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# UTILITIES AT THE DAWN OF A SOLAR AGE

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## I. INTRODUCTION

In the midst of a natural gas shortage, steadily increasing oil prices, and severe inflation of the costs of constructing new electrical generating stations, Americans received one bit of good news: a study for the Energy Research and Development Administration (ERDA) has found that solar heating is competitive with other energy sources in many parts of the United States.<sup>1</sup> One sector of the business community may not have greeted this news with enthusiasm. Public utilities, which currently provide a substantial portion of the energy used to heat buildings, could lose a great deal if solar-powered heating systems become widespread. Although it seems unlikely solar energy use could grow quickly enough to reduce the demand on existing powerplants,<sup>2</sup> it would undoubtedly shrink future needs.

Moreover, the use of electricity by solar building owners as a back-up source of energy could disrupt utility load curves. Load factors represent the ratio of the average amount of utility capacity in use, to the highest output over a given period.<sup>3</sup> A utility customer

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1. MITRE CORP., AN ECONOMIC ANALYSIS OF SOLAR WATER AND SPACE HEATING (prepared for ERDA, M76-79, Nov. 1976) (written by G. Bennington, M. Bohannon & P. Spewak of MITRE Corp.).

2. Space heating accounts for only about 20% of national energy needs, and no authorities expect that solar energy is likely to contribute more than half of this amount, even assuming aggressive government support, before 1990. See OFFICE OF TECH. ASSESSMENT, U.S. CONGRESS, COMPARATIVE ANALYSIS OF THE 1976 ERDA PLAN AND PROGRAM 119-20 (1976). ERDA has set a goal of only 10% incorporation of solar energy systems in new building starts for 1985. ERDA, NATIONAL PROGRAM FOR SOLAR HEATING AND COOLING, Doc. No. 23A, at 9 (1975). For an assessment by a solar industry representative, see S. Butt, Solar Market Capture and Market Penetration: Solar Heating and Cooling (Oct. 5, 1976) (unpublished paper on file with the authors).

3. S. FELDMAN & B. ANDERSON, THE PUBLIC UTILITY AND SOLAR ENERGY INTERFACE: AN ASSESSMENT OF POLICY OPTIONS 47-48 (prepared for ERDA Cont. No. E (49-18) —2523, 1976) [hereinafter cited as PUBLIC UTILITY AND SOLAR ENERGY INTERFACE]. See also E. BERLIN, C. CICHETTI & W. GILLEN, PERSPECTIVE ON POWER 29-31 (1974) [hereinafter cited as PERSPECTIVE ON POWER]; R. MORGAN & S. JARABECK, HOW TO CHALLENGE YOUR LOCAL ELECTRIC UTILITY 57 (1974).

with occasional or infrequent needs causes the load factor to drop, meaning that the capacity required to serve that customer often lies idle. Since even idle capacity must be paid for, the cost of serving the occasional user may be higher than the cost of serving a customer who uses the same amount of electricity, but has a steady demand. Depending on the size of the solar user's collector and storage capacity, his need for electric heating will generally occur only when the weather is unusually severe or cloudy. This may cause the solar user with electrical backup to fall into the higher cost group. Although the battle has hardly begun, one utility has already tried to retaliate by imposing a rate structure that reflects the *potentially* higher costs of serving solar customers.<sup>4</sup>

On the other hand, some utilities may see an opportunity to profit from participation in the solar energy market. Natural gas companies may soon have to locate alternative sources of energy because gas reserves are steadily declining.<sup>5</sup> At least one gas company has already begun experiments with solar-assisted gas heating systems.<sup>6</sup>

Utility decisions like the above could help determine the rate at which solar energy is utilized—if at all. Utilities are powerful institutions in the energy market, with many weapons in their arsenal. This article will address some of the important issues emerging from the relationship of utilities to solar energy, and will focus on the regulatory process within which those issues will be decided.

## II. UTILITY REGULATION: A GENERAL OVERVIEW

Over seventy-five percent of the electrical generating capacity in the United States is the property of private power companies.<sup>7</sup> Although these companies are privately owned, their operations are regulated by state public utility commissions (PUCs) because of the "natural monopoly" nature of the utility business. The general consensus is that it would be counterproductive to have competing electrical generating and transmission systems in the same area.<sup>8</sup>

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4. The Public Service Co. of Colorado cited the increasing use of solar heating as one justification for a controversial new rate structure it had requested. See text accompanying note 64 *infra*.

5. See generally Rosenberg, *Conservation by Gas Utilities as a Gas Supply Option*, PUBLIC UTIL. FOR., Jan. 20, 1977, at 13. The validity of claims that proved gas reserves are declining is currently the subject of intense controversy. See, e.g., Miller, *Natural Gas: The Hidden Reserves*, Washington Post, Feb. 13, 1977, § c, at 1.

6. Solar assisted gas energy (SAGE) is the name of a project of the Southern California Gas Co. See PUBLIC UTILITY & SOLAR ENERGY INTERFACE, *supra* note 3 at 22; Hirshberg, *Public Policy for Solar Heating and Cooling*, BULL. ATOM. SCIENTIST, Oct. 1976, at 37-40. A recent survey found over 100 utility projects involving solar energy, most of them in the area of heating and cooling buildings. ELECTRIC POWER RESEARCH INST., 3 SOLAR ENERGY INTELLIGENCE REPORT 19 (Jan. 31, 1977).

7. *Public Power*, PUBLIC POWER, Jan.-Feb. 1975, at 28.

8. 16 U.S.C. §§ 791-825 (1970), as amended, (Supp. III 1973). See generally PERSPECTIVE ON POWER, *supra* note 3, at 53-79; Stoel, *Energy*, in FEDERAL ENVIRONMENTAL LAW 928 (E. Dolgin & T. Guilbert eds. 1974).

## A. FEDERAL REGULATION

Federal jurisdiction over utilities is limited primarily to regulation of the wholesale rates of interstate sales of electricity, and the siting of hydroelectric plants.<sup>9</sup> However, the Federal Power Commission (FPC) does set accounting standards and reporting requirements that are valuable sources of information.<sup>10</sup> The FPC has generally been conservative in its policies. For example, it rarely supports legislation to expand its jurisdiction or increase its involvement in utility rate making.<sup>11</sup>

Recent regulations issued by the FPC on filing rate schedules offer some hope for a more active energy conservation program.<sup>12</sup> The Commission announced recognition of the shift in public concern for the "proper utilization and conservation of our natural resources including fuels and raw materials as well as air, water and land," although action reflecting these concerns was left for a later date.<sup>13</sup> Utilities were asked to submit more detailed rate reports including "a complete explanation as to the method used in arriving at the cost of service allocated to the sales and service for which the rate or charge is proposed, and showing the principal determinants used for allocation purposes."<sup>14</sup>

Recent congressional proposals would also expand federal regulation of utilities.<sup>15</sup> One proposal, for example, would dictate permissible rates and other essential utility policies.<sup>16</sup> While Congress almost certainly has the power to regulate utilities under the commerce clause,<sup>17</sup> or on grounds of national security,<sup>18</sup> it seems likely that the states will continue to exercise primary responsibility for utility practices.

9. See 16 U.S.C. §§ 797(c), 817 (1970); *id.* §§ 824-837h (1970), *as amended*.

10. 16 U.S.C. §§ 825, 825(c) (1970).

11. PERSPECTIVE ON POWER, *supra* note 3, at 60-72; 2 A. KAHN, THE ECONOMICS OF REGULATION 76 (1970-71) (2 Vols.); Breyer & MacAvoy, *The Federal Power Commission and the Coordination Problem in the Electrical Power Industry*, 46 S. CAL. L. REV. 695-701 (1973).

12. 40 Fed. Reg. 48,673 (Oct. 18, 1975).

13. *Id.* at 48,674 (Oct. 18, 1975).

14. *Id.* (codified in 18 C.F.R. § 35.12(5) (1976)).

15. *E.g.*, H.R. Res. No. 12461, 94th Cong., 2d Sess. (1976). See Samuelson, *Battle Lines Are Being Generated for Reform of Electric Utility Rates*, NAT'L J., Oct. 16, 1976, at 1474. Willard, *Electric Power: The Struggle Over Controls*, Washington Post, Aug. 8, 1976, § C, at 3.

16. Willard, *supra* note 15.

17. U.S. CONST. art. 1, § 8.

18. A possible limitation on the power of Congress, however, was suggested by the Supreme Court in *National League of Cities v. Usery*, 96 S. Ct. 2465 (1976). The Court held that federal regulation of wages paid by state governments to their employees constituted an unconstitutional infringement on state sovereignty. *Id.* at 2474.

The Court also granted certiorari in a Clean Air Act case testing the limits of federal authority to order indirect source controls such as parking bans and automobile inspection programs. *Brown v. EPA*, 521 F.2d 827 (9th Cir. 1975), *cert. granted*, 96 S. Ct. 2224 (1976).

Direct federal regulation of utilities would not be affected by these cases, but proposals to require state programs could be.

## B. STATE REGULATION

State public utility commissions have generally acted as overseers rather than initiators of policy. However, this may be changing in some states<sup>19</sup> due partly to the regulatory principle that management decisions are best made by the utility, limited only by broad public interest principles. Also, as a practical matter, utility commissions have often lacked the resources and staff to take an aggressive posture. The Colorado PUC, for example, has only fourteen professionals, which is fewer than those available to one large utility. However, it should be noted that in most states there is no legislative barrier to utility commissions undertaking more assertive programs, and some PUC's have become more active in recent years.<sup>20</sup>

From the standpoint of solar energy use, the crucial regulatory function is rate approval. Typically, regulatory agencies first decide how much a utility will be allowed to earn, and then approve rate schedules designed to produce that approved profit margin.<sup>21</sup> The rate of return is a function of the rate base—those investments on which the utility may make a profit. Operating expenses (including fuel costs), taxes, and other noncapital costs are then added, to determine the utility's total revenue needs. A utility's decision to market or lease solar collectors would have to be approved by the utility commission before these expenses could be added to the rate base. It should also be noted that the utility profits only if it makes an investment in capital. Therefore, a utility might finance the purchase of solar collectors by homeowners, but it would lose the benefits of depreciation and of an increase in its rate base.

Rate structures are also designed to reflect different costs of service. For example, residential consumers have traditionally paid higher rates than large industrial customers because of the lower costs of billing and metering a single large user. Industries willing to accept interruptible service, that is, the possibility of service cut-offs during peak periods, also receive a lower rate.

Challenging a public utility position is often expensive and difficult. Utility presentations to a regulatory commission are a business expense; consumer groups and energy conservationists rarely have access to equal resources. For instance, a recent estimate

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19. Samuelson, *supra* note 15, at 1480. See also R. MORGAN & S. JARABEK, *supra* note 3, at 65-70.

20. Statement of Toni Golden quoted in [1976] ENERGY REP. (BNA) A-25. As an example of more assertive regulation, generic hearings on rate structure reform have been initiated in California, Colorado, Connecticut, Hawaii, Maine, Maryland, Massachusetts, New Hampshire, New York, North Carolina, and Pennsylvania. *Id.* at A-27.

21. PERSPECTIVE ON POWER, *supra* note 3, at 59.

found that the Virginia Electric Power Company alone spends about \$250,000 on a single rate hearing.<sup>22</sup> Once the regulatory agency makes its decision, judicial review is usually very limited, in deference to administrative expertise on technical issues. Although many cases can be cited where courts remanded decisions for lack of substantial evidence,<sup>23</sup> the burden is clearly on the challenger.

There is one major exception to the scope of utility commission jurisdiction: publicly owned utilities are usually exempt from state jurisdiction because they are already publicly controlled. Some utility critics view locally owned utilities as one alternative to the unresponsiveness of privately owned systems.<sup>24</sup> Whether or not this argument is valid, it appears that in the short run municipal utilities are too small to play a major role in national energy issues. In 1972 municipal utilities accounted for only ten percent of total installed capacity.<sup>25</sup>

Within the broad regulatory process outlined above, several principal issues should be discussed as they relate to solar energy. The sections that follow consider three general topics: service and rate discrimination; scope of PUC jurisdiction and its consequences for solar users; and utility participation in the solar market.

### III. RATE AND SERVICE DISCRIMINATION<sup>26</sup>

A crucial question relating to solar energy is whether utilities may discriminate in their rates and service in ways that either favor or hinder the development of solar heating and cooling. At one extreme, public utilities could refuse to provide any backup service on cloudy days. At the other extreme, the utilities could refuse certain services to customers who did *not* install solar equipment. Which-ever direction the discrimination cuts, the legal question is the same: may a public utility provide services and rates which treat solar customers differently from other customers?

#### A. STATE ANTIDISCRIMINATION LAW

One of the major purposes of public regulation of electric utili-

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22. Kast, *Va. Consumers Defeated Twice—In Just 10 Minutes*, Washington Star, Jan. 26, 1977, § B, at 1.

23. *E.g.*, *Southwestern Gas & Elec. Co. v. Town of Hatfield*, 219 Ark. 515, 243 S.W.2d 378 (1951). See generally 1 F. COOPER, *STATE ADMINISTRATIVE LAW* 744-46 (2 vols.).

24. *Utilities and Solar Energy: Will They Own the Sun?*, PEOPLE & ENERGY, Oct. 1976, at 2; Northcross, *Who Will Own the Sun?*, THE PROGRESSIVE, Apr. 1976, at 14-16.

25. *Public Power*, PUBLIC POWER, Jan.-Feb. 1975, at 28.

26. The analysis in these sections draws heavily from existing treatises on public utility regulation, particularly A. PRIEST, *PRINCIPLES OF PUBLIC UTILITY REGULATION* (1969) (2 vols.); G. TURNER, *TRENDS AND TOPICS IN UTILITY REGULATION* (1969). For an extremely lucid discussion of the economic issues raised by utility regulation, see A. KAHN, *supra* note 11. For a review of more recent developments, see *PERSPECTIVE ON POWER*, *supra* note 3.

ties is the prevention of unreasonable discrimination or undue preferences. Nearly every state has a statute prohibiting conduct that favors one class of customers while harming another. Typical of these statutes is New Jersey's:

No public utility shall:

a. Make, impose or exact any unjust or unreasonable, unjustly discriminatory or unduly preferential individual or joint rate, commutation rate, mileage and other special rate, toll, fare, charge or schedule for any product or service supplied or rendered by it within this state;

b. Adopt or impose any unjust or unreasonable classification in the making or as the basis of any individual or joint rate, toll, fare, charge or schedule for any product or service rendered by it within this state.

No public utility shall make or give, directly or indirectly, any undue or unreasonable preference or advantage to any person, locality or particular description of traffic, or subject any particular person, locality or particular description of traffic to any prejudice or disadvantage.<sup>27</sup>

Such antidiscrimination statutes only proscribe discrimination that is "unreasonable," "unjust," "undue," or "unlawful."<sup>28</sup> Whether a particular utility rate or service unlawfully discriminates is a question of fact to be determined on a case-by-case basis by the state utility commission.<sup>29</sup> It is, therefore, very difficult to predict how any given discriminatory practice will be dealt with.

In general, the cases and state utility decisions suggest that utilities have substantial freedom to treat different classes of customers differently. For example, large industrial users of electricity often receive special low promotional rates—a discriminatory practice defended on the ground that it costs the utility less to serve very large customers.<sup>30</sup> Many states have permitted their utilities to grant special promotional rates or other considerations to attract new industries to the state and thereby reduce the unit cost of power for all electricity consumers.<sup>31</sup> Such promotional considerations have included payments to customers who install electric heating, unusually large residential capacity, electric water heaters, electric appliances or electric wiring. These considerations have also included the subsidization of the installation of wiring, piping, and underground service for select customers.

Only two general principles have emerged from the reported

27. N.J. STAT. ANN. § 48:3-1 (1969); *id.* § 48:3-4 (1969), *as amended*, (Supp. 1976).

28. 1 A. PRIEST, *supra* note 26, at 286-88.

29. *Id.*

30. *E.g.*, *Re Pacific Gas & Elec. Co.*, 9 P.U.R.3d 97 (Cal. Pub. Util. Comm'n. 1955).

31. *See, e.g.*, *Gifford v. Central Maine Power Co.*, 217 A.2d 200 (Me. 1966); *Re City*

decisions. The first is that a discriminatory practice is more likely to be found reasonable if it produces indirect benefits to all customers.<sup>32</sup> This principle would favor discrimination that benefits solar systems if such discrimination would reduce rates for all customers by reducing the utility's needs for capital equipment and fuel. Some decisions have gone even farther by suggesting that for a discriminatory practice to be unreasonable or unjust it must not only benefit one class of customers, but must also burden another class.<sup>33</sup> Under those decisions a practice that assists solar owners without burdening other customers is more likely to be found reasonable.

A second principle that emerges from the cases is that utilities may treat different classes of customers in different ways if there is a reasonable basis for distinguishing them.<sup>34</sup> Thus, if there is a reasonable basis for distinguishing solar customers from other customers—as there almost certainly is—then solar customers may be charged different rates and may receive different services. The basis for such a distinction might be the unpredictable nature of the demand for electricity by solar customers, their use of less electricity than other residential customers, or the ability of solar customers to use their storage facilities to control the time of day they demand power.

Regardless of whether a particular discriminatory practice is unlawful, if solar customers feel they are victims of unreasonable discrimination, for example, through the utility's refusal to provide them with backup power service, they may find it extremely difficult to obtain relief. Public utility commission hearings can be long and expensive. Also, utility commissions have broad discretion to determine what is, and is not discriminatory.<sup>35</sup> Another problem is that customers can seek help in the courts only after exhausting their administrative remedies.<sup>36</sup> Once in court, the customers must bear

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Ice & Fuel Co., 260 App. Div. 537, 23 N.Y.S.2d 376 (1940); Re Promotional Practices of Electric & Gas Utils., 65 P.U.R.3d 405 (Conn. Pub. Util. Comm'n 1966); Re Delaware Power & Light Co., 56 P.U.R.3d 1 (Del. Pub. Serv. Comm'n 1964); Superior Propane Co. v. South Jersey Gas Co., 60 P.U.R.3d 217 (N.J. Bd. Pub. Util. Comm'n 1965); Re Promotional Activities by Gas & Electric Co's, 68 P.U.R.3d 163 (N.Y. Pub. Serv. Comm'n 1967); Virginia State Corp. Comm'n v. Appalachian Power Co., 65 P.U.R.3d 283 (Va. Corp. Comm'n 1966). See also *Oklahoma v. Oklahoma Gas & Elec. Co.*, 9 P.U.R.4th 369 (Okla. Sup. Ct. 1975). But utility commissions have not been reluctant to strike down promotional practices found to be of little value to the utility or the bulk of its customers. Re Southwest Gas Corp., 61 P.U.R.3d 467 (Cal. Pub. Util. Comm'n 1965); Re Carolina Power & Light Co., 52 P.U.R.3d 469, (N.C. Util. Comm'n 1964); Re Portland Gen. Elec. Co., 67 P.U.R.3d 417 (Ore. Pub. Util. Comm'n 1967).

32. *E.g.*, *Rossi v. Garton*, 88 N.J. Super. 233, 211 A.2d 806, 60 P.U.R.3d 210 (1965). See also Memorandum: Legal and Regulatory Analysis of Conservation Proposal for the Federal Energy Administration, Energy Resource Development 14 (Dec. 8, 1976) (law firm of Belnap, McCarthy, Spencer, Sweeny & Harkway) (on file with the authors).

33. *E.g.*, *California Portland Cement Co. v. Union Pac. R.R.*, 12 P.U.R.3d 482, 485-96 (Cal. Pub. Util. Comm'n 1955). 1 A. PRIEST, *supra* note 26, at 295, 300-02.

34. *E.g.*, *Hicks v. City of Monroe Util. Comm'n*, 237 La. 848, 112 So. 2d 635, 29 P.U.R.3d 275 (1959). See also 1 A. PRIEST, *supra* note 26, at 283.

35. See *Pittsburgh v. Public Util. Comm'n*, 168 Pa. Super. Ct. 95, 78 A.2d 35 (1951).

36. *Smith v. Southern Union Gas Co.*, 58 N.M. 197, 269 P.2d 745 (1954); *Ten. Ten Lincoln Place, Inc. v. Consolidated Edison Co.*, 273 App. Div. 903, 77 N.Y.S.2d 168 (1948).



the burden of proving a given practice discriminatory.<sup>37</sup> This burden is difficult to meet. A utility commission's findings will generally be upheld if the record of its proceedings shows a substantial basis for its findings.<sup>38</sup>

## B. FEDERAL ANTIDISCRIMINATION LAW

State antidiscrimination statutes are not the only bar to discriminatory practices by utilities. The federal antitrust laws may also outlaw rates or services that single out the owners of solar energy systems for special treatment. It is now clear that the antitrust exemption for state action will not totally immunize public utilities from antitrust liability. In a recent decision, the Supreme Court held that a privately owned public utility is not exempt from possible antitrust liability when it furnishes its customers light bulbs without charge.<sup>39</sup> The state action antitrust exemption was found not to apply, although the light bulb promotional practice had been approved by the state public utility commission as part of the utility's rate structure and could be discontinued only with the PUC's permission. In reaching its holding the Court noted that "state authorization, approval, encouragement, or participation in restrictive private conduct confers no antitrust immunity."<sup>40</sup>

There are several grounds on which utility discrimination toward solar heating and cooling could be deemed anticompetitive, and therefore a violation of antitrust laws. Perhaps the most obvious ground is when the utility refuses to provide backup service to solar customers. When protection of the utility's monopoly position is the reason for such a refusal, there may be a violation of the Sherman Act's prohibition against monopolies and attempts to create monopolies.<sup>41</sup> An antitrust violation might also be found if a utility subsidizes its entrance into the solar heating and cooling market by distributing its losses across all utility customers, giving it an overwhelming advantage.<sup>42</sup> Finally, a utility's use of rate dis-

37. *E.g.*, North Carolina *ex rel* Util. Comm'n v. Carolina Power & Light Co., 250 N.C. 421, 109 S.E.2d 253 (1959); I A. PRIEST, *supra* note 26, at 324-25.

38. *Chicago Bd. of Trade v. United States*, 223 F.2d 348 (D.C. Cir. 1955).

39. *Cantor v. Detroit Edison Co.*, 96 S. Ct. 3110 (1976).

40. *Id.* at 3116.

41. Refusals to deal with solar customers would be a classic violation of section 2 of the Sherman Act which provides that:

Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding one million dollars if a corporation, or, if any other person, one hundred thousand dollars, or by imprisonment not exceeding three years, or by both said punishments, in the discretion of the court.

15 U.S.C. § 2 (Supp. IV 1974). *See, e.g.*, *Otter Tail Power Co. v. United States*, 410 U.S. 366 (1972), where a public utility was found to have violated section 2 of the Sherman Act by refusing to sell electricity to a municipally operated utility distribution system.

42. Such conduct could be viewed as temporary price cutting to put rival solar firms out

crimination to favor or hinder solar heating and cooling is arguably a violation of the Robinson-Patman Act.<sup>43</sup> That Act declares illegal the practice of requiring some purchasers to pay more for commodities of like grade and quality if such discrimination tends to lessen competition or create a monopoly.<sup>44</sup>

There may also be constitutional restraints on the ability of a utility to discriminate for or against solar systems. If a state utility commission approves a discriminatory practice, it may violate the federal constitution's command of equal protection.<sup>45</sup> However, under recent readings of that constitutional provision, a state has substantial leeway in discriminating if it has any reasonable justification.<sup>46</sup>

### C. SERVICE DISCRIMINATION

An extremely important service discrimination issue is whether a public utility can refuse to provide backup electricity for structures with solar heating or cooling systems. The short answer is that it appears a utility may not, unless it can demonstrate a compelling case that backup service would cause substantial harm to the util-

of business. See *Puerto Rican American Tobacco Co. v. American Tobacco Co.*, 30 F.2d 234 (2d Cir. 1929). Or, it might be viewed as an illegal tying arrangement in situations where a solar customer's receipt of favorable treatment is conditioned on his acceptance of the utility service. Tying arrangements are another classic antitrust violation. See 15 U.S.C. § 14 (1970); *International Business Mach. Corp. v. United States*, 298 U.S. 131 (1936).

43. 15 U.S.C. §§ 13, 13a, 13b, 21a (1970).

44. The Act provides in part:

It shall be unlawful for any person engaged in commerce, in the course of such commerce, either directly or indirectly, to discriminate in price between different purchasers of commodities of like grade and quality, where either or any of the purchases involved in such discrimination are in commerce, where such commodities are sold for use, consumption, or resale within the United States . . . where the effect of such discrimination may be substantially to lessen competition or tend to create a monopoly in any line of commerce, or to injure, destroy, or prevent competition with any person who either grants or knowingly receives the benefit of such discrimination, or with customers of either of them: *Provided*, That nothing herein contained shall prevent differentials which make only due allowance for difference in the cost of manufacture, sale, or delivery resulting from the differing methods or quantities in which such commodities are to such purchasers sold or delivered. . . . *And provided further*, That nothing herein contained shall prevent persons engaged in selling goods, wares, or merchandise in commerce from selecting their own customers in bona fide transactions and not in restraint of trade: *And provided further*, That nothing herein contained shall prevent price changes from time to time where in response to changing conditions affecting the market for or the marketability of the goods concerned, such as but not limited to actual or imminent deterioration of perishable goods, obsolescence of seasonal goods, distress sales under court process, or sales in good faith in discontinuance of business in the goods concerned.

15 U.S.C. § 13(a) (1970).

45. U.S. CONST. amend. XIV.

46. In *McGowan v. Maryland*, 366 U.S. 420 (1961) the Court stated:

The Fourteenth Amendment permits the States a wide scope of discretion in enacting laws which affect some groups of citizens differently than others. The constitutional safeguard is offended only if the classification rests on grounds wholly irrelevant to the achievement of the State's objective. State legislatures are presumed to have acted within their constitutional power despite the fact that, in practice, their laws result in some inequality.

*Id.* at 425-26.

ity's existing customers. Refusal to provide service would not only transgress the federal antitrust laws and the antidiscrimination statutes discussed above, but it would violate the utility's common law and statutory duty to provide utility service.

The basic concept of a public utility is an entity that has dedicated its property to serve the public without discrimination.<sup>47</sup> Almost every state has a statutory provision requiring utilities to "furnish adequate and safe service,"<sup>48</sup> "provide such service, instrumentalities, and facilities as shall be safe and adequate and in all respects just and reasonable,"<sup>49</sup> or "furnish reasonably adequate service and facilities."<sup>50</sup> The Supreme Court enunciated the underlying purpose of these statutes in the following terms:

Corporations which devote their property to a public use may not pick and choose, serving only the portions of the territory covered by their franchises which it is presently profitable for them to serve, and restricting the development of the remaining portions by leaving their inhabitants in discomfort without the service which they alone can render.<sup>51</sup>

Of course, the duty to provide adequate service has some limits. Utilities will be excused from providing service when prevented from doing so by acts of God, labor disputes, and shortages of fuel supply.<sup>52</sup> Although there is substantial precedent to the contrary,<sup>53</sup> in some cases utilities have been excused from providing service when to do so would be unusually expensive.<sup>54</sup>

As with most issues in public utility regulation, the "duty to serve" requirement is interpreted on a case-by-case basis with "reasonableness" and the "public interest" as the touchstones. In the case of backup service for solar heating and cooling systems, the public interest probably demands that the utilities provide service. The major argument against providing backup service is that it requires the utility to build and maintain expensive peaking equipment that would only be used infrequently, for example, when cloudy periods have drained the storage facilities of solar structures, and the solar owners are consequently demanding power simultaneously with

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47. For a general discussion of a utility's duty to serve, see Hodel & Wendel, *The Duty and Responsibility of Oregon Public Agencies to Provide Adequate and Sufficient Electrical Utility Service*, 54 ORE. L. REV. 539-50 (1975); Note, *Utility's Duty to Serve*, 62 COLUM. L. REV. 312 (1962).

48. OR. REV. STAT. § 757.020 (1975).

49. N.Y. PUB. SERV. LAW § 65 (McKinney 1955), as amended, (McKinney Supp. 1976).

50. WIS. STAT. ANN. § 196.03(1) (1957).

51. *New York & Queens Gas Co. v. McCall*, 245 U.S. 345, 351 (1917).

52. 1 A. PRIEST, *supra* note 26, at 237-38.

53. *E.g.*, *Corporation Comm'n v. Southern Pac. Co.*, 55 Ariz. 173, 99 P.2d 702 (1940).

54. *E.g.*, *Re Union Elec. Co. of Mo.*, 90 P.U.R.(N.S.) 194 (Mo. Pub. Util. Comm'n 1950); *Re Billings Gas Co.*, 26 P.U.R.(N.S.) 328 (Mont. Pub. Serv. Comm'n 1938); *Re New York Tel. Co.*, 37 P.U.R.(N.S.) 173 (N.Y. Pub. Serv. Comm'n 1941).

peak demand from other customers. This argument appears to be of little consequence, since utilities can condition the receipt of solar backup power on the installation of equipment that will draw power from the utility only during nonpeak periods. Even if such a condition did not eliminate the peak demand induced by solar customers, the public interest in fuel conservation might justify the enforcement of the duty to serve.

How will the duty to serve affect discrimination in favor of solar customers? In particular, can a gas company refuse to provide gas connections to new residences that do not install solar heating and cooling equipment? All indications are that such a discriminatory practice would be viewed as reasonable. Present natural gas shortages present a strong argument for conditioning the receipt of gas on the implementation of various conservation measures. Some states have taken measures to restrict gas to certain customers or to eliminate its availability for some uses. For example, New York banned the use of gas in swimming pools and in buildings without adequate insulation.<sup>55</sup> A few states have banned the use of gas in decorative lighting.<sup>56</sup>

#### D. RATE DISCRIMINATION

Utility rate structures have recently become a political issue.<sup>57</sup> At rate hearings across the country, utility regulators have become the arbiters of the merits of different, extremely complex theories for utility pricing. The major participants in this debate, in addition to the utilities themselves, are industrial, consumer, and environmental representatives. As a special subgroup of consumers, solar energy users also have a great deal at stake.

##### 1. Types of Rate Structures

A relatively simple example helps to demonstrate the importance of this relationship. A homeowner considering a solar system is told he can expect to reduce his annual outside energy consumption by seventy percent. The homeowner purchases the system and it performs as promised. However, the homeowner finds that his utility bills have dropped far less than expected, and his total dollar sav-

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55. *National Swimming Pool Inst. v. Kohn*, 80 Misc. 2d 655, 364 N.Y.S.2d 747, 9 P.U.R. 4th 237 (1974); *New York Pub. Serv. Comm'n*, Case 26286 (Apr. 16, 1974). See also *Bar on Heated Pools Leaves Californians Boiling*, *New York Times*, Feb. 5, 1976, at 33.

56. *Leroy Fantasies, Inc. v. Swidler*, 44 App. Div. 2d 266, 354 N.Y.S.2d 182, 4 P.U.R. 4th 334 (1974), *appeal denied*, 34 N.Y.2d 519, 316 N.E.2d 884 (1974); *Colorado Pub. Util. Comm'n*, Decision No. 87640 (Oct. 21, 1975).

57. See generally *Bigger Electric Bills Ahead for Big Business*, *BUSINESS WEEK*, Nov. 29, 1976, at 55. Several periodicals are devoted exclusively to utility issues. For example, *Public Utilities Fortnightly* emphasizes the utility perspective and *Power Line* presents an environmentally oriented view.

ings amount to only fifty percent. The difference is attributable to a declining block rate schedule, which imposes a higher fee for the first block purchased. This pricing system is the most common rate structure for residential customers, and it was designed to encourage long-run growth in demand.<sup>58</sup>

Another common utility rate structure provides a lower price to all-electric customers. This practice is essentially a holdover from the days of competition between gas and electric companies for new business. At the time such rates were adopted, growth was a source of declining costs, and therefore benefited all a utility's customers. Although this situation no longer exists, the all-electric rate structure continues in many places.<sup>59</sup> The current justification by utilities is that the demand imposed by all-electric users is largely offpeak, that is, when the demands on the utility's capacity are low.<sup>60</sup> This rate might be denied to homeowners using the utility to back up a solar system, leading to higher than expected costs for service.<sup>61</sup>

Some utilities also provide standby or breakdown service to customers whose entire electrical requirements are not regularly supplied by the utility.<sup>62</sup> Although under current definitions this rate would not apply to customers using solar energy strictly for heating and cooling, future solar technologies that use solar energy to generate electricity would be affected.<sup>63</sup> Utilities may argue that the rationale for standby service—the irregular and unpredictable nature of the customer's demand—also applies to solar energy users, and that they should therefore be included in this category. Since such service may include a high minimum monthly charge, the impact on solar users would be adverse.

From the standpoint of the utility company, the solar energy

58. PERSPECTIVE ON POWER, *supra* note 3, at chaps. 1-3.

59. For example, general residential service rates for service from the Public Service Co. of Colorado are:

|                |                          |
|----------------|--------------------------|
| \$1.50         | for first 30 kwh or less |
| 3.708c per kwh | for next 70 kwh or less  |
| 2.928c per kwh | for next 900 kwh or less |
| 1.958c per kwh | all additional kwh       |

The rates for residential service, all-electric homes are:

|                |                           |
|----------------|---------------------------|
| \$6.67         | for first 200 kwh or less |
| 2.938c per kwh | for next 800 kwh or less  |
| 1.958c per kwh | all additional kwh        |

Thus, the all-electric customer is given a small advantage. FEDERAL POWER COMM'N, NATIONAL ELECTRIC RATE BOOK: COLORADO 3 (Aug. 1975). Rate books are published for each state and are updated periodically.

60. Letter insert in monthly bill from Potomac Electric Power Co., Washington, D.C. to its customers (Jan. 1977).

61. In conversations with officials at the Energy Research and Development Administration, the authors were told that denials of all-electric rates to solar users have already occurred.

62. *E.g.*, Southern California Edison, Rate Schedule S: Standby (June 1, 1964) (on file with the Cal. Pub. Util. Comm'n, Sheet No. 3598-E).

63. For a description of technologies for generating electricity from solar energy, see W. CLARK, ENERGY FOR SURVIVAL 383-95 (1974).

user is a rather special customer. The usual residential consumer varies his demand with the outside temperature. This demand may vary considerably with the seasons, but the general range and timing are relatively predictable. In contrast, most solar buildings will use their backup systems only occasionally, after a cloudy period or severe weather. If the utility has to maintain capacity to meet this infrequent demand, the costs of serving the solar customers may not be covered by prevalent rates. Of course, this assumes the solar user requires auxiliary service when the utility is operating at peak, an issue addressed below.

The possibility of conflict between solar energy users and utilities has already surfaced in Colorado. Public Service Company, a Colorado utility, requested a rate schedule for new residential customers designed in part to capture the extra costs imposed by solar heated dwellings.<sup>64</sup> The proposed rate schedule was a demand/energy rate, which has two components: an energy charge, reflecting the total kilowatt-hours used, and a demand charge, based on the maximum kilowatt demand during any fifteen minutes. The theory underlying this division is that the demand charge reflects the cost of generating capacity, as opposed to the cost of the fuel used to serve the customer. This rate structure has traditionally been used for large commercial and industrial customers whose demand was considered high enough to justify the added costs of metering.

Solar energy advocates testifying before the Colorado Public Utility Commission were extremely critical of the demand charge concept.<sup>65</sup> They contended that the impact on solar users would be devastating since the occasional user would pay a relatively high charge for any occasional demand, despite very low amounts of total energy consumption. One calculation indicated that a solar system which provides seventy percent of heating needs would reduce the homeowner's electric bill thirty-five percent under the existing declining block rate, but only fifteen percent under the demand charge.<sup>66</sup> The economics of solar energy are presently marginal in most places, so this difference, it was contended, might discourage consumers from installing a solar system.

Solar advocates also attacked the demand charge concept in the

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64. Testimony of James H. Ranniger, Manager of Rates and Regulation for the Public Service Co. of Colorado, Colorado Public Utilities Comm. Investigation and Suspension Docket No. 935, at 14 (Sept. 22, 1975).

65. Testimony of Dr. Ernst Habicht, Jr. and Dr. William Vickrey for the Environmental Defense Fund, at the Colorado Public Utilities Comm. Investigation and Suspension Docket No. 935 (Sept. 22, 1975). See generally Mills, *Demand for Electric Rates: A New Problem and Challenge for Solar Heating*, 19 AM. SOC'Y HEATING, REFRIG. & AIR CONDITIONING ENG. J. 42 (1977).

66. Mills, *supra* note 65, at 42. The solar system would save more of the entire bill but for the nonheating demands of electricity for appliances.

Public Service Company case by questioning whether the demand from solar heated buildings was likely to coincide with the utility's peak period; if not, no capacity charge was justified. Several studies have attempted to answer this question by simulating the performance of solar heated buildings, and by comparing their needs for backup energy with utility load curves.<sup>67</sup> One recent study examined six different utilities and concluded as follows:

No general statement can be made. . . . This analysis must be performed on an individual utility basis, since variations in the ambient weather conditions, load curves, and generation mixes of utilities will be the prime determinants in the magnitude of the impact.<sup>68</sup>

The same studies have also noted the importance of thermal energy storage systems as a potentially significant factor. A simple rock bed or water tank, for example, might easily store a day's worth of heating needs. An appropriately designed building with an adequate storage system could always be served off-peak.<sup>69</sup>

As an alternative approach that would be fair to both homeowners and the utility, solar advocates testifying before the Colorado Public Utility Commission supported time-of-day pricing. Time-of-day rate structures charge more for power consumed during peak periods and less during other hours, such as late at night. A homeowner with an energy storage system, whether or not he also had a solar unit, could buy energy during off-peak times, but use it to provide heat during peak periods. The argument is complicated by questions about the added cost of time-of-day meters and utility claims that present off-peak periods are needed to allow for maintenance.

The Colorado Public Utility Commission initially granted the

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67. Results of these studies are summarized in PUBLIC UTILITY & SOLAR ENERGY INTERFACE, *supra* note 3, and MITRE CORP. ENERGY RATE INITIATIVES STUDY OF THE INTERFACE BETWEEN SOLAR AND WIND ENERGY SYSTEMS AND PUBLIC UTILITIES (prepared for the Fed. Energy Comm'n, Tech. Rep. 7431, draft, Dec. 20, 1976) (written by G. Swetnam & D. Jardine of MITRE Corp.) [hereinafter cited as ENERGY RATE INITIATIVES].

68. S. FELDMAN & B. ANDERSON, UTILITY PRICING AND SOLAR ENERGY DESIGN 117 (National Science Foundation/Research Applied to National Needs, Grant No. APR-75-18006, 1976).

69. Feldman and Anderson found:

Present solar building designs do not generally avail themselves to the exclusive use of off-peak electric power but generally will use a portion of their auxiliary energy during peak periods. This situation can be remedied by modifications to the control system, storage and collector size, use patterns or a combination of these factors. By designing the solar building to utilize only off-peak energy, the building owner may incur increased capital costs, these in turn may be offset by a decrease in his energy bill due to the use of lower cost off-peak electricity.

*Id.* at 28. This analysis, however, only holds true as a description of heating needs. The technology for cooling with solar energy is less advanced; solar energy cooling and storage could be analyzed in the same way but it remains more hypothetical than real. *Id.* at 18. See also Klein, Beckman & Duffie, *A Design Procedure for Solar Heating Systems*, 18 SOLAR ENERGY 113 (1976).

Public Service Company's request,<sup>70</sup> but following a rehearing the PUC decided that there were numerous general questions concerning the demand charge schedule that should be addressed in a generic rate hearing.<sup>71</sup> During the interim, the demand charge was left as an option since some all-electric customers might benefit (relative to a declining block rate).

Several other rate structures have been proposed that have different implications for solar users. A few utilities have flat rates for residential customers.<sup>72</sup> Flat rates are simply a set amount per unit of energy, regardless of the amount purchased.<sup>73</sup> This rate structure is neutral with regard to energy savings. However, since demand costs are not charged separately, the solar user may be subsidized by other customers if his needs occur during peak periods.

Lifeline rates have been adopted in a few states.<sup>74</sup> Under this system, less is charged for the first units of energy. Its goal is to ease the burden on low-income consumers.<sup>75</sup> This rate may incidentally benefit solar users whose needs for supplemental sources of energy are small enough to fall within the "lifeline" amount.

A final type of utility pricing is interruptible rates. This rate has traditionally been available only to industries willing to accept the risk of service interruptions in return for lower rates. Some studies have pointed out that a solar user willing to accept the risk of going without utility service on infrequent occasions could save the utility substantial amounts in capital requirements, justifying a lower rate.<sup>76</sup> If the peak occurred only rarely, this alternative might be considerably less expensive than additional units of storage or collector area.<sup>77</sup>

## 2. Legal Response to Rate Discrimination

The legal principles involved in rate regulation are similar to those discussed for service discrimination.<sup>78</sup> The same prohibitions on discriminating among customer categories apply, as do the am-

70. In the Matter of Proposed Increased Rates and Charges Contained in Tariff Revisions Filed by Public Serv. Co. of Colo., No. 87460 (Colo. Pub. Util. Comm'n, Oct. 21, 1975).

71. Home Builders Ass'n of Metropolitan Denver v. Public Serv. Co. of Colo., No. 89573 (Colo. Pub. Util. Comm'n, Oct. 26, 1976).

72. *E.g.*, Re Jacksonville Gas Corp., 100 P.U.R.(N.S.) 83, 86 (Fla. R.R. & Pub. Util. Comm'n 1953) (electricity); Re City of Helena, 89 P.U.R.(N.S.) 370, 373 (Mont. Pub. Serv. Comm'n 1951) (water); Re Madison Gas & Electric Co., 5 P.U.R.4th 28, 40 (Wis. Pub. Serv. Comm'n 1974) (electricity).

73. "Flat rate" is also used to connote a rate in which the total bill is the same no matter how much power is used, as opposed to a rate in which the per kwh charge is the same no matter how much is used.

74. *E.g.*, CAL. PUB. UTIL. CODE § 739 (West 1975), as amended, (West Supp. 1977).

75. See 'Lifeline Rates'—Are They Useful?, ENERGY CONSERVATION PROJECT REPORT, No. 4, at 13 (Jan. 1976).

76. *E.g.*, PUBLIC UTILITY & SOLAR ENERGY INTERFACE, *supra* note 3, at 155.

77. S. FELDMAN & B. ANDERSON, *supra* note 61, at 120.

78. See text accompanying notes 47-56 *supra*.



biguities concerning what constitutes "discrimination."

A rate structure that adversely affects solar energy users may be difficult to challenge under current case law. Several cases have upheld the legality of rate structures that subsidize all-electric customers, despite antidiscrimination laws.<sup>79</sup> For example, in *Rossi v. Garton*,<sup>80</sup> a New Jersey court held that an allowance of \$150 to anyone installing electric home heating did not violate the state's anti-discrimination statute.<sup>81</sup> The court interpreted the statute to bar only "unjust" discriminations, and concluded that only arbitrary discriminations are unjust. The court stated: "If the difference in rates is based upon a reasonable and fair difference in conditions which equitably and logically justify a different rate, it is not an unjust discrimination."<sup>82</sup>

A New York public utility commission summarized the requirements for promotional rate structures as follows:

(1) Promotional inducements may never vary the rates, charges, rules, and regulations of the tariff pursuant to which service is rendered to the customer.

(2) Promotional inducements must be uniformly and contemporaneously available to all persons within a reasonably defined group.

(3) The costs of the promotional practices must not be so large as to impose a burden on customers in general and must be recoverable through related sales stimulation within a reasonable period of time.

(4) The size and nature of the allowance or other promotional inducement must be reasonably related to the objective sought to be achieved and reasonably expected to promote the interests of the utility and its customers.<sup>83</sup>

If a rate structure that provides a *direct* subsidy for the use of one source of energy is legal, then a rate structure that *incidentally* burdens a competing source of energy is, presumably, also valid.

Such facile judicial acceptance of promotional rate structures should not be expected in the future. Until the late 1960s, the cost of power declined with each new power plant. Utilities could therefore argue that promotional rate structures would, over time, bring new business that would justify additional power plants. These new plants would then lower the bills of all customers of the utility.<sup>84</sup>

79. For an example of such a statute, see N.J. STAT. ANN. § 48:3-1 (1969); *id.* § 48:3-4 (1969), as amended, (Supp. 1976), quoted at text accompanying note 27 *supra*.

80. 88 N.J. Super. 233, 211 A.2d 806, 60 P.U.R.3d 210 (1965).

81. N.J. STAT. ANN. § 48:3-1 (1969); *id.* § 48:3-4 (1969), as amended, (Supp. 1976).

82. 88 N.J. Super. 233, 236, 211 A.2d 806, 808, 60 P.U.R.3d 210, 212 (1965).

83. Re Promotional Activities by Gas & Electric Corps., 68 P.U.R.3d 162, 170 (N.Y. Pub. Serv. Comm'n 1967).

84. I A. PRIEST, *supra* note 26, at 318.

More recently, inflation, changes in regulatory practices, and increased environmental costs have forced the long-run cost of power to steadily rise.<sup>85</sup>

In these circumstances, promotional rates lose much of their appeal. A New York court recognized the common impact of rising fuel prices in a recent decision overturning a subsidy for all-electric homeowners.<sup>86</sup> The subsidy, which was to run for a year, was intended to lessen the impact of higher electric rates on residential customers who had previously been induced to buy all-electric homes by favorable rates. The court held that the subsidy "constituted undue preference and advantage" in violation of the state antidiscrimination law.<sup>87</sup>

As a result of this change in financial realities, it may be more defensible for public utility commissions to grant subsidies for conservation than for promotion of energy consumption. Several utility commissions have explicitly authorized programs to finance the installation of insulation to conserve natural gas.<sup>88</sup> Since it can be reasonably claimed that conservation by some consumers contributes to the eventual economic benefit of all, earlier precedent in support of promotional practices should be applicable. Some states have adopted legislation specifically authorizing conservation programs, eliminating any doubt about their validity.<sup>89</sup>

#### IV. REGULATORY BURDENS ON MULTI-USER SOLAR SYSTEMS

In some factual settings it will make sense for several persons to share the power from a single solar system. Situations where this may be desirable include: apartment buildings, including condominiums and cooperatives; mobile home parks; district heating and cooling plants; shopping center complexes; and industrial parks.

##### A. SCOPE OF PUC JURISDICTION

In most states solar systems would not fall within the jurisdic-

85. From 1956 to 1970, the average cost of electricity in the United States declined from 2.61c per kwh to 2.10c. Since 1970, costs have increased steadily; the average cost per kwh in 1975 was 3.21c, despite an equally steady rise in consumption during the same period. Samuelson, *supra* note 15, at 1475. See also Joskow, *Inflation and Environmental Concern: Structural Changes in the Process of Public Utility Pricing Regulation*, 17 J. Law & Econ. 291 (1974).

86. *Lefkowitz v. Public Serv. Comm'n*, 40 N.Y.2d 1047, — N.E.2d —, 392 N.Y.S.2d 239 (1976), *aff'g*, 50 App. Div. 2d 338, 377 N.Y.S.2d 671 (1975).

87. *Lefkowitz v. Public Serv. Comm'n*, 50 App. Div. 2d 338, —, 377 N.Y.S.2d 671, 674 (1975).

88. *E.g.*, *Re Pacific Power & Light Co.*, 69 P.U.R.3d 367 (Idaho Pub. Util. Comm'n 1967); *In the Matter of the Application of Mich. Consol. Gas Co. for Authorization of a Program for the Conservation of Natural Gas*, 1 P.U.R.4th 229 (Mich. Pub. Util. Comm'n 1973). Related decisions by public utility commissions have allowed the restriction of energy to approved uses and the prohibition of energy use by uses considered wasteful. See notes 55-56 *supra* and text accompanying.

89. *E.g.*, CAL. PUB. UTIL. CODE §§ 2781-88 (West 1975), as amended, (West Supp. 1977); N.J. STAT. ANN. § 48:2-23 (1969), as amended, (Supp. 1976).

tion of a state Public Utility Commission where those systems are operated and owned by a *single* entity on its own property for its own use (as may be the case with a university heating plant that services several dormitories and classroom buildings).<sup>90</sup> And, to the extent that joint systems are operated by municipal utilities within the bounds of the franchising municipality, there should be no PUC jurisdiction in most states.<sup>91</sup>

But, if two or more separate entities share a solar system, will they be subject to the jurisdiction of a state PUC and the various burdens that accompany such regulation? Any regulatory jurisdiction that does exist over multi-user systems will be at the state level. Neither the Federal Power Commission nor any other federal agency has authority to regulate the production, sale, or shipment of heated or cooled water.<sup>92</sup>

At the state level, PUC jurisdiction over multi-user solar systems will turn on the interpretation of utility commission statutes. While electric utilities are almost universally regulated, regulation of utilities supplying heat or cold is not nearly so pervasive. Nevertheless, some states do have statutes granting the PUC jurisdiction over entities that provide heat or cold to the public. For example, the definition of public utility in Wisconsin includes every entity that

may own, operate, manage or control any . . . plant or equipment or any part of a plant or equipment . . . for the production, transmission, delivery or furnishing of *heat* . . . either directly or indirectly to or for the public. . . .<sup>93</sup>

And Illinois law defines a public utility as every entity that

owns, controls, operates or manages within this State, directly or indirectly, for public use, any plant, equipment or property used or to be used for or in connection with, or owns or controls any franchise, license, permit or right to engage in:

. . .

c. the production, storage, transmission, sale, delivery or furnishing of *heat, cold, light, power, electricity or water*. . . .<sup>94</sup>

90. See notes 95-98 *infra*, and text accompanying.

91. In many states, municipal utilities are exempt from PUC jurisdiction. *E.g.*, FLA. STAT. ANN. § 366.02 (1968), repealed by ch. 76-168, § 3 [1976] Fla. Laws —, —, effective July 1, 1980. *But see* WIS. STAT. ANN. § 196.58(5) (1957).

92. Generally, the Federal Power Commission has jurisdiction only over hydroelectric plants and the interstate transport and sale of electricity. See 16 U.S.C. §§ 797, 824 (1970).

93. WIS. STAT. ANN. § 196.01 (1957), *as amended*, (Supp. 1976) (emphasis added).

94. ILL. REV. STAT. ch. 111 2/3, § 10.3 (Smith-Hurd 1966), *as amended*, (Smith-Hurd Supp. 1977) (emphasis added).

In these states the key legal issue on which jurisdiction turns is whether the heating or cooling entity is providing its services to the public. In short, a shared solar system will not be found to be a public utility if its energy is not provided "to the public."

The majority rule appears to be that a company is serving the public if it has "dedicated its property to public use."<sup>95</sup> Such dedication exists if the entity is serving, or has evidenced a readiness to serve, an "indefinite public" which has a legal right to receive service.<sup>96</sup> Evidence of dedication to public use includes a willingness to serve all who request service, wide solicitation of customers, the actual provision of service to all who ask for it, voluntary submission to state regulation, or an attempt to exercise the power of eminent domain.<sup>97</sup> It is important to note that this test does not require that an entity provide unlimited service to all who apply. It need only be willing to serve demands within its geographic area and to the extent of its capacity.<sup>98</sup>

Under a minority rule, certain activities that do not involve a dedication of property to public use may nonetheless be "so affected with the public interest" as to give rise to utility commission jurisdiction. This view has, for example, prevailed in at least one case involving a shopping center that generated its own electricity.<sup>99</sup>

It is difficult to predict whether multi-user systems will be subject to the burdens of PUC regulation. Under the rules discussed above, it is at least arguable that a multi-user solar system would fall within PUC jurisdiction in states whose utility statutes purport to regulate heat and cold. This uncertainty may discourage investors from developing shared solar systems.

## B. CONSEQUENCES OF PUC JURISDICTION

There are several reasons why the owners of a shared solar

95. *E.g.*, *Allen v. California R.R. Comm'n*, 179 Cal. 68, 175 P. 466 (1918).

96. "The principal determinative characteristic of a public utility is that of service to, or readiness to serve an indefinite public . . . which has a legal right to demand and receive its services or commodities." *Motor Cargo, Inc. v. Board of Township Trustees*, 52 Ohio Op. 257, 258, 117 N.E.2d 224, 226 (1953). *See, e.g.*, *Claypool v. Lightning Delivery Co.*, 38 Ariz. 262, 299 P. 126 (1931); *Story v. Richardson*, 186 Cal. 162, 198 P. 1057 (1921); *Sutton v. Hunziker*, 75 Idaho 395, 272 P.2d 1012 (1954); *Peoples Gas Light & Coke Co. v. Ames*, 359 Ill. 132, 134 N.E. 260 (1935); *Missouri v. Brown*, 323 Mo. 818, 19 S.W.2d 1048 (1929); *Bricker v. Industrial Gas Co.*, 58 Ohio App. 101, 16 N.E.2d 218 (1937); *Limestone Rural Tel. Co. v. Best*, 56 Okla. 85, 155 P. 901 (1916); *Schumacher v. Railroad Comm'n*, 185 Wis. 303, 201 N.W. 241 (1924); *Cawkes v. Meyer*, 147 Wis. 320, 133 N.W. 157 (1911); *Re Nafe*, 4 P.U.R.3d 369 (Ohio Pub. Util. Comm'n 1953). *See generally* Priest, *Some Bases of Public Utility Regulation*, 36 Miss. L.J. 18 (1965).

97. *See* DOW CHEM. CO., ENVIRONMENTAL RESEARCH INST. OF MICH., TOWNSEND-GREENSPAN & CO. AND CRAVATH, SWAINE & MOORE, ENERGY INDUSTRIAL CENTER STUDY 373 and cases cited therein (prepared for the Office of Energy Research & Development Policy, National Science Foundation, Grant No. OEF 74-20242, June 1975).

98. *E.g.*, *Camp Rincon Resort Co. v. Eshleman*, 172 Cal. 561, 158 P. 126 (1916); *Higgs v. City of Fort Pierce*, 118 So. 2d 582 (Fla. 1960); *State Pub. Util. Comm'n v. Bethany Mut. Tel. Ass'n*, 270 Ill. 183, 110 N.E. 334 (1915).

99. *Cottonwood Mall Shopping Center, Inc. v. Utah Power & Light Co.*, 440 F.2d 36 (10th Cir. 1971).

system should fear PUC jurisdiction. If a shared solar system is found to be a public utility, it must file reports and accounts,<sup>100</sup> serve all customers who demand service within a given area,<sup>101</sup> submit its rate schedules to the PUC for approval,<sup>102</sup> continue providing service until given permission to discontinue,<sup>103</sup> provide safe and adequate service,<sup>104</sup> and comply with limitations on the issuance of securities.<sup>105</sup>

Perhaps the most significant burden that PUC jurisdiction would place on shared solar systems would be the duty to apply for certificates of public convenience and necessity. State utility regulatory statutes universally require that every public utility must obtain a certificate before beginning operation or even construction of its equipment.<sup>106</sup> Not only are certification proceedings often long and expensive, but the PUCs use the certification process to protect the monopoly of existing utilities. The general rule is that an existing utility shall be given a monopoly in its area unless the public convenience and necessity require otherwise. In practice this means that a new utility is almost never permitted in an area already served by an existing utility. Even where the existing utility is providing woefully inadequate and inefficient service, it will be permitted to exercise monopoly control over its service area if it promises to correct its shortcomings.<sup>107</sup>

The obvious question is whether a multi-user solar system found to be a public utility will be certified to provide heat and cold to areas being served by existing utilities. If the existing utility already provides heat and cold, the answer is fairly simple—the existing utility will probably be permitted to retain its monopoly in the absence of some overwhelming reason to the contrary.

The question is more problematical where the existing utility is providing heat and cold indirectly (by selling gas or electricity). In such instances, there appears to be little justification for denying certification to the shared solar system. A recent study completed for the Energy Research and Development Administration concludes that there is substantial case precedent for certifying solar energy systems despite the fact that conventional facilities exist for providing heat and cold.<sup>108</sup> The precedents cited in the ERDA study sug-

100. *E.g.*, FLA. STAT. ANN. § 366.05(1) (1968).

101. *See* notes 47-56 *supra*, and text accompanying.

102. *E.g.*, CAL. PUB. UTIL. CODE § 454 (West 1975), *as amended*, (West Supp. 1977).

103. *E.g.*, WIS. STAT. ANN. § 196.81 (1957), *as amended*, (Supp. 1976).

104. *E.g.*, CAL. PUB. UTIL. CODE § 761 (West 1975).

105. *E.g.*, FLA. STAT. ANN. § 366.04 (1968), *as amended*, (Supp. 1976), repealed by ch. 76-168, § 3 [1976] Fla. Laws —, —, effective July 1, 1980.

106. *E.g.*, ILL. REV. STAT. ch. 111 2/3, § 56 (Smith-Hurd 1966).

107. *See, e.g.*, Kentucky Util. Co. v. Public Serv. Comm'n, 252 S.W.2d 885 (Ky. Ct. App. 1952); W. JONES, REGULATED INDUSTRIES 347 n.2 (1967).

108. WILSON, JONES, MORTON & LYNCH, THE SUN: A MUNICIPAL UTILITY ENERGY SOURCE 5-6 (1976) (prepared under an agreement with the city of Santa Clara, Cal., with the support of ERDA).

gest that new energy forms should be permitted to compete with existing energy forms if the new form is cheaper, cleaner, or in some way more efficient. An electric light company, for example, was certified despite the existence of an acetylene light company, on the ground that the electric company provided a new and different service.<sup>109</sup> A gas company was certified for the same region served by an electric plant, although it would serve the same needs as the electric plant. The certification was justified because gas was cheaper and different.<sup>110</sup> Similarly, because an electric railway offers a different form of motive power than a steam railway, an electric railway won certification where a steam railway was already available.<sup>111</sup> Finally, several decisions allowed the certification of natural gas companies.<sup>112</sup> In one case the court said that natural gas was cleaner and more serviceable than manufactured gas.<sup>113</sup>

Despite these precedents supporting certification of solar public utilities in areas served by competing utilities, it is clearly within the authority of some PUCs to deny certification. The mere possibility of PUC jurisdiction over shared solar facilities, and the threat that such jurisdiction may be used to prevent operation of the facilities, is a substantial barrier to the development of joint solar systems.

There are several obvious ways to eliminate these threats. The first, and simplest, would be for PUCs to declare that they will not choose to exercise jurisdiction over solar heating and cooling plants. This raises the question of whether utilities threatened by competition from the solar plants can compel the PUC to exercise its jurisdiction. This issue is likely to hinge on statutory construction issues: first, whether the challenged activity is a public utility; and second, whether the PUC may or must exercise jurisdiction over a public utility.

Because PUCs may be forced to assert jurisdiction over shared facilities, legislative action may be the only feasible approach. Legislative action may take several forms. A law might simply state that the public interest demands that shared solar facilities be permitted to compete with existing utilities. Such an approach would not preclude PUC regulation of other aspects of joint solar heating and cooling plants. A more drastic approach would be for the legislature to completely exempt solar facilities from PUC jurisdiction. A related proposal has been put before the California legislature.

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109. *Re Markham*, 1916A P.U.R. 1007, 1012 (Mo. Pub. Serv. Comm'n 1915).

110. *Re Gas Fuel Service*, 3 P.U.R. (N.S.) 55, 60 (Cal. R.R. Comm'n 1933).

111. *Southern Pac. Co. v. San Francisco-Sacramento R.R.*, 1929A P.U.R. 116, 122 (Cal. R.R. Comm'n 1928).

112. *E.g.*, *Re North Dakota Consumers Gas Co.*, 30 P.U.R. (N.S.) 9 (N.D. Bd. R.R. Comm'rs 1939); *Lukens Steel Co. v. Manufacturers Light & Heat Co.*, 25 P.U.R. (N.S.) 20 (Penn. Pub. Util. Comm'n 1938).

113. *McFayden v. Public Util. Consol. Corp.*, 50 Idaho 561, 299 P. 671 (1930).

[A] person (a) using a power source other than a conventional power source for generating electricity solely for his own use and not for resale to others, except to an electric utility, and utilizing a transmission service . . . shall not be subject to regulation by the commission as a public utility.<sup>114</sup>

While this bill applies only to electrical generators, it could easily be broadened to encompass suppliers of heat and cold. Finally, the United States Congress could pass legislation to preempt state regulation of solar energy facilities. As discussed above, such preemptive action appears to be within Congress's authority, but is unlikely.

## V. PUBLIC UTILITIES AND SOLAR COMMERCIALIZATION

The discussion so far has been confined to the role of utilities in providing backup service to solar energy users. An equally significant possibility is the direct involvement of utilities in the solar energy market. Utility participation might come in a variety of forms, ranging from simply financing homeowners' purchases of collectors, an approach used in some states to help homeowners install insulation,<sup>115</sup> to the actual provision of solar collectors by utilities as an alternative form of energy service.

Many utilities are already considering such programs. The Southern California Gas Company, for example, is testing the use of solar assisted gas heating for apartment buildings.<sup>116</sup> Other utilities are also experimenting with solar energy,<sup>117</sup> and the utility-funded Electric Power Research Institute has a division devoted exclusively to solar energy projects.<sup>118</sup>

### A. DESIRABILITY OF UTILITY PARTICIPATION IN THE SOLAR MARKET

The merit of utility participation in the solar market is a hotly contested issue.<sup>119</sup> Utility advocates point to several possible advantages.

First, although solar energy utilizes the "free" energy from the sun, it requires additional first or capital cost. Since the construction industry is highly "first-cost intensive," we expect that solar energy will have some difficulty finding ear-

114. A.B. 4069, Cal. Legis. 1975-76 Reg. Sess.

115. See note 88 *supra*, and text accompanying.

116. See note 5 *supra*.

117. A recent survey found more than 100 electric utilities supporting solar energy research. Most of these projects involved the use of solar energy for heating and cooling buildings. ELECTRIC POWER RESEARCH INST., SURVEY OF ELECTRIC UTILITY SOLAR PROJECTS (ER 321-SR, 1977).

118. For a description of Electric Power Research Institute (EPRI) solar research projects, see EPRI, SOLAR ENERGY, FALL 1976 (EPRI Research Project 549, 1976). A summary is also provided in PUBLIC UTILITY & SOLAR ENERGY INTERFACE, *supra* note 3, at 27-32.

119. See generally PUBLIC UTILITY & SOLAR ENERGY INTERFACE, *supra* note 3; ENERGY RATE INITIATIVES, *supra* note 67.

ly, rapid acceptance. A utility company is used to high first-cost (capital intensive) business ventures. Utility company sponsorship in the "lease to the user" mode will do a lot to reduce this barrier . . .

Second, the sponsorship of a utility company may help overcome market "fragmentation." If the utility company buys the equipment and leases it in a large-scale fashion, the solar industry will face at least one aggregated market (to the gas company). This may provide a large enough incentive to actively stimulate a solar energy system fabrication industry.

Third, because a utility company already has a sales/distribution/service network which operates within the housing industry, the Utility Company scenario provides a way of "product fitting" solar energy systems.

Finally, because of the traditional anti-innovation bias within the industry (a bias which is quite understandable given the industry environment), utility company sponsorship will help overcome some of the traditional "institutional-cultural biases" against solar energy which exist within the housing industry.<sup>120</sup>

On the other hand, utility critics have been quick to raise the spectre of utility "ownership of the sun," with the attendant evils of "excessive profit-taking and monopolistic favoritism in equipment purchases."<sup>121</sup> While some of this opposition no doubt arises from ideological beliefs, specialists in utility economics have also raised serious questions about the desirability of using utilities to promote solar energy. Roger Noll, although he ultimately concludes that a limited form of utility involvement may be desirable,<sup>122</sup> notes two dangers.

[A] regulated utility has an incentive to invest in solar technology that is too durable, that is excessively efficient in converting sunlight to usable energy, and that requires inefficiently little maintenance. If permitted this would lead to excessive costs and prices for solar energy, and inefficiently slow adoption of the technology.

Second, regulated utilities can use solar technology strategically to recapture some of the monopoly profits that regulation takes away and to foreclose competition in the solar energy business.<sup>123</sup>

120. Hirshberg & Schoen, *Barriers to the Widespread Utilization of Residential Solar Energy: The Prospects for Solar Energy in the U.S. Housing Industry*, 5 POL'Y SCI. 453, 468 (1974).

121. See note 24 *supra*.

122. R. Noll, *Public Utilities and Solar Energy Development* (1976) (unpublished paper on file with the authors), reprinted in PUBLIC UTILITY & SOLAR ENERGY INTERFACE, *supra* note 3, at 176 [citations to Noll's paper will hereinafter be made to the reprinted version].

123. *Id.* at 183.



A compromise suggested by some utility critics is the use of publicly-owned utilities, which are considered more amenable to public control.<sup>124</sup> Even if this approach avoids some of the perverse incentives that exist for regulated, privately-owned utilities, too few public utilities exist to make it a realistic option.

While these issues will undoubtedly be debated by economists for years to come, it is likely that some utilities will enter the solar market. Unless the political strength of utility opponents becomes substantially stronger, utilities should be able to convince their regulators of the desirability of what can be portrayed as an energy conservation program. The economic grounds for opposing the concept are sufficiently complex and esoteric to justify a decision either way. Moreover, gas utilities will have a strong incentive to undertake such activities because of the declining availability of their product. Without some new source of energy services, gas firms face the prospect of steadily declining reserves.

#### B. REGULATING UTILITY PARTICIPATION IN THE SOLAR MARKET

It is appropriate to examine the legal framework in which utility participation in the solar market will be regulated. Several alternative regulatory policies will be discussed, and their legal consequences distinguished.<sup>125</sup> First, utilities might ask for a monopoly on the distribution of solar systems. They might hope to do this by denying backup energy to persons not using utility-supplied solar equipment. The utility could either rent or sell the equipment to the customer, but no other business could market competitive systems. Such a program would be extremely controversial; the necessary regulatory approval is unlikely. It is difficult to imagine any justification for the creation of a monopoly in solar equipment sales. In contrast, the generation of electricity is a natural monopoly that requires regulation to substitute for price competition.<sup>126</sup> Conceivably, electric utilities could argue that the use of solar collectors for heating so strongly affects the reliability of their systems that regulatory control over their use is justified. However, this issue could be addressed through appropriate rate structures.

Exclusive marketing rights would also probably run afoul of federal antitrust laws or state policies against anticompetitive practices. The Supreme Court decision, *Cantor v. Detroit Edison*, discussed previously, limited state activity to provide exemptions if the challenged

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124. See notes 24-25 *supra*, and text accompanying. See also ENVIRONMENTAL ACTION FOUNDATION, TAKING CHARGE: A NEW LOOK AT PUBLIC POWER (1976).

125. This delineation follows that used in PUBLIC UTILITY & SOLAR ENERGY INTERFACE, *supra* note 3, at 178-81.

126. See 1 A. KOHN, *supra* note 11, at 11-12.

activity is central to the purposes of a state's regulatory program.<sup>127</sup> The light bulb exchange program under attack failed to meet the test since "there is no reason to believe that [without the program] Michigan's regulation of its electric utilities will no longer be able to function effectively."<sup>128</sup> A regulatory authority would have to offer a more convincing rationale for a program that even more clearly contravened federal antitrust principles.

It is far more likely that utilities will be allowed to compete with other distributors, than that they will be granted exclusive marketing rights. Utilities' sales programs could be handled as a part of the utilities' regulated services, or through independent, separate subsidiaries. Precedents exist for both arrangements. For example, Pacific Telephone in California leased and installed mobile radio telephones for a number of years as an independent business. The company eventually decided that regulation was desirable, and filed an application with the state PUC. The commission accepted jurisdiction, and the service became a regulated business in competition with other unregulated concerns.

A utility is likely to view a regulated mode as most desirable because of the opportunities for cost sharing and risk spreading. Stated in terms favorable to the utility, it has been observed as follows:

A regulated utility may be able to overcome [some of the initial market resistance to solar energy] . . . if it is permitted, through rates it charges its customers, to spread at least some of the costs associated with its solar energy program among all of its customers and thereby reduce the unit cost to those persons who choose to utilize solar devices or systems.<sup>129</sup>

On the other hand, utility critics have suggested other possible incentives, in the opportunity for manipulation of expenses between the regulated and unregulated markets.

Because the utility is always more expert than the regulator on the technical and economic conditions facing the firm, a technological advance that provides more flexibility in firm operations can be used strategically by the utility to work a better deal from the regulated market. For example, a joint solar/gas utility would have to work out a method to

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127. 96 S. Ct. 3110 (1976).

128. *Id.* at 3118. Compare with *Gas Light Co. of Columbus v. Georgia Power Co.*, 440 F.2d 1135 (5th Cir. 1971) (electric utility rates and practices immune from private anti-trust suit where PUC gave lengthy consideration to challenged activities); *Washington Gas Light Co. v. Virginia Elec. & Power Co.*, 438 F.2d 248 (4th Cir. 1971) (electric utility rate preference for underground transmission lines immune from private anti-trust even though PUC did not specifically approve).

129. J. Lake, *Legal Aspects of the Use of Solar Energy for Water and Space Heating* 17-18 (1976) (unpublished paper on file with the authors).

allocate its costs between solar-assigned and gas-only services. If it could succeed in effectuating an allocation that, in fact, attributed too much cost to gas, it would succeed in taking advantage of its monopoly in the gas business to subsidize its solar energy business.<sup>130</sup>

It is questionable whether the use of an unregulated subsidiary is any less subject to manipulation than a regulated component of a utility. In both situations, common expenses will be incurred for such things as advertising, equipment, etc., that could be allocated to either the utility or its solar business. Nor is there any inherent reason why accounting requirements should be any different simply because of the status of the solar entity. The process of allocating costs will require value judgments in either case; one man's accounting trick is another's example of a natural advantage.

Indeed, the principal reason for seeking utility participation in the solar business is the existence of economic advantages, such as access to the capital market at more favorable interest rates, a developed distribution and billing system for energy services, and other relevant expertise. As long as these natural advantages are not abused through tying agreements or other illegal arrangements, no harm is done.

Whether or not the solar business is regulated, close scrutiny by the public utilities commission will be desirable. The regulatory process is certainly accustomed to the notion of cost sharing. Life-line rates, for example, diverge from simple cost-of-service principles, but are justified by other social objectives. The conservation of nonrenewable resources could easily be recognized as a benefit to all consumers of the utility, and therefore warrant some sharing of expenses from the solar business.<sup>131</sup> In any case, such cost sharing is likely to be tightly constrained by federal antitrust laws. Utility practices that are not explicitly authorized by utility commissions *and* are not clearly related to energy conservation objectives will be vulnerable to treble damage suits, a very effective weapon. Any effort to destroy competition by selling below market rates would certainly be challenged.<sup>132</sup>

In addition to antitrust considerations, another important legal issue is the scope of PUC jurisdiction over a solar business. Competitors of a utility entering the solar business are likely to contest PUC jurisdiction. They would hope to prevent the utility from obtaining the advantages associated with a regulated rate of return. This is likely to be particularly important in the early stages of the solar market, when small differences in price may be far less important

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130. R. Noll, *supra* note 122, at 183-84.

131. J. Lake, *supra* note 129, at 17-18.

132. G. TURNER, *supra* note 26, at 407-09.

to consumers than questions of reliability and performance guarantees.

The broad legal issues surrounding the exercise of PUC jurisdiction are described in the preceding section on regulatory burdens. Initially, there is a question of statutory construction—whether the service falls within the businesses enumerated by the state code. Thus, jurisdiction could be based on a provision in the statute for the regulation of “heat services” or, less directly, on the ground that such services are undertaken “in connection with or to facilitate” the utility’s primary business. In the case of solar energy, for example, it could be argued that the impact of solar energy use on the utility’s service is so great that combined regulated service is in the public interest.

The difficulty of drawing clear boundaries in this area is illustrated by the California case involving the exercise of jurisdiction by the California PUC over the rental and service of mobile radio telephones by Pacific Telephone.<sup>133</sup> The company had for some years offered the same service on an unregulated basis. At the company’s request, the PUC accepted jurisdiction and a private competitor appealed. A divided California Supreme Court approved jurisdiction on the ground that the service was closely related to the company’s regulated businesses.<sup>134</sup> As the court interpreted the statute, the most relevant issue was the use to which the technology was to be applied. Because telephone communication was intended, the service fell within the statute. Presumably, a similar argument could be made on behalf of regulating solar equipment as an energy service within the broad meaning of the statute. However, the issue is so borderline that the outcome is likely to rest on the wording of different statutes and the attitude of specific regulatory agencies and reviewing courts.

### C. RESTRICTING UTILITY PARTICIPATION IN THE SOLAR MARKET

An alternative to utility participation in the solar energy market would be to restrict such activities as much as possible. The extent to which such prohibitions could be imposed also depends on the ability of a PUC to assert jurisdiction over the offending activity. There is no legal basis for seeking jurisdiction unless the challenged activity affects the utility’s regulated business.<sup>135</sup> However, it seems likely that a sufficient nexus between solar energy and other energy services exists to justify jurisdiction *if* the PUC chooses to exercise it.

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133. *Commercial Communications, Inc. v. California Pub. Util. Comm’n*, 50 Cal. 2d 512, 327 P.2d 513 (1958).

134. *Id.* at —, 327 P.2d at 522.

135. See G. TURNER, *supra* note 26, at 20.

As a mixed question of fact and law, the agency's judgment is likely to receive only limited deference.

On the other hand, there are instances where utility companies were essentially forced to accept limitations on their outside activities. AT&T, for example, accepted a limitation on unregulated businesses as part of a settlement to an antitrust suit in 1956.<sup>136</sup> The New York Public Service Commission limited participation by utilities in solid waste disposal to expenditures for modifications of, or additions to, boiler equipment and the purchase cost of processed solid waste fuel. The utilities were willing to accept such restrictions to avoid being stuck with a larger bill.<sup>137</sup> Even where regulatory commissions lack direct leverage, they have other means of exerting influence. Opposing the preferences of the PUC is bad business from the utility standpoint.

#### D. UTILITIES AS FINANCIERS IN THE SOLAR MARKET

As a final alternative to the distribution of solar equipment, utilities might undertake to act simply as financiers or insurers. This would be an undesirable role for the utility, since the utility must assume all the risks, but do so without the benefit of financial profit from inclusion of solar expenses in its rate base. Borrowing for solar purposes would also compete with more profitable utility programs, thereby increasing their tremendous capital needs. There are precedents in the insulation financing programs discussed earlier,<sup>138</sup> but the amount of money that would be involved in solar systems is substantially greater—insulation is usually a matter of a few hundred dollars, whereas a solar system costs several thousand dollars or more.

An assertive PUC might try to force a utility to finance solar purchases. The utility's certificate of operation is a license subject to conditions on whatever terms the regulatory agency believes necessary.<sup>139</sup> A reluctant utility might be ordered to finance public purchase of solar collectors much like utilities have been ordered to use expensive technology to reduce air pollution.

## VI. CONCLUSIONS

In each of the three areas discussed, regulatory jurisdiction, ser-

136. *United States v. Western Elec. & AT&T*, 13 RAD. REG. (P-H) 2143, [1956] TRADE REG. REP. (CCH) paras. 71, 134 (D.N.J. 1956) (consent judgment).

137. P. MEIER & T. MCCOY, SOLID WASTE AS AN ENERGY SOURCE FOR THE NORTHEAST 96 (prepared for ERDA, No. 50550, 1976).

138. See notes 88-89 *supra*, and text accompanying.

139. See, e.g., COLO. REV. STAT. § 40-3-111 (1974), *id.* § 40-4-102 (1974). This power is frequently exercised in the context of environmental controls; the PUC may license a new facility subject to the condition that it meet all air pollution standards, which require the use of expensive sulphur-removal technology for coal-fired plants. See *Pawnee Plant for Morgan Stirrs Up Verbal Dust*, Denver Post, May 9, 1976, at 18.

vice and rate discrimination, and utility participation in the solar market, significant uncertainty exists concerning appropriate regulatory policies and the impact of current law. From the perspective of conservationists and solar energy advocates, this problem is compounded by differences among utilities and states. Very few generalizations are possible. Examining these issues for each utility could be slow, complex, and expensive. This situation could very well impede the commercialization and acceptance of solar energy systems. Utilities are not likely to risk significant sums without some assurance of protection from the antitrust laws. Other distributors may be reluctant to start their own retail business if utilities are expected to enter the market. Homeowners will want to know the net cost and savings of their solar systems, a calculation that depends on expectations about future rate structures and available sources of auxiliary energy. Builders of multi-family dwellings may think twice about installing a solar system if they may be subject to PUC regulation.

The time is clearly ripe for legislation and administrative attention to these questions. There are actions that should be taken by the federal government, state governments, and public utility commissions. The federal government should address those technical issues, such as appropriate methodologies for evaluating the impact of solar systems on utility load patterns, that are common to every state and utility. This is already being done to some extent. For example, several studies have been funded by the federal government.<sup>140</sup> But a larger, more systematic effort in cooperation with utility regulators and utility representatives seems appropriate. The federal government should also offer a clearinghouse for technical information and assist states in the formulation of policy agendas.

State legislatures must decide the broad policy issues involved in solar utility relationships. For example, a decision to subsidize the use of solar collectors can be clarified by technical studies on the effect of direct incentives for energy conservation. Political judgments must also be made about the importance of such unquantifiable benefits as conservation of nonrenewable fuels and reduced dependence on fossil fuels. Moreover, a political decision must be made on the relative merits of different forms of incentives—tax credits or loan subsidies may be a more equitable and efficient approach than the use of utility rate structures. Since these alternatives are not available to PUCs, state legislatures must make these choices. The federal government may also play a role in this area.

Within the broad policy established by the state, considerable

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140. *E.g.*, ENERGY RATE INITIATIVES, *supra* note 67; S. FELDMAN & B. ANDERSON, *supra* note 68.

discretion must still be exercised by public utility commissions. The specifics of rate structures, scope of regulatory jurisdiction, and particular utility programs are too technical to be decided by legislative bodies. Until recently, any expectation that PUCs would voluntarily address such questions with more than a rubber stamp for utility proposals was unrealistic. Fortunately, the increasing political interest in utility regulatory decisions has made many of these agencies much more responsive. Still, such assertiveness remains the exception rather than the rule. To assure resolution of these issues through administrative processes, state legislation should require PUCs to investigate and recommend appropriate policies, subject to legislative review.

These recommendations are obviously directed more to the process of decision making than to substantive solutions for the issues we have raised. Unfortunately, the issues defy simple universal answers. The most important short-term need is to alleviate the uncertainty in the existing regulatory environment. The general approaches we have suggested would go far to meet this need.