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Conflict in Implementing Environmental and Energy Policies

G.S. Peter Bergen*

I. Introduction

Regulated entities¹ need stable and predictable environmental rules to implement major long-term projects and to efficiently conduct their daily business operations. They need to know what will be expected of them by the government in order to plan, design, finance, and build.

The environmental regulatory system, however, is often characterized by instability and uncertainty. Rules are frequently changed during the various stages of planning, construction, licensing, and operation. Regulated entities must constantly follow changing developments in the regulatory fabric to learn about new requirements for environmental compliance, how those requirements affect operations, and how to finance the cost of compliance.

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1. While the public perception seems to be that private industry is responsible for "pollution" and environmental compliance, the environmental laws also impact heavily on local, state, and federal agencies which operate facilities. Consider, for example, municipal sewage treatment works, *see* Clean Water Act, 33 U.S.C. §§ 1281-97 (1976 & Supp. V 1981)(construction grants); garbage disposal sites, *see* Resource Conservation and Recovery Act, 42 U.S.C. §§ 6941-6949 (1976 & Supp. V 1981); and incinerators, *see* Clean Air Act, 42 U.S.C. § 7602(e) (Supp. V 1981) (defines "person" to include municipalities, states, and federal agencies). Similarly, environmental standards affect military operations, *see* *Romero-Barcelo v. Brown*, 643 F.2d 835, 861 (1st Cir.), *cert. denied*, 454 U.S. 816 (1981)(the discharge of any pollutant under the Clean Water Act, 33 U.S.C. § 1311(a) (1976 & Supp. V 1981), includes the Navy's dropping of ordnance into coastal waters). Highway construction is frequently challenged under the National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321-4370 (1976 & Supp. V 1981) or other acts. *See, e.g.,* *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402 (1971); *Sierra Club v. U.S. Army Corps of Engineers*, 541 F. Supp. 1367 (S.D.N.Y. 1982).

Shifting and unrealistic environmental policies and interpretations can severely impede the overall environmental and energy regulatory systems' objectives of a "clean" environment with reliable and inexpensive energy supplies. Examples of resultant inconsistency and contradiction can be found in the hazardous waste and nuclear regulatory schemes. Moreover, proposed legislative measures² to regulate "acid rain" appear to have a similar potential to interfere with overall policy objectives of environmental and energy regulation.

II. Background

A. Federal & State Regulation

At the present time, a complex federal-state regulatory program affects virtually all activities, whether existing or proposed, which result in emissions to air, discharges to water, or disposal of wastes on land, or which have significant impacts on land or resource use.³ Agency regulations have expanded and developed at an astounding pace over the past fifteen years, producing an enormous volume of rules requiring implementation. The United States Environmental Protection Agency (EPA) alone has promulgated nine volumes of environmental regulations in

2. S. 2001, 98th Cong., 1st Sess., 129 Cong. Rec. 14528 (daily ed. Oct. 25, 1983) (introduced by Sen. Durenberger); H.R. 3400, 98th Cong., 1st Sess., 129 Cong. Rec. 4773 (daily ed. June 23, 1983) (introduced by Rep. Waxman); S. 768, 98th Cong., 1st Sess., 129 Cong. Rec. 2547 (daily ed. March 10, 1983) (introduced by Sen. Stafford).

3. See, e.g., National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321-4370 (1976 & Supp. V 1981); Clean Air Act, 42 U.S.C. §§ 7401-7642 (Supp. V 1981); Clean Water Act of 1977, 33 U.S.C. §§ 1251-1376 (1976 & Supp. V 1981); Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§ 6901-6987 (1976 & Supp. V 1981); Surface Mining Control and Reclamation Act, 30 U.S.C. § 1201 (Supp. V 1981); Outer Continental Shelf Lands Act Amendments of 1978, § 208, 43 U.S.C. § 1344 (Supp. V 1981). States have enacted corresponding legislation. See, e.g., N.Y. Env'tl. Conserv. Law §§ 19-010 to 0711 (air pollution control); §§ 17-0101 to 1907 (water pollution control); §§ 27-0101 to 0301 (solid waste treatment and disposal); §§ 8-0101 to 0115 (environmental quality review) (McKinney 1973 & Supp. 1983). See also *infra* note 6 (state air, water, and solid waste laws reprinted in Env't Rep. (BNA)).

the Code of Federal Regulations over the last fourteen years.⁴ Since the program involves states as well as the federal government in a "delicate partnership,"⁵ the fifty states have generally responded with comparable rules.⁶ Moreover, individual agency policies have shifted and been amended almost continuously since 1970 in response to legislation,⁷ court decisions,⁸ and political factors.⁹

Implementing these complex programs has been a formidable challenge. For example, EPA and state environmental regulatory agencies face immense management problems in administering these ambitious programs, in addition to the more obvious problems of implementing basic policies in response to legislation. These legislative programs generally reflect the demands of the public and its growing concern for the environment. The public at large clearly wants a "clean environment." However, the public is buffeted by conflicting notions of what is "clean," and what the costs and benefits are. Thus, regulations often reflect public preference while neglecting operational reality—the certainty and predictability required by regulated entities for compliance.

4. See Protection of the Environment, 40 C.F.R. §§ 1-424 (1983) (includes air program, §§ 50-87; water program, §§ 100-149; pesticides, §§ 162-180; ocean dumping, §§ 220-231; solid waste program, §§ 240-267; superfund, § 300; effluent guidelines, §§ 401-466).

5. *Train v. Natural Resources Defense Council, Inc.* 421 U.S. 60 (1975); *Union Elec. Co. v. EPA*, 427 U.S. 246 (1976).

6. See [State Air Laws] *Env't Rep.* (BNA) 301:0101-556:0501; [State Water Laws] *Env't Rep.* (BNA) 701:0101-956:1041; [State Solid Waste -- Land Use] *Env't Rep.* (BNA) 1101:0101-1356:2501.

7. Clean Air Act Amendments of 1977, 42 U.S.C. §§ 7401-7642 (Supp. V 1981); Clean Water Act of 1977, 33 U.S.C. §§ 1251-1376 (1976 & Supp. V 1981); See also S. 757, 98th Cong., 1st Sess. (1983); S. 1363, 98th Cong., 1st Sess. (1983); H.R. 2867, 98th Cong., 1st Sess. (1983) (pending amendments to the Solid Waste Disposal Act).

8. *Train v. Natural Resources Defense Council, Inc.*, 421 U.S. 60 (1975). See also EPA Memorandum, Proposal to Amend EPA's PSD and Nonattainment NSR Regulations [14 Current Developments] *Env't Rep.* (BNA) 601 (July 21, 1983).

9. For instance, compare the policies of leasing federal lands for oil and gas exploration under the Carter and Reagan administrations.

In addition, courts are confronted with novel and complex environmental cases, often based on poorly drafted statutes,¹⁰ containing highly technical, lengthy, factual records.¹¹ The “arbitrary and capricious” and “substantial evidence” standards of review set forth in the Administrative Procedure Act,¹² require that the federal courts defer to the agencies’ policy choices and technical interpretations of the facts.¹³ Accordingly, the judicial decisions are more often based on procedural grounds rather than substantive technical merit.¹⁴

B. *Uncertainties in Licensing*

A number of cases have involved the overlay of environmental laws to plans to develop energy projects, such as nuclear plants,¹⁵ coal conversions,¹⁶ hydroelectric plants,¹⁷ offshore oil and gas drilling,¹⁸ electric

10. *Alabama Power Co. v. Costle*, 636 F.2d 323 (D.C. Cir. 1979). *United States v. Wade*, C.A. 79-1426, slip op. (E.D. Pa. December 20, 1983). *See United States v. A. & F. Materials Co.*, 20 Env’t Rep. Cas. (BNA) 1353, 1357 (S.D. Ill. 1984) (hastily and inadequately drafted statute).

11. *See, e.g., Ethyl Corp. v. EPA*, 541 F.2d 1 (D.C. Cir. 1976), *cert. denied* 426 U.S. 941 (1976); *Sierra Club v. Costle*, 657 F.2d 298 (D.C. Cir. 1981); *Scenic Hudson Preservation Conf. v. F.P.C.*, 453 F.2d 463, 469 (2d Cir. 1971).

12. Administrative Procedure Act § 10(e), 5 U.S.C. § 706(e) (1982).

13. *See, e.g., Industrial Union Dep’t, AFL-CIO v. American Petroleum Inst.*, 448 U.S. 607, 656 (1980) (courts must generally defer to an agency when it is making predictions within its area of expertise).

14. *See Baltimore Gas & Elec. Co. v. Natural Resources Defense Council, Inc.*, 103 S. Ct. 2246 (1983) (disallows substantive review of the agency’s generic rulemaking). *Compare Sierra Club v. EPA*, 719 F.2d 436 (D.C. Cir. 1983) (remanding EPA rules with an opinion analyzing the technical aspects of appropriate heights for smokestacks).

15. *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council, Inc.*, 103 S. Ct. 2246 (1983); *Vermont Yankee Nuclear Power Co. v. Natural Resources Defense Council, Inc.*, 435 U.S. 519 (1978).

16. *Environmental Defense Fund v. Flacke*, 96 A.D.2d 862, 465 N.Y.S.2d 759 (1983).

17. *Scenic Hudson Preservation Conf. v. FPC*, 453 F.2d 463 (2d Cir. 1971); *Power Authority of N.Y. v. Williams*, 60 N.Y.2d 315, 457 N.E.2d 726, 496 N.Y.S.2d 620 (1983).

18. *Secretary of the Interior v. California*, 104 S. Ct. 656 (1984).

transmission lines,¹⁹ and coal mines.²⁰ Federal²¹ and state²² licensing and regulation of construction of energy facilities typically require construction permits to be compatible with environmental requirements, interposing the full panoply of hearing and public debates under the National Environmental Policy Act (NEPA)²³ and comparable state "little NEPA" laws.²⁴ The complex licensing and environmental proceedings and appellate review can take months and sometimes years,²⁵ and spawn related

19. *Save Our Wetlands, Inc. v. Sands*, 711 F.2d 634 (5th Cir. 1983); *Detroit Edison Co. v. United States Nuclear Regulatory Comm'n*, 630 F.2d 450 (6th Cir. 1980).

20. *Hodel v. Indiana*, 452 U.S. 314 (1981); *Hodel v. Virginia Surface & Mining Reclamation Ass'n, Inc.*, 452 U.S. 264 (1981).

21. Federal Power Act, 16 U.S.C. § 2705 (1982); Atomic Energy Act, 42 U.S.C. §§ 2131-2141 (1976 & Supp. V 1981); Natural Gas Act, 15 U.S.C. § 717(f) (1982); Surface Mining Control and Reclamation Act of 1977, 30 U.S.C. § 1263 (Supp. V 1981).

22. N.Y. Pub. Serv. Law §§ 121-126, 141-149 (McKinney Supp. 1983); Me. Rev. Stat. Ann. tit. 38 §§ 481-489 (1964 & Supp. 1983); Minn. Stat. Ann. § 116C.51-116C.69 (West 1976 & Supp. 1984).

23. 42 U.S.C. §§ 4331-4332 (1976 & Supp. V 1981).

24. See, e.g., N.Y. Envtl. Conserv. Law § 8 (McKinney Supp. 1983). See also Robinson, *SEQRA's Siblings: Precedents from Little NEPA's in the Sister States*, 46 Alb. L. Rev. 1155 (1982).

25. For example, the licensing proceedings and judicial review related to Consolidated Edison's application for construction of the Cornwall pumped-storage hydroelectric project lasted for 18 years. Consolidated Edison applied to the Federal Power Commission (FPC) for a license in 1963. After hearings, the license was granted in 1965. 33 FPC 428 (1965). The license was remanded for further hearings in 1965, *Scenic Hudson Preservation Conference v. FPC*, 354 F.2d 608 (2d Cir. 1965), and after further hearings, was reissued in 1970, 44 FPC 350 (1970). The second license was upheld on review in 1971. *Scenic Hudson Preservation Conference v. FPC*, 453 F.2d 463 (2d Cir. 1971), cert. denied, 407 U.S. 926 (1972). The license proceedings were reopened in 1974, *Hudson River Fishermens' Ass'n v. FPC*, 498 F.2d 827 (2d Cir. 1974), causing Consolidated Edison to suspend construction of the project, which had only begun a few months earlier. The 1974 suspension of construction coincided with Consolidated Edison's cash flow difficulties resulting from the Arab oil embargo. The company's financial problems were resolved by the late 1970's, but the company surrendered the license in 1981, 14 FERC 62,098, July 23, 1981, as part of a settlement of environmental litigation involving whether closed-cycle cooling systems should be installed at its nuclear plant and other plants on the Hudson River. See *Central Hudson Gas & Electric Corp. v. EPA*, 587 F.2d 549 (2d Cir. 1978). By the time the license was surrendered, the original cost of the project had escalated by a factor of

lawsuits.²⁶

Throughout the period of licensing and environmental hearings, the project's proponent is subject to a wide variety of uncertainties. These include whether to purchase or condemn land for the project, whether to expend funds for final engineering plans (and if so, for which alternative plan), and whether or when to borrow funds for construction. These uncertainties are sometimes compounded by new legislation, enacted during pending licensing proceedings, imposing new procedural and substantive requirements.²⁷ Changing economic conditions during this process can alter the original need for a project.²⁸

C. *Compartmentalization of Agency Implementation*

It is inevitable that different segments of agencies will specialize in regulating individual segments of the overall system. But, from time to time, it should not be forgotten that the individual segments of the regulatory framework are only parts of a single regulatory system.

Not often is consideration given to linkage among policies concerning hazardous waste, nuclear energy, and acid rain. Thinking is normally compartmentalized—divided by the enormous complexity of any one of the three topics, and even by the institutional structures of government agencies

ten, nuclear energy for pumping the project was not available, and alternative measures had been adopted to supply the peaking energy which the project was intended to provide.

26. See, e.g., *Power Authority of N.Y. v. Williams*, 60 N.Y.2d 315, 457 N.E.2d 726, 469 N.Y.S.2d 620; *DeRham v. Diamond*, 32 N.Y.2d 34, 295 N.E.2d 763, 343 N.Y.S.2d 84 (1973).

27. See, e.g., 10 C.F.R. § 50-34(b)(6)(v) (1983) (requiring applicants for nuclear plant construction and operating licenses to submit "emergency plans"). On the basis of this newly issued requirement (45 Fed. Reg. 55402-18 (1980)) Seacoast Anti-Pollution League of New Hampshire attempted to secure suspension or revocation of construction permits granted to Public Service Company of New Hampshire four years before. *Seacoast Anti-Pollution League of New Hampshire v. United States Nuclear Regulatory Comm'n*, 690 F.2d 1025 (1982).

28. See *supra* note 25.

themselves. For example, EPA's and the states' hazardous and solid waste staff deal only with solid and hazardous waste disposals and clean-ups.²⁹ Similarly, the Nuclear Regulatory Commission (NRC) regulates construction and operation of nuclear reactors.³⁰ The generated nuclear wastes are regulated under the Nuclear Waste Policy Act of 1982, and not under the hazardous waste laws discussed here.³¹ Also, acid rain, if and when explicitly regulated, will no doubt come under the jurisdiction of EPA and state air regulatory personnel.³² Compartmentalized structure can result in policy choices which emphasize the particular interests of the personnel responsible for developing the policy. Air division staff, for example, may opt for reduced air emissions without sufficient consideration of land, water, or energy impacts.³³

D. *Interrelated Environmental Areas*

Almost daily, newspapers report new developments about hazardous waste, acid rain, or nuclear power plants.

29. See *Directory of Environmental Officials*, Chemical Engineering, Oct. 17, 1977, at 9 (An organization chart for the EPA and a listing of state water and air control agencies). See also [Federal Regulations] *Env'tl. Rep.* (BNA) 101:0091-101:0099.

30. Atomic Energy Act, 42 U.S.C. §§ 2011-2284 (1976). The Atomic Energy Commission's jurisdiction over nuclear safety is exclusive. See *Power Reactor Dev. Co. v. International Union of Elec., Radio, & Machine Workers*, 367 U.S. 396 (1961). However, federal agency jurisdiction does not preempt state power entirely. See *Silkwood v. Kerr-McGee*, 104 S. Ct. 615 (1984); *Pacific Gas & Elec. Co. v. State Energy Resources Conserv. & Dev. Comm'n*, 103 S. Ct. 1713 (1983).

31. Nuclear Waste Policy Act of 1982, Pub. L. No. 97-425, 1982 U.S. Code Cong. & Ad. News (96 Stat.) 2201 (to be codified at 42 U.S.C. § 10101); Resource Conservation and Recovery Act of 1976 (RCRA) 42 U.S.C. §§ 6901-6987 (1976 & Supp. V 1981); Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9601-9657 (Supp. V 1981).

32. Acid rain bills, still pending in Congress, have been proposed as amendments of the Clean Air Act: S. 768, 98th Cong., 1st Sess. (1983); H.R. 3400, 98th Cong., 1st Sess. (1983).

33. See, e.g., *United Petroleum Assoc. v. Williams*,—Misc. 2d—, 471 N.Y.S.2d 1007 (Sup. Ct., Albany County, Dec. 1983) which annulled certain air regulations of the New York Department of Environmental Conservation (DEC) because DEC's air staff failed to consider water pollution impacts of the rule. (Notice of appeal filed by DEC, Jan. 30, 1984).

However, there is little understanding of practical interrelationships among hazardous waste, acid rain, and nuclear policy choices.

The controversy about the origin of acid rain and possible ways to deal with it provides a good example of the impracticalities and uncertainties that can result from not interrelating issues in energy and environmental policies. For instance, acid rain policy must be interrelated with hazardous or solid waste policy. Fossil fuels, like coal and oil, typically contain varying amounts of sulfur, which, when burned, cause oxides of sulfur (SO₂)³⁴ to be emitted to the atmosphere. While other emissions, such as nitrogen oxides (NO₂)³⁵ from fossil fuel boilers and vehicle engines, are also said to contribute to acidification of rainfall, SO₂ is most frequently cited in the media as the cause of acid rain.³⁶

Bills have been introduced in Congress which propose acid rain solutions by limiting or "capping" total SO₂ emissions³⁷ from power generators. The bills are either national in scope or apply only to power generators in the eastern United States.³⁸ Adoption of some of these bills

34. Since sulfur dioxide is the most abundant of the various sulfur oxides emitted to the atmosphere, the designation SO₂ will be used.

35. W. Chameides and D. Davis, *Chemistry in the Troposphere*, Chemical and Engineering News, Oct. 4, 1982, at 39, 49. NO₂ is used to designate NO, NO₂, N₂O, and NO₃. Id. at 47.

36. Electric utilities account for over two-thirds of the total man-made emissions of sulfur oxides and approximately one-third of the nitrogen oxide emissions. Almost half of the nitrogen oxide emissions are from the exhaust pipes of automobiles, trucks and buses. M. Wayne, *Clarifying the Scientific Unknowns*, EPRI J., Nov. 1983, at 8 (a journal by Electrical Power Research Institute); N.Y. Times, Jan. 25, 1984, at A14, col. x. See EPA, *The Acidic Deposition Phenomenon and its Effects: Critical Assessment Review Papers* (EP-600/8-83-016A, May 1983). See also Acid Precipitation Task Force, 1982 Ann. Rep. (report required to be submitted to the President and Congress by Jan. 15 pursuant to the Acid Precipitation Act of 1980, Pub. L. No. 96-294, 94 Stat. 770). See generally, National Research Council, *Acid Deposition: Atmosphere Processes in Eastern North America* (1983).

37. H.R. 3400 would require a ten million ton annual reduction in SO₂ emissions by 1993 at a cost estimated to exceed \$100 billion. Estimate by Temple, Barker and Sloan (Jan. 1984) (consultants to Edison Electric Institute).

38. See *supra* note 2.

would mean that more expensive "scrubbing" facilities would be added to generating units to remove ninety percent or more SO₂ before exhaust gases are emitted to the atmosphere.³⁹ Removing SO₂ from exhaust gases by "flue gas desulfurization" (FGD) creates a waste product called scrubber sludge, which has a toothpaste-like consistency.⁴⁰

Scrubber sludge is disposed of on land. At present, this sludge⁴¹ is considered "solid waste" under federal rules.⁴² However, a 1980 amendment to the federal solid waste law⁴³ requires that EPA reconsider whether scrubber wastes should be classified as "hazardous."⁴⁴ EPA has not yet submitted its finding to Congress.⁴⁵

Thus, acid rain bills have the potential to require utilities to create "hazardous" waste. They clearly would require creation of solid wastes. However, none of these bills address the problem of siting landfill facilities for scrubber sludges. Because the acid rain bills do not address the issue of sludge disposal, it is presumed that this disposal will be accomplished under state and local laws. Uncertainty in the regulation of the entire area of acid rain is therefore created, as landfill siting, an attendant step in the disposal process, is extremely controversial⁴⁶ and subject to lengthy delays.

39. Parkinson, *A Shot of Limestone May Cure SO₂ Removal Woes*, Chemical Engineering, Feb. 20, 1984, at 30.

40. See generally, *Sierra Club v. Costle*, 657 F.2d 298 (D.C. Cir. 1981).

41. Scrubber sludge normally refers to waste products from scrubbing units, such as FGD systems. In this article, the term is used to include coal ash - the inorganic residue that remains after coal has been burnt. Although the compositions of scrubber sludge and coal ash are substantially different, disposal problems are similar.

42. 40 C.F.R. § 261.4(b)(4) (1983).

43. Solid Waste Disposal Act Amendments of 1980, Pub. L. No. 96-482, 94 Stat. 2334 (amending scattered sections of RCRA, 42 U.S.C. §§ 6901-6987 (1976 & Supp. V 1981)).

44. 42 U.S.C. § 6982(n) (Supp. V 1981).

45. EPA's report on whether coal ash and scrubber sludge should be classified as "hazardous" was due in October, 1982. See 42 U.S.C. § 6982(n)(Supp. V 1981). Industry sources are optimistic that a report will be filed in 1984, and that EPA will determine not to classify coal ash and scrubber sludge as hazardous, because leachates from ash and sludge landfills do not significantly threaten groundwater supplies with heavy metal pollution.

46. S. Epstein, L. Brown, and C. Pope, *Hazardous Waste in America* 38 (1982).

Acid rain policy is also related to nuclear energy policy. For example, an increase in the number of nuclear generating plants would reduce reliance on fossil fuels used to generate electric energy.⁴⁷ The corresponding abatement of SO₂ emissions would result in a reduction in acid precipitation.

There should be, accordingly, consideration of the relationship among hazardous waste, nuclear energy, and acid rain policies. A closer examination of these topics will reveal their relationships and the conflicts in implementing specific environmental policies.

III. Hazardous Waste

The existence of hazardous landfill and illegal dumping sites, which create substantial threats to public health, is a culmination of circumstances and events not entirely predicated on the irresponsibility of the landfill owners and operators. The situation exemplifies the role of the regulatory process in creating, rather than solving problems in several respects. Compartmentalized legislation that failed initially to deal adequately with solid and hazardous wastes became coupled with subsequent regulatory failure to facilitate an emerging waste recycling industry. Looking at the overall picture, one can infer that the regulatory process itself shares responsibility with the waste generators on whom ultimate liability for remedial action has been imposed.

A. *Congressional Encouragement of Waste Treatment*

The 1974 Arab oil embargo greatly stimulated the concept of reclaiming waste solvents.⁴⁸ The ten-fold crude oil price increase made recycling attractive to entrepreneurs.

47. See *Nuclear Power's Uphill Battle*, N.Y. Times, Jan. 20, 1984, at D1, col. 3.

48. Solvents are organic chemical liquids derived from petroleum.

Recycling was encouraged by Congress⁴⁹ in the 1976 Resource Conservation and Recovery Act⁵⁰ (RCRA) that advocated the use of "alternative fuels."⁵¹

Similarly, the need for solvent recovery and waste recycling was raised by the Clean Water Act (CWA)⁵² of 1972 which prohibits water pollution.⁵³ By 1975, businesses generating waste solvents had obtained wastewater discharge permits limiting the amounts of pollutants which could be discharged and requiring monthly monitoring reports to be filed. Since waste solvents and certain other wastes could not lawfully be discharged into the sewer, businesses collected and sold their waste solvents or paid to have them removed. Solvent recovery and waste treatment companies emerged. The solids removed from effluent discharge streams in response to CWA regulations then had to be landfilled. Air pollution control facilities installed in response to the Clean Air Act⁵⁴ collected particulates from smoke stack gases. These were also landfilled along with the scrubber sludge described earlier.⁵⁵ In some cases, these solids were mixed with hazardous wastes, or themselves may have been "hazardous" under EPA's sweeping definition of the term.⁵⁶

B. *RCRA, an Inadequate Remedy*

In 1976 Congress attempted to close the "gap" in environmental regulation, previously focused on air and water pollution control, by enacting RCRA.⁵⁷ RCRA

49. 42 U.S.C. § 6902 (1976).

50. 42 U.S.C. §§ 6901-6987 (1976 & Supp. V 1981).

51. 42 U.S.C. § 6902 (1976). Congress found that solid waste is a potential source of fuel and that there was a need to reduce dependence on petroleum, gas, nuclear energy, and hydroelectric generation. 42 U.S.C. § 6901(d) (1976 & Supp. V 1981).

52. 33 U.S.C. §§ 1251-1376 (1976 & Supp. V 1981).

53. 33 U.S.C. § 1251(a)(1) (1976 & Supp. V 1981).

54. 42 U.S.C. §§ 7401-7642 (Supp. V 1981).

55. See *supra* note 40 and accompanying text.

56. See *infra* note 73.

57. See *supra* note 50.

imposed standards⁵⁸ for solid waste disposal⁵⁹ and for hazardous waste treatment,⁶⁰ storage⁶¹ and disposal.⁶² These standards include a complex system of “cradle-to-grave” manifesting and reporting so that the generation, transport, treatment, and final disposition of all hazardous wastes would be recorded.⁶³ Every hazardous waste generator, storer, treator, and disposer is subject to RCRA’s detailed requirements, which involve minimum regulatory standards set by the EPA, with licensing and enforcement by the states.⁶⁴

Between 1977 and 1980, the recycling facilities classified within RCRA’s rubric of treatment, storage and disposal facility operators⁶⁵ (TSDFs) were subject to tremendous uncertainty. New rules, conflicting requirements, and confusion paralyzed these operators, including the solvent recovery operators.⁶⁶ Some couldn’t get permits from the states because the states didn’t have rules in place. Others did obtain state permits. Most could not raise money to finance new facilities, in part because of lenders’ concerns that the investment would soon be outdated by new rules. State regulatory agencies could not provide a clear framework that regulated entities could use in planning efforts. This was even an impediment to planning two or three years ahead, considering that the building and equipment they would have to purchase to comply with

58. At the present time, RCRA is still not fully implemented. Most transportation, storage, and disposal facilities (TSDFs) are still operating under interim authority. 40 C.F.R. pt. 265 (1983). Few TSDFs have received final permits. 40 C.F.R. pt. 266 (1983).

59. 42 U.S.C. §§ 6941-6949 (1976 & Supp. V 1981).

60. 42 U.S.C. § 6924 (1976 & Supp. V 1981) (standards were to be promulgated no later than April 21, 1978).

61. *Id.*

62. *Id.*

63. 42 U.S.C. §§ 6921-6924 (1976 & Supp. V 1981).

64. *See* 40 C.F.R. pts. 260-264 (1983). *See also* N.Y. Admin. Code tit. 6, pt. 360 (1983).

65. *See* 40 C.F.R. § 6.1002 (1983).

66. *United States v. Chem-Dyne Corp.*, 572 F. Supp. 802 (S.D. Ohio 1983); *United States v. Seymour Recycling Corp.*, 554 F. Supp. 1334 (S.D. Ind. 1982).

regulations had depreciable lives of ten years or more.

Another problem was that treatment and landfill sites were difficult to locate, tending to give monopolistic power to the few hazardous waste treatment and disposal facilities already in existence. Moreover, pricing of disposal services was based on what the traffic would bear. This acted as a disincentive to dispose of hazardous wastes properly, since some generators may have opted to dispose of their wastes through the cheapest, but not the most effective recycler.⁶⁷

Public reaction was also a problem for waste handlers. The public reacted against licensing of sanitary and hazardous waste landfills.⁶⁸ No one would tolerate a hazardous waste facility in his backyard. The combination of federal and state environmental impact laws enabled environmental groups to delay or stop proposed treatment facilities and landfills.⁶⁹ The resulting uncertainty in the licensing process while siting disputes were heard added heavily to the hazardous waste recycler's woes. Many reclaimers whose operators were frustrated by shifting and unclear requirements, went bankrupt.⁷⁰ In many cases, landfills which endangered the public's health became inactive and were abandoned.⁷¹

C. *Superfund to the Rescue?*

In an effort to confront the problems posed by inactive and abandoned waste disposal sites, Congress hastily

67. This suggests that consideration should be given to franchising and rate regulation of hazardous waste treatment and disposal operators. This would require recyclers and TSDFs to take specific kinds of wastes at prices set by governmental authorities, akin to public service commissions. If effectively set up and operated, this kind of regulation could discourage illegal disposal by providing generators with assured places to dispose of waste, at rates which apply equally to all users.

68. Epstein, Brown, and Pope, *supra* note 46, at 37-38.

69. O'Leary v. Moyer's Landfill, Inc., 523 F. Supp. 642 (E.D. Pa. 1981); Niagara Recycling, Inc. v. Town Board of Niagara, 56 N.Y.2d 859, 438 N.E.2d 1142, 453 N.Y.S.2d 427 (1982); SCA Chem. Waste Serv., Inc. v. Board of Appeals of Porter, 52 N.Y.2d 963, 419 N.E.2d 872, 437 N.Y.S.2d 969 (1981).

70. See *supra* note 66.

71. *Id.* and Epstein, Brown and Pope, *supra* note 46, at 303.

enacted the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or "Superfund")⁷² in the closing days of the Carter administration. CERCLA authorizes EPA to undertake removal and remedial action whenever "any hazardous substance⁷³ is released⁷⁴ or there is a substantial threat of such release"⁷⁵ into groundwaters, surface waters, or the air.⁷⁶ Liability is imposed for the costs of waste removal and related remedial action⁷⁷ and for "damage to natural

72. 42 U.S.C. §§ 9601-9657 (Supp. V 1981), H.R. Rep. No. 1016, 96th Cong., 2d Sess. 22, *reprinted* in 1980 U.S. Code Cong. & Ad. News 6125.

73. EPA's rules designate as "hazardous" a wide variety of waste materials from dioxin to less toxic or offensive materials such as printing inks. *See* 40 C.F.R. pt. 261 (1983). States tend to adopt EPA's list of hazardous wastes. *See, e.g.*, N.Y. Admin. Code tit. 6, pt. 366 (1984). Note, however, that a New York court has held invalid New York's effort to incorporate the EPA list of hazardous wastes by reference into the state rules. *People v. Attic Metals Indus.*, N.Y.L.J., Jan. 31, 1984, at 1, col. 2 (Co. Ct. Suffolk County). Some states have made additions to the EPA list. The New York rules, for example, provide that a waste is "discarded" when it is burned as a fuel to recover heat. N.Y. Admin. Code tit. 6, §366.1 (c)(ii) (1984). EPA excludes burning a waste as fuel from the definition of "discarded" materials. 40 C.F.R. § 261.2(C)(2) (1983). Thus, in New York, waste automotive engine oil used as fuel is "hazardous" if it contains lead from leaded gasoline and demonstrates an "EP toxicity" of more than five parts per million of lead. Under EPA's rules, such oil used as fuel is not discarded, and therefore not a hazardous waste.

74. "Releases" have been defined in CERCLA cases as seepage of waste chemicals from landfills. *See supra* note 66. CERCLA defines "removal" as:

[T]he cleanup or removal of released hazardous substances from the environment, such actions as may be necessary taken in the event of the threat of release of hazardous substances into the environment, such actions as may be necessary to monitor, assess, and evaluate the release of hazardous substances, the disposal of removed material, or the taking of such other actions as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or the environment, which may otherwise result from a release or threat of release.

42 U.S.C. § 9601(23) (Supp. V 1981).

75. 42 U.S.C. § 9604(a)(1) (Supp. V 1981).

76. 42 U.S.C. § 9607 (Supp. V 1981).

77. CERCLA defines "remedial action" as:

[T]hose actions consistent with permanent remedy taken instead of or in addition to removal actions in the event of a release or threatened release of a hazardous substance into the environment, to prevent or minimize the release of hazardous substances so that they do not migrate to cause substantial danger to present or future public health or welfare or the environment.

42 U.S.C. § 9601(24) (Supp. V 1981). *See also* 42 U.S.C. § 9607 (Supp. V 1981).

resources."⁷⁸ Persons held liable⁷⁹ are:

- 1) those who create the wastes (generators);⁸⁰
- 2) those who owned the landfills and reprocessing centers (site owners);⁸¹ and
- 3) those who transported the wastes from the generator's place of business to the landfill (transporters).⁸²

Courts have determined that liability under CERCLA is joint and several,⁸³ retroactive,⁸⁴ and absolute.⁸⁵ The following hypothetical demonstrates how compliance with the regulatory scheme in this area does not necessarily absolve the waste generator from future liability.

A manufacturer who sent ten drums of waste ink solvents to a state-permitted recycling facility in 1975, for treatment or use as fuel, might find itself liable in 1984 for the full costs of cleanup and natural resource damages at the entire site. Perhaps a total of a million drums of solid or hazardous waste were sent to that site by 500 or more generators and transporters over many years. Typically, the generators whose wastes were sent to the site, the "deep pockets," are sued in federal court.⁸⁶ The landfill site owner, being bankrupt, is judgment-proof. In most cases, he probably had no liability insurance or his property carrier may have

78. 42 U.S.C. § 9797(a) (Supp. V 1981).

79. *Id.*

80. 42 U.S.C. § 9607(a)(3) (Supp. V 1981). This provision generally covers any party who arranges for the transport of hazardous substances. *See United States v. Price*, No. 80-4140, slip op. (July 28, 1983).

81. 42 U.S.C. § 9607(a)(2) (Supp. V 1981).

82. 42 U.S.C. § 9607(a)(4) (Supp. V 1981).

83. *United States v. Northeastern Pharmaceutical & Chem. Co.*, No. 80-5066-CV-5-4 (W.D. Mo. Jan. 31, 1984); *United States v. Wade*, No. 79-1426 (E.D. Pa. Dec. 20, 1983); *United States v. Chem-Dyne Corp.*, 572 F. Supp. 802 (S.D. Ohio 1983) (all holding that liability is joint and several if the defendants caused an indivisible harm).

84. *United States v. Northeastern Pharmaceutical & Chem. Co.*, No. 80-5066-CV-5-4 (W.D. Mo. Jan. 31, 1984) (liability applies to acts performed before CERCLA was enacted).

85. *United States v. Northeastern Pharmaceutical & Chem. Co.*, No. 80-5066-CV-54 (W.D. Mo. Jan. 31, 1984); *United States v. Price*, 523 F. Supp. 1055 (D.N.J. 1981) (both holding that strict liability applies); *United States v. Chem-Dyne Corp.*, 572 F. Supp. 802 (S.D. Ohio 1983).

86. *See supra* notes 84, 85.

denied coverage because the insured intended that his site be covered with wastes.

As a result of this kind of pattern, complex multi-defendant cases like *United States v. Chem-Dyne Corp.*, *United States v. Seymour Recycling Corp.*, *United States v. Environmental Conservation & Chemical Corp.*, and *United States v. Stringfellow*⁸⁷ are pending in the federal courts. These generators, who in a good faith effort to comply with the law, sent their waste to solvent and waste recovery operators instead of dumping it thoughtlessly, are being made to pay the costs of cleanup of the abandoned sites. Most, if not all, of those who illegally dumped their wastes in sewers escaped liability.

D. Summary

The energy policies and developments of 1974-1976 motivated entrepreneurs to enter the resource recovery business, but subsequent policy shifts and legal uncertainties since the passage of RCRA resulted in shifting capitalization of a sound resource recovery industry. In many instances, the policies and regulatory requirements, which changed too rapidly, added to the problem instead of solving it.

IV. Nuclear Energy

Events of the last several years have shown that the initial era of nuclear power development is over. This is reflected in the current state of affairs for the nuclear industry.⁸⁸ An NRC panel recently recommended against granting an operating license to Commonwealth Edison's Byron nuclear power plant, already built at a cost of \$3.5 billion.⁸⁹ Public Service Company of Indiana abandoned its

87. See *United States v. Stringfellow*, No. CV-85-2501-MML (C.D. Cal. 1984) (Superfund Cleanup orders on summary judgment motions filed April 5, 1984), and *United States v. Environmental Conservation & Chemical Corp.*, No. 1P-83-14190 (S.D. Ind. 1983). See also *supra* note 66.

88. See *infra* notes 91-97 and accompanying text; See *infra* note 111.

89. *Deepening Nuclear Woes*, N.Y. Times, Jan. 17, 1984, at D1, col. 3.

Marble Hill nuclear power plant because of lack of money.⁹⁰ Cincinnati Gas & Electric's Zimmer plant will be abandoned, and may even be converted to a coal-fired plant.⁹¹ Long Island Lighting Company's Shoreham plant may never operate.⁹² The Seabrook Station of Public Service of New Hampshire may be abandoned.⁹³ Washington Public Power Supply System (WPPS) is unable to meet its financial obligations,⁹⁴ incurred as a result of operations in this area. With the exception of Commonwealth Edison, each of these utilities, one a municipal entity, faces bankruptcy unless rate or other relief is granted.⁹⁵

Here again, the regulatory system is not totally blameless.⁹⁶ Shifting and changing requirements imposed

90. *Half-Built Indiana Nuclear Plant Abandoned at a \$2.5 Billion Cost*, N.Y. Times, Jan. 17, 1984, at A1, col. 1.

91. *Nearly Completed Nuclear Plant Will Be Converted to Burn Coal*, N.Y. Times, Jan. 22, 1984, at A1, col. 5.

92. *Cuomo Stays Open To Shoreham Plan*, N.Y. Times, Dec. 20, 1983, at A1, col. 1.

93. *N.H. PUC Would Delay Seabrook Unit*, Nuclear Industry, Aug. 1982, at 18.

94. *Surcharge Is Suggested at Washington Utility*, N.Y. Times, Nov. 18, 1983, at D1, col. 1.

95. Brody, *Nuclear Waste: Construction Delays Cast Cloud Over Utilities*, Barron's, June 13, 1983, at 13, col. 1.

96. Both the Atomic Energy Commission and its successor, NRC, have been charged with failing to "deal adequately with reactor safety and waste disposal problems." Yellin, *High Technology and The Courts: Nuclear Power and The Need For Institutional Reform*, 94 Harv. L. Rev. 489, 498 (1981). It has also been asserted that Congress did not maintain effective control over the commercialization process, compare 42 U.S.C. § 2013(A) (1976) (atomic energy program intended to foster research and development in order to encourage maximum scientific and industrial progress) and 42 U.S.C. §§ 2012(d),(e), 2133(b), 2134(a),(d), 2201(i), 2232(a) (1976) (generally recommending broad, vaguely defined safety regulations in atomic energy development), define an institutional framework for managing nuclear wastes, M. Willrich & R. Lester, *Radioactive Waste* 93 (1977), or provide definitive reactor safety and siting standards, see Yellin & Joskow, *Siting Nuclear Power Plants*, 1 Va. J. Nat. Resources L. 1 (1980). However, this author maintains that the NRC's efforts in these areas were adequate. The interaction among multiple environmental, safety, and related regulatory proceedings involving a number of federal and state agencies, which resulted in uncertainty, frustrated development of predictable reactor safety, environmental, and waste disposal policies, and helped to precipitate a negative public reaction with respect to nuclear development.

a heavy financial toll on reactor owners. In the nuclear industry, the onus fell on huge utilities which had always been financially sound. Fortunately, when the severity of the economic loss became apparent, they were not in the same precarious position as the solvent recovery companies which were relatively undercapitalized. Perhaps that is why there has not been the rash of bankruptcies in this regulated industry as in the hazardous waste management industry.

Nonetheless, these utilities are suffering severe problems. Public antipathy to nuclear plants flared in the aftermath of Three Mile Island.⁹⁷ Siting a new nuclear reactor now involves long environmental hearings and controversy far exceeding even that of the siting of a hazardous waste landfill.

Furthermore, even if an NRC construction license is granted, new design requirements and changes in plans⁹⁸ could result in runaway costs during construction.⁹⁹ Additionally, the Supreme Court's recent decision in *Pacific Gas & Electric Co. v. State Energy Resources Conservation & Development Commission*¹⁰⁰ makes it possible for a state to prevent the construction of a nuclear power plant anywhere within its borders even after an NRC license is granted. This also could cause disastrous financial loss. The Shoreham, Seabrook, Marble Hill, WPPS, and Zimmer experiences demonstrate that delays will raise projected budgets tenfold, by compounding of interest on the capital borrowed to construct the plant.¹⁰¹ Regulatory uncertainty

97. See generally Report to the President's Commission on the Accident At Three Mile Island (1979). (also known as the Kemeny Report).

98. See Shapar & Malsh, *Proposed Changes in the Nuclear Power Plant Licensing Process: The Choice of Putting A Finger in the Dike or Building a New Dike*, 15 Wm. & Mary L. Rev. 539 (1973).

99. See Scheibla, *Legal Fallout Lethal? Recent Court Decisions Threaten Nuclear Power*, Barron's Oct. 4, 1976, at 3, col. 1 (survey of nuclear utility companies indicated that a one-month delay in construction would cost millions of dollars).

100. 103 S. Ct. 1713 (1983).

101. Inflation and postponement of return on large capital investments make delay extremely costly to utilities.

and delay¹⁰² have been instrumental in virtually stopping nuclear power development in the United States.¹⁰³

V. Acid Rain

Because the nature and scope of the acid rain problem have not been clearly defined,¹⁰⁴ a great deal of skepticism exists in both private¹⁰⁵ and public¹⁰⁶ sectors as to whether proposed legislation will solve the problem. Many scientists dispute whether the acidity of lakes in the northeastern region of the country is linked in any way to the sulfur emissions from electric power plants in the midwest.¹⁰⁷

102. The licensing and construction of nuclear power plants requires nine to ten years. Hennessey, *Licensing of Nuclear Power Plants by the Atomic Energy Commission*, 15 Wm. & Mary L. Rev. 487, 488 (1974); Phillips, *President Nixon's Energy Message and the Electric Generating Industry Lawyer*, 6 Nat. Resources Law. 537, 538 (1973).

103. See Maleson, *The Historical Roots of the Legal System's Response to Nuclear Power*, 55 S. Cal. L. Rev. 597, 618 n.98 (1983).

104. Chemical reactions for the conversion of SO₂ from stack emissions to acid rain in the atmosphere are unclear. The sequence is partially but not precisely understood. Sulfur and nitrogen oxide emissions (SO₂ and NO₂) can react with atmospheric oxidants, such as ozone (O₃), to form sulfates (SO₄) and nitrates (NO₃), which can then combine with hydrogen from water vapor (H₂O) and nitric acid (HNO₃). The scope of the problem is also under debate. For example, early studies suggested that acidic deposition might cause crop damage; however, later studies indicate that crops face no real danger from acid rain. Routine application of fertilizers outweigh any acid input that acid rain might provide, and the lime that farmers regularly add to their soil to counteract fertilizer induced acidity also neutralizes any rain-borne acid. See *Acid Rain Research: A Special Report*, EPRI J., Nov. 1983, at 8, 36. See also testimony of Kurt D. Anderson (New York Power Pool) before the House Subcommittee on Health and the Environment (Dec. 1, 1983); [14 Current Developments] Env't Rep. (BNA) 572 (Aug. 5, 1983); [14 Current Developments] Env't Rep. (BNA) 611 (Aug. 12, 1983).

105. Bagge, *Acid Rain: Perspective of the National Coal Association*, 14 Nat. Resources L. Newsletter 3, at 3 (Summer 1982). [hereinafter cited as Bagge].

106. Riordan, *Progress on Acid Deposition Research*, 8 EPA J., Nov.-Dec. 1982, at 21. [hereinafter cited as Riordan].

107. Bagge, *supra* note 110. One theory is that emissions of acid precursors simply contribute to a massive pool of oxides in the atmosphere. The transformation of such oxides may depend largely on low levels of catalysts, so a given degree of emission reduction might yield no reduction at all in deposition rates. Other areas of debate concern the geographical relationship of sources and receptors and the related issue of what design of source control measures will produce optimum benefits in receptor areas. See Kamlet, *Acid Rain: An Environmentalist's Perspective*, 14 Nat. Resources L. Newsletter 6, 7 (1982).

Even more scientists dispute whether a cutback in SO₂ emissions will yield a comparable or even a proportional level of reduced acid deposition.¹⁰⁸ Henri Poincaré, the eighteenth century mathematician, said: "Science is built of facts the way a house is made of bricks, but an accumulation of facts is no more science than a pile of bricks is a house."¹⁰⁹ So it is with the acid rain problem. There is an overwhelming amount of scientific information available, but much of it is inconclusive or unsubstantiated. An adequate scientific foundation upon which we can erect a firm set of decisions to deal with the acid rain phenomenon¹¹⁰ does not exist.

Despite the scientific controversy, Congress has hastily proposed legislation,¹¹¹ largely in response to domestic and international pressure,¹¹² to attack a suspected source of the problem. H.R. 3400 and its companion bills propose a mandatory federal SO₂ reduction program for the electric utilities in the hope that acid deposition would be reduced.¹¹³ Lake acidification is a highly charged environmental concern among residents of the northeastern United States and adjacent provinces of Canada.¹¹⁴ But Congress cannot guarantee that even a fifty percent reduction in emissions from midwestern power plants would result in a reduction in rainfall acidity in the Adirondack mountains, the New England states, or in the eastern Canadian provinces.¹¹⁵

108. *Id.*

109. Bagge, *supra* note 110, at 3; Riordan, *supra* note 111.

110. Riordan, *supra* note 111, at 20.

111. *See supra* note 2 and accompanying text.

112. *See generally* Rejhon, *Acid Deposition in North America: A Canadian Perspective*, 14 *Nat. Resources L. Newsletter*, at 1 (Summer 1982).

113. *See supra* note 2 and accompanying text.

114. *See supra* note 117.

115. *See supra* notes 109, 112. Instead of attacking the suspect or assumed source of the problem, a more logical approach is to pursue mitigation measures aimed at helping to reverse any environmental changes that have occurred. For example, lake acidity can be neutralized by adding lime to the water. Even though every lake is different and an individual treatment program might have to be developed for each lake, the cost would be quite low compared to the multi-billion dollar price tag of the proposed retrofit emission control program. The benefit of

Acid rain legislation would require utilities to switch to low-sulfur coal or to install expensive flue gas scrubbers.¹¹⁶ The substitution of one raw coal with another that has a lower sulfur content has several major disadvantages. One disadvantage is cost. Low-sulfur coal typically carries a price premium of up to thirty percent.¹¹⁷ Moreover, if coal switching becomes a reality, demand for low-sulfur coal would rise, causing the premium to increase significantly.¹¹⁸ Delivery cost must also be considered, since most low-sulfur coal is from the western part of the United States. The impact on the coal industry in northern Appalachia and the midwest must also be taken into account.¹¹⁹ Thus, acid rain legislation impacts detrimentally on our national energy policy of developing a plentiful and reliable energy source based on our country's total coal reserves.¹²⁰

Additionally, H.R. 3400 would force utilities to build flue gas desulfurization (FGD) systems. As described in a previous section, the FGD process creates a solid by-product. Consequently, there will again be a severe problem as landfills for disposal will have to be sited.¹²¹ The siting

this approach is that the measure focuses directly on the problem, not the "perceived" source of the problem. See *Acid Rain Research: A Special Report*, EPRI J., Nov. 1983, at 10.

116. Whitaker, *Developing the Options for Emissions Control*, EPRI J., Nov. 1983, at 51. [hereinafter cited as Whitaker]. See also Parkinson, *A Shot of Limestone May Cure SO₂ Removal Woes*, Chemical Engineering, Feb. 20, 1984, at 30 (refers to the retrofit costs and SO₂ removal capabilities of FGD systems) [hereinafter cited as Parkinson].

117. Whitaker, *supra* note 121, at 42.

118. *Id.*

119. Environmental policy needs to be compatible with energy policy, which mandates minimizing dependence on imported oil.

120. To the extent that acid rain legislation drives utilities toward use of low sulfur oil (as an alternative to using coal), our country's dependence on imported oil will increase, not decrease. Yet, national policy is to reduce independence on Mideast oil supplies. Thus, acid rain policy collides with foreign policy.

121. Approximately 1000 acres would be required for a 1000 Megawatt (MW) plant. Lecture by Professor Sarofim of the Massachusetts Institute of Technology, at Union Carbide Corp. (Nov. 2, 1983); Whitaker, *supra* note 121, at 45; See generally *Sierra Club v. Costle*, 657 F.2d 298 (D.C. Cir. 1981) (lengthy discussion of FGD technology with sketches of scrubbers).

problem may be further complicated if the FGD by-product, scrubber sludge, falls within the definition of "hazardous waste." H.R. 3400 does not even address the problem of siting FGD sludge landfills.¹²² It is logical that any such legislation should include strict and comprehensive federal standards for siting scrubber sludge disposal sites. Scrubbing also uses large quantities of water;¹²³ yet, no mention of water treatment or disposal appears in any of the proposed bills.

Another problem is that while FGD is one of the few technically feasible techniques that can achieve the proposed sulfur-removal requirements, it is also one of the most expensive.¹²⁴ The high capital cost is especially undesirable in the retrofit situation where FGD systems have to be squeezed into an older plant that has limited remaining economic life. This expensive add-on solution extends the depreciable life of these older relatively inefficient units rather than encouraging their replacement.¹²⁵

Ill-conceived acid rain legislation would generate its own uncertainties, as policies and regulations shift to meet new philosophies. When Congress amended the Clean Air Act in 1977, it required that existing plants reduce their emissions to insure attainment of federal National Ambient Air Quality Standards.¹²⁶ New plants, however, would be held to the tighter federal New Source Performance Standards (NSPS).¹²⁷ The philosophy behind NSPS was that as older plants were retired, their replacements would constitute a higher percentage of our generating capacity; therefore, the nation's air quality would improve while upgrading the efficiency of generating plants. This sound policy was

122. H.R. 3400, 98th Cong., 1st Sess. (1983).

123. Anywhere from 500-2800 gal./min. for 500 MW plant. Whitaker, *supra* note 124, at 45.

124. See Parkinson, *supra* note 121, at 30.

125. *Id.*; Whitaker, *supra* note 121, at 41; Bagge, *supra* note 110, at 5.

126. See 42 U.S.C. §§ 7408-7411(d) (Supp. V 1981).

127. 42 U.S.C. § 7411(d) (Supp. V 1981).

based on realistic environmental and energy concerns. However, the proposed acid rain legislation would force utilities to shift investment capital from developing newer systems that combine superior environmental performance with improved energy and operational efficiency, to older, less-efficient plants.¹²⁸ Legislation should allow the nation to move forward to the next generation of coal plants rather than tying us to continued use of older units that must be modified for environmental compliance. If it is shown to be necessary and desirable to reduce SO₂ emissions even more than is presently required, the most reasonable approach would be to modify existing Clean Air Act requirements to provide for more rapid siting, licensing, and construction of new efficient and less-polluting power plants.¹²⁹

In the past, effects from a slowdown in fossil fuel development may have been mitigated by nuclear energy development. Since nuclear development appears to be at a standstill,¹³⁰ our national energy policy will suffer the full effect from any reduced energy-related research and development. Common sense dictates that the acid rain problem should first be clearly defined. Only then should a solution be developed which considers all the relevant factors, including waste disposal and energy costs.¹³¹

128. New power generation technologies now being developed, like fluidized bed combustion and gasification-combined cycle promise to produce electricity from coal in a manner that is not only intrinsically cleaner but is also intrinsically more efficient than conventional coal-burning power generation systems. Investing in these new technologies, in addition to working on advanced retrofit emission control, is important for the future of the coal industry in this nation. Whitaker, *supra* note 124, at 51. See Parkinson, *supra* note 124, at 33; *Coal-Cleaning Route Gets Commercial Tryout*, Chemical Engineering, Feb. 20, 1984, at 35.

129. Bagge, *supra* note 110, at 5.

130. See *supra* Section IV.

131. President Reagan appears to have recently accepted this position. See *Head of E.P.A. Defends Reagan Plan For Further Acid Rain Study*, N.Y. Times, Jan. 27, 1984, at A9; N.Y. Times, Jan. 26, 1984 at B8. See also Acid Precipitation Act of 1980, Pub. L. No. 96-294, 94 Stat. 770 (codified as amended at 42 U.S.C. §§ 8901-8912 (Supp. V 1981)) (established the U.S. Interagency Task Force on Acid Precipitation, representing a concerted, nationwide research effort to improve our understanding of the causes, effects, and possible answers to the acid rain question).

VI. Conclusion

Uncertainty, delay, and shifting regulatory requirements have a profound impact on regulated entities. The close focus on efforts to solve specific problems often clouds from view the ramifications of the big picture¹³² — interrelated energy and environmental regulations equally compatible with a clean environment and sound operations of regulated entities.

The plethora of changing requirements, imposed at federal, state, and local levels tends to set off chaotic chain reactions which often have a destructive effect on the achievement of overall environmental and energy goals. These reactions seem to be greatest when policies are hastily created in response to uncertain factual situations.

Not every hazardous waste site is a Love Canal. Three Mile Island was an isolated event. Acid rain is poorly understood, yet there is strong pressure to spend \$100 billion to stop it.

The problem of uncertainty in environmental and energy regulations is significant. It can be mitigated most effectively by recognizing that environmental policies need to be grounded on solid technical and economic facts. When policies are merely responses to the cries of "Chicken Little" that "the sky is falling," the overall objective of a clean environment can be severely frustrated.

132. The recent remand by the Court of Appeals for the D.C. Circuit of the EPA's "tall stack" rules has upset the settled expectations of many SO₂ emitters. *Sierra Club v. EPA*, 719 F.2d 436 (D.C. Cir. 1983). The remand puts in doubt the assumption that stacks two and one-half times as high as nearby buildings will be credited in ambient air quality analyses. EPA's response to the remand has been to defer action on all pending applications for revisions to state implementation plans under the Clean Air Act. See EPA Draft Interim Policy on Stack Height Rules Pending Revision of Regulations in Response to Court Order, [14 Current Developments] *Env't Rep.* (BNA) 1516 (Dec. 30, 1983). This has slowed progress on planned coal conversions, meaning that more Arab oil and natural gas will be burned while the costs of the pending coal conversion projects escalate with inflation.