POWER PLANT SITING—A REGULATORY CRISIS

In no other area of natural resources use is the conflict between the consumptive demands of the American people and the desire for environmental protection more dramatically illustrated than in the production of energy.[1] All across the nation, power plant construction projects have been attacked by environmental groups and a worried public. The most startling aspect of these challenges is their timing—coming in the midst of a period of unprecedented growth in the demand for electrical energy.

The warning signals of this increased demand have already appeared on the American scene. The past few years have seen blackouts and brown-outs in many major American cities, and the future promises little in the way of improvement. For example, it has been estimated that between the present and the year 2000 the United States will require more energy than it has consumed in its entire history to date.[2] In addition, since 1968, the United States has increased its energy consumption at a rate of approximately 5% per year—about four times faster than the growth in population.[3] Concomitant to such an increase in the demand for energy, has been an increase in the construction of power plants and a multiplication of the problems of power plant siting.

I. Energy Needs vs. Environmental Protection

Although the purpose of this Note is not to discuss the development of a comprehensive *national* policy with regard to the problems of power plant siting and the energy supply, a brief survey of some of the component factors (*i.e.* environmental, economic and political) which influence energy production decisions of public utilities may be helpful by way of supplying a perspective on the problem.

The problems of the "environmental crisis" and a number of potential solutions have been presented to the American public in recent years. The public concern which was generated in this regard, however, was not without its pitfalls. The first waves of the newly awakened public concern over environmental degradation all but obscured the growing problem faced by the utilities of supplying the energy needs of the nation, and public objections on environmental grounds have delayed or frustrated the construction of many power plants across the country.[4]

---

[1] Council on Environmental Quality, Environmental Quality 159 (1970).

[2] Ramey, *The Energy Needs of the Nation and the Cost in Terms of Pollution,* 14 Atom. En. L. Rev. 26, 32 (1970).

[3] *Id.* at 31; the United States, which comprises approximately 6% of the world's population, at present consumes 35% of the total energy output of the world.

[4] A partial list of the challenged projects includes: Udall v. FPC, 387 U.S. 429 (1966); Calvert Cliffs' Coordinating Comm. v. AEC, 449 F.2d 1109 (D.C. Cir. 1971); Northern States Power Co. v. Minnesota, 447 F.2d 1143 (8th Cir. 1971); New Hampshire

The very construction of these plants is evidence that many of the public utilities are genuinely concerned with their own ability to meet the growing demands for energy. This concern is justifiable, for in 1970, utilities were producing 75% more power than they did in 1960. At the same time, power reserves for peak demand periods were shrinking to new lows, some of which were far below the 15 to 20% reserves recommended by the Federal Power Commission (FPC). On a national scale, 39 of 181 major utilities have reserves of less than 10%.[5] Yet in the face of this pressing need for ever increasing supplies of energy, the objections to the construction and siting of new power plants continue to be raised.

A. *Environmental Considerations*

The environmental objections which have been raised in many instances, and which must be given consideration by the utilities in their construction plans, have taken many forms. The considerations discussed below are by no means all-inclusive, but may serve as a sample of the ecological issues encountered by utilities in any siting decision.

Some of the environmental objections have as their basis the natural aesthetics of the area in which the utility seeks to locate its generating facility. Other challenges have taken the form of resistance to the type of facility proposed, or the fuel source to be used by the plant because of the types of pollutant produced. For example:

1. Coal and oil burning plants may emit a variety of pollutants in both gaseous and solid particulate form. The complete combustion of carbonaceous fuels will produce carbon dioxide. The incomplete combustion of these fuels will yield carbon monoxide, which begins to become hazardous to most humans at about 100 parts per million when experienced over a period of several hours.[6] In addition to the above substances which are emitted in massive amounts, there are a variety of other substances which are emitted in much lower concentrations, but with a much greater toxicity.[7] For example, sulphur dioxide, which is produced primarily from the combustion of coal and oil, which contain sulphur in various chemical forms, may be converted by atmospheric reaction into sulphuric acid.[8] In addition, two of the oxides of nitrogen are normally considered to be pollutants. These nitrous oxides are characteristic only of a highly industrialized society such as our own.[9] Nitric oxide, the primary product, is formed when combustion takes place at a sufficiently high temperature and pressure to cause a reaction between the nitrogen and the oxygen contained in the atmosphere. Electrical power plants and other

v. AEC, 406 F.2d 170, (1st Cir. 1969); Scenic Hudson Preservation Conf. v. FPC, 354 F.2d 608, *cert. denied*, 384 U.S. 941 (1966).

[5] COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY 159 (1970).

[6] J. KRIER, ENVIRONMENTAL LAW AND POLICY 8 (1971).

[7] *Id.*

[8] *Id.*

[9] *Id.* at 9.

energy conversion activities which operate on a large scale fix nitrogen in this fashion.[10]

2. Another problem, which is common to both fossil fueled (coal, oil and gas) and nuclear fueled plants, is thermal pollution, which is due essentially to their need for cooling water, and the effects of returning heated water to river, stream and bay ecosystems.[11] The exact ecological effects of thermal pollution are not yet clear, and will require extensive monitoring and investigation in the future.[12]
3. Hydroelectric generating plants present a problem with respect to the large reservoirs which are needed in order to meet demands in periods of peak loads. This may necessitate the flooding of lands, resulting in an interruption of the ecology of the area flooded.
4. Various other environmental concerns have been generated as a result of the construction of new power plants. These concerns have included fear of nuclear accidents and radioactive pollutants, nuclear waste disposal, and power transmission line siting problems.

B. *Economic and Political Considerations*

The problems of our growing energy demands are further complicated by the political and economic realities of an increasingly industrialized world. A simple description of the relationships involved could be illustrated in the following manner:[13]

SOURCE—MARKET DEMAND—END USE

The most logical manner to organize any discussion of the problems suggested by this description would be to consider each segment of the chain chronologically.

1. *Available Fuel Resources*:
   a. *Coal*: The United States has been well endowed with coal resources. Coal has seen extensive use in the generation of electrical power, and at the present time accounts for more than 60% of all thermal electric energy production. During the 1950's and 1960's, a combination of factors such as increased labor productivity and improved technology in the mining industry resulted in a decline in the cost of coal. In more recent years, however, this trend has been reversed, and the cost of coal is once again increasing. Some of the forces which have tended to exert upward pressure on the price of this commodity have been rising labor costs, more stringent safety requirements in the mining industry, and environmental restrictions on the sulphur content of the coal produced. This rise in cost has had a serious impact on the electric power

---

10 *Id.*

11 COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY 160 (1970).

12 *See generally* Note, *Thermal-Electric Power and Water Pollution: A Siting Approach*, 46 IND. L.J. 61 (1970).

13 Ramey, *The Energy Needs of the Nation, and the Cost in Terms of Pollution*, 14 ATOM. EN. L. REV. 26, 31 (1970).

industry which consumes more than one-half of the nation's coal output.[14]

b. *Residual Fuel Oil*: Residual fuel oil may not be economically transported over long distances as may natural gas, and its use is thus limited to areas in which low cost water transportation is available. In 1968, slightly more than 25% of the residual fuel oil supply was consumed by electric utilities. Use of residual fuel oil has been increasing because of its lower price —a consequence of not being subject to import quotas.[15] The technology is also available for removal of most of the sulphur which is contained in residual fuel oil.

c. *Natural Gas*: One-sixth of all the natural gas produced in this country is utilized for electric power generation. This production accounts for about one-quarter of all electrical energy produced by steam electric plants. Gas is a desirable fuel because it is clean, has minimal disposal problems, is easily transported, and is able to meet air quality standards easily. There is some doubt, however, that our domestic supplies of this commodity will be able to meet the foreseeable demands in the next twenty years.[16]

2. *Market Demands*: The growing demand for energy has been accompanied by a shift in primary fuel usage. In the late 1800's the shift was from wood to coal and to oil and gas by the middle 1900's.[17] It is expected that these fuel resources will continue to play a major role in the production of energy in the United States well into the twenty-first century.[18] Concurrently, there has been a shift in the primary markets for energy. It is estimated that by 1980, public utilities will move into first position in the primary markets.[19] The current shift to electrical power, when combined with the finite supply of fossil fuels and the emergence of nuclear fuels suggest that there will be further shifts in the future.

3. *End-Use Patterns*: Another aspect of the problem faced by the utilities is found in the patterns of energy and fuel use in the United States. The shift may be aptly seen by the following statistics.[20]

	1960	1970
Transportation	20%	25%
Electricity	21%	25%
Heat	48%	40%
Chemical and non-energy use	11%	10%
Total Energy Supply	100%	100%

These changes in use patterns make planning by utilities difficult,

---

[14] *Hearings Before the Joint Comm. on Atomic Energy*, 91st Cong., 1st Sess., pt. 1, at 56 (1969).

[15] *Id.* at 57.

[16] *Id.*

[17] *Hearings on S. Res. 45 Before the Senate Committee on Interior and Insular Affairs*, 92d Cong., 2d Sess., at 680 (1972).

[18] *Id.*

[19] *Id.* The four primary markets are normally considered to be industrial-commercial, transportation, electric utilities and residential.

[20] *Hearings on S. Res. 45 Before the Senate Committee on Interior and Insular Affairs*, 92d Cong., 2d Sess., at 682 (1972).

> especially when prospects of future changes in usage as well as changes in fuel sources are expected.

To summarize, "[t]he present energy picture is one of rapidly rising demand and a tight or even short supply of capacity in the major domestic fuel sources."[21] A portion of this problem may be attributed to the new environmental policies of our nation, which have been superimposed upon the supply-demand balance previously existing in the public utilities industry.[22] Viewed in this manner, the term "fuel shortage" is a misnomer, for what exists in actuality is a "clean-fuel shortage." There are prospects for "clean fuels" for the future,[23] but reviewing the problems previously mentioned, it is clear that there will "be no free lunches if we are serious about protecting the environment, and at the same time meeting our energy needs."[24]

II. Federal Regulation of Power Plant Siting

There are those today who question "whether our society possesses the internal discipline to consciously adopt a set of coherent policies."[25] However, short of the other alternative—governmental fiat,

> [t]he public has a right to choose, but one would hope that that choice would be explicit—after weighing the full consequences of a particular decision. Piecemeal policies, inevitably result in the inadvertent short-changing of higher policy objectives. Haphazard choice, based upon immediate emotion, is potentially crippling; it is tolerable only if not carried too far.[26]

The truth of these statements is readily apparent. In the midst of the "fuel crisis" of the winter of 1973, the cry was raised for states to suspend many of their air quality regulations to permit the use of high sulphur fuels. The continued pressure for energy demands could foreseeably force a retreat from some of the gains made in the area of environmental protection, and foreshadow another victory for those who subscribe to a "crisis theory of planning."[27] There are indications, however, that gains in the field of rational planning are being consolidated. For example, the National Environmental Policy Act of 1969[28] requires that the Council on Environmental Quality, which was created in the Executive Office of the President, "formulate and recommend national policies to promote the improvement of the quality of the environment."[29] On the other hand, there is no single regulatory agency

---

21 *Id.* at 305.
22 *Id.*
23 Some of the alternative "clean fuels" which may be available for the future with continued research and development are: geothermal power (earth's heat), solar energy, magnetohydrodynamics, and nuclear fusion reactions.
24 *Hearings on S. Res. 45 Before the Senate Committee on Interior and Insular Affairs*, 92d Cong., 2d Sess., at 306 (1972).
25 Schlesinger, *Energy—the Environment and Society*, 14 Atom. En. L. Rev. 3, 5 (1970).
26 *Id.* at 4.
27 C. Haar, Land Use Planning 130 (1959).
28 42 U.S.C. § 4321 (1970).
29 *Id.* § 4342.

which is charged with the responsibility of formulating a national policy concerning energy production or consumption. As a result, most of the decisions concerning power plant siting have been resolved at the state level, by private decision-makers. A brief survey of the federal regulations concerning power plant siting will reveal how a fragmentation of power has dictated this particular allocation within the decision-making process.

Federal regulation in the area of power plants is limited primarily to nuclear and hydro-electric facilities. There is no federal agency at present which is charged with the responsibility of licensing fossil-fueled stations. The Atomic Energy Commission (AEC) licenses nuclear power plants.[30] It has been recently determined that the Atomic Energy Act of 1954, as amended,[31] vested in the AEC exclusive jurisdiction over radiological health and safety standards.[32] These factors have always been considered by the AEC in their hearings, but the AEC had ruled that they had no jurisdiction to consider other factors such as thermal pollution.[33] The AEC is now subject to the requirements of the National Environmental Policy Act (NEPA). Sections 102(2) (a) and (b) of the NEPA[34] anticipate the use of an interdisciplinary approach which charges the governmental agencies to give consideration to environmental factors in addition to technological and economic considerations. The Water Quality Improvement Act of 1970[35] requires any applicant whose activities may result in a discharge into any navigable waters of the United States to provide certified assurances "that such activity will be conducted in a manner which will not violate applicable water quality standards."[36]

The Federal Power Commission (FPC) licenses only hyroelectric generating facilities.[37] The FPC, unlike the AEC, has broad statutory authority to affect a review of environmental issues. It has been mandated that the FPC must insure that any particular project is, "best adapted to a comprehensive plan for improving or developing a waterway or waterways" and "for the improvement and utilization of waterpower development, and for other beneficial public uses, including recreational uses. . . ."[38]

The FPC has, in addition, the authority to give preferences, in cases of conflicting applications to the applicant whose plans are "best adapted to develop, conserve, and utilize in the public interest the water resources of the region. . . ."[39] The courts, in several cases, have interpreted these provisions

---

30 *Id.* §§ 2061, 2134. *See generally* Power Reactor Dev. Co. v. International Union of Elec. Workers, 367 U.S. 396 (1961), which presents an analysis of the AEC's licensing procedure.

31 42 U.S.C. § 2134 (1970).

32 Northern States Power Co. v. Minnesota, 447 F.2d 1143 (8th Cir. 1971).

33 New Hampshire v. AEC, 406 F.2d 170 (1st Cir. 1969).

34 National Environmental Policy Act of 1969, 42 U.S.C. § 4321 *et seq.* (1970).

35 33 U.S.C. § 1151 (1970).

36 *Id.*

37 16 U.S.C. § 797(e) (1970).

38 *Id.* § 803(a); Udall v. FPC, 387 U.S. 428 (1967); Scenic Hudson Preservation Conf. v. FPC, 354 F.2d 608, *cert. denied*, 384 U.S. 941 (1966).

39 16 U.S.C. § 800(a) (1970).

broadly, finding an affirmative duty on the part of the FPC to consider "and make a record of such factors as the need for the power, the environmental suitability, and engineering and economic feasibility of alternative methods of generation and of alternative sites, and the adequacy of environmental controls at the site finally selected."[40] The FPC will now also be subject to the requirements of the NEPA.

The sweeping language of section 102(2) of the NEPA provides in part that "all federal agencies shall, *inter alia*, consider a vast spectrum of environmental factors in decision making . . . and prepare detailed environmental statements for all 'other major Federal actions significantly affecting the quality of the human environment.' "[41] As the licensing function would probably fall within the category of a "major Federal action" several other federal agencies may now have the power of review of various aspects of the siting problem. For example, the Army Corps of Engineers has the authority to license any discharges of refuse matter into navigable waters of the United States.[42] When these powers are combined with the authority of the NEPA[43] and the Water Quality Improvement Act of 1970,[44] the Corps of Engineers could conceivably have regulatory powers over many aspects of power plant site selection.

III. State Regulation of Power Plant Siting

A. *Present State Regulation*

As public concern over power plant sitings grew, the number of legal challenges to these projects also increased. The tools for these challenges were close at hand. Utilizing a welter of all but forgotten federal, state and local laws, citizens' lobbies were able to effect a piece-meal, after-the-fact adjudication of many choices for power plant sitings. A portion of these tactics may be attributed to a sense of frustration, impotency, and futility on the part of the public concerning the impact of the public sector in the decision-making process. This reaction is readily understandable, for the siting of power plants has traditionally been announced *fait accompli* by the utilities.[45] This stealth had often been a result of the desire of the utilities to facilitate land acquisition and reduce price speculation for the land.[46]

This type of acquisition procedure has been facilitated at the state level, by the paucity of legislation dealing with siting decisions. As of 1968, only 20 states had public agencies which licensed new coal, oil or gas burning power facilities, which at the present are the mainstay of the power industry. Of

---

40 Smith, *Electricity and the Environment—The Generating Plant Siting Problem*, 26 Bus. Lawyer 169, 173 (1970).
41 42 U.S.C. § 4321 (1970).
42 33 U.S.C. § 407 (1970).
43 42 U.S.C. § 4321 (1970).
44 33 U.S.C. § 1151 (1970).
45 Smith, *supra* note 40, at 171.
46 *Id.*

these 20 states, 16 required public hearings to be held on the applications of the utilities. Approximately one-half of these states consider the appearance and location of both the plants and transmission lines. Other environmental issues such as air and water pollution, and fish and wildlife protection are considered by other state agencies.[47] Even in those states which do not formally consider licensing,[48] many of these environmental issues are considered by other agencies.

The general thrust of the matter "is that state and local authorities have not had the statutory mandate nor the technical competence to evaluate adequately the grounds of environmental suitability of proposed generating stations."[49] Where such authority has existed, however, the primary concerns have been with the reliability and safety of the utilities involved.

B. *Recent State Initiatives*

The Energy Policy Staff, of the Office of Science and Technology, has identified a number of needs with respect to power plant siting. These are:

1. The implementation and funding of expanded research and development programs, specifically designed to identify areas of environmental impact from power generating facilities and to discover means of reducing this impact.[50]
2. Long range planning of power plant siting, with particular attention devoted to environmental factors.[51]
3. The development of alternative plant sites at least 5 years in advance of construction.[52]
4. A greater amount of public participation in the planning and site selection process, with an emphasis on measures to reduce the number of adversary proceedings and their consequent appeals.[53]
5. Provisions for planning and preconstruction review by a public agency with the authority to coordinate all available information concerning both the power supply and environmental issues, in order to avoid a portion of the fragmentation of authority now existing on the state level. This agency should be a "one-stop" agency—the approval of this agency should mean that construction may proceed without further permission from other agencies.[54]

---

47 F. GRAD, ENVIRONMENTAL LAW 11-56 (1971).

48 The State of Iowa does not formally regulate power plant siting. However, many of the environmental effects of a siting decision are regulated by other state agencies such as the Water Quality Commission (IOWA CODE Ch. 455B), Conservation Commission (IOWA CODE Ch. 107), and the Natural Resources Council (IOWA CODE Ch. 455A) whose approval must be obtained in order for the utility to receive an operating permit.

49 Smith, *supra* note 40, at 171.

50 ENERGY POLICY STAFF, OFFICE OF SCIENCE AND TECHNOLOGY, ELECTRIC POWER AND THE ENVIRONMENT, at 3 (1970).

51 *Id.*

52 *Id.*

53 *Id.* at 4.

54 *Id.* An outstanding example of this fragmented authority may be found in *Orange County Air Pollution Control Dist. v. Public Utilities Commission*, 4 Cal. 3d 945, 484 P.2d 1361 (1971).

The following paragraphs will consider several recent and novel state initiatives dealing with power plant siting. These will be dealt with in a manner designed primarily to reveal the extent to which each program reflects the needs outlined by the Energy Policy Staff.

The Washington Program:

The intent of the Washington program is "to seek courses of action that will balance the increasing demands for thermal power plant location and operation in conjunction with the broad interests of the public." The program will attempt to provide operational safeguards for the protection of the welfare of the citizens; protect the quality of the environment; and provide low-cost electrical energy.[55] The program establishes a "thermal power plant site evaluation council," which will consist of the directors of 14 state agencies, and a representative of any county wherein an application for a plant permit is filed.[56] Among the powers given to the council are the following:[57]

> (1) To develop and apply topical environmental and ecological guidelines in relation to the type, design, and location of thermal power plant sites and associated transmission line routes;
>
> (2) To establish rules of practice for the conduct of public hearings pursuant to the provisions of the Administrative Procedure Act. . . ;
>
> (3) To prescribe the form, content, and necessary supporting documentation for site certification;
>
> (4) To receive applications for site locations and to investigate the sufficiency thereof;
>
> (5) To make and contract, when applicable, for independent studies of thermal power plant sites and transmission line routes proposed by the applicant;
>
> (6) To conduct hearings on the proposed location of the thermal power plant sites and, when applicable, the associated transmission line routes;
>
> (7) To prescribe the means for monitoring of the effects arising from the construction and the operation of thermal power plants, and where applicable, associated transmission lines to assure continued compliance with terms of certification.

Within 12 months of the receipt of an application, the council will then report its recommendation to the governor who will make the final determination within 60 days, subject to judicial review.[58]

Applications for plant site certification must be accompanied by a $25,000 fee to enable the commission to sponsor an independent consultant's study.[59] The applicants must in addition submit their own environmental study,[60] and

---

55 WASH. REV. CODE ANN. § 80.50.010 (Supp. 1972).
56 *Id.* § 80.50.030.
57 *Id.* § 80.50.040.
58 *Id.* §§ 80.50.100, 80.50.140.
59 *Id.* § 80.50.070.
60 *Id.* § 80.50.060.

due to what economists call "cost externalization."[74] Thus, if a power plant discharges large amounts of heated water into a river, it will impose large costs on the lower riparian users which the generating station itself will not be forced to bear. External costs such as this, are difficult to identify and reallocate upon private economic units in a dynamic industrial situation, dictating of necessity some form of public regulation.[75]

If the regulation decisions are to be made at the state level, there are several alternatives available for structuring the regulatory institution. These are:

1. Place the siting authority within the agencies already regulating public utilities.[76]
2. Create a separate siting agency.[77]
3. Locate the siting agency in a land-use or environmental planning unit.[78]

While each of these schemes has its own particular advantages and disadvantages, one important disadvantage "in locating siting regulation at the state level is that state planning and licensing responsibility cannot be plenary."[79] As we have already seen, the AEC and the FPC have jurisdiction over nuclear and hydroelectric plants. While these agencies may be viewed as another set of constraints on a state agency of general jurisdiction, the result in some instances may be a confrontation of state and federal authority.[80]

IV. Conclusion

It is clear that the United States must have more energy. It is equally necessary that we also have a cleaner environment. In addition, there will have to be action concerning power plant siting. There are moves today to establish a National Energy Policy which could have the effect of pre-empting state planning for power supplies. This may be avoided if the states are willing to take positive action to:

1. Realistically time the siting decision (*i.e.*, before the utility is irrevocably committed to a site economically.[81])
2. Find appropriate techniques to force planning.[82]
3. Ensure rapid and final planning decisions (*i.e.*, "one-stop" agencies).[83]

Whatever form it may take—state, regional or national—the need for this planning is becoming a critical reality.

John S. Barnard

---

74 *Id.* at 187.
75 *Id.*
76 *Id.* at 188.
77 *Id.* at 189.
78 *Id.*
79 *Id.* at 190.
80 Northern States Power Co. v. Minnesota, 447 F.2d 1143 (8th Cir. 1971).
81 Smith, *supra* note 40, at 191.
82 *Id.* at 192.
83 *Id.* at 195.