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Richard L. Gordon

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# THE POWERPLANT AND INDUSTRIAL FUEL USE ACT OF 1978—AN ECONOMIC ANALYSIS

RICHARD L. GORDON\*

Among the articles of faith of current energy policymaking is that burning oil and natural gas in large boilers and similar facilities is undesirable and therefore should be prohibited. This premise was the basis for the principal provisions of the Powerplant and Industrial Fuel Use Act of 1978.<sup>1</sup>

The act, in turn, is a highly attenuated version of a more ambitious program proposed by President Carter in his April 1977 National Energy Plan.<sup>2</sup> The act provides for regulations governing the use of oil and natural gas. These rules are notably less stringent than those proposed by the President. Moreover, the President proposed that additional pressures for fuel conversion be generated by a combination of taxes on oil and gas use by powerplants and industry and rebates of the taxes to subsidize conversion expenditures. These proposals were effectively ignored; only some minor tax credit provisions were enacted—and these were incorporated into another bill.<sup>3</sup>

The present article deals with the evolution of the act from the President's proposals to the final legislation. I begin by examining the basic question of why fuel conversion should be sought in the first place. Next, a comparison is made between the 1977 proposals and the 1978 legislation. Note is taken of some of the efforts to appraise the impacts of the legislation. Finally, conclusions are presented.

## FUEL CONVERSION AND ENERGY POLICYMAKING

As is typical of most economic policies that involve compromising essentially irreconcilable interests, the fuel conversion policies discussed here lack a coherent rationalization by their advocates. Indeed, none may exist; the essence of compromise is to fashion policies that are sufficiently consistent with a wide enough variety of views to permit enactment.

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\*Professor of Mineral Economics, The College of Earth and Mineral Sciences, The Pennsylvania State University, University Park, PA.

1. 42 U.S.C.A. §§ 8301-8483 (Supp. 1978). "Industrial" in the title of the act means large-scale fuel users other than electric utilities.

2. EXECUTIVE OFFICE OF THE PRESIDENT, ENERGY POLICY & PLANNING, THE NATIONAL ENERGY PLAN (1977).

3. The Energy Tax Act of 1978, Pub. L. No. 95-618, 92 Stat. 3174 (codified in scattered sections of 26 U.S.C.), which is the subject of another article in this issue.

Nevertheless, at least two reasons can be given to justify the chosen policies. These reasons serve as the basis for an appraisal of the legislation. After the proposed explanations are stated, it is necessary to examine whether, in fact, such beliefs are widespread. Then the wisdom of the arguments can be evaluated. Finally, we can consider the relationship between the basic premises and their implementation.

Both proposed explanations are alternatives to the (advanced) welfare economics model of attaining economic efficiency by a competitive market in which those causing environmental damages are accountable for their actions. The simpler-to-explain view is that the market appraisal of scarcity, even when corrected for environmental problems, is invalid. Collective consumer opinions, for example, are considered to give inadequate attention to the needs of future generations. Thus, an all-wise authority should step in and alter resource use towards a more satisfactory pattern.

The more complex concept is that, even if it is possible to attain economic efficiency in the textbook fashion, it is undesirable to do so. The two basic justifications for this view are that the market will produce inequities and that monopoly in the marketplace will interfere with attaining efficiency. Therefore, regulation must replace the market in resource allocation.

It is quite important to know the relative weights given to equity and efficiency by the advocates of interference. Efficiency is well defined in economic analysis, and thus it is easy in principle to appraise allegations that intervention is increasing efficiency. However, we lack agreed-upon measures of what constitutes equity, and thus many outrages can be and have been perpetrated under the guise that some vision of equity is being furthered.

Numerous discussions of energy convey the impression that their authors reject the economic criteria of efficiency.<sup>4</sup> The desire to come close to efficiency by administrative means seems implicit in the President's National Energy Plan, the seventh principle of which is "*energy prices should generally reflect the true replacement cost of energy.*"<sup>5</sup> The open question is whether some equity-efficiency tradeoffs were being made. The evidence suggests that the tradeoff concept was a major element. The program was designed so residential consumers of both oil and natural gas would pay less than world

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4. One pair of well-publicized examples comes from the work of S. David Freeman; see S. FREEMAN, *Energy: The New Era* (1974) and ENERGY POLICY PROJECT STAFF, FORD FOUNDATION'S ENERGY POLICY PROJECT, A TIME TO CHOOSE: AMERICA'S ENERGY FUTURE (1974) (Freeman was the director of the project).

5. NATIONAL ENERGY PLAN *supra* note 2, at 29 (emphasis in original).

market prices for energy, while powerplant industrial users of oil would pay more than world market prices.<sup>6</sup> This was plainly an inefficient allocation of resources, given the existing distribution of income. One could argue that inequitable income distribution had caused too little consumption of household heating fuel and too much consumption of electricity and industrial products, and that some inefficiency was justified to correct this inequity. However, it is hard to believe that the consumers of the one type of energy differed at all from consumers of the others, let alone that the differences justified intervention.

It is far clearer that Congress in both its pre-1977 actions and in the 1978 energy legislation considered it desirable to make tradeoffs between energy and efficiency. The insistence on energy price ceilings and the efforts to cushion consumers from the full impact of higher import prices reflect precisely such an equity-efficiency trade-off.

Professional economists who distrust regulation routinely criticize the arguments expressed here. Their traditional objections can appropriately be applied to the fuel shifting case. The fundamental criticism is that reality is far too complex for regulators to comprehend. Thus, regulators cannot determine what constitutes a superior allocation in any of the senses I have defined, nor can they be sure that their policies will in fact attain the stated objectives. Therefore, regulation can involve substantial enforcement and compliance expenses to produce unclear benefits.<sup>7</sup> This view of regulation leads immediately to the conclusion that fuel shifting policies have doubtful merits. The rationalizations suggested have all proven unimpressive at best, and I consider them to be ill founded.

It appears fairly clear that the failure to charge oil and gas prices based on imported oil prices has its least serious efficiency effects on electric utilities. The inefficiencies in the covered industrial sector probably are well below average.

Electric utility thermal generation in 1978 was split 51 percent from coal, 19 percent from oil, 18 percent from gas, and 14 percent from nuclear power. More detailed data available only for 1977 indicate that over 93 percent of the powerplant oil use was of heavy oil imported at world prices. Most of the gas use was at long-existing

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6. The operative provisions were a rebate to household oil users of a proposed tax on domestic oil to raise its buyers' price to world levels, continued controls on old gas prices, and taxes on industrial and powerplant use of oil. These taxes would have caused such users to pay more than world oil prices.

7. In principle, environmental regulations fare better than the others discussed here in having a rationale and producing clear benefits. Actual controls may be sufficiently ill-designed that radical reform, if not outright abandonment, may be appropriate.

plants, particularly in producing states.<sup>8</sup> All available indicators suggest that expanding the power output of plants regulated by the act generally will involve coal or nuclear power.<sup>9</sup> A few plants using imported oil may also be built. Under these conditions, the major impact of the regulations is likely, for reasons discussed more fully below, to be a transfer of natural gas from electric utilities to other users.

Since we know very little about the covered industrial facilities, we cannot be so confident that most of them, in fact, would also only consider imported fuel oil and coal as their source of additional supplies. Some might join the scramble for access to price-controlled natural gas. However, it is by no means clear that the fuel shifting provisions of the act make sense as a way of sorting out the best allocation of gas. The provisions discussed below fail to provide definite rules about the actual access of industrial consumers to gas. Both excess allotments and excess curtailments could easily occur.

It has also become apparent that the decisions discussed below to discourage natural gas consumption more than oil consumption may have been ill advised. It is quite possible that the combination of domestic price relief, the availability of Mexican gas, and possible construction of a pipeline to deliver Arctic gas from Alaska and Canada may make gas use more desirable than oil use. In the short run, the regulatory overkill that apparently has resulted in some spare gas-producing capacity implies that some temporary shifts from oil to gas might be appropriate.

It appears that considerable demagoguery went into the powerplant and industry proposals—namely, an effort to suggest that big power companies and industries, rather than their customers, would bear the additional expense. Certainly we can expect, particularly in the utility case, that the costs will be passed on. The basis for believing that the victims of these cost increases are more deserving than (or even different from) those sheltered is at best tenuous.

Another possible explanation for the fuel-shifting provisions is the fear that powerplants and industry were responding “irrationally” to the mass of restrictions affecting the production and use of coal and nuclear power. The disincentives to oil and gas use then would offset the reluctance to shift fuels. Again the argument seems an unfortu-

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8. U.S. Department of Energy, *Monthly Energy Rev.*, 60 (June 1979); FEDERAL ENERGY REGULATORY COMMISSION, ANNUAL SUMMARY OF COST & QUALITY OF ELECTRIC UTILITY PLANT FUELS, 1977, at 28 (1978).

9. See, e.g., NATIONAL COAL ASSOCIATION, STEAM ELECTRIC PLANT FACTORS 1978 (1978) and U.S. DEP'T OF ENERGY, INVENTORY OF POWER PLANTS IN THE UNITED STATES, APRIL 1979 (1979).

nate one. If coal and nuclear power regulations were well conceived and well implemented, the fuel choices based on them would be sound. If the regulations are defective, it would be better to correct them. To be sure, this correction might not be considered politically feasible. Thus, we are left with the excuse that the best way to curb the ill effects of one defective government policy is to add another elaborate policy. It is precisely the piling of one more complex policy on top of another that causes so many economists to object to regulation of energy.

It is also possible that, on the electric utility side, the regulatory process was impeding desirable changes to coal by preventing pass-through of the costs of capital investments needed to allow coal use in an environmentally acceptable fashion. If this is the case, again we have imposed one dubious policy in the hope that it will offset another. A final obvious rationale for the fuel shifting measures chosen is that they appealed to members of Congress from coal producing states.

In sum, it is hard to justify the principle of special policies for fuel conversion instead of a general energy price increase. The practices as initially proposed and as finally enacted appear even less attractive than the principle.

#### MAJOR FUEL USERS AND NATIONAL ENERGY LEGISLATION<sup>10</sup>

As noted above, the presidential proposals affecting electric utilities and large industrial users (both of which are described here by the term major users) differ markedly from the actual legislation. The key differences are that much less use of the tax system to affect the fuel use of major consumers is authorized than was requested, and the regulations influencing fuel choice are less stringent than requested.

Before dealing with the evolution from proposals to legislation, some of the technical distinctions established in the act must be discussed. First, both electric powerplants and industrial facilities had to be defined.<sup>11</sup> The main question about powerplants is whether they should include facilities used mainly for supplying power

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10. For additional explanatory material and critiques, see *National Energy Plan*, *supra* note 2; see also EXECUTIVE OFFICE OF THE PRESIDENT, ENERGY POLICY & PLANNING, REPLACING OIL WITH COAL & OTHER FUELS IN THE INDUSTRIAL & UTILITY SECTOR (1977); CONGRESSIONAL BUDGET OFFICE, PRESIDENT CARTER'S ENERGY PROPOSALS: A PERSPECTIVE (1977); GENERAL ACCOUNTING OFFICE, AN EVALUATION OF THE NATIONAL ENERGY PLAN (1977).

11. Relevant definitions are contained in Sections 103(a)(7) to (12) of the act, 42 U.S.C.A. § 8302(a)(7) to (12) (Supp. 1978).

to their owners. The draft bill<sup>1 2</sup> simply stated that included powerplants were those that produced primarily for sale; the actual law contains an explicit exclusion for plants that sell less than half their power and also are engaged in producing process heat for their owners (so-called cogeneration facilities).<sup>1 3</sup> Industrial facilities are those using a boiler, gas turbine, combined cycle (a gas turbine to which a steam boiler to use the waste heat is coupled), or an internal combustion engine.<sup>1 4</sup> The legislation explicitly excludes such facilities used in producing oil and gas.<sup>1 5</sup> A further limitation is that coverage of both powerplants and industrial facilities is limited to single units using at least 100 million Btu per hour or plants with combined fuel use in excess of 250 million Btu per hour.<sup>1 6</sup>

The meaning of the coverage rules in the electric powerplant sector is quite clear. The electric utility industry operates a readily identified group of plants that are covered by the rules; indeed, these facilities so often are far larger than the cutoff size that the number of plants affected is fairly small (less than 500 in 1977).<sup>1 7</sup> Just how many covered industrial plants exist and what their characteristics are is less apparent. Data on these users is limited to a survey taken by the Federal Energy Administration, about which little has been made public. What can be noted is that the covered facilities could be far smaller than a modern electric powerplant. Such powerplants are likely to use upwards of one million tons of coal per year. A covered industrial plant might consumer as little as 18,000 tons of coal annually.<sup>1 8</sup> Just how many such installations might exist remains to be seen.

A second key distinction is between new and old plants. New plants are subject to tighter restrictions than existing ones, and thus care had to be taken in delineating the basis of classification. The President proposed that a new plant be one that, in the view of the regulatory authorities, had reached a point at which it could no longer reasonably be designed and constructed so as to be capable of using

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12. Draft National Energy Act, H.R. DOC. NO. 95-138, 95th Cong., 1st Sess. (1977).

13. 42 U.S.C.A. § 8302(a)(7)(B)(ii) (Supp. 1978).

14. 42 U.S.C.A. § 8302(a)(10)(A) (Supp. 1978).

15. 42 U.S.C.A. § 8302(a)(10)(B)(ii) (Supp. 1978).

16. 42 U.S.C.A. § 8302(a)(10)(A)(i), (ii) (Supp. 1978).

17. According to the National Coal Association, 264 electric power plants of 25 megawatts or more in capacity burned oil for other than startup purposes and 371 burned gas. The details show that well over 100 plants burn both oil and gas and thus the total number of plants using oil, gas, or both is closer to 500. A 25-megawatt plant uses roughly 250 million Btu per hour. NATIONAL COAL ASSOCIATION, *supra* note 9.

18. Assuming a capacity factor of 50 percent, i.e., 4380 hours of operation per year, and a coal content of 24 million Btu per ton, we have Btu consumption of 438 billion and 18,250 tons of coal used.

coal without incurring significant financial or operational detriment. In addition, plants already identified as candidates for conversion to coal under the Energy Supply and Environmental Coordination Act of 1974 also were to be considered new plants.

Slightly more detailed versions of both definitions are embodied in the legislation. First, plants clearly instituted after the enactment of the act are new facilities.<sup>19</sup> In addition, plants whose "construction or acquisition" began after April 20, 1977 (the date of the President's energy message) are covered unless excessive costs or reliability problems would be caused. The Department of Energy (DOE) is to establish rules defining what constitutes either excessive cost or reliability problems.<sup>20</sup> The legislation adds the further provision that sale of an existing plant does not make it a new one.<sup>21</sup>

At least in the electric utility sector, the potential for controversy about newness is confined to three plants announced before the 1973 oil price increases but delayed for completion in the early 1980s. The owner of two of the proposed plants is engaged in a debate with the Department of Energy over whether these should be considered new plants.<sup>22</sup> Because of the lack of knowledge about the industrial sector mentioned above, the problems of new plant identification cannot adequately be delineated. Nevertheless, to lessen disputes, the Department of Energy has found it necessary to revise the proposed rules for defining new plants.<sup>23</sup>

In any case, the legislation sets roughly the same basic rules for the various classes of facilities as the President had proposed. All new powerplants and all new industrial boilers are subject to a ban on oil and natural gas use;<sup>24</sup> the Department of Energy can prohibit such use in new industrial nonboilers if this is feasible (prohibitions may

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19. 42 U.S.C.A. § 8302(a)(8)(A) (Supp. 1978).

20. 42 U.S.C.A. § 8302(a)(8)(B) (Supp. 1978).

21. 42 U.S.C.A. § 8302(a)(9)(B) (Supp. 1978).

22. See the 1978 annual report of Baltimore Gas and Electric Company; the proposed owner (Potomac Electric Power Company) of the third such plant mentions no comparable problem in its annual report.

23. The Department of Energy has issued several documents on the implementation of the act. See *Powerplant and Industrial Fuel Use Act, Proposed Rules for Implementation*, 43 Fed. Reg. 53,974 (Nov. 17, 1978); *Special Rule for Temporary Public Interest, Proposed Exemption of Use of Natural Gas by Existing Powerplants Under the Powerplant & Industrial Fuel Use Act of 1978*, 44 Fed. Reg. 1694 (Jan. 5, 1979); *Powerplant & Industrial Fuel Use Act (Existing Facilities), Proposed Implementation Rules; Hearings*, 44 Fed. Reg. 5808 (Jan. 29, 1979); *Transitional Facilities, Revised Interim Rule to Permit Classification of Certain Powerplants & Installations as Existing Facilities*, 44 Fed. Reg. 17,464 (Mar. 21, 1979); *Definitions & Administrative Procedures & Sanctions; Interim Rule*, 44 Fed. Reg. 28,530 (May 15, 1979); *Powerplant & Industrial Fuel Use Criteria for Petition for Exemption from Prohibitions*, 44 Fed. Reg. 28,950 (May 17, 1979).

24. 42 U.S.C.A. § 8311(1), 8312(a) (Supp. 1978).



apply either to classes of facilities or to specific installations).<sup>25</sup> The legislation adds a provision that all new power plants must have the capability of burning coal or some other alternative to oil or natural gas.<sup>26</sup> Existing electric power plants are required to cease natural gas use by January 1, 1990, may not convert from petroleum to gas, and are prohibited from increasing the proportion of gas used.<sup>27</sup> Where feasible, oil and gas use may be prohibited by the Department of Energy for such existing powerplants.<sup>28</sup> Permission must be secured to increase the oil use of plants also burning coal.<sup>29</sup> Existing industrial facilities are covered only by discretionary conversion requirements;<sup>30</sup> conversions may be required when it is possible to burn other fuels.<sup>31</sup>

Some additional provisions, however, were added by the Congress. The Department of Energy is authorized to ban when feasible the use of natural gas in space heating boilers using more than 300,000 cubic feet of natural gas per day.<sup>32</sup> Prohibitions have also been placed on decorative use of natural gas lights.<sup>33</sup> The federal government's own major fuel burning facilities have been required to limit oil and natural gas use.<sup>34</sup>

As proposed by the President and approved by Congress, increases in oil use by existing powerplants are restricted, and the President has been given power to allocate coal supplies and to restrict oil and gas use in emergencies.<sup>35</sup> A number of assistance programs were added by Congress—loans to aid purchase of pollution equipment by electric utilities converting to coal,<sup>36</sup> assistance to areas affected by increased coal or uranium mining,<sup>37</sup> and assistance to railroads in increasing their capacity to transport coal.<sup>38</sup> Finally, a series of studies—on the structure and performance of the coal industry, the effects of the law on small utilities, the socioeconomic impacts of increased coal use, and the use of oil and gas in combustors—was authorized.<sup>39</sup>

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25. 42 U.S.C.A. § 8312(b) (Supp. 1978).

26. 42 U.S.C.A. § 8311(2) (Supp. 1978).

27. 42 U.S.C.A. § 8341(a) (Supp. 1978).

28. 42 U.S.C.A. § 8341(b) (Supp. 1978).

29. 42 U.S.C.A. § 8375 (Supp. 1978).

30. 42 U.S.C.A. § 8342 (Supp. 1978).

31. *Id.*

32. 42 U.S.C.A. § 8371 (Supp. 1978).

33. 42 U.S.C.A. § 8372 (Supp. 1978).

34. 42 U.S.C.A. § 8373 (Supp. 1978).

35. 42 U.S.C.A. §§ 8374, 8375 (Supp. 1978).

36. 42 U.S.C.A. § 8402 (Supp. 1978).

37. 42 U.S.C.A. § 8401 (Supp. 1978).

38. Sec. 803 of the act, codified at 45 U.S.C.A. §§ 821, 822, 825 (Supp. 1978).

39. 42 U.S.C.A. §§ 8451-8457 (Supp. 1978).

The tradition of authorizing studies to assuage concerns that Congress does not wish to face immediately is well known. What may be noted here is that practically every energy bill of the 1970s has had such provisions, and that the work proposed in this statute is in well-trod areas. A prior act—the Federal Coal Leasing Amendments Act of 1975<sup>40</sup>—established a requirement that the Department of Justice issue an annual report on competition in the coal industry; the first report under that requirement appeared in 1978. Other reports on competition have appeared from the Federal Trade Commission, the General Accounting Office, and the Tennessee Valley Authority. Similarly, numerous studies of regional energy impacts have been sponsored by various government agencies.

The differences between proposals and legislation are most important in the provisions establishing circumstances under which exceptions can be made from the basic rules. The President's proposals allowed for a blanket exemption of peak load power stations from the controls. New powerplants and industrial facilities were to be exempted either permanently or temporarily from the ban on oil use if lack of alternatives, environmental problems, and difficulties in securing reliable coal supplies precluded use of coal or other fuels. Similar exemptions were available for existing powerplants and industrial facilities, and a special provision was included allowing a five-year exemption from gas conversion by powerplants if it could be shown that the plant would shift to a synthetic gas from coal or some other alternative fuel.

Congress expanded upon these concepts in various ways.<sup>41</sup> Exemptions based on "substantial" cost penalties if coal were used instead of imported oil were introduced.<sup>42</sup> The exemption for plants that would convert to synthetic fuels was extended so any facility covered by the act was eligible.<sup>43</sup> As an alternative to eliminating gas use in existing plants, Congress allowed the electric utilities to develop company-wide plans for reducing gas use that could allow continued use of some gas in heavily used (base load) plants for as much as ten years past the 1990 deadline.<sup>44</sup>

More critically, several new categories of plants eligible in various degrees for permanent exemptions were established. Categories that were applicable to both new and old plants included plants affected

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40. 30 U.S.C. §208-2 (1976).

41. The exemption provisions appear in §§311-313 of the act, 42 U.S.C.A. §§8351-8353 (Supp. 1978).

42. 42 U.S.C.A. §8351(a), 8352(a) (Supp. 1978).

43. 42 U.S.C.A. §8351(b) (Supp. 1978).

44. 42 U.S.C.A. §8391 (Supp. 1978).

by state or local rules that precluded conversion,<sup>45</sup> those that could best convert by using a mixture of coal and oil or gas,<sup>46</sup> those designed only for use in emergencies,<sup>47</sup> those operating as intermediate load plants,<sup>48</sup> those used in processes in which fuel substitution was infeasible,<sup>49</sup> and those designed solely to operate when other plants were undergoing planned maintenance.<sup>50</sup> The explanation in the conference committee report on the bill indicates that the state and local rules provision is designed primarily to insure that consideration is given to problems of plants facing state and local environmental rules stricter than those of the federal government; the report warns that care must be taken to insure that these regulations were not imposed to assist evasion of the act.<sup>51</sup> The act defines intermediate load as less than 3,500 hours of operation per year;<sup>52</sup> since there are 8,760 hours in a 365-day year, such plants would operate less than 40 percent of the time.

A further exemption for new plants can be secured if they are needed to insure reliability of service.<sup>53</sup> Existing plants can be exempt if they are baseloaded gas-fired electric powerplants burning less than 250 million Btu per hour that cannot easily convert to other fuels,<sup>54</sup> if they use liquified natural gas for environmental reasons,<sup>55</sup> or if they are served by a gas pipeline from Canada and the termination of gas use would interfere with overall service on the pipeline or cause substantial financial penalties.<sup>56</sup>

The details of each exemption differ somewhat from the others. The key consideration is the stringency of the tests applicable to the exemption. At one extreme, best represented by the international pipeline provisions, it is only necessary to establish that the facility is, in fact, one to which the provisions apply. At the other extreme, the general exemption provision requires proof that a wide range of direct operating cost, environmental, or reliability problems makes the conversion infeasible. In the intermediate cases, the requirements involve consideration both of whether the facility falls into the speci-

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45. 42 U.S.C.A. § 8352(b) (Supp. 1978).

46. 42 U.S.C.A. § 8352(d) (Supp. 1978).

47. 42 U.S.C.A. § 8352(e) (Supp. 1978).

48. 42 U.S.C.A. § 8352(g) (Supp. 1978).

49. 42 U.S.C.A. § 8352(k) (Supp. 1978).

50. 42 U.S.C.A. § 8352(l) (Supp. 1978).

51. Joint explanatory statement of the Committee of Conference, comments on § 212, H.R. REP. NO. 95-1749, 95th Cong., 2d Sess. 77 (1978).

52. 42 U.S.C.A. § 8302(a)(18)(B) (Supp. 1978).

53. 42 U.S.C.A. § 8351(g) (Supp. 1978).

54. 42 U.S.C.A. § 8352(h) (Supp. 1978).

55. 42 U.S.C.A. § 8352(i) (Supp. 1978).

56. 42 U.S.C.A. § 8352(j) (Supp. 1978).

fied classes and of whether problems of coal use would arise. Presumably, the purpose of distinguishing these categories is to make them subject to less stringent tests of whether coal use is infeasible, but the language of the act, particularly in the intermediate load powerplant provisions, is by no means clear.

A more critical point is that the criteria for exemptions presented in the act are not much more specific than the summary versions presented here. Instead, the act invariably calls for development by the Department of Energy of rules for implementing the law.<sup>57</sup> Thus the Powerplant Act, like all too much economic legislation, delegates an enormous amount of responsibility for determining exactly how the law will be administered.

As of August 1979, the regulations were still in tentative form, but enough material was available to suggest that the administrative problems would be at least as severe as anticipated.<sup>58</sup> The most pervasive element of the draft regulations is the specification in great detail of the mass of evidence that a company must provide to qualify for an exemption.

Various rules were proposed for determining what constitutes a cost disadvantage sufficient to justify an exemption. Here we focus on the DOE formula, designed for widespread use, by which costs of the preferred fuel shifting alternative are compared to oil use.<sup>59</sup> This has been, predictably, the subject of considerable controversy. The most recent DOE discussion available (that of May 17)<sup>60</sup> proposes a complex method by which applicants for exemptions on a cost basis would calculate their costs. First, DOE has developed various formulas for placing the costs on a "present value" basis (one that uses standard financial rules to take account of the need to pay interest on investments). More critically, DOE has proposed to determine many of the crucial assumptions for the calculation—the interest rate at which the present values are determined, the precise way that oil prices are to be estimated, and the zero-escalation assumption applied to price changes. Finally, DOE itself will select the critical rate of cost excess (set at 30 percent in the May 17 rules) that justifies an exemption. Thus, DOE has shown that, as suggested above, it has wide discretion to define rules for implementing the act.

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57. Provisions regarding rulemaking and judicial review appear in §§701 & 702 of the act, 42 U.S.C.A. § 8411, 8412 (Supp. 1978).

58. See the material cited at note 23, *supra*.

59. See *Powerplant & Industrial Fuel Use Criteria for Petition for Exemption from Prohibitions*, 44 Fed. Reg. 28,950 (May 17, 1979).

60. See *id.*

## ESTIMATING THE IMPACTS OF THE ACT

The impacts of the Powerplant Act on the electric utility sector seem, for reasons already suggested, easy to determine; not much will happen that would not have happened anyway. The effects on industry are considerably more uncertain. As already noted, little information exists on industrial fuel use. Thus, appraisal involves estimating the effect of a law whose meaning will not be clear until the supporting regulations are issued on a sector about whose fuel use characteristics little is known.

Nevertheless, some analysts have attempted to make such estimates for the earlier forms of the program. The White House energy staff hired consultants to determine the economics of fuel choice for boilers of different sizes; these consultants then received data from a Federal Energy Administration survey of major industrial fuel burning facilities that provided information on the characteristics of large industrial fuel users. From these data, a model of conversion possibilities was developed. Calculations with this model indicated that the full presidential program of prohibitions, fuel use taxes, and tax rebates would produce a gross increase in 1985 industrial coal use (over what it otherwise would have been) of almost 200 million tons; energy conservation measures would offset this gain and make the net increase about 175 million tons.<sup>61</sup>

All the groups established to advise Congress provided some form of comment on these provisions, but the efforts of the Congressional Budget Office (CBO) are the most interesting.<sup>62</sup> The Budget Office undertook both an initial appraisal of the President's fuel shifting proposals as part of a survey of the total National Energy Plan and a subsequent special study of fuel conversion. The initial estimate was that the gain in coal use was more likely to be 150 million tons.<sup>63</sup>

In 1978, the CBO undertook a separate study of the potential for fuel conversion. It hired the same consultant used by the White House staff to prepare a new estimate of the pattern of fuel use in industrial boilers and a different consultant to appraise the economics of boilers. Then the Budget Office synthesized the material into an estimate of the effects of the pending Senate and House energy bills and several alternative policies. Both the Senate and House bills employed tax and rebate provisions that differed from each other and from the President's proposals. The Senate provisions

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61. *Replacing Oil with Coal*, *supra* note 10, at III.2.

62. *See* note 10, *supra*.

63. CONGRESSIONAL BUDGET OFFICE, PRESIDENT CARTER'S ENERGY PROPOSALS: A PERSPECTIVE 47 (1977).

were expected to increase coal use by about 56 million tons; the House provisions, by 82 million.<sup>64</sup> These impacts, however, were due entirely to the taxes and rebates; later in the report, it is noted that the impact of regulations would depend upon how they were administered and that the total covered industrial sector had total energy use about equal to the increase in coal use under the House bill that was analyzed.<sup>65</sup>

DOE issued in November 1978 an initial analysis of the impact of the act. The analysis indicates that the act, were it the only energy bill passed in 1978, would raise coal use by 0.5 to 0.9 quadrillion Btu in 1985 and by 2.4 to 2.9 quadrillion Btu by 1990. The higher gain is associated with setting the criterion of an excessive cost increase at 30 percent; the lower gain occurs with the same criterion but with only new units covered by the conversion requirements. It is noted, moreover, that raising the cutoff ratio to 50 percent only saves 0.1 quadrillion Btu, and very little more is saved by more stringent cut-off criteria.<sup>66</sup> Using the factor of 23.75 million Btu per ton that other DOE reports suggest for coal consumption in the United States,<sup>67</sup> the 1985 range is between 21 and 38 million tons and the 1990 level is from 101 to 122 million tons.

However, these impacts are calculated without considering the effects of the changes in natural gas prices mandated by other 1978 legislation. DOE provided only tentative estimates of the differences in oil and gas use produced by the changes in natural gas pricing. These changes actually produce a greater reduction in oil and gas use (0.9 instead of 0.7 quadrillion Btu) in 1985, because rising gas prices increase the availability of gas enough to encourage greater reductions in oil use. By 1990, however, the situation is reversed. Conversion measures produce 2.2 quadrillion Btu in lower oil and gas use without the change in gas pricing; 1.3 quadrillion Btu (equivalent to 55 million tons of coal), with the new gas policy. Presumably, oil price deregulation would lower the figure even further. For comparison purposes, it may be noted that U.S. energy consumption in 1978 was 77.7 quadrillion Btu, of which 14 quadrillion Btu was from coal.<sup>68</sup> The trivial impact of the regulations hardly seems to justify the effort.

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64. CONGRESSIONAL BUDGET OFFICE, REPLACING OIL & NATURAL GAS WITH COAL: PROSPECTS IN THE MANUFACTURING INDUSTRIES 45 (1978).

65. *Id.* at 52.

66. D. MEAD, F. MURPHY & W. MONTGOMERY, ANALYSIS OF PROPOSED U.S. DEPARTMENT OF ENERGY REGULATIONS IMPLEMENTING THE POWERPLANT AND INDUSTRIAL FUEL USE ACT (1978).

67. See any issue of the U.S. Department of Energy, *Monthly Energy Review*.

68. *Id.*

### CONCLUSIONS

The review of the fuel conversion legislation suggests that we have succeeded only in adding another administrative monstrosity to the existing collection affecting the energy sector. The provisions have even less justification than most of their predecessors. Observers of energy problems have long argued that politicians are incapable of resolving the issues sensibly. The fuel conversion provisions unfortunately confirm these fears. If the President and Congress truly believed coal to be a more desirable fuel than oil or natural gas, they would have been better advised to relax some of the more dubious regulations that have been issued in the areas of air pollution and surface mining reclamation and fully and immediately to deregulate oil and gas prices.