

# Global Benefits Versus Local Concerns: The Need for a Bird's Eye View of Nuclear Energy

KATHLEEN C. REILLY\*

We had a brief but shattering experience in 1973 during the embargo on Middle East oil. The effect of this experience confirmed the wisdom—indeed the necessity—of identifying and exploiting alternative energy sources—particularly for the long term. The most promising new source identified to date is nuclear-generated energy.

—Justice Powell (joined by Justices Rehnquist, Marshall and Blackmun) (1984)<sup>1</sup>

Since the highly publicized episode at the Three Mile Island nuclear reactor in 1979, nuclear power has evoked fear in the hearts of Americans. The accident at Three Mile Island, however, resulted in no injury or death, and scientists claim that very little radiation actually escaped from the plant.<sup>2</sup> There has been no scientific evidence disproving these statements. While many people turned against nuclear power after the Three Mile Island accident because of its perceived risks, scientists, presumably those persons most knowledgeable about nuclear power, do not take these risks very seriously. A professor of physics writes:

The present risk to the average American from the nuclear-power industry is equivalent to that of smoking one cigarette in one's life . . . of an overweight person increasing his weight by 0.004 ounces . . . crossing a street one extra time every three years . . . or increasing the national speed limit from 55 to 55.003 miles per hour.<sup>3</sup>

Many argue that no other energy source carries the potential for such vast economic and environmental benefits as nuclear power,<sup>4</sup> which currently

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\* J.D. Candidate, 1995, Indiana University School of Law—Bloomington; B.A., 1990, Williams College. Sincere thanks to my parents and Aileen and Noel Meehan for their constant encouragement.

1. *Silkwood v. Kerr-McGee Corp.*, 464 U.S. 238, 281-82 (1984) (Powell, J., dissenting).

2. See Jim Morris, *Clampdown: The Silencing of Nuclear Industry Workers*, HOUS. CHRON., Mar. 28, 1993, at 23.

The 1986 accident at Chernobyl, which was considerably more severe than the Three Mile Island accident, has been cited by nuclear opponents as a reason not to develop nuclear energy. However, a Nobel laureate in physics has written:

The horrors of Chernobyl should not be used as an argument against nuclear power. . . . A Chernobyl accident cannot happen [in the United States]. The design of a Chernobyl-type reactor is completely different from any reactor in the West; it would never have been licensed in any western country.

Hans A. Bethe, *Chernobyl: It Can't Happen Here*, N.Y. TIMES, May 2, 1991, at A25; see also John-thor Dahlburg, *Atom Sows Crop of Sadness*, L.A. TIMES, Sept. 2, 1992, at A1 (stating that the 1979 Three Mile Island accident released 14 curies of radiation, whereas the 1986 Chernobyl accident released 50 million curies).

3. Bernard Cohen, *Most Scientists Don't Join in Radiation Phobia*, WALL ST. J., Nov. 30, 1983, at 28.

4. See Edward M. Davis, *Nuclear Age: Take Two?*, PUB. UTILS. FORT., Jan. 1, 1993, at 18 (“[U]ncertainties in the price and supply of natural gas, and increasingly stringent [environmental] restrictions on the use of fossil fuels will make nuclear energy an integral and essential part of

provides twenty-two percent of the nation's electricity.<sup>5</sup> Even President Clinton, who vowed upon entering office to halt an increase in nuclear power development, now supports a new generation of nuclear power plants.<sup>6</sup>

Though many may view Clinton's reversal as just another broken campaign promise, those well-versed in nuclear power's environmental benefits know precisely why Clinton now supports nuclear power. On October 19, 1993, Clinton unveiled his "Climate Change Action Plan," a scheme to reduce greenhouse gases in the earth's atmosphere that contribute to global warming.<sup>7</sup> The goal of this plan is to reduce emissions from fossil fuel burning to 1990 levels by the year 2000. Clinton can achieve this goal only if the fossil fuels burned to produce energy are replaced by a clean-burning substitute.<sup>8</sup> In its 1993 study, the World Energy Council, a group made up of 500 energy experts from 100 nations, stated that "if global policy makers are serious about reducing greenhouse gases in the long term, nuclear power must make a comeback."<sup>9</sup> Thus, the only practical alternative to fossil fuels identified so far is nuclear energy.<sup>10</sup>

No one is omniscient about the risks of developing either nuclear power or other energy sources. Americans may acknowledge the economic and environmental benefits of nuclear power, but decide they are not worth even the very small risk of a nuclear catastrophe. Alternatively, Americans may stand by Congress' 1954 decision to encourage nuclear development. Before the country makes such a decision, however, Americans must accurately evaluate the costs and benefits of nuclear energy. Currently, inefficient distribution of regulatory authority over nuclear power prevents accurate analysis of these factors.

When formulating a plan for development and oversight of nuclear power, Congress provided for complete federal regulation of nuclear power in the

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America's energy mix.").

Former Senator Timothy Wirth of Colorado, now a Presidential appointee, is perhaps the most influential Democrat to actively support nuclear power. See E. Michael Blake, *United States Council on Energy Awareness Upbeat on Clinton*, NUCLEAR NEWS, Dec. 1992, at 18. Former Senator Paul E. Tsongas also vocally supported nuclear power during the 1992 Presidential campaign, thus "legitimizing" the issue and enabling other Democrats to join the ranks of nuclear power supporters. See Margaret E. Kriz, *Born Again*, NAT'L J., July 4, 1992, at 1578, 1579.

5. See Jeff Pelline, *Nuclear Power Stalled in the U.S.: High Costs, Safety Concerns Plague Industry*, S.F. CHRON., Aug. 16, 1993, at D1, available in LEXIS, News Library, CURNWS File; see also Ray Silver, *Worldwide Prospects for Nuclear Energy: Rosy Forecast v. Gloom and Doom*, NUCLEONICS WK., Oct. 7, 1993, at 14, 14-15 (translating the 22% of electricity provided by nuclear energy into the equivalent of 8% of the total national energy supply).

6. See David Mutch, *Despite a Pledge of 'No Increase,' Clinton Backs a New Generation of Nuclear Plants*, CHRISTIAN SCI. MONITOR, Sept. 29, 1993, at 1.

7. *Clinton Unveils CO<sub>2</sub> Plan: 61 Utilities Volunteer*, ELECTRIC LIGHT AND POWER, Dec. 1993, at 1, 2; see discussion *infra* part IV.B.

8. See Mutch, *supra* note 6, at 4.

9. Daniel Kaplan, *Nuclear Energy the Key to Greenhouse Policy*, ENERGY DAILY, Oct. 25, 1993, at 1.

10. See *infra* part IV.B. For a discussion of how current use of nuclear power has already dramatically reduced greenhouse gases in the earth's atmosphere, see Pelline, *supra* note 5 (citing a Council for Energy Awareness study which concluded that since 1973, the use of nuclear energy has cut worldwide emissions of carbon dioxide by 1.3 billion tons).

1954 Atomic Energy Act ("AEA" or "Act").<sup>11</sup> Thirty years later in *Pacific Gas & Electric Co. v. State Energy Resources Conservation & Development Commission*,<sup>12</sup> the Supreme Court interpreted the Act as providing for exclusive federal regulation of the safety aspects of nuclear plant construction, licensing, and operation. The Court added, however, that states retain their traditional responsibility for determining questions of economic cost and the need for nuclear power.<sup>13</sup> The Court indicated that within these realms, federal law must not preempt state law.

States may believe that the United States should develop nuclear power on a national basis.<sup>14</sup> Given the public's fear of radiation produced by nuclear power, however, state and local governments do not want such development "in their backyard." Since the *Pacific Gas* holding in 1983, state and local governments have stalled nuclear development in their respective spheres. Their efforts take the form of either exacting huge costs from utilities that operate nuclear plants, or prohibiting nuclear plant construction. Department of Energy officials believe that these added costs not only weaken nuclear power development, but may even cause some existing facilities to close.<sup>15</sup> Officials add that they do not know what sources will replace the significant portion of energy currently supplied by nuclear plants.<sup>16</sup>

In one recent effort to reduce regulatory inefficiency,<sup>17</sup> Congress streamlined the nuclear plant licensing process in the 1992 National Energy Policy Act by placing more power in the hands of the Nuclear Regulatory Commission.<sup>18</sup> Congress thereby reduced the degree to which state and local

11. Pub. L. No. 83-703, 68 Stat. 919 (amending Atomic Energy Act of 1946, Pub. L. No. 79-724, 60 Stat. 755) (codified as amended at 42 U.S.C. §§ 2011-2297g (1988 & Supp. V. 1993)).

12. 461 U.S. 190 (1983).

13. *Id.* at 205. Specifically, the Court stated:

Congress, in passing the 1954 Act and in subsequently amending it, intended that the Federal Government should regulate the radiological safety aspects involved in the construction and operation of a nuclear plant, but that the States retain their traditional responsibility in the field of regulating electrical utilities for determining questions of need, reliability, cost, and other related state concerns.

Need for new power facilities, their economic feasibility, and rates and services, are areas that have been characteristically governed by the States.

*Id.*

14. See Dean Takahashi, *Signs of Revival Buoy Nuclear Power Industry*, L.A. TIMES, May 30, 1991, at D5 (pointing out that polls sponsored by *Time Magazine* and CNN showed a surge in support for nuclear power, and that one poll by the U.S. Council for Energy Awareness showed that 66% of Americans strongly favor nuclear reactor construction).

15. See Jason Makansi & Sheldon Strauss, *Non-burn Electric Generation: How Today's Options Stack Up*, POWER, July 1992, at 15 ("The viability of nuclear power hinges on the ability to demonstrate that it can be used safely, reliably, and economically."); see also discussion *infra* part IV.A.

16. When commenting on the possibility of nuclear plants shutting down, Department of Energy Secretary Hazel O'Leary stated, "Why do I care? Because I don't know where the power to replace these generating stations will come from." Pelline, *supra* note 5.

17. See H.R. REP. NO. 474, 102d Cong., 2d Sess., part 8, at 65 (1992), reprinted in 1992 U.S.C.A.N. 2282, 2283 (stating that "[i]nefficiencies in the licensing process should be reduced").

18. National Energy Policy Act, 42 U.S.C. § 2235 (Supp. V 1993). The Act streamlined nuclear plant licensing by consolidating two permits which had been issued at different stages of plant construction into one permit. The former system allowed plant opponents twice as many opportunities for public hearings concerning safety that could delay the plant's operation. See discussion *infra* part IV.B.

governments can influence the costs of nuclear plant licensing.<sup>19</sup> In this instance, Congress acknowledged that regulatory efficiency must increase in order for nuclear power to develop. Nevertheless, the United States must reduce regulatory inefficiencies further, since “the impetus to operate [nuclear plants] efficiently and to regulate the nuclear industry intelligently has never been greater.”<sup>20</sup>

Given current national and international efforts to reduce global warming caused by fossil fuel emissions,<sup>21</sup> there is strong motivation for Congress to continue the nuclear energy promotion it began in 1954 with the Atomic Energy Act.<sup>22</sup> This Note argues that, without federal preemption of state nuclear regulation, the national and global advantages of nuclear power development will remain hidden. This situation will prevent the United States from developing a sound energy policy based on national and global interests. Part I argues that the U.S. Supreme Court misapplied established preemption doctrine in *Pacific Gas* by ignoring the “full purposes and objectives of Congress”<sup>23</sup> behind the Atomic Energy Act. Part II cites two examples where failure of federal law to preempt state nuclear regulation stultifies efforts to develop nuclear power. Part III argues that the Supreme Court’s distinction in *Pacific Gas* between matters of safety and cost is so problematic that the Court unintentionally contradicted its own precedent in *Silkwood v. Kerr-McGee Corp.*<sup>24</sup> It also argues that courts should consider the opportunity costs of nuclear nondevelopment when evaluating nuclear energy’s costs and benefits. Part IV notes that since nuclear energy use can significantly reduce the greenhouse gas emissions which cause global warming, the motivation to promote nuclear power is stronger than ever. This Note therefore concludes that Congress must amend the Atomic Energy Act to clearly establish federal preemption of state nuclear regulation.

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19. This is uniformly seen as a positive influence on the efficiency of nuclear regulation. For references to the National Energy Policy Act of 1992 in this vein, see, for example, Davis, *supra* note 4, at 18 (“Congress’ overwhelming directive to reform the nuclear plant licensing process . . . marks the beginning of a new era for nuclear energy in the United States.”), and Tom Watson & Ann Pelham, *A Win for Nuclear Power*, LEGAL TIMES, Aug. 10, 1992, at 6.

20. David Stellfox, *IPE Round-Up: Industry and NRC Officials Debate Future Use of PRA*, INSIDE NRC, Nov. 2, 1992, at 3 (quoting Jack Newman of Newman & Holtzinger, a law firm specializing in nuclear regulation).

21. See discussion *infra* part IV.B.

22. See 42 U.S.C. § 2013(d) (1988) (“[The Act’s purpose is to] encourage widespread participation in the development and utilization of atomic energy for peaceful purposes . . .”).

23. *Hines v. Davidowitz*, 312 U.S. 52, 67 (1941) (setting a standard for federal preemption of state law).

24. 464 U.S. 238 (1984).

## I. PREEMPTION OF STATE LAW REGARDING NUCLEAR ENERGY

### A. Federal Preemption in Pacific Gas

According to the Supremacy Clause of the U.S. Constitution,<sup>25</sup> a federal statute may override a competing claim of authority made by a state in several ways. Such an override may occur when a federal statute expressly states its supremacy over state law in a given area. Alternatively, a federal statute may implicitly, rather than expressly, preempt state law by "leaving no room" for state regulation in a field which is of dominant federal interest.<sup>26</sup> Thus, an express statement of federal preemption is not always necessary. Finally, a federal statute preempts a state law with which it actually conflicts.<sup>27</sup> This may occur when it is technically impossible to comply with both state and federal law; it may also occur where "[state] law stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress."<sup>28</sup> Thus, congressional intent is the "ultimate touchstone"<sup>29</sup> in Supremacy Clause analysis. The search for true congressional intent can be elusive, however.

The Supreme Court interpreted the scope of the AEA's preemption of state nuclear regulation most definitively in *Pacific Gas & Electric Co. v. State Energy Resources Conservation & Development Commission*.<sup>30</sup> In *Pacific Gas*, a California statute imposed a moratorium on nuclear plant construction until the Federal Government established an approved, permanent facility for disposing of high-level radioactive waste.<sup>31</sup> The plaintiff power company argued that federal law, embodied in the AEA and administered by the Nuclear Regulatory Commission ("NRC" or the "Commission"),<sup>32</sup> preempted the California statute. Citing the Atomic Energy Act, the plaintiff utility pointed out that Congress gave the NRC exclusive regulatory authority over the transfer, delivery, receipt, acquisition, possession, and use of nuclear

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25. The Supremacy Clause states: "[T]he Constitution, and the Laws of the United States which shall be made in Pursuance thereof . . . shall be the supreme Law of the Land . . ." U.S. CONST. art. VI, cl. 2.

26. See *Pacific Gas & Elec. Co. v. State Energy Resources Conservation & Dev. Comm'n*, 461 U.S. 190, 204 (1983); see also *Fidelity Fed. Sav. & Loan Ass'n v. de la Cuesta*, 458 U.S. 141, 153 (1982); *Rice v. Santa Fe Elevator Corp.*, 331 U.S. 218, 230 (1947).

27. *Louisiana Pub. Serv. Comm'n v. FCC*, 476 U.S. 355, 368 (1986).

28. *Hines v. Davidowitz*, 312 U.S. 52, 67 (1941); see also *California v. ARC Am. Corp.*, 490 U.S. 93, 100 (1989).

29. *Pilot Life Ins. Co. v. Dedeaux*, 481 U.S. 41, 45 (1987).

30. 461 U.S. 190 (1983).

31. Cal. Pub. Res. Code §§ 25524.1(b), 25524.2 (West 1977 & Supp. 1983). For a discussion of recent federal efforts to establish such a permanent disposal site, see Nancy Zacha, *Shooting Fish in a Barrel*, NUCLEAR NEWS, Dec. 1993, at 13 (pointing out that while environmentalists say that it is technologically impossible to have a safe disposal site, scientists insist the problems are political and not technical).

32. The NRC is the federal agency currently responsible for regulating nuclear energy. Before 1974, it was referred to as the Atomic Energy Commission ("AEC"). Hereinafter, both will be referred to as the "Commission."

materials.<sup>33</sup> Therefore, the utility argued that the California statute was an intrusion into the federal regulatory realm as defined by the Act.

The Court agreed that the Federal Government "has occupied the entire field of nuclear safety concerns."<sup>34</sup> Applying traditional preemption doctrine, the Court found that Congress granted the Commission sweeping preemption authority regarding "radiological safety aspects involved in the construction and operation of a nuclear [power] plant."<sup>35</sup> Consequently, state regulation of nuclear power plant construction based on public health and safety concerns "would . . . be in the teeth of the Atomic Energy Act's objective to insure that nuclear technology be safe enough for widespread development and use—and would be pre-empted for that reason."<sup>36</sup> However, the Court held that state regulation based on considerations *other than* radiological safety would remain beyond the reach of federal preemption. The Court included state economic considerations among those immune to preemption, interpreting the Act as reserving the right of states to regulate nuclear power based on the "[n]eed for new power facilities, their economic feasibility, and rates and services."<sup>37</sup> The Court noted that states have traditionally governed in these areas.<sup>38</sup>

California argued that its statute was not preempted because it was based on economic rather than health and safety concerns. In this case, the state statute would fall under the rubric of traditional, cost-based state regulation and thus avoid preemption. Agreeing with the State of California's argument, the Court concluded that the statute's "reason for being" was to limit the potential costs of generating nuclear power.<sup>39</sup> Therefore, the Court ruled that federal law did not preempt the state statute and upheld the moratorium on nuclear plant construction.<sup>40</sup>

The California statute simply presumed that nuclear power without a disposal site would be too expensive, giving no threshold amount below which it would be acceptable. In other words, the California statute presumed that a nuclear plant *must have* a permanent waste disposal site to be workable. Thus, by preventing nuclear plant construction until the Federal Government establishes a permanent waste site, the statute privileges California's ideas about what safety procedures are necessary before nuclear development can go forward. Many scientists do not share the concerns of the California Legislature and believe that a permanent depository for high-level radioactive

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33. *Pacific Gas*, 461 U.S. at 207.

34. *Id.* at 212.

35. *Id.* at 205.

36. *Id.* at 213.

37. *Id.* at 205.

38. *Id.*

39. *Id.* at 214.

40. Despite the Supreme Court's holding in *Pacific Gas*, federal courts have been reluctant to accept state arguments that a statute blocking nuclear operations exists solely for economic reasons. *See, e.g., Jersey Cent. Power & Light Co. v. Township of Lacey*, 772 F.2d 1103, 1112 (3d Cir. 1985) (holding that federal law preempted a township ordinance prohibiting storage of spent fuel since the statute's true purpose was to "protect the public good"), *cert. denied*, 475 U.S. 1013 (1986).

wastes is not necessary. Recent reports suggest that spent fuel can be stored at most nuclear reactor sites for another 100 years, while technology works to significantly reduce the associated dangers in the interim.<sup>41</sup> If the Commission believes it is not necessary to have a permanent waste disposal site to adequately preserve the public's health and safety, the California statute disregards this opinion. Thus, while *Pacific Gas* gave federal regulators exclusive authority over nuclear safety, states may override that authority simply by claiming that some aspect of nuclear power generation is too costly.

### B. Congressional Intent Behind the Atomic Energy Act

According to the holding in *Hines v. Davidowitz*,<sup>42</sup> when deciding whether federal law should preempt a state statute, courts must consider whether "[state] law stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress."<sup>43</sup> By permitting states to regulate nuclear power based on cost considerations, the Supreme Court ignored the "full objectives" of Congress in the Atomic Energy Act.

When analyzing the "full objectives" of Congress behind the Atomic Energy Act, one must look to the language of the Act itself. Congress passed the Act in 1954 "to encourage widespread participation in the development and utilization of atomic energy for peaceful purposes to the maximum extent consistent with the common defense and security and with the health and safety of the public."<sup>44</sup> Originally, the Federal Government had complete control over peacetime uses of nuclear power.<sup>45</sup> Congress passed the AEA to eliminate this federal monopoly. Thus, Congress' purpose in the Act was clearly to promote nationwide commercial nuclear development. Since Congress also saw the need for expert supervision of such development, however, it granted the Commission expansive nuclear regulatory authority. Congress determined that federal regulation of private nuclear development would be necessary for "optimum progress, efficiency, and economy in this area of atomic endeavor."<sup>46</sup>

41. See Scott Allen, *If We Can't Bury Nuclear Waste in Nevada, Where Can We?*, BOSTON GLOBE, May 17, 1993, at 25 ("[S]ome academic researchers suggest the whole notion of a . . . 'permanent' waste site may one day be seen as Twentieth Century hubris. . . . What if there's a cure for cancer [discovered in the meantime] . . . which would make radiation exposure less terrifying?"); Doug J. Swanson, *Cost, Frustrations Soar as Nuclear Project Lags: Backers Admit Problems with Nevada Program*, DALLAS MORNING NEWS, May 23, 1993, at 1A ("In recent years, many scientists have come to believe that spent fuel can be safely stored at most reactor sites for another century."); But see Margaret Kriz, *Wasting Away*, NAT'L J., Oct. 9, 1993, at 2430 (quoting Department of Energy Secretary O'Leary as saying the nuclear industry is "at risk" because there is not a permanent disposal site for high-level radioactive wastes).

42. 312 U.S. 52 (1941).

43. *Id.* at 67; see also *supra* notes 22-27 and accompanying text.

44. 42 U.S.C. § 2013(d).

45. *Pacific Gas & Elec. Co. v. State Energy Resources Conservation & Dev. Comm'n*, 461 U.S. 190, 206 (1983) ("Until 1954 . . . the use, control, and ownership of nuclear technology remained a federal monopoly.").

46. H.R. REP. NO. 2181, 83rd Cong., 2d Sess. 9 (1954).

The Atomic Energy Act designated the Commission as the federal nuclear regulatory agency, and directed it to regulate as it "may deem necessary or desirable to promote the common defense and security or to protect health or to minimize danger to life or property."<sup>47</sup> In this provision of the Act, Congress' "full objective" is to give the Commission great authority to evaluate the costs and benefits of nuclear power on a national basis. Nothing in the Act expressly states that the Commission should consider economic costs in its promotion of nuclear energy. However, nothing in the Act expressly provides that economic costs should be excluded from these equations.

In 1959, Congress amended the Act to clarify the differing responsibilities of state and federal nuclear regulators. The amendment granted the Commission exclusive control over hazardous materials used in nuclear plants<sup>48</sup> and increased the efficiency of nuclear regulation in two ways. First, the amendment placed authority to develop safety standards with the most qualified regulatory body. Here, Congress expressly recognized the Commission as the national seat of expertise regarding matters of atomic energy.<sup>49</sup> Second, Congress enabled the Federal Government to formulate effective, uniform standards for nuclear energy nationwide, thus preventing an inefficient patchwork of safety regulation varying between states.<sup>50</sup> This establishment of a centralized federal nuclear regulatory body maximized the regulatory gains of expertise and national uniformity.<sup>51</sup>

47. 42 U.S.C. § 2201(b) (Supp. V 1993).

48. 42 U.S.C. § 2021(a)(1) (1988); *see also* S. REP. NO. 870, 86th Cong., 1st Sess. 8 (1959) ("Licensing and regulation of more dangerous activities—such as nuclear reactors—will remain the exclusive responsibility of the [federal] Commission.").

49. *See* H.R. REP. NO. 1125, 86th Cong., 1st Sess. 3 (1959) (establishing a federal nuclear regulatory agency because "the technical safety considerations [of nuclear power] are of such complexity that it is not likely that any State would be prepared to deal with them during the foreseeable future").

50. *See* JOSEPH P. TOMAIN, NUCLEAR POWER TRANSFORMATION 18 (1987) ("[L]egislation creating the commercial nuclear regulatory bureaucracy centralized decision making in Washington . . . [putting it] in a position superior to that of the states to promote the uniform use of nuclear energy."). In traditional preemption cases, the uniformity of federal law can become a value in itself, since it increases regulatory efficiency. Therefore, state law may be preempted simply to preserve the efficiency of federal regulation. *See, e.g.*, *International Paper Co. v. Ouellette*, 479 U.S. 481, 493, 496-97 (1987) (refusing to allow application of state water pollution law in order to avoid overriding EPA standards and thus engendering interstate confusion among point sources). Federal regulators are still working to increase the uniformity and efficiency of nuclear energy generation. For example, the new generation of nuclear reactors supported by President Clinton will be manufactured according to pre-approved plant designs, thus preventing legal delays after construction has begun. *See* Mutch, *supra* note 6, at 4.

51. In 1971, the Eighth Circuit Court of Appeals recognized that the expertise and uniformity of federal nuclear regulation is important in and of itself:

The nature of the subject matter regulated and the need for uniform controls in order to effectuate the objectives of Congress are additionally supportive of a finding of pre-emption [of state regulation]. In enacting the Atomic Energy Act of 1954, Congress made specific findings concerning the development, use and control of atomic energy. Included in these findings are a number of statements to the effect that the processing and utilization of . . . special nuclear material *must be regulated by the United States in the national interest* because of their affect [sic] upon interstate and foreign commerce and in order to provide for the common defense and security and to protect the health and safety of the public.

*Northern States Power Co. v. Minnesota*, 447 F.2d 1143, 1153 (8th Cir. 1971) (emphasis in original), *aff'd per curiam*, 405 U.S. 1035 (1972).



In *Pacific Gas*, the Supreme Court acknowledged that Congress' "full objectives" behind the Atomic Energy Act included complete federal occupation of nuclear safety regulation.<sup>52</sup> However, complete federal occupation of nuclear safety is not possible if the states can regulate nuclear power based on economic factors. As the Court of Appeals for the District of Columbia Circuit acknowledged in *Siegel v. Atomic Energy Commission*, the Act's broad delegation of authority to the Commission "is virtually unique in the degree to which broad responsibility is reposed in the administering [federal] agency, free of close prescription in its charter as to how it shall proceed in achieving the statutory objectives."<sup>53</sup> Given this broad mandate, it is unlikely Congress intended to eliminate economic concerns from the Commission's deliberations as to what it "may deem necessary or desirable . . . to protect health."<sup>54</sup> Preventing the Commission from considering costs, as the Court did in *Pacific Gas*, eliminates the regulatory expertise and efficiency advantages Congress hoped to obtain through exclusive federal regulation of nuclear power.

## II. TWO EXAMPLES OF CURRENT NUCLEAR REGULATION BY STATES

According to *Pacific Gas*, states may regulate nuclear power based on economic cost considerations, while the Federal Government has exclusive authority to regulate nuclear safety. This decision presumes that financial considerations are always distinct from considerations of public health and safety. However, the two examples of current nuclear regulatory administration which follow illustrate the extent to which the fields of safety-based regulation and cost-based nuclear regulation overlap. This overlap exposes the distinction that forms the basis of the *Pacific Gas* holding as meaningless. These examples also reveal the difference between the federal and state views of nuclear safety. These differing perceptions of safety create a struggle for nuclear regulatory authority between the states and the Federal Government.

In the first example of current state-based nuclear regulation, states regulate low-level wastes deemed "below regulatory concern" ("BRC") by the Federal Government. This is the only instance where Congress permits states to regulate nuclear matters based *expressly* on safety concerns. In the second example, Individual Plant Examinations performed by plants to fulfill federal regulation requirements may prompt states to impose fines based on presumed inadequacies. This Note will argue that state regulation in both of these areas decreases efficiency by diverting finite utility resources toward risks that do not merit such attention. It is the localized focus of state governments that exaggerate these risks.

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52. *Pacific Gas & Elec. Co. v. State Energy Resources Conservation & Dev. Comm'n*, 461 U.S. 190, 205 (1983).

53. 400 F.2d 778, 783 (D.C. Cir. 1968).

54. See 42 U.S.C. 2201(b).

### A. Radioactive Wastes "Below Regulatory Concern"

In 1986 and 1990, the Nuclear Regulatory Commission issued policy statements that caused a political uproar.<sup>55</sup> In order to reduce the cost of decommissioning nuclear power plants and removing waste therefrom, the Commission proposed classifying, on a case-by-case basis, certain solid waste materials with low radioactivity as "below regulatory concern." Among other things, the policy would preempt states' ability to regulate disposal of such wastes. Under the BRC policy, utilities could simply disperse such wastes into the open environment, thereby reducing their disposal costs.<sup>56</sup>

According to Commission Chairman Kenneth Carr, the policy "was developed to ensure that decisions are made in a consistent and uniform manner from a risk perspective, and to ensure consistency in the levels of safety for existing and future exemption decisions."<sup>57</sup> Thus, the Commission, by deeming that a certain low level of radioactivity was acceptable in the open environment, implied that a certain small amount of risk presented by the waste would be acceptable in all circumstances.<sup>58</sup> Carr stated that the actual numbers used to establish the point at which wastes were to be considered "below concern" were very low levels of radiation. He compared these levels to the difference between living in a brick house, which emits a certain amount of natural radiation, rather than a wooden house, which emits less.<sup>59</sup> Put in these terms, the level at which wastes were to be considered "below regulatory concern" seems dramatically insignificant. Many people who live in brick houses do not know (or care) that they are being irradiated

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55. Radioactive Waste Below Regulatory Concern: Policy Statement, 51 Fed. Reg. 30,839 (1986) (codified at 10 C.F.R. pt. 2, app. B (1988), removed and reserved by 58 Fed. Reg. 44,611 (1993)); Below Regulatory Concern: Policy Statement, 55 Fed. Reg. 27,522 (1990).

56. A "below regulatory concern" policy already existed for disposal of liquid and gaseous wastes with low radioactivity. See 10 C.F.R. §§ 20.2003-20.2005 (1994).

57. *Hazardous Waste, NRC's 'Below Regulatory Concern' Policy Fatally Flawed, Rep. Miller Says*, DAILY REPORT FOR EXECUTIVES, July 27, 1990, at A-13, available in LEXIS, News Library, NWLTRS File.

58. An important function of an expert agency is to evaluate phenomena in terms of risk. Some experts theorize that it is possible to compare and evaluate all risks against each other, thereby establishing a "national risk policy" where any event whose occurrence was below a certain threshold of probability would be beyond regulation. For discussion of such a policy, see Carr, *Looking Back, Says 'We Got a Few Things Done—More Than We Thought'*, INSIDE N.R.C., June 3, 1991, at 1, 3-5 [hereinafter Carr, *Looking Back*].

Commentator Peter Huber would rely on evaluation of risk by an expert agency rather than by non-experts (e.g., the courts):

Regulatory agencies are equipped to make the risk comparisons on which all progressive transformation of the risk environment must be based. The courts are simply not qualified to second-guess such decisions; when they choose to do so they routinely make regressive risk choices. Requiring—or at least strongly encouraging—the courts to respect the comparative risk choices made by competent, expert agencies would inject a first, small measure of rationality into a judicial regulatory system that currently runs quite wild.

Peter Huber, *Safety and the Second Best: The Hazards of Public Risk Management in the Courts*, 85 COLUM. L. REV. 277, 335 (1985).

59. Carr, *Looking Back*, supra note 58, at 4.

by their homes.<sup>60</sup> This policy statement was a clear attempt by the Commission to use its expertise in radiological matters and to reduce costs by eliminating state regulation of the disposal of BRC wastes. An official in the Environmental Protection Agency correctly stated it was foolish to abolish the "below regulatory concern" policy, emphasizing that the policy was developed in response to "[c]ertain economic realities that exist in this country."<sup>61</sup>

In the AEA, Congress viewed the Nuclear Regulatory Commission as a federal agency with greater expertise in nuclear matters than the states. In the area of radioactive waste, one would presume that the Commission is in a better position than the states to know which wastes are worth regulating and, therefore, where to invest and where not to invest valuable regulatory resources. However, Congress abolished the Commission's "below regulatory concern" policy in its Energy Policy Act of 1992 ("1992 Act"),<sup>62</sup> after many states voiced great opposition to it.<sup>63</sup>

The reason behind this provision in the 1992 Act seems to be a political appeasement of states rather than a carefully considered distribution of authority between equally capable regulators. Congress explicitly acknowledges as much in the House Report accompanying the Act:

In the Committee's opinion, the NRC's . . . [below regulatory concern] policies . . . were excessively liberal. . . . [T]he Committee feels it is inappropriate for the federal government to use preemption to compel state and local governments to accept radioactive materials at landfills, or into public commerce, if in the judgments of those states such practices are not in the public interest. Accordingly, it is appropriate to give states the authority to regulate such practices where NRC decides to deregulate or relax regulation of them. These provisions are strongly supported by state governments.<sup>64</sup>

60. For a discussion of how the public perceives activities which present dangers comparable to those presented by low-level radioactive waste (such as taking two cross-country flights), see *id.*

61. DAILY REPORT FOR EXECUTIVES, *supra* note 57, (quoting Richard J. Guimond, Office of Radiation Programs director at the Environmental Protection Agency).

62. The relevant portions of the Energy Policy Act are as follows:

(a) IN GENERAL.—No provision of this [Act], or of the Low-Level Radioactive Waste Policy Act, may be construed to prohibit or otherwise restrict the authority of any State to regulate, on the basis of radiological hazard, the disposal or off-site incineration of low-level radioactive waste, if the Nuclear Regulatory Commission, after the date of the enactment of the Energy Policy Act of 1992 exempts such waste from regulation.

(b) RELATION TO OTHER STATE AUTHORITY.—This section may not be construed to imply preemption of existing State authority. Except as expressly provided in subsection (a), this section may not be construed to confer on any State any additional authority to regulate activities licensed by the Nuclear Regulatory Commission. . . .

(d) REVOCATION OF RELATED NRC POLICY STATEMENTS.—The policy statements of the Nuclear Regulatory Commission . . . relating to radioactive waste below regulatory concern, shall have no effect after the date of the enactment of this Act.

Energy Policy Act of 1992, Pub. L. No. 102-486, § 2901(a), 106 Stat. 2776, 3122 (codified at 42 U.S.C. § 2023 (Supp. V 1993)); see also E. Michael Blake, *Twenty Nagging Questions and Not-Necessarily-Satisfying Answers About LLW Management in the United States*, NUCLEAR NEWS, Dec. 1993, at 42, 43 ("The National Energy Policy Act of 1992, which gave the nuclear industry streamlined power plant licensing . . . also revoked the NRC [below regulatory concern] policy statements . . .").

63. For example, Pennsylvania believed that the BRC policy would destroy efforts to ensure safe disposal of low-level waste. See DAILY REPORT FOR EXECUTIVES, *supra* note 57.

64. H.R. REP. NO. 474, *supra* note 17, at 72, reprinted in 1992 U.S.C.C.A.N. 2283, 2290.

In this report, Congress addresses low-level waste disposal in terms of the "public interest" as evaluated by the states. In the AEA, however, Congress itself delegated authority to the Federal Government to determine what nuclear regulation is "consistent . . . with the health and safety of the public."<sup>65</sup> By implying that something other than "health and safety" constitute the states' "public interest," Congress contradicted itself.

Indeed, such "public interests," not health and safety, seem to be barring nuclear energy development within state borders at all costs. This is further illustrated by the fact that states do not bother to regulate disposal of many consumer products, such as smoke detectors, which contain comparably low levels of radiation.<sup>66</sup> If Congress truly believes that the Commission is less capable than states at determining which nuclear wastes are "below regulatory concern," then it is difficult to imagine why Congress would allow the Commission to continue exclusive regulation of all other nuclear safety matters. By deferring to states' opinions of what wastes do *not* lie "below regulatory concern," the provision ignores the expert opinion behind the Federal Commission's policy.

Congress' elimination of the Commission's BRC policy has caused nuclear plant operating costs to increase significantly. Specifically, the costs of removing low-level wastes from nuclear plants across the country have risen dramatically in recent years.<sup>67</sup> Operators of nuclear plants across the country cite disposal of such wastes as the primary reason for a general increase in costs.<sup>68</sup> States now require special treatment of these wastes—treatment which utilities could have forgone under the Commission's BRC policy. Costs surrounding low-level waste disposal are likely to increase further. The 1992 National Energy Policy Act allows states to prevent low-level waste deemed "below regulatory concern" from being shipped in from another state for

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65. 42 U.S.C. § 2013(d) (1988).

66. According to one commentator:

The inconsistency in the status of certain consumer products, like smoke detectors, had been one of the things the NRC hoped to work out through the BRC process. [After the 1992 National Energy Policy Act, 42 U.S.C. §§ 4321-4370(d) (Supp. V 1993)] the inconsistency remains, so some minimally radioactive material continues to go through what amounts to a BRC process and is discarded without controls.

Blake, *supra* note 62, at 43.

67. Steven E. Kuehn, *Yankee Rowe Decommissioning Estimate Alarms Industry*, POWER ENGINEERING, Aug. 1992, at 15 ("Central to the increase in decommissioning costs is the estimated expense of disposing of low level radioactive waste . . ."); see also Susan E. Kinsman, *Cost of Closing Nuclear Plants Rising Fast*, HARTFORD COURANT, May 20, 1993, at A1, A6 (noting that one utility which is dismantling four nuclear plants expects to pay \$368 per cubic foot for disposal of 654,114 cubic feet of low-level waste); Makansi & Strauss, *supra* note 15, at 17. ("Generation of low-level, solid radioactive waste (radwaste) [and the threat of radiation exposure to employees] . . . have been costly elements in nuclear generation.").

68. See Kinsman, *supra* note 67, at A6.

disposal,<sup>69</sup> thereby exacerbating the effects of an already severe shortage in low-level waste disposal sites.<sup>70</sup>

The Commission's BRC policy clearly would have saved a great deal of money for nuclear utilities. The policy's elimination encourages inefficient allocation of resources by forcing utilities to spend money on low-level waste disposal rather than on more pressing safety concerns. It also encourages states to establish more stringent safety requirements than the Nuclear Regulatory Commission—a troublesome scenario, given that it is the Commission's responsibility to regulate all *other* areas of nuclear safety. Since every nuclear plant produces large amounts of low-level waste, state overregulation of this waste has serious consequences for national nuclear development.

### *B. Individual Plant Examinations*

In 1987, the Commission called for individual plants to examine their facilities for severe accident vulnerabilities. The policy requires the management of each nuclear plant to undertake expensive studies and evaluate their individual plant's potential for severe accidents. These examinations are called Individual Plant Examinations ("IPE's").<sup>71</sup> After an IPE, the response required of plant operators will vary according to the nature and severity of the accident risks discovered. The Commission may not require plants to implement new safety procedures upon finding a previously undiscovered accident risk, if it determines that such implementation is not worth the cost.<sup>72</sup> Rather, the licensee may decide whether or not to implement the

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69. 42 U.S.C. 2021(j) (Supp. V 1993). The House Report which accompanied the 1992 Act stated: This subtitle also provides states with the additional authority separately to prohibit or otherwise restrict the importation into the state for purposes of storage or disposal of "BRC" low-level radioactive waste . . . This provision gives states the option of permitting BRC material disposal within the state . . . while prohibiting importation of BRC wastes from outside the state.

H.R. REP. NO. 474, *supra* note 17, at 71, reprinted in 1992 U.S.C.C.A.N. 2283, 2289.

70. See Blake, *supra* note 62, at 42; see also Marie Leone, *Washington Update*, POWER, Nov. 1993, at 8 (discussing how the "not-in-my-state" argument has blocked siting of nuclear waste depositories).

71. Individual Plant Examinations are simply assessments of the risk of a severe accident at a given facility. These assessments are also called "Probabilistic Risk Assessments" ("PRA's"). IPE's are simply PRA's performed on a specific nuclear plant.

72. See Joseph R. Egan & Mitchell S. Ross, *The Uses and Abuses of IPE Results by State Agencies*, NUCLEAR NEWS, June 1993, at 45, 46 ("If the IPE indicates that plant design and operations meet NRC regulations and that further safety improvements are neither substantial nor cost-effective, enhancements would not be suggested unless significant new safety information becomes available.").

remedial measures at its own discretion,<sup>73</sup> or upon the Commission's recommendation.<sup>74</sup>

The ultimate purpose of IPE's is to "extend both the NRC staff's and [the nuclear] industry's knowledge of plant capabilities."<sup>75</sup> This improved knowledge leads to the establishment of more efficient plant regulation, whereby utilities spend money on those procedures that increase safety the most.<sup>76</sup>

Because the *Pacific Gas* decision permits state regulation of nuclear plant costs, nonexpert state agencies may step in and decide how utilities should use IPE results. When a utility implements safety procedures following an IPE, state agencies may disallow the utility from recovering the implementation costs by increasing rates to energy consumers. These disallowances are called "prudence disallowances."<sup>77</sup> Naturally, they are problematic to utilities because they prevent the utilities from recouping safety maintenance costs.

Virtually any mishap in a nuclear plant can lead to prudence disallowances.<sup>78</sup> Even when something does *not* go wrong, indeed, when it *is prevented from* going wrong because of a utility's response to an IPE, a state may impose prudence disallowances. An IPE may alert federal regulators to a plant's failure to meet the minimum safety standards. Thus after an IPE, the Commission may require plants to make such improvements "without regard to cost."<sup>79</sup> However, *anything* done without regard to cost is susceptible to a state prudence disallowance, even if it is crucial for public safety. If a plant implements new safety improvements as required by the Commission, the state may impose a prudence disallowance based on the cost of the procedure alone, regardless of the Commission's opinion that the improvement is necessary for public safety.<sup>80</sup> Furthermore, if a utility chooses to implement

73. See *id.* ("Licensees are themselves expected to use IPE results to determine whether potential improvements (both design and procedural) are warranted. The NRC expects licensees to correct vulnerabilities and to report those changes to the NRC."); Thomas E. Tipton, *Implementation of the Final Maintenance Rule*, NUCLEAR NEWS, Aug. 1993, at 37, 38 ("Although the NRC encourages use of [IPE's] to determine risk significance, it does not require use of [IPE] results. The method chosen is left to the licensee."); see also *Mark-I Hardened Vent Improvements, Other IPE-Related Work Underway*, INSIDE N.R.C., Nov. 1, 1993, at 9 (citing examples of improvements made as a result of IPEs).

74. See Egan & Ross, *supra* note 72, at 46 ("If the IPE indicates that plant design or operations could be enhanced by substantial additional protection beyond NRC regulations, then appropriate functional enhancements would be 'recommended' and supported with analysis demonstrating that the benefits of such enhancements are substantial and worth the cost . . .").

75. Stellfox, *supra* note 20, at 3.

76. *Id.* ("Such improved knowledge should lead to pay-offs in better, performance-based rules, as well as guides for their implementation.")

77. Egan & Ross, *supra* note 72, at 49.

78. *Id.* at 46 ("[S]tate prudence standards can impose strict liability . . . on utilities for failing to meet preset capacity factors or operations and maintenance targets.")

79. See *id.* ("If the IPE indicates that plant design or operations must be changed to meet NRC regulations, then appropriate functional enhancements would be mandated by the NRC 'without regard to cost,' except as appropriate to select from among alternatives.")

80. See *id.* at 47. Egan and Ross point out that in the late 1970's and 1980's, certain utilities achieved cost reductions by battling the NRC over what safety implementations were actually necessary. The more acquiescent utilities, on the other hand, suffered state-imposed prudence disallowances amounting to several hundred million dollars. *Id.*

safety procedures over and above those deemed necessary by the Commission, states may still impose prudence disallowances.

Prudence disallowances can be induced by IPE's, as well as occur in response to them, since modifications from an IPE alert state regulators to the disallowance opportunity.<sup>81</sup> It is ironic that close federal regulation of nuclear plants alerts state agencies to impose additional costs, since the AEA provided for federal regulation specifically to avoid such unnecessary costs.<sup>82</sup>

Since the Commission's opinion regarding the necessity of a given safety procedure has no bearing on the state's opinion of what is prudent, prudence disallowances completely ignore the Commission's determination of which safety procedures are financially worth implementing. In effect, the regulatory body with the greatest influence on which nuclear safety procedures to forgo and which ones to implement is a state agency rather than an expert federal commission.

The Supreme Court's decision in *Duquesne Light Co. v. Barasch*<sup>83</sup> effectively gave states the legal authority to determine what constitutes prudent behavior on the part of a utility. This decision "removed from judicial purview all inquiry as to the means by which utility commissions reach their rate decisions, allowing courts to focus only on 'end results.'"<sup>84</sup> Courts will prevent state regulation through prudence disallowances only if the end results are not just and reasonable.<sup>85</sup> This is an extremely flexible standard.

This scenario threatens not only nuclear regulatory efficiency, but the continued development of nuclear power itself. Those knowledgeable about inefficiencies in nuclear regulation point out that society is no longer wealthy enough "to spend large amounts of money on insignificant risks."<sup>86</sup> Many believe that failure to reduce these inefficiencies will eliminate any future nuclear power.<sup>87</sup> IPE's have the potential to make us more knowledgeable as to the risks that are worth correcting. The challenge is to use IPE's for this purpose, rather than to provide an opportunity for state agencies to impose costs over and above those which make plants safer.

81. *Id.* at 49 ("[There are] situations where a state utility commission observes that a utility has modified its procedures following an incident, and infers from that observation that the utility's original procedures must have been inadequate; a prudence disallowance is then levied based on assumed inadequacies.").

82. See discussion *supra* part I.B.

83. 488 U.S. 299 (1989).

84. Egan & Ross, *supra* note 72, at 46.

85. *Duquesne*, 488 U.S. at 310.

86. Stellfox, *supra* note 20, at 4 (quoting William Rasin, vice president, Nuclear Management and Resources Council).

87. See *id.* ("[U]nless something is done now 'to salvage the economics of the current generation [of operating plants]. . . [t]he prospects for the future could be swept away in a tide of prematurely shut down plants.'" (quoting Jack Newman of the Newman & Holtzinger law firm).

### III. THE LEGACY OF AN ERRONEOUS DISTINCTION IN PACIFIC GAS

#### *A. The Impossibility of Distinguishing Safety from Economics*

The field of nuclear regulation has been paralyzed by the Supreme Court's distinction between safety and economics in *Pacific Gas*. This false distinction allows states to overregulate nuclear power, thereby discounting the opinions of experts in nuclear technology and aborting attempts to promote nuclear energy.

The division between safety standards and economic concerns in nuclear regulation blurs when one looks at the individual phases of nuclear power generation. One can consider costs surrounding the actual production of energy in financial terms only, rather than in terms of safety. For example, one can consider construction of a nuclear plant solely in terms of dollars, not in its potential to shield the public from radiological hazards. One may evaluate the cost of building materials, the expertise of the contractor, or the location of a site on valuable real estate as purely economic concerns. To take another example, the need for frequent waste disposal from a nuclear plant has distinct financial ramifications. At some point, the frequency of waste disposal from a plant becomes excessive, placing unreasonable burdens on a utility's operations costs. It is also clear, however, that both frequency of waste disposal and the sound construction of nuclear plants are important safety issues in the realm of nuclear energy.<sup>88</sup>

In 1971, the Eighth Circuit, in *Northern States Power Co. v. Minnesota*,<sup>89</sup> acknowledged that splitting the regulation of nuclear power between states and the Federal Government might be separating consideration of matters that are inextricably linked. In *Northern States Power*, the State of Minnesota argued that state control over radioactive effluents from nuclear plants lay well within its traditional police powers. The court did not deny this argument. Instead, it dismissed the argument by pointing out that control over radioactive effluents was "inextricably intertwined" with nuclear energy matters regulated exclusively by the Federal Government.<sup>90</sup> The court refused to take a "microcosmic approach to the subject matter being regulated," emphasizing that splitting regulatory authority would undermine congressional intent to achieve a "proper balance between desired industrial progress and adequate health and safety standards."<sup>91</sup>

The separation of cost considerations from safety considerations, matters which are also inextricably linked, yields the same undesirable results. Congress cannot consider an agency to be the apex of knowledge in a particular area, and yet ignore the agency's determination of what procedures are worthwhile at a given cost. This, however, is precisely the outcome of

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88. See TOMAIN, *supra* note 50, at 15 ("Safety and finances are not discrete topics. Waste disposal is a radiological hazard as much as it is an accounting entry on the utility's books.")

89. 447 F.2d 1143 (8th Cir. 1971), *aff'd per curiam*, 405 U.S. 1035 (1972).

90. *Id.* at 1153.

91. *Id.*



*Pacific Gas*, where the state determined what costs presented by nuclear power were acceptable, thereby preempting the federal agency's safety regulation.

*B. Collapse of the Safety/Economics Distinction in  
Silkwood v. Kerr-McGee Corp.*

In *Silkwood v. Kerr-McGee Corp.*,<sup>92</sup> the Supreme Court established a partnership between federal and state regulation of nuclear safety, rather than federal preemption of such state regulation. In doing so, the Court seemed to ignore the absolute distinction between safety considerations and cost considerations it had made only one year earlier in *Pacific Gas*. Perhaps the Court did so inadvertently, since it did not address any inconsistency between the two cases. This Note argues that the Court's approach reveals that the distinction between safety and economics is malleable to the point of meaninglessness.

Karen Silkwood was a laboratory analyst who was severely contaminated by plutonium over a three-day period while working at Kerr-McGee. Silkwood's estate successfully sued the utility under a state-law tort action and received punitive damages of \$10 million. The district court allowed the award of punitive damages, holding that Kerr-McGee had a duty to limit radiation release to an "as low as reasonably achievable" standard.<sup>93</sup> The Court of Appeals for the Tenth Circuit reversed the district court, holding that the award of damages was contrary to the AEA which provided that the Federal Government preempts "any state action that competes substantially with the [Federal Government] in its regulation of radiation hazards."<sup>94</sup> Although not reaching the issue of whether Kerr-McGee had complied with federal safety standards for nuclear plant operations, the Tenth Circuit held that Kerr-McGee was not liable for punitive damages under state law.<sup>95</sup>

The Supreme Court, however, reversed the Tenth Circuit by narrowing the *Pacific Gas* preemption test. The Court held that the lack of a federal remedy for plaintiffs such as Karen Silkwood, coupled with the congressional intent behind the Act, evidenced that state tort remedies would apply under these circumstances. The Court ignored Kerr-McGee's argument that "because the state-authorized award of punitive damages in this case punishes and deters conduct related to radiation hazards, it falls within the prohibited field [of nuclear safety regulation]."<sup>96</sup>

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92. 464 U.S. 238 (1984).

93. *Silkwood v. Kerr-McGee Corp.*, 485 F. Supp. 566, 585 (W.D. Okla. 1979) (quoting 10 C.F.R. § 20.1 (1974)).

94. *Silkwood*, 667 F.2d 908, 923 (10th Cir. 1981).

95. *Id.*

96. *Silkwood*, 464 U.S. at 249. *But see* *County of Suffolk v. Long Island Lighting Co.*, 728 F.2d 52, 60-61 (2d Cir. 1984) (holding that federal law preempted both state tort and contract claims against the Long Island Lighting Company because the claims interfered with the delicate balance between safety and productivity).

In spite of its holding, the Court acknowledged that Congress intended to grant the Federal Government authority to regulate nuclear safety because of its greater expertise in the field than that possessed by the states.<sup>97</sup> In his strong dissent, Justice Powell stressed the importance of placing nuclear regulation in the hands of experts, stating, "The Court defends the awarding—even on the basis of inferences—of punitive damages judgments by lay juries with no competency to understand the highly sophisticated technology of nuclear facilities."<sup>98</sup> Nevertheless, the Supreme Court upheld the award of punitive damages even though the Commission found that the utility had complied with all federal safety standards.<sup>99</sup>

The *Silkwood* majority acknowledged the "tension between the conclusion that safety regulation is the exclusive concern of federal law and the conclusion that a State may nevertheless award damages based on its own law of liability."<sup>100</sup> By describing the conflict between federal and state law as mere "tension," the Court seemed to assume that the effect of imposing punitive damages under state law would be *de minimis*, and would not have a great influence on safety practices.<sup>101</sup> The award in *Silkwood*, however, clearly illustrates that the effect of such damages is not *de minimis*; the \$10 million fine was 100 times greater than the maximum fine imposed for a violation of federal standards by the NRC.<sup>102</sup> The Court admitted that upholding Kerr-McGee's liability was tantamount to allowing state regulation, stating that "the award of damages based on the state law of negligence or strict liability is regulatory in the sense that a nuclear plant will be threatened with damages liability if it does not conform to state standards."<sup>103</sup> The dissent also emphasized this point, stating that "[t]he prospect of paying a large fine—in this case a potential \$10 million—for failure to operate a nuclear facility in a particular manner has an obvious effect on the safety precautions that nuclear licensees will follow."<sup>104</sup>

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97. *Silkwood*, 464 U.S. at 250 ("Congress' decision to prohibit the States from regulating the safety aspects of nuclear development was premised on its belief that the Commission was more qualified to determine what type of safety standards should be enacted in this complex area.")

98. *Id.* at 278 (Powell, J., dissenting); see also *id.* at 283 ("This case is a disquieting example of how the jury system can function as an unauthorized regulatory medium."); *id.* at 285 ("Juries unfamiliar with nuclear technology may be competent to determine and assess compensatory damages on the basis of liability without fault. They are unlikely, however, to have even the most rudimentary comprehension of what reasonably must be done to assure the safety of employees and the public."); see also *Pacific Gas & Elec. Co. v. State Energy Resources Conservation & Dev. Comm'n*, 461 U.S. 190, 205 (1983) (holding that in enacting the Atomic Energy Act, Congress intended for the Federal Government to regulate the safety aspects of constructing and operating nuclear plants).

99. See *Silkwood*, 464 U.S. at 262 (Blackmun, J., dissenting) ("[T]he Commission conducted a complete investigation into the *Silkwood* contamination, and found no material violation of federal regulations that could justify imposing a fine.")

100. *Silkwood*, 464 U.S. at 256.

101. In his dissent, Justice Blackmun, joined by Justice Marshall, pointed out that "[i]t is abundantly clear . . . that the punitive damages award in this case deters a nuclear facility from operating in the same manner as Kerr-McGee." *Id.* at 261 (Blackmun, J., dissenting).

102. *Id.* at 263.

103. *Silkwood*, 464 U.S. at 256.

104. *Id.* at 260 (Blackmun, J., dissenting).

Finally, the dissent added that the Court's majority recognized that "punitive damages are expressly designed for this purpose [of influencing safety precautions that nuclear licensees will follow]."<sup>105</sup> This point has great significance. By recognizing that punitive damages under state law are designed for the purpose of influencing safety precautions, and yet allowing them anyway, the majority expressly contradicted its own *Pacific Gas* holding of the previous year. It did so by allowing states to indirectly regulate nuclear energy with a safety purpose in mind, while in *Pacific Gas* the Court had granted the Federal Government *exclusive* authority in this realm.<sup>106</sup>

*Silkwood* is a clear acknowledgement by the Supreme Court that the distinction between safety and economics, which it perpetrated in *Pacific Gas*, is meaningless. Clearly, potential liability under state law indirectly regulates safety management of utilities. A utility will conduct safety procedures in such a manner as to avoid paying fines under state law. The state's indirect regulatory authority over these safety procedures will simply increase in proportion to the amount of the fine imposed. Under these circumstances, any *exclusive authority* in the field of nuclear safety, and consequent preemption of state regulation, is fictional. Despite its firm distinction between safety and economics made only one year earlier in *Pacific Gas*, the Supreme Court in *Silkwood* addressed and tolerated the clear invasion of state-law punitive damages awards into the supposedly exclusive realm of federal nuclear safety regulation. By doing so, the Court acknowledged that its distinction between safety and economics does not really exist.

### C. *Opportunity Costs of Nuclear Energy Alternatives: Union of Concerned Scientists v. Nuclear Regulatory Commission*

Clearly, federal regulators must evaluate nuclear energy safety procedures in light of their cost-effectiveness. Undoubtedly, there are procedures which, though economically burdensome, are too beneficial from a safety perspective to forgo. For example, a very expensive procedure which eliminates all possibility of radiation leakage would be worthwhile for nuclear plants to implement. On the other hand, such a procedure may be so costly that the utility could not survive financially if it implemented the procedure. In this case, the procedure may be too costly from a societal standpoint to make implementation feasible.

In cases where a nuclear plant shuts down because its safety costs are too great, one must consider opportunity costs—the value of benefits forgone in favor of another benefit. Naturally, the opportunity costs of forgoing nuclear power include the elimination of energy the nuclear plant would have provided. However, this cost will vary under different circumstances. The fewer energy alternatives to nuclear power that exist, the higher the value of

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105. *Id.*

106. *See Pacific Gas & Elec. Co. v. State Energy Resources Conservation & Dev. Comm'n*, 461 U.S. 190, 212-13 (1983).

the forgone nuclear energy. In the unlikely circumstance that no energy sources other than nuclear power exist, the choice would be between a less-safe nuclear plant and zero electricity. Arguably, zero electricity could prove to be "more expensive" to society than an operating nuclear plant that is not as safe as it might possibly be. Another opportunity cost of forgoing clean-burning nuclear energy would be the use of coal or fossil fuels as nuclear substitutes which contribute to air pollution.<sup>107</sup> The more severe the air pollution problems that already exist, the higher the costs of additional air pollution.

In 1987, the Court of Appeals for the District of Columbia Circuit addressed opportunity costs in *Union of Concerned Scientists v. Nuclear Regulatory Commission*.<sup>108</sup> The AEA requires the Commission to evaluate an "adequate protection" standard for the general public regarding nuclear power.<sup>109</sup> This standard is the minimum safety level which utilities must maintain at all times for any nuclear plant. In *Union of Concerned Scientists*, the court considered whether the Commission could include economic costs when calculating its "adequate protection" standard. The anti-nuclear plaintiffs argued that the court should not permit the NRC to consider costs when evaluating what constituted "adequate protection."

The court of appeals admitted that the use of the word "adequate" by the Act implied some degree of discretion on the part of the NRC.<sup>110</sup> The court also admitted that "adequate protection" did not mean nuclear energy had to be entirely risk-free; rather, a certain amount of risk was acceptable at this level.<sup>111</sup> Ultimately, the court ruled that the Commission could consider the costs of operations maintained *above* the minimum "adequate protection" standard. The court, however, agreed with the plaintiffs that the Commission should not consider cost when determining what constitutes the minimum safety standard of "adequate protection."<sup>112</sup>

The notion of opportunity costs reveals the close link between economic and safety concerns. The court's ruling effectively eliminated the consideration of opportunity costs regarding nuclear energy and how these costs may vary under different circumstances. In his concurring opinion, Judge Williams

107. See *infra* Part IV.B.

108. 824 F.2d 108 (D.C. Cir. 1987).

109. 42 U.S.C. § 2232(a) (1988) (requiring the Commission to ensure that "the utilization or production of special nuclear material . . . will provide . . . adequate protection to the health and safety of the public").

110. *Union of Concerned Scientists*, 824 F.2d at 114 ("[T]he word 'adequate' implies some discretion on the part of the Commission, and it might be reasonable to aver that this discretion entails some freedom to consider factors other than health and safety in determining the adequate-protection standard.").

111. *Id.* at 118 ("The level of adequate protection need not, and almost certainly will not, be the level of 'zero risk.'").

112. According to the court of appeals:

The language of [the AEA] makes no reference to economic costs [concerning the adequate protection standard]. Its command is simple and sure: the Commission must provide "adequate protection" of the public health and safety. The inquiry . . . thus appears narrow, focusing solely on health and safety considerations.

*Id.* at 114.

pointed out the foolishness behind the majority's ruling.<sup>113</sup> To illustrate, he used the example of a new safety procedure for nuclear energy which, although it had the potential to save lives, would be extremely costly. In fact, the procedure would be so costly that requiring its implementation would cause many nuclear plants to simply shut down because of insolvency.<sup>114</sup> Thus, when deciding whether to implement this safety procedure, one would have to consider the availability of alternative energy sources. If there were none, the lack of available energy due to the closing of nuclear plants might cost society even more than the failure to implement the expensive nuclear safety procedure. In this case, one would measure the true increase in public safety by the costs of implementation. This cost is then weighed against the cost of nonimplementation (in terms of a lack of available energy and the consequent economic loss).

Judge Williams pointed out that the court's ruling prevents the Commission from making these comparisons. In effect, this scheme leaves the United States without a regulatory body able to calculate the true, nationwide "costs"—both financial and environmental—of failure to develop nuclear power.<sup>115</sup> In order for the Commission to determine whether it is worthwhile to sustain the cost of a particular safety procedure, the Commission should be able to include in its calculation the opportunity costs of forgoing nuclear power. What the Commission might consider "adequate protection" under conditions of energy abundance may vary from its conception of "adequate protection" under conditions of energy scarcity.

Many argue that our lack of non-nuclear energy sources is not great enough to concern ourselves with the societal costs associated with nondevelopment of nuclear power. In his concurring opinion, Judge Williams cheerfully states that a lack of alternatives "appears remote," assuming that the flow of fossil fuels and natural gas will continue unhindered.<sup>116</sup> Many experts disagree, however. Since nuclear power currently provides almost one-fourth of all electricity produced in the United States,<sup>117</sup> the country could not easily replace any reduction in this energy supply. Although wind and solar energy, due to their lack of polluting agents and radiation threats, have staunch advocates in the environmental movement, these sources have heretofore provided only a minuscule share of national energy.<sup>118</sup> Moreover, many experts believe that these energy sources are simply unworkable.<sup>119</sup> Finally,

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113. *Id.* at 120-22 (Williams, J., concurring).

114. *Id.* at 122.

115. *See also infra* text accompanying notes 121-23.

116. *Union of Concerned Scientists*, 824 F.2d at 121 (Williams, J., concurring).

117. *See Silver, supra* note 5, at 14.

118. Robert J. Beck, *Demand and Producer Politics to Shape Second Half Oil Market*, OIL & GAS J., July 26, 1993, at 49 (pointing out that geothermal, wind, wood, and solar energy produced only 0.3% of the total electricity consumed in 1992).

119. *See, e.g., Pelline, supra* note 5 (quoting Bechtel Power, the nuclear construction unit of the Bechtel Group, for the proposition that even if the U.S. demand for electricity grows at a modest 1.9% annually, the nation will "need more power than it can get from nonnuclear sources"); *Report Finds Federal Energy Subsidies Heavily Favored Production*, INSIDE ENERGY/WITH FEDERAL LANDS, May 17, 1993, at 4 (citing a study by the Alliance to Save Energy which favored nuclear power over wind

scientists also point out that the nation needs to do more than simply maintain its current energy supply. Demand for energy continues to grow and is expected to increase at a significant rate over the next few years.<sup>120</sup>

If the Nuclear Regulatory Commission is the regulatory body with the most expertise regarding safety standards of nuclear energy, then it must also be the regulatory body with the greatest ability to weigh costs and benefits between different safety procedures. The Commission is the regulatory body in the best position to evaluate the nationwide opportunity costs of failure to develop nuclear power, because it is a federal agency with a broad, nonlocalized vision.<sup>121</sup> In this sense, it is the most efficient regulator of nuclear energy. When regulating from this broad, nonlocalized perspective, the Commission can realize the "full objectives of Congress" behind the Atomic Energy Act. When the Commission cannot regulate in this manner, nuclear regulation becomes a tangled morass.

The segregation of safety concerns from economic concerns regarding nuclear power is meaningless. Safety and economics are not separate, discrete topics.<sup>122</sup> Rather, the two are inextricably linked. One can see this by analyzing nuclear power development in terms of opportunity costs. In his concurring opinion in *Union of Concerned Scientists*, Judge Williams pointed out that this artificial distinction between safety and economics could not have been the legislative intent behind the Atomic Energy Act; otherwise the Act would be a "virtual 'suicide pact.'"<sup>123</sup> *Pacific Gas*, which allows states to regulate based on costs only, and *Union of Concerned Scientists*, which prevents federal regulators in the Commission from considering costs, both render the Atomic Energy Act such a "suicide pact." It is highly unlikely that

and solar power); Henry Stein, *Renewables Promise Advances/Problems for Utilities*, *ELECTRIC LIGHT & POWER*, May 1993, at 18 (pointing out that government intervention will be needed for solar energy to succeed to any great extent, and that costs involved with solar energy are great).

120. According to one commentator:

Demand for electricity has grown at a compounded 3% per year over the last five years and shows little indication of appreciably slowing . . . [Electricity] generation capacity has grown at only half that rate . . . The 1980's unwillingness of utilities to build new capacity now threatens, if not guarantees, future electricity shortages in the U.S.

Michael Barbis, *U.S. Natural Gas Industry Poised for Upcycle*, *GAS WORLD INT'L*, Apr. 3, 1993, at 8.

A \$5 million study recently completed by representatives from 100 countries resulted in a 1993 report entitled "Energy for Tomorrow's World." The report projects massive increases in energy demand fueled by dramatic population growth centered in the developing world. It also concludes that the "most important requirement for supplying an adequate global energy supply up to 2020 will be the efficient and responsible use of fossil fuels and nuclear energy." The report, however, qualifies its enthusiasm for fossil fuels by emphasizing their contribution to air pollution. See *Massive Growth in Energy Demand Seen by 2020; Fueled by Developing Nations*, *ELECTRIC UTIL. WK.*, Oct. 25, 1993, at 14. For this study's report on nuclear energy's environmental advantages, see Kaplan, *supra* note 9.

121. See discussion *infra* part IV.B.

122. Cf. *TOMAIN*, *supra* note 50, at 15.

123. *Union of Concerned Scientists v. Nuclear Regulatory Comm'n*, 824 F.2d 108, 121 (D.C. Cir. 1987) (Williams, J., concurring) (quoting *Terminiello v. Chicago*, 337 U.S. 1, 37 (1949) (Jackson, J., dissenting); see also *Northern States Power Co. v. Minnesota*, 447 F.2d 1143, 1154 (8th Cir. 1971) ("In short, a dual system of licensing and regulation with control exerted by both the states and the federal government over the level of radioactive effluents discharged from nuclear power plants would create 'an obstacle to the accomplishment and execution of the full purposes and objectives of Congress.'") (quoting *Hines v. Davidowitz*, 312 U.S. 52, 67 (1941)), *aff'd per curiam*, 405 U.S. 1035 (1972).

Congress envisioned nuclear regulation as it currently stands when it passed the Atomic Energy Act.

#### IV. THE EFFECTS OF DILUTING EXPERT, CENTRALIZED REGULATION OF NUCLEAR POWER

##### *A. Plant Operational Costs and the Survival of Nuclear Power*

If Congress' "full purposes and objectives" in the Atomic Energy Act were to encourage private development of nuclear energy,<sup>124</sup> then any regulatory structure which inhibits nuclear development necessarily inhibits such congressional intent. Currently, the Supreme Court's *Pacific Gas* distinction between safety and economics inhibits such development.

The Court in *Pacific Gas* based its holding on the notion that the Atomic Energy Act "allowed the States to determine—as a matter of economics—whether a nuclear plant vis-à-vis a fossil fuel plant should be built."<sup>125</sup> Thus, the Court emphasized that states must not consider safety when making such determinations. Nevertheless, it is unrealistic to assume that states consider nuclear energy solely in terms of "economics" and ignore the fact that nuclear energy presents safety risks.<sup>126</sup> Such restraint would require an inordinate amount of willpower. Instead, states almost certainly evaluate the advantages of nuclear power based on their own estimation of nuclear safety.

States, observing nuclear power from a localized point of view, inevitably base their safety estimations on parochial concerns. They may very well overemphasize the risk of a severe nuclear accident, since this would profoundly affect the population within their borders. Many people support nationwide development of nuclear power, but are markedly less enthusiastic when asked if it should be developed in their own vicinity.<sup>127</sup> Thus, allowing states to prohibit nuclear plant construction based on cost, as does the Court's decision in *Pacific Gas*, privileges a limited point of view regarding nuclear power while contradicting the congressional intent behind the Atomic Energy Act.

While states overemphasize the likelihood of a nuclear disaster, they simultaneously de-emphasize the significant environmental benefits of nuclear energy. Many of these benefits would be external to state borders and thus apparent only from a national or global perspective. State concerns are inherently more parochial than those called for by the realities of a nationwide electricity grid, where "major generating plants . . . are part of an interstate transmission system which makes possible the purchase and sale of electric

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124. See *supra* part I.B.

125. *Pacific Gas & Elec. Co. v. State Energy Resources & Dev. Comm'n*, 461 U.S. 190, 222 (1983).

126. See *id.* at 225 (Blackmun, J., concurring) ("In making its traditional policy choices about what kinds of power are best suited to its needs, a State would be forced to ignore the undeniable fact that nuclear power entails certain risks.")

127. See Kriz, *supra* note 4, at 1578-79.

power between major systems across the nation."<sup>128</sup> One state's nuclear plant may increase considerably another state's cheap, abundant energy supply. Conversely, the prevention of nuclear plant construction by one state can have a significant detrimental impact on another state. For example, California's moratorium on nuclear plants, upheld in *Pacific Gas*, may have forced California to import electricity from states in the Northwest. Production of this electricity may severely pollute the Northwest, but leave the Californian environment untouched. Thus, the existence of a nationwide electricity grid calls for efficient, centralized federal regulation.

In *Northern States Power*, the Eighth Circuit Court of Appeals anticipated state overregulation of nuclear power. The court enforced federal preemption of state nuclear regulation because "[states] might conceivably be so overprotective in the area of health and safety as to unnecessarily stultify the industrial development and use of atomic energy for the production of electric power."<sup>129</sup>

The 1971 predictions of the Eighth Circuit in *Northern States Power* have come to pass. The examples set forth in Part II of this Note illustrate that much of the excessive cost of nuclear power is due to state overregulation, not technological shortcomings. In fact, recently there has been considerable technological advancement facilitating nuclear power generation. For example, from 1983 to 1992, the percentage of generating capacity in use per nuclear plant has increased from 58% to 72%.<sup>130</sup> While one would expect this increase in efficiency to lower costs, in fact plant operational costs have risen. In the same time period, plant operational and maintenance expenses rose from \$43 per kilowatt hour to \$83 per kilowatt hour.<sup>131</sup>

Opponents of nuclear power seize upon the considerable costs of nuclear development under current regulatory authority as a reason to abandon nuclear energy. They argue that nuclear energy is not worthwhile because it is too expensive.<sup>132</sup> This fact allows for effective anti-nuclear rhetoric, but is often presented dishonestly. Nuclear opponents imply that the technology itself is too expensive to be practical, regulation costs aside. However, the failure of Congress to repeal the Atomic Energy Act, coupled with the recent increases in efficiency of nuclear power generation, suggest otherwise. Nuclear power is too expensive because anti-nuclear sentiment has inflated regulatory costs of nuclear plants, rather than because nuclear power is an ill-conceived

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128. *Northern States Power Co. v. Minnesota*, 447 F.2d 1143, 1153 (8th Cir. 1971), *aff'd per curiam*, 405 U.S. 1035 (1972).

129. *Id.* at 1154.

130. See *ROD Meeting: Striving for Excellence*, NUCLEAR NEWS, Oct. 1993, at 31, 32.

131. *Id.* Many of these costs arise from hiring the labor necessary to fulfill oversight requirements of nuclear regulation. See *id.*; see also Mutch, *supra* note 6 (discussing a new generation of generic nuclear power plants with significantly cheaper maintenance and oversight costs).

132. See, e.g., Kriz, *supra* note 4, at 1578 (noting that a Greenpeace spokesperson maintains that nuclear energy is too expensive to develop); Mutch, *supra* note 6, at 4 (noting that Dan Becker, director of the Sierra Club's energy and global-warming program, cites "enormous costs" as one of the problems unique to nuclear power).



technological impossibility. Indeed, nuclear opponents raise the issue of plant costs with the intent to inhibit nuclear development.

Opponents of nuclear power also attempt to delay licensing and thereby greatly increase nuclear plant costs. For example, New York state and local officials prevented the Shoreham nuclear plant on Long Island from commencing operations because they considered the Commission's severe accident evacuation plans inadequate. The Shoreham plant conformed fully to federal safety standards. Nevertheless, the completed plant sat dormant during the evacuation debate between state and federal regulators, incurring huge interest and other overhead costs of up to \$1 million per day.<sup>133</sup> The delay had nothing to do with technological problems of the plant, other than the remote possibility of a severe nuclear accident.<sup>134</sup> Opponents of the Shoreham plant fought for such delays, timing their challenges to occur at a point when costs from the delay were the greatest.<sup>135</sup> This effective tactic inflated the Shoreham plant's costs to unmanageable proportions and caused the utility to abandon the plant altogether. Thus, plant opening delays successfully retard federal development of nuclear energy.<sup>136</sup>

State overregulation, by inflating operational costs, achieves the same result as delay tactics. Utilities plan to build fewer nuclear plants because of extensive state regulation and its effect on the cost of operations. For example, Pacific Gas and Electric executives recently stated that their company does not plan to build nuclear plants in the near future because of "huge capital outlays and regulatory hurdles"<sup>137</sup>—not because nuclear power itself is unworkable. Thus, there is a direct link between overregulation and the continued development of safe nuclear power generation. As state governments force utilities to fulfill regulations motivated by fear rather than efficiency, fewer utilities will elect to invest in nuclear power.<sup>138</sup>

Electricity production has become intensely competitive in recent years. It is now an industry where "[o]nly the leanest, most efficient, lowest-cost

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133. See Matthew L. Wald, *The States, the Federal Government and the Atom*, N.Y. TIMES, Oct. 20, 1986, at A24.

134. For a discussion of how remote the possibility of a nuclear accident is, see Cohen, *supra* note 3, at 28 ("[S]cientific studies find that the number of deaths expected from nuclear power, including accidents, radioactive waste and everything else, is less than 10 a year . . . [whereas coal burning] is typically estimated to kill 10,000 Americans each year with its air pollution . . ."); see also *supra* text accompanying note 3.

135. The 1992 National Energy Policy Act streamlined nuclear plant licensing to prevent the use of such tactics. See Wilson Dizard III, *House Energy Bill Aids Industry in Licensing, Waste, Decommissioning Areas*, INSIDE N.R.C., June 1, 1992, at 1, 9 ("Often, nuclear opponents raised objections [to a nuclear plant] just as construction was being completed, sometimes delaying operation.").

136. In another example of delay tactics, congressional efforts to establish a permanent high-level waste depository at Nevada's Yucca Mountain have been stalled by Nevada officials, who have used "every legal and scientific means they could think of to prevent scientists from setting foot on the site." Kriz, *supra* note 41, at 2433. State officials and nuclear opponents know that these delays greatly diminish the likelihood of such a disposal site being built, since they raise costs astronomically. See *id.* at 2430-31 (quoting Cas Robinson, director of the Nuclear Waste Project, who stated, "Those that are saying, let there be an independent review and a blue-ribbon commission, what they're really saying is let's kill the program.").

137. Pelling, *supra* note 5.

138. See *supra* note 15.

producers will succeed."<sup>139</sup> Therefore, economically efficient regulation of nuclear power is crucial to its survival. Federal preemption of state regulation is only one step of many needed to solve the problem of inefficient nuclear plant operations. Federal regulators themselves see the need to streamline nuclear regulation. For example, there is a movement currently underway within the NRC to adapt regulations to the needs of individual plants, rather than prescribing identical procedures for every nuclear facility in the country.<sup>140</sup> Misguided state regulation, based upon parochial concerns and a lack of expertise, bars such regulatory efficiency.

The dissenting opinion in *Silkwood v. Kerr-McGee Corp.* correctly stated that the majority holding, by permitting punitive damages under state law, eliminated uniform regulation<sup>141</sup> and thus "could discourage investment needed to further the acknowledged national need for this alternative source of energy."<sup>142</sup> The dissent openly acknowledged, therefore, that failure to preempt state nuclear regulation only works to hinder the development of nuclear energy.<sup>143</sup> The efficiency of uniform federal regulation itself encourages investment in nuclear energy "to the maximum extent" as envisioned in the Atomic Energy Act.<sup>144</sup> As the Eighth Circuit stated in *Northern States Power*, "Only through the application and enforcement of uniform standards promulgated by a national agency will [the AEA's] dual objectives [of industrial progress and adequate safety] be assured."<sup>145</sup>

### *B. The Global Opportunity Costs of Failure to Develop Nuclear Energy*

If nuclear energy production ceases, the nation will be forced to turn to alternatives such as coal and fossil fuel to increase its energy supply and meet

139. Phillip Bayne, *Nuclear Power in the 1990s; Lean, Efficient and Competitive*, INSTITUTIONAL INVESTOR, Oct. 1993, at S234.

140. See E. Michael Blake, *San Diego Attendees Look at the Environment*, NUCLEAR NEWS, Aug. 1993, at 78, 84 ("[Moni Dey, of the NRC,] noted the work in recent months to remove from regulations any requirements that are deemed marginal to safety, and five areas where the agency is looking at making the regs more risk-based and performance-oriented . . .").

141. *Silkwood*, 464 U.S. 238, 285 (1984) (Powell, J., dissenting) ("In sum, the Court's decision will leave this area of the law in disarray. No longer can the operators of nuclear facilities rely on the regulations and oversight of the NRC.")

142. *Id.* at 286.

143. For another recent example of the added costs to utilities accompanying an increase in state nuclear regulation, see Alan M. Slobodin, *State Authority Over Businesses is Broadened*, NAT'L L.J., Aug. 13, 1990, at S13, S16 ("[In 1990] the Supreme Court also saddled the nuclear industry with more state litigation concerns. . . . The decision poses a substantial financial threat to Nuclear Regulatory Commission licensees and their contractors because of the cost of defending "whistleblower" claims, [and] the costs of damages that may be awarded to the successful complainant . . .") (citing the Supreme Court's decision in *English v. General Electric Co.*, 496 U.S. 72 (1990)).

144. See *supra* note 48 and accompanying text; see also *Northern States Power Co. v. Minnesota*, 447 F.2d 1143, 1153-54 (8th Cir. 1971), *aff'd per curiam*, 405 U.S. 1035 (1972) (interpreting this provision as Congress vesting authority in the Atomic Energy Commission "to resolve the proper balance between desired industrial progress and adequate health and safety standards.")

145. *Northern States Power*, 447 F.2d at 1154.

a projected increase in demand for energy.<sup>146</sup> However, both coal and fossil fuels release greenhouse gases when burned, increasing the threat of global warming.

The burning of coal, fossil fuels, and natural gas is responsible for one-half of *all* global warming.<sup>147</sup> Ninety-five percent of atmospheric carbon dioxide, a primary contributor to global warming, is a result of burning fossil fuels to produce electricity.<sup>148</sup> The United States' contribution of carbon dioxide alone accounts for twenty percent of the world's total greenhouse gas emissions resulting from energy production.<sup>149</sup> These figures dramatically illustrate that construction of power plants which burn coal and fossil fuels is in direct conflict with current government policy established by President Clinton in his "Climate Change Action Plan."<sup>150</sup>

Since nuclear power does not introduce greenhouse gases into the atmosphere, clearly there is a reason for the Federal Government to conduct greater promotion of nuclear energy.<sup>151</sup> Nevertheless, utilities have abandoned nearly completed nuclear power plants in the face of current overregulation and have opted for energy producers that emit greenhouse gases and other polluting agents.<sup>152</sup> For example, utilities in Ohio and Michigan recently suspended nuclear plant construction because of excessive regulation arising from local opposition to nuclear power. Both utilities opted for different energy sources.

146. See *supra* note 120 and accompanying text.

147. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE: THE IPCC SCIENTIFIC ASSESSMENT at xi (1990). According to this study, by the year 2025 the world's mean temperature will increase by 1 degree Celsius, and will increase up to 3 degrees Celsius by the end of the next century.

148. OFFICE OF TECHNOLOGY ASSESSMENT, CHANGING BY DEGREES: STEPS TO REDUCE GREENHOUSE GASES 57 (1991).

149. *Id.* at 79.

150. See *supra* note 7 and accompanying text.

151. See Makansi & Strauss, *supra* note 15, at 15 ("With the rekindling of the environmental movement, including the controversial global-warming issue, non-combustion options—such as . . . nuclear power—have crept back up to the top of the energy/environmental policy agenda."). Along with the scientific community, even the financial community acknowledges that nuclear power and prevention of global warming go hand in hand. See, e.g., Kriz, *supra* note 4, at 1578 (quoting a Wall Street analyst from Smith Barney, Harris Upjohn & Co., Inc., who states, "I think nuclear is an option that we can no longer pooh-poo, especially in light of questions about global warming . . . If you're talking greenhouse, you've got to be talking nuclear.").

In Europe, nuclear power is hailed as an energy source which presents great advantages "in terms of resource conservation and environmental protection." *Advantages of Nuclear Energy*, FIN. TIMES LIMITED; POWER EUROPE, Nov. 5, 1993; see also Kaplan, *supra* note 9, at 2.

152. In discussing the various hazards associated with nuclear energy and more traditional power sources, one commentator stated:

Indeed, by some of the more pessimistic estimates, air pollution from coal-fired plants kills many thousands every year. Hydroelectric dam failures have the potential to kill many thousands in a single catastrophic accident. . . . Nothing could demonstrate more clearly than Chernobyl that nuclear power is also hazardous. But "also" is the critical qualifier. Until we know where nuclear technology ranks in the overall scheme of environmental impact and other social costs, we cannot know whether we want more or less of it, even in the shadow of Chernobyl.

Peter Huber, *Electricity and the Environment: In Search of Regulatory Authority*, 100 Harv. L. Rev. 1002, 1053-54 (1987).

In Ohio, a Cincinnati utility transformed its nearly-completed nuclear plant into a coal-burning plant.<sup>153</sup> Utility executives expressly cited overregulation as the reason for abandoning nuclear generation, but maintained they still considered nuclear power to be an excellent energy source which the United States needs to pursue.<sup>154</sup> The various opportunity costs of this failure to pursue nuclear power are significant. The Cincinnati nuclear plant was ninety-seven percent complete before the utility decided to convert it to a coal-fired facility. The utility opted for conversion despite an *additional* cost of \$1.7 billion.<sup>155</sup> The regulatory hurdles put in place by local and state governments overwhelmed even this huge amount.

In addition, there are environmental factors to consider when evaluating the opportunity costs of the failure to build a nuclear power plant in Cincinnati. Emissions from coal-fired power plants are a major contributor to greenhouse gases as well as to the air pollution which causes acid rain.<sup>156</sup> The Cincinnati utility chose to build a coal-fired plant even though it would lie in the heart of a region already severely affected by acid rain.<sup>157</sup> The decision does not, however, fully account for exacerbating this widespread regional phenomenon that reaches far beyond the borders of Cincinnati and the state of Ohio. In addition, production of coal often entails strip mining, a practice infamous for its ability to wreak environmental havoc. Too much of this environmental cost is external to the State of Ohio, since coal is easily purchased from other states. Finally, the abandonment of nuclear energy in favor of burning coal worsens global warming by introducing huge amounts of greenhouse gases into the earth's atmosphere.<sup>158</sup>

Given the widespread environmental effects of energy sources other than nuclear power, the decision of whether to develop nuclear power is much more than a matter of state economic concerns. Clearly, local governments opting to abandon nuclear energy do not bear all the opportunity costs of nuclear nondevelopment. Nevertheless, these opportunity costs do exist on both a national and global basis.

Urgent efforts to combat the "greenhouse effect" caused by excess carbon dioxide in the earth's atmosphere emphasize the global ramifications of energy production. Refusing to entertain the notion of a nuclear plant within their borders, states externalize these significant costs and opt for "dirtier" energy sources. Since the decision in *Pacific Gas* prevents the Federal

153. See Leone, *supra* note 70, at 28.

154. *Id.* (quoting a Cincinnati utility executive as saying, "Our experience doesn't make me less of a believer in nuclear power.")

155. Kenneth N. Gilpin, *Cincinnati Gas Official Still for Nuclear Power*, N.Y. TIMES, Aug. 3, 1984, at D2.

156. See, e.g., Stephen G. Breyer, *Vermont Yankee and the Courts' Role in the Nuclear Energy Controversy*, 91 Harv. L. Rev. 1833, 1836-38 (1978) (pointing out the environmental dangers of burning coal, including aggravation of the "greenhouse effect"); Huber, *supra* note 152, at 1019 ("Coal-burning electric power plants . . . contribute heavily to airborne acidity . . .").

157. Huber, *supra* note 152, at 1019 n.66 ("[The plant] is located in Ohio, the heart of acid rain country.")

158. See text accompanying notes 147-50.

Government from preempting state regulation of nuclear power based on cost considerations, federal regulators cannot prevent local governments from making environmentally harmful choices such as the one made in Cincinnati. Without an effective federal nuclear regulatory body, there is no entity which will take into account the important environmental opportunity costs of nuclear nondevelopment.<sup>159</sup>

Given the potential for widespread damage presented by global warming, Congress should amend the Atomic Energy Act<sup>2</sup> to undo the inefficient distribution of nuclear regulatory authority established in *Pacific Gas*. In the Energy Policy Act of 1992, Congress took one small step toward eliminating such inefficiency entirely.<sup>160</sup> By reducing the opportunity for public hearings in the nuclear plant licensing process, Congress significantly reduced the degree to which state governments can block plant construction. Nevertheless, states can still obstruct almost every phase of nuclear energy production thereafter.

Congress should amend the Atomic Energy Act by expressly vesting authority in the Federal Government to regulate nuclear power based on both financial concerns and safety concerns. Such an express declaration would permit complete preemption of state nuclear regulation under the Supremacy Clause.<sup>161</sup> This amendment would ease the burden on utilities of state-imposed regulation based on local concerns. Concurrently, it would allow the federal Nuclear Regulatory Commission to effectively regulate nuclear development from a national and even global perspective.

### CONCLUSION

States and the federal Commission are able to lock horns over nuclear regulation because of the Supreme Court's holding in *Pacific Gas*, which separates consideration of nuclear energy costs from consideration of nuclear energy safety. This has created a regulatory morass in which utilities waste billions of dollars on prematurely aborted nuclear projects. To create substitutes for nuclear energy, utilities build plants that rely on burning coal and fossil fuels. Greenhouse gas emissions from these plants exacerbate global warming, an urgent international problem recently addressed by the Clinton administration.

In light of the current global concerns surrounding energy production, only a nonlocal point of view permits accurate evaluation of the costs and benefits of nuclear power. Presently, state governments are in a position to decide whether nuclear power development should continue. This contradicts the

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159. Commentators analogize the need for centralized regulation of nuclear power to the argument set forth by environmentalists that federal control of clean air regulation is far superior to local regulation. See, e.g., Huber, *supra* note 152, at 1033 n.127 (quoting the vice president for government affairs and counsel of the National Audubon Society bemoaning the "regulatory balkanization" of clean air enforcement).

160. See, e.g., 42 U.S.C. 2235.

161. See *supra* discussion part I.A.

congressional intent behind the Atomic Energy Act, which gave the Federal Atomic Energy Commission broad regulatory authority to oversee nuclear development. Congress should amend the Atomic Energy Act to clarify federal preemption of state nuclear regulation. Such an amendment would permit regulation of nuclear energy based on national and global concerns, thereby bettering our chances for creating a sound national energy policy.