—internal and external; availability of land for the storage of coal; and other equipment such as a boiler, unloaders, conveyors, crushers, pulverizers, scales, burners, soot blowers, and special coal-burning instrumentation and controls.

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66. Id. § 792(c).
67. Id. § 792(d).
68. Id. § 792(f)(1).
69. Id.
70. "Primary energy source" is defined by FEA as "the fuel that is or will be used for all purposes except for the minimum amounts required for startup, testing, flame stabilization and control . . . ." 10 C.F.R. § 305.2 (1976).
73. 10 C.F.R. § 305.3(b)(1) (1976).
It is specifically provided that the absence of any one or combination of these facilities is not grounds for concluding that the powerplant lacks the requisite capability to burn coal.\textsuperscript{74}

In addition, before a prohibition order may be issued, the FEA must specifically find that: (a) the burning of coal is \textit{practicable} and \textit{consistent with the purposes of ESECA}; (b) coal and coal transportation facilities are \textit{available} during the period the order is in effect; and (c) the \textit{reliability of service} in the area served by the plant will not be \textit{impaired}.\textsuperscript{75}

In determining whether a prohibition order is practicable, the FEA is required to consider the "reasonableness" of additional costs associated with burning coal, including but not limited to fuel costs, costs of equipment for coal burning, and costs of complying with the requirements of the Clean Air Act and other environmental mandates. The FEA must also consider the financial capabilities of the powerplant owner.\textsuperscript{76}

Under FEA regulations, a prohibition order is "consistent with the purposes" of ESECA if it discourages the use of oil and gas and encourages increased or continued use of coal by powerplants in a manner consistent "to the fullest extent practicable" with existing national environmental commitments.\textsuperscript{77}

In determining whether coal will be "available" during the effective period of a prohibition order, the FEA is required to evaluate the type of coal to be utilized, the location of that coal, the practicability of coal production (including the possibility of new mine openings and anticipated demand), and state or local laws or policies limiting the extraction of coal.\textsuperscript{78} The availability of coal transportation facilities is to be determined by evaluating the method by which coal is to be delivered to the powerplant.\textsuperscript{79}

Whether or not reliability of service in the area served by the plant will be impaired is to be determined by an analysis of the following factors: the loads of the electric power dispatching system of which the powerplant is a part, the capacity and resources of that system relative to

\textsuperscript{74} \textit{Id.} This regulatory requirement reflects the intention of the Congress as expressed in the Conference Report to ESECA. \textit{See} H.R. \textit{Rep.} No. 93-1085, 93d Cong., 2d Sess. 28 (1974).


\textsuperscript{76} \textit{See} 10 C.F.R. § 305.3(b) (2)(i) (1976).

\textsuperscript{77} \textit{Id.} § 305.3(b) (2)(ii).

\textsuperscript{78} \textit{Id.} § 305.4(b)(3)(i).

\textsuperscript{79} \textit{Id.} § 305.4(b)(3)(ii).
the powerplant's output as a result of the prohibition order, and the effects of the powerplant's discontinuance of burning oil and gas.\textsuperscript{80} FEA regulations define the term "impairment" as a significant increase in the probability of loss of load on the system sufficient to result in a "substantial hazard" to commerce or the public health and safety.\textsuperscript{81}

Finally, before a prohibition order may be issued, the FEA must provide public notice and the opportunity for oral as well as written comment.\textsuperscript{82} After these requirements have been satisfied and a public hearing affording the opportunity to comment has been held, the FEA may issue a prohibition order to the affected utility.\textsuperscript{83}

Before a prohibition order becomes effective, there are other complex requirements which also must be satisfied. The effectiveness of a prohibition order is contingent upon the completion of certain notification or certification procedures by the EPA, the issuance by the FEA of an environmental impact report on the effects of executing the prohibition order, and the issuance of a "notice of effectiveness" to the affected powerplant by the FEA.

The prohibition order does not become effective until the administrator of the EPA notifies the FEA, pursuant to section 119(d)(1)(B) of the Clean Air Act, that the powerplant will be able on and after July 1, 1975, to burn coal in compliance with all applicable air pollution requirements\textsuperscript{84} without a "compliance date extension" under section 119(c) of the act. If such notification is not given, the EPA adminis-

\textsuperscript{80} Id. § 305.3(b)(4)(i).
\textsuperscript{81} Id. § 305.3(b)(4)(ii). The Conference Report to ESEA encouraged the FEA to consult with the FPC in determining reliability of service because coal conversion "may have implications respecting adequacy and reliability of bulk power, supply matters within the FPC's jurisdiction . . . ." H.R. REP. No. 93-1085, 93d Cong., 2d Sess. 28 (1974).
\textsuperscript{82} See 15 U.S.C. § 792(b)(3)(A) (Supp. V, 1976). FEA regulations specify that the proposed prohibition order is to be published in the Federal Register. 10 C.F.R. § 305.5(b) (1976). In providing for the opportunity to comment, the FEA's practice has been to conduct nonadjudicatory hearings at which the affected utilities and the public are invited to make comment. Representative of the restrictions placed on such hearings were the following comments of the FEA about a June 16, 1975 hearing concerning four prohibition orders: "An FEA official will be designated to reside at the hearing. It will not be a judicial or evidentiary-type hearing. During an oral presentation, questions may be asked only by those conducting the hearing, and there will be no cross-examination of persons making oral presentations. At the conclusion of all initial oral presentations, each person who has made an oral statement will be given the opportunity, if he or she so desires, to make a rebuttal statement." 40 Fed. Reg. 23927 (1975).
\textsuperscript{83} See 10 C.F.R. § 303.37(a) (1976).
\textsuperscript{84} The term "air pollution requirement" means any emission limitation, schedule or timetable for compliance, or other requirement, which is prescribed under any federal, state, or local law or regulation. See 42 U.S.C. § 1857c-10(a)(2) (Supp. V, 1975).
trator can certify the earliest date that such powerplant, pursuant to a prohibition order, will be able to burn coal consistent with section 119 of the Clean Air Act.85

Like the EPA, the FEA also must consider environmental impact prior to the effectiveness of a prohibition order. The FEA has adopted the view that the National Environmental Policy Act of 1969 (NEPA)86 requires that a detailed "programmatic" statement be prepared regarding the general effect of the ESECA coal utilization program on the quality of the human environment.87 With respect to particular prohibition orders, FEA regulations obligate the agency to perform an analysis of the environmental impact of making each order effective. As a result of that requirement, the FEA must either issue a declaration that the particular order is not likely to have a significant environmental impact or prepare an environmental impact statement covering "significant site-specific impacts" (effects resulting from the particular powerplant) of each prohibition order if such impacts have not been "adequately discussed" in the general programmatic statement discussed above or in other designated public fora.88

Following EPA action and the FEA's environmental assessment, the FEA must issue a "notice of effectiveness" to the affected powerplant. This notice must specify a compliance schedule which assures that the prohibition order can be complied with on its effective date.89 The effective date of a prohibition order may not precede the date on which the notice of effectiveness was served.90 A prohibition order is valid only so long as the criteria underlying its issuance continue to be satisfied.

ESECA specifically provides that a prohibition order must be rescinded or modified if the FEA determines that the conditions specified in the act for such orders (e.g., practicability and availability of coal) are no longer met.91

EPA Authority To Reduce Environmental Requirements

Section 3 of ESECA, which added a new section 119 to the Clean

87. The specifics of this requirement are stated at 10 C.F.R. § 305.9(a) (1976).
88. Id. § 305.9(c).
89. See id. §§ 305.37(b)(3), (c).
90. Id. § 303.37(c).
Air Act, provides that, under certain conditions, the EPA may grant relief in the form of a "compliance date extension" to powerplants required by the FEA to convert to coal. A compliance date extension lengthens the time by which a powerplant must meet specified air pollution requirements.\textsuperscript{92} However, the EPA may not relax national primary ambient air quality control standards.\textsuperscript{93} If those primary standards are not being met in an air quality control region, the FEA may not make effective a coal conversion order to a powerplant located in that region any sooner than the date the EPA certifies the powerplant can comply with SIP emission limitations while burning coal.\textsuperscript{94}

A compliance date extension may not extend beyond January 1, 1979.\textsuperscript{95} The EPA must provide public notice and the opportunity to comment before issuing any compliance date extension.\textsuperscript{96} Furthermore, the EPA may revoke the compliance extension at any time if the plant violates a primary standard or a regional limitation.\textsuperscript{97}

In another respect, ESECA seeks to provide flexibility with respect to environmental requirements; ESECA requires the EPA to review SIPs and advise the states whether such plans can be revised without interfering with the attainment and maintenance of any national ambient air quality (primary or secondary) standard.\textsuperscript{98}

**Construction Orders**

A third essential feature of ESECA authorizes the FEA to issue orders which require that powerplants in the "early planning process" be designed or constructed with coal-burning capability. FEA regulations define "early planning process" as the period commencing ten years prior to the scheduled commencement of electric power sales and terminating with construction of the foundation piling of the powerplant.\textsuperscript{99}

Even if a powerplant is in the early planning process, a construction order cannot be issued unless the FEA finds that there is no impairment of service reliability\textsuperscript{100} and that there is an adequate and

\textsuperscript{92} See note 84 supra.
\textsuperscript{94} Id. § 1857c-10(c)(2)(D).
\textsuperscript{95} Id. § 1857c-10(c)(1).
\textsuperscript{96} Id. § 1857c-10(c)(4).
\textsuperscript{97} Id. § 1857c-10(d)(3)(A).
\textsuperscript{98} Id. § 1857c-5(a)(3)(B).
\textsuperscript{100} Title 10, section 307.3(c)(1) of the Code of Federal Regulations requires analysis of specific factors similar to those set forth in section 305.3(b)(4), concerning the issuance of a prohibition order.
reliable supply of coal reasonably expected to be available.

Furthermore, the FEA must consider the availability of coal transportation facilities.

If the FEA makes the above findings, the agency is then required to consider the following factors in exercising its discretion to issue such an order: (1) the existence and effects of contractual commitments for construction of a new powerplant; (2) the capability of the powerplant to recover any increase in capital investment required as a result of the issuance of a construction order; (3) the potential loss of revenue resulting from a delay in the commencement of the sale of electric power caused by the issuance of a construction order; and (4) relevant policies or regulations of any state or local agency.

Unlike prohibition orders, construction orders require no EPA certification. However, as with prohibition orders, the FEA must perform an analysis of the environmental impact of a construction order and must act on that specific analysis.

Allocation of Coal

A fourth essential provision of ESECA empowers the FEA to allocate coal, in case of shortages, to powerplants or major fuel burning installations which have been prohibited from burning natural gas or petroleum products as their primary energy source. The FEA has commented that its coal allocation program is "restrictive" in view of the "immense" practical problems, including factors limiting the fungibility of coal (such as variations in sulfur content and other coal characteristics such as ash fusion, BTU content, range of volatiles, temperatures, and grindability) and limitations inherent in the nature of coal supply systems. Accordingly, the "FEA [has] proposed to exercise its coal allocation authority only in exceptional circumstances, and the regulations . . . reflect this carefully considered policy."

FEA regulations provide that prior to December 31, 1978, the FEA may allocate coal to three designated parties. First, the FEA may

101. Title 10, section 307.3(c)(2) of the Code of Federal Regulations requires an evaluation of specific factors very similar to those set forth in section 305.3(b)(3)(i) concerning the issuance of a prohibition order.

102. 10 C.F.R. § 307.3(c)(2) (1976).

103. See id. § 307.3(d).

104. See text accompanying notes 86-88 supra.

105. 10 C.F.R. § 307.7(c)(1976).


107. Id. at 28421.

108. See id. at 28420.
allocate coal to any powerplant to which a prohibition order has been issued, provided that such allocation is "feasible." Second, the agency may allocate coal to any person designated by the EPA as one upon whom a fuel exchange requirement should be imposed to avoid or minimize adverse impact on public health and welfare resulting from coal conversion, provided that the FEA determines that the costs of fuel consumption resulting from requiring such exchange will not be "excessive." Third, the FEA may allocate coal to any ultimate coal consumer (one who obtains coal for its own use and not for resale) located in an area designated by the EPA as one requiring low sulfur fuel on a priority basis to avoid or minimize adverse impact on public health, to the maximum extent "practicable."

With respect to the "feasibility" limitation on allocating coal to plants having received prohibition orders, the FEA must analyze (1) the type and location of coal required by the particular powerplant, (2) the ability of the supplier to provide the coal, (3) the supplier's existing contractual commitments for coal, (4) the cost of the coal, and (5) the impact of cost on electric power rates. To determine the "excessiveness" of fuel costs resulting from a fuel exchange requirement, the FEA is directed to consider various specified costs, including those associated with burning the coal and those imposed on ultimate consumers. Determination of the "practicability" of allocating coal to ultimate consumers in EPA-designated priority areas includes consideration of coal availability, supplier capability, and any adverse impacts created by that allocation.

The FEA may not allocate coal to any powerplant until two years after the effective date of a prohibition order and then only if the FEA determines that an allocation is necessary as a result of "significantly changed circumstances" concerning coal availability.

The regulations provide the FEA with broad powers concerning the implementation of its allocation authority. The FEA is empowered

110. Id. § 309.3(b).
111. Id. § 309.3(c).
112. Id. § 309.3(a)(1).
113. Id. § 309.3(b).
114. Id. § 309.3(c).
115. Id. § 309.3(a)(2). It will be recalled that the FEA is not supposed to issue a prohibition order unless it determines there is an adequate coal supply available. See text accompanying note 75 supra.
to issue supply orders which specify terms and conditions of delivery. If necessary, the FEA ultimately may even specify applicable prices.

**Coal Conversion Record to Date**

Stuart Rosenblum, formerly chief of the legal and regulatory branch of the FEA coal conversion program, has commented that the program is intended to be a "pilot program that could, by definition, achieve only limited coal substitution." That statement is, in fact, consistent with President Nixon's statement upon signing ESECA into law. At that time, President Nixon stated that the "limited program" created by ESECA "represents a step in the right direction, but it does not provide a basis for the long term program of coal conversion necessary to achieve our goal of developing the capacity for energy self-sufficiency." In view of the limited scope of the program, the FEA has restricted its attention to coal conversions by existing utilities with existing coal burning facilities. The FEA has attempted to justify that decision on the grounds that

>b{oiler units built specifically for gas and oil firing do not generally have the capability or necessary equipment to burn coal; therefore, only those power plants which have burned coal in the past or were built to burn coal but never burned it will be considered for prohibition orders.}

A 1975 report prepared by the Congressional Research Service concluded that conversion of approximately 7 percent of existing fossil fuel fired powerplants "could occur with minimum difficulties" and that this could be accomplished in approximately five years. That report concluded that "[t]he overall impact of this conversion, however, will be small." The FEA has identified eighty existing powerplants which could be converted to coal or ordered to continue using coal without exorbitant conversion costs. The generating capacity of those eighty plants constitutes only about 7 percent of total fossil fuel fired generating capacity.

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116. 10 C.F.R. § 309.3(d)(1)(i).
117. Parties affected by a supply order will have thirty days from issuance of the order to agree to a price for the allocated coal before the FEA may determine the price. Id. § 309.3(e)(1)(ii).
119. **Staff of the Senate Comm. on Interior and Insular Affairs, 94th Cong., 1st Sess. ser. 94-22 (92-112), Executive Energy Messages 153 n.48 (Comm. Print 1975).**
120. **Environmental Statement, supra note 13, at 11-12.**
121. **See Factors Affecting Coal Substitution, supra note 5, at 2.**
122. *Id.*
The FEA estimated in April 1975 that nineteen of those plants could be converted immediately without violating primary ambient air quality standards and that an additional thirty-seven to forty-one could be converted by 1977, but that regional limitations would reduce the number of plants able to convert to seven in 1975 and to only twenty-four to twenty-six more by 1977. The significant risk provision would prevent two other plants from converting to coal. Consequently, as few as twenty-nine powerplants were estimated to be eligible for the use of coal as a primary energy source by 1977. Furthermore, the FEA has projected that only four additional coal-fired plants are scheduled to be completed by 1980.

It is clear that the government's present coal conversion program is likely to have a less than substantial effect by 1980. Indeed, as of October 15, 1976, not a single coal conversion order had been made effective, much less implemented. A review of specific action by the federal government to date is illuminating.

In April 1975, the FEA issued an environmental impact statement for the FEA program to implement section 2 of ESECA. On May 9, 1975, the FEA issued the first of a series of notices entitled "Intention to Issue Prohibition Orders to Certain Powerplants." The notices summarized the orders, the findings supporting the orders, and the procedural rules concerning oral and written comment. On June 30, 1975, the FEA issued prohibition orders to twenty-five utilities, affecting seventy-four powerplants at thirty-two generating stations. The FEA issued no prohibition orders during the period from July 1, 1975 through October 15, 1976.

As of January 15, 1976, the EPA administrator had notified the FEA that four plants could burn coal and comply immediately with all air pollution requirements without a compliance date extension. By July 15, 1976, the EPA had notified the FEA of three additional powerplants able to meet these requirements. As of October 4, 1976, the EPA had taken the following action with respect to the

123. Id. at 28.
124. See Environmental Statement, supra note 13, part IV.
125. Id.
127. See, e.g., 40 Fed. Reg. 23928-29 (1975), where the FEA made various specific findings with respect to conversion of coal by a powerplant owned by the Village of Winnetka, Illinois.
128. See id. at 28430.
130. See id. at 38207.
powerplants to which the FEA issued prohibition orders on June 30, 1975:

(1) It notified the FEA that eleven powerplants could burn coal and comply with all applicable air pollution requirements immediately, without a compliance date extension.

(2) It promulgated compliance date extensions to sixteen powerplants.

(3) It proposed in the Federal Register compliance date extensions for four powerplants.

(4) It certified the earliest dates by which compliance would be possible for thirty-five powerplants.131

As of October 15, 1976, the FEA had taken no further action to implement the prohibition orders issued to those powerplants as to which the EPA had completed necessary certification.

To summarize, of the seventy-four prohibition orders issued to twenty-five utilities by the FEA on June 30, 1975, the EPA had, as of October 15, 1976, completed its required certification with respect to sixty-six powerplants, while the FEA had completed its required action (including completion of environmental impact assessment and issuance of notices of effectiveness) with respect to none. It must be inquired why the FEA has acted so slowly, particularly relative to the EPA's satisfactory record in completing actions within that agency's responsibility.

In the issuance of construction orders, the FEA has taken action more swiftly. However, none of the plants to which construction orders have been made effective are in operation. On June 6, 1975, the FEA issued a "Notice of Intention to Issue Construction Orders to Certain Powerplants in the Early Planning Process."132 On June 30, 1975, the FEA issued construction orders to thirty-five utilities involving seventy-four powerplants at forty-seven generating stations.133 One year later, the FEA issued notices of effectiveness making effective thirty of the construction orders to twenty-one of the utilities,134 following publication of the required environmental analyses. No administrative appeals of the construction orders were filed within the thirty-day period allowed by FEA regulations.135 On September 30, 1976, the FEA

133. See id. at 28430-34.
issued construction orders to an additional forty-eight powerplants.\textsuperscript{138}

The FEA has acknowledged that all forty-eight of the powerplants to which construction orders have been issued were required to be designed with coal burning capability.\textsuperscript{137} Consequently, it might be contended that issuance of these construction orders does not advance the nation's coal conversion effort. Nevertheless, these construction orders will act to ensure that there will be no future conversions to oil or gas by the power plants to which the construction orders apply.

The FEA has finally indicated an intention to require powerplants which are not being designed with coal burning capability to be redesigned in order to have that capability. On October 7, 1976, the FEA's Office of Coal Utilization announced its intention to issue notices of intent to issue construction orders to a number of powerplants (totaling less than ten), whose present plant construction plans do not provide for coal burning boilers.\textsuperscript{138}

Despite the comprehensive regulatory scheme for coal allocation, as of October 15, 1976, the FEA had not issued any coal supply orders. It is unfortunate that the FEA has failed to exercise that coal allocation authority, particularly where allocation of low sulfur coal might enable powerplants to which prohibition orders have been issued to convert immediately to coal use and comply with applicable air quality standards.

\section*{Compliance Record with Environmental Requirements}

The nation's poor coal conversion record is coupled with a poor statistical record of compliance by utilities with air quality requirements. A 1973 EPA study of coal consumption by utilities indicated that 47.7 percent of the coal burned by utilities did not achieve required emission limitations of applicable SIPs.\textsuperscript{139} The EPA report is supported by a more recent Bureau of Mines study which reported that of 400 million tons of coal shipped to utilities during fiscal year 1975, applicable air quality standards would not be met with respect to 195 million tons (48.75 percent). The high sulfur content of much of that coal leads to a higher level of sulfur oxide emissions when the coal is burned.\textsuperscript{140}


\textsuperscript{137} \textit{Id.}


\textsuperscript{139} \textit{Division of Stationary Source Enforcement, Environmental Protection Agency, Summary of Coal-Fired Power Plants Out of Compliance with Sulfur Dioxide Emission Limitations} (1975).

\textsuperscript{140} Bureau of Mines, U.S. \textit{Dep't of the Interior, Effects of Air Quality Requirements on Coal Supply} 4 (1976).
However, the Bureau of Mines report indicated that "[n]onconformance is minimized to some extent . . . by permissible variances and compliance date extensions pending the effectiveness of plans for increasing conformance." In this connection, EPA records (as of approximately October 1, 1976) indicate that of the seventy-four powerplants to which prohibition orders were issued by the FEA on June 30, 1975, the EPA had issued or proposed to issue compliance date extensions for twenty. These statistics indicate the high percentage of instances where the EPA has recognized that air quality control requirements cannot be complied with immediately.

The poor compliance record by the electric utility industry and the necessity for the issuance of variances and compliance date extensions may reflect overly ambitious expectations by the government as to the industry's technological capability to comply immediately with air quality requirements. In fact, at the time of the Clean Air Act amendments of 1970, Congress recognized that the pollution control technology necessary for the attainment of ambient air quality standards had not been developed and intended the Clean Air Act to force industry to formulate such technology. Spokesmen for the electric utilities and the coal industry agree that efficient sulfur control technology is not presently available and, moreover, complain that the federal government has offered minimal support for an economic means of attaining compliance with air quality control requirements. The utilities are clearly nervous about the level of capital investment in air quality control technology necessary to enable coal burning powerplants to comply with air quality requirements. They have recently experienced increases in operating costs, increases in interest rates, and drops in the prices of their stocks. Their current financial difficulties could easily be exacerbated by the considerable investment in air quality control technology that seems necessary. Furthermore, state regulatory commissions, which set utility rates, may not automatically allow the passthrough to

141. Id.
142. See text accompanying notes 92-97 supra.
143. See Duquesne Light Co. v. EPA, 522 F.2d 1186, 1196 (3rd Cir. 1970), vacated, 96 S. Ct. 3185 (1976).
145. See, e.g., BUREAU OF MINES, U.S. DEP'T OF INTERIOR, EFFECTS OF AIR QUALITY REQUIREMENTS ON COAL SUPPLY 2 (1976). See also Duquesne Light Co. v. EPA, 522 F.2d 1186 (3d Cir. 1970), vacated, 96 S. Ct. 3185 (1976), where it was established that a utility would have to expend a minimum of $202 million in pollution control equipment of a certain type, and that annual operating and maintenance expenses would total at least $56 million.
electricity consumers of pollution control equipment costs. Nevertheless, the utilities have expressed a willingness to commit themselves to coal conversion, if these and other questions involving the economic feasibility of capital investment in pollution control equipment can be satisfactorily resolved.146

The technological considerations applicable to compliance with air quality control requirements will now be reviewed.

**Status of Inexpensive Air-Purification Technology**

Presently available forms of air pollution control technology, especially with respect to sulfur oxide emissions, are the subject of considerable debate both as to effectiveness and as to cost.

Sulfur oxide emissions can be controlled by two methods: noncontinuous and continuous emission control systems. In a noncontinuous control system, tall stacks are employed at the powerplant to disperse sulfur oxide emissions so that at ground level the air quality meets the applicable standards. Noncontinuous control systems are generally advocated by the electric utilities, but the EPA has ruled that noncontinuous controls are not appropriate long-term solutions to emission limitation requirements, although permissible for interim use pending installation of continuous emission control systems.147

Continuous emission control systems, supported by the EPA, consist of two major categories, precombustion and postcombustion. Precombustion methods include switching to lower sulfur coal, physical coal cleaning, and coal conversion processes such as gasification, liquefaction, and solvent refining. Capital costs of converting the powerplant and the lack of low sulfur coal148 are the chief impediments to switching to such coal. Capital costs are also an obstacle to coal washing. Coal conversion processes are still technologically infeasible for large scale use. Developmental work is presently underway on another precombustion system, the fluidized bed process, which is believed to involve lower capital costs than other conventional systems.149

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146. See, e.g., NATIONAL ELECTRIC RELIABILITY COUNCIL, FOSSIL AND NUCLEAR FUEL FOR ELECTRIC UTILITY GENERATION 1 (1976). The National Electric Reliability Council includes representatives of all of the electric power systems in the United States and is a leading spokesman for the electric utility industry.

147. See FACTORS AFFECTING COAL SUBSTITUTION, supra note 5, at 40.

148. In one case a court said, "The EPA and the utilities agree that low-sulfur coal is presently scarce and will not be available to satisfy the needs of the utility industry for at least five years." Duquesne Light Co. v. EPA, 522 F.2d 1186 (3d Cir. 1970), vacated, 96 S. Ct. 3185 (1976).

149. Under the fluidized bed combustion process, sulfur from the combusted coal
Postcombustion systems include fuel gas desulfurization units ("scrubbers") in a number of variations. The use of "scrubbers," which typically trap sulfur oxides in lime or limestone as it passes out of a powerplant's smokestack, is the "center of massive controversy." The EPA has advocated use of scrubbers in order to meet sulfur oxide emission limitations. The United States Court of Appeals for the Third Circuit, however, ruled in Duquesne Light Co. v. EPA that the EPA had acted arbitrarily and capriciously in approving an SIP which ordered the purchase and installation of scrubbers in a new coal-fired powerplant without considering the economic impact of the increased costs created by the purchase and installation of such scrubbers. The court also indicated that scrubbers had not been demonstrated to be reliable or technologically feasible. The judgment in Duquesne, however, was vacated and remanded by the United States Supreme Court in view of its holding in Union Electric Co. v. EPA, that it is improper for the EPA administrator to disapprove an SIP on the ground that the technology required by the plan has not been proved feasible.

Proposed Tightening of Environmental Requirements

At the same time that electric utilities have been experiencing difficulty in complying with existing air pollution control requirements, Congress has been considering strengthening those requirements. The most significant proposal would add a new subsection to the Clean Air Act, requiring each state containing an area in which the air quality is better than any national ambient air quality standard to adopt and enforce provisions to prevent significant deterioration of air quality in that area as part of its SIP. The proposed amendment, among other things, would include the following provisions:

1. SIPs would be required to provide for a permit system whereby all powerplants emitting over 100 tons of pollutants a year must apply for an operating permit from the state.

2. Increments setting forth the maximum allowable increase combines with limestone seated on a hot bed. The sulfur may then be removed, and the limestone recycled.

150. FACTORS AFFECTING COAL SUBSTITUTION, supra note 5, at 38.
151. See, e.g., ENVIRONMENTAL PROTECTION AGENCY, REPORT TO CONGRESS ON CONTROL OF SULFUR OXIDES (1975).
152. 522 F.2d 1186 (3d Cir. 1975), vacated, 96 S. Ct. 3185 (1976).
153. See id. at 1197-1200.
in pollutants for particulates and sulfur dioxide would be stated in the statute.

(3) Certain lands would be initially designated as Class I areas.157

A leading spokesman for the electric utility industry, the National Electric Reliability Council, has commented that "[s]hould these ‘significant deterioration’ amendments be passed, they would constitute a formidable barrier in most areas of the country to the development of new coal-fired generating plants, thus greatly restricting coal as a future energy source."158

The EPA, however, is somewhat less pessimistic concerning the effect of the significant deterioration amendments on coal conversion. An October 1975 EPA report concluded as follows:

The aggregate impact of the Senate and House significant deterioration proposals would not prevent the construction of new coal-fired power plants. However, the Congressional proposals would require most new coal-fired plants to either meet emission limitations more stringent than Federal New Source Performance Standards (NSPS), construct taller stacks, build smaller plants and/or relocate at alternative sites.159

Conclusion and Recommendations

It is crucial that we end governmental indecision concerning the reconciliation of our national objectives of energy independence and environmental protection. In an atmosphere of uncertainty, the private sector cannot plan or make the necessary commitment to increase the number of coal-fired powerplants. The federal government should clearly state what will be required of the private sector. A more comprehensive mandatory coal conversion program should be instituted and environmental safeguards on the air which we breathe should not be relaxed. Expedition of technological research and development of effective air pollution control methods at a reasonable cost through governmental initiative should bolster an effective coal conversion program without greatly increasing costs to consumers. But even if we must pay more for burning coal in a fashion that will not pollute the air we breathe, we should pursue this course. The era of cheap energy is over, whether we primarily use coal or oil and gas. We cannot afford to be at the mercy of such an unpredictable source of oil and gas as OPEC.

157. Id.
158. NATIONAL ELECTRIC RELIABILITY COUNCIL, 6TH ANNUAL REVIEW OF OVERALL RELIABILITY AND ADEQUACY OF THE NORTH AMERICAN BULK POWER SYSTEMS 10 (1976).
159. IMPACT OF SIGNIFICANT DETERIORATION, supra note 44, at 2.
A change in policy by the federal government, emphasizing an accelerated, comprehensive coal conversion effort and a commitment to maintain stringent air quality control requirements could make significant progress, even within the present legal framework. For example, under existing law the FEA surely could have made effective at least some of its prohibition orders after the EPA completed its required action. Statements by then President-elect Carter indicate that, at a minimum, a clear statement of federal commitment to coal conversion can be expected from the new administration.  

In addition to a clear statement of commitment, new coal conversion legislation is desirable. Such legislation should include certain of the provisions of S. 1777, the "National Petroleum and Natural Gas Conservation Act of 1975." That bill was considered by the 94th Congress in 1976, but, unfortunately, time constraints prevented the bill from reaching the Senate floor for a vote. The provisions of S. 1777 provide for a significantly more comprehensive coal conversion program than the ESECA program and include more stringent coal conversion requirements. Virtually all powerplants and other sources to be completed after January 1, 1979, would be required to have coal-burning capability. Furthermore, these new powerplants would not be permitted to use either gas or petroleum as their primary boiler fuel after January 1, 1979, unless they pay a civil penalty during the period of violation. Unless the FEA were to find that conversion to coal is not practicable, existing powerplants subject to S. 1777 would have to use coal as their primary boiler fuel after January 1, 1985, or be subject to pay a civil penalty. 

160. In a public letter to David Boren, the Governor of Oklahoma, then President-elect Carter said, "I favor a substantial shift from the use of oil and gas—our highest quality energy sources—to coal, which we have in abundance. We must immediately begin a program to encourage conversion from the use of petroleum and natural gas to coal in those applications for which coal is an acceptable substitute. Our present demand for coal is limited by two important factors. First, we have geared our technological growth to oil and gas for well over 100 years. Second, we have failed to establish a stable regulatory climate in which coal producers are sure of the rules of the game before they make investments in expanded production or new mines. Switching to the use of coal will require strong presidential leadership and proper federal incentives to encourage the conversion process. A Carter Administration will provide this leadership." Letter from James E. Carter, Jr. to David Boren, Oct. 19, 1976.

162. See id. § 101(b)(1).
163. Id. § 102(a)(2).
164. Id. § 103(d).
165. Id. § 102(b)(2)(B).
166. Id. § 102(b)(4).
167. Id. § 103(d).
This proposed legislation would make no significant compromises with respect to environmental considerations. The provisions of S. 1777 require that after January 1, 1980, existing powerplants may operate only if they conform to environmental requirements. However, the bill provides for some administrative flexibility in implementing its requirements. For example, the FEA would be permitted to grant compliance date extensions, temporary exemptions, and permanent exemptions from the requirements summarized above in certain circumstances.

Considering the emphasis President Carter has given to the use of coal as an energy source, it is likely that a bill similar to S. 1777 will be introduced in the 95th Congress. With the threat of a White House veto (which prevailed under then President Ford) removed, it would appear that such stringent legislation would have an excellent chance of enactment.

With respect to other proposed legislation likely to be introduced in the next Congress concerning significant deterioration of the air, it may be advisable for the federal government to adopt a more tentative posture. It may be desirable that the proposed immediate strengthening of the significant deterioration requirements be deferred until adequate air pollution control equipment is developed.

In connection with an expanded coal conversion effort and rigorous enforcement of air pollution laws, a greater federal effort should be made to encourage the development of low-cost air pollution control equipment. In fact, the federal government has instituted a research and development program concerning air pollution control technology. In June 1975, the Energy Research and Development Administration (ERDA) established by the Energy Reorganization Act of 1974 released a national energy research and development plan which, in part, provides for an increased effort to expand coal use through improved environmental control technologies. It is too soon to measure the success of that program. Several demonstration projects, however, have been funded by ERDA. For example, an ERDA-funded demon-

168. Id. § 102(b)(1).
169. Id. § 102(b)(2).
170. Id. § 102(b)(4).
171. Id. § 102(b)(2)(B).
stratification plant using the fluidized bed combustion process has recently been completed.\textsuperscript{174} Government funding of demonstration projects of this nature should be expanded. In addition, adequate incentives for development of inexpensive air pollution control equipment should be provided to the private sector. For example, legislation similar to a bill introduced in 1976 by Senator Humphrey (which was not enacted into law) would be helpful. The provisions of that Senate bill, S. 3209, the "Coal Substitution Incentives Act of 1976,"\textsuperscript{175} would provide loans and loan guarantees for utilities to install air pollution control equipment that would enable them to convert to coal. Furthermore, tax incentives for the development by private industry of inexpensive air pollution control technology might be instituted.

It is also important for the various governmental bodies involved to ensure that most of the increased costs incurred by electric utilities in developing, installing, and maintaining air pollution control equipment may be passed through to ultimate customers. We all must share the increased expense of converting to a more secure energy source and ensuring that we breathe clean air.

Other important considerations in an effective coal conversion program are the adequacy of useable coal supply and of coal transportation facilities.\textsuperscript{176} Although potential coal reserves are vast, much of the immediately available coal is high in sulfur content. Uncertainties as to the permissibility of burning high sulfur coal has severely constrained the expansion of its production.\textsuperscript{177} However, an unequivocal federal commitment to coal conversion and the development of satisfactory equipment to control sulfur oxide emissions can beneficially affect available coal supply. A governmental statement of such a commitment should help alleviate concern by the coal industry as to whether there is assured long-term demand for increased production of high sulfur coal.

Governmental action of this nature should also assuage the fears of the coal transportation industry; rail and water carriers in particular have been reluctant in the past to commit their resources to a major expansion in fleets and equipment necessary for transporting increased

\textsuperscript{175} S. 3209, 94th Cong., 2d Sess. (1976).
\textsuperscript{176} S. 3209, 94th Cong., 2d Sess. (1976).
\textsuperscript{177} For a discussion of the relevant considerations affecting coal supply and transportation, see Factors Affecting Coal Substitution, supra note 5, at 1-9.
quantities of coal. Assurances of long-term demand for increased quantities of coal should encourage a greater investment in the necessary transportation equipment.

The foregoing recommendations do not constitute a panacea for the nation's dilemma with respect to balancing energy and environmental considerations. However, these specific proposals should make a significant contribution to achieving energy independence at an acceptable cost without sacrificing environmental quality.