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## Principles of Energy Policy

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# Principles of Energy Policy

John S. Lowe\*

## I. INTRODUCTION

Energy policy has been at the center of American political rhetoric since the early 1970s. Twenty years, five presidents and ten Congresses later, however, the United States still has no coherent energy policy.

Why has development of a coherent energy policy proved so difficult for the United States, when other democratic nations have been able to move so much faster?<sup>1</sup> I suggest that the root of the problem has been an attitude, an expectation of plenty.

When colonists first came to what is now the United States, they found a new world with what seemed to them infinite amounts of land, water, and energy resources. Over generations, there developed an expectation of the American people that there was, and always would be, plenty of everything for everyone. We have been forced over the last twenty years—as a nation and a people—to acknowledge that our resources are finite. That acceptance has not come easily or quickly.<sup>2</sup>

There are signs, however, that the dam of inaction has broken, that this country's people and their leaders are now ready to confront the task of developing a principled energy policy.

## II. WHY HAVE AN ENERGY POLICY

The threshold question of the quest for a national energy policy is "Why bother?" Because of the almost childlike faith of Americans in the free market, many people have failed to see the need for a formal energy policy. Even brief analysis, however, leads irresistibly to rejection of the position that a free market makes an energy policy unnecessary. The free market cannot adequately serve society's collective needs. The market works very efficiently to allocate private resources among competitors, producing an affordable price and an optimum number of whatever pri-

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\* Copyright John S. Lowe, 1992. John S. Lowe is the George W. Hutchison Professor of Energy Law at Southern Methodist University. This paper is based upon the Foulston & Siefkin lectures the author delivered at Washburn University in April, 1992. The author expresses his thanks to Julie Herzog Orta, his research assistant, to Dolores McKnight, his secretary, to Eric N. Whitney, a former student, and to the Hutchison Endowment at Southern Methodist University, for their assistance in the preparation of this paper.

1. For example, France has embraced nuclear-generated electricity, combining streamlined planning approvals and efficient waste-handling procedures, with such success that it has become a major power exporter. Japan, which imports more than 5 million barrels of oil per day, has diversified its primary energy mix and sources of supply and built strategic facilities that have provided its industrial base with singular insulation against short-term price spikes. For discussion of the French and Japanese policies, see Henry R. Linden, *Energy, Economy, and the Environment*, PUB. UTIL. FORT., May 15, 1992, at 31.

2. I first developed this theme, in much the same words, in 1976. See John S. Lowe & Lon C. Ruedisili, *Federal and State Responses to the Energy Dilemma*, DISCOVERY, 1976, at 3.

vate goods individuals seek to purchase. It is axiomatic, however, that the market does not efficiently produce public goods—products like national defense or a stable economy—whose benefits accrue to all the individuals in society whether or not they pay for them.<sup>3</sup>

If one is concerned about public needs—raising an army, protecting the national economy, or preserving the environment—some degree of governmental intervention is necessary. Even a totally free market will probably never produce public goods because there is almost no demand from individuals for products such as high technology tanks and fighter planes or interstate highway systems. Clearly, the market will not produce such products in the short run, and if they are not produced, there may not be a long run; outside forces may use their own high technologies and infrastructures to prevent others from developing countervailing power.

The present reliance of the United States upon foreign oil imports and the risks that that reliance presents to the national economy illustrates the hazards of failing to implement policies that will provide public goods. In 1992, the United States economy consumed about 17.5 million barrels of oil a day, about 39 percent of total United States energy consumption. Of that quantity, we imported approximately 8 million barrels, approximately 45 percent.<sup>4</sup> United States' oil imports have been at least 40 percent or better of total consumption since 1975. One estimate is that total petroleum imports will rise to an average of 11.1 million barrels per day by 2000, which will amount to approximately 60 percent of domestic demand.<sup>5</sup> In 1992, United States' oil imports will account for more than half of the United States' international trade deficit. A large contribution by oil imports to the United States' trade deficit is nothing new; in 1990, \$52 billion of the approximately \$100 billion trade deficit resulted from imports of oil.<sup>6</sup> By 2020, the cumulative trade deficit resulting from oil imports alone will be \$10 trillion—more than three

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3. P.A. SAMUELSON & W.D. NORDHAUS, *ECONOMICS* 311, 745 (14th ed. 1992).

4. OFFICE OF TECHNOLOGY ASSESSMENT, U.S. CONGRESS, *U.S. OIL IMPORT VULNERABILITY* 12 (1991). In 1990, the United States obtained about 42 percent of its oil needs from foreign oil sources, which was only 4 percent lower than the 1977 figure. In the first three months of 1992, the United States imported 43.2 percent of the oil that it used. Anne Reifenberg, *U.S. Oil Imports Rise 5.7 percent in Quarter*, DALLAS MORNING NEWS, Apr. 16, 1992, at D2. By October, 1992, oil imports totaled 7.6 million barrels per day, the highest level since the final week of 1978, during the Iranian revolution. Roger Benedict, *U.S. Crude Oil Imports Climb to 14-Year High Level*, OIL DAILY, Oct. 22, 1992, at 1. One estimate is that imports will supply 48 percent of United States oil demand in 1992. James Flanigan, *Oil Industry Can Help Lubricate U.S. Economy*, L.A. TIMES, Apr. 15, 1992, at D2.

5. Lou Bley, *Producers Peer into the Future: Report on Issues and Forecasts of Supply and Demand for Oil and Gas in the United States*, PETROLEUM ECONOMIST, July 1991, at 21 (reporting the Independent Petroleum Association of America's Long Range Demand/Supply Forecast). The Energy Information Agency has estimated that United States net imports of oil will rise from 42 percent of total oil consumption in 1989 to 55 percent in 2000. GENERAL ACCOUNTING OFFICE, *ENERGY POLICY: DEVELOPING STRATEGIES FOR ENERGY POLICIES IN THE 1990S* 5 (June 1990).

6. Louis W. Powers, *What the OTA Report Says to Congress*, OIL & GAS J., Jan. 20, 1992, at 24.

times the national debt today and one hundred times the 1990 deficit for all foreign trade.<sup>7</sup>

One significance of the statistics is that United States oil imports impose a day-to-day burden upon the world economy. Because the United States uses about 25 percent of total world oil imports,<sup>8</sup> an increase in oil imports to the United States tends to cause an increase in the world price of oil, driving up the price of all the oil used by all consumers.<sup>9</sup> An example illustrates the seriousness of the situation. If United States oil imports increased from 8 million barrels a day to 10 million, and the world price increased from \$18 to \$20 per barrel, the total oil import bill for the United States would increase from \$144 million per day to \$200 million, as a result. The cost to the United States' economy of each barrel of the additional 2 million barrels of oil imports would be \$28 per barrel.<sup>10</sup> Indeed, increases in the United States dependence upon oil imports has a ripple effect upon the world economy, for other importing countries must also pay higher prices for their imports.

The statistics are also important because they illustrate that expanding United States reliance upon oil imports may present a threat of disruptive price shocks. The problem is not just the high volume and cost of oil imports, but our dependence upon oil imports. In 1990, OPEC nations accounted for 16.67 million barrels per day of the 23.85 million barrels per day in world oil exports, or nearly 70 percent.<sup>11</sup> More than half of United States oil imports in 1992 will come from OPEC, 31 percent from Saudi Arabia alone.<sup>12</sup> A significant interruption in supply caused by war, natural disaster, or political disagreement could easily cause a steep and sharp oil price spike and trigger a recession, spiraling inflation, or some other unpleasant economic effect.<sup>13</sup> That happened twice in the 1970s.<sup>14</sup>

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7. *Id.*

8. CAMBRIDGE ENERGY RESEARCH ASSOCIATES & ARTHUR ANDERSON, *WORLD OIL TRENDS* 36 (1992) [hereinafter *WORLD OIL TRENDS* 1992].

9. Wilfrid L. Kohl, *Oil and U.S. National Security*, *AFTER THE OIL PRICE COLLAPSE*, 1991, at 156-57.

10. *Id.* at 157. (Economists call this effect the "demand component" of the "import premium"). The example is based upon Harry G. Broadman & William G. Hogan, *Oil Tariff Policy in an Uncertain Market*, *DISCUSSION PAPER SERIES*, JOHN F. KENNEDY SCHOOL OF GOVERNMENT, HARVARD UNIVERSITY (Nov. 1986, E-86-11), *cited in* Kohl, *supra* note 9, at 173 n.17.

11. *WORLD OIL TRENDS* 1992, *supra* note 8, at 34, 40.

12. Flanigan, *supra* note 4, at D2. In 1990, OPEC provided about 61 percent of United States crude oil imports, up from 58 percent in 1989, and 51 percent of product imports, compared with 34 percent in 1989. *OIL MARKET LISTENER*, Mar. 21, 1991, at 1.

13. Kohl, *supra* note 9, at 158. (This effect may be called the "disruption premium" or the "security premium" of imported oil).

14. The energy crisis of the 1970s illustrates what economists call the "single supplier" problem. For necessities of life, demand tends to be inelastic—as prices rise or fall, demand remains relatively stable. Energy demand is inelastic because energy is a necessity of our way of life. When prices rise abruptly, consumers cannot quickly reduce their consumption or switch to an alternative. SAMUELSON & NORDHAUS, *supra* note 3, at 70. Because of demand inelasticity, a single supplier who controls a substantial portion of the market can boost prices at will and reap higher profits without experiencing a corresponding decline in the quantity sold. The result may be a price shock

History was not repeated in the Gulf War of 1990 because world inventories and excess productive capacity were high. On August 2, 1990, world inventories of oil were at their highest levels in years, sufficient for approximately 100 days of consumption and several days above normal operating levels.<sup>15</sup> What had been a troubling surplus that had forced oil prices below \$15 per barrel became a valuable cushion that steadied market reactions. More important, world unused production capacity was greater than combined Iraqi and Kuwaiti production. Iraq produced about 3 million barrels of oil per day in July 1990, and Kuwait about 1.5 million barrels—a total of about 4.5 million barrels per day. Producing countries outside the scope of Iraq's menace—Libya, Iran, Indonesia, Nigeria—possessed immediate additional sustainable capacity of approximately 2 million barrels per day. The United Arab Emirates and Saudi Arabia, though threatened, maintained another 2.8 million barrels per day unused production capacity.<sup>16</sup> Oil lost to the market as a result of the United Nations' embargo of oil from Iraq and Kuwait was quickly replaced. There never was a real shortage of oil during the Gulf War.<sup>17</sup>

Friendly excess production capacity may not exist when the next crisis arises. While oil demand in the United States and other western industrialized nations was flat in the 1980s, demand in Asia and the OPEC nations themselves surged to an annual rate of more than 3.5 percent, resulting in world-wide increases in oil demand of approximately 1.6 percent a year.<sup>18</sup> Energy economists predict an expansion of approximately 5.5 million barrels per day of oil production capacity in the 1990s in four OPEC countries—Saudi Arabia, Iran, the United Arab Emirates, and Venezuela—but non-OPEC production capacity “may be instead on a long plateau or even a slight decline,” due primarily to the internal problems of the former Soviet Union.<sup>19</sup> We might not be so lucky the next time an oil crisis looms.<sup>20</sup>

In short, I suggest that it is a very easy call that the United States needs an energy policy. This country must have an energy policy to pro-

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that sets off a recession, as occurred in the mid-1970s. For further discussion of the principle, see Douglas R. Bohi, *The Iraqi Invasion, Oil Price Behavior and U.S. Energy Policy*, 15 S. ILL. U. L.J. 541, 557 (1991).

Estimates of the reduction in United States Gross National Product levels caused by the Arab Oil Embargo range from 3 percent to 5 percent per year. Estimates of the reduction in United States Gross National Product levels caused by the Iranian Crisis of 1979 range from 3 percent to 8 percent per year. Kohl, *supra* note 9, at 158-59.

15. CAMBRIDGE ENERGY RESEARCH ASSOCIATES, GLOBAL ENERGY ALERT, at 2 (Aug. 1992).

16. *Id.* at 2-3.

17. *Id.* PLATT'S OILGRAM PRICE REPORT, Mar. 1, 1991, at 1. Yet oil prices surged upward. In the panic that followed the Iraqi invasion of Kuwait and the imposition of United Nations sanctions embargoing Kuwaiti and Iraqi oil, prices nearly doubled—to \$30 a barrel—and they briefly hit nearly \$40 in early October, despite the fact that it was apparent that there was no real oil shortage.

18. WORLD OIL TRENDS 1992, *supra* note 8, at 2.

19. *Id.* at 2-3.

20. Saudi Arabia is an obvious weak link in the oil supply chain. See Beth McConnell, *Former U.S. Official Says U.S.-Saudi Tete-a-Tete Might Not Last*, ENERGY REP., Sept. 28, 1992, at 646.

tect its economy and the world's economy. Energy independence may no longer be a viable goal for the United States, but if we wish to continue to control our nation's future and to be able to play a positive role in stable development in the world economy, we must develop and implement an energy policy directed toward energy security.

### III. THE EMERGING CONSENSUS

There are some optimistic signs. While this country has no energy policy worthy of the name, we are close as a society to an agreement that we need an energy policy, and that our energy policy ought to take into account at least three elements: (1) energy diversity, (2) market compatibility, and (3) cost internalization. I predict that the United States will develop an energy policy in the 1990s, and that these factors will define its scope.

In fact, as I complete this article, Congress has just passed and President Bush has just signed an omnibus energy act. The Energy Policy Act of 1992,<sup>21</sup> the first major energy legislation enacted since 1978, was thought by some to be "too large for Congress to swallow."<sup>22</sup> In fact, to secure passage of the legislation that they had considered for two years, congressional leaders had to strip from it the major provisions that would have directly increased production or decreased imports.<sup>23</sup> The act, while no longer comprehensive, nonetheless includes halting but important steps toward addressing underlying problems. More important to the point of this discussion, the Energy Policy Act of 1992 was made possible only by political recognition of the elements that I have identified.

#### A. *Energy Diversity*

Energy diversity means that the United States ought not rely too heavily upon any single source or supplier of energy. We learned during the energy crisis of the 1970s, and again in the Gulf War, that it is economically dangerous to rely on a single energy resource or a single source of supply. The only viable response to the economic instability inherent in an energy policy that relies upon a single source of energy—oil at the present time—is to move toward energy diversity. The United States must develop sources of energy other than oil, particularly imported

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21. Pub. L. No. 102-486, 106 Stat. 2776 (West Supp. 1992).

22. Patrick Crow, *U.S. Energy Issues on Hold on Capitol Hill*, OIL & GAS J., Dec. 30, 1991, at 21.

23. Patrick Crow, *U.S. General Election Can Open Door to Energy Policy Changes*, OIL & GAS J., Oct. 12, 1992, at 21. Deleted from the bill during two years of consideration were provisions that would have opened portions of the Alaskan National Wildlife Reserve to oil development, encouraged drilling on the Outer Continental Shelf, continued a subsidy for coalbed methane production, encouraged the use of natural gas as a substitute for oil, and raised Corporate Average Fuel Efficiency standards. *Id.*

oil.<sup>24</sup> Second, we ought to be looking to diversify our supplies of oil and other sources of energy. To the extent that the United States succeeds in developing and implementing an energy policy based upon energy diversity, we minimize the risks of embargoes or price shocks that may do substantial damage to our economy.<sup>25</sup>

Implicit in the developing consensus that energy diversity is the key-stone of United States energy policy is acceptance of the fundamental fact that there is unlikely to be a one-stop, quick fix to America's energy problems. Twenty years ago, the position of domestic producers in the United States was that "energy independence" was possible if government would just remove price regulations on oil and gas. In the 1990s, it is obvious to all that domestic American oil and gas production cannot meet all of America's energy needs. Twenty years ago there would have been those who would have argued that in the 1990s we would have a world powered by nuclear-generated electricity. The Chernoble incident substantially subdued nuclear power advocates. Twenty years ago, nuclear power supporters would probably have been drawn into argument by environmentalists urging that by the 1990s we would have a complete lifestyle change to a world economy based on solar and wind power. It has not happened; the collapse of world oil prices in the mid-1980s has made solar power cost-ineffective.<sup>26</sup> The failure of the likely quick-fix

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24. Both of the major Presidential candidates in 1992 recognized this vital point. The Bush Administration's National Energy Strategy stated that:

No single policy tool can substantially increase America's energy security. The basic vulnerability involves oil, but reducing this vulnerability requires a broad array of actions: maintaining adequate strategic reserves; increasing the efficiency of our entire fleet of cars, trucks, trains, planes and buses; increasing United States petroleum production in an environmentally sensitive manner; further deregulation of the natural gas industry; and using alternative fuels.

PRESIDENT BUSH, NATIONAL ENERGY STRATEGY 4 (1991) [hereinafter NATIONAL ENERGY STRATEGY 1991]. The Clinton campaign was equally supportive of energy diversity, though it stressed conservation savings: "Clinton's National Energy Policy promotes national security, energy diversity, economic prosperity and environmental protection. . . ." CLINTON FOR PRESIDENT COMMITTEE, BILL CLINTON ON NATIONAL ENERGY POLICY 1 (1992) [hereinafter CLINTON FOR PRESIDENT COMMITTEE].

25. In fact, diversification of supply has occurred. Since 1979, non-OPEC producers have increased their share of world oil supplies from 40 percent to 60 percent. NATIONAL ENERGY STRATEGY 1991, *supra* note 24, at 83.

26. We tend to forget the roller coaster-like volatility of world oil prices over the last twenty years. In the first eight years of the 1970s, the Organization of Oil Producing Countries (OPEC) used its market leverage to push the average price of oil from less than \$2 per barrel to nearly \$18 per barrel. World oil consumption grew to over 65 billion barrels per day, nearly 50 percent of which was provided by OPEC. Panic-buying resulting from the outbreak of the Iranian Revolution in 1979 sent prices to near \$40 per barrel, where they remained through 1982.

High prices spurred major conservation efforts and substantial increases in the production of non-OPEC oil, which put both the high prices and OPEC's share of the market under pressure. By 1985, world oil consumption had dropped 5 million to 6 million barrels per day below 1979 levels. Non-OPEC countries had increased their production 6 million barrels per day over the same period. OPEC's market share was cut nearly in half, from 31 million barrels per day back to 16 million, as OPEC fought to stabilize prices at \$25-\$30 per barrel with production curtailments. Nonetheless, excess world oil production capacity grew to nearly 10 million barrels per day by the mid-1980s.

OPEC could maintain high prices only by continuing to cut production, which put the economies of its member countries at risk. In 1980, the OPEC countries' revenues were \$284 billion. By 1986, they had plummeted to \$77 billion. At Saudi Arabia's insistence, OPEC shifted to a market-

solutions is important because it lays the premise for the embrace of the principle of energy diversity. Acceptance that the problem is difficult, that it cannot be easily solved, is the first step to solving it. That is an important change.

Energy diversity was a keystone of the Bush Administration's National Energy Strategy.<sup>27</sup> The Strategy sought to "diversify the sources of oil supply *outside* the Persian Gulf by encouraging environmentally sensitive production in the United States" and by simultaneously reducing "the importance of oil to the United States economy—through conservation, efficiency improvements, and oil displacement."<sup>28</sup> The Strategy proposed a variety of specific actions primarily directed to enabling the United States to produce its way out of oil import dependence,<sup>29</sup> including opening portions of the Arctic National Wildlife Refuge (ANWR) to oil development,<sup>30</sup> encouraging drilling on the Outer Continental Shelf,<sup>31</sup> and speeding licensing of nuclear power plants<sup>32</sup> and certification of new natural gas pipelines.<sup>33</sup>

Many of the National Energy Strategy proposals designed to increase the supply of domestic energy did not survive the congressional gauntlet.<sup>34</sup> Enough provisions promoting energy diversity survived, however, that one can fairly conclude that a congressional majority accepted the principle. The Policy Act of 1992 contains several provisions that should help to make the United States less dependent upon foreign oil imports, including sections to promote the use of alternative-fueled vehicles,<sup>35</sup> to increase competition in the electricity generation industry by easing its regulation under the Public Utility Holding Company Act

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share strategy, opening the oil spigot and collapsing prices to \$10 per barrel, before restoring official quotas intended to sustain a price of \$18 per barrel. In fact, the world market price at the end of July, 1990, just before Iraq invaded Kuwait, languished at about \$15 per barrel, because many of OPEC's members failed to stick to their production quotas. ARTHUR ANDERSON WORLDWIDE ORG. & CAMBRIDGE ENERGY RESEARCH ASSOCIATES, *WORLD OIL TRENDS* 2, 20-24, 44-45 (1991) [hereinafter *WORLD OIL TRENDS* 1991].

27. The National Energy Strategy was the Bush Administration's variation upon the congressionally-mandated National Energy Plan, which the Federal Energy Administration Act, 15 U.S.C. § 761 (West Supp. 1992) required.

28. NATIONAL ENERGY STRATEGY 1991, *supra* note 24, at 4.

29. The National Energy Strategy, originally issued by the Bush Administration in February 1991, was supplemented in February 1992. See PRESIDENT BUSH, NATIONAL ENERGY STRATEGY: ONE YEAR LATER (Feb. 1992) [hereinafter NATIONAL ENERGY STRATEGY 1992].

30. *Id.* at 79.

31. *Id.*

32. *Id.* at 110.

33. *Id.* at 91.

34. For example, the proposals to open portions of the Arctic National Wildlife Refuge (ANWR) to oil development, to encourage drilling on the Outer Continental Shelf, and to speed the certification of new natural gas pipelines; all were dropped during the legislative process.

35. Energy Policy Act of 1992, Pub. L. No. 102-486, §§ 301-626, 106 Stat. 2776 (West Supp. 1992). The Energy Policy Act of 1992 requires that 30 percent of state and federal vehicle fleets be converted to alternative fuels—including methanol, denatured ethanol, natural gas, liquefied petroleum gas, hydrogen, electricity, "and any other fuel the Secretary determines . . . would yield substantial energy security benefits and substantial environmental benefits"—by 1996. The Department of Energy is empowered to decide how quickly to require conversion thereafter and whether to extend the requirements to private fleets. *Id.* § 301.



of 1935<sup>36</sup> and increasing transmission access,<sup>37</sup> to streamline nuclear power plant licensing<sup>38</sup> and nuclear waste disposal,<sup>39</sup> and to increase domestic oil and gas drilling by repeal of the Alternative Minimum Tax for independent oil and gas producers.<sup>40</sup> The Department of Energy estimates that the Act has the potential to cut oil imports into the United States by 4.7 million barrels per day by 2010, which would be one third lower than presently estimated levels.<sup>41</sup> The Energy Policy Act of 1992 is a significant, if disappointingly tentative, step toward energy diversity.

### B. *Market Compatibility*

A second element of an energy policy in the 1990s upon which there is substantial agreement is that the programs that we use to implement an energy policy must be compatible with the market. The United States' political experience of the last twelve years has convinced the American public that the market works, that we get in trouble if we impede the market's normal functioning, and that the most effective way to regulate is to harness market mechanisms. Looking back, for example, we can see that the oil and gas price controls imposed to protect consumers and the nation's economy against high prices for oil and gas resulted in shortages of energy and economic disruption.<sup>42</sup>

Those who are likely to make United States energy policy in the 1990s agree, across political lines and across the economic strata of our society, that whatever programs we adopt must be market compatible.<sup>43</sup> In the political debates of 1992, all of the candidates preached the religion of supply and demand. Market compatibility was explicitly incorporated in the Bush Administration's National Energy Strategy: "Wherever possible, markets should be allowed to determine prices, quantities, and technology choices. In specific instances where markets cannot or do not work efficiently, government action should be aimed at removing or overcoming barriers to efficient market operation."<sup>44</sup> Market compatibility of regulations was also a tenet of Governor Clinton's

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36. *Id.*

37. *Id.* §§ 722-726.

38. *Id.* §§ 2801-2807.

39. *Id.* § 801.

40. *Id.* § 1915.

41. Thomas F. Berg, *Congress Passes Energy Bill to Applause of Gas Associations*, NAT. GAS Wk., Oct. 12, 1992, at 1, 9.

42. Price regulation of the oil and gas industries costs the American economy tens of billions of dollars. For an historical analysis, see generally, Richard J. Pierce, *Reconsidering the Roles of Regulation and Competition in the Natural Gas Industry*, 97 HARV. L. REV. 345 (1983).

43. The consensus that policies should be implemented by market compatible methods is not limited to energy policy. The Clean Air Act Amendments of 1990, 42 U.S.C. §§ 7401-7642 (1990), provide in Title IV, Part II for an emissions trading system for sulphur dioxide allowances. The purpose of the system is to allow polluters flexibility in choosing how to control pollution. For discussion, see Brennan Van Dyke, *Emissions Trading to Reduce Acid Deposition*, 100 YALE L.J. 2707 (1991).

44. NATIONAL ENERGY STRATEGY 1991, *supra* note 24, at 2.

presidential campaign pronouncements.<sup>45</sup> The energy policy of the 1990s likely will be implemented by market forces, rather than by command and control regulation.<sup>46</sup>

The process by which the Energy Policy Act of 1992 was enacted illustrates the consensus in favor of market compatible regulation. The final version of the legislation pointedly omitted tightening the CAFE rules, the Corporate Average Fuel Efficiency Standards.<sup>47</sup> Earlier proposals included CAFE standards that would have required average fleet mileage of 40 miles per gallon by 2001.<sup>48</sup> Since transportation accounts for 63 percent of total United States oil use—about 10.8 million barrels per day—improvement in average mileage offers a large potential opportunity for oil savings.<sup>49</sup> Average automobile fuel efficiency in the United States increased from about 17 miles per gallon in 1983 to 20 in 1988.<sup>50</sup> In 1975, the average new American automobile got 16 miles per gallon of gasoline burned.<sup>51</sup> By 1988, the average American car put on the road averaged 29 miles per gallon.<sup>52</sup> Technology is available that would allow a new car fleet fuel economy of about 30 miles per gallon by 1995 and 37 miles per gallon by 2001.<sup>53</sup>

Proposals to increase the CAFE standards, however, encountered opposition on several fronts. The Bush Administration and many industrial state congressmen opposed CAFE increases on the grounds that they would result in lighter, less safe vehicles, and cost the beleaguered American auto industry jobs.<sup>54</sup> The proposal's cost effectiveness was also challenged; some economists charged that higher fuel and emissions savings could be attained more cheaply by offering a \$700 bounty to those

45. Clinton's Environmental Plan included the promise to "harness market forces to reward consumers and businesses that conserve and penalize polluters and inefficient energy users." *Candidates Environmental Positions*, TEX. ENVT'L NEWS, Oct. 1992, at 13. Clinton's energy plan promised to "[d]evelop and implement revenue-neutral market incentives to reward consumers and businesses that conserve." CLINTON FOR PRESIDENT COMMITTEE, *supra* note 24, at 2.

46. Command and control regulation will continue to play a role, of course, both in energy policy and in environmental policy. For example, Clinton's environmental position also included a promise to improve energy efficiency by accelerating "progress toward more fuel-efficient cars and raise the CAFE standards." *Candidates Environmental Positions*, *supra* note 45, at 13. Title III of the Energy Policy Act of 1992 contains a mixture of tax incentives and regulatory mandates designed to develop alternative fueled fleets of commercial vehicles.

47. The CAFE standards, mandated by 5 U.S.C. § 2202 (West Supp. 1992), impose upon each automobile manufacturer the obligation to meet fleet average fuel efficiency standards for the cars they sell. The standards are a classic example of technology-forcing regulation.

48. *National Energy Strategy (Part 3): Hearings before the Subcomm. on Energy and Power of the House Comm. on Energy and Commerce*, 102d Cong., 1st Sess. 102-59 (1991), at 4-58.

49. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 4, at 13.

50. *Id.*

51. NATIONAL ENERGY STRATEGY 1991, *supra* note 24, at 65.

52. *Id.*

53. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 4, at 14.

54. *National Energy Strategy: Hearings before the Subcomm. on Energy and Power of the House Comm. on Energy and Commerce*, 102-59 (1991), Pt. 3, at 4-58 (prepared statement of Linda G. Stuntz, Deputy Under Secretary for Policy, Planning and Analysis, U.S. Department of Energy) [hereinafter *Hearings*]. See also President Bush's statements quoted in Thomas F. Berg, *Presidential Candidates Discuss Energy Issues*, PUB. UTIL. FORT., Mar. 15, 1992, at 38.

who scrapped pre-1979 cars.<sup>55</sup> Ultimately, the CAFE provision was dropped.<sup>56</sup> I predict that when Congress revisits the CAFE standards, as proponents have promised will occur early in the Clinton Administration, market-oriented regulations such as bounties for retirement of gas-guzzling and polluting vehicles,<sup>57</sup> a gas tax,<sup>58</sup> a petroleum end-use tax,<sup>59</sup> or a carbon tax,<sup>60</sup> will become the focus of attention.

### C. Cost Internalization

The final element in the emerging consensus on energy policy is cost internalization. We have substantial agreement in the 1990s that it is fair that those who create products ought to have the major share of the benefits of the creation of those products. The corollary principle is that those who create or use products also ought to bear the costs that are associated with their creation or with their use—that costs should be internalized. Economists have talked about this principle for generations. They call it the externality principle. An externality exists when production or consumption causes uncompensated costs (external diseconomies) or unearned benefits (external economies).<sup>61</sup> Economists usually focus on cost internalization. Their argument is that permitting people to use resources for their own benefit without requiring them to bear the full costs generated by the use of those resources unfairly transfers wealth from the people who bear the burden of the use of resources to the people who actually use the resources, and encourages overuse of society's re-

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55. A study conducted by DRI/McGraw-Hill concluded that a \$700 bounty paid to those who scrapped old cars would save more energy and result in a greater reduction of hydrocarbon, nitrogen oxide and carbon monoxide pollutants than an increase in the CAFE standards to 32 miles per gallon. *Scrapping Old Cars Seen as Better Option for Reducing Gasoline Use*, INSIDE ENERGY/WITH FEDERAL LANDS, Oct. 28, 1991, at 6. Americans tend to keep their cars on the road longer, which slows the impact of higher CAFE standards. The average age of cars on the highway increased from 6 to 7.6 years from 1978 to 1988. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 4, at 13. Higher CAFE standards would likely result in higher auto prices, which would accentuate the trend to keep old vehicles running.

56. Senator J. Bennett Johnson and his supporters in the Senate dropped their proposal to open the ANWR to drilling, and those supporting increased CAFE standards in turn abandoned their efforts. Holly Idelson, *Senate Passes Energy Bill, 94-4; Arctic Refuge Issue Dropped*, CONG. Q., Feb. 22, 1992, at 397-99.

57. The Bush Administration asserted that it already had the necessary statutory authority to institute a program to scrap old vehicles under Title I, Section 108 of the Clean Air Act Amendments of 1990. *Hearings, supra* note 54, at 138-39.

58. Independent Presidential Candidate Ross Perot made a 50 cent gasoline tax increase (to be implemented over 5 years) a cornerstone of his economic program, primarily because of its debt-reduction possibilities.

59. See *supra* note 58. Patrick Crow, *Consensus Energy Policy*, OIL & GAS J., Dec. 9, 1991, at 37. A Johns Hopkins Foreign Policy Institute panel of former high level government energy policy strategists recently recommended an end-use petroleum tax as preferable either to price controls or to market regulation.

60. A tax on carbon-based fuels would be broader than a gasoline tax, and would be directed more to mitigation of environmental concerns than oil imports, but such a tax would have an important conservation effect. See Editorial, *Why No Carbon Tax?*, N.Y. TIMES, May 25, 1992, at Y8.

61. SAMUELSON & NORDHAUS, *supra* note 3, at 376. "More precisely, an externality is an effect of one economic agent's behavior on another's well-being where that effect is not reflected in dollar or market transactions." *Id.* at 310.

sources.<sup>62</sup> Creation of externalities is a natural tendency of private users of commonly owned resources such as air, water and oil and gas.<sup>63</sup> Society has responded to the problem of externalities by prohibiting certain kinds of behavior, or taxing detrimental behavior, or requiring corrective action. Each of these techniques acts to internalize the costs.

While the concept of the dilemma of the commons and the principle that costs ought to be internalized are concepts that economists have accepted by economists for a very long time, those concepts were only recently accepted by the American people. Cost internalization is an anathema to the frontier mentality. In the 1990s, however, the principle of cost internalization has become a part of the political fabric.

Ironically, however, though the principle of cost internalization is now accepted, its application is likely to provide great difficulty in the formulation of energy policy because its application requires hard and somewhat arbitrary choices. The major problem is determining what costs to internalize.

The Gulf War provides a vivid example of the difficulty of applying the cost-internalization principle. In the panic that followed the invasion and the imposition of United Nations sanctions embargoing Kuwaiti and Iraqi oil, world oil prices doubled from about \$15 to about \$30 virtually overnight. Prices stayed high in the following weeks, peaking at \$40 per barrel in early October 1990.<sup>64</sup> The United States and its allies did three things to stabilize oil prices—we worked through the International En-

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62. *Id.* at 376. The principle that we should internalize costs by avoiding externalities—by refraining from imposing costs on people who are not using the resource or enjoying the resource—is a basic tenant of the environmental movement. The “tragedy of the commons” is the classic hypothetical illustrating the principle that costs ought to be internalized:

The tragedy of the commons unfolds in this way. Picture a pasture open to all. It is to be expected that each herdsman will try to keep as many cattle as possible on the commons. . . .

As a rational being, each herdsman seeks to maximize his gain. Explicitly or implicitly, more or less consciously, he asks, “What is the utility of me adding one more animal to my herd?” This utility has one negative and one positive component.

(1) The positive component is a function of the increment of one animal. Since the herdsman receives all the proceeds from the sale of the additional animal, the positive utility is nearly + 1.

(2) The negative component is a function of the additional overgrazing created by one more animal. Since, however, the effects of overgrazing are shared by all the herdsman, the negative utility for any particular decision-making herdsman is only a fraction of - 1.

Adding together the component partial utilities, the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another; and another. . . . But this is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest. . . . Freedom in a commons brings ruin to all.

Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 1244-45 (1968).

63. Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 1244-45 (1968); George W. Sherk, *Eastern Water Law: Trends in State Legislation*, 9 VA. ENVTL. L.J. 287 (1990). A “tragedy of the commons” occurs whenever “[t]he economic interest of the individual would best be served by maximizing individual use before other individuals, acting in a similar manner, have depleted the shared resource.” *Id.*

64. Roger Vielvoye, *World Oil Prices in Jeopardy*, OIL & GAS J., Jan. 13, 1992, at 14.

ergy Agency to mitigate shortages, we released oil from the Strategic Petroleum Reserve, and we raised a military force to protect Saudi Arabia and eject Iraqi troops from Kuwait.<sup>65</sup> Reasonable people may disagree, however, whether those three actions of the United States and its allies to get oil prices back down to a price that would not damage the world economy were costs that should have been internalized in the price of the oil that we used.

As soon as the initial successes of Iraqi arms in Kuwait became apparent, the United States and its allies began to work through the International Energy Agency to share the oil shortages caused by the war.<sup>66</sup> Throughout the fall of 1990, the IEA jawboned member nations with surplus oil to share their supplies with those whose supplies were interrupted by the United Nations' embargo.<sup>67</sup> In early 1991, the IEA governing board voted to draw on 900 million barrels of crude oil reserves committed by its member nations, including the United States Strategic Petroleum Reserve, to avert any shortages caused by the Gulf War.<sup>68</sup>

In addition, the United States used its Strategic Petroleum Reserve unilaterally. In August, 1990 the Strategic Petroleum Reserve contained approximately 568 million barrels of crude oil, the equivalent of about ninety days of net crude oil imports.<sup>69</sup> The SPR was tapped during the

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65. A good case can be made that market forces would have caused world oil prices to drop eventually, whatever the actions or inactions of the United States and its allies because of the high inventories of oil and readily available unused production capacity. See the discussion in the text and accompanying notes 15-17, *supra*.

66. Bohi, *supra* note 14, at 554. The IEA is the result of an agreement in 1974 among the 16 members of the Organization of Economic Cooperation and Development (OECD) to cooperate in the event of an energy crisis and to share oil when supplies are interrupted. The IEA agreement calls for its members to maintain strategic stocks of petroleum and to coordinate plans for demand reduction in an emergency. *Id.* INTERNATIONAL ENERGY AGENCY, THE INTERNATIONAL ENERGY AGENCY 6 (1983). It also requires member countries to sell oil reserves or reduce imports to moderate a severe shortage in the world oil market. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 4, at 7. The premise of the agreement is that collective action will spread the cost burden over more countries and ensure that the effectiveness of actions will not be offset. *Id.* For a detailed analysis of the information gathering systems of the IEA, see *International Energy Agency, S. 1413, 1979: Hearings on S. 1413 Before the Subcomm. on Antitrust, Monopoly and Business Rights of the Senate Comm. on the Judiciary*, 96th Cong., 1st Sess. 44-73 (1979) (report of the Federal Trade Commission). For a brief explanation of the IEA's Emergency Sharing Provisions, see *National Energy Strategy: Hearings before the Subcomm. on Oversight and Investigations of the House Comm. on Energy and Commerce*, 101st Cong., 1st Sess. 101-148 (1990).

67. Not everyone agreed that the IEA was effective. See Phillip K. Verlager, Jr., *Understanding the 1990 Oil Crisis*, 11 ENERGY J. 15 (1990) (urging that the IEA should use price-based criteria rather than volume-based criteria to activate its crisis management programs). In part in response to such criticisms, the Energy Policy Act of 1992 authorizes the President to draw upon the Strategic Petroleum Reserve where there is an "emergency situation" and "a significant reduction in supply" resulting in "a severe increase in the price of petroleum products" which "is likely to cause a major adverse impact on the national economy." Energy Policy Act of 1992, Public L. No. 102-486, § 1401, 106 Stat. 2776 (West Supp. 1992), amending § 161 of the Energy Policy and Conservation Act, 42 U.S.C. § 6241 (1988).

68. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 4, at 5, 6.

69. *Id.* at 5. The Energy Policy & Conservation Act of 1974, 42 U.S.C.A. §§ 6231-6263 (West 1983), provided the initial authority both for establishing the Strategic Petroleum Reserve and for formation of the International Energy Agency. Originally planned to reach 1 billion barrels, the SPR's maximum size was reduced in 1982 to 750 million barrels (42 U.S.C.A. § 6240 (West 1983)) and then expanded to 1 billion barrels by the Energy Policy Act of 1992, Pub. L. No. 102-486,

Persian Gulf Crisis in a congressionally approved drawdown by President Bush, who ordered the release of 5 million barrels of oil on September 26, 1990 for a test sale.<sup>70</sup> In addition, the Bush Administration waived the Jones Act provisions requiring that only United States flag tankers can move oil between United States ports.<sup>71</sup> Little oil was actually withdrawn, however, because world supplies proved adequate and prices remained relatively stable.<sup>72</sup>

Finally, the United States amassed in the Middle East an overwhelming military force that enabled it and its 27 allies to eject Iraqi troops from Kuwait and crush the Iraqi military in just 43 days of combat. The United States alone contributed 527,000 men and women, 110 ships, 2,000 tanks, 2,200 armored personnel carriers, 1,700 helicopters and 1,800 fixed wing aircraft to the force.<sup>73</sup>

The Allies' political, economic and military actions steadied the oil markets. The initial success of Operation Desert Storm triggered an unprecedented \$10 crash in oil prices in a single day, dropping prices below \$20.<sup>74</sup> Iraqi scud missile attacks against Israel and Saudi Arabia brought prices back to the \$20 to \$25 range,<sup>75</sup> but with the collapse of Iraqi resistance, prices hovered around \$20.<sup>76</sup> This was no energy crisis. Nobody had frozen in the dark. There had been no long gas lines, no early closings, no unconscionable profits—despite the loss to the market of about the same percentage of oil as was withheld in the 1973 Arab oil embargo. Those who had prophesied economic chaos were wrong.

But none of the actions the United States took to avert price shocks was free. The International Energy Agency costs about \$16 million a year to run, of which the United States' share is approximately \$4 million.<sup>77</sup> The Strategic Petroleum Reserve represents an investment of at

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§ 1402, 106 Stat. 2776 (West Supp. 1992), amending § 154(a) of the Energy Policy and Conservation Act, 42 U.S.C. § 6234 (1988). The Strategic Petroleum Reserve is intended to act as a cushion against price shocks. It had never been drawn upon until the fall of 1990. Bohi, *supra* note 14, at 550.

70. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 4, at 5, 6. See also Bohi, *supra* note 14, at 550.

71. 50 U.S.C.A. § 1601 (West 1983). In January, 1991, only five United States flag tankers were available to transport Strategic Petroleum Reserve oil. Waiver was important in avoiding a market bottleneck because 60 percent of U.S. refineries lack access to pipelines serving Strategic Petroleum Reserve sites. *Is It Finally Time to Call Up the Oil Reserves*, BUS. WK., Jan. 28, 1991, at 35.

72. OFFICE OF TECHNOLOGY ASSESSMENT, *supra* note 4, at 7.

73. Anthony H. Cordesman, *The Persian Gulf War: An Analysis*, WORLD ALMANAC AND BOOK OF FACTS 1992, at 35-38 (1992). These numbers reflect only United States forces. The 28 nation coalition included 118,000 Saudi Arabian troops, 43,000 British troops with 170 tanks and 72 combat planes, 40,000 Egyptian troops with 250 tanks, 16,000 French troops, and 20,000 Syrian troops, as well as forces from Canada, Oman, Qatar and the United Arab Emirates. *Id.*

74. OIL MARKET LISTENER, Jan. 18, 1991, at 1.

75. *Oil Markets Brace for Price Collapse as Mideast War Rages Amid Oil Glut*, OIL & GAS J., Jan. 28, 1991, at 21.

76. PLATT'S OILGRAM PRICE REPORT, *supra* note 17, at 1.

77. *International Energy Program: Hearings before the Subcomm. on Energy and Power of the House Comm. on Energy and Commerce*, 100th Cong., 2d Sess. 100-213 (1988), at 54 (statement of William F. Martin, Deputy Secretary of Energy for International Energy Programs).

least \$20 billion.<sup>78</sup> Operations Desert Shield and Desert Storm cost approximately \$100 billion.<sup>79</sup>

Which of those costs ought to be internalized in the price that Americans pay for oil at the pump? The gasoline that we buy at the service station today is made substantially from imported oil, and a part of the cost of that imported oil is the cost of the International Energy Agency, the Strategic Petroleum Reserve, and the military power of the United States. How do we determine on a societal basis which of those costs ought to be internalized to the consumers who use the products made from imported oil?<sup>80</sup> Cost-internalization decisions can probably be made in a democracy only by political compromise. Ultimately, we must recognize that some goods share public and private characteristics, so that an arbitrary decision of whether and how much of their costs to internalize is the best that we can do.

The difficulty of applying the cost-internalization principle is a major impediment to the development and implementation of energy policy, however. Cost internalization was at the heart of the defeat of the Bush Administration's proposal to open the Arctic National Wildlife Refuge to oil development.<sup>81</sup> In the final analysis, the Administration and the industry could not persuade Congress that external environmental costs could be avoided.<sup>82</sup> On the other hand, the Energy Policy Act of 1992 contained a \$150 million per year/\$2.25 billion lifetime cap on the

78. *Strategic Petroleum Reserve: Hearings on H.R. 3193 before the Subcomm. on Energy and Power of the House Comm. on Energy and Commerce*, 101st Cong., 2d Sess. 101-159, at 3 (statement of Congressman Philip R. Sharp). See also Gurney, *The U.S. Strategic Petroleum Reserve: Politics Prevail*, PETROLEUM REV., Oct. 1990, at 498. Another commentator suggests that when interest is taken into account, the United States' investment in the Strategic Petroleum Reserve "must be approaching \$35 billion or \$40 billion." Donald P. Hodel, *The Theory of Energy Policies and Programs*, NAT. RESOURCES & ENV'T, Fall 1991, at 11.

79. *Update on Costs of Desert Shield/Desert Storm: Hearings before the House Comm. on the Budget*, 102nd Cong., 1st Sess. 102-12, at 39-40 (statement of Frank C. Conahan, Assistant Comptroller General, National Security & Internal Affairs Div., General Accounting Office).

80. Energy Secretary Hodel suggested a "user fee" on imported oil in 1985 to offset the cost of the Strategic Petroleum Reserve and the United States military presence in the Persian Gulf. See Hodel, *supra* note 78, at 11. Others have recommended against an oil import fee because it might unleash political stresses between oil exporting and oil importing nations. See, for example, the Johns Hopkins Foreign Policy Institute recommendation reported at Crow, *supra* note 59, at 37.

81. The Arctic National Wildlife Refuge is a 19 million acre refuge established by the Alaska National Interest Lands Conservation Act of 1980. The National Energy Strategy proposed opening 1.5 million acres of the coastal plain to oil exploration, estimating that there was a 46 percent chance of finding recoverable reserves in the area and that production might amount to 870,000 barrels per day by 2005. NATIONAL ENERGY STRATEGY 1991, *supra* note 24, at 79. The Office of Technology Assessment generally discounted the benefit of allowing drilling in the ANWR, saying that the reserve was small compared with those in the Middle East and other potential areas already found in the United States. OFFICE OF TECHNOLOGY ASSESSMENT, U.S. OIL IMPORT VULNERABILITY: THE TECHNICAL REPLACEMENT CAPACITY, at 17 n.30. However, many industry geologists disagreed with OTA's estimate that ANWR has a potential of only 3.6 billion barrels of oil; they say the reserves there are almost five times that number. Powers, *supra* note 6, at 25.

82. Senator Max Baucus of Montana made the point, saying that the oil industry's pledge to develop ANWR without environmental damage was "a promise that cannot be kept. I reject a policy that would sacrifice one of the five greatest places on earth for six months of oil." Patrick Crow, *The ANWR Leasing Issue*, OIL & GAS J., Apr. 29, 1991, at 37. See also Idelson, *supra* note 56, at 397.

amount that nuclear utilities must pay to decommission and clean up aging enrichment facilities,<sup>83</sup> an implicit acknowledgement that nuclear-generated electricity has a role in United States energy policy.

#### IV. CONCLUSION

In a perfectly rational world, the United States would have developed and implemented a comprehensive and coherent energy policy years ago. That we have not largely reflects the tenacity with which our people and their elected representatives have clung to our society's historic expectations of plenty. The settlers of what became the American Republic found what seemed infinite amounts of raw land, water and energy resources that could be haphazardly exploited to bring wealth. There quickly developed in our society an expectation that there was and always would be plenty of everything for everyone. Generations of Americans have been brought up to believe that each of us should work hard, be productive, and that the fruits of our labor will come inevitably.

Capitalism is the vehicle that has created and met our expectations of plenty. Capitalism was particularly well suited to the circumstances that prevailed in the formative years of this country. Indeed, despite the burdens it has carried since the end of World War II, our economic system has continued to deliver. Few Americans have become truly rich, but enough have realized the material benefits most seek that we have been loathe to consider fundamental changes.

I submit that the world-wide torturous economic restructuring of the 1970s and 1980s have blunted Americans' expectations of plenty. With the penetrating vision that comes only from hindsight, the American people now see that our expectations have been achieved largely by squandering our great natural resources and poisoning our environment—that free enterprise creates externalities.

The stage is set for healthy adaptation of the American dream, and development of an energy policy will be an important component of that change. While the specifics of energy policy will continue to be contentious, there is great hope in the public recognition that we need an energy policy and in the growing consensus of the three elements—energy diversity, market compatibility, and cost internalization—that the programs that make up a policy should embrace.

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83. Energy Policy Act of 1992, Pub. L. No. 102-486, § 1101, 106 Stat. 2776 (West Supp. 1992).