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A Report on Utility Participation in Solar Energy Development

James P. Lough

I. INTRODUCTION

The energy problem facing the world today is well-known; it has been highly publicized by such international events as the Arab Oil Embargo of the early Seventies. The most potentially disastrous implications of the energy crisis, however, run much deeper than the momentary political flares, sparked by the oil shortage, which blaze for a short while. Industrialized nations, especially those in the western world, that have experienced economic growth with the aid of inexpensive petroleum must either locate new sources of energy or squeeze energy out of old sources in order to maintain their economic vitality.

A significant aspect of the crisis is that in the 1970's, "the gross increases in oil reserves in the non-Communist world, smoothed to allow for the irregularity of discoveries, fell below the curve for annual production" This trend is not expected to change. Even if demand is significantly lowered, the energy crisis will be merely postponed.² Domestic policies which stimulate production, while possibly diminishing the risk of a politically caused dearth of oil, will not alter the underlying fact that the world is running out of that valuable commodity.

Numerous oil replacements have been proposed in the hope of thwarting the crisis. One of the suggested sources, previously considered the best alternative to oil in generating electricity, is nuclear power. However, recent problems have arisen which will severely reduce the contribution from this source in the 20th century. Since the accident at the Pennsylvania Three Mile Island plant, confidence in nuclear energy has been shaken.³ One consequence of the accident is

EDITOR'S NOTE: Mr. Lough is a member of the California Bar and an associate in Borton, Petrini & Conron, Bakersfield, Cal. B.A., California State University, Fullerton (1976); J.D., Southwestern University, Los Angeles (1979); LL.M., Washington University School of Law, St. Louis (1980). The author wishes to express his gratitude to Professor Daniel R. Mandelker of Washington University School of Law, who supervised the initial preparation of this article.

1. T. MONTRIAL, *ENERGY, THE COUNTDOWN: A REPORT TO THE CLUB OF ROME* 144-45 (1979) [hereinafter cited as *MONTRIAL*].

2. *Id.* at 149.

3. General Public Utilities Corporation, owner of the Three Mile Island Plant (TMI), filed a \$500,000,000 negligence action against Babcock & Wilcox, builders of the facility.

that utility companies have stopped ordering nuclear plants.⁴ Given the long lead times required for construction, this virtual loss of a major source of energy will have profound impact throughout the remainder of the century.

Another source of energy presented as a replacement for oil is coal. It is a plentiful energy source which is theoretically able to supply enough energy to sustain world levels of fossil fuel consumption for the next two hundred years.⁵ Clearly, coal will be a significant contributor to world energy needs and it plays a large role in the federal energy strategy.⁶ The Department of Energy (DOE) has stated that coal will reduce consumption of oil by 300,000 to 450,000 barrels per day by 1985.⁷ While these reductions are possible, there are many drawbacks to the wide-spread use of coal. Health, environmental, and safety problems which exist in the mining, transportation, and ultimate use of coal could restrict its development.⁸

The problems associated with the three major sources of energy have caused the focus to shift to heretofore neglected alternatives, ranging from conservation to nuclear fusion.⁹ Some recently have been given a chance to play a large role in federal energy strategy. Even utility companies, which consume one-third of the energy in the United States, have been inquiring into these sources as part of a strategy for reducing consumption of nonrenewable energy sources.¹⁰ Included among these new sources is solar energy. According to government estimates, various forms of solar energy could displace twenty percent of the nation's total energy use by the year 2000.¹¹ A significant por-

See Utility Sues Builder on TMI Reactor, L.A. Times, March 26, 1980, part IV, at 1, col. 6. General Public Utilities Corporation has begun to emphasize conservation and use of alternative energy sources, such as a 28 megawatt cogeneration facility in New Jersey, rather than continuing to build new power plants at past rates to meet demand. *See New Tremors from TMI*, St. Louis Post-Dispatch, April 21, 1980, part C, at 2, col. 1.

4. Predating TMI, this decline in new orders for nuclear power plants started in 1973, partly because of cost. In 1976, the marginal cost of electricity produced by nuclear plants was 20% higher than coal power plants. In 1978, more plants were cancelled than were ordered. B. COMMONER, *THE POLITICS OF ENERGY* 45 (1979) [hereinafter cited as *COMMONER*].

5. D. HAYES, *RAYS OF HOPE: THE TRANSITION TO A POST-PETROLEUM WORLD* 39 (1977) [hereinafter cited as *HAYES*].

6. U.S. Dep't of Energy, *National Energy Plan II* 99-108 (May, 1979).

7. *Id.* at 102.

8. MITRE Corp., Ford Foundation, *Nuclear Power: Issues and Choices* (1977) [hereinafter cited as *MITRE*].

9. U.S. Dep't of Energy, *National Energy Plan II* 99-108 (May, 1979).

10. *See New Tremors from TMI*, St. Louis Post-Dispatch, April 21, 1980, part C, at 2, col. 1; *PG&E Plans Interest-Free Energy Conservation Loans*, L.A. Times, March 26, 1980, part IV, at 1, col. 6.

11. The only figures presently available are those listed below, which are the calculations used by DOE for determining the contribution of solar energy under the National

tion of this displacement of conventional sources could come from the use of active and passive solar systems in the residential/commercial sector.¹²

Energy Conservation Policy Act of 1978 and other federal legislation. The following table gives a breakdown, by sectors, of the amount of energy displaced by solar energy:

Potential Contribution of Solar Technologies in 2000
(Quadrillion BTUs per Year)

MARKET	1977	Year 2000 Cases		
		(Base)	(Max. practicable)	(Tech. limit)
Residential/commercial sector:				
Active systems (hot water heating, and space cooling)	Small	0.9	2.0	3.8
Passive systems	Small	0.2	1.0	1.7
Industrial/agricultural sector	—	1.0	2.6	3.5
Electricity generation:				
Hydro				
High head	2.4	3.5	3.5	3.5
Low head	Small	0.4	0.8	1.0
Solar thermal	—	0.1	0.4	1.5
Wind	—	0.6	1.7	3.0
Photovoltaics	—	0.1	1.0	2.5
Ocean thermal energy conversion	—	—	0.1	1.0
Solar power satellite	—	—	—	—
Biomass	1.8	3.1	5.4	7.0
Total Energy Displaced	4.2	9.9	18.5	28.5

U.S. Dep't of Energy, National Energy Plan II 121 (May, 1979) (footnotes omitted). The "maximum practicable" figure represents about 20% of the United States energy use in the year 2000. *Id.*

12. *Id.* Department of Energy (DOE) regulations define the covered solar system as follows:

(1) *Solar Domestic Hot Water Systems*. . . [E]quipment designed to absorb the sun's energy and to use this energy to heat water for use in a residential building other than for space heating, including thermosiphon hot water heaters.

(2) *Active Solar Space Heating Systems*. . . [E]quipment designed to absorb the sun's energy and to use this energy to heat living space by use of mechanically forced energy transfer, such as fans or pumps.

....

(4) *Passive Solar Space Heating and Cooling Systems*. . . [S]ystems that make most efficient use of, or enhance the use of, natural forces—including solar insulation, winds, nighttime coolness and opportunity to lose heat by radiation to the night sky—to heat or cool living space by the use of conductive, convective or radiant energy transfer.

10 C.F.R. § 456.105(v) (1980).

The partial shift to conservation and other options which do not use nonrenewable resources has been encouraged to a limited degree by recent federal energy legislation. One area where significant energy savings can be made is in the residential sector. The National Energy Conservation Policy Act of 1978¹³ initiates federal involvement in the stimulation of sales and installation of residential conservation measures. The program begun under the Act has as its objective, "insulat[ing] 90 percent of the existing domestic housing stock by 1985 and to support the solar program goal of having 2.5 million solar homes by 1985."¹⁴

The focus of this article will be on the solar energy aspects of residential conservation development under the National Energy Conservation Policy Act of 1978 (NECPA). While the Act, as a whole, will benefit solar development, it also has provisions which could obstruct long-range solar energy use. NECPA severely restricts entry into the solar energy market by utility companies. This prohibition, although it is subject to exceptions,¹⁵ arguably can eliminate an excellent source of solar energy development and thereby impede potential contributions to the overall energy supply.

The general prohibition against utility participation in the sales, service, and installation of residential solar systems is based primarily on apprehension that utilities will otherwise dominate the market. The Act does set up standards for review of unfair trade practices.¹⁶ However, because the standards and review procedures are based on a presumption of utility preclusion and the Act itself increases the prospects of unfair competition by utilities,¹⁷ the Act might work to preclude entry into the market by utilities without the support of substantial evidence that the prohibition is justified. The rationale behind the preclusion of utilities is based on their monopolistic market

13. 42 U.S.C. §§ 8201-8278 (Supp. II 1978) as amended by Act of June 30, 1980, Pub. L. No. 96-294, 94 Stat. 741.

14. *Hearings on the Status of Federal Programs to Promote the Commercialization of Solar Energy: Hearings Before the Subcomm. on Energy and Power of the House Comm. on Interstate and Foreign Commerce, 96th Cong., 1st Sess. Serial No. 96-1 (1979)* (statement of Omi G. Walden).

15. 42 U.S.C. § 8217(d)-(e) (Supp. II 1978); see text accompanying notes 64-70 *infra*.

16. 42 U.S.C. § 8217(e) (Supp. II 1978). These are the standards to be established by DOE and the Federal Trade Commission which govern waiver of the prohibition of utility activity in providing and financing energy conservation measures. See note 70 and accompanying text *infra*.

17. See notes 108 & 165-66 and accompanying text *infra*. The increased contacts between the utilities and their customers mandated by the Act may put the utilities in a market position so advantageous that the Secretary will find the granting of waivers pursuant to these standards impossible.

position and procedures exist in the Act sufficient to negate this advantage if necessary.¹⁸

The basic problem is that it is too early in the game to know how the solar industry will develop and the Congressional presumption against the utilities may eliminate a potential source of solar supply. This exclusionary action taken early in the developmental stages of a federal regulatory program is similar to the Environmental Protection Agency's choice of the catalytic converter as its chief air pollution device.¹⁹ The peremptory choice of this control strategy was made early and was based upon incomplete information. As a result, possible alternative strategies which would have benefited air quality in the long run were not developed.

The same fate might befall the residential solar energy field if the Act works to exclude utility participation at this early stage. This article looks at NECPA and its regulations with an emphasis on the role of utilities. The benefits and disadvantages of permitting utilities to influence the formation of the solar energy industry will be discussed in the context of possible NECPA reforms to further stimulate solar energy development. Although the ultimate impact of this legislation cannot now be predicted, if the Department of Energy (DOE) does not discourage the potential contribution of utilities, solar energy could more quickly and efficiently develop into a real solution to some of our energy problems.

II. THE NATIONAL ENERGY CONSERVATION POLICY ACT (NECPA)

A. *General Purposes*

The Residential Energy Conservation Utility Program under NECPA was enacted in 1978,²⁰ as part of a general methodology to help reduce the growth in energy demand and conserve nonrenewable resources. It presently applies to residential buildings with four or

18. See 42 U.S.C. §§ 8214(b)(1), 8217(e) (Supp. II 1978).

19. See Comment, *The Automobile Controversy—Federal Control of Vehicular Emissions*, 4 *ECOLOGY L.Q.* 661, 680-92 (1975). Because of largely self-imposed time constraints, the Environmental Protection Agency (EPA) concentrated its research efforts on pollution control devices which could be added on to the existing internal combustion engine. This emphasis on add-on controls, coupled with the time constraints, precluded research into other alternatives such as replacing the internal combustion engine or modifying the fuel used to achieve the desired reductions.

This preclusion of other alternatives left the EPA with only one option, the catalytic converter. Many regard this device as only a short-term answer for meeting pollution control goals. If the catalytic converter does not turn out to be the right strategy, the EPA and the automobile industry will be forced to seek new alternatives.

20. National Energy Conservation Policy Act of 1978, Pub. L. No. 95-619, 92 Stat. 3206, as amended by Act of June 30, 1980, Pub. L. No. 96-294, 94 Stat. 741.

fewer units.²¹ In order to accomplish its goals, the Act regulates the conduct of suppliers and installers of home residential conservation measures and lending institutions which finance the conservation measures.²² In addition, the Act regulates utility companies when they engage in sales, service, installation, and/or financing of residential conservation devices.²³

Affirmative duties are placed upon the regulated industries to prevent the occurrence of unethical business practices which could damage the industry and lead to fewer residents taking advantage of the energy saving measures. Congress intended to regulate the solar and conservation fields in a way which would insure product quality, prevent unfair trade practices, and instill a sense of confidence in customers concerning reliability.²⁴ The problems Congress has tried to head off are common to infant industries where consumer awareness is at a minimum and exaggerated claims abound.²⁵

The main public concerns with solar development are reliability and potential energy savings. Since few solar units are now in place, long term reliability is still an open question. Reliability, in turn, affects

21. 42 U.S.C. § 8211(9)(B) (Supp. II 1978). Utility participation in the solar energy industry is not presumptively prohibited where industrial, commercial, or multiple dwellings exceeding four units are concerned. After January 1, 1982, the program will expand to cover any residence with more than four dwelling units that contain individual unit heating or cooling systems. National Energy Conservation Policy Act Amendments of June 30, 1980, Pub. L. No. 96-294, § 541, 94 Stat. 741 (amending 42 U.S.C. § 8211(9) (Supp. II 1978)).

22. The Secretary of Energy, under 42 U.S.C. § 8214(b)(1) (Supp. II 1978), shall not approve a residential energy conservation plan unless it contains procedures to prevent unfair, deceptive, or anticompetitive acts affecting commerce. These procedures must include measures to insure, under 42 U.S.C. § 8213(b)(2) (Supp. II 1978), that standards are established to provide for the general safety and effectiveness of installation procedures, for fair and reasonable prices and rates of interest, and for the blacklisting of suppliers, contractors, or lending institutions who provide substandard service. The ability to delete individuals and companies from the list of recommended businesses likely will be the method of eliminating unscrupulous firms from the residential utility program.

Through DOE regulations, standards have also been established to insure that suppliers and installers meet certain minimum requirements. For example, installation and material standards for solar domestic hot water and active solar space heating systems are found at 10 C.F.R. § 456.702 (1980). Generally, the equipment and material standards are found at *id.* §§ 456.701-914. In addition, Congress has required that all suppliers, manufacturers, and installation contractors must warrant their materials and workmanship for one year. National Energy Conservation Policy Act Amendments of June 30, 1980, Pub. L. No. 96-294, § 542(b), 94 Stat. 741-42 (to be codified in 42 U.S.C. § 8213(3)(c)).

23. National Energy Conservation Act Amendments of June 30, 1980, Pub. L. No. 96-294, §§ 546, 547, 94 Stat. 743-45.

24. See Comment, 30 MERCER L. REV. 547, 548-55 (1979).

25. See Danziger, *Solar Energy Financing: Variable Loan Payments in an Energy Savings-Paid Loan Program*, 1 WHITTIER L. REV. 13, 16 (1978).

potential dollar and energy savings as break-down costs cannot be accurately estimated.²⁶ A 1977 Arizona study of current solar users showed that poor product quality and high cost/benefit ratios were among the most widely cited reasons for slow solar development.²⁷ In order to solve these problems, the Act delegates authority to DOE to promulgate regulations which will give quality control measures the force of law.²⁸

B. *The Implementation Plan*

The primary responsibility for accomplishing the purposes of the Act, namely, insuring conservation and protecting the public from unfair trade practices, was delegated by Congress to DOE. The Secretary is vested with the duty to promulgate regulations and establish procedures to be followed by the affected parties.²⁹ The method of implementation follows an increasingly familiar pattern wherein Congress allows the federal agency with primary responsibility to regulate conduct within a broad legislative mandate. The agency, here DOE, delegates authority to special state agencies to implement the program at the local level.³⁰ Other examples of this method of regulation can be found under the Clean Air Act,³¹ the Coastal Zone Management Act,³² and the Clean Water Act.³³ This method has been

26. See Smackey, *Should Electric Utilities Market Solar Energy?* PUB. UTIL. FORT. SEPT. 28, 1978, at 37, 42 [hereinafter cited as Smackey].

27. See Walker, *Factors Influencing Solar Energy Commercialization*, in V ENERGY TECHNOLOGY 473 (1978) [hereinafter cited as Walker]. Dr. Walker surveyed solar users in Phoenix, Tucson, and Yuma where, despite the high number of days with sunshine, the progress of solar commercialization has been slower than expected. Those responding to the study, when asked for the "most common factors inhibiting current demand for solar energy products," provided the following information:

REASON	FREQUENCY OF MENTION
High initial cost of products	68.1%
Not enough information available to the public	44.9%
Poor product quality	28.2%
Poor cost/benefit ratio	20.4%
Unfavorable public attitudes	16.7%
Lack of Government support	16.2%

Id. at 475. As stated by Dr. Walker, with the exception of the last factor, *viz.*, lack of government support, these factors are common "characteristics of the developmental life cycle for any durable good." *Id.*

28. 42 U.S.C. §§ 8222-8223 (Supp. II 1978).

29. 42 U.S.C. §§ 8213, 8222 (Supp. II 1978); see 10 C.F.R. §§ 456.101-914 (1980).

30. 42 U.S.C. § 8214 (Supp. II 1978). See Brooks, *The Law of Plan Implementation in the United States*, 16 URB. L. ANN. 225, 233 (1979) [hereinafter cited as Brooks].

31. 42 U.S.C. §§ 7401-7642 (Supp. II 1978).

32. 16 U.S.C. §§ 1451-1464 (1976 & Supp. III 1979).

33. 33 U.S.C. §§ 1251-1376 (1976 & Supp. III 1979).

called "The Plan Implementation Model" in a recent article.³⁴ The most significant aspect of this planning strategy is its joinder, in a single document, of planning goals with implementation devices to achieve the statutory purposes.³⁵ In short, Congress identifies the basic objectives and policy issues; then the federal agency defines the more specific standards and methods which the implementation plans may adopt; finally, the individual states must fashion a particular implementation plan for achieving these goals and standards.³⁶ Under NECPA, the states submit a residential energy conservation plan to the Secretary of Energy for approval.³⁷ The Secretary cannot approve the plan unless it contains several mandatory elements.³⁸ It must, for example, require each regulated utility to implement a program supplying customers with information on available conservation measures.³⁹ The list of conservation measures must also include the names of approved businesses which can assist the customer in taking advantage of the product list.⁴⁰ Suppliers and contractors conducting business in the field must be listed along with lending institutions willing to finance consumer conservation activities.⁴¹ The state implementation

34. See Brooks, *supra* note 30, at 231. Traditional planning methods separate planning from implementation, as in land use planning by local governments whose plans are usually advisory. See T. KENT, *THE URBAN GENERAL PLAN* (1964). See generally Pierce, *The Choice Between Adjudication and Rulemaking for Formulating and Implementing Energy Policy*, 31 HASTINGS L.J. 1 (1979); Stewart, *Pyramids of Sacrifice? Problems of Federalism in Mandating State Implementation of National Environmental Policy*, 86 YALE L.J. 1196 (1977) [hereinafter cited as Stewart]. See also Haar, *In Accordance with a Comprehensive Plan*, 68 HARV L. REV. 1154 (1955); Mandelker, *The Role of the Local Comprehensive Plan in Land Use Regulation*, 74 MICH. L. REV. 899 (1976).

35. See Brooks, *supra* note 30, at 231-32 where the author amplifies the distinction between the methods:

The underlying assumptions of the implementation plan are customarily different from the advisory model of planning. The implementation plan assumes the basic objectives, which are usually within a narrow range, are agreed upon, and the major planning task is to select the array of approaches necessary to achieve those objectives.

Id.

36. See *id.* at 231-33. There are many inherent problems with the implementation plan, however, since the establishment of flexible criteria for the individual plans often causes vagueness and confusion as to what the plans actually require. *Id.* at 233, 259-60.

37. The proposed state plan must be submitted within 180 days of the effective date of the regulations. 42 U.S.C. § 8213(c)(1)(A) (Supp. II 1978); see 10 C.F.R. § 456.205(b) (1980).

38. 42 U.S.C. § 8214 (Supp. II 1978), as amended by Act of June 30, 1980, Pub. L. No. 96-294, § 542(c), 94 Stat. 742; § 543, 94 Stat. 742; § 546(b), 94 Stat. 744.

39. 42 U.S.C. § 8216(a) (Supp. II 1978); see 10 C.F.R. § 456.306 (1980).

40. 42 U.S.C. § 8214(a)(2)(3) (Supp. II 1978), as amended by Act of June 30, 1980, Pub. L. No. 96-294, §§ 542(c), 543, 94 Stat. 742; see 10 C.F.R. § 456.312 (1980).

41. 42 U.S.C. § 8214(a)(2)(3) (Supp. II 1978), as amended by Act of June 30, 1980, Pub. L. No. 96-294, §§ 542(c), 543, 94 Stat. 742; see 10 C.F.R. § 456.312 (1980).

plan (SIP) must also provide a procedure for resolving complaints against those who sell and install conservation equipment.⁴²

As promulgator of the regulations, DOE is responsible for elucidating the standard of compliance. For example, DOE must set forth safety and effectiveness standards for all home conservation measures,⁴³ as well as those standards according to which the states may establish price and rate of interest guidelines.⁴⁴ DOE, pursuant to Federal Trade Commission direction, must promulgate regulations designed to prevent unfair and anticompetitive trade practices.⁴⁵ Once the states meet the requirements for the mandatory elements and submit their implementation plans to the Secretary, approval shall be had within ninety days.⁴⁶ If the Secretary disapproves an SIP,⁴⁷ the state has sixty days to submit another plan.⁴⁸

42. 42 U.S.C. § 8214(c)(Supp. II 1978); see 10 C.F.R. § 456.315 (1980). Under the rules promulgated by the Secretary, complaints by eligible customers against persons who sell, install, or finance conservation and solar measures are to be resolved by a conciliation conference. The conference must be provided free of charge and participation by the customer bringing the complaint is voluntary.

For persons having grievances arising from injuries caused by an activity carried out under a state implementation plan or from a violation of the plan, a redress proceeding is required by 10 C.F.R. § 456.315(b) (1980). This procedure is available even if the person bringing the complaint has already participated in a § 456.315(a) conciliation conference. *Id.* § 456.315(a). The redress proceeding is more formal and has provisions for timely notice and hearing. All persons with a substantial interest in the matter are allowed to participate. It is held before an impartial officer, as in the conciliation conference, and formal evidentiary procedures are not required. The decision of the hearing officer is enforceable under state law and a statement of reasons for the finding must be written. The decision and statement of reasons must be forwarded to the lead agency, *i.e.*, the state agency in charge of the implementation plan.

43. 42 U.S.C. § 8223 (Supp. II 1978). Standards for solar hot water and space heating systems are authorized under 10 C.F.R. § 456.702 (1980); these standards are found in U.S. Dep't of Housing and Urban Development, Intermediate Minimum Property Standards Supplement (1977). For other energy conservation standards, see 10 C.F.R. §§ 456.801-815 (1980) (material standards); *id.* §§ 456.901-914 (installation standards).

44. 42 U.S.C. § 8213(b)(2)(C) (Supp. II 1978).

45. *Id.* § 8213(b)(2)(D). The FTC and DOE also must jointly file a report with Congress on the financing, installation, and supply activities of utility companies. National Energy Conservation Policy Act Amendments of June 30, 1980, Pub. L. No. 96-294, § 547, 94 Stat. 744 (amending 42 U.S.C. § 8217(g) (Supp. II 1978)).

46. 42 U.S.C. § 8213(c)(1)(B) (Supp. II 1978).

47. *Id.* See 10 C.F.R. § 456.205 (1980). The regulations do not provide for alternative procedures if the state and DOE cannot agree upon a mutually satisfactory plan. See Gordon, *When Push Comes to Infringement of State Sovereignty: Implementation of EPA's Transportation Control Plans*, 1976 WIS. L. REV. 1111, 1143-55; Stewart, *supra* note 34, at 1239-43; Comment, *The Implementation of Transportation Controls Under the 1977 Clean Air Act Amendments*, 50 U. COLO. L. REV. 247, 252-58 (1979).

48. If a state does not submit a plan within 270 days, the Secretary of Energy can devise a substitute plan to serve in the absence of a state implementation plan. 42 U.S.C. § 8220 (Supp. II 1978). This option, if resorted to, could be self-defeating since the key to

Upon approval of the SIP, affirmative duties arise for the regulated utilities.⁴⁹ No later than six months after SIP acceptance, each regulated utility must begin informing its residential customers about suggested conservation measures for their building type, and the savings likely to result from the installation of suggested measures and recommended techniques, including those developed by DOE, which save energy and do not require installation.⁵⁰ To implement this strategy, the utility must include in its program procedures whereby energy audits of residences can be conducted upon request of the owner or occupier.⁵¹ At the inspection, the utility or its subcontractor must determine and inform the residential customer of estimated costs and savings likely to result from installation of the measures.⁵² The utility must also arrange to have the suggested measures installed and, if necessary, arrange for a lender to finance the purchase.⁵³ At

an efficient state-federal program rests on state implementation. In past programs, implementation problems have arisen when federal solutions are provided for uniquely local concerns. See Stewart, note 34 *supra*. Because of these local-federal conflicts, it is unlikely that DOE will promulgate any substitute plans. According to one source, a few states, such as Oregon, currently have NECPA-like programs in operation. See Browne & Graine, *State Energy Regulation Through Conservation Legislation*, in 3 ENERGY LAW SERVICE (Monograph 9A at 24) (H. Green ed. 1979).

49. 42 U.S.C. § 8211(5) (Supp. II 1978). "The term 'regulated utility' means a public utility with respect to whose rates a State regulatory commission has ratemaking authority." *Id.* A "public utility" is defined as "any person, State agency, or Federal agency which is engaged in the business of selling natural gas or electric energy, or both, to residential customers for use in a residential building." *Id.* § 8211(4).

50. 42 U.S.C. § 8216(a) (Supp. II 1978); see 10 C.F.R. § 456.306 (1980). Each regulated utility must send each eligible customer a program announcement detailing the services offered, including: (1) a list of program measures; (2) estimates of costs and savings for a specified period of time; (3) a description of the services offered by the utility under the residential program; (4) a brief explanation of energy tax credits available; (5) an explanation of the Weatherization Assistance Program for Low Income Persons, see 10 C.F.R. §§ 440.1-30 (1980); and (6) a description of methods used to calculate energy savings. 10 C.F.R. § 456.306(a)(1980).

51. 42 U.S.C. § 8216(b)(1)(A) (Supp. II 1978); see 10 C.F.R. § 456.307 (1980).

52. Under the program audit, the utility auditor must determine the applicability of each program measure (conservation devices). A solar system is applicable to the residence and, therefore, must be considered, under 10 C.F.R. § 456.307(b)(2) (1980), if:

(v) [w]ith respect to active solar heating systems, or combined active solar systems, a site exists on or near the residence which is free of major obstruction to solar radiation and the residence has a space heating system other than a steam heating, electric resistance radiant heating, or electric resistance baseboard heating system;

(vi) [w]ith respect to active domestic hot water systems, a site exists on or near the residence which is free of major obstruction to solar radiation . . .

Id.

53. Installation, 42 U.S.C. § 8216(b)(1)(B) (Supp. II 1978); see 10 C.F.R. § 456.308 (1980); financing, 42 U.S.C. § 8216(b)(1)(C) (Supp. II 1978); see 10 C.F.R. § 456.309 (1980).

utility expense, it must provide lists of approved suppliers, installers, and lending institutions to the residential customers in its service area.⁵⁴

The utility program also requires the public utility to carefully account for the payment of costs associated with the program. All amounts spent and received by the company attributable to its utility program must be reconciled on the utility's books separately from other business activities.⁵⁵ The method of recovery is to be determined by the state public utility commission.⁵⁶ The costs incurred by a utility in distributing information to all residential class customers, such as published lists of suggested measures, suppliers, installers, and lending institutions, will be distributed to the entire class of customers.⁵⁷ For inspections, the cost of the requested visit can be charged either to the entire customer class or to the customer requesting the service. The customer, however, can be directly charged a total of only fifteen dollars per dwelling unit or the actual cost of such activities, whichever is less.⁵⁸

While the general guidelines regarding costs of providing information and other aspects of the utility program have been enunciated by Congress, the actual planning and implementation will be carried out by DOE and the state agencies who will work under strict DOE regulations. Many of the difficult policy questions concerning utility involvement in the commercial aspects of solar energy and conservation have been delegated to DOE,⁵⁹ and problems regarding federal control over

54. 42 U.S.C. § 8216(c)(1)(B) (Supp. II 1978); see 10 C.F.R. § 456.310(b)(1) (1980).

55. 42 U.S.C. § 8216(c)(1)(A) (Supp. II 1978).

56. National Energy Conservation Policy Act Amendments of June 30, 1980, Pub. L. No. 96-294, § 544(1), 94 Stat. 742 (amending 42 U.S.C. § 8216(c)(1)(C) (Supp. II 1978)).

57. 42 U.S.C. § 8216(c)(1)(B) (Supp. II 1978); see 10 C.F.R. § 456.310(b)(1) (1980).

58. The 1980 amendment further provided that in determining the amount to be recovered directly from customers, the state regulatory authority (in the case of a regulated utility) or the utility (in the case of a nonregulated utility) shall take into consideration insofar as practicable the customers' ability to pay and the likely levels of participation in the utility program which will result from such recovery. National Energy Conservation Policy Act Amendments of June 30, 1980, Pub. L. No. 96-294, § 544, 94 Stat. 742 (amending 42 U.S.C. § 8216(c)(1)(C) (Supp. II 1978)).

59. The Act includes exemption provisions, see 42 U.S.C. § 8217(d) (Supp. II 1978), which would allow a utility to participate in the commercialization of solar energy. The prohibitions on supply, installation, and financing will not apply to any solar equipment which the Secretary of Energy determines was being installed or financed by a public utility on the date of enactment, *id.* § 8217(d)(1); nor will a public utility be prohibited from engaging in these activities if the Secretary determines that they were broadly advertised or substantial preparations were completed for them on or before the date of enactment, *id.* § 8217(d)(2). The Secretary has considerable discretion in ascertaining the contours of the elements of these exemptions. Additional discretion has been delegated to the Secretary of Energy with regard to granting temporary exemptions for a period not to exceed three years, *id.* § 8219(a). Probably the most significant delegation of discre-

state implementation of utility plans have been left to DOE to work out.⁶⁰

C. *The Presumption Against Utility Participation*

While the statutes are aimed at unfair and unethical practices in all aspects of the solar and conservation industries, the utility companies bear the greatest burden and have the most limited access to the commercial aspect of the conservation and solar energy fields. The Congressional fears of utility involvement seem to be similar to those of oil company entry into alternative energy fields.⁶¹ This is based on the theory that large corporations would control the industry and prevent the development of healthy competition.⁶² Consequently, the Act presumptively prohibits utilities from supplying, installing, or financing conservation measures.⁶³

tionary power to the Secretary of Energy under this legislation is his authority to determine on a case by case basis the extent to which utilities will be allowed to participate in the commercialization of solar energy equipment and other energy conservation devices under the waiver provision of § 8217(e):

The Secretary may, upon petition of a public utility, supported in the case of a regulated utility by a Governor, waive in whole or in part the prohibitions contained in subsection (a) of this section with respect to the utility if such utility demonstrates to the satisfaction of the Secretary that, in carrying out prohibited activities under subsection (a) of this section, fair and reasonable prices and rates of interest would be charged and the Secretary finds, after consultation with the Federal Trade Commission, that such activities would not be inconsistent with the prevention of unfair methods of competition and the prevention of unfair or deceptive acts or practices.

Id. § 8217(e).

60. *Id.* § 8220.

61. There have been a number of bills in Congress aimed at oil companies and their expansion into non-oil businesses. One such bill, S. 1246, 96th Cong., 1st Sess., 125 CONG. REC. S6701-12 (daily ed. May 24, 1979), attempts to prevent large oil companies from acquiring businesses with assets in excess of \$100,000,000. See Lazaroff, *The Legislative Attack on Oil Company Mergers—Dragon Slaying or Search For a Scapegoat?* 57 U. DET. J. URB. L. 41, 41-48 (1979). Another bill, known as the Energy Industry Competition and Performance Act, would outlaw "the retention or acquisition of any interest or control of any coal or uranium asset by a major petroleum company." See Moyer, *Horizontal Divestiture in the Petroleum Industry: An Analysis*, 24 ANTITRUST BULL. 535, 536 (1979).

62. The prohibition was based on a substantial possibility that utility participation would lead to anticompetitive and unfair business practices. Proposed Rulemaking and Public Hearing on Residential Conservation Service Program, 44 Fed. Reg. 16,546, 16,566-67 (1979).

63. 6 U.S. CODE CONG. & AD. NEWS 8135, 8142-44 (1978); 42 U.S.C. § 8217(a) as amended by Act of June 30, 1980, Pub. L. No. 96-294, § 546a, 94 Stat. 743. By recent amendment, utility companies can participate to a limited extent in the supply of solar and conservation measures through independent contractors. The independent supplier or installer must be on the list of suppliers or installers each utility must keep under the program. Selection of an independent contractor by a utility cannot result in the diversion of contracts to the independent contractor. 6A U.S. CODE CONG. & AD. NEWS 4016, 4017 (1980);

Two exceptions to the general prohibition exist in the form of a grandfather clause⁶⁴ and a waiver procedure.⁶⁵ Under the grandfather clause, a utility which began installing, supplying, or financing residential conservation measures by November 9, 1978, may continue doing so under the Act.⁶⁶ This includes utilities which had already begun advertising or had made substantial preparations toward undertaking such activities by the date of enactment.⁶⁷ The waiver petition allows the utility to apply to the Secretary of Energy if it desires to install, supply, or finance residential conservation measures.⁶⁸ This petition must first gain the support of the governor of the state where the petitioner's service area is located.⁶⁹ In its petition, the utility must demonstrate to the Secretary that:

[I]n carrying out prohibited activities . . . fair and reasonable prices and rates of interest would be charged and the Secretary finds, after consultation with the Federal Trade Commission, that such activities would not be inconsistent with the prevention of unfair methods of competition and the prevention of unfair or deceptive acts or practices.⁷⁰

The presumption under NECPA is that utility companies will inhibit beneficial economic growth in the conservation and solar energy fields.⁷¹ This presumption makes "front end" review applicable only to

National Energy Conservation Policy Act Amendments of June 30, 1980, Pub. L. No. 96-294, § 546(a), 94 Stat. 743 (amending 42 U.S.C. § 8217 (a)-(c) (1980)). The extent of participation by utilities under this recent legislation is unknown as Congress did not specify whether utilities are permitted to benefit financially from the contracts, or can only recover costs and expenses in a manner similar to other aspects of the utility program.

64. 42 U.S.C. § 8217(d) (Supp. II 1978). See note 59 *supra*.

65. 42 U.S.C. § 8217(e) (Supp. II 1978). See note 59 *supra*.

66. 42 U.S.C. § 8217(d) (Supp. II 1978); see 10 C.F.R. § 456.504. Some utilities, such as Southern California Gas Company, have already entered the field and are engaging in sales and service of residential conservation measures. See Sparrow, *Public Utility Involvement with Distributed Solar Systems*, 1 SOLAR L. RPTR. 955, 958 n.12 (1979) [hereinafter cited as Sparrow].

67. 42 U.S.C. § 8217(d)(2) (Supp. II 1978); see 10 C.F.R. § 456.504(b) (1980).

68. 42 U.S.C. § 8217(e) (Supp. II 1978); see 10 C.F.R. § 456.505 (1980).

69. 42 U.S.C. § 8217(e) (Supp. II 1978); see 10 C.F.R. § 456.505(a)(1) (1980).

70. The application for the waiver shall be presented to the Assistant Secretary for Conservation and Solar Energy for determination. 10 C.F.R. § 456.507 (1980). Any person adversely affected by the decision of the Assistant Secretary regarding the waiver or grandfather clauses may appeal to the Office of Hearing and Appeals. *Id.* § 456.508.

71. See Lawrence & Minan, *The Competitive Aspects of Utility Participation in Solar Development*, 54 IND. L.J. 229, (1979) [hereinafter cited as Lawrence & Minan I], where the authors state:

The potential for unfair competition is probably the more urgent concern advanced in support of complete prohibition of public utility involvement in supplying solar systems. The National Energy Conservation Policy Act indicates it was foremost in the minds of the draftsmen of this legislation. [See, e.g., 42 U.S.C. §§ 8214(b)(1), 8214(e) (Supp. II 1978)].

With the utilities' substantial investment in conventional generating equipment,

utility companies.⁷² However, taking the Act as a whole, it appears that Congress was similarly concerned about possible unfair business prac-

the concern is that they will be interested in restricting the competitive energy source and not in promoting it. Public utilities might effectively use their superior financial strength and the flow of their monopoly profits to drive smaller rivals out of business. On the other hand, unfair competition, like the stifling of technological development, can also occur under conditions in which the utilities actively seek to utilize rather than suppress the solar resource. Business advantages from existing utility contacts with customers might accrue to utilities which would make it too difficult for other entities to compete.

Appliance sales and promotional inducements by electric and gas utilities provide some historical support for the concern over unfair competition with utility involvement. In the past, utilities were actively involved in the sale of large domestic appliances such as ranges and hot water heaters since these sales increased the demand for electric and natural gas service. The advantages of increased demand for utility services were so great that some utilities even sold appliances at a loss.

Utilities also used a number of promotional practices designed to induce builders of multi-unit structures and developments to use one energy source exclusively and to encourage individuals to shift from one source of energy to another. These practices included "cash payments, free underground trenching, free appliances, free advertising, free installation of appliances, low-cost financing, and guaranteed rates." The utilities considered these inducements to be necessary in order to effectively compete in markets which had been predominantly served by other utilities or by fuel oil companies. These types of activities resulted in claims by appliance retailers and other companies in affected markets that the utility involvement constituted unfair competition.

Id. at 262-64 (citations added and footnotes omitted). It is unlikely, however, that the anticompetitive aspects of past utility involvement in consumer sales activities will recur with the sales of solar equipment for various reasons cited by the authors. *Id.* at 264-65.

72. "Front-end review" refers to the practice of requiring regulatory review of a program or federal grant application prior to the implementation of the program. It is done when the regulatory agency, because of the existence of certain facts, assumes that federal law will not be followed in a certain program. In such cases, review prior to implementation assures the agency that its laws and procedures will be followed.

Such a presumption is found in Housing and Urban Development regulations for grant applications by local governments trying to secure housing assistance funds. If a certain percentage of the funds in the grant application is not set aside for low-income housing, it is assumed the application does not meet statutory requirements for being of primary benefit to low income persons. See 24 C.F.R. § 570.302 (1980).

This same presumption of failure to meet legal requirements has been applied to utility participation of solar energy commercialization. The assumption is that utility companies will act to restrain trade and engage in anticompetitive practices unless their commercialization plans are first reviewed. While any other business is allowed to enter the field without "front-end review," utility companies must go through the time consuming waiver process. Considering the safeguards built into NECPA, this front-end review would seem unnecessary. Complaint procedures are built into the program to address violations, 10 C.F.R. § 456.315 (1980), and the FTC has the duty to promulgate specific guidelines to prevent unfair trade practices, *id.* § 456.505. These devices would eliminate decisions, made by states, which ostensibly will be based on antitrust grounds but ultimately will be linked to political concerns. Since antitrust questions are a federal issue, the decision should rest at the federal level.

tices of non-utilities.⁷³ While the Act aims to increase consumer acceptance of and ultimate satisfaction with conservation and solar energy measures, it puts up arguably unfair obstacles to entry by one of the best possible sources of solar energy development.

III. SOLAR ENERGY UTILITY MONOPOLY

A. *The Rationale for the Public Utility Monopoly*

While utility participation in solar and conservation commercialization is not totally precluded under NECPA, it is certain that, under the present regulatory framework, permitting a utility monopoly of solar energy systems is unacceptable. Given the basic rationale for the utility monopoly, the refusal to extend their monopoly franchise to decentralized solar applications is wise.

The development of the utility regulatory scheme which led to a service monopoly came about because of factors unique to the industries involved. The principal factor which set the utilities apart from the bulk of business ventures has been the high start-up costs for provision of service.⁷⁴ A significant portion of the utility expense is in transmission costs, such as power lines and other service delivery equipment. Competition within service areas resulted in duplications of the power grid for each competing company and higher costs to customers.⁷⁵ To prevent this destructive competition, state and local governments began awarding franchises for exclusive sales areas. In exchange for this protection, the utilities gave up some of their autonomy to the state public utility commissions (PUCs).⁷⁶ The public utility has a responsibility which has been stated as:

73. The concerns of Congress go to the prevention of unfair pricing policies and trade practices. Overall, the thrust of the legislation is to increase the acceptance of conservation and solar energy measures by insuring reliability. Congressional fears were based not only on utility participation, but also on the poor performance by the existing solar industry. See *Solar Energy Devices Abound But Many Are Useless or Inefficient*, Wall St. J., April 28, 1977, at 1, col. 1. *Contra*, Mara & Engel, *Institutional Barriers to Solar Energy: Early HUD Demonstration Experiences*, 1 SOLAR L. RPTR. 1095, 1113-15 (1980). However, review of the participation of non-utilities in the program does not come about until a complaint is lodged; 10 C.F.R. § 456.315 (1980).

74. See W. NICHOLSON, *MICROECONOMIC THEORY: BASIC PRINCIPLES AND EXTENSIONS* 293 (1972).

75. See Lovins, *Energy Strategy: The Road Not Taken?* 55 FOREIGN AFFAIRS 65 (1976) [hereinafter cited as Lovins]. "[U]tilities distribute approximately 10 percent of total 'end use' energy in this nation and require nearly 27 percent of all energy needed to generate electricity." *Id.* at 68. See also Cockrell, *Coal Conversion by Electric Utilities: Reconciling Energy Independence and Environmental Protection*, 28 HASTINGS L.J. 1245-46 (1977) [hereinafter cited as Cockrell].

76. See J. BONBRIGHT, *PRINCIPLES OF PUBLIC UTILITY RATES* (1961); G. WILSON, J. HERRING & R. EUTSLER, *PUBLIC UTILITY REGULATION 21-70* (1938); Bull, *Competition Between Public and Private Enterprise*, 26 AM. J. COMP. L. 433, 442 (1978).

(1) the duty to serve all who come, (2) with adequate facilities, (3) at reasonable rates and (4) without discrimination. This responsibility charges each utility with the proper administration of a public trust, which properly speaking is a function of the state itself. Once the responsibility is acquired, it cannot easily be set aside.⁷⁷

With the monopoly protection, utilities were able to expand their facilities to meet an ever increasing demand for services without fear of undercutting competition.⁷⁸ This expansion of generating capacity enabled utilities to provide service at a lower cost because of the economies of scale particularly associated with electrical power plants.⁷⁹ Within limits, the larger the production facility, the more efficiently it can operate. This expansion aided the industrial development of the nation and allowed for the extension of the utility network to every part of the country.⁸⁰ Throughout all of this expansion, cost of service either dropped or increased just slightly.⁸¹

B. *Utility Costs Rise in the Seventies*

The trend of reduced cost and increased service continued through the Sixties, but began to reverse itself in the Seventies.⁸² Three factors in particular worked to increase the cost of service. Probably the first and most dramatic cause of the reversal was the Arab Oil Embargo of

77. Hills, *A Reappraisal of Public Utility Responsibility in the Electric Utility Industry*, 9 ENVTL L. 407, 414 (1979) (footnotes omitted) [hereinafter cited as Hills].

78. Under the holding in *Wolff Packing Co. v. Industrial Court*, 262 U.S. 522 (1923), the state has the power to regulate certain industries, such as gas and electric companies, whose businesses are carried out under a public grant of authority. These powers give the state control over these industries, but special privileges are also extended to the utilities. The power of eminent domain was one of the special privileges extended to the utility companies. *Munn v. Illinois*, 94 U.S. 113 (1877). While the special status given to utilities sets them apart from industry in general, they are still subject to most of the controls common to all business, such as the antitrust laws. In *Otter Tail Power Co. v. United States*, 410 U.S. 366 (1973), it was held that the special status of the utilities does not exempt them from the Sherman Act. Section 2 of the Sherman Act, applied in *Otter Tail*, states in part: "[e]very person who shall monopolize, or attempt to monopolize . . . any part of the trade or commerce among the several States . . . shall be deemed guilty of a felony . . ." 15 U.S.C. § 2 (1976).

This statutory restraint is of particular importance to this inquiry as it provides a significant weapon against unfair utility participation in the solar and conservation fields without resorting to front-end review. See Laitos & Feuerstein, in 3 ENERGY LAW SERVICE (Monograph 7A at 30-36) (H. Green ed. 1979).

79. See Lawrence & Minan I, *supra* note 71, at 255.

80. *Id.*

81. Rate schedules declined until 1950, then began to rise slightly throughout the 50's and 60's. See Shephard, *Utility Growth and Profits Under Regulation*, in W. SHEPHARD & T. GIES, *UTILITY REGULATION: NEW DIRECTION IN THEORY AND POLICY* 3, 16 (1967).

82. See Samuelson, *Battle Lines are Being Generated for Reform of Electric Utility Rates*, 8 NAT'L. J. 1474 (1976).

1973 and the subsequent crude oil price hikes.⁸³ Plants that used oil were forced to raise prices.⁸⁴ Second, the troubled national economy hurt the utility industry; for example, the recent inflationary periods were manifested in rate increases. One area of utility operations particularly hit by inflation is the construction of new plants.⁸⁵ Since the construction of power plants is a long and involved process, with lead times of eight to twelve years, inflation and higher interest rates can multiply original cost estimates.⁸⁶

Third, compliance with the demands of environmentalists has augmented the cost of providing utility service. For example, meeting the more stringent health and safety requirements of the Seventies retarded the construction of new plants. The application of the Clean Air Act⁸⁷ and the Clean Water Act⁸⁸ to major industrial sources, such as power plants, has raised the cost of generating power and aggravated the omnipresent inflationary problems.⁸⁹ These constrictions will persist even as the emphasis shifts to solving the energy crisis. Short-term measures such as increasing the use of coal could exacerbate health problems, resulting in the reinforcement of present controls.⁹⁰ Coal-fired plants, while not subject to OPEC price increases, will incur added costs because their use presents additional environmental problems such as "acid rain."⁹¹ Nuclear energy faces

83. See MONTBRIAL, *supra* note 1, at 66-85.

84. These price hikes caused rates to increase at an alarming proportion:

In 1974, electric power rates increased 55 percent. . . . Also during 1974 and the first half of 1975, fuel oil prices rose 59 percent and natural gas rates 21 percent. According to a study by a Senate subcommittee, \$9.6 billion in increases were granted in 1974 to electric and gas utilities. The 1974 increases and pending requests equal almost one percent of the gross national product and were a significant contributor to overall inflation.

Taubman & Frieden, *Electricity Rate Structures: History and Implications for the Poor*, 10 CLEARINGHOUSE REV. 431, 438 (1976) (footnote omitted) [hereinafter cited as Taubman & Frieden]. See also Comment, *Con Edison: The Crisis of the Investor-Owned Utility*, 3 FORDHAM URB. L.J. 545, 547-48 (1975).

85. See Joskow, *Inflation and Environmental Concern: Structural Change in the Process of Public Utility Price Regulation*, 17 J.L. & ECON. 291 (1974).

86. See Solomon & Gilgus, *Energy Conservation: A Legal and Policy Analysis*, 30 MERCER L. REV. 487 (1979). See Hills, *supra* note 77, at 408.

87. 42 U.S.C. §§ 7401-7642 (1976 & Supp. II 1978).

88. 33 U.S.C. §§ 1251-1376 (Supp. III 1979).

89. See Grainey, *Energy Conservation: The Federal-State Nexus*, 27 AMER. U.L. REV. 611 (1978) [hereinafter cited as Grainey].

90. The Powerplant and Industrial Fuel Use Act of 1978, Pub. L. 95-620, 92 Stat. 3889 (codified at 42 U.S.C. 8301-8483 (Supp. II 1978)), generally prohibits the construction of new oil- and/or gas-fired power plants and encourages coal use. For the applicable regulations on new electric power plants, see 10 C.F.R. § 503 (1979); see also Cockrell, note 75 *supra*.

91. Areas of the country with high concentrations of industry, particularly the Northeast, are very susceptible to this problem. See Kirschten, *Politics at the Heart of the Clean Air Debate*, 11 NAT'L. J. 812 (1979).

similar problems of added costs and extended delays to insure safety.⁹² The delivered cost of nuclear power has accelerated along with other energy sources, so that the claims made in the Fifties that electricity would be so cheap that metering wouldn't be needed sound very hollow today.⁹³

Although price increases are restrained to a limited extent because public utilities are permitted to function as monopolies, added costs from outside the system detract from this advantage. Large, centrally located energy distribution systems requiring high technology have experienced skyrocketing costs, and this trend will continue. According to a leading commentator, because utility companies have not based the price of service on the replacement costs of future supplies, "the current-dollar cost of a kilowatt-hour will treble by 1985, and that two-thirds of that increase will be capital charges for new plants."⁹⁴

C. The Inapplicability of the Monopoly Power to Decentralized Solar Energy

While the rationale for monopoly control of large scale power plants is still present, the question remains whether this monopoly should be extended to the marketing of small scale, decentralized solar systems. The economies of scale which justified the monopoly of energy delivery in large, central generating facilities do not pertain to solar units. As stated by Professors Lawrence and Minan:

The public utility natural monopoly markets have "lines" which connect the supplier with the consumer. The significant investment in these lines is the basis of the natural monopoly since their duplication by a competitor creates more capacity than is required and thereby unit costs are raised. Physical lines of connection do not have to be constructed before a sale or lease of solar equipment can be made.

The fixed lines between the supplier and customer result in the creation of a geographical market which can serve customers only in that area. The fixed costs of investment in these permanent connections can thus be recovered only in the market in which they are constructed. On the other hand, the supplier of solar equipment, like the manufacturer or retailer of electrical or gas appliances, is not bound by such market constraints, since these services can be more easily shifted to other markets.⁹⁵

These fixed costs in central power generation are not present in the solar context to justify the extension of the monopoly power to decentralized, independent systems.

92. See MONTBRIAL, *supra* note 1, at 160; COMMONER, *supra* note 4, at 32-48; HAYES, *supra* note 5, at 49-74; MITRE, *supra* note 8, at 110-11.

93. See note 92 *supra*.

94. See Lovins, *supra* note 75, at 71.

95. Lawrence & Minan I, *supra* note 71, at 255-56 (footnotes omitted).

Giving the utilities a monopoly over solar systems could stifle future development because utilities would lack incentives to stimulate production and lower costs.⁹⁶ With a captured market, there is little reason for innovations in the product to increase the market share or forestall competition. There would also be little incentive to reduce costs so that persons of low to moderate incomes could afford the units. At present, only upper income persons are purchasing solar units because initial costs range between \$1,600.00 and \$2,100.00 per unit installed.⁹⁷ If the utilities have a monopoly, they could keep the number of units down through pricing policies, utilize the units only as a load leveling device, and prevent sales which would cut into the base load of power generation.⁹⁸ Only persons who could afford the high start-up costs would benefit, leaving the rest of the population in the utility grid to pay the bulk of the accelerating costs of centrally generated power.⁹⁹

Another problem with extension of the monopoly stems from the methods used by the public utility commissions to establish rates.¹⁰⁰ The rate limits placed upon utilities by PUCs depend upon the size of the rate base. The larger the rate base, *i.e.*, capital value of the utility property less depreciation, the greater the potential profits.¹⁰¹ There is a tendency on the part of utility companies to overcapitalize in order to increase their profitmaking ability.¹⁰² This is known as the Averch, Johnson, and Wellisz (A-J-W) effect. If the A-J-W effect is applied to solar systems, they will be constructed in an overly durable manner to increase the rate base.¹⁰³ Customers would have to pay for superfluous

96. *But see* Sparrow, *supra* note 66, at 963:

Utilities are notoriously poor at innovation, both in implementing new technologies and in developing them; technological risk bearing has not been their forte. Until the advent of the Electric Power Research Institute, the bulk of research and development and process innovation in the electric utility industry was done, not by the industry itself, but by its major suppliers such as General Electric and Westinghouse.

Id.

97. *See* Smackey, *supra* note 26, at 42.

98. *See* Lawrence & Minan, *Solar Energy and Public Utility Rate Regulation*, 26 U.C.L.A. L. REV. 550 (1979) [hereinafter cited as Lawrence & Minan II].

99. Much of the allocation of costs among customer classes depends on the rate schedule devised by the utility and approved by the public utility commission. *See* Dean & Miller, *Utilities at the Dawn of a Solar Age*, 53 N.D. L. REV. 329, 333-50 (1977) [hereinafter cited as Dean & Miller].

100. *Id.*

101. J. BONBRIGHT, *PRINCIPLES OF PUBLIC UTILITY RATES* (1961).

102. *See* Lawrence & Minan I, *supra* note 71, at 273-74; Sparrow, *supra* note 66, at 964-65.

103. *See* note 102 *supra*. *See* Averch & Johnson, *Behavior of the Firm Under Regulatory Constraint*, 52 AM. ECON. REV. 1052 (1962); Wellisz, *Regulation of Natural Gas*

quality which would price many persons out of the market. This problem only surfaces where the utility retains ownership of the installed unit, thereby adding to its rate base. Undoubtedly, this "goldplating" phenomenon will occur in a utility monopoly also to counteract one of the major disincentives to solar investment by the general public, the lack of reliability. Utility companies, known for reliability, would tend to build units with useful lives far beyond what is necessary for the average installation.¹⁰⁴ By obviously overbuilding the product, utilities would allay these fears of poor workmanship. The A-J-W effect, coupled with the need to establish public confidence in the reliability of solar units, would increase unit costs unnecessarily, thereby reducing the number of units sold.

Since the National Energy Conservation Policy Act only permits utility participation in the sales, service, financing, and installation of solar units on an individual company basis pursuant to regulatory approval, the Act's policies are clearly antithetical to utility involvement under an extension of the monopoly framework. Given that decentralized solar energy systems do not lend themselves to natural monopoly, the prohibition appears justified. A utility monopoly could block the innovation needed in the industry to decrease unit costs while maintaining product quality. Utility monopolies could also discourage significant portions of our population from obtaining the benefits offered by a solar system. Competition in the industry is critical at this time if companies are to emerge which can provide good product quality and service at prices affordable by a significant number of persons.

IV. SOLAR COMMERCIALIZATION WITHOUT UTILITY PARTICIPATION

NECPA puts a heavy burden on the public utilities to inform residential customers of the availability of conservation and solar measures. The utility must provide lists of installers, sellers, and financial institutions to customers. The utility company must also, upon request, inspect any home within its service area and recommend those conservation measures which it deems to be most cost effective, as well as arranging for installation and financing. While the utility companies have these affirmative duties¹⁰⁵ which will ultimately lower demand and revenues, they may not participate in the commercial aspects unless they can get federal and state approval.¹⁰⁶

Pipeline Companies: An Economic Analysis, 71 J. POL. ECON. 30 (1963). *Contra*, Joskow, *Inflation and Environmental Concern: Structural Change in the Process of Public Utility Price Regulation*, 17 J. L. & ECON. 291 (1974).

104. See Hills, note 77 *supra*.

105. 42 U.S.C. § 8216(a)-(b) (Supp. II 1978); see text accompanying notes 49-54 *supra*.

106. 42 U.S.C. § 8217(d), (e), (g) (Supp. II 1978); see text accompanying notes 64-70 *supra*.

While many of the problems involved in the interface of solar energy and utilities, such as the application of antitrust regulations, are similar for all types of utility companies, electrical utilities face unique problems in providing service to customers who use solar energy devices. The service provided to solar users is that of back-up capacity to get customers through extended cloudy periods which exceed the storage capacity of the solar systems. If this service is required during a peak power demand period, the electrical utility may have more demand than it has generating capacity so that power shortages will occur. Within certain limits, this problem does not affect gas utilities as gas volume can be increased without taxing any generating capacity. Since power generators used by electrical utilities only in peak periods are less efficient and more expensive to operate, delivered costs will increase.¹⁰⁷ Because of the particular problem faced by electrical utilities, the following inquiry into the difficulties of solar commercialization without utility participation will emphasize the prospective influence of electrical companies.

The NECPA exclusion of utilities could undermine the strength of conservation efforts. For example, utility companies are required to impart to their customers the information which would motivate them to conserve energy and possibly to use alternative energy methods such as solar energy units. Conceivably, utilities could use this influential position to minimize any perceived threat to their revenue-making ability.¹⁰⁸ Although, initially, conservation techniques will benefit electrical utilities, they may ultimately threaten their base load revenues. Conservation devices can be advantageous to electrical utilities by moderating customer demand.¹⁰⁹ Properly used, conservation can help

107. See Sparrow, *supra* note 66, at 965-66.

108. It is curious that Congress felt that there was a substantial possibility of unfair and anticompetitive practices by utilities if they were allowed to market solar and conservation measures, yet the legislation gave utilities the duty of stimulating the development of alternative measures through utility programs. If it is true that utilities would engage in unfair practices to gain a competitive edge, why should they be entrusted with the duty of informing customers how they can save energy and ultimately cut utility revenues?

This quasi-fiduciary position the regulated utilities possess would allow them to shade the presentation given at the customer's residence away from energy saving devices which would cut revenues. While brochures and advertisements could be reviewed by state and federal officials, the day to day customer contacts could not be supervised. The best alternative would be to put residential inspections under an independent contractor, as suggested later under section VI, part B (*Problems Caused by the Fiduciary Duties Placed upon Utilities*) *infra*.

109. See Lawrence & Minan I, *supra* note 71, where the authors explain why a public utility may be interested in conservation techniques:

Factors which may not be readily apparent explain why the utilities are interested in such market entry. Natural gas utilities envision solar energy as a means to conserve dwindling supplies of natural gas by relying on solar energy to satisfy a por-

them avoid the periods of intense energy consumption which tax the generating capacity of electrical utilities, thereby diminishing their reliance on the auxiliary generating capacity reserved for these peak-load periods.¹¹⁰ The auxiliary generators used during peak-load periods are generally older and less efficient models which burn relatively high quantities of more expensive fuels, *e.g.*, oil and gas as opposed to coal and nuclear power. They also require start-up time¹¹¹ in order to make

tion of customer demand. Electric utilities are more likely to focus on decentralized use of solar energy for load management purposes. Widespread adoption of solar systems with adequate storage capacities could significantly diversify utility customer demand, smoothing out a utility's load curve to enable more efficient use of plant facilities. Time of day pricing as it affects the operation of solar energy systems is not the exclusive means to achieve load management control. However, to the extent that such systems are cost beneficial compared with other control techniques and effective in diversifying demand, the utilities are likely to be interested in greater solar utilization.

Id. at 250-51 (footnotes omitted).

110. This will be especially true when solar users obtain their backup service during off-peak hours. *See* Smackey, *supra* note 26, at 43. The application of heat storage technology to solar units would allow solar users to obtain their backup service during periods of low-demand when the utilities can most economically provide it. *See* Lawrence & Minan I, *supra* note 71, where the authors describe heat storage technology:

A transfer fluid or ceramics are heated electrically during non-peak hours in the early morning and late evening. This stored heat is then available for use the next day. Similarly, the fluid in the storage tank of a solar system could be heated during off-peak hours on those days when the solar energy is inadequate to assure a sufficient level of stored capacity. Some utilities have already adopted special rates for service provided only during off-peak hours. Since this off-peak service is less expensive for the utility to provide, the rates for such service have been significantly lower than rates for conventional service.

The off-peak service is more economical for the utility to provide because it does not coincide with the utility's daily peak. When service demand can be diversified by spreading it out during the day rather than having it overlap during relatively short periods, the utility can use its generation facilities more efficiently. A smaller plant capacity is possible whenever the peak demands of different classes do not have to be satisfied simultaneously. Hence, a very realistic way for utilities to try to avoid higher total demand costs is to encourage daily diversity in energy demands.

Although utilities in the past have vigorously promoted their various energy forms in order to increase total sales, greater emphasis is today being placed on diversification of customer demand.

Id. at 240 (footnotes omitted).

111. Start-up time indicates a waste of energy because each time high consumer demand necessitates the use of auxiliary generating capacity, the process of activating the generator requires a new expenditure of energy. Once the period of intense demand has subsided, the auxiliary generators are stopped so that energy is lost as the generator falls from the active to the passive state. The start-up time is, therefore, equivalent to a waste of energy, although it is more accurate to say that the waste occurs in that the auxiliary generator is ever shut off.

them available to meet the power requirements of the periods of greatest energy demand. All these costly aspects of producing more electricity during peak-load periods provide the electrical utilities with the incentive to shift part of the demand from peak periods to times of lesser demand, a pricing technique called load leveling. As a consequence of load leveling, part of the demand is shifted away from the less efficient auxiliary generators and onto the continuously running and more efficient base load generators. Since home solar energy devices coupled with adequate heat storage capacity can lower demand during peak load periods, the load of the electrical utility is leveled out and, on the whole, the power company benefits.¹¹²

The ability of electrical utilities to take advantage of load shifting techniques¹¹³ has influenced the rate-making process, which is undergoing a period of reform. Congress has become involved and has enacted laws requiring investigation of methods for shifting power loads.¹¹⁴ While various load leveling devices have been mentioned and

112. Solar energy benefits utility companies in several respects. By lowering demand, it reduces dependence on peak power generators. See Sparrow, *supra* note 65, at 958-60. Solar systems that also incorporate storage methods allow utilities to sell power during off-peak hours to customers who need backup to get through extended cloudy periods. By lowering the peak demand, through solar energy, conservation, and storage techniques, the building of new power plants can be delayed. This benefits the utilities and also helps them meet governmental pressure to lower energy demand. See Grainey, *supra* note 89, at 611. Public utility commissions, such as the California PUC, are pushing conservation in lieu of new construction to meet demand. They make it more difficult for utilities to justify new plants before exhausting other alternatives. See Leary, *Conserving Energy, California Style*, CALIF. J., June, 1980, at 219. With the emphasis on lowered demand, solar energy would give the utility companies a device to recapture some of the profits lost by their inability to expand at the previous rates.

113. See Lawrence & Minan I, *supra* note 71, where the authors discuss the interest of electrical utilities in load shifting techniques:

This heightened interest in diversity has been prompted largely by the effects of inflation on capital construction costs, delays and frustrations in obtaining regulatory approval for the siting of nuclear and conventional power plants, and the evolution of a national policy promoting energy conservation. Thus, utilities have increasingly directed attention to various load management techniques designed to reduce the maximum power demand on a utility. These techniques include, for example, ripple or radio control mechanisms or other types of interruptible service, energy storage devices, and load limiting devices. Time of day pricing for backup service represents a means to induce customers to use such service only during off-peak hours in order to take advantage of the lower rates. Time of day pricing would provide an effective means of securing load management controls in addition to providing the solar user with an economical rate for backup service.

Id. at 240-41 (footnotes omitted).

114. Public Utility Regulatory Policies Act of 1978, 16 U.S.C. §§ 2601-2645 (Supp. III 1979); see Silverstone, *The Public Utility Regulatory Policies Act—A Consumer's Guide to Title I*, 2 W. NEW ENG. L. REV. 25 (1979).

studied,¹¹⁵ the most commonly suggested method has been peak load or, more specifically, time-of-day pricing.¹¹⁶ Under this method, the customer is charged by two criteria: amount of power used and the time at which it is used. If power was used during off-peak hours, the customer would be charged at a low rate, reflecting the utility's use of the base load generating capacity. For electricity used during peak load periods, a premium would be charged to reflect the added costs of generation arising from the use of less efficient power sources. This type of pricing policy has been proposed many times by power companies and would generally help solar users save more money than they presently do under traditional pricing policies. It is contrasted with the more traditional pricing method, the declining block rate.¹¹⁷

The declining block rate was developed when utility companies wanted to stimulate the growth of electricity use. Under this method, the customer is charged for the first unit of energy expended, with a declining rate for each succeeding unit of energy used. This method encourages waste because, in the course of using needed electricity, the cost of each additional unit becomes less of an inhibitive factor in determining the total amount of energy a consumer will use. The ad-

115. For a discussion of various pricing reform measures, see Aman & Howard *Natural Gas and Electrical Utility Rate Reform: Taxation through Ratemaking*, 28 HASTINGS L.J. 1085 (1977) [hereinafter cited as Aman & Howard]; Cudahy & Malko, *Electric Peak-Load Pricing: Madison Gas and Beyond*, 1976 WIS. L. REV. 47; Dean & Miller, *supra* note 99, at 339-45; Lawrence & Minan II, *supra* note 98, at 568-81; Taubman & Rauch, *Recent Decisions on Rate Structure Reform: A Survey with Emphasis on Lifeline Rates*, 10 CLEARINGHOUSE REV. 607 (1976); Comment, *Lifeline Electric Rates: Are They Unreasonably Discriminatory?* 83 DICK. L. REV. 541 (1979).

116. Time-of-day falls under a broader category of pricing:

Peak load pricing refers to the general concept of pricing electric service to reflect the higher cost of providing service during the utility's peak load periods. Seasonal pricing refers to the concept of pricing electric service to reflect the varying costs of providing service at different times during the year and time of day pricing reflects the varying costs of providing service at different times during the day.

Aman & Howard, *supra* note 115, at 1089 n.11.

117. Taubman & Frieden, *supra* note 84, at 432. A typical schedule can be found in the former rates for residential customers of Madison Gas and Electric Company:

MEASURING UNIT	AMOUNT CHARGED
Fixed charge	\$0.75
First 100 kwh	
(kilowatt-hours)	0.285/kwh
Next 400 kwh	0.0203/kwh
Next 500 kwh	0.0203/kwh
Next 500 kwh	0.0156/kwh
Over 1,500 kwh	0.0156/kwh

Id.

vent of load level pricing will cause conservation and solar energy units to appear more attractive to consumers.¹¹⁸

A second energy measure which will help electrical utilities to balance their loads and also allow for more efficient energy use is cogeneration.¹¹⁹ This is the use of waste heat in commercial and industrial settings to provide energy.¹²⁰ Cogeneration has proven to be a feasible source of energy; for example, in West Germany, cogeneration presently produces 29% of the country's electricity.¹²¹ It is not a new concept, but one which declined in importance as industrial users found they could get bulk power more cheaply from the electrical utility companies. Due to rising utility rates, cogeneration will likely gain importance and some electrical companies and the federal government are investigating ways to stimulate its use.¹²²

The collective and significant use of conservation measures such as solar energy, time-of-day pricing, cogeneration, and others, however, presents the strong possibility that energy savings will exceed the load leveling stage to jeopardize utility revenues. Many European power companies have already reached the level load stage, and while the United States is behind the Europeans in energy savings, the time will arrive when conservation cuts into the base load.¹²³ Given the long useful life periods of power generating facilities, utilities will have difficulty meeting this contingency and may end up with excess capacity. If this does occur, utility companies will try to keep enough customers in the power grid to maintain a level load, in order to protect against revenue losses which will accompany excess capacity. The solar users, for example, may be required as a class to pay for the backup service to the extent that a utility can show that increased costs are due to

118. The key factor about solar energy is whether or not a consumer will initially invest in the type of unit which provides a storage capacity sufficient to permit the postponement of back up service to off-peak hours. See generally Lawrence & Minan II, note 98 *supra*.

119. Cogeneration facilities can benefit utility companies in several ways. They can provide power from waste heat and thereby satisfy energy demand without using nonrenewable resources. Cogeneration facilities can be added on to an existing power plant to increase its efficiency. See Danziger, *Renewable Energy Resources and Cogeneration: Community Systems and Grid Interaction As a Public Utility Enterprise*, 2 WHITTIER L. REV. 81 (1979). Utilities may also purchase power from cogeneration facilities attached to private business and sell it to the public. 16 U.S.C. § 824 a-3 (Supp. II 1978).

120. See Cross, *Cogeneration: Its Potential and Incentives for Development*, 3 HARV. ENVTL L. REP. 236 (1979). Under Public Utilities Regulatory Policies Act of 1978, 16 U.S.C. §§ 2601-2645 (Supp. III 1979), the federal government has attempted to stimulate the use of cogenerating facilities.

121. See Lovins, *supra* note 75, at 74.

122. *Id.*

123. See Hershberg, *The Challenge and Opportunity for Utilities in Residential Energy Conservation Service*, PUB. UTIL. FORT., Mar. 26, 1979, at 19.

providing this service. Such costs may effectively eliminate the economic advantage of converting to solar energy.¹²⁴

On the other hand, the utility regulatory commissions may adopt a strong policy advocating solar energy use, and consequently prohibit such cost-based price classifications. In this event, the utility will have to shift the fixed costs associated with excess generating capacity to those remaining in the utility grid in order to preserve its own economic stability.¹²⁵ The customers left in the utility grid will be those who cannot afford the high initial costs of a solar unit. The poor, who can least afford higher energy costs, will be supporting the utility companies and subsidizing those who need only intermittent backup service for their solar units.¹²⁶

Although the government may intervene to solve the problem of unreasonable energy costs for the poor, it is unlikely that this will effectuate an adequate resolution.¹²⁷ Tax rebates or other forms of transfer payments to the poor, for example, may be offered to offset the burden. Alternatively, grants or low interest government loans could expedite solar commercialization among low to moderate income households in a manner similar to the present weatherization program. This could help many low income families obtain energy help; but programs like this invariably have horizontal equity problems because similarly situated persons are disparately treated. Equity problems arise from the lack of adequate funding, improper notice, and ignorance of application procedures on the part of eligible persons. The sum total of these flaws is a disturbing loss of potential beneficiaries which defeats the program's purpose. An example of a government program to provide services to the poor that has succumbed to these problems is the housing program.¹²⁸ One study showed that only 1.4% of eligible persons were able to obtain public housing.¹²⁹ Similar figures in energy conservation would aggravate the problem of disproport-

124. See Lawrence & Minan I, *supra* note 71, at 237-38; see also notes 130-38 and accompanying text *infra*.

While it is economically impractical, at present, to rely totally on solar energy in most residential settings, the day will come, if breakthroughs are made in storage technology, when systems will be cost-effective without utility back up service. DUFFIE & BECKMAN, *SOLAR HEATING AND COOLING, AAAS ENERGY II: USE, CONSERVATION AND SUPPLY* 144, 150-51 (P. Abelson & A. Hammond ed. 1978).

125. See Lawrence & Minan II, *supra* note 98, at 560.

126. See Lawrence & Minan I, *supra* note 71, at 241; Taubman & Frieden, note 84 *supra*.

127. The Weatherization Program for Low Income Persons (10 C.F.R. §§ 440.1-30 (1980)), has provided very little funding, considering the size of the problem.

128. A. SOLOMON, *HOUSING THE URBAN POOR: A CRITICAL EVALUATION OF FEDERAL HOUSING POLICY* (1974).

129. *Id.* at 82.

tionate energy costs among members of the low and middle income groups. Moreover, even if government intervention is successful in defraying the energy costs of some low and middle income persons, this would not alter the basic unfairness of a system which requires those of moderate means to pay disproportionately higher energy prices so that solar energy users can pay for intermittent service at rates unreflective of the electrical utilities' fixed costs.

Depending upon the rate structure used to accommodate the periodic needs of solar energy users, a future profit squeeze for utilities could work to defeat the savings incentive to switch to solar power.¹³⁰ In the context of present technologies, solar energy systems for the home are not cost effective without backup service by the utilities¹³¹ because of the high cost of storage systems sufficient to get the solar energy home through the cloudiest periods of the year.¹³² Rather than pay the cost for adequate storage systems, which would disincline most persons from switching to solar energy, the vast majority of solar users would prefer to be dependent upon the utility grid for the intermittent backup service. In effect, solar users are shifting the cost of sufficient storage systems for their solar units to the utilities in return for less expensive storage capacity and the use of backup service.¹³³ As the number of solar units increases, the requirements for backup service will place increasing burdens on the electrical utility companies who must meet the demand for service during those periods of cloudiness.¹³⁴

The further question of who pays for the operation of excess generating capacity will be resolved by the method the utilities use to classify their solar customers.¹³⁵ If the utility companies put the entire burden of excess generating capacity on the solar users, costs for backup service will be prohibitive and the cost effectiveness of the solar installation will be severely affected. How utilities view solar energy will largely determine how the rate structure is designed. If solar users are grouped with other residential users under a load leveling pricing structure such as time-of-day, the cost effectiveness of solar power units will be enhanced.¹³⁶ Utility companies could, however,

130. See Lawrence & Minan II, *supra* note 98, at 550-53.

131. *Id.* at 551 n.5.

132. See Lawrence & Minan I, *supra* note 71, at 231-34.

133. See *id.* at 235.

134. See Lawrence & Minan II, *supra* note 98, at 559-64. Even though the use of load leveling techniques, such as time-of-day pricing, and of modest solar storage systems could shift the need for intermediate backup service to off-peak periods, a heavy cost may still be incurred by utilities in providing backup service. Given a significant number of solar households, their demands for backup power by solar users will coincide so that a new peak might be created.

135. See *id.* at 564-68.

136. See Aman & Howard, *supra* note 115, at 1089.

perceive solar energy as a threat and seek separate grouping. Solar energy could seriously endanger the financial stability of electrical utilities if many conventional energy customers were lost to it and the need for backup service caused additional peak demand problems. The difficulties which solar energy will present to the utilities' revenues will only be heightened by the conjunctive use of other alternative sources such as cogeneration, thereby forcing utilities to seek the submergence of conservation measures in general and solar energy in particular.

Once the point of load leveling has been passed, utility revenues will begin to drop at accelerated rates and utilities will be forced to look for ways of recapturing their lost market. While solar energy commercialization would not allow utilities to maintain present profit levels, it would give them an offset for declining revenues.¹³⁷ If they are not able to pursue this avenue, utilities could retard the transition to decentralized solar power by charging solar users for occasional auxiliary service which would approximate the cost of full-time heating and cooling with a conventional system. Such a reaction on the part of utilities is probable in view of the present legal and economic structure of public utility rate regulation.¹³⁸

V. BENEFITS OF UTILITY PARTICIPATION

Utilities, because of their market position, possess many qualities which make them well suited for a role in the expansion of the residential solar energy market. Under current laws, many of these qualities are not likely to emerge. The restrictions placed on utilities out of fear of market domination could ultimately reduce the growth of the solar energy industry.

One such advantage possessed by the utilities lies in their relationship to the housing industry. This relationship could be used to stimulate solar development in newly constructed homes. So far, residential builders have been reluctant to invest in the construction of homes with solar facilities, but the established sales and service network between utilities and builders could assist in overcoming that reluctance.¹³⁹

Under NECPA, few utilities can directly participate in the sales and service of solar products and receive financial benefits without going through lengthy administrative procedures.¹⁴⁰ Without financial incentive, it would seem unlikely that utility companies would cut future

137. See Sparrow, note 66 *supra*.

138. See Lawrence & Minan II, *supra* note 98, at 563-64.

139. See Dean & Miller, note 99 *supra*.

140. See notes 59 & 72 and accompanying text *supra*.

profits by stimulating solar development among homebuilders. However, a recent amendment to the Act could help instill in homebuilders confidence that solar products are a good investment. This amendment allows utilities to contract with independent suppliers or installers of solar and conservation products.¹⁴¹

141. National Energy Conservation Policy Act Amendments of June 30, 1980, Pub. L. No. 96-294, § 546 (a), 94 Stat. 743 (amending 42 U.S.C. § 8217(c) (Supp. II 1978)). This amendment allows participation of suppliers and contractors in the utility program through a contractual relationship with the utility. It provides:

(c) EXEMPTION FROM PROHIBITION ON SUPPLY AND INSTALLATION—

(1) The prohibition contained in subsection (a) shall not apply to any residential energy conservation measure supplied or installed by a public utility through contracts between such utility and independent suppliers or contractors where the customer requests such supply or installation and each such supplier or contractor—

(A) is on the list of suppliers and contractors referred to in section 213 (a)(2);

(B) is not subject to the control of the public utility, except as to the performance of such contract, and is not an affiliate or a subsidiary of such utility; and

(C) if selected by the utility, is selected in a manner consistent with paragraph (2).

(2) As provided under the provisions described in section 213 (b)(2)(D), activities of a public utility under paragraph (1)—

(A) may not involve unfair methods of competition;

(B) may not have a substantial adverse effect on competition in the area in which such activities are undertaken nor result in providing to any supplier or contractor an unreasonably large share of contracts for the supply or installation of residential energy conservation measures;

(C) shall be undertaken in a manner which provides, subject to reasonable conditions the utility may establish to insure the quality of supply and installation of residential energy conservation measures, that any financing by the utility of such measures shall be available to finance supply or installation by an contractor on the lists referred to in section 213 (a)(2) or to finance the purchase of such measures to be installed by the customer;

(D) to the extent practicable and consistent with subparagraphs (A), (B), and (C), shall be undertaken in a manner which minimizes the cost of residential energy conservation measures to such customers; and

(E) shall include making available upon request a current estimate of the average price of supply and installation of residential energy conservation measures subject to the contracts entered into by the public utility under paragraph (1).

Id. (Section 213 referred to in the statute is codified at 42 U.S.C. § 8214 (Supp. II 1978)). While utilities may contract with solar suppliers and installers under this amendment, it is uncertain whether they can profit from these contracts. Other contracts which utilities may enter into under NECPA, such as engaging independent contractors to carry out energy audits, allow only for a recovery of costs.

A lack of financial interest in the contracts could have two effects. One is that utilities will be less likely to promote solar development under independent contractors if it means only less service demand and increased costs. The second effect is that a lack of a significant connection between the contractors and the utility will fail to stimulate confidence in the product among skeptics, such as those in the building industry. Without a financial incentive, the utilities will have little to gain from vouching for the product of the independent contractor.

Under this recent legislation, it is difficult to tell whether utilities will financially benefit from these relationships with independent contractors and, therefore, be willing to foster an expansion of the solar market. The amendment does not address the issue. From a perusal of other sections of the amending legislation, it would appear that all a utility could gain from these contracts would be a recovery of costs.¹⁴² Allowing only cost recovery, however, would provide little incentive for utilities to use their position to expand the solar market in the homebuilding industry.

The June 30, 1980 amendment to NECPA also prevents utilities from using another strength they have in the energy marketplace. Utilities have the financial capacity to purchase large orders of standardized solar units for resale and/or leasing to the public.¹⁴³ Without the availability of considerable sources of capital, it will be very difficult for companies to engage in large scale production in order to lower costs. The amendments to NECPA prevent any utility from awarding large contracts to any individual company.¹⁴⁴ This hampers the ability of companies to lower per unit costs through mass production. Ultimately, the restrictions upon contract awards will lessen the impact of solar energy in the residential market.

Without this prohibition,¹⁴⁵ utility companies could put contracts out for public bid. An award would help the contractor lower per unit costs through mass production,¹⁴⁶ while utilizing a fair and open method of selection. After award of the contract, the supplier would be assured of constant orders. Utilities could borrow funds to finance the contract at more favorable rates than a smaller solar energy company, and pass those savings on to the consumers.¹⁴⁷

Another benefit presumptively precluded by the legislation is consumer confidence in solar products which would be gained through their association with the utilities.¹⁴⁸ Utilities have a reputation for reliability; the sale and/or service of solar units by a utility would clothe the product with the appearance of reliability.¹⁴⁹ This would help allay consumer fears of poor performance, a factor which generally in-

142. See note 141 *supra*.

143. See Lawrence & Minan I, *supra* note 71, at 268-69.

144. National Energy Conservation Policy Act Amendments of June 30, 1980, Pub. L. No. 96-294 § 546(a), 94 Stat. 744 (to be codified in 42 U.S.C. § 8217(c)(2)(B)); see note 141 *supra*.

145. National Energy Conservation Policy Act Amendments of June 30, 1980, Pub. L. No. 96-294 § 546(a), 94 Stat. 744 (to be codified in 42 U.S.C. § 8217(c)(2)(B)).

146. See Dean & Miller, *supra* note 99, at 353.

147. See Lawrence & Minan I, *supra* note 71, at 269.

148. See Smackey, *supra* note 26, at 38; Lawrence & Minan I, *supra* note 71, at 271.

149. See Walker, *supra* note 27, at 473.

hibits sales. The consumer would know of a reliable source of service in case of breakdown.

The present legislative framework does create some links between the utility and the solar contractor.¹⁵⁰ However, the extent of these connections will be insufficient to instill customer confidence. Since the recent legislation does not appear to give utilities any benefits under any contract arrangements, it is highly unlikely that utilities will share any of the burdens of continuing product service. In fact, the only warranties required under the Act pertain to contractors and not utility companies.¹⁵¹ The one year warranty, backed by the solar manufacturer, supplier, or installer, will do little to allay fears of poor future performance of and service for a product with a long useful life. Therefore, the lack of any meaningful connection between utilities and solar products will impede future market expansion.

Market expansion is also impaired by the restrictions placed on utilities in the financing of residential conservation measures. Utilities would be an excellent source of creative financing mechanisms to enable more persons to purchase capital intensive solar equipment. Utilities are able to absorb the up-front capital costs required and, therefore, are in a position to offer creative financing methods.¹⁵² At present, sales are made directly and NECPA requires the utility to arrange bank loans.¹⁵³ Since few persons can afford the up-front costs

150. National Energy Conservation Policy Act Amendments of June 30, 1980, Pub. L. No. 96-294, § 546(a), 94 Stat. 743-44 (to be codified in 42 U.S.C. § 8217(c)).

151. The amended legislation provides:

(A) the manufacturer of any residential energy conservation measure offered under a utility program shall, in connection with such measure, warrant in writing that the residential customer for whom the measure is installed, the installation contractor who installs the measure, and the supplier of the measure shall (for those measurers found within one year from the date of installation to be defective due to materials, manufacture, or design), at a minimum, be entitled to obtain, within a reasonable period of time and at no charge, appropriate replacement parts or materials;

(B) the supplier of any residential energy conservation measure offered under a utility program shall, in connection with such measure, provide, at a minimum, to any person who purchases the measure from such supplier a warranty equivalent to that required under subparagraph (A); and

(C) the contractor for the installation of any residential energy conservation measure offered under a utility program shall, in connection with such measure, warrant in writing that, at a minimum, any defect in materials, manufacture, design or installation found within one year from the date of installation shall be remedied without charge and within a reasonable period of time

National Energy Conservation Policy Act Amendments of June 30, 1980, Pub. L. No. 96-294 § 542(b), 94 Stat. 741 (to be codified in 42 U.S.C. § 8213(b)(3)).

152. See Dean & Miller, note 99 *supra*.

153. 42 U.S.C. § 8216(b)(1)(C) (Supp. II 1978).

and many persons cannot obtain conventional financing allowed under the Act,¹⁵⁴ consumer access to solar systems is limited.

Given utility participation, many persons who could not otherwise obtain credit would still be able to utilize solar units. Several alternative financing measures could be developed with utility participation. One possible method is to have the cost figured into the monthly utility bill.¹⁵⁵ The customer would pay a flat rate each month for service with the savings realized from use of the alternative energy source going towards retirement of the debt, including interest. The more energy saved during a given time period, the faster the retirement of the debt. Once the debt is retired, title passes to the customer and the utility bill is thereafter reduced by the amount of the energy savings. A second possible method is a leasing arrangement in which the utility company retains title and the customer leases through payments on the monthly bill.¹⁵⁶ Under this option, the customer would obtain cost savings immediately and not have to wait for the end of the payback period. Compared to direct sale, the savings would probably not be as great, but it would allow persons to obtain solar cost savings without incurring debt.

Overall, the Act prevent utilities from participating in the sales and service of solar systems to any meaningful degree. This preclusion prevents the use of utilities as a means to increase the market penetration of solar products. Utilities possess many qualities, such as size, market position, capital resources, and an image of reliability, which would aid in the expansion of the solar energy industry. Current legislation prevents the exploration of these unique qualities.

VI. POSSIBLE UTILITY PARTICIPATION

A. *Problems Caused by Front-End Review*

NECPA, although it attempts to instill consumer confidence in solar energy, might impede solar development by precluding participation by the largest potential suppliers of solar equipment. The presumption

154. Because of recent credit and interest problems, it cannot be assumed that loans for solar equipment will be available to low and middle income homeowners who usually own the most energy inefficient homes. See Taubman & Frieden, note 84 *supra*.

155. A recent amendment to NECPA allows customers to prepay their loans on their utility bills. The utility can only recover the administrative cost of accepting the prepayment and passing it on to the lender. National Energy Conservation Policy Act Amendments of June 30, 1980, Pub. L. No. 96-294 § 544(6), 94 Stat. 743 (to be codified in 42 U.S.C. § 8216(f)). Were utilities to carry the loans themselves for conservation products they installed or supplied, they could pay the interest and purchase price out of energy savings. Since utilities already have computerized billing systems, the system could be implemented at very little expense. See Lawrence & Minan I, *supra* note 71, at 270.

156. See Sparrow, note 66 *supra*.

against utility participation prevents the implementation of many creative programs which would provide services to a broader range of customers. Had Congress allowed DOE to promulgate pre-set standards which eliminate the necessity for front-end review, utilities could compete on equal footing with other solar power businesses. Since the review of utility participation uses the same standards¹⁵⁷ as are used for other participants—*i.e.*, unfair and anticompetitive business practices, product reliability, high prices, and interest rates—front-end review does not seem justified.¹⁵⁸

In meeting DOE standards, only utilities must go through the procedure of winning approval from the governor of the affected state.¹⁵⁹ The procedures for review also include an affirmative finding by DOE that the prices and interest rates will be fair and reasonable and that no anticompetitive conditions will be fostered by a utility's participation.¹⁶⁰ While DOE has stated that it welcomes utility applications, the uncertainty of a process which requires gubernatorial approval seems to contradict this statement.¹⁶¹ This requirement substitutes political for technical and ecological considerations; the FTC and DOE are consulted only subsequent to approval by the state governor, so that their policies are not immediately relevant.¹⁶² Consequently, state-by-state

157. See note 22 *supra*.

158. The case-by-case waiver process acts to retard solar development by forcing delays on utility companies who want to participate in solar commercialization. A utility cannot apply for a waiver until the state where the utility is located has established its waiver procedures. The procedures are part of the state implementation plan which must first be approved by DOE. From the experiences of other approval processes involving state plans for air pollution and water quality, it is not unreasonable to assume that litigation will arise and postpone implementation. This was true with aspects of the California Air Quality Implementation Plan and the ensuing litigation. *EPA v. Brown*, 431 U.S. 99 (1977); see generally note 48 *supra*. In addition, the case-by-case policy allows for variations between states as to the application of the waiver process. The variations will lead to uncertainty among potential participants, thereby increasing the risks for utility entry. *Contra*, Lawrence & Minan I, *supra* note 71, at 274.

159. See note 59 *supra*.

160. *Id.*

161. 44 Fed. Reg. 64,634 (1979).

162. 10 C.F.R. § 456.505 (1980) reads:

(a) The Assistant Secretary may waive any prohibition of § 456.502(a) upon petition by a covered utility pursuant to § 456.507 and a finding that:

(1) The petition, in the case of a covered utility subject to a State Plan, is supported by the Governor, and

(2) If such waiver were granted:

(i) Fair and reasonable prices and rates of interest would be charged, and

(ii) The otherwise prohibited activities would not involve or result in unfair methods of competition or unfair or deceptive acts or practices.

(b) Before the Assistant Secretary makes the finding described in paragraph (a)(2)(i) of this section, he or she shall consult with those staff members of the Federal Trade Commission as the Chairman of the Commission may designate.

variations are incorporated into the approval process which could prevent innovative programs from being implemented due to political influences. Such a political decision would be difficult to overturn because of the degree of discretion involved and the absence of procedural requirements which allow only limited judicial review. The appeals procedure provided for in the regulations applies only to application decisions rendered by DOE;¹⁶³ if the governor of a state disapproves, the waiver petition never reaches DOE.¹⁶⁴

B. *Problems Caused by the Fiduciary Duties Placed upon Utilities*

Once a waiver request reaches DOE, many of the problems relating to unfair trade practices arise out of provisions in the Act itself and the regulations promulgated thereunder rather than from problems inherent in the utility industry. The Act and the regulations have placed utilities in a quasi-fiduciary position with their customers which requires that they must inform, investigate, recommend, and arrange for the implementation of conservation and solar energy measures.¹⁶⁵ This entrustment naturally invites exploitation by the utilities and greatly enhances the possibility of unfair competition.¹⁶⁶ Therefore, prior to any serious consideration of utility participation in the solar energy industry, the necessity for safeguards must be recognized. The primary opportunities for potential abuse lie in the information dissemination and energy audit procedures.

It is possible that in disseminating information as required by the Act, utilities would shade the brochures in favor of their own products because no clear preventative standards or procedures exist.¹⁶⁷ Pre-distribution review, pursuant to federal guidelines, by the state energy

163. Appeals to DOE can only be made on an order, finding, or determination made by DOE, not the states. 10 C.F.R. §§ 456.103, .508 (1980).

164. The DOE/states' sharing of authority under NECPA is consistent with previous uses of the Plan Implementation Model. See notes 30-36 and accompanying text *supra*. As with other uses of the method, there is a strong possibility of conflict between federal and state goals. Since some authority must be delegated to the states, along with the delegation of duties, the goals of a unified national conservation and solar energy policy will be weakened. See note 48 *supra*.

Under the existing framework, the states have the authority to disapprove a waiver request. The grounds for disapproval under NECPA are primarily federal, such as antitrust violations; 42 U.S.C. § 8217 (Supp. II 1978). These should be dealt with at the federal level. However, under the waiver provision as enacted by Congress, utility participation could be rejected at the state level on uniquely federal grounds. This would leave the aggrieved utility company with no recourse at the federal level. The appeals procedure set out in 10 C.F.R. § 456.103 (1980) protects persons against federal and not state actions.

165. 42 U.S.C. § 8216(a)-(b) (Supp. II 1978); see note 108 *supra*.

166. See Lawrence & Minan I, *supra* note 71, at 266-67.

167. *Id.*

agency in charge of the SIP or by DOE could prevent abuses without hampering participation by qualified utilities.

Additional problems could arise with regard to the energy audit. A probable conflict exists between the utility's statutory duty to advise customers of the optimum conservation methods available to them and the utility's own corporate duty to maximize profits for its stockholders through the sale of solar and conservation equipment.¹⁶⁸ While the employees in many instances would have the legal duty to recommend the installation of a competitive unit, the new company policy to this effect would be at odds with the employees' understanding of the basic welfare and traditional policies of the company. This conflict would be apparent to consumers who would distrust the audit, even if it were handled fairly by the utilities, and the audit's effectiveness would be reduced. Moreover, placing the duty to recommend products of competitors only on utility companies introduces an unfair and anti-competitive element into the marketplace. A plausible solution to this dilemma would be to require all utility companies who compete in the market to contract out the energy audits. Having the inspections done by an independent contractor would remove the bias or appearance of bias. This type of subcontracting is allowed under the present legislation,¹⁶⁹ and the separate accounting already required for the program¹⁷⁰ would facilitate regulating agencies in checking on the revenue flow between utility and contractor.

C. *Competitive Problems Caused by the Utility Position*

Besides difficulties arising out of the nature of the duties imposed by NECPA, utility participation could result in unfair competition stemming from the monopoly position which utilities hold in conventional energy forms. The most serious of the problems would be cross-subsidization of solar expenses from the profits of power generating activities.¹⁷¹ A utility could sell units at below cost and drive competitors out of the market so that a utility monopoly of solar energy would result. Utility companies are in a position to engage in anti-competitive practices absent controls because, at present, non-utility solar companies do not have a market position firm enough to withstand unfair competition.¹⁷² This type of competition could leave the

168. *Id.* at 262-68.

169. 42 U.S.C. § 8216(b)(1)(A) (Supp. II 1978); see 10 C.F.R. § 456.308 (1980). Since each state plan must prohibit utilities from unfairly discriminating among contractors when arranging for the installation of program measures, a mechanism for contracting out the energy audit according to NECPA policies is already available.

170. 42 U.S.C. § 8216(c)(1)(A) (Supp. II 1978).

171. See Dean & Miller, *supra* note 99, at 336; Lawrence & Minan I, *supra* note 71, at 274-75.

172. See Lawrence & Minan I, *supra* note 71, at 265-66.

utilities in the position of controlling solar development to meet utility revenue needs, rather than allowing market forces to shape the industry. Utility policies could shift customer preferences back to nonrenewable sources if they were more profitable. The subsidization could be shifted from the solar division to power generation when renewable sources become prohibitively expensive. Prices could be raised on solar units to maintain the demand on the power grid which would otherwise shift to alternative sources.

The development of a monopoly situation is not the ultimate effect of permitting utility participation in the solar industry. By extending the separate accounting and financing requirements to the marketing of solar equipment, perhaps through a wholly owned subsidiary, problems of cross-subsidization could be minimized.¹⁷³ Under the Act, utilities have to use separate accounting for the operation of the residential conservation program.¹⁷⁴ A broader application of this concept to solar sales, installation, financing, and service would make cross-subsidization more difficult. Cross-subsidization could also be minimized by regulating the funding for solar operations. Instead of allowing the companies to finance the solar program out of current expenses, the backing should come from investors. This would prevent the solar business from being financed by the revenues received directly from power supplied by conventional sources.

VII. CONCLUSION

While utility participation is allowed under NECPA, it is subject to a front-end review by the state and federal governments.¹⁷⁵ The review covers problems which may be more acute for utilities but which are common to any company in a new industry. Many of the conflicts with utility participation arise, not out of the nature of the industry, but out of the mandatory duties placed on utilities by NECPA. While the prob-

173. Utility companies would not be able to monopolize the field as long as antitrust laws were enforced. *See* Dean & Miller, *supra* note 99, at 336-45. The most serious problem would be cross-subsidization of solar products by other profit-making activities of the utility. A wholly-owned subsidiary, in charge of solar development, could minimize these problems if it were subject to public utility regulation and both state and federal financial disclosure requirements. At the state level, utility companies before the public utility commissions could be made to justify rate increases on non-solar grounds. Funds to support the solar division or to provide the starting capital could be restricted to monies from investors and stockholders and not profits from non-solar activities. Furthermore, if antitrust enforcement were conducted at the federal level, complaints would be followed up by the FTC and DOE. Federal disclosure requirements could keep the federal government informed of any utility company's attempt to monopolize a market through cross-subsidization. *Contra*, Lawrence & Minan I, *supra* note 71, at 274.

174. 42 U.S.C. § 8216(c)(1)(A) (Supp. II 1978).

175. *See* note 72 *supra*.

lems can have serious consequences if left uncontrolled, proper standards would eliminate many of the problems associated with utility participation. Proper review by the state agencies in charge of the implementation plans would provide adequate safeguards if federal standards were set up beforehand.

Under the present regulatory framework, utility participation is uncertain and its role in achieving energy independence is clouded. The presumptive preclusion under the Act was an untoward reaction on the part of Congress in light of the ramifications of denying utilities a positive role in solar development. If utilities are precluded from participating in the market, long-term threats to utility revenues could cause them to restrict solar development. This could take the form of rate discrimination, denial of service, and other methods designed to protect the utilities from ending up with great amounts of generating capacity but no customers to support it.

In a situation where utilities were able to participate on an equal footing as can be provided, they would find it possible to view solar energy as a way to offset dependence on continually decreasing supplies of nonrenewable energy sources which have continually increasing prices. This participation will not totally supplant losses in customer demand resulting from general conservation measures and new energy sources such as solar power and cogeneration, but it can help the utilities make the transition.¹⁷⁶ As long as there exists a need for conventional energy sources, there will exist a public need for utility companies. The public regulatory commissions cannot allow the revenue losses from solar energy and conservation techniques to threaten the financial well-being of utilities. Consequently, rates for conventional and backup service will have to be increased despite the problems this increase would create. Undoubtedly, the greater the financial opportunity afforded utilities by solar energy, the less likely that the cost of backup service will be so high as to prohibit the significant conversion to solar energy.

Utilities are also able to provide many forms of service which conventional companies cannot, thereby broadening the customer base for solar energy and enhancing its chance of success as a realistic alternative energy source. The presence not only of many advantages to permitting utilities to market solar energy equipment, but also of many promising solutions to the problems posed by utility participation, leads to the conclusion that Congress chose the easy answer of utility preclusion. This was an unfortunate choice for which the utilities and, ultimately, the public will suffer.

176. See also notes 109 & 112 *supra*.

