

Chapter VII

PRESENT FEDERAL COAL POLICY

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	<i>Page</i>
Policy Evolution •	337
National Environmental Policy Act	338
Federal Coal Leasing	339
Past Leasing Law and Practice	340
Development of a New Federal Coal Leasing Policy	341
Problem Areas	342
Surface Mining Control and Reclamation Act of 1977	343
The Federal Mine Safety and Health Act of 1977.....	345
The Clean Air Act. ,	349
Background and History.	349
National Ambient Air Quality Standards	349
New Source Performance Standards, ..	350
Nonattainment Areas.	351
Prevention of Significant Deterioration/Visibility Protection.	352
EPA Studies and Potential New Standards	353
Interface with Energy Legislation, ..	353
Implementation of the Amendments	354
The Clean Water Act	355
Water Quality Standards	356
Effluent Limitations	356
Thermal Discharges	358
Permit Systems.	359
Areawide Planning	359
Resource Conservation and Recovery Act of 1976. . . ,	360
Coal Conversion Authority.	361
Other Federal Policy Actions	363
Implementation •	365
Institutional Factors, ..., ,	365
Environmental and Social Impacts.	365
The Promotion of Coal Use	368
Evaluation	368

TABLES

	<i>Page</i>
58. Standards for Particulate Matter, Sulfur Dioxide, and Nitrogen Dioxide .,	350
59. Effluent Limitations: Steam Electric Power Generating Units	357
60. Effluent Limitations: Coal Mining Point Source Category	358
61. Potential Sludge and Ash Disposal Costs Under RCRA. ..	361

PRESENT FEDERAL COAL POLICY

Neither Congress nor the President has yet articulated a comprehensive and consistent policy for coal. Nevertheless, the major elements of such a policy are in place. The National Energy Act of 1978 and the earlier Energy Supply and Environmental Coordination Act of 1974 promote the use of coal to increase the Nation's capability to use domestic energy sources. The National Environmental Policy Act, the Clean Air Act and Amendments, the Clean Water Act, the Surface Mine Control and Reclamation Act, and other Federal policy actions minimize environmental degradation resulting from, among other causes, the production and use of coal. The Mine Safety and Health Act is intended to reduce the hazards to miners, while black lung benefits compensate for past abuses. Various provisions also have been made to assist communities experiencing rapid growth as a result of coal development. Thus coal policy might be summarized briefly as: When fossil fuel is to be used, coal shall be the choice wherever practical, but it must be mined and burned in ways that minimize the negative environmental and human impacts. These goals are obviously contradictory, but they need not be mutually exclusive.

Because Congress has never legislated a national coal policy, the current Federal role has evolved incrementally as part of a continuing political process where different interests – both inside and outside of Government—compete for influence. This competition involves lobbying Congress, media campaigns, gaining access to policy makers, researching issues, bargaining with the opposition, and mobilizing and targeting pressure. The consequence of this process is that Federal policy is often contradictory, frequently delayed by legal challenges, occasionally jarred by legislative initiatives, and rarely settled once and for all.

This chapter explores the present structure of Federal coal policy and how it is being implemented. The next chapter analyzes policy strategies that may be considered in the future.

POLICY EVOLUTION

At the end of World War II, coal supplied about half the Nation's energy needs. By 1950, it had been eclipsed by oil, and natural gas surpassed it in 1958. Such a rapid decline in absolute as well as relative importance indicates that more was occurring than an industry succumbing to stronger competition. Both market prices and Federal policies discouraged the use of coal relative to oil and gas. Similarly, the negative impacts of coal were not of paramount concern to the Federal Government except in so far as they contributed to the tilt toward oil and gas. Federal coal on western lands was made easily available, but little development was expected to take place.

In the last decade, the realization of the resource limitations of oil and gas has renewed interest in coal as the logical substitute, result-

ing in a variety of Federal policies related to coal. Federal legislation first addressed the occupational health and safety risks of coal mining. Subsequent Federal policy directives addressed the air and water quality effects of mining and combustion on human health and the environment. Recently, the disposal of mine and combustion wastes and the reclamation of surface mines have come under Federal jurisdiction. However, there are many points in the entire pattern of coal production and use where the different goals — increased production, environmental protection, and maximum social benefit— conflict. Both Congress and the executive branch have sought to fashion policies and administrative frameworks that can resolve these conflicts, but they often are frustrated by overlapping and conflicting mandates that result in inconsistent or fragmented

policies. For example, an adequate water supply is crucial to mining operations but the lack of a comprehensive Federal water policy offers little direct support to a policy of increased coal development.

The Federal legislation that constitutes the major elements of a national coal policy are analyzed below, categorized according to their goals: environmental and social impact management, and the promotion of coal use.

National Environmental Policy Act

The National Environmental Policy Act of 1969¹ (NE PA) was intended to restructure Federal agency decision making in favor of an interdisciplinary approach to ensure that environmental amenities and values would receive appropriate consideration along with the traditional economic and technical factors. NEPA was the first major environmental legislation passed by Congress and it has remained the most far-reaching in scope.

In general, NE PA has a threefold purpose: to declare a national policy to create and maintain conditions under which man and nature can exist in productive harmony and can fulfill the social, economic, and other requirements of present and future generations; to increase the understanding of ecological systems and natural resources; and to promote efforts that will prevent or eliminate damage to the environment. As one means of achieving these purposes, NEPA requires all Federal agencies to include a detailed environmental impact statement (EIS) in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment. The EIS requirement has been held to be applicable to a wide variety of Federal actions, ranging from the construction of a Federal building to the issuance of a construction permit for a nuclear powerplant.

An EIS is required to include detailed information about:

- the environmental impact of the proposed action,
- any adverse environmental effects that cannot be avoided should the proposal be implemented,
- alternatives to the proposed action,
- the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
- any irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented.

In addition, the Council on Environmental Quality (CEQ) regulations for the preparation of EISs require discussions of indirect effects, such as population and growth; energy requirements and the conservation potential of various alternatives and mitigation measures; and possible conflicts between the proposed action and the objectives of other Federal, regional, State, tribal, or local policies.

All coal-related activities that have a significant impact on the environment and that need Federal authorization require an EIS. This includes coal leases on Federal lands and large coal combustion facilities. Although permits issued by the Environmental Protection Agency (EPA) under the Clean Air and Water Acts are exempt from the EIS requirement, those Acts require separate analyses of a project's impact on the environment.

The original CEQ regulations implementing NEPA were limited to the preparation of EISs and did not address NE PA's other provisions intended to improve agency planning and decisionmaking. In addition, CEQ's guidelines for preparing EISs were only advisory; more than 70 different sets of agency regulations were promulgated to implement the guidelines. As a result, agency practices varied widely and the EIS tended to become an end in itself rather than a means to making better decisions. The NEPA process was criticized by environmentalists for its attention to procedure rather than substance, by permittees for delays it caused in project authorization, and by Government officials for the amount of paperwork it required.

¹42 U. SC. 4321 et seq

In 1977, CEQ was given the authority to issue binding regulations to replace its advisory guidelines and the various agency regulations. The new CEQ requirements, which were published in November 1978, are designed to produce better agency decisions and to reduce delays and paperwork.²

The new CEQ regulations are intended to comply with the original intent of NE PA that the E IS be an action-forcing procedure to implement the substantive requirements of the Act and thus to produce better agency decisionmaking. They require agencies to publish a concise public record that indicates how the E IS was used in making a decision. This record must indicate which alternative is preferable on environmental grounds. If that alternative is not the one chosen, the record must identify the essential considerations of national policy that were balanced in making the decision, including factors not related to environmental quality such as economic and technical considerations or legislative mandates, and must explain why the environmental considerations were outweighed by these other factors. A second provision of the new regulations, which is intended to produce better decisions, requires **agencies to monitor projects to ensure that mitigation procedures and other conditions established in the EIS are implemented. Finally, the new regulations require that a list of the people who helped prepare an EIS and their professional qualifications be included in the statement to encourage accuracy and professional responsibility and to ensure that an interdisciplinary approach was followed,**

To reduce paperwork, the regulations require agencies to reduce the length of EISs (CEQ suggests 150 pages as the limit for a normal E IS), prepare analytic rather than encyclopedic statements, use plain language, follow a clear format, and reduce emphasis on background material. In addition, Federal agencies can eliminate duplication by preparing EISs jointly with State and local agencies that require similar assessments. The regulations also institute a new "scoping" procedure for deciding which issues should be emphasized in

the E IS and how the responsibility for the E IS should be apportioned among the agencies involved. This scoping procedure is to begin as early as possible in the N EPA review and must be integrated with other planning.

Provisions of the regulations designed to reduce delays in project authorizations include emphasizing interagency cooperation before the E IS is prepared rather than submission of adversary comments on a completed draft, establishing time limits for E IS preparation, and using categorical exclusions to define actions that are exempt from the E IS requirement. In addition, the regulations call for a "tiered" approach in which material common to a broad program or a related series of actions is included in broader EISs, such as national program or policy statements, and then summarized and incorporated by reference in successively narrower EISs, such as regional or basinwide program assessments and, ultimately, site-specific statements. Finally, many of the regulations intended to reduce paperwork also will reduce delays, such as the scoping process and the elimination of duplicate statements.

It is too soon to tell whether these regulations will restructure agency decision making in order to implement fully NE PA's environmental policy goals. However, the regulations should significantly reduce the resources required to comply with the Act and thus prevent N EPA from becoming a limiting factor in decisions related to coal development.

Federal Coal Leasing

The National Energy Plan calls for expanded reliance on coal. Some commentators have suggested that Federal coal reserves will be a key factor in determining whether the Nation will meet its energy goals. Western coal comprises roughly half of the total U.S. coal reserves; the Federal Government owns 65 percent of Western *coal and indirectly* controls another 20 percent. On the other hand, the 1977 amendments to the Clean Air Act may considerably reduce the advantages that have accrued to low-sulfur Western coal in the past if those amendments require pollution con-

²43 F R 55978 (Nov. 29, 1978)

trols regardless of the sulfur content of the fuel.

Even if Western coal is required to meet national energy goals, it is not clear how many new Federal coal leases would be needed. Sixteen billion tons of Federal coal already are under lease and another 9 billion are subject to existing applications for preference-right leases. In addition, there are an estimated 93.4 billion tons of recoverable coal reserves on private lands in the West.

Thus it is unclear how important Federal coal will be to the Nation in the future or whether additional Federal leasing is needed. Yet no comprehensive Federal coal leasing policy currently exists, and even if more Federal coal is required to meet the Nation's energy goals, it probably will not be able to play a central role until the early 1980's. This section reviews the history of Federal coal leasing, examines recent congressional action, and outlines the major obstacles to a rational leasing policy.

Past Leasing Law and Practice

Originally, the Federal Government sold or gave away its coal-bearing lands. Then, under the Mineral Leasing Act of 1920,³ it became Federal policy to issue leases for prospecting and mining. Where there were known coal deposits, leasing tracts were awarded by competitive bidding. In other areas, the Department of the Interior issues 2-year prospecting permits. If commercial quantities of coal were discovered during those 2 years, the permittee was entitled to a preference-right lease for all or part of the land.

Although the 1920 Act contained numerous provisions designed to protect the public interest and to ensure a fair return to the Government, most leases were issued on an ad hoc basis without regard to energy needs or environmental factors. Much of the leased land fell into the hands of a few large companies that were interested only in speculation. The Federal Government often charged lower royalties than private lessors and Government leases

could be held without development at little cost and transferred at will.

Leasing generally was based on a site-by-site response to applications, usually at the State level with no National policy guidance. Consequently, what mining did occur was hampered by irrational landownership patterns in the Western coalfields. Areas that logically should have been mined as single units were divided among private owners and Federal lessees. Similarly, there was often a split in ownership of surface and mineral rights. In addition, data necessary to develop a coherent National policy, such as information on the location and extent of coal deposits, were not available.

In November 1970, the Bureau of Land Management (BLM) released a study that summarized the results of these abuses.⁴ The study found that while the number of acres being leased was rising, production from leased lands was dropping; 91 percent of all coal leases were not producing anything. BLM concluded that "existing policies and procedures with respect to the development of federally managed coal resources are inadequate to encourage their development." As a result of this study, the Department of the Interior imposed a moratorium on coal leasing while it reassessed its own policies. In February 1973, interior announced that a new long-term policy was under development and in the interim no new prospecting permits would be issued and coal would be leased only where certain "short-term" criteria were met.

The short-term criteria were designed to prevent undue hardship to companies as a result of the moratorium. Initially, they permitted coal leasing when necessary to maintain an existing operation or to serve as a reserve for production in the near future. Unfortunately, these criteria were abused and received scathing criticism from the General Accounting Office.⁵ The criteria were revised in July 1977; 2 months later they were included in an in-

⁴*Holdings and Development of Federal Coal Leases*, (U.S. Department of the Interior, Bureau of Land Management, unpublished, November 1970).

⁵*Further Action Needed on Recommendations for Improving the Administration of Federal Coal-Leasing Program* (Washington, D. C.: General Accounting Office, U.S. Comptroller General, April 1975).

³30 USC. 181 et seq.

junction issued by a Federal court against the entire Federal leasing program. ^bAt present, short-term leasing is permitted only when necessary to maintain the level of production at an existing mine or to meet existing contracts and when the extent of the lease is not greater than required to meet these conditions for 3 years.

Short-term leasing has produced little coal. Only 12 leases covering 30,459 acres have been issued since 1973. Industry is reluctant to commit itself to short-term coal leases and the court's criteria are difficult to meet.

Over the same period, the Federal Government's long-term leasing program has gone through two stages, known as EMARS I and EMARS II. In May 1974, the Department of the Interior issued a draft programmatic EIS, outlining its plans for a long-term leasing program, or Energy Minerals Allocation Recommendation System (EMARS I), which required the Government to set leasing targets based on national energy needs. Under EMARS I, leasing tracts were to be nominated by the Government based on land use plans. Environmental impact assessments were to be performed on the nominated tracts and those that were suitable for leasing put up for competitive bidding.

In September 1975, after a comment period on the impact statement and EMARS I, the Department of the Interior issued the final programmatic EIS. The impact statement adopted an Energy Minerals Activity Recommendation System (EMARS II) instead of the Allocation System contained in the draft statement. Under EMARS II, industry would nominate leasing tracts, indicating the type, amount, and location.

Both the final impact statement and the EMARS II program were criticized severely. The General Accounting Office noted, among other deficiencies, that the Department of the Interior was assuming its traditional role of reacting to industry proposals rather than man-

aging national energy resources. ⁷In September 1977, a Federal court enjoined Interior from taking any steps whatsoever, directly or indirectly, to implement the new coal leasing program, and ordered the Department to correct the deficiencies in the final EIS and to circulate the revised statement for review and comment. ⁸Until the new EIS is completed — which Interior indicates will be not earlier than mid-1979 — no long-term Federal coal leasing will occur.

Development of a New Federal Coal Leasing Policy

In 1976, Congress passed the Federal Coal Leasing Amendments Act⁹ to address the deficiencies of the Mineral Leasing Act of 1920. The 1976 amendments discourage speculation by making leases more difficult to obtain and to hold cheaply. Federal leases now must be developed within 10 years or they terminate automatically, they cannot be issued for less than their fair market value, and minimum royalties are set. In addition, all leasing must be by competitive bidding with 50 percent leased under a deferred bonus bidding system that makes it easier for small companies to compete. Preference-right leases are abolished, and no person or corporation may hold more than 100,000 acres of leases.

The amendments also contain various provisions to encourage land use and environmental planning, including the creation of "logical mining units." In addition, one-half of all royalties must be turned over to the States to provide public services and mitigate community impacts. Finally, the Department of the Interior is directed to conduct a comprehensive exploratory program to determine the extent of Federal coal reserves.

In 1977, BLM promulgated regulations to implement the Federal Coal Leasing Amendments Act. Because they are so recent and because

^a*Natural Resources Defense Council v. Hughes*, 7 E.L.R. 20785 (D. D. C., 1977).

⁷*Role of Federal Coal Resources in Meeting National Energy Needs To Be Determined and the Leasing Process Improved* (Washington, D. C.: General Accounting Office, U.S. Comptroller General, April 1976)

⁸*NRDC v. Hughes*.

⁹30 USC. 201-209.

new leasing has been almost nonexistent since 1970, the degree to which they will remedy past abuses is unclear. However, it already is obvious that a number of the regulations are confusing and may have to be clarified or revised.

In his May 1977 environmental message, President Carter directed the Secretary of the Interior to undertake a major review of Federal coal leasing policy. In particular, the Secretary was directed to ensure that the Department of the Interior could respond to reasonable production goals while leasing only those areas where mining is environmentally acceptable and is compatible with other land uses. Special attention is to be given to existing leases that are nonproducing or environmentally unacceptable.

In response to this directive and to a request by the court that enjoined EMARS II, the Department of the Interior created a Federal Coal Management Review Policy Committee.¹¹ The committee has undertaken 13 management tasks in response to the Presidential directive. One of its first products is a paper that outlines three options for an overall approach to long-term leasing: industry nomination of both areas and tracts for leasing, Government identification of areas with industry nomination of specific tracts, and Government selection of both areas and tracts.¹²

Until the committee's work is complete, it is unclear what direction the new Federal coal leasing policy will take, or which, if any, of these three options will be adopted. However, the Secretary of the Interior has stated that the new Federal policy will restrict coal leasing to those areas where the Federal Government owns the surface rights.¹³

Problem Areas

Many of the problems that still must be resolved by the Federal Coal Management Review Policy Committee, the Department of the Interior, and Congress are carryovers from earlier leasing policy. They include logical mining units, preference-right lease applications, the requirements of diligent development and continued operation, estimated recoverable reserves, advance royalty payments, and the exchange of environmentally sensitive leased lands for other unleased Federal land.

A logical mining unit (LMU) is a contiguous area of coal land under the control of one operator that can be developed effectively and mined within a defined period of time. The theory of LMU makes sense; it asserts that national leasing policy should consider the nature of the coal resource in each case and then assemble the physical resources necessary to produce the coal economically while preserving environmental safeguards. However, the regulations promulgated by BLM to implement the Federal Coal Leasing Amendments Act depart from this theory in two respects. First, under the regulations, boundaries of an LMU are set according to the legal boundaries of leases rather than according to natural formations of the coal seam. Second, an LMU is required to produce a fixed amount of coal each year without regard to the individual characteristics of each coal mining operation.

Technical problems also surround the formation of LMUS. The Secretary of the Interior does not appear to have the authority to order private, State, or Indian lands to be combined with Federal leases to form an LMU nor does the Secretary have the authority to divide existing leases into several LMUS. In addition, practical and legal problems may arise from the requirements that all lands in an LMU be contiguous and that the holders of existing leases must consent to their inclusion in an LMU. Finally, industry representatives have argued that the congressional mandate that all reserves in an LMU be mined within a 40-year period may result in inefficiencies in some circumstances.

¹¹ The President's Environmental Program (Washington, D C : Council on Environmental Quality, 1977).

¹² *Federal Coal Management Review Policy Plan* (U.S. Department of the Interior, unpublished, July 25, 1977).

¹³ *Memorandum to the Secretary of the Interior From the Deputy Executive Secretary on Department/ Approach for the Long-Term Coal Leasing Program: Decisionmaking* (unpublished, Oct. 17, 1977).

¹⁴ '220 Energy Users Report 24 (Oct. 22, 1977).

Much uncertainty and controversy also surrounds the preference-right lease applications (PRLAs). At present, there are approximately 180 outstanding PRLAs covering an estimated 9 billion tons of coal on 446,000 acres. The Department of the Interior contends that it must issue a PRLA when a permittee has established that the land contains commercial quantities of coal. "Commercial quantities" was interpreted as coal "of such character and quantity that a prudent person would be justified in the further expenditure of his labor and means with a reasonable prospect of success in developing a valuable mine . . ."⁴¹ Some critics have questioned the appropriateness of the prudent person test and suggested the substitution of a "workability" or "paying quantities" concept. Others have asserted that, in addition to the commercial quantities test, Interior must consider environmental impacts before issuing a PRLA. Finally, even if all the foregoing issues are resolved quickly, it will take years to process the pending applications. It appears that a minimum of 5 to 7 years will pass before any coal can be produced from PRLA tracts.

A number of problems also exists in the regulations that implement the requirements for diligent development and continued operation of leases. First, the regulations define those requirements in terms of LMUS, yet old leases cannot be designated as LMUS without the consent of the lessees. The Department of the Interior has taken the position that it can designate an old lease as an LMU when it is readjusted despite statutory language that suggests that the consent of the lessee is required. Second, it is not clear that the present definition of diligent development, which does not require periodic reports, will prevent lessees from holding land for long periods of time without substantial development.

Additional problems exist in implementing the concept of estimated recoverable reserves. **Many of the key terms in the coal leasing regulations are defined in terms of this concept, but there is no commonly accepted definition of "estimated recoverable reserves" and various organizations compute reserves in dif-**

ferent ways at different times. As a result, industry and Government estimates can vary by as much as 100 percent. Moreover, the present regulatory scheme provides Federal leaseholders with strong incentives to underestimate their recoverable reserves.

Finally, problems exist in the regulations designed to implement those portions of the 1976 amendments that relate to advance royalty payments and exchanges of land or leasing rights. The protection afforded by advance royalty provisions of the amendments appears to have been diluted by the Department of the Interior regulations that grant the Mining Supervisor blanket authority to permit advance royalty payments in lieu of continued operation without requiring a specific finding that such a substitution would be in the public interest. In addition, Interior currently is developing regulations that would authorize the exchange of Federal land under lease or subject to a PRLA for future bidding rights. The Department would prefer the broader authority to exchange leases in environmentally sensitive areas for other unleased land as well as for future bidding rights.

Surface Mining Control and Reclamation Act of 1977

Many surface mining operations result in disturbances that adversely affect commerce and the public welfare by destroying or diminishing the utility of land for commercial, industrial, residential, recreational, agricultural, and forestry purposes. Many operations have caused erosion and landslides, contributed to floods, polluted the water, destroyed fish and wildlife habitats, impaired natural beauty, damaged private property, and undercut Government policies and programs to conserve soil, water, and other natural resources. The existing State regulatory programs intended to deal with these impacts varied widely and often were not enforced adequately. These findings, and others, formed the basis for congressional action leading to passage of the Surface Mining Control and Reclamation Act (SMCRA) of 1977.⁴⁵ A detailed analysis is presented in volume 11, appendix XVI 1.

⁴¹ 41 F R 18847 (May 7, 1976)

⁴⁵ 30 U S C 1201 et seq

Based on the assumption that mining should be a temporary activity, the Act was intended to change coal mining practices that generate severe social and environmental costs and to prohibit mining operations in areas that cannot be reclaimed. To accomplish these goals, the Act mandates State permit programs for surface mines and for the surface operations of underground mines and State procedures for designating areas unsuitable for mining. In the interim, or in the event of a State's failure to establish an adequate program, the Federal Government will retain regulatory authority. In addition, the Act establishes a fund for the reclamation of abandoned mines.

This section discusses the permit programs for surface and underground mining. Mandated procedures for designating areas as unsuitable for mining are discussed in chapter IV.

Each application for a surface coal mining and reclamation permit must include detailed information about the type and method of coal mining operation, engineering techniques, and equipment to be used; the probable hydrologic consequences of the mining and reclamation, both on and off the minesite; any man-made features or significant archeological sites that may be affected by mining; the geological and physical characteristics of the coal, including a chemical analysis of potentially acid- or toxic-forming strata; a soil survey of potential prime farmland; and the reclamation plan.

The probable hydrologic consequences of mining and reclamation must be determined relative to the hydrologic regime and the quantity and quality of surface and ground water systems including dissolved and suspended solids under seasonal flow conditions. Sufficient data must be collected to enable the regulatory agency to assess the probable cumulative impacts of all mining in the area on hydrology and water availability.

The reclamation plan must describe the condition of the land prior to mining including its existing and potential land uses and its productivity as well as its average yield of food, fiber, forage, or wood products under optimum management. The plan also must specify the proposed postmining land use and describe in

detail how this use will be achieved including the engineering techniques and equipment to be used, the cost per acre of reclamation, and a detailed timetable for accomplishing reclamation. In addition, the plan must describe the means of compliance with applicable air and water quality and health and safety regulations.

All surface mining permits issued under the Act must require that the coal mining operations meet all applicable environmental protection performance standards. These standards govern the maximum recovery of fuel; restoration of the land to its original contour; use of explosives; waste disposal, including the use of waste piles as dams or embankments; construction of access roads; and revegetation. Additional, more stringent standards apply to environmentally sensitive areas such as prime farmland, steep slopes, alluvial valleys, and timber lands.

Permits for underground mining must also require the mine operator to prevent subsidence to the extent possible, seal all openings to the surface, and prevent acid or other toxic drainage.

Enforcement of SMCRA'S performance standards and reclamation plans will play a critical role in determining the impact of the Act on coal production and environmental quality. As with administration of other SMCRA provisions, enforcement can be delegated to States if their mining standards and reclamation requirements are at least as stringent as the national standards. If this strategy of delegating the primary enforcement role to the States is successful, the Federal Office of Surface Mining (OSM) would not require large-scale enforcement resources. If the strategy does not succeed, the ability of OSM to enforce the Act adequately is uncertain. During interim enforcement of the Act by OSM, about 160 inspectors were responsible for ensuring compliance at more than 3,900 surface mines and approximately 2,550 underground mines (or approximately 1 inspector per 35 surface and per 56 underground mines).

An inadequate inspection force will result in an inability to make the required number of in-

spections and therefore an emphasis on "problem mines" and flagrant violations. It is doubtful that all problem mines will be identified; those mines that are not inspected as frequently as required could escape strict compliance with the Act.

Other issues related to enforcement of SMCRA include the availability and adequacy of performance bonds, which are intended to secure compliance with the Act. The amount of a bond depends on the characteristics of the site, but must be sufficient to cover completion of the reclamation plan if the work had to be performed by the regulatory agency. Where reclamation is difficult and therefore expensive, performance bonds may be difficult to secure. The Small Business Administration, which guarantees bonds from private sureties in other industries, reportedly does not plan to do so for coal mine reclamation. " In addition, where the adverse impacts of mining may not become apparent until long after mining has ceased (for example, acid drainage from underground mining), the period of liability may be insufficient.

The mining industry has been highly critical of SMCRA. The principal complaints include the complexity and detail of the regulations and the resulting increased costs of mining and reclamation. The industry argues that the Act and OSM's draft regulations are too detailed and do not permit a mine operator to tailor the engineering designs to site specific factors. The result, according to industry, will be substantial increases in the cost of mining and reclamation, and therefore in the cost of coal. Many of these requirements will be made more flexible in OSM's final regulations, issued spring of 1979. However, much of the specificity is written into the Act itself and must be changed legislatively. Once these changes have been made, the cost increases attributable to SMCRA probably will not be substantial enough to limit either the supply of or demand for coal. For example, OSM's cost analysis of the discretionary portions of the Act (that is, excluding the requirements that were

specified by Congress) indicates that their final regulations would result in only a 0.25-percent increase in the cost of electricity to the average residential customer in 1985.⁷

The Federal Mine Safety and Health Act of 1977

The hazards in mining coal and other materials, and the need to provide for the health and safety of the Nation's miners, have long been matters of Federal law. The Federal Mine Safety and Health Act of 1977's is the most recent expression of congressional intent to remedy unsafe conditions and practices and to reduce the number of mining fatalities and injuries. The 1977 Act is based on the Federal Coal Mine Health and Safety Act of 1969; it incorporates many of the provisions of the 1969 Act but increases the level of protection for miners.

The 1969 Act complemented the earlier Metal Act, "" which regulated the occupational health and safety of all miners except coal miners, and represented a direct response to the number of deaths and serious injuries from unsafe and unhealthy conditions and practices in coal mines. To remedy these abuses, the Act established interim mandatory health and safety standards and directed the Departments of the Interior and of Health, Education, and Welfare to develop permanent standards; to ensure that mine operators comply with those standards; to provide benefits for victims of black lung; and to assist the States in developing and enforcing effective health and safety programs.

Implementation and enforcement of the mandatory standards established under the 1969 Act resulted in dramatic decreases in the

⁷*Permanent Regulatory Program Implementing Section 501(b) of the Surface Mining Control and Reclamation Act of 1977* (U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement, Final Environmental Statement OSM-EIS-1, January 1979).

⁸30 U.S.C. 801 et seq. (Public Law 95-164, Nov. 9, 1977).

⁹30 U.S.C. 801 et seq. (Public Law 91-173, Dec. 30, 1969).

¹⁰30 U.S.C. 721 et seq. Repealed by Public Law 95-164 (Nov. 9, 1977).

¹¹"Excessive Regulation Drowns the Industry," *Coal Age*, January 1979, pp. 11-13.

number of coal mine fatalities and injuries. However, a 1974 report on occupational safety and health²¹ found that the incidence of work-related injuries and illnesses for miners still exceeded the "all industry" rate by about 14 percent. Work-related deaths showed, even more forcefully, the continuing inadequacy of mine safety and health laws and their enforcement. According to this report, about 1 of every 1,500 mine workers was killed on the job or died from work-related injuries or illnesses in 1973. This compared with 1 of every 2,800 railroad workers, 1 of every 4,000 construction workers, and only 1 of every 12,400 for all workers covered by the Occupational Safety and Health Administration.

In 1977 the Senate Committee on Human Resources drew a number of conclusions from its oversight of the Metal Act and the 1969 Coal Act:

First, the Metal Act does not provide effective protection for miners from health and safety hazards and enforcement sanctions under that Act are insufficient to encourage compliance by operators.

Second, enforcement of safety and health laws should be the responsibility of agencies which are generally responsible for the needs of workers.

Third, both the Coal and the Metal Acts do not provide means to react quickly enough to newly manifested health hazards.

Fourth, the procedures by which safety and health standards are made under both the Metal and the Coal Act are much too slow and cumbersome for standards promulgated under those Acts to keep pace with developments in a dynamic and expanding industry.

Fifth, the assessment and collective **civil penalties under the Coal Act have resulted in penalties which are much too low, and paid much too long** after the underlying violations to effectively induce meaningful operator compliance.

Sixth, enforcement sanctions under the current laws are insufficient to deal with chronic violators. 22

²¹*Annual Report on Occupational Safety and Health* (Washington, D. C.: U.S. Department of Labor, Occupational Health and Safety Administration, 1974).

²²Senate Report No. 95-181, 95th Cong., 1st sess., Federal Mine Safety and Health Act of 1977, p. 7.

By enacting the Federal Mine Safety and Health Act of 1977, Congress combined protection of all miners under a single comprehensive law that adopts the best features of both earlier statutes relative to health and safety. Insofar as the 1977 Act's objectives affect coal mine productivity, the Act adopts the consensus of labor and industry witnesses that a safe coal mine is also a productive mine. The resulting extensions of regulatory power in coal mining are more the product of technical improvements in the standard-setting and enforcement process than substantial departures from prior law.

The 1977 Mine Safety and Health Act adopted the provisions of the 1969 Act that prescribed mandatory health and safety standards and provided black lung benefits. That these parts of the Act were not appreciably altered is consistent with the legislative intent that standard-setting and enforcement procedures be made uniform throughout the mining industry while the standards themselves remain responsive to the characteristics of different segments of the industry.

Although much of the 1969 Coal Act remains as it was, several important changes are expected to increase the level of safety and health protection in the Nation's coal mines: standard-setting and enforcement provisions were made more effective, administration was transferred from the Department of the Interior to the Department of Labor, the Federal Mine Safety and Health Review Commission was established, mandatory health and safety training of miners was instituted, and the exercise of safety and health rights by miners was given added protection and support.

Past procedures for promulgating and revising standards in both the Metal and the Coal Acts had resulted in long delays between the perception of needed improvements and the implementation of new or revised standards. Each step in the process now requires compliance within a specified period. Enforcement procedures now also must comply with a more rigorous timetable.

A key element of the 1977 Act is the shift of administration from the Department of the In-

terior to the Department of Labor, Interior's responsibility for maximizing energy resource development was found to be incompatible with concurrent responsibilities for enforcing mine safety and health regulations; the Labor Department was perceived as having but one purpose: the welfare of the workers. The responsibilities of Interior's Mining Enforcement and Safety Administration also have been transferred to the Department of Labor, where an Assistant Secretary for Mine Safety and Health will preside over the new Mine Safety and Health Administration.

Under the 1969 Coal Act, review of contested matters was an internal function of the Secretary of the Interior, who established a Board of Mine Operations Appeals to separate prosecutorial and investigative functions from his adjudicatory functions. With the transfer of administration to the Department of Labor, a similar system was considered but ultimately rejected. While recognizing organizational and administrative drawbacks, Congress was persuaded to establish a completely independent adjudicatory authority, the Mine Safety and Health Review Commission. An independent commission was considered essential to provide administrative adjudication that preserves due process and instills more confidence in the program. Affected miners or their representatives have an opportunity to participate in the Commission's proceedings, and it is the intent of Congress that the Commission develop procedures to facilitate the participation of parties appearing *pro se* or not represented by counsel. This attention to adjudicative detail and purpose is better suited to serving both the interests of the parties and the underlying purposes of the Act.

One of the historic problems in the American coal industry has been the inadequate training afforded coal miners. Many miners still go underground with little or no training and, until very recently, the Federal requirements for training were weak. The 1977 Act provides for at least 40 hours of training for new underground miners, 24 hours for new surface miners, and 8 hours per year of refresher training for all miners. Miners must be paid

their normal rate of pay and any costs incurred while attending this training. If an inspector determines that any miner has not received the requisite training, then the miner must be withdrawn from the mine until his training is complete. Any miner so withdrawn may not be discriminated against by the operator and is entitled to full compensation during the training.

Congress expressed its displeasure with the Interior Department's repeated attempts to restrict miners' protection from retaliation for engaging in safety activity by changing not only the substantive aspects of the antidiscrimination provisions but also the procedural aspects. Under the new provisions, once a complaint is filed, the Secretary must conduct an investigation. If as a result of the investigation the Secretary believes that a violation has occurred, the Secretary must file to intervene in the proceedings and attempt to prove to the Commission that a violation has occurred. If the Secretary concludes that no violation occurred, the miner can still prosecute a case before the Commission. Even where the Secretary participates in the proceedings, the miner has the right to offer evidence, cross-examine the respondent's witnesses, and generally participate as a party. In both the 1969 Act and the 1977 Act, the miner is entitled to an award of attorney's fees if a violation of the antidiscrimination provision is proved. The 1977 Act, in clearly setting out the procedural steps in an antidiscrimination proceeding and clearly delineating the role of the Secretary, has greatly strengthened the antidiscrimination provision.

One of the most valuable provisions in the 1977 Act is the possibility of temporary reinstatement. Under the 1969 Act, miners often were severely disadvantaged if they chose to prosecute complaints, including significant economic hardship during the 1 or 2 years it might take to litigate their claims. The 1977 Act solves this problem by requiring the Secretary to make an initial determination, after a factual investigation of a discrimination complaint, as to whether the miner's complaint is frivolous. If the Secretary determines that the complaint is not frivolous, the Secretary must

petition the Commission for temporary reinstatement of the miner, and the Commission must order reinstatement absent a showing of bad faith on the part of the Secretary. This simple measure should go a long way in providing practical protection for the miners who exercise their safety rights and are discharged as a result.

Both the 1969 and the 1977 Acts provide for reinstatement with back pay for discharged miners who prevail on their discrimination claims. The 1977 Act also provides for interest on an award of back pay to compensate miners for the loss of wages during litigation.

The loss of income that occurs when a miner is fired presents serious problems that back pay and interest alone may fail to remedy. Neither the 1969 Act nor its legislative history explicitly provided for the award of special damages to a miner who had been discriminated against for attempting to enforce safety rules. Not surprisingly, the Interior Department never exercised its discretionary authority to award special damages, even where clear economic damages resulted from a discriminatory act. The legislative history of the 1977 Act rejects the Interior Department position and specifically authorizes the award of special damages. In addition to compensatory relief, the 1977 Act anticipates the use of affirmative relief, such as a cease and desist order, where appropriate.

The Federal Mine Safety and Health Act of 1977 is not a major departure from prior law governing the operators of the Nation's coal mines. Those most affected will be miners employed in other mining sectors and mine operators. The present law does represent an incremental improvement, however, in what is an ongoing congressional effort to reduce mining deaths and injuries to the lowest practicable levels. In addition to the major changes already discussed, several smaller amendments in the law can be expected to further these objectives.

For example, the definition of a mine "oper-

ator" is expanded to include any independent contractor performing construction services at a mine. Thus, employees of mine construction contractors now are considered miners and the Secretary should be able to issue citations, notices, and orders, and the Commission should be able to assess civil penalties, against these contractors. Statistics on mine-related deaths and injuries also will be more accurate because these contractors previously were not required to comply with recordkeeping and reporting obligations.

In addition, some penalties have been made more harsh, the collection of fines has been facilitated by an 8-percent interest charge, and an additional enforcement mechanism, injunctive-type relief, has been adopted to provide a flexible method of dealing with habitual or chronic violators of the Act.

Because the 1977 Act is modeled on its predecessor, the Mine Health and Safety Act of 1969, no substantial adaptations by the coal industry appear necessary. While noncoal mining operations previously subject to the Metal Act may face adjustment difficulties, coal industry and labor familiarity with the prior law should permit a relatively smooth transition. Increased operating costs may result from mandatory safety and health training, but whether the total additional costs directly associated with the legislation represent a net loss to the operators remains unclear,

Costs and benefits associated with safety and health regulations have been difficult to define accurately. If productivity can be improved as a result of vigorous Federal enforcement and operator compliance, all parties will benefit. If productivity remains unchanged or declines, however, coal consumers can be expected to share the burdens of improving the safety and health of the Nation's miners. Not unmindful of these costs, Congress has nevertheless declared mine safety to be an overriding concern, and the several changes described can be expected to lessen the annual rate of mining deaths and injuries.

The Clean Air Act

In drafting the Clean Air Act Amendments of 1977,²³ Congress was aware of the related but often conflicting demands of environmental and energy policies. However, the amendments do not always reflect a consistent unified approach to the fundamental problems involved, and the overall effect of the Act is difficult to assess. To the extent that coal-fired facilities have a greater potential for emitting air pollutants than do facilities using other energy sources, they may require greater expenditures for pollution control equipment under the Act or be subject to stricter siting and other pre-construction review procedures and thus may be at a competitive disadvantage. On the other hand, some provisions of the Act exempt coal-burning sources from regulatory restrictions applicable to other fuels. Still other provisions limit the growth and development of all stationary sources in certain areas.

It is not possible to quantify the impact of any of these provisions on increased coal use, much less to assess their combined impact. Such an analysis would require a major technical and economic inquiry. Rather, this section identifies and briefly discusses the nature of the Clean Air Act provisions that affect the use of coal by new fossil-fuel-fired sources as well as the conversion from oil or gas to coal by existing sources. Some of these provisions have been in effect since 1970; others are included in the 1977 amendments.

Background and History

Before 1970, air pollution control essentially was left to the States, with the Federal Government providing technical and financial assistance for planning and for R&D. The Clean Air Act Amendments of 1970²⁴ inaugurated direct Federal regulation, mandated specific State implementation plans (SIPs), and required Federal intervention in the absence of State action.

The 1970 amendments represented a balance between uniform national requirements

and the preservation of States rights. Those factors that were deemed to require national uniformity in order to prevent regional subversion of the Act's goals or regional economic advantages included numerical standards for how clean the air must be and for emissions of airborne pollutants from future sources as well as guidelines for air quality control plans. The States were required to devise and implement plans in accordance with these guidelines for achieving and maintaining the specified levels of air quality. The Act also allowed the States to set more stringent standards. This fundamental role division continues under the 1977 amendments, which were intended to remedy problems that had developed under the 1970 Act and to strengthen some regulatory programs.

National Ambient Air Quality Standards

The central feature of the 1970 Clean Air Act Amendments was the requirement that EPA promulgate National Ambient Air Quality Standards (NAAQS). NAAQS define air quality in terms of ambient concentrations of pollutants. These standards represent target levels for air quality; they do not regulate emissions from individual sources. The amendments required two sets of standards that reflected the latest scientific knowledge about the effects of various air pollutants. Primary standards were intended to protect public health; secondary standards were designed to protect the public welfare from pollution damage to soils, vegetation, animals, materials, and other environmental factors not related to human health.

Pursuant to the 1970 amendments, the EPA Administrator listed six pollutants as having potentially adverse effects on public health and welfare and established primary and secondary NAAQS for each. Standards have been established for sulfur oxides (SOX) (measured as sulfur dioxide (SO₂)), particulate matter, nitrogen dioxide (NO₂), hydrocarbons, photochemical oxidants, and carbon monoxide (CO); standards for lead were proposed in 1978. Under the 1977 amendments, these standards are to be reviewed and revised if necessary every 5 years beginning in 1980. The standards for SO_x, particulate matter, and NO₂, the pri-

²³Public Law 95-95 (Aug. 7, 1977), 42 U.S.C. 1857 et seq.

²⁴Public Law 91-604 (Dec. 31, 1970).

mary byproducts of coal combustion, are listed in table 58.

Table 58.—Standards for Particulate Matter, Sulfur Dioxide, and Nitrogen Dioxide

Pollutant	Averaging time	Primary standard	Secondary standard
Particulate matter	Annual (geometric mean)	75 $\mu\text{g}/\text{m}^3$	60 $\mu\text{g}/\text{m}^3$
	24-hour	260 $\mu\text{g}/\text{m}^3$	150 $\mu\text{g}/\text{m}^3$
	3-hour	—	—
Sulfur dioxide. . .	Annual (arithmetic mean)	80 $\mu\text{g}/\text{m}^3$	—
	24-hour	365 $\mu\text{g}/\text{m}^3$	—
	3-hour	—	1,300 $\mu\text{g}/\text{m}^3$
Nitrogen dioxide .	Annual (arithmetic mean)	100 $\mu\text{g}/\text{m}^3$	100 $\mu\text{g}/\text{m}^3$
	24-hour	—	—
	3-hour	—	—

These ambient air quality standards are implemented at the national level through standards of performance for new stationary sources and guidelines for State control strategies for existing sources as well as through guidelines for regulatory programs designed to improve air quality in areas that have not attained the national standards, to prevent degradation of air quality in areas cleaner than the national standards, and to protect visibility in important scenic areas.

The State role centers on the preparation and implementation of a plan, consistent with EPA guidelines, that sets out control strategies for meeting and maintaining NAAQS in various parts of the State (known as air quality control regions (ACQRs)). States have considerable discretion in deciding what emission limitations and other controls on individual sources to use in cleaning up their air, as long as their SIPs are shown to be capable of achieving the national standards.

The 1970 Act required the States to attain the primary standards as expeditiously as practicable but not later than 3 years after the date the SIP became effective. The SIPs also were required to specify a reasonable time at which the secondary standards would be achieved; "reasonable time" was defined by EPA to depend on the degree of emission reduction

needed to attain the standards and on the social, economic, and technological problems involved in doing so. However, as of 1977, 116 of the 247 ACQRs reported violations of the primary annual particulate standard while 108 reported violations of the 24-hour standard. Similarly, 12 ACQRs reported violations of the primary annual SO_2 standard while 37 reported violations of the 24-hour standard. ^aThe 1977 amendments require the States to revise their SIPs by 1979 in order to provide for attainment of the primary standards by 1982. However, the amendments did not change the "reasonable time" requirement for achieving the secondary standards.

New Source Performance Standards

The Clean Air Act Amendments of 1970 required the EPA Administrator to establish standards of performance for large new or substantially modified stationary sources to ensure that they would not exacerbate existing air quality problems or contribute to new ones. Under the 1970 Act, New Source Performance Standards (NSPS) included federally determined allowable rates of emissions from 19 categories of sources. SIPs were required to include a procedure for preconstruction review of new sources to ensure that these standards were met.

The 1977 amendments significantly tightened these requirements. In order to meet NSPS, 28 categories of sources now must apply the best technological system of continuous emission reduction that has been demonstrated adequately. In addition, fossil-fuel-fired sources are subject to an enforceable percentage reduction in emissions that would have resulted from the use of untreated fuels.

In determining which technological systems of continuous emission reduction have been demonstrated adequately, the EPA Administrator is required to consider the energy requirements of a technology as well as its cost and any nonair quality health and environmental impacts. In calculating the percentage reduction requirements, the Administrator may give

^a2543 F.R. 8962 (Mar. 3, 1978).

credit for mine-mouth and other precombustion fuel-cleaning processes. NSPS have been promulgated for fossil-fuel-fired steam generators and for coal preparation plants. EPA plans to announce new standards for industrial boilers in 1980.

As discussed in chapter IV, the NSPS provisions in the 1977 amendments have become controversial. If the final regulations require continuously operating flue-gas desulfurization (FGD) systems, it probably will promote the use of locally available high-sulfur coals, especially in the Midwest, while removing the advantage that accrued to low-sulfur coal under the previous regulations. In addition, a continuous control requirement could delay the construction of new coal-fired powerplants, causing a greater reliance on existing plants than would have occurred under the previous regulations.²⁶ Regardless of whether the final regulations require full, partial, or a sliding-scale control, they will increase the pollution control costs of new coal-fired plants.

Nonattainment Areas

The 1970 Clean Air Act Amendments did not specify the consequences of a State's failure to attain NAAQS by the deadline. While EPA regulations promulgated in 1976²⁷ filled this gap to some extent, it was clear that congressional guidance was necessary. Consequently the 1977 amendments add new requirements that must be incorporated into all SIPs by July 1979.

The 1977 amendments basically adopt EPA's 1976 offset policy for nonattainment areas until July 1979. In general, this policy imposes the following conditions for the issuance of construction permits for new or modified sources in nonattainment areas: the source meets the lowest achievable emission rate (LAER), the permit applicant certifies that all its other facilities are in compliance with all applicable Clean Air Act control requirements, the permit applicant has secured emissions reductions from existing sources that more than offset the emissions from the proposed source, and a

positive net air quality benefit results. LAER must reflect the most stringent emission rate required by any State or the lowest rate achieved in practice, if the latter is more stringent. In no event, however, may emissions from a source subject to LAER be allowed to exceed the applicable NSPS.

This offset policy applies to any source capable of emitting 100 tons per year of a pollutant that would exacerbate an existing NAAQS violation. EPA has announced that it will implement the policy through the use of significance levels patterned after the prevention of significant deterioration (PSD) increments (see below). A source will not be considered to exacerbate air quality problems if its emissions are below the specified significance level. "

Whether a source is subject to the offset policy is determined on a case-by-case basis through air quality modeling. Thus a source still could be located in an AQCR with localized violations so long as its emissions will not exacerbate those local violations.

After June 30, 1979, construction of new or modified stationary sources that would adversely affect air quality in nonattainment areas must be prohibited unless the applicable SIP meets the requirements of the 1977 amendments. SIP revisions must provide for attainment of the primary standards not later than 1982, and in the interim must require annual incremental emissions reductions from existing sources through the implementation of reasonably available control measures.

As with the new NSPS requirements, EPA's offset policy is controversial. It places significant constraints on siting in many areas because the offsetting reductions are difficult to obtain and LAER is expensive to meet; siting constraints could become even more severe if SIP revisions are not accomplished in a timely manner. In addition, most industries feel it is inappropriate to place the burden of securing emission reductions on the private sector

²⁶43 F.R. 42154 (Sept 19, 1978)

²⁷41 F.R. 55524 (Dec 21, 1976).

²⁸44 F.R. 3274 (Jan 16, 1979).

rather than on Government.²⁹ Although many States are expected to adopt EPA's offset policy in their SIP revisions, they are being encouraged by EPA to experiment with alternative programs for cleaning up "dirty air" areas, such as emission taxes, or banking of emission reductions to allow for future growth.³⁰

Prevention of Significant Deterioration/ Visibility Protection

The 1970 Clean Air Act Amendments merely required EPA and the States to achieve and maintain NAAQS; they did not address the question of air quality in areas already cleaner than NAAQS require. In 1972 environmental groups brought suit against EPA to prohibit the Agency's approval of SIPs that failed to prevent significant deterioration of air quality. Relying on the Act's stated purpose of protecting and enhancing the Nation's air quality, the court ordered EPA to develop a program to prevent the degradation of air quality in clean air areas. EPA's PSD regulations were promulgated and incorporated into all SIPs in 1974, and were adopted with some changes in the 1977 amendments.

In general, the PSD program divides clean air areas into three classes and specifies the maximum allowable increases in ambient concentrations of pollutants, or PSD increments, for each class.

As discussed in chapter IV, construction of a major emitting facility (defined to include most large fossil-fuel-fired steam electric plants and other coal-burning sources) that will affect air quality in a clean air area is subject to extensive preconstruction review and permit requirements. Review of a permit application must be preceded by an analysis of the ambient air quality at the proposed site and in areas within 50 km downwind that may be affected by emissions from the proposed facility.

²⁹*Sixteen Air and Water Pollution Issues Facing the Nation* (Washington, D.C.: General Accounting Office, U.S. Comptroller General, October 1978).

³⁰44 F.R. 3274 (Jan. 16, 1979).

³¹*Sierra Club v. Ruckelshaus*, 344 F.Supp. 253 (D.D.C., 1972), *affd.* 4 E.R.C. 1815 (D.C. Cir. 1972), *affd. Fri v. Sierra Club*, 412 U.S. 541 (1973).

The PSD regulations could constrain the development of coal combustion facilities in two main situations: where the difference between the baseline concentration and the maximum allowable increase already is lower than the applicable increment, and where sources that are exempt from PSD review (because of their size or date of construction) will use up available increments. However, a 1975 Federal Energy Administration (FEA)/EPA study of the effects of the then-pending PSD legislation on the electric utility industry concluded that the requirements would not significantly hamper siting of even the largest sources of air pollution.³² These conclusions are summarized in appendix XVI of volume 11. In addition, the study analyzed the economic impacts of PSD requirements on the utility industry; it concluded that the industry's total capital requirements and annual operating costs as well as the costs to consumers would increase less than 3 percent to the year 1990.

Siting considerations also could be affected by regulations intended to protect visibility in Class I areas (national parks and wilderness areas subject to the lowest PSD increments) primarily valuable for scenic factors. The 1977 amendments established a national goal of preventing any future—as well as remedying any existing—impairment of visibility in these areas. By August 1979, EPA is required to promulgate regulations to assure reasonable progress toward meeting the national goal, taking into account the economic, energy, and environmental costs of compliance. In addition, States must revise their SIPs to require all existing major stationary sources constructed in the last 15 years to install the best available retrofit technology for controlling emissions that may impair visibility. A principal contributor to reduced visibility is fine particulate matter; these particles are not captured by the current technology-of-choice, electrostatic precipitators. Their control may require the use of baghouses, a costly alternative. However, the Act does provide exemptions for sources that

³²*An Analysis of the Impact on the Electric Utility Industry of Alternative Approaches to Significant Deterioration* (Washington, D.C.: Federal Energy Administration and Environmental Protection Agency, October 1975).

can demonstrate that they will neither cause nor contribute to a significant impairment of visibility in mandatory Class I areas, or where the costs of compliance would be too high (for example, if the source is scheduled for retirement soon). Until the final regulations are published, it is not possible to estimate the extent to which visibility protection requirements will constrain increased coal consumption.

EPA Studies and Potential New Standards

In adopting the 1977 amendments, Congress directed EPA to undertake an extensive review of existing standards and to study potential new standards. To the extent that EPA's efforts result in tightening existing standards or in promulgating new standards, these provisions may impose new and potentially costly constraints on the use of coal. At this time, however, it is possible only to identify the areas of potential concern.

The amendments require EPA to review air quality criteria and NAAQS by the end of 1980, and every 5 years thereafter, and to revise the criteria and standards as appropriate. Any revision of a NAAQS for a pollutant may result in major changes in SIPs and control requirements applicable to sources of that pollutant. In addition, the amendments direct EPA to promulgate a 3-hour primary standard for NO_2 , unless EPA determines that there is no significant evidence that this standard is necessary. A stringent short-term NO_2 standard may require flue-gas denitrification, a technology that is not expected to be available until after 1985.

Another provision of the amendments requires EPA, in conjunction with the National Academy of Sciences, to complete a study of the health effects of fine particulate; preliminary findings will be published by June 1979. The amendments also require EPA to determine whether emissions of radioactive pollutants, cadmium, arsenic, and polycyclic organic matter may endanger public health. If EPA finds that these emissions do pose a hazard to human health, then EPA must establish air quality standards, NSPS, or hazardous pollutant standards for them. For radioactive pollutants, EPA must make this determination by

August 1979; background documents on the sources, health effects, population exposures, and risks associated with the other pollutants were available for public comment in spring 1978. All of these pollutants are present in trace amounts in the fly ash of coal emissions; moreover they are concentrated preferentially on the fine particulate matter that conventional control technologies do not remove effectively. Baghouses entailing large costs and space requirements would be required to capture these materials if the standards mandated highly efficient removal.

Finally, EPA currently is developing a standard for the control of sulfates, a transformation product of SO_x . Sulfates also adhere to fine particulate and contribute to visibility impairment and acid precipitation, primarily in the Northeast. A stringent sulfate standard may impose severe constraints on new coal-fired sources in the Eastern United States.

Interface With Energy Legislation

The Energy Supply and Environmental Coordination Act (ESECA) of 1974³⁷ (discussed below) amended the Clean Air Act to provide for coordination between national energy and air quality goals. EPA's primary responsibilities under ESECA were to determine the earliest date that a source converting to coal could meet applicable air pollution control requirements and, if necessary, to grant an order to the source extending its date of compliance with the Clean Air Act. The 1977 Clean Air Act Amendments repealed this requirement under ESECA and placed EPA's coal conversion oversight within its general authority to grant delayed compliance orders.

In 1978, ESECA was replaced by the Powerplant and Industrial Fuel Use Act³⁸ (see below), which prohibits the use of oil or natural gas as a primary energy source in new fuel-burning installations and the use of natural gas in existing facilities after 1990. Temporary and permanent exemptions from these prohibitions are

³⁷Public Law 93-319 (June 22, 1974), as amended by Public Law 94-163 (Dec 22, 1975) and Public Law 95-70 (July 21, 1977)

³⁸Public Law 95-620 (Nov 9, 1978)

provided for facility operators who demonstrate that they cannot meet the prohibition without violating environmental requirements such as emissions limitations; the operator must demonstrate that he has made a good faith effort to comply with environmental requirements before he is entitled to use gas or oil instead of coal. The Act specifically states that it is not intended to permit any existing or new facility to delay or avoid compliance with applicable environmental requirements.

The 1977 Clean Air Act Amendments encourage increased coal use through measures designed to prevent significant local or regional economic disruption or unemployment. Where a source or class of sources intends to use petroleum products, natural gas, or non-local coal in order to comply with the Clean Air Act requirements, and it is determined that the result would be local economic disruption or unemployment, the President can prohibit the source from using any fuel other than locally or regionally available coal. A source may be ordered to enter into long-term contracts of at least 10 years for supplies of local coal as well as contracts to acquire additional pollution controls. This provision does not exempt a source from the requirements of the Act, but prevents it from relying on fuels with a sulfur content lower than that of locally available fuels.

Implementation of the Amendments

This review of the 1977 amendments indicates that, if effectively implemented, the Act may increase the costs of coal utilization and may impose siting constraints in both dirty and clean air regions, primarily in the vicinity of Eastern and Western coal resources. However, the extent to which the environmental and health objectives of the amendments are achieved and, conversely, the extent to which substantial constraints on increased coal use are created, depend on the implementation of the Act. Major implementation factors to be considered include monitoring requirements, air quality modeling, and the level of enforcement.

The Act contains several provisions designed to ensure that major stationary sources

such as fossil-fuel-fired powerplants monitor their emissions. A condition for EPA approval of SIPs is that they include requirements for the installation of monitoring equipment and for the submission of periodic reports on the nature and amount of emissions. In addition, EPA has independent authority to require a source to monitor and report its emissions when EPA determines that this information is required to assess compliance with the Act.

Monitoring data are used in conjunction with dispersion modeling techniques in order to determine a source's impact on air quality under a variety of Clean Air Act provisions. Current regulations limit the applicability of air quality models to a downwind distance of not more than 50 km.³⁵ However, recent research suggests that under certain meteorological conditions, such as after prolonged periods of stagnation or during extremely persistent winds, air pollutants and their transformation products may be transported over distances greater than 50 km. To the extent that this longer range transport of pollutants occurs and is not regulated directly, it may interfere with enforcement of measures directed at visibility protection and it may consume PSD increments in clean air areas or contribute to NAAQS violations in nonattainment areas downwind. Thus the limits imposed on air quality modeling may further constrain siting downwind.

Finally, the 1977 amendments enhance EPA's enforcement authority in several important respects. First, EPA now has the authority to seek civil penalties to a maximum of \$25,000 per day of violation. Second, criminal actions now may be brought against any responsible corporate officer. Third, and most important, the amendments provide for the imposition of noncompliance penalties that operate in addition to the other penalty provisions. These noncompliance penalties essentially remove the economic advantages accruing to a noncomplying source. The Act sets forth elab-

³⁵43 F.R. 26380 (June 19, 1978). See also *Guideline on Air Quality Mode/s* (Research Triangle Park, N. C.: U.S. Environmental Protection Agency, April 1978), OAQPS 1.2-080.

orate procedures and standards for this penalty provision, which, in general, requires a source not in compliance as of July 1979 to pay a quarterly penalty equal to the money saved during that quarter as a result of non-compliance.

However, a variety of problems still exist in enforcing the Clean Air Act and in air quality management in general. Gaps may be created in the ability to enforce the Act when new regulations are challenged in court (as they almost always are). New regulations supplant old ones, yet the courts will grant a stay of enforcement of the new ones, leaving EPA with nothing to enforce. In addition, enforcement problems may occur from a lack of communication among the various agencies and governments involved. Thus action taken by the Department of Justice, the EPA Office of General Counsel, or the State may undercut enforcement actions in progress at the EPA regional offices. Similarly, there is a general lack of integration within EPA for overall environmental management strategies. Personnel responsible for developing air programs may be unaware of the implications of their actions for solid waste disposal or water pollution and vice versa.

General air quality management also is constrained by States' rights in that administration of the Clean Air Act must be turned over to the States as soon as their SIPs meet the minimum requirements, yet the States may not be ready or able to administer and enforce the Act adequately. Conversely, whenever a State program falls below the minimum requirements, administration and enforcement revert to the EPA regional office regardless of whether that office has sufficient funds or personnel.

In addition, most of the Clean Air Act requirements are dependent on the technological and economic availability of control technology, yet the Act places most of the burden for developing that technology on Federal R&D programs that are not funded adequately. A shift in regulatory philosophy that would force industry to take the initiative, such as an emissions tax, could alleviate some of EPA's management problems. Finally, because EPA must use its available R&D funding to attempt

to remedy existing pollution *control* problems the Agency is unable to allocate funds to the anticipation of future control problems.

Conclusions

The Clean Air Act of 1970 failed to achieve the primary NAAQS nationwide by the target date of 1975. In 1977 Congress responded with thorough revisions of the Act in order to achieve those standards in areas that had not done so and to protect the quality of the air in regions that already are cleaner than NAAQS. Whether in light of continued industrial growth the new amendments will achieve the desired air quality is uncertain. In an effort to do so, however, the amendments may impose new constraints on stationary sources.

Whether the 1977 amendments will impede increased coal use is largely a question of economics. Within certain limits, increased costs resulting from clean air requirements, such as NSPS, will not significantly affect the amount of coal used; fuel demand has been shown to be rather unresponsive to moderate price increases. However, regulations that may delay the siting of facilities, such as those for nonattainment areas and for PSD, or that may substantially increase the cost of new facilities, could encourage greater reliance on existing capacity in lieu of new plants. In addition, provisions of the Act that require stringent controls regardless of the sulfur content of the fuel may tend to favor production of locally available high-sulfur coals over higher priced low-sulfur coal.

The Clean Water Act

Water pollution associated with the direct use of coal stems from three major sources: surface and deep mining operations, preparation plants (including ancillary storage areas and washing facilities), and combustion facilities. Effluents from these sources are regulated under the Clean Water Act³⁶ (formerly known as the Federal Water Pollution Control Act) through ambient water quality standards, effluent limitations for new and existing sources, limitations on thermal discharges, permit programs, and areawide planning.

3633 *U.S.C.* 466 et seq.

Water Quality Standards

Section 101 of the Clean Water Act establishes two national water quality goals. The first, to be achieved by 1983, is an interim goal that provides for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water. The second national goal is the elimination of all pollutant discharges. The States have the primary responsibility for achieving these goals and for planning the development and use of land and water resources consistent with them. In 1977, Congress recognized that significant progress toward these goals was not being made and that the discharge elimination goal probably is unrealistic. Accordingly, the Clean Water Act Amendments of 1977 extended the deadline for compliance with the stricter limitations under the Act by 1 to 3 years.

Each State is required to develop and implement, subject to the approval of the Administrator of EPA, a comprehensive water quality management plan that includes water quality standards. These standards consist of the designated uses of the waters involved, including their use and value for public water supplies; propagation of fish and wildlife; recreational, agricultural, industrial, and other purposes; and navigation. In addition, the standards include water quality criteria for the waters based on these uses.

In general, the water quality standards are to be achieved through effluent limitations on discharges from point sources (see below). However, for those waters for which the effluent limitations are not stringent enough to implement the applicable water quality standard, the State must establish a total maximum daily load for the relevant pollutants. This load must be established at the level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety that takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. In addition, the State must estimate the total maximum daily thermal load required to assure protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife. This estimate must take into account

the normal water temperatures, flow rates, seasonal variations, existing sources of heat input, and the dissipative capacity of the waters, and also must include a margin of safety that takes into account any lack of knowledge about the development of thermal water quality criteria.

Effluent Limitations

Effluent limitations are restrictions established by a State or the EPA Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents that are discharged from point sources. Effluent limitations may be categorized by: 1) the sources for which they have been established, 2) whether those sources discharge directly into receiving waters or into a publicly owned treatment works, and 3) the degrees of control required for each category of sources or pollutants and the dates those controls become mandatory.

In general, the 1977 amendments require all categories of point sources to apply the best practicable control technology currently available (BPCTCA) not later than July 1, 1977. Those point sources that discharge conventional pollutants (including, but not limited to, pollutants classified as biological oxygen demanding, suspended solids, and hydrogen-ion concentration (pH)) must apply the best conventional pollution control technology (BCPCT) not later than July 1, 1984. Finally, all categories of point sources must apply the best available technology economically achievable (BATEA) that will result in reasonable further progress toward the stringent discharge elimination goal if the Administrator finds that the goal is technologically and economically achievable. BATEA is required not later than 3 years after the date the effluent limitations for a pollutant have been established or by July 1, 1984, whichever is later, but in no case later than July 1, 1987. In determining the control measures and practices to be applicable to point sources, the EPA Administrator must take into account the age of equipment and facilities involved, the process employed, the engineering aspects of the application of various types of control technologies, process changes, and nonwater quality environmental

impacts (including energy requirements) as well as the total cost of achieving the limitation in relation to the effluent reduction benefits to be achieved.

Where pollutants are introduced into publicly owned treatment works they are subject to pretreatment standards to ensure that the effluent limitations applicable to the treatment works will not be violated. In addition, as mentioned above, where the general effluent **limitations are not strict enough to contribute to the attainment or maintenance of the water quality** goals for a particular stream, the EPA Administrator may establish stricter standards for point sources located along that stream. These stricter, water quality related effluent limitations must take into account: 1) the tradeoff between the economic and social

costs of achieving the limitation, including any economic or social dislocation in the affected communities, and the social, economic, and water quality benefits to be obtained; and 2) whether the limitation can be implemented with available technology or alternative control strategies.

The principal coal-based activities for which effluent limitations have been established are steam electric-power generation and coal mining; these are summarized in tables 59 and 60. The steam electric-power generating point source category applies to all units that produce electricity for distribution and sale. It is broken down further by the size and age of the unit. In practice, however, neither the distinctions based on size and age of the facility nor those based on degree of control required

Table 59.—Effluent Limitations: Steam Electric Power Generating Units

Source category	Technology requirement	Type of discharge	Pollutant	Limitation	Measurement time
Generating unit ^a and small unit ^b subcategories: existing and new ^c sources;	BPCTCA and BATEA	All except once-through cooling water; all	pH	6.0-9.0	At all times
old unit ^d subcategory		low-volume waste sources; ash transport water; metal cleaning wastes; boiler blowdown	PCBS	No discharge	At all times
		Metal cleaning wastes; boiler blowdown	TSS	100 mg/l	Maximum/day
				30 mg/l	30-day average
			Oil and grease	20 mg/l	Maximum/day
				15 mg/l	30-day average
			Copper	1.0 mg/l	Maximum/day
				1.0 mg/l	30-day average
			Iron	1.0 mg/l	Maximum/day
				1.0 mg/l	30-day average
		Once-through cooling water; cooling tower blowdown	Free available chlorine	0.5 mg/l	Maximum concn.
				0.2 mg/l	Average concn.
Generating unit and small unit subcategories: existing sources; old unit subcategory	BATEA	Cooling tower blowdown	Zinc	1.0 mg/l	Maximum/day
				1.0 mg/l	30-day average
			Chromium	0.2 mg/l	Maximum/day
				0.2 mg/l	30-day average
			Phosphorus	5.0 mg/l	Maximum/day
				5.0 mg/l	30-day average
Generating unit and small unit subcategories: new sources		Cooling tower blowdown	Materials added for corrosion inhibition, including but not limited to zinc, chromium, phosphorus	No detectable amount	Maximum/day
				No detectable amount	30-day average
Area runoff ^f subcategory: existing and new sources	BPCTCA and BATEA	Material storage and construction runoff	TSS	50 mg/l	Maximum/day
			pH	6.0-9.0	at all times

^aAll limitations expressed in mg/l are to be multiplied by the volume of the waste flow.

^b"Generating unit" means any unit except those defined as small or old.

^c"Small unit" means any unit (except one defined as old) of less than 25 MWe rated capacity or any unit which is part of an electric utilities system with a total net generating capacity of less than 150 MWe.

^dNew sources are those on which construction is commenced after the applicable limitations are published.

^e"Old unit" means any unit of 500 MWe or greater capacity first placed in service on or before January 1, 1970, and any unit of less than 500 MWe capacity first placed in service on or before January 1, 1974.

^fApplicable to discharges resulting from material storage and construction runoff except untreated overflow associated with a 10-year, 24-hour rainfall.

Table 60.—Effluent Limitations: Coal Mining Point Source Category

Source category	Technology requirement	Quality of discharge	Pollutant	Limitation	Measurement time
Coal preparation plants and associated areas; coal mines	BPCTCA	Acid ^a and alkaline ^b	Iron	7.0 mg/l	Maximum/day
				3.5 mg/l	30-day average
		Alkaline	TSS	70 mg/l	Maximum/day
				35 mg/l	30 day average
			pH	6.0-9.0	At all times
			Manganese	4.0 mg/l	Maximum/day
				2.0 mg/l	30-day average

^a“Acid or ferruginous mine drainage” means mine drainage that before any treatment either has a pH of less than 6.0 or a total iron concentration of more than 10 mg/l.

^b“Alkaline mine drainage” means mine drainage that before any treatment has a pH of more than 6.0 and a total iron concentration of less than 10 mg/l.

(BPCTCA or BATEA) is meaningful. As can be seen in table 59, except for pollutants from corrosion-inhibiting materials, the effluent limitations are the same across the board. The coal mining point source category applies to all active mining areas (surface and deep) including secondary recovery facilities and preparation plants but excluding surface mines in which grading has been completed and reclamation work has begun. The limitations are broken down into those applicable to acid drainage and to alkaline drainage.

The EPA Administrator may modify any of the limitations for a point source if the owner of the source demonstrates that the modified requirement will represent the maximum use of technology within his economic capability and will result in reasonable further progress toward the discharge elimination goal.³⁷ The 1977 amendments provide that such a modification is mandatory if the owner also demonstrates that it will not interfere with attainment of a water quality standard or the 1983 water quality goal, and it will not result in additional requirements on any other point source. As mentioned above, this provision reflects congressional doubt about the reasonableness and practicability of the 1985 discharge elimination goal.

Thermal Discharges

Limits on thermal discharges from steam electric-generating plants are included in the effluent limitations for those sources. These include the BATEA requirements for existing

generating units and NSPS for generating units and for small units.

Existing generating units are required to eliminate the discharge of heat from the main condensers by July 1, 1981, through the application of BAT EA. Exceptions to this general limitation include:

- Blowdown from recirculated cooling water systems, provided the temperature of the discharge does not exceed the lowest temperature of recirculating cooling water prior to the addition of the makeup water. (Systems technologically incapable of meeting this exception are exempt provided they begin construction prior to July 1, 1981.);
- Blowdown (overflow) from a cooling pond under construction or in operation prior to July 1, 1981, and used to cool water before it is recirculated to the main condensers;
- Where sufficient land for mechanical draft evaporative cooling towers is not available (on property owned before March 4, 1974) and where no alternate recirculating cooling system is practicable;
- Where the total dissolved solids concentration in blowdown exceeds 30,000 mg/l and land not owned by the owner of the source is located within 150 m in the prevailing downwind direction of every practicable location for mechanical draft cooling towers and no alternate recirculating system is practicable; and
- Where the cooling tower plume would, in the opinion of the Federal Aviation Administration, cause a substantial hazard to commercial aviation in the vicinity of a

³⁷40 CFR pts. 402, 423, 434

major commercial airport and no alternate recirculating cooling water system is practicable. 38

In addition, the effective date of the retrofit requirement may be extended for from 1 to 2 years where reliability would be jeopardized by timely compliance.

The New Source Performance Standards for generating units and small units provide that there shall be no discharge of heat from the main condensers except in the case of blowdown from recirculated cooling water systems or from cooling ponds where the temperature of the blowdown does not exceed the lowest temperature of recirculated cooling water prior to the addition of the makeup water. In addition, the Act requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts (e. g., impingement and entrainment).

Where these limitations on thermal discharges are deemed to be more stringent than necessary for the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife, the EPA Administrator may modify the thermal discharge limits for a source. In addition, sources upon which modifications are begun after 1972 and which, as modified, meet all applicable effluent limitations, are exempt from more stringent limitations for a period of 10 years following completion of the modifications.

Permit Systems

Effluent limitations and water quality standards are implemented through State certification programs and through the National Pollutant Discharge Elimination System (NPDES).

An applicant for a Federal license or permit to conduct any activity, including the construction or operation of facilities, that may result in a discharge into navigable waters, must obtain State certification that the discharge will not violate any effluent limitations, water quality standards, or NSPS. Where the discharge will affect more than one State, the

Federal licensing or permitting agency must condition the permit to ensure that all water quality requirements will be met. In addition, when Federal regulations require only a construction permit, the certifying State must be given an opportunity to review the manner in which the facility will be operated in order to ensure that water quality requirements will not be violated. If the State finds that the operation of the facility will result in violations, the Federal agency may suspend the license or permit.

NPDES is designed to ensure the orderly and timely achievement of water quality goals without sacrificing economic or energy growth. Under NPDES, a facility may be issued a permit for a discharge on the condition that the discharge will meet all applicable water quality requirements. NPDES permits are issued under State programs approved by EPA, or, where a State program has not been approved, by the EPA Administrator. The permits are for fixed terms not to exceed 5 years and can be terminated or modified for violations. Compliance with the conditions under which an NPDES permit is issued is deemed compliance with the effluent limitations and water quality standards promulgated under the Clean Water Act.

Areawide Planning

Section 208 of the Clean Water Act encourages areawide land and water management planning for regions with substantial water quality problems because of urban-industrial concentrations or other factors. The features of section 208 plans that could affect coal development include programs:

1. to regulate the location, modification, and construction of facilities that may result in a discharge;
2. to control mine-related sources of pollution including new, current, and abandoned surface and deep mine runoff;
3. to control construction activity-related sources of pollution; and
4. to control the disposal of residual waste material and of pollutants on land or in subsurface excavations.

³⁸Id.

Section 208 programs were intended to provide the long-range planning basis for the implementation of other Clean Water Act programs. However, the other programs addressed immediate pollution problems and received funding priority over section 208. Consequently, implementation of areawide land and water management planning has been slow; to date only 9 of 216 plans have received final approval. For reasons primarily related to local politics, when the section 208 plans are implemented they are not expected to affect the siting of new coal combustion facilities significantly.

Resource Conservation and Recovery Act of 1976

Prior to passage of the Resource Conservation and Recovery Act (RCRA) of 1976,³ the Federal Government faced a policy vacuum in regard to the control of solid wastes from coal-producing and coal-consuming facilities. Because there were no major Federal programs related to the land disposal of solid wastes, disposal practices could not even be regulated indirectly through the requirements of NEPA. Yet scrubbers eventually will produce large quantities of sludge, and coal mines are notorious for their waste piles.

In general, RCRA seeks to control open dumping under a system of State plans and permits for solid waste disposal. All forms of solid waste are covered, both hazardous and nonhazardous, with more stringent regulations for the former. In neither case, however, are there prohibitions on waste disposal.

The implementation of this Act by EPA could have far-reaching consequences for the handling of solid wastes from coal production and use. For example, section 1004(5) of the Act defines "hazardous wastes" to include those which, because of their quantity, concentration, or physical, chemical, or infectious characteristics may pose a substantial present or potential hazard to human health or to the environment. Under section 3001, EPA is required to: 1) establish criteria for identifying

the characteristics of hazardous wastes, taking into account toxicity, persistence, and degradability in nature, potential for accumulation in tissue, and related factors such as flammability, corrosiveness, and other hazardous characteristics; and 2) based on these characteristics, list particular hazardous wastes that will be regulated.

The generator of a substance that is listed as a hazardous waste is responsible for its disposal in accordance with the applicable State plan. In addition, generators of hazardous wastes are subject to extensive recordkeeping provisions that require them to identify the quantities of wastes generated, the constituents of the wastes that are significant in quantity or in potential harm to human health or the environment, and the eventual disposition of the wastes. Finally, the generator must furnish information on the general chemical composition of hazardous wastes to anyone transporting, storing, treating, or disposing the wastes.

The Act also imposes Government-wide responsibilities that affect coal production and use. It requires Federal agencies to conform to EPA solid waste management guidelines if their activities, such as leasing or permitting, embrace production or disposal of solid wastes, particularly hazardous solid wastes. The impact of this provision is unclear until the Act's implementation by EPA is understood more fully within Federal agencies. However, it can be expected to involve operating agencies such as the Tennessee Valley Authority and permitting agencies such as the Departments of the Interior and Agriculture, which grant mining leases and approve powerplants on Federal land.

The overall effect of RCRA probably will be to increase the cost of waste disposal; the Act also could increase the amount of waste to be disposed. If neither ash nor sludge is determined to be hazardous, the costs of waste disposal could increase as much as 45 percent (see table 61). However, a preliminary analysis by the utility industry of various waste streams from coal-fired powerplants indicates that bottom ash, fly ash, and scrubber sludge all could

³42 U.S.C. 6901 et seq

Table 61.—Potential Sludge and Ash Disposal Costs Under RCRA

	Ash (mills/kWh)	Sludge (mills/kWh)	Total (mills/kWh)	Percent increase over base
Base case (current average treatment)	0.45	0.41-0.69	0.86-1.14	—
Case 1: Ash: Nonhazardous Sludge: Nonhazardous.	0.57-0.65	0.65-1.03	1.22-1.68	45
Case 2: Ash: Hazardous Sludge: Nonhazardous.	0.77-0.84	0.65-1.03	1.42-1.87	65
Case 3: Ash: Hazardous Sludge: Hazardous	0.77-0.84	0.90-1.17	1.67-2.01	84
(Case 4, where ash is nonhazardous but sludge is hazardous, is considered extremely unlikely)	-	-	-	-

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be classified as hazardous.” All three wastes yield substances (primarily toxic trace elements) in concentrations that exceed the allowable limits for drinking water. In addition, ash contains concentrations of radionuclides and corrosive substances that approach the allowable limits. If either or both of these wastes is listed as hazardous, disposal costs could increase as much as 84 percent (see table 61).

Listing ash and/or sludge as hazardous also would change utility disposal practices significantly. Sludge ponds could be prohibited as “open dumps” (an area in which there is a reasonable probability of adverse effects on health or the environment) and utilities forced to find alternative disposal methods. **In addition, the sale or use of wastes probably would be discouraged.** The National Ash Association estimates that more than 80 percent of the utilities that burn coal sell or use a portion of their ash and sludge wastes. The provisions of RCRA that govern transportation of these wastes could make them noncompetitive. This could increase disposable ash wastes by approximately 18 million tons annually at current levels; no comparable estimates were available for sludge. This effect directly contradicts RCRA’S stated objective of promoting the recovery and recycling of solid wastes.

Cost increases also could be expected in the disposal of coal mine wastes, which contain significant quantities of potentially toxic trace metals, if they are listed as hazardous. Potential overlaps between RCRA and SMCRA could add to these cost increases.

“Electric Power Research Institute, *The Impact of RCRA (Public Law 94-580) on Utility Solid Wastes* (F P-878, TPS 78-779, August 1978)

Coal Conversion Authority

ESECA⁴ was enacted following the 1973 oil embargo in order to reduce imports of natural gas and oil by increasing the use of coal in their place. Under ESECA, the FEA Administrator was required to prohibit powerplants, and possibly other major fuel-burning installations, from burning natural gas or oil as their primary energysource if certain conditions were met. These conditions are:

- that the facility has the capacity and necessary plant equipment to burn coal;
- that the burning of coal by the facility is practicable, that adequate coal supplies and transportation facilities will be available, and that the order would not impair a powerplant’s reliability of service; and
- that EPA either certifies that the facility will be able to comply with applicable portions of the Clean Air Act by the effective date of the FEA order or grants a compliance date extension.

In addition, ESECA authorized the FEA Administrator to require a powerplant or other major fuel-burning installation in the early planning process to be designed and constructed to use coal as its primary energy source. As with the prohibitions, design or construction requirements were conditioned on an adequate supply of coal and preservation of reliability of service, as well as the ability of the owner of the facility to meet existing contractual commitments and to recover capital investments made as a result of the FEA order.

4. Public Law 93-319 (June 22, 1974), as amended by Public Law 94-163 (Dec 22, 1975) and Public Law 95-70 (July 21, 1977)

Finally, the FEA Administrator was authorized to allocate coal, while EPA was empowered to issue temporary suspensions of some SIP provisions, in order to facilitate coal conversion. FEA authority to issue conversion orders under ESECA expired on December 31, 1978.

For a variety of reasons, including ineffective management and inadequate funding and personnel, ESECA did not result in many coal conversions. On June 30, 1975, FEA issued prohibition orders to 74 generating units at 32 powerplants and construction orders on 143 units at 97 powerplants. By early 1977, EPA had reviewed 65 of the 74 prohibitions, finding that only 11 of the 65 could burn coal immediately and remain in compliance with the Clean Air Act. Compliance date extensions were given to 20 more, while 34 were found to require additional pollution control equipment.⁴² Other stumbling blocks to the success of ESECA included the lack of financial incentives (other than market price) to stimulate coal conversions and the lack of statutory prohibitions for new sources.

The first National Energy Plan proposed by the Carter administration anticipated that two-thirds of the reduction in projected 1985 oil imports (3.3 million bbls/d out of 4.5 million bbls/d) would be achieved by coal conversions. The primary means by which these conversions were to be accomplished was a tax on industry use of oil and gas. (The utility sector was expected to switch to coal because of market incentives and was not considered the chief target of the proposed legislation.) However, Congress failed to approve the industrial use tax, and the final energy package is designed to achieve coal conversions through a regulatory program with slightly more authority than that granted under ESECA.

The primary purposes of the Powerplant and Industrial Fuel Use Act of 1978⁴³ (part of the National Energy Act) are: 1) to reduce petroleum imports and increase the capability to use indigenous energy resources, 2) to con-

serve natural gas and petroleum for uses other than electrical generation for which there are no feasible substitutes, and 3) to encourage the greater use of coal, synthetic gas derived from coal, and other alternate fuels in lieu of natural gas and petroleum. Supporting purposes of the Act include the rehabilitation and upgrading of railroad service and equipment necessary to transport coal, compliance with all applicable environmental requirements, and assurance of adequate supplies of natural gas for agricultural uses.

The Powerplant and Industrial Fuel Use Act (PIFUA) strengthens the regulatory program under ESECA in two primary ways. First, PIFUA prohibits, with certain exemptions, the use of natural gas or petroleum as a primary energy source in new electric powerplants and new major fuel-burning installations" and provides that no new electric powerplants may be constructed without the capability to use coal or any other alternate fuel as a primary energy source. In addition, PIFUA prohibits existing powerplants from using natural gas as their primary energy source after 1990 and, in the meantime, from switching from any other fuel to natural gas and from increasing the proportion of natural gas used as the primary energy source. The Secretary of Energy is granted additional authority to prohibit the use of petroleum and natural gas where certain conditions related to technical and economic feasibility are met.

Second, these prohibitions are reinforced with a shift in the burden of proof. That is, under ESECA, the choice of fuel was left up to the owner of a facility, and the Federal Government was required to prove that a particular facility could and should use coal. PIFUA, however, begins with a blanket prohibition against the use of oil and natural gas, and the owner of a facility must make a good faith effort to comply with the prohibition and show that despite these efforts he will be unable to

⁴²*Progress in the Prevention and Control of Air Pollution in 1976: Annual Report of the Administrator of the Environmental Protection Agency to Congress, S. Dec. No. 95-75, 95th Cong., 1st sess. (November 1977).*

⁴³Public Law 95-620 (Nov. 9, 1978).

"The provisions of the Powerplant and Industrial Fuel Use Act are applicable to powerplants and other stationary units that have the design capability to consume any fuel at a heat input rate of at least 100 million Btu per hour or to a unit at a site that has an aggregate heat input rate of at least 250 million Btu per hour.

comply and that he is entitled to an exemption from that prohibition.

The prohibitions also are reinforced with a variety of financial assistance provisions. PIFUA **provides an additional 10-percent tax credit** for industrial investment in alternative energy property such as boilers, pollution control technology, and equipment for producing synthetic fuels from coal. In addition, investment tax credits and accelerated depreciation were denied for new gas and oil burners. PIFUA also provides loans for up to two-thirds of the cost of pollution control equipment for powerplants. Finally, funds were made available for the rehabilitation and maintenance of railines used to transport coal.

These statutory prohibitions are, however, subject to numerous temporary and permanent exemptions. In addition, the Department of Energy (DOE) is given great latitude in interpreting the Act. Therefore, PIFUA'S success in achieving coal conversions will not be possible to predict until DOE promulgates the final regulations under which exemptions will be granted. For example, PIFUA permits an exemption if the cost of coal "substantially exceeds" the cost of oil or natural gas. The definition of "substantially exceeds," the costs to be included in the determination and the methods for arriving at those costs will be set out in the regulations and will determine the availability of exemptions under this provision.

Despite these uncertainties, DOE estimated in June 1977 that a regulatory program alone (that is, without an industrial use tax) would increase industrial coal consumption by 66 million tons in 1985 (as compared to no further legislation) and would yield 700,000 bbls/d in oil savings. However, the impact of PIFUA may be difficult to ascertain because most utilities and major industries are not planning new oil- or gas-burning facilities. Utilities have reported plans to bring 250 new coal-fired units on line by 1985; no new large industrial oil- or gas-fired boilers have been ordered since March 1977 and industry projections indicate none are expected. However, these projections could be undercut by environmental regulations. EPA plans to announce New Source Performance Standards for industrial boilers

under the Clean Air Act soon after PIFUA takes effect. If those standards are stringent, industrial coal use could be constrained severely in the Eastern United States. Because large powerplants and industrial boilers are the chief target of PIFUA, and because those facilities already plan to use coal to the extent possible, the main effect of PIFUA could be to provide financial assistance to ensure those plans do not change. Where PIFUA could have a major impact — on smaller industries — the amount of coal involved is not as great and exemptions are more easily obtained.

Other Federal Policy Actions

In addition to the protection from adverse impacts of coal use afforded to health and the environment by the above legislation, a variety of other Federal policy actions may affect coal production and use. These include the Endangered Species Act, the National Historic Preservation Act, the Fish and Wildlife Coordination Act, and a variety of measures related to transportation and transmission.

To the extent that coal production and use disrupt the ecology, it may be constrained by the Endangered Species Act of 1973.⁴⁵ The Act is designed to protect all forms of wildlife (including mammals, birds, reptiles, amphibians, fish, shellfish, and other crustaceans, and insects) and plants through conservation programs for endangered and threatened species and for the ecosystems upon which these species depend. The provisions of the Act that are most relevant to coal production and use are the prohibitions against "taking" any species that the Secretary of the Interior has determined to be endangered or threatened and against violating any regulation promulgated under the Act, and the requirement that all Federal departments and agencies consult with the Secretary to ensure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of these species or result in the destruction or adverse modification of their habitat.

Actions related to the production or consumption of coal, such as mining or facility construction, that would result in the death of

⁴⁵ 16 U.S.C. 1531 et seq

endangered or threatened species, are constrained by the prohibition against taking. In addition, the regulations promulgated under the Act designate habitats that are critical to the survival of some species. Any action affecting a designated critical habitat is an offense under the Act if it might be expected to result in a reduction in the number or distribution of the species of sufficient magnitude to place the species in further jeopardy or to restrict the potential expansion or recovery of the species. Several of these designated critical habitats are in major coal-producing counties.

The requirement that all Federal agencies consult with the Secretary of the interior to ensure that actions authorized, funded, or carried out by them will not result in ecological displacement or otherwise adversely affect endangered species directly affects almost all coal-related activities. For example, most surface mines require a permit under the Surface Mining Control and Reclamation Act. Similarly, most coal facilities, such as preparation and generating plants, require permits and authorizations under a variety of Federal laws such as the Clean Air and Water Acts. In determining whether actions will adversely affect an endangered or threatened species, agencies must consider not only the particular action to be authorized or funded, but also the probable secondary effects, such as induced private development.

Once an agency has consulted with the Secretary of the Interior, the final decision on whether or not to proceed with an action lies with the agency itself. That is, the Secretary of the Interior does not have veto power over actions of other agencies that might adversely affect critical ecosystems. However, the Act makes liberal provision for citizen suits to enjoin actions that violate the Act or regulations promulgated under it. In these suits the court will give great weight to the Secretary of the Interior's opinion about the effect of an action, and will defer to the Secretary to determine what modifications are necessary to ensure that an action does not adversely affect endangered or threatened species.

The National Historic Preservation Act of 1970⁴⁶ (NH PA) requires all Federal agencies to

obtain comments from the Advisory Council on Historic Preservation whenever any action may affect a site or structure listed, or found eligible for listing, in the National Register. In addition, regulations promulgated under NHPA require the agencies to determine whether there are historic, archeological, architectural, or cultural resources that may be eligible for listing in the National Register. If there are, the proposed project must be referred to the agency charged with protection of those resources for review.

As with the Endangered Species Act, NHPA's requirements affect almost all coal-related activities. Significant historic and cultural resources already have become the focus for concern over the impacts of energy development in the Eastern United States, while the preservation of archeological sites is a key issue in the **Indian** lands of the West. However, in very few instances may a proposed project be blocked by NH PA. Rather, the Act requires that an adequate opportunity to study the historic or other resource be provided before the project proceeds. Therefore, the primary impact of NHPA would be to delay proposed coal-related activities that might endanger these resources.

The Fish and Wildlife Coordination Act of 1970⁴⁷ offers some protection against the modification of any water body as the result of a Federal or federally permitted project. Under the Act, Federal agencies must consult with the Department of the Interior's Fish and Wildlife Service and with the State agency having jurisdiction over fish and wildlife, prior to taking any action on a proposed project. Serious consideration must be given to mitigating adverse impacts to fish and wildlife, and a project may be enjoined until the mandated coordination and consultation have occurred.

The principal coal-related activities that may be affected by this legislation include the construction of cooling water intake structures and of barge and other transportation facilities. However, these activities also are subject to the requirement that all projects affecting navigable waters obtain a permit from the

⁴⁶16 U.S.C. 470 et seq.

⁴⁷16 U.S.C. 661 et seq.

Army Corps of Engineers. In practice, therefore, the consultation required under the Fish and Wildlife Coordination Act usually occurs at the time of application for the Corps permit. If water resources will be taken by the project and wildlife values destroyed, mitigating measures may be required to protect the water flow or even to replace lands lost to construction.

Finally, the Transportation Act of 1966⁴⁸ forbids the taking of publicly owned wildlife refuges and parks as well as public or private historic sites for highway construction unless there is no feasible and prudent alternative and all steps are taken to minimize harm. This provision probably will not pose significant constraints to coal use because adequate transportation facilities already exist in most

parts of the country. Its greatest potential impact would occur if greatly increased production of Western coal required new highway construction.

Similarly, where transportation or transmission facilities are routed across public lands, or where the site for a combustion facility is on public land, the Federal agency having jurisdiction over the land must issue a permit for use of the right-of-way. There usually are statutory limits on the width of the corridor or on the size of the site, and other limitations may be imposed by the agency in order to prevent adverse environmental impacts. Again, these requirements probably would have a greater effect in the West where there is the largest concentration of Federal land.

IMPLEMENTATION

How these major Federal policy actions are implemented plays a central role in determining whether they contribute to or obstruct a coherent national coal policy. The primary factors relevant to their effective implementation include the number of agencies with responsibility for regulating coal production and use, the extent to which those agencies' mandates may overlap and conflict, and the number of gaps in regulatory programs created by unanticipated problems.

Institutional Factors

The responsibility for implementation of the various laws that affect coal production and use and their impacts on health and the environment is divided among a variety of administrative departments and agencies. The major areas of responsibility for environmental and social impacts are environmental impact assessment, air and water quality management, resource extraction, occupational health and safety, solid waste disposal, and siting and land use. For the promotion of coal use, agency responsibility covers resource exploration and acquisition, and resource use. Although

the focus of this discussion is on Federal agencies and their responsibilities, it must be kept in mind that State and local laws and their implementation also have a substantial impact on the direct use of coal.

Environmental and Social Impacts

Since the passage of the National Environmental Policy Act (NEPA), all Federal agencies must prepare a detailed EIS on all major actions significantly affecting the quality of the human environment. Two Federal agencies have EIS oversight responsibilities: CEQ and EPA. CEQ was established by NEPA to advise the President on environmental affairs, to provide the public with information about environmental issues, and to monitor other agencies' compliance with NEPA. CEQ regulates the preparation of EISs, serves as the Federal repository for EISs, reviews and comments on draft EISs, and develops comparative analyses on the EIS process. However, CEQ's role is primarily advisory; it can neither compel compliance with NEPA nor block actions it feels would have unacceptable impacts.

EPA was established in 1970 to administer a variety of environmental laws and to police the environmental activities of other agencies

⁴⁸49 U.S.C. 1650

by reviewing and publicly commenting on “environmentally impacting actions.” As with CEQ, EPA’s role in EIS review is advisory; it can make recommendations but cannot block other agencies’ actions unless those actions violate other environmental legislation.

A number of State and local governments have enacted environmental policy acts loosely modeled on NEPA. Their requirements range from detailed EISS to advisory planning mechanisms.

The Federal agency primarily responsible for air quality management is EPA. As discussed in previous sections, EPA’s role under the Clean Air Act includes publishing information about the effects of airborne pollutants on human health and the environment and about means of monitoring and controlling those pollutants, establishing numerical standards for ambient air quality and for pollutant emissions from various sources, promulgating guidelines for State plans to implement those standards, and implementing and enforcing the standards in the absence of State action. HEW sponsors some research into the health effects of airborne pollutants, and the Department of Justice assists EPA in enforcing the Clean Air Act.

The States have the primary responsibility for implementing and enforcing the Federal air quality standards in accordance with EPA guidelines. In addition, implementation and enforcement authority may be delegated to local government where State law permits and where the locality is deemed to be capable of handling this responsibility.

As is the case with air quality, EPA has the primary Federal oversight responsibility for water quality management. EPA publishes information about water pollutants and methods of control, sets water quality standards and effluent limitations for sources in order to meet those standards, establishes guidelines for State regulatory and permit programs, and implements and enforces the Clean Water Act in the case of State failure to do so. A variety of Federal departments and agencies assist EPA in fulfilling this responsibility including the Department of Agriculture, which is responsible for watershed management and runoff ero-

sion prevention; the Geological Survey, National Oceanic and Atmospheric Administration, National Aeronautic and Space Administration, and the Coast Guard, which assist EPA in water quality surveillance; HEW, which assists EPA in researching the harmful effects of water pollutants; the Department of Justice, which aids EPA and the States in enforcing the Clean Water Act; and the Department of the Interior, which assists EPA in determining the standards of water quality necessary for wildlife protection.

The State role under the Clean Water Act centers on developing and implementing plans and permit programs consistent with EPA guidelines.

As mentioned above, there is no comprehensive Federal policy for water resource management. The allocation of water rights traditionally has been the responsibility of the States, and means of allocation vary widely. However, many Federal agencies have been assigned duties that affect State allocations. First, the Water Resources Council⁴² (WRC) assesses water supplies and, through its River Basin Commissions, coordinates regional water resource planning. In addition, WRC evaluates water resource requirements and availability for nonnuclear energy technologies. The Department of the Interior sells or leases water supplies from its reclamation projects and, in cooperation with the Army Corps of Engineers, evaluates reservoir projects for the development of domestic, municipal, or industrial water supplies. The Corps also is responsible for inland waterways in cooperation with the Department of Commerce. The Department of Housing and Urban Development assists in water supply and distribution planning. The Departments of the Interior and Agriculture cooperate on water conservation and utilization projects. These and a variety of other agencies have additional minor and advisory responsibilities for the management of water resources as they relate to irrigation, aquatic life, recreation, flood control, and other purposes.

⁴²42 U.S.C. 1962a et seq.

The Department of the Interior has primary Federal responsibility for the environmental and social impacts of resource extraction. Within the Department of the Interior, the Office of Surface Mining (OSM) implements the Surface Mining Control and Reclamation Act (SMCRA). Under SMCRA, OSM sets environmental performance standards for all aspects of surface mining and for the surface operations of underground mines and establishes guidelines for State permit programs designed to implement and enforce those standards.

A variety of other offices within the Department of the Interior are responsible for environmental management of Federal coal leases. The Geological Survey has overall regulatory authority over extraction operations after leasing decisions have been made, including the site-specific conditions to be incorporated in leases as well as the resource conservation regulations for Federal lands. The Bureau of Land Management develops the reclamation requirements to be included in mining plans, while the Bureau of Indian Affairs regulates mining activities on Indian lands.

Prior to the passage of SMCRA, State regulation of the environmental impacts of mining varied widely. States that wish to retain regulatory authority over surface coal mining and reclamation operations now must develop comprehensive plans and permit systems in accordance with SMCRA. OSM will regulate the mining activities in those States that fail to develop or enforce a regulatory program.

Until the 1960's, regulation of the occupational health and safety impacts of mining was characterized by conflicts between State and Federal jurisdiction. These conflicts were resolved in 1969 with passage of the Coal Mine Health and Safety Act, which gave the Department of the Interior primary regulatory responsibility for miner's health and safety. Within the Department of the Interior, the Mining Enforcement and Safety Administration (MESA) set minimum standards, outlined penalties for violations, and established mine closure criteria. However, the Department of the Interior's concurrent responsibility for maximizing energy resource development was found to be incompatible with its duty to enforce mine

health and safety regulations, and in 1977 the Mine Safety and Health Act shifted the latter duty to the Department of Labor. The Department of Labor's Mine Safety and Health Administration (MSHA) will take over MESA's responsibilities. Both HEW's National Institute for Occupational Safety and Health and the Department of the Interior's Bureau of Mines conduct mine health and safety research.

Federal responsibility for solid waste disposal is divided among EPA, the Department of the Interior, and the Army Corps of Engineers. Under the Resource Conservation and Recovery Act (RCRA), EPA has general oversight authority for solid waste disposal. EPA is required to promulgate guidelines for the transportation and disposal of hazardous and nonhazardous wastes of all types (except radioactive wastes). The Department of the Interior's OSM sets minimum environmental performance standards for the disposal of spoil and coal-processing wastes. If either of these wastes is listed by EPA as hazardous or if EPA's environmental protection standards are more stringent than OSM's, the mine operator will be required to meet the stricter standards. Finally, the Army Corps of Engineers issues permits for the disposal of solid wastes or of dredge and fill material in navigable waters.

Implementation and enforcement of EPA's requirements under RCRA and of OSM's regulations under SMCRA may be turned over to States that establish approved regulatory programs. To the extent allowed by these State programs, local governments may control the location of waste disposal through land use planning and zoning.

As with water resource management, no comprehensive Federal policy exists for land use and facility siting. Although the Nation's energy goals call for increased reliance on coal, the recent escalation in parties-at-interest to energy development makes it difficult to find acceptable sites for new coal combustion facilities. In addition, most of the Federal regulatory programs discussed above indirectly control facility siting to prevent unacceptable site-specific environmental and social impacts, but there is little coordination among these programs.

Only on Federal lands do Federal agencies have any direct control over land use and energy facility siting. The Departments of the Interior and Agriculture supervise most Federal coal lands and have the authority to forbid mining where it would be environmentally unacceptable. For all Federal lands, the agency having jurisdiction over the land must issue a permit for use of the land as the site for a coal-related facility or for the right-of-way for transportation or transmission purposes.

Indirect controls—primarily constraints—on facility siting may be exercised by CEQ and EPA through their role in reviewing EISs. In addition, a variety of EPA regulations for air and water quality management limits the number of sites available to utilities and industry.

The States have the greatest amount of control over facility siting and land use, either through their general police power to protect the public health and welfare or through the implementation of federally mandated programs. Under their police power, States can control energy resource development through land use planning and zoning, permit requirements, and regulation of public utilities. A few States have enacted comprehensive statewide land use planning legislation; some only provide statewide planning for energy facility siting; in others all land use and siting remains under piecemeal legislation, much of it implemented at the local level.

The Promotion of Coal Use

Federal responsibility for resource exploration and acquisition rests with the Department of the Interior, which administers the Federal coal-leasing program. Within the Department of the Interior, the Geological Survey evaluates coal resource data while BLM records lease applications and collects various fees, rents, and royalties. In addition, other agencies with jurisdiction over the surface of public lands, such as the Department of Defense, may block coal leases on their lands.

The responsibility for coal extraction and use is divided between the Departments of the Interior and Energy. As discussed above, the Department of the Interior oversees Federal coal leases. But the 1977 Department of Ener-

gy Organization Act gives DOE control over economic leasing terms and conditions. DOE's duties under the 1977 Act include establishing long-term production goals for federally owned energy resources, developing standards for rates of production from Federal leases, specifying economic terms and conditions of individual leases (for example, eligibility of joint ventures), and setting guidelines for post-lease conditions (such as recommending forfeiture of a lease that does not meet production rates). To facilitate cooperation between the Departments of the Interior and Energy in administering the leasing program, the 1977 Act created a Leasing Liaison Committee within DOE but composed of equal numbers of members from both departments.

The use of coal is governed mainly by DOE through conversion of existing facilities to coal, the prohibition of new large facilities from burning gas or oil, R&D on new technology, and regulatory price setting.

Evaluation

Many critics of present Federal coal policy and of the agencies that implement it argue that energy development is overregulated. Certainly the scope of Federal intervention has grown dramatically in the last decade. The number of permits, certifications, and authorizations required to operate a coal mine or a coal combustion facility has increased substantially. Often several agencies share the responsibility for regulating a particular activity, such as leasing federally owned coal. Where those responsibilities overlap, conflicts may occur between the goals of the agencies involved. For example, limitations imposed on Federal coal leases by the Department of the Interior to prevent unacceptable environmental or social impacts may be incompatible with the economic terms and conditions imposed by DOE to achieve national energy goals. Whether the present Federal coal policy is perceived as counterproductive usually is a function of the interests being represented. impartial analysis is rare and conventional cost-benefit analysis often cannot adequately weigh the tradeoffs between the dollar costs of regulation and the resulting unquantifiable environmental and health benefits.

On the other hand, some commentators argue that more regulation of coal-related activities is required, either because of the manner in which agencies have interpreted their Federal mandates, or because gaps or inconsistencies in those mandates preclude the existence of either a coherent national coal policy or a coherent national environmental policy. The most significant obstacles include the lack of comprehensive Federal programs for coal, water, and land resource management; the conflict between States rights and the need for uniform Federal legislation; the lack of workable mechanisms for solving interstate or interregional problems; and the lack of mechanisms for long-range planning.

No comprehensive Federal policies currently exist for coal leasing, water resource management, or land use and facility siting. A Federal coal-leasing policy should be developed and implemented by the early 1980's, long before any significant coal supply constraints are expected to arise. Water availability and land use, however, may present obstacles to increased coal use.

As discussed above, water supplies traditionally have been allocated by the State with some Federal oversight. For the most part, State control of water resources is logical because of the wide variation in water availability. Thus a regulatory scheme that may be workable in the East, where surface and ground water resources are relatively abundant, would not be appropriate for the arid and semiarid regions of the West. Yet as the competition for water for agricultural, industrial, residential, and energy uses increases, a national system of priorities may become necessary.

Similarly, while land traditionally has been considered the Nation's most abundant resource, past abuses and the increasing concerns of parties-at-interest have begun to limit the land available for energy resource development. As with water, the concerns over land use and siting have regional variations. In the more industrialized East the concerns center on facility siting patterns; concentrations of coal-fired powerplants in particular areas may lead to cumulative and interactive impacts

that are not fully understood. In the Western States, the primary concern is the preservation of environmentally valuable scenic areas and the prevention of the adverse social and economic impacts of rapid development. To date, proposals for Federal land use legislation have been designed to encourage statewide planning. But many of the existing siting problems, such as air quality management and the long-range transport of pollutants, do not respect State boundaries. Without comprehensive nationwide land use planning that directly addresses facility siting problems it may not be possible to meet national energy goals.

Problems also have arisen in implementation of those regulatory schemes that mandate comprehensive State programs in accordance with Federal guidelines. Although nationwide legislative uniformity in these areas is in the public interest, States are under increasing pressure to reduce spending and are reluctant to accept the responsibility for major new regulatory programs. Yet if the States wish to preserve their rights to regulate energy development within their borders, they must accept that responsibility. Similarly, where federally mandated State regulatory programs are found to be inadequate, responsibility for their implementation and enforcement reverts to Federal agencies that have neither adequate personnel nor funding to perform those duties.

As discussed in chapter V, a variety of environmental impacts of energy resource development have become regional problems that do not lend themselves to management on a State-by-State basis. Yet the mechanisms for solving interstate pollution problems are cumbersome and ineffective, and the result will be an increase in the number of suits between States. For example, the State of Kentucky has passed a law that requires powerplant operators to obtain a permit from Kentucky if they take water from or discharge waste into the Ohio River along the State's border. This law effectively gives Kentucky control over powerplant siting along the Ohio River in the States of Ohio, Indiana, and Illinois. Kentucky has announced that those States must work together to solve their common air and water pollution and siting problems or face legal action by

Kentucky. To some extent, the existing Federal EPA regions could be used to manage interstate pollution problems, but the same issues of coordination and cooperation exist at the regional level; there has been very little interaction among the EPA regional offices even though environmental management strategies developed for one region may significantly affect another. For example, Kentucky's programs are under the jurisdiction of EPA region IV while Ohio, Indiana, and Illinois are in region V. The neighboring States of Pennsylvania and West Virginia, which share the same pollution problems, are under the jurisdiction of region III. In September 1978, these three EPA regions established an interregional task force to coordinate pollution control in the Ohio River Valley. Such interstate and interregional cooperation must become the rule rather than the exception if environmental problems are to be solved. Existing mechanisms for this cooperation, such as interstate compacts, should be adequate if used effectively.

Finally, most of the Federal policy actions discussed represent a legislative response to an

existing problem, such as lack of development of Federal coal leases or the already polluted condition of the Nation's air and water. Consequently most of the programs and the R&D funding is aimed at solving these problems and little attention is given to long-range planning or to researching potential future problems.

In summary, the piecemeal legislative approach to energy resource development and environmental management has resulted in a variety of implementation problems. Some of these result in additional dollar costs to the developer. Others result from a lack of coordination within and among regulatory agencies, such as the solid waste impacts of air pollution control or interstate and interregional energy development impacts. Still other problems, such as the obstacles to energy facility siting, may require additional regulation if the Nation's energy goals are to be met. For the most part, however, these problems could be solved if existing legislation were implemented in an effective, coordinated manner.