

# COMMENTS

## TRANSFORMING THE ENERGY SYSTEM: CALIFORNIA'S PLAN TO DEVELOP COGENERATION AND SMALL POWER PRODUCTION

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### INTRODUCTION

The California Public Utilities Commission ("CPUC") has aggressively encouraged the development of cogeneration and small power production in California during the last ten years.<sup>1</sup> Under the CPUC program, the electric utility, the traditional source of electric power, has slowly been supplanted by smaller, independently owned cogenerators and small power producers.<sup>2</sup> Without a doubt, the plan has encouraged unparalleled quantities of independently produced energy.<sup>3</sup> However, the cumulative effect of this staggering new contribution to the energy market is not clear. It is uncertain whether a large amount of cogeneration and small power production is an economically and environmentally desirable alternative to utility produced power. Nor is it clear how the influx of energy will affect the utilities' ability to operate the energy system. The CPUC's plan to encourage the development of cogeneration and small

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1. In August of 1982 the electricity received from independent producers on Pacific Gas & Electric's system equaled about 1% of the utility's total demand; by December of 1985 the three major California utilities had 2,873 megawatts of independent power production on-line, equal to about 10% of the peak demand for that month. By July of 1986, producers of close to 13,000 megawatts of independent power had signed commitments to produce power, but had not yet come on-line. *Implementation of The Public Utility Regulatory Policies Act of 1978: Hearings Before the Committee on Energy and Natural Resources, 99th Cong., 2d Sess. 901, 902 (1986)* [hereinafter *PURPA Oversight Hearings*] (testimony of Duncan Wyse, Director, Policy and Planning Division, Public Utilities Commission, State of California).

2. The California Energy Commission forecasts call for 25% of future electrical supply to be met by renewable energy resources and cogeneration facilities. *PURPA Oversight Hearings, supra* note 1, at 932, 933 (statement of the California Energy Commission).

3. As of March 31, 1986, California had signed commitments for more small power and cogeneration capacity than any of the other forty-nine states. The top five states are:

STATE	NO. OF FACILITIES	CAPACITY (MW)
1. California	835	11,122.2
2. Texas	109	7,066.0
3. Pennsylvania	119	2,194.9
4. New York	158	2,005.8
5. Louisiana	37	1,966.8

*PURPA Oversight Hearings, supra* note 1, at 480, 493 (statement submitted by Lawrence R. Anderson, Director, Office of Electric Power Regulation, Federal Energy Regulatory Commission).

power facilities may in practice overencourage development and reduce competition in the energy market. This plan may cost the ratepayers in California a great deal of money.

Two developments have contributed to the boom in cogeneration and small power production. First, the competitive edge previously enjoyed by electric utilities has weakened. Traditionally, electric utilities enjoyed a natural monopoly in their service areas.<sup>4</sup> Utilities provide large-scale, technologically advanced power plants which operate under economies of scale, producing energy less expensively than smaller plants. As a result, self-generated electricity, which accounted for 60% of all United States electricity in 1900, was almost completely replaced by utility generated power.<sup>5</sup> By 1973, utilities supplied 95.8% of all United States electric capacity.<sup>6</sup> In the mid-1970s, however, high capital costs devalued the economies of scale enjoyed by the large generating plants.<sup>7</sup> As a result, the economic advantages enjoyed by utilities were weakened, and other forms of energy production became economically viable.

Second, statutory reform has encouraged the development of alternate sources of energy. Congress removed some of the regulatory and economic barriers to cogeneration and small power production in the Public Utilities Regulatory Policy Act of 1978 ("PURPA" or "the Act").<sup>8</sup> The Federal Energy Regulatory Commission ("FERC") implemented the Act by promulgating rules which directed the States to establish programs to encourage the development of qualifying cogeneration and small power production facilities.<sup>9</sup> Under this favorable economic and regulatory environment, cogeneration and small power production became efficient and profitable.

Cogeneration and small power production offer three advantages over conventional utility-produced power: increased fuel efficiency, lower capital investment costs, and greater flexibility in responding to fluctuations in demand.<sup>10</sup> First, cogeneration uses less fuel to simultaneously produce both electric and thermal energy than is required to produce the same output separately using

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4. Major technological advances in the 1920's enabled the fledgling electricity industry to change its production base from small independent plants to intricate networks of large generating plants. In order to raise capital and coordinate these expansive facilities, local power companies merged to form public utility holding companies which centralized the production and distribution processes in the industry. The industry matured into a natural monopoly due to these economies of scale. See *A Future for Cogeneration: FERC v. American Electric Power Service Corp.*, 16 CONN. L. REV. 393, 394-95 (1984).

5. Munson, *The Growing Role of Independent Electricity Producers*, PUB. UTIL. FORT., May 30, 1985, at 13.

6. *Id.*

7. By 1980, the average cost of constructing new power plants increased to over a thousand dollars per kilowatt for baseload power plants. *Cogeneration: Hearings Before the Subcommittee on Energy Development and Applications of the Committee on Science and Technology*, 96th Cong., 2d Sess. 380, 382 (1980) (testimony of John O'Sullivan, Chief Advisory Counsel, Federal Energy Regulatory Agency Staff) [hereinafter Testimony of John O'Sullivan].

8. Public Utility Regulatory Act of 1978, Pub. L. No. 95-617, 92 Stat. 3117 [hereinafter PURPA] (codified in scattered sections of 16 U.S.C.). The Act is discussed in text accompanying notes 26-43, *infra*.

9. See *infra* notes 45-61 and accompanying text.

10. Zimmer and Jones, *Cogeneration: Boon or Bane to Consumers?*, PUB. UTIL. FORT., June 12, 1986, at 23, 24.

conventional technologies.<sup>11</sup> Second, cogeneration and small power production facilities are generally smaller and thus require a smaller capital investment to build than large utility generating plants.<sup>12</sup> Third, cogeneration facilities can be constructed and brought on-line quicker than large plants and are more responsive to sudden increases in demand.<sup>13</sup>

This Comment analyzes the CPUC plan to encourage the development of cogeneration and small power production in California. The Comment first examines the legislative and administrative origins of the CPUC plan. It then discusses the pricing methodology and the standard offer process the CPUC implements in its campaign to encourage cogeneration. It next evaluates whether the CPUC plan is meeting its goals and whether the latest standard offer to be implemented, Standard Offer Four, solves the problems presented by earlier offers. Finally, the Comment suggests that SO4 can be improved by (1) requiring cogeneration facilities to bid competitively for offers, (2) guaranteeing system reliability, and (3) more accurately forecasting future demand for energy.

## I. PURPA AND ITS IMPLEMENTATION

In California, the Public Utilities Commission requires the three major utilities<sup>14</sup> to offer a variety of standard offers<sup>15</sup> to any cogenerator or small power producer who qualifies under the requirements of PURPA and the CPUC.<sup>16</sup> Currently, the CPUC is in the process of promulgating final Standard Offer Four ("SO4"), which follows several prior efforts to encourage the development of cogeneration and small power production.<sup>17</sup> In so doing, the CPUC strives to comply with the FERC rules implementing PURPA.<sup>18</sup>

### A. The Energy Problem and the Congressional Response: PURPA

The 95th Congress opened in the midst of a nationwide energy crisis.<sup>19</sup> The economy was overwhelmingly dependent on natural gas and oil.<sup>20</sup> Large-scale voluntary conservation efforts had resulted in no significant reductions in overall demand.<sup>21</sup>

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11. *Id.*

12. *Id.*

13. *Id.*

14. California's three major electric utilities are Pacific Gas & Electric ("PG&E"), San Diego Gas & Electric ("SDG&E") and Southern California Edison Company ("Edison"). Decision 82-01-103, OIR 2, 8 C.P.U.C. 2d 20, 24 (1982) (rules regarding electric utility purchases of electric power from cogeneration and small power production facilities).

15. *See infra* text accompanying notes 85-88.

16. 8 C.P.U.C.2d at 24.

17. *Re Pacific Gas & Elec. Co.*, 68 P.U.R.4th 1 (1985) (Dec. 85-07-022, order adopting methodology for setting rates for cogenerated and small power produced electricity).

18. *See infra* text accompanying notes 44-63.

19. SENATE COMM. ON ENERGY AND NATURAL RESOURCES, 96th Cong., 1st Sess., ENERGY INITIATIVES OF THE 95th CONGRESS 1 (Comm. Print 1979).

20. Oil and gas account for 75% of all energy consumed in the United States. *Id.* at 1, 3.

21. After a two-year decline in energy consumption from the record 1973 level, the trend reversed and U.S. energy consumption grew 4.8% in 1976. *Id.* at 1. Furthermore, U.S. production of oil and gas has peaked and is expected to decline to near exhaustion by the end of the century. Dependence on imported oil has increased to nearly one-half of the total national oil demand, and OPEC countries contribute 80% of these imports. *Id.*

As a response to the crisis, in April 1977 President Carter formally presented the outlines of the National Energy Act ("NEA"), a comprehensive new energy plan.<sup>22</sup> The NEA was designed to combat the crisis by proposing tax and other incentives and disincentives to encourage both voluntary conservation of energy and conversion to fuels other than oil and natural gas.<sup>23</sup> It placed primary emphasis on conservation, rather than on measures to stimulate supply.<sup>24</sup> Segments of the administration's proposals were enacted in five major laws passed by the 95th Congress and signed by President Carter on November 9, 1978.<sup>25</sup>

One of the laws passed was PURPA, which embodies the administration's strategy of encouraging conservation.<sup>26</sup> PURPA requires states to consider re-forming natural gas and electricity rates to encourage efficiency and conservation.<sup>27</sup>

To create a highly integrated and efficient national energy scheme, Title II of PURPA extends greater authority to the FERC to develop guidelines concerning the transfer and sale of energy between utilities and other energy generators.<sup>28</sup> Title II includes sections 201 and 210, which encourage the production of electricity through two unconventional means: cogeneration<sup>29</sup> and small power production.<sup>30</sup>

Prior to the passage of PURPA, an independent cogenerator or small power producer seeking to interconnect with an electric utility was confronted by three obstacles. First, utilities were not required to purchase power generated from such sources.<sup>31</sup> Second, some utilities charged cogenerators and

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22. *Id.* at 2.

23. *Id.* at 14.

24. *Id.* at 8.

25. The five statutes which compose the National Energy Act are the Natural Gas Policy Act of 1978, Pub. L. No. 95-621, 92 Stat. 3350 (codified at 15 U.S.C. §§ 3301-3342 (Supp. III 1979) and 42 U.S.C. § 7255 (Supp. V 1987)), which provides for maximum price controls on natural gas, deregulation of certain gas, incremental pricing for industrial users; the Powerplant and Industrial Fuel Use Act of 1978, Pub. L. No. 95-620, 92 Stat. 3289 (codified in scattered sections of 42 U.S.C.), which prohibits the use of oil and natural gas boilers in many new electric utility generation facilities and discourages future use of the fuels in existing facilities; the Energy Tax Act of 1978, Pub. L. No. 95-168, 92 Stat. 3174 (codified at 26 U.S.C. §§ 23, 46), which includes a number of provisions which encourage, through business tax credits for industrial investment, conversion to the use of alternative fuels, especially coal; the National Energy Conservation Policy Act, Pub. L. No. 95-619, 92 Stat. 3206 (1978) (codified in scattered sections of 12, 15, 23, 42 U.S.C.), which extends and adds grants and programs to weatherize low income households, encourage solar energy, improve energy efficiency of hospitals and schools, encourage utility residential energy audits, and set efficiency standards for consumer appliances and automobiles; and PURPA, § 1, 92 Stat. 3117 (codified in scattered sections of 16 U.S.C. (1982)).

26. PURPA, § 1, 92 Stat. 3117 (codified in scattered sections of 16 U.S.C. (1982)).

27. PURPA, § 101, 92 Stat. 3120 (codified at 16 U.S.C. § 2611 (1982)). Title I of PURPA requires state public utility commissions to consider rate and other reforms which encourage conservation and maximize efficiency. PURPA, § 201, 92 Stat. 3134 (amending 16 U.S.C. § 796 (1982)).

28. PURPA, § 202, 92 Stat. 3135 (amending 16 U.S.C. § 824i (1982)).

29. "Cogeneration" is the use of industrial waste heat to generate electricity for an industry's own premises and for raising revenue through the sale of surplus energy. See *infra* notes 38 and 50.

30. A "small power producer" is a party who is not primarily engaged in generating electric power and who produces no more than 80 megawatts of energy from renewable resources. See *infra* notes 37 and 51.

31. FERC v. Mississippi, 456 U.S. 750, 751 (1982).

small power producers discriminatory rates for supplementary,<sup>32</sup> back-up,<sup>33</sup> and maintenance<sup>34</sup> services.<sup>35</sup> Third, interconnected cogenerators were potentially subject to plenary federal and state public utility regulation. Congress designed sections 201 and 210 to encourage cogeneration and small power production by eliminating these obstacles.<sup>36</sup>

Section 201 of the Act inserts new definitions of a "small power production facility"<sup>37</sup> and a "cogeneration facility,"<sup>38</sup> which restricts the facilities eligible for the benefits of section 210 under the Federal Power Act.<sup>39</sup> However, section 201 delegates authority to the FERC to determine the specific qualification requirements concerning size, fuel use, and efficiency.<sup>40</sup>

Section 210 of the Act requires the FERC to establish and periodically revise rules to encourage cogeneration and small power production by requiring utilities to sell electricity to and purchase electricity from qualifying facilities.<sup>41</sup> Although Congress left much of the specific rulemaking to the FERC, section 210 specifies that a utility must purchase electricity from or offer to sell electricity to a qualifying facility. Congress further provided that the rates of such sale or purchase must be just and reasonable for consumers and not discriminate against qualifying facilities.<sup>42</sup> Section 210 also specifies that the purchase rate for power by electric utilities from cogenerators or small power producers shall not exceed the "incremental cost to the electric utility of alternative electric energy."<sup>43</sup>

## B. FERC's Promulgation of the PURPA Mandate

Congress granted the FERC authority to establish Federal guidelines to accomplish three major goals.<sup>44</sup> The first goal was to require electric utilities to interconnect and offer to buy electric power from small power producers and cogenerators at just and reasonable rates.<sup>45</sup> The second goal was to prohibit

32. "Supplementary power" refers to "electric energy or capacity supplied by an electric utility, regularly used by a qualifying facility in addition to that which the facility generates itself." 18 C.F.R. § 292.101(b)(8) (1986).

33. "Back-up power" refers to "electric energy or capacity supplied by an electric utility to replace energy ordinarily generated by a facility's own generation equipment during an unscheduled outage of the facility." 18 C.F.R. § 292.101(b)(9) (1986).

34. "Maintenance power" refers to "electric energy or capacity supplied by an electric utility during scheduled outages of the qualifying facility." 18 C.F.R. § 292.101(b)(11) (1986).

35. *FERC v. Mississippi*, 456 U.S. at 751.

36. *Id.*

37. A "small power production facility" is defined as a facility, not greater than 80 megawatts, which produces electricity by the use, as a primary source, of biomass, waste, or renewable resources. PURPA, § 201, § 3(17)(A)-(C), 92 Stat. 3134 (amending 16 U.S.C. § 796(17)(A)-(C)(1982)).

38. A "cogeneration facility" is a facility which produces electric energy and steam or other forms of useful energy, such as heat. 16 U.S.C. § 796(18)(A)-(C) (1982).

39. 16 U.S.C. § 796(17), (18) (1982).

40. 16 U.S.C. § 796(17)(A)-(C), (18)(A)-(C) (1982).

41. PURPA, § 210(a), 92 Stat. 3144 (codified at 16 U.S.C. § 824a-3(a) (1982)).

42. 16 U.S.C. § 824a-3(b)-(c) (1982).

43. 16 U.S.C. § 824a-3(b) (1982).

44. 16 U.S.C. § 824a-3 (1982).

45. *See id.*; see also H.R. Conf. Rep. No. 1750, 95th Cong., 2d Sess., 63, 97, reprinted in 1978 U.S. CODE CONG. & ADMIN. NEWS 7797, 7831 [hereinafter "Conference Report"]. The conference

utilities from charging high or discriminatory rates for back-up or auxiliary services delivered to on-site generators.<sup>46</sup> The third goal was to exempt cogenerators and small power producers from many of the burdensome regulations that utilities are subject to under state and federal law.<sup>47</sup>

Pursuant to these statutory mandates, and after extensive deliberations, the FERC issued Orders Number 69<sup>48</sup> and 70<sup>49</sup> in 1980. FERC Order No. 70 establishes the requirements for treating cogenerators<sup>50</sup> and small power producers<sup>51</sup> as qualifying facilities ("QFs") under the Act.<sup>52</sup>

The FERC rules governing rates for sales of power between utilities and QFs do not implement a "perfect formula" for an appropriate pricing

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report explains:

[t]hese rules shall insure that, in requiring any electric utility to offer to purchase electric energy from any qualified cogenerator or any qualified small power producer, the rates for this type of purchase are to be just and reasonable to the electric consumers of the utility, in the public interest, and are not to discriminate against cogenerators or small power producers.

Conference Report, at 97. The conferees intended that the phrase "just and reasonable to the electric consumers of the utility" be interpreted in a manner which protects the interests of the electric consumer in receiving electric energy at equitable rates. *Id.*

46. *Id.* at 97-98.

47. For example, under PURPA, cogenerators and small power producers are not subject to the Federal Power Act (16 U.S.C. §§ 791a-825r) and the Public Utility Holding Company Act (15 U.S.C. §§ 79-79z-6):

The conferees recognize that cogenerators and small power producers are different from electric utilities, not being guaranteed a rate of return on their activities generally or on the activities vis vis the sale of power to the utility and whose risk in proceeding forward in the cogeneration or small power production enterprise is not guaranteed to be recoverable. . . . The establishment of utility type regulation over them would act as a significant disincentive to firms interested in cogeneration and small power production.

*Id.*

48. Order No. 69, issued Feb. 25, 1980, 45 Fed. Reg. 12214 (1980), establishes rules implementing section 210 of PURPA. 18 C.F.R. § 292.101, .301-.403, .601-.602 (1986).

49. Order No. 70, issued March 20, 1980, 45 Fed. Reg. 17959, established rules implementing § 201 of PURPA. 18 C.F.R. § 292.201-.207 (1986).

50. The FERC rules amend the requirements for cogeneration under PURPA section 201 by ruling that electric energy and other forms of useful energy should be produced through the sequential use of energy. 18 C.F.R. § 292.202(c). This means that, in order to qualify, a facility must use heat rejected from one process in another process.

Eligible cogeneration includes both topping-cycle cogeneration facilities, in which energy is first used to produce useful power and the rejected heat is used to provide useful thermal energy, 18 C.F.R. § 292.202(d) (1986), and bottoming-cycle cogeneration facilities, in which energy is first applied to the useful thermal process and reject heat emerging from the process is used for power production. 18 C.F.R. § 292.202(e) (1986).

51. The FERC ruled that small power production facilities include small hydroelectric projects; municipal solid waste facilities; geothermal, wind, and solar systems. 18 C.F.R. § 292.204 (1986).

52. The FERC also issues cogeneration efficiency requirements, adopting the test that at least 5% of a qualifying topping-cycle facility's total energy output must be in the form of useful thermal energy output. 18 C.F.R. § 292.205(a)(1) (1986). This operating standard prevents a powerplant from attaining qualifying status by bleeding off a trivial amount of steam for some heating use. 45 Fed. Reg. 17,959, 17,966-67 (1980). There is no efficiency standard for bottom-cycle cogeneration systems since all heat which is otherwise wasted is converted to energy.

The 1980 rules do not subject cogenerators to fuel or size requirements. Cogenerators may use any fuel including oil and natural gas. However, when facilities built after 1980 increase their use of these fuels, the FERC restricts qualification to facilities which meet efficiency standards. *See* 18 C.F.R. § 292.205(a)(2), (b) (1986).

Conversely, the rules subject small power production facilities to statutory restrictions regarding both size and fuel. Small power production facilities may not have a rated capacity greater than 80 megawatts, 18 C.F.R. § 292.204(a) (1986), or use fossil fuels as their primary energy source, 18 C.F.R. § 292.204(b) (1986).

philosophy.<sup>53</sup> The FERC only issues pricing principles, leaving the states free to select the methodology appropriate to implement the rates.<sup>54</sup> Under the rules, an electric utility is obligated to purchase any energy or capacity made available by QFs.<sup>55</sup> Such purchases can be made on an "as-available" basis or pursuant to a legally enforceable obligation.<sup>56</sup>

The principal pricing provision<sup>57</sup> issued by the FERC requires a rate equal to the utility's "full avoided cost."<sup>58</sup> The costs that an electric utility can avoid by purchasing energy from QFs are generally classified as either "energy" costs or "capacity"<sup>59</sup> costs.<sup>60</sup> The "avoided cost" measure places the burden of determining the cost of energy on the buyer, the utility, rather than the power producer, whether it is a cogenerator or a small power producer.<sup>61</sup> In two separate cases, the Supreme Court held that Congress did not exceed its constitutionally granted authority by passing PURPA<sup>62</sup> and that the FERC had not exceeded its statutory authority by implementing a full avoided cost rule.<sup>63</sup>

53. Testimony of John O'Sullivan, *supra* note 7, at 386.

54. *Id.*

55. 18 C.F.R. § 292.303 (1986). The rules expressly allow utilities and cogenerators to reach agreement on a rate of purchase which is otherwise inconsistent with the "avoided cost" measure. 18 C.F.R. § 292.301 (1986).

56. 18 C.F.R. § 292.304(d) (1986). A qualifying facility has the option to either (1) sell whatever energy it determines to be available at a rate equal to the utility's avoided cost at the time of delivery, or (2) sell energy or capacity by contract over a specified term at the utility's avoided cost. *Id.* The avoided cost may be measured either when the obligation is incurred or at the time of delivery. *Id.*

57. The FERC specifies other criteria to be considered by state commissions in determining avoided costs. These criteria include the "availability of capacity or energy from a qualifying facility during the system's daily and seasonal peak periods[,] . . . [t]he relationship of the availability of energy or capacity from the qualifying facility . . . to the ability of the electric utility to avoid costs, including the deferral of capacity additions and the reductions of fossil fuel use[.]" and savings related to lower line losses. 18 C.F.R. § 292.304(e) (1986).

58. Avoided cost refers to "the incremental costs to an electric utility of electric energy or capacity or both which, but for the purchase from the qualifying facility or qualifying facilities, such utility would generate itself or purchase from another source." 18 C.F.R. § 292.101(b)(6) (1986).

In choosing the "avoided cost" measure, the FERC rejected alternate pricing schemes which have shared rate savings with the utility's consumers. The FERC believed that providing a greater incentive for cogeneration would benefit the ratepayers and the nation as a whole by decreasing reliance on fossil fuels and encouraging more efficient use of energy. Preamble to FERC Order No. 69, 45 Fed. Reg. 12,214, 12,222 (1980).

59. "Energy costs" are variable costs associated with producing electric energy. Typically, these costs include fuel, operating, and maintenance costs. "Capacity costs" are associated with providing the capability to generate electricity and consist primarily of the cost of constructing the generating facility. A purchasing utility avoids capacity costs only if the seller agrees to provide power on the demand of the purchasing utility. 45 Fed. Reg. 12,214, 12,216, 12,225 (1980).

60. The full avoided cost payment may include both the energy and the capacity components. 18 C.F.R. § 292.101(b)(6), 292.304(e)(2) (1986).

61. This is in contrast to the usual method used by utilities in determining the prices for electrical services. Traditionally, rates charged by utilities are based upon the cost of service, which requires the keeping of detailed records and frequent reporting to regulatory agencies. Recognizing that cogenerators are exempt from this kind of regulation under PURPA, the FERC bases rates for power produced by these facilities on the avoided costs of the buyer. Testimony of John O'Sullivan, *supra* note 7, at 387.

62. In *FERC v. Mississippi*, 456 U.S. 742 (1982), the Supreme Court unanimously ruled that Congress had a rational basis for concluding that the operation of electric utilities affect interstate commerce and therefore, enactment of PURPA was within Congress' commerce power. *Id.* at 758.

63. In *American Paper Inst. v. American Elec. Power Serv. Corp.*, 461 U.S. 402, 417 (1983), the Court ruled that the FERC has not acted arbitrarily or capriciously in promulgating the full avoided

### C. CPUC's Plan for California

In a December 19, 1979 ruling, the CPUC took official notice<sup>64</sup> of the FERC regulations implementing section 210 of PURPA.<sup>65</sup> Applying the FERC regulations, the CPUC adopted a full avoided cost pricing methodology for QFs.<sup>66</sup> Subsequently, the CPUC ordered the three major California electric utilities to file standard offers for power purchases based on avoided cost principles.<sup>67</sup> The offer represents the complete transaction and includes contract terms such as price, interconnection requirements, and rates for sales of power to qualifying facilities, including back-up, maintenance, and supplementary power.<sup>68</sup> These offers are available to all cogeneration and small power facilities qualifying under PURPA section 203.<sup>69</sup>

The CPUC initially approved three standard offers based on "short-run" avoided costs.<sup>70</sup> The Commission also issued guidelines for long-run standard offers to be finalized later.<sup>71</sup>

In September of 1983, the Commission issued the first of several decisions implementing Interim Standard Offer Four, which is based on long-run avoided

cost rule under PURPA section 210. The Court reasoned that FERC had considered the potential rate savings for electric utility consumers and "deemed it most important to provide the maximum incentive for the development of cogeneration and small power production." *Id.* at 417. The Court limited its holding by indicating that things might change in the future. Specifically it stated that "[a]t this early stage in the implementation of PURPA, it was reasonable for the Commission to prescribe the maximum rate authorized by Congress and thereby provide the maximum incentive for the development of cogeneration and small power production." *Id.* at 417-418.

64. Decision No. 91109, OII No. 26, 3 C.P.U.C.2d 1, 13 (1979) (Commission investigation of PG&E electric resource plan and alternatives).

65. California Public Utilities Code §§ 2801-2824 (1976), which predates PURPA, also requires the Commission to encourage cogeneration and small power production. The Public Utilities Code definition of a "private energy producer," CAL. PUB. UTIL. CODE § 2802 (Deering Supp. 1987), is interchangeable with PURPA's definition of a "qualifying facility." PURPA, § 201, § 3(17)(A)-(C), (18)(A)-(C), 92 Stat. 3134 (amending 16 U.S.C. § 796(17)(A)-(C), (18)(A)-(C) (1982).

66. 3 C.P.U.C.2d at 14.

67. Decision 82-01-103, OIR 2, 8 C.P.U.C.2d 20, 24 (1982) (Commission rules regarding electric utility purchases of electric power from cogeneration and small power production facilities).

68. *Id.* at 39.

69. See generally 18 C.F.R. §§ 292.203 (stating general requirements for qualification), 292.303(a) (obligating utilities to purchase available energy from qualifying facilities).

70. Standard Offer No. 1 ("SO1") is designed for "as-available" QFs, those projects unable to make a firm commitment to supply electricity at peak hours. 8 C.P.U.C.2d at 43-49; see *infra* note 91 and accompanying text.

Standard Offer No. 2 ("SO2") is designed for QFs who could make a firm commitment for up to 30 years to maintain an 80% capacity factor during summer peak periods. 8 C.P.U.C.2d at 20; see *infra* notes 92-93 and accompanying text.

Standard Offer No. 3 ("SO3") is a simplified version of SO1 for QFs smaller than 100 kilowatts. 8 C.P.U.C.2d at 73-75; see *infra* note 94 and accompanying text.

71. The long-term resource plan bases offer prices on new utility resources, as opposed to short-run avoided costs. Under this option, firm capacity is based on a utility's long-run marginal costs developed from the utility's resource plan. 8 C.P.U.C.2d at 61-63. It is designed to establish firm prices for longer periods and to compensate qualifying facilities for the full value of new resources. *Id.* In comparison, the first three standard offers use a "five-year forecast" calling for fixed energy prices for a period of five years tied to either an "as-available" or "firm capacity" option. See *supra* note 70.

costs.<sup>72</sup> However, two years later the Commission concluded that Interim Standard Offer Four overvalues capacity and energy payments and suspended the availability of the entire interim offer to QFs not already under contract to any of the three utilities.<sup>73</sup>

The Commission next began to develop final SO4, which is also based on long-run avoided costs.<sup>74</sup> Currently, the CPUC is considering amending the terms of SO4, and has not yet required the utilities to submit SO4 to potential QFs.

As the plan evolves, the Commission bases its decisions to stimulate the development of QF power on the benefits resulting from increased QF power. These goals fall into the following categories: (1) encouraging the development of QFs without harming the ratepayers; (2) reducing dependence on foreign oil; (3) maintaining system reliability; (4) creating environmental benefits; and (5) creating a competitive environment in the energy industry.

## II. PRICING METHODOLOGY AND OFFER PROCESS OF THE CPUC PLAN

This section begins by considering the CPUC rationale behind the adoption of its avoided cost methodology. Secondly, it studies the implementation of that methodology into the standard offer process. Finally, it examines the culmination of the standard offer process with the proposal of final SO4.

### A. Full Avoided Cost Methodology

In its December 19, 1979 ruling, the CPUC adopted a full avoided cost pricing methodology for all of its standard offers.<sup>75</sup> The Administrative Law Judge ("ALJ") rejected a proposal for establishing the price for power through negotiation between the utility and the cogeneration facility.<sup>76</sup> The ALJ ruled

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72. Decision 83-09-054, Sept. 7, 1983, Before the Pub. Util. Comm'n of the St. of Cal. (CPUC file copy, log no. 8181) (proceedings on adopting standard offers based on long-run avoided costs for power purchase contracts with PG&E, Edison, and SDG&E).

73. Decision 85-04-075, Apr. 17, 1985, Before the Pub. Util. Comm'n of the St. of Cal. (CPUC file copy, log no. 9264) (continuing the suspension of payment options for qualifying facility projects of over 50 megawatts).

In addition, on March 19, 1986, the Commission temporarily suspended SO2 and called for a hearing to decide the offer's future viability. Decision 86-03-069, Mar. 19, 1986, Before the Pub. Util. Comm'n of the St. of Cal. (CPUC file copy, log no. 10099). After that hearing, the Commission concluded that the capacity price schedule for SO2 is overvalued compared to the utilities' actual avoided cost. The overvaluation was so great that the Commission suspended the offer until further notice. Decision 86-05-024, May 7, 1986, Before the Pub. Util. Comm'n of the St. of Cal. (CPUC file copy, action JAS). Recently, the Supreme Court refused to hear an appeal brought by PG&E from a ruling by the California Supreme Court that the CPUC's pricing of cogenerated power does not violate the standards set by PURPA. Decision No. 86-10-038 Oct. 16, 1986, Before the Pub. Util. Comm'n of the St. of Cal. (Commission's interpretation of interim SO4), *cert. denied*, No. 87-178, slip op. (Oct. 5, 1987) (LEXIS, Genfed Library, U.S. File).

74. *Re Pacific Gas & Elec. Co.*, 68 P.U.R.4th 1, 4-5 (1985) (Decision 85-07-022). See *infra* notes 104-141 and accompanying text for discussion of specific contract and price terms of SO4.

75. Decision No. 91109, OII No. 26, 3 C.P.U.C.2d 1, 14 (1979) (Commission investigation of PG&E electric resource plan and alternatives).

76. *Id.* at 15.

that reliance on negotiations is untenable due to the monopoly position of the utility as the sole buyer of cogenerated power in the market.<sup>77</sup> Instead, the ALJ ruled that the Commission should establish price guidelines so as to more nearly approximate the competitive market and "therefore, to further the public interest."<sup>78</sup>

In selecting the full avoided cost measure, the Commission selected the maximum price authorized under the FERC's regulations and rejected passing any of the savings on to the utility ratepayers. The ALJ stated:

A proposal for paying less than the full avoided cost has been considered and rejected. The reason to pay only a portion of the full avoided cost would be to consciously retain a small cost savings for ratepayers. The other advantages of cogeneration, however, outweigh this benefit and favor the full avoided cost approach.<sup>79</sup>

The Commission ruled that five factors favor the full avoided cost approach. First, less cogeneration is developed when the price is lower than the full avoided cost and thus, the savings from less expensive cogenerated power are lost.<sup>80</sup> Second, in light of the expensive and capital intensive nature of the projects, a disproportionate number of cogeneration projects are discouraged by a reduction from the full avoided cost.<sup>81</sup> Third, by establishing a full avoided cost rate, the Commission minimizes risks and uncertainty to cogeneration producers, which lowers the minimum required rate of return on the investment and encourages the development of cogeneration.<sup>82</sup> Fourth, cogeneration reduces dependence on foreign sources of oil, encourages technologies using renewable fuels, and reduces pollution.<sup>83</sup> Fifth, the competitive market is most closely approximated at the full avoided cost.<sup>84</sup>

## B. Standard Offers

The Commission ordered the three major California electric utilities to file standard offers with the CPUC and make the offers available to QFs for power purchases based on avoided cost principles.<sup>85</sup> "The CPUC was not compelled by either PURPA or the FERC rules to adopt a 'standard offer' approach, but chose to do so in its own rules implementing PURPA."<sup>86</sup> Standard offers are available to all QFs.<sup>87</sup> The CPUC designed the standard offers to encourage QF development by preventing discrimination among QFs, providing uniform

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77. *Id.* at 14.

78. *Id.*

79. *Id.*

80. *Id.* at 15.

81. *Id.*

82. *Id.*

83. *Id.*

84. *Id.*

85. Decision 82-01-103, OIR 2, 8 C.P.U.C.2d 20, 24 (1982) (rules regarding electric utility purchases of electric power from cogeneration and small power production facilities).

86. *PURPA Oversight Hearings*, *supra* note 1, 105, 124 (prepared testimony of Michael R. Peevey, Executive Vice President, Southern California Edison Company).

87. *Id.*

contract language and standardizing costing methodologies for determining avoided cost among all utilities and all contracts.<sup>88</sup>

### C. Short-Run Avoided Cost Offers: SO1, SO2, SO3

Under the first three standard offers, the QFs receive payment for energy they generate under a short-run version of the full avoided cost methodology. This payment is designed to reflect the variable cost of providing an additional unit of electricity and is derived from the utility's variable operating costs plus a shortage value.<sup>89</sup> Capacity prices paid to QFs under the offers are based on the capital costs of a "generic" utility combustion turbine plant, rather than the actual costs the utilities experience.<sup>90</sup>

SO1, the "as-available" offer, pays both an energy payment and a capacity payment in cents per kilowatt hour, varying by time of delivery.<sup>91</sup> The offer is similar to a spot market purchase in a competitive environment as it requires no long term obligation from the QFs.

SO2, the "firm capacity" offer, is similar to SO1 except that the QF agrees to meet specific performance requirements.<sup>92</sup> Producers who qualified for this offer receive more pricing certainty, since they can fix capacity prices<sup>93</sup> for up to 30 years.

88. *Id.*

89. 8 C.P.U.C. at 43. "Shortage costs" on the utility system are defined as the expected cost of an outage at a particular time, or the probability of an outage multiplied by the customer costs associated with that outage. Decision 82-12-120, Order Instituting Ratemaking No. 2, 10 C.P.U.C.2d 553, 601-02 (1982) (rules on standard offers for cogeneration).

90. The Commission adopts the capital costs of a combustion turbine as a proxy for shortage costs. 10 C.P.U.C.2d at 553, 603. A utility which manages its reserve margins of power efficiently pursues capacity-related investments up to the point where the last unit of investment costs the same as shortage costs avoided through such investment. *Id.* at 603. The combustion turbine is a proxy for this marginal capacity-related investment. *Id.*

91. The inclusion of capacity payments in the "as-available" offer is controversial. The utility position is that energy provided by a QF on an "as-available" basis does not allow a utility to avoid any capacity costs. Decision 82-01-103, OIR 2, 8 C.P.U.C.2d 20, 47-48 (1982) (rules regarding electric utility purchases of electric power from cogeneration and small power production facilities). The utilities argue that it is appropriate to institute objective performance standards in order to justify paying capacity payments. *Id.* Potential QFs argue that their output reduces utility demand for electricity and subsequent need for capacity, and thus they are entitled to capacity payments without any performance requirements. *Id.* at 48-49. The Commission agrees with the QFs and includes capacity payments equivalent to 100% of the shortage value of QF power output in the "as-available" standard offers. *Id.* at 52.

92. Performance requirements concern availability during the system peak periods including dispatchability, reliability, contract duration and termination, scheduling of outages, and availability during emergencies. *Id.* at 58.

A later CPUC decision promulgated rules concerning performance requirements of the "firm capacity" offers. The Commission adopted a utility proposal which provides the qualifying facility with two choices as to its specific performance requirements: the qualifying facility can obtain capacity payments if it agrees to produce when called upon, or if it agrees to provide an output equivalent to 80% of a summer peak period. 10 C.P.U.C.2d at 571, 583-87. In the event a qualifying facility terminates a "firm capacity" contract, the facility is required to repay the amount it paid that exceeds what it would have earned under the "as-available" offer. California Public Utilities Commission. *Id.* at 596-99.

93. The value of firm capacity is based on the avoided capacity cost used in the utility's last general rate case. 8 C.P.U.C.2d at 58. *See infra* note 97.

SO3 is a variant of SO1 that simplifies requirements for small facilities generating less than 100 kilowatts.<sup>94</sup>

The CPUC encourages the utilities to enter into standard offer contracts with the QFs. The Commission ruled that purchases under the standard offers are *per se* reasonable; consequently the utilities can recover the costs of such purchases without further review.<sup>95</sup> However, any variation from the standard offer renders it nonstandard and subject to review by the Commission.<sup>96</sup> Since there is no risk that the payments under the standard contract would be disallowed,<sup>97</sup> standard contracts often displace specially tailored agreements.<sup>98</sup>

On May 7, 1986, the Commission concluded that SO2, an offer designed for facilities that could make a "firm capacity" commitment, had been overvalued to such an extent that the offer would be suspended<sup>99</sup> until further notice.<sup>100</sup> This offer had two components: an energy payment based on short-run avoided energy costs, and a capacity payment. The energy price measure was sensitive to fluctuations in fuel prices since it was updated periodically and contained a fuel cost component. However, the capacity price, which was fixed for the whole term of the contract, was quite insensitive to fuel cost volatility.<sup>101</sup> When oil prices declined dramatically, the capacity component of the offer remained fixed and overvalued the existing contracts with QFs.

Moreover, the capacity pricing system inadequately adjusted to market fluctuations for future contracts. Under the scheme of SO2, capacity price schedules contained in the standard offers were updated during the utilities' general rate cases, conducted every third year.<sup>102</sup> The ALJ found this method of updating the offers had the unintended effect of clustering contract signing before the anticipated occurrence of a downward adjustment in price terms.<sup>103</sup> As

94. *Id.* at 74.

95. *Id.* at 40.

96. The Commission ordered advance review of all nonstandard contracts for two years following the order. *Id.* at 82. A written application for the nonstandard contract which clearly states the differences between it and the standard offer and identifies the gains and costs to the ratepayer is required for subsequent approval. *Id.* at 83.

97. On a semi-annual basis, regulated utilities present a rate case to the appropriate public utility commission. Reasonable expenses, along with a reasonable rate of return, are "allowed"—i.e. passed onto the ratepayers through the rates the public utility commission allows the utility to charge. See generally 1 A.J.G. PRIEST, PRINCIPLES OF PUBLIC UTILITY REGULATION THEORY AND APPLICATION 139 (1974). As noted, the Commission ruled that purchases under the standard offers are *per se* reasonable. See *supra* note 95 and accompanying text.

98. For example, the Commission concurs with FERC's regulations allowing utilities to own up to 50% of a cogeneration facility, and rejected a proposition denying utilities the advantages of full avoided cost pricing for qualifying facilities in which a utility owns a share. However, the Commission is concerned that utilities might accord their affiliates special treatment resulting in anti-competitive effects, and therefore ruled that all proposals for utility partial ownership of qualifying facilities are subject to review on a case-by-case basis. 8 C.P.U.C.2d at 32.

99. SO2 had been suspended earlier pending an investigation of its effects. Decision 86-03-069, Mar. 19, 1986, Before the Pub. Util. Comm'n of the St. of Cal. at 4 (CPUC file copy, log no. 10099).

100. Decision 86-05-024, May 7, 1986, Before the Pub. Util. Comm'n of the St. of Cal. at 3 (CPUC file copy, action JAS).

101. *Id.*

102. *Id.* at 26.

103. *Id.* at 27.

a result, the SO<sub>2</sub> pricing process created a significant potential for overvaluation.

#### D. Long-Run Avoided Cost Offer: SO4

SO4 is the Commission's second attempt at a standard offer which pays QFs on the basis of long-run avoided costs.<sup>104</sup> In issuing the offer on the basis of long-run avoided costs, the CPUC minimizes the price uncertainty which QFs face due to volatile fluctuations in fuel, oil, and gas prices.<sup>105</sup> Under the short-term avoided cost based standard offers, lenders and equity investors are reluctant to commit capital since a project's payment stream is so uncertain.<sup>106</sup> One stable long-run avoided cost projection would enable the cogeneration industry to arrange financing for potential QFs.<sup>107</sup>

The CPUC faced the threshold problem of developing a method to determine long-run avoided costs that both provides price stability and fairly represents the actual future avoided cost. Prices fixed under long-term forecasts could exceed actual avoided costs. This would be inconsistent with the maximum price authorized under PURPA. The Commission ruled, however, that such a scenario would not violate PURPA:

We think the proper view and test is whether over the course of a long-term contract, despite periodic swings in actual avoided costs both above and below a forecast, the prices reasonably compensate QFs for their value in avoiding a utility's costs, and keep the ratepayer economically indifferent to whether the generation was performed by the utility or a QF. As long as there is equal likelihood that swings in actual avoided costs are both below and above the forecast, over the term of forecast based prices, we think the spirit and letter of PURPA are followed.<sup>108</sup>

In September 1983, the Commission issued the first of several decisions implementing SO4.<sup>109</sup> In light of the difficulty involved in determining an adequate measure for long-run avoided costs, the Commission issued Interim Standard Offer Four on a temporary basis until it could develop a more permanent solution to the problem of fairly valuing and pricing power over the long run.<sup>110</sup>

The Commission decided upon a forecast methodology for Interim Standard Offer Four and ordered the offer be made available to QFs.<sup>111</sup> However,

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104. Decision 83-09-054, Sept. 7, 1983, Before the Pub. Util. Comm'n of the St. of Cal. at 3-4 (CPUC file copy, log no. 8181) (proceedings on adopting standard offers based on long-run avoided costs for power purchase contracts between PG&E, Edison, SDG&E and qualifying facilities).

105. *Id.*

106. *Id.*

107. *Id.*

108. *Id.* at 6.

109. See, e.g., *id.*; *Re Pacific Gas & Elec. Co.*, 76 P.U.R.4th 1 (1986); *Re Pacific Gas & Elec. Co.*, 68 P.U.R.4th 1 (1985).

110. Although Interim Standard Offer Four is issued on an interim basis, those who enter into contracts under it are not subject to price changes or later terms. Decision 83-09-054, Sept. 7, 1983, Before the Pub. Util. Comm'n of the St. of Cal. at 2-3 (CPUC file copy, log no. 8181). The offer is interim only in terms of its availability to qualifying parties. *Id.*

111. The Commission ruled that the appropriate method for valuing future contracts between a utility and a qualifying facility is through forecasting a utility's marginal energy cost plus its shortage cost. *Id.*

on April 17, 1985, the Commission concluded that Interim Standard Offer Four overvalued capacity and energy payments, and it suspended the availability of the entire interim offer to QFs not already under contract to any of the three utilities.<sup>112</sup> Despite the initial failure of Interim Standard Offer Four, the Commission also bases the final SO4 on long-run avoided costs. The Commission reiterated the need for an offer which provides pricing certainty, enhances the financing potential of qualifying facilities and recognizes the long-term value of new cogeneration and small power production in utility resource plans.<sup>113</sup>

The Commission propounded SO4 in two phases. In the first phase, the Commission concentrated on developing a methodology for calculating the utilities' long-run avoided costs. In the second phase, the Commission focused on actual price and contract terms for the standard offer.

In phase I, the Commission stated that its selected methodology is the one which most accurately reflects the avoided cost over the long term without being so overly complicated that its assumptions cannot be reasonably verified and understood.<sup>114</sup> The CPUC selected a "simplified generation resource plan"<sup>115</sup> approach, which the Public Utilities Commission staff had submitted.<sup>116</sup> Under this approach, long-run avoided costs are determined by calculating the difference in total utility systems costs under two scenarios. First, the total costs of energy production are calculated assuming that only utility resources are used to meet future loads. Second, these costs are calculated assuming that both utility and QF resources are used.<sup>117</sup> Thus, if a utility is able to defer or cancel some future plants because of QF power, then the QF price is based on the projected capital and operating costs of those avoided plants.<sup>118</sup>

The Commission supports this plan for two reasons. First, the CPUC believes that the approach approximates the QF pricing goal established by

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112. See Decision 85-04-075, Apr. 17, 1985, Before the Pub. Util. Comm'n of the St. of Cal. at 2 (CPUC file copy, log no. 9264) (decision continuing the suspension of payment options for qualifying facility projects over 50 megawatts).

By October, PG&E had signed contracts totaling 1800 megawatts of capacity under Interim Standard Offer Number 4, with over 600 megawatts of that capacity attributed to oil and gas cogenerators. Decision 84-10-098, Oct. 17, 1984, Before the Pub. Util. Comm'n of the St. of Cal. at 2 (CPUC file copy, log no. 8937) (interim opinion). The Commission decided that there were minimal benefits to adding oil and gas cogenerators to the power producing system to displace the utilities' own incremental oil and gas generation. *Id.*

The Commission was reluctant to suspend the offer entirely, however, since it feared that suspension would discourage the development of a sufficient number of new projects. Decision 85-04-075, Apr. 17, 1985, at 2. Concerned that many signed facilities would not actually complete their projects and operate successfully, the Commission required each utility to sign a limited amount of additional long-run avoided costs contracts under reduced rates. *Id.*

113. *Re Pacific Gas. & Elec. Co.*, 68 P.U.R.4th 1, 4-5 (1985).

114. *Id.* at 29.

115. *Id.* at 9.

116. *Id.* at 31. A number of corporations involved in the production of cogeneration and small power production also favored this approach. These proponents included Ultrasonics Inc., Occidental Geothermal Inc., and Union Oil Company. *Id.* at 9-10.

117. *Id.* at 9.

118. *Id.*

PURPA.<sup>119</sup> Second, the CPUC states that the methodology can be reasonably implemented and verified.<sup>120</sup>

In phase II of the proceedings, the Commission determined specific pricing and contract terms of the offer, and ruled how the offer should be implemented.<sup>121</sup> First, a utility must file an application which includes a resource plan with a twelve year planning horizon.<sup>122</sup> This plan identifies potential resource additions that the applicant believes are cost effective for its system, and states the costs associated with each resource and the year in the planning horizon that the resource becomes cost effective.<sup>123</sup> The applicant also presents a series of scenarios forecasting electricity supply and demand over the planning horizon which illustrates how its choice of resource additions might change depending on variations of demand growth or other variables.<sup>124</sup> Thus, the CPUC seeks through SO4 to bring on-line the same amount of generating capacity developed by a utility without QFs.

Second, the CPUC staff and other participants have an opportunity to review and critique utility forecasts and scenarios and to present scenarios of their own.<sup>125</sup> The Commission retains this check over the utility forecast plans in order to assure that the forecasts the parties submit are good faith estimates of future demand.

Third, the Commission determines which resources in the utilities' plans are avoidable<sup>126</sup> and which are subject to substitution by qualifying facilities.<sup>127</sup>

Fourth, after making any modifications the Commission orders, the utilities announce the availability of long-run standard offer contracts based on the costs of the avoidable resources.<sup>128</sup> During a three month solicitation period, potential QFs submit bids detailing (a) the resource which they seek to avoid; (b) the QF's capacity; and (c) the lowest percentage of the resource's fixed costs

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119. *Id.*

120. *Id.*

121. *Re Pacific Gas & Elec. Co.*, 76 P.U.R.4th 1 (1986).

122. *Id.* at 42.

123. *Id.*

124. Much of this resource plan and energy forecasting report was previously required by the California Energy Commission for other purposes. *Id.*

125. *Id.* at 42-43.

126. The Commission ruled that only baseload and intermediate mode plants can be avoided. *Id.* at 53. The order exempts peaking plants, which are used during peak periods, from final SO4 because such plants have low energy-related capital costs. *Id.* Furthermore, allowing utilities to develop and maintain their own peaking plants enables them to exert more control over the supply and dispatch of energy during peak periods. *Id.*

127. The CPUC considers three factors in determining whether a project should be replaced by QFs. First, the CPUC considers whether the avoidable plant is cost-effective. *Id.* at 43. Second, it considers whether the project appears in the first eight years of the resource scenario chosen by the Commission. *Id.* at 43. The planning horizon incorporated in the resource plan spans twelve years. *Id.* at 44. However, the Commission held that the offer makes the resources that become cost effective in the first eight years available to QFs. *Id.* The Commission is hesitant to bind utilities to contracts for terms of twelve years, but it nevertheless wants the utilities to plan twelve years in advance. *Id.* Third, it considers whether the scenario chosen is plausible, reasonable, internally consistent, and consistent with energy regulatory policy and goals. *Id.* at 43.

128. *Id.*

that the QF is willing to accept.<sup>129</sup> The utility opens the responses at the end of the solicitation period.<sup>130</sup>

If the bids from QFs seeking to avoid a resource do not cumulatively exceed the resource's capacity, then each of the QFs is offered a contract based upon the full fixed costs of the resource.<sup>131</sup> If the bids cumulatively exceed the resource's capacity, then contracts are offered to the low-bidding QFs up to the megawatt limit of the resource, at the percentage of the resource's fixed costs bid by the lowest losing bidder.<sup>132</sup> The offers should be updated every two years after new resource plans are submitted by the utilities.<sup>133</sup>

Although the QFs are paid under the offer to enable the utility to avoid a planned resource, the Commission does not require the QFs to emulate the performance requirements of the avoided resource. The Commission ruled that the performance requirements of SO1 apply.<sup>134</sup> Instead of requiring the QFs to emulate the avoided resource, the Commission recommends that the utility negotiate certain "adders" to meet desired performance requirements in exchange for greater compensation.<sup>135</sup> Thus, if a utility requires certain performance standards, it can pay a QF to perform at this higher standard.

Actual payments under the Commission's scheme are broken into three time frames. Period one begins once a contract is signed and extends until the planned on-line date of the resource it avoided.<sup>136</sup> Period two begins once the avoided resource would have come on-line and lasts until the resource would be retired,<sup>137</sup> or for a maximum of fifteen years.<sup>138</sup> Period three begins when the avoided resource would have retired and continues until the QF retires.<sup>139</sup>

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129. *Id.*

130. *Id.*

131. *Id.*

132. Thus, under SO4, the QFs earn 100% of the fixed costs, unless the offer is oversubscribed. *Id.* at 49. If it is oversubscribed, then those QFs with the lowest bids are selected and each selected bidder is paid the percentage of fixed costs bid by the lowest bidding loser. *Id.* The Commission terms this procedure a "Second Price Auction." *Id.*

133. This update follows the submission of each California Energy Commission electricity report demand forecast, upon which the resource plan is based. *Id.* at 43.

134. *Id.* at 47.

135. *Id.* at 48.

136. The Commission held that QFs in period one earn the short-run marginal cost of the energy and/or capacity they provide. *Id.* at 50. This is similar to SO1, SO2, and SO3. See *supra* notes 89-90 and accompanying text.

137. During period two, when the planned resource is actually avoided, the QF receives energy and energy-related capital cost payments equal to the costs that were avoided by substituting the QF. *Re Pacific Gas & Elec. Co.*, 76 P.U.R.4th 1, 51 (1986). The energy payments equal the avoided plant's heat rate times the fuel price for the fuel the plant would have consumed. *Id.* at 52. The energy-related capital cost payments equal the annualized cost of the avoided plant. *Id.*

The Commission makes an exception to this payment option for oil and gas fired cogenerators, whose payment is partly based on the cost of oil and gas, regardless of whether the avoided resource would have used oil or gas. *Id.* at 51. Public staff and the utilities argued that this option exposes ratepayers to greater risk from volatile oil and gas markets than construction of the utility resource. *Id.* The Commission acknowledged the risk, but ruled that cogeneration should be encouraged and expresses concern that the option available to other QFs is wholly insensitive to the fuel costs of cogenerators who would otherwise risk default. *Id.*

138. *Id.* at 46.

139. *Id.*

The Commission finds it necessary to create distinct time periods since a new QF in period one does not yet avoid a resource and thus should not be entitled during that period to the energy related capital cost that it earns in period two.<sup>140</sup> Furthermore, in period three, which follows the planned retirement of the avoided resource, the QF's contract ends and the QF is entitled to negotiate a new contract.<sup>141</sup>

The CPUC introduced SO4 to provide a standard offer to QFs based on long run avoided costs in order to facilitate a stable long-term obligation. The CPUC hopes to minimize price uncertainty and enhance the financing potential of QFs. If SO4 is successful, large quantities of new QF power will be developed and the goals of the CPUC will be fulfilled.

### III. CRITICISM OF THE CPUC PLAN, AND PROPOSALS FOR SOLUTIONS

The implementation of PURPA in California has successfully encouraged large amounts of independently produced energy. However, by altering the traditional functioning of the energy industry, the CPUC plan causes several inefficient and uneconomical effects. This section evaluates the CPUC's plan. First, it examines the goals which the plan is designed to fulfill. Second, it considers whether the problems faced by the CPUC early in the process are solved by SO4. Finally, it suggests ways to improve SO4.

#### A. Does the Plan Meet the CPUC's Goals?

The CPUC attempts to simultaneously encourage the development of QFs and balance the interests of the utilities, potential QFs, and the ratepayers.<sup>142</sup> The plan has successfully encouraged unparalleled numbers of QFs to generate electricity in California.<sup>143</sup> In so doing, the CPUC argues that its stimulation of QF power is warranted by social benefits which profit the utilities and ratepayers.<sup>144</sup> Thus, if the interests of concerned parties are balanced, the CPUC could argue that the extent of QF stimulation is balanced by the social benefits enjoyed by society as a whole. It is not clear, however, what the actual benefits of QF power are and whether they will be passed on to the ratepayer. If these benefits are fictitious, the extent of QF development encouraged by the CPUC plan may be unwarranted. This section examines the goals which the CPUC expects the plan to fulfill and whether the benefits expected to result from reaching these goals will occur.

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140. *Id.*

141. *See id.* at 46-47.

142. *See supra* notes 79-84 and accompanying text.

143. The CEC forecasts that 25% of the state's capacity will be produced by QF power. Statement of the California Energy Commission, *PURPA Oversight Hearings*, *supra* note 1, at 933.

144. Decision 82-01-103, OIR 2, 8 C.P.U.C. 20, 40-41 (1982) (rules regarding electric utility purchases of electric power from cogeneration and small power production facilities).

### 1. Encouraging QF Power Without Harming the Ratepayer

The CPUC hopes to keep the ratepayer indifferent as to whether electricity is generated by a QF or by a utility, and it is not directly seeking to lower ratepayer electricity costs as a result of QF development.<sup>145</sup> Indeed, in selecting its full avoided cost methodology, the CPUC consciously rejected retaining a savings for the ratepayers by paying QFs less than the utility's full avoided cost.<sup>146</sup> The Commission states that "[t]he other advantages of cogeneration, however, outweigh this benefit and favor the full avoided cost approach."<sup>147</sup> Thus, the CPUC's goals are to avoid harming the ratepayers by increasing electricity costs, while helping the ratepayer by introducing other benefits of QF power into the system. However, it is uncertain whether the ratepayer has been kept indifferent to the price of electricity, and the other benefits may not be actual.

A ratepayer is adversely affected by the infusion of QF power into the system if the utility is obligated to compensate the QF for the energy the utility could have purchased elsewhere or produced itself at a lower cost. Thus, the ratepayer is indifferent as to electricity rates only if the prices paid to QFs mirror the costs the utility would have experienced. In practice, the CPUC plan overprices QF energy and the ratepayer suffers as a result. For example, SO<sub>2</sub> and Interim Standard Offer Four committed the utilities to enter into long-term contracts which overvalued the worth of QF power to such a degree that the offers had to be suspended.<sup>148</sup>

A report prepared for the Department of Energy concludes that the three major California utilities in 1984 purchased some energy from QFs at higher prices than the cost of utility-generated energy.<sup>149</sup> This comparison is incomplete, however, because it ignores the contribution of low cost energy purchased from other sources, usually less expensive than many forms of utility-generated power.<sup>150</sup> As a result, QF power cost the utilities more than power from other alternative sources.<sup>151</sup> These higher costs are reflected in the rates charged by the utilities for electricity, and thus the ratepayers are not indifferent.

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145. Decision 83-09-054, Sept. 7, 1983, Before the Pub. Util. Comm'n of the St. of Cal. at 6 (CPUC file copy, log no. 8181) (proceedings on adopting standard offers based on long-run avoided costs for power purchase contracts between three large electric utilities and qualifying facilities: PG&E, Edison, and SDG&E).

146. Decision No. 91109, OII No. 26, 3 C.P.U.C.2d 1, 15 (1979) (Commission investigation of PG&E electric resource plan and alternatives); see *supra* note 79 and accompanying text.

147. 3 C.P.U.C.2d at 15.

148. See *supra* notes 99-103, 109-112.

149. HAGLER, BAILLY & CO., POTENTIAL DETRIMENTAL EFFECTS OF COGENERATION DEVELOPMENT ON UTILITIES COSTS: A PRELIMINARY ASSESSMENT 18 (prepared for the U.S. Dep't of Energy), reprinted in *PURPA Oversight Hearings*, *supra* note 1, at 261, 279.

150. For example, in 1986 PG&E purchased 32.1% of its energy under favorable terms from utilities in the Pacific Northwest, who supplied low-cost excess hydropower. PAC. GAS AND ELEC. CO., 1986 ANNUAL REPORT 14.

151. *Id.*

## 2. Reducing Consumption of Foreign Oil

The CPUC states that the ratepayer and society at large benefit if cogeneration is stimulated because of the reduction in utility consumption of foreign oil and gas.<sup>152</sup> Although the CPUC argues that QFs reduce the nation's dependence on foreign oil and gas, the majority of operating QFs burn oil or gas.<sup>153</sup> Thus, the energy industry as a whole remains dependent on the oil and gas to generate energy.

It is possible that development of oil burning QFs increases consumption and dependence on foreign oil. Specifically, the Commission's scheme replaces future utility resources with QFs. These future utility resources might be more fuel efficient than the QF replacement or could burn fuels other than oil and gas. As a result, oil dependent QFs may be brought on-line to avoid more efficient or economical utility resources. For example, the CPUC could replace a utility's plan to construct further geothermal or hydroelectric facilities with oil or gas burning cogeneration units. The end result under this scenario is a higher level of oil consumption, not a lower level.

Furthermore, even if utility oil consumption is reduced, dependence on foreign oil is not necessarily reduced. A reduction in demand for foreign oil decreases its price; other industries consume more of the less expensive oil, and hence dependence on it does not decrease.<sup>154</sup> Thus, the actual impact of QF power on the nation's oil and gas consumption is uncertain.

## 3. Increasing System Reliability

Another "social benefit" of QF power the Commission cites is an increase in system reliability resulting from a larger number of smaller facilities.<sup>155</sup>

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152. Decision No. 91109, OII No. 26, 3 C.P.U.C.2d 1, 12 (1979). Electric utility consumption of natural gas and petroleum decreased between 1978 and 1985. AMERICAN GAS ASS'N, GAS FACTS: 1985 DATA, Table 10-1 at 124.

153. Over 57.5% of the QFs on-line in California are cogenerators that burn oil or gas. PAC. GAS & ELEC. CO., COGENERATION AND SMALL POWER PRODUCTION REPORT A-1 to A-24 (Third Quarter 1986); S. CAL. EDISON CO., COGENERATION/SMALL POWER PROJECTS III-1 to III-5 (Third Quarter 1986); SAN DIEGO GAS & ELEC., CUSTOMER GENERATION QUARTERLY REPORT *passim* (Third Quarter 1986). An American Gas Association forecast for 1981-2000 projects that industrial cogenerators will account for between 8% and 14% of the industrial natural gas demand and that commercial cogeneration presents a "significant market" for natural gas. *Hearing Before the Subcomm. on Energy, Conservation & Power of the House Comm. on Energy and Commerce on the Cogeneration and Small Power Production Program Clarification Act of 1982*, 97th Cong., 2d Sess. 287, 289 (1982) (written statement of the American Gas Association).

Proponents of cogeneration argue that although the cogeneration systems burn oil and gas, they are more efficient since they use the power twice to produce energy and steam. See, e.g., Brennan, *Cogeneration: A Technology Whose Time Has Come*, 28 NAT'L REAL ESTATE INVESTOR 228 (1986) (stating that a well-designed cogeneration system can be up to two times as efficient as a typical utility plant). However, it is not clear whether these efficiencies are substantial enough to overcome the cost advantages of a large oil or gas-burning utility resource.

154. A Harvard University study notes that in November 1986, a decade after the oil crisis, American imports of foreign oil averaged 5.1 million barrels a day, the highest level since 1981. The study concludes that this dependence on foreign oil creates a renewed threat to the United States economy. N.Y. Times, Nov. 18, 1986, at d16, col. 5.

155. 3 C.P.U.C.2d at 14. Proponents of decentralization argue that the presence of QFs would increase reliability, since one breakdown out of hundreds of QFs would not affect the system, while a breakdown of a large utility plant could affect the stability of the entire system. *Id.*

Although decentralization has long been touted as desirable,<sup>156</sup> the actual impact of QF power on system reliability is questionable.

QFs are not required to install back-up systems to generate power during unexpected outages. A utility, however, is obligated to keep the system running and must back up any unplanned outages.<sup>157</sup> Additionally, QFs are investments designed to operate at the lowest capital cost. When the energy production business becomes unprofitable, a QF will go out of business. In contrast, utilities are obligated to serve because they eventually recover their costs from consumers, thus they reliably serve despite the cost.<sup>158</sup>

Moreover, the presence of QFs interferes with the utility's ability to operate the system as reliably and efficiently as it could without them. The utility must continuously balance within narrow tolerances the supply of electricity with the demand for it in order to maintain service quality and reliability as well as system integrity. If the utility is unable to coordinate a number of highly interdependent components on an electric grid, the supply of electricity could become unreliable or the energy could be supplied inefficiently at a more expensive and wasteful price.<sup>159</sup> The utility, under the CPUC's plan, is not able to control QFs in the same manner as it controls its own resources. For example, the utilities under SO1 must purchase energy as it becomes available, not when it is needed in the system.<sup>160</sup> It is doubtful that the many planning and operating decisions involved in running a system could be made as reliably or efficiently through a network of arm's-length contracts as through integration under a single organization.

The Commission's innovations in SO4 pose three additional challenges to system reliability: QFs are not required to emulate the performance of the utility resources they replace; utilities are required to purchase QF power even if that requires the utility to curtail its minimum load; and QFs may replace a utility's planned baseload plants.

Under SO4, QF power is presumed to avoid and replace planned utility resources.<sup>161</sup> However, the system, as designed, cannot fully replace the benefits which result from the utility-constructed resource. For example, the Commission ruled that under SO4, QFs are subject to special performance requirements.<sup>162</sup> Although a QF is paid under the offer to avoid a planned resource, it

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156. See *PURPA Oversight Hearings*, *supra* note 1 at 578, 582 (statement of Duncan Wyse on the benefits provided by the CPUC plan).

157. 18 C.F.R. § 292.303(b) (1986).

158. See generally 1 A.J.G. PRIEST, *PRINCIPLES OF PUBLIC UTILITY REGULATION THEORY AND APPLICATION* 227 (1974).

159. See *PURPA Oversight Hearings*, *supra* note 1 at 101, 136-38 (statement of Michael R. Peevey). The functions which must be coordinated include: the preservation of electrical frequency standards and system stability by having a significant portion of generation able to follow load subject to central dispatch; dispatch of generation on an economical basis; planning and coordinating unit commitment and maintenance schedules; operating and planning to operate for adequate response to emergencies and subsequent system recovery; and scheduling of generation to achieve scheduled transfers of power across electrical systems. *Id.*

160. See generally Decision 82-12-120, Order Instituting Ratemaking No. 2, 10 C.P.U.C.2d 553, 601 (1982) (rules on standard offers for cogeneration).

161. See *supra* notes 123-137 and accompanying text.

162. See *supra* notes 134-135 and accompanying text.

is not required to emulate the performance standards of the avoided resource.<sup>163</sup> For example, if the avoided utility resource is an oil-fired combustion turbine, the utility can expect the plant to perform in certain ways.<sup>164</sup> However, under SO4 the replacement QFs are not required to perform in the same manner. Replacement QFs only need to produce the same amount of power.<sup>165</sup> Therefore, the offer will not necessarily respond to the needs of the system. A utility which needs 100 megawatts of power which is available around the clock may end up with 100 megawatts of cogenerated power that is available only during the business hours of the industrial plant with which the QF is affiliated.<sup>166</sup> The Commission recognizes this problem and suggests that the utilities negotiate certain "adders" to the standard offer to obtain the needed performance standards from QFs.<sup>167</sup> The utilities can then raise the offer price to compensate the QFs for performing as the utility requires.

The Commission's reliance on the "adders" plan is flawed. The QF is paid to replace a planned resource at the cost level equal to that of the planned resource, but the QF is not required to emulate that avoided resource. The utility should not pay the full price of the planned resource if it is not receiving in return a full replacement. Under the Commission's plan, if the utility seeks a full replacement, it must pay more for adders, which will raise the offer price to more than the cost of the avoided resource. Whether the utility provides its own back-ups or contracts with adders, the utility will pay more than its true full avoided cost. This is inconsistent with the pricing policies of PURPA and the regulations promulgated by the FERC.<sup>168</sup>

The second challenge to system reliability raised by SO4 is the utilities' minimum load problem. A utility must either operate certain plants at a minimum level at all times or shut those plants down. Typically, these plants are expensive to shut down and start up, but inexpensive to run continuously.<sup>169</sup> A utility's "minimum load" is the aggregate of the minimum

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163. See *supra* note 134 and accompanying text.

164. A turbine, for example, can be put on-line relatively quickly to meet sudden surges in demand. It is also available around the clock and can provide level amounts of electricity for extended continuous periods. See *supra* note 90.

165. Utility resources will be replaced by groups of QFs who in the aggregate will supply the same capacity that the planned plant would have. See *supra* notes 128-132 and accompanying text.

166. This example is intended to exemplify how the specific needs of a utility might not be met by the Commission's plan. Currently, much of a utility's off-peak demand can be generated by its own resources. In practice, most utilities require extra energy during peak daytime periods, which is when many cogeneration plants operate. However, under the Commission's plan, at some point in the future the utilities will retire resources with around the clock capabilities and will need new resources with similar capabilities. At that point, the above situation could occur.

Furthermore, new cogeneration plants do not necessarily supply the utilities with the energy during peak periods. Since industrial plants require energy during peak periods, it is likely that cogeneration plants will devote much of the energy they produce during these periods to the industrial process they are affiliated with. As a result, surplus energy is less available for purchase by the utilities during peak periods.

167. See *supra* note 135 and accompanying text.

168. See *supra* notes 44-47 and accompanying text.

169. See Decision 86-07-004, July 2, 1986, Before the Pub. Util. Comm'n of the St. of Cal., at 11 n.5 (each utility has plants it runs whenever they are available for reasons including the "low running costs of baseload plants"). For example, a nuclear plant must produce a minimum amount of electricity or be shut down. Following shut down, an expensive and lengthy process is required to

generating levels of all such plants. The utility must continuously generate this minimum load or suffer the economic and efficiency losses from down-loading some of its plants. Under SO4 and other existing standard offers, utilities are required to purchase energy and capacity from QFs whenever it is available.<sup>170</sup> When demand for energy is low, the utility's minimum load plus the amount of QF power available may exceed the actual demand. The utility must then curtail one of the sources. Since the utility is required to purchase the QF power when available, the utility must curtail its own resources. The utility is then forced to expensively shut down one of its own plants and purchase energy from the QFs, resulting in higher energy costs. As a result, the energy used by the utility is overvalued.

Third, it is uncertain under SO4 whether utilities are able to build new baseload plants.<sup>171</sup> Under the offer, the Commission has discretion to determine which plants are avoided by QF power.<sup>172</sup> However, the commission does not establish a minimum percentage of baseload plants which will be utility operated.<sup>173</sup> Since new utility plants are avoided and old plants are eventually retired, it is conceivable that in the future all baseload energy will be supplied by QFs. As more of the baseload supply is provided by QFs, the utility is further restricted in curtailing or increasing its own available resources and adjusting the supply of energy to meet varying demand. When power must be curtailed or increased, the utility is not able to adjust the incoming supply of power from the QFs. As a result, the utilities would dispatch power inefficiently. Thus, SO4 diffuses the utility's ability to operate the system efficiently, and as a result, energy availability is less reliable.

#### 4. *Creating Environmental Benefits*

The Commission also argues that the environmental benefits of cogeneration and small power production warrant stimulation of QF power.<sup>174</sup> The Commission states that conventional energy generation creates pollution and environmental degradation.<sup>175</sup> This argument is superficially appealing, but every form of energy production involves environmental costs. The aggregate effect of QFs may be more destructive to the environment than other power sources. Every QF facility harms the environment in some way. For example, the Environmental Defense Fund (EDF) recently reported that electricity-generating facilities that burn garbage as fuel produce toxic ash, including lead and cadmium, when the garbage is incinerated.<sup>176</sup> When such environmental

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start the reactor up again. Thus, it is less expensive to run the reactor at minimum levels than to shut the plant down.

170. See *supra* notes 90-91 and accompanying text.

171. Under SO4, "peaking plants," which are used to quickly increase supply to meet demand in peak periods, are not avoided by QFs. All baseload plants, which provide the base source of energy, can be avoided by QFs. See *supra* note 126.

172. See *Re Pacific Gas & Elec. Co.*, 68 P.U.R.4th 1, 32-33 (1985).

173. *Id.*

174. Decision No. 91109, OII No. 26, 3 C.P.U.C.2d 1, 14-15 (1979).

175. Decision 82-01-103, OIR 2, 8 C.P.U.C.2d 20, 41 (1982).

176. *Setback for S.F. on Garbage Energy*, San Francisco Chron., Mar. 13, 1987, at 2, col. 4.

costs are considered in the aggregate, the environmental effects are significant.<sup>177</sup> Utility resources, larger in size than QF facilities but fewer in number, may produce less net environmental harm.

Secondary environmental costs for development of significant amounts of QF power must also be considered. When numerous smaller facilities are constructed, significant environmental degradation may occur. For example, as sites are developed, more natural resources are used, more transmission lines are installed to link the system and more pesticides are sprayed to keep the lines clear of foliage. It is difficult, if not impossible, to fully characterize the costs of any system. The stimulation of QF development cannot be justified by the potential environmental benefits independent of an analysis of the potential environmental costs.

### 5. *Encouraging Competition*

By selecting an avoided-cost methodology, the Commission ruled that the price measure should approximate the competitive market.<sup>178</sup> The Commission argues that standard offers, available to all QFs, reduce the monopoly power of the utilities and guarantee that the power purchase rates are determined by market forces.<sup>179</sup> The CPUC predicts that QF resources will effectively and economically compete with utility resources because as the supply of electricity increases, customer rates will decrease.<sup>180</sup>

Standard offers demonopolize the electricity industry by requiring utilities to purchase power from qualifying facilities, thus opening the market to non-traditional sellers of electricity. However, standard offers do not guarantee that transactions between utilities and QFs are competitively based or determined by market forces. Indeed, the introduction of standard offer contracts into the regulated power market may have anti-competitive effects.

The Commission's scheme encourages competition if only the number of actors in the energy production market, and no other factor, is considered. PURPA removes obstacles which discourage cogenerators and small power producers from participating in the power production market.<sup>181</sup> Therefore, additional suppliers of energy are eligible to enter the market. A market full of new sellers is theoretically more competitive. However, in order to fully understand the competitive effects of standard offers, the scope of examination must be broadened to consider the nature of the energy market.<sup>182</sup> By simply introducing new actors into a regulated industry, standard offers do not make the sellers of power operate in a competitive market.

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177. As of March, 1986, 617 QF facilities were in operation in California and a total of 1,214 had signed contracts. *PURPA Oversight Hearings*, *supra* note 1, at 101, 118 (statement of Michael R. Peevey).

178. Decision No 91109, OII No. 26, 3 C.P.U.C.2d at 15.

179. *Id.*

180. Decision 82-01-103, OIR 2, 8 C.P.U.C.2d 20, 40 (1982).

181. *See supra* text accompanying notes 31-36.

182. *See generally* BONBRIGHT, *THE PUBLIC UTILITY CONCEPT* 3-25 (1961) (regulated private ownership is characteristic of traditional public utilities; regulation includes governmental price controls and protection of consumers).

Standard offers remove competition between supplying QFs because they guarantee a set price to each and every facility which can meet the Commission's requirements. The QFs do not compete among themselves to contract with the utilities since the standard offer guarantees them a buyer. Thus, any facility which can make a profit by selling energy at the administratively determined price will enter the market. QFs are not forced to compete with other suppliers of energy, and as a result their motivation to reduce costs and increase efficiency is lessened.<sup>183</sup>

Furthermore, standard offers require the utility to purchase from QFs all the energy produced by QFs, regardless of whether the energy is needed at the time.<sup>184</sup> The utility is presumed to demand all energy and all capacity available. Consequently, standard offers do not approximate the market or encourage QFs to produce energy more efficiently or economically. As a result, competition is stifled.

In an energy market without QFs, the utility has three available sources of energy. First, it can fire up its own facilities and generate power itself. Second, it can make a spot purchase from other utilities. Third, it can contract with other utilities for power over a longer term. At all times, the utility maintains the minimum capacity needed to supply its system through the least expensive mixture of these sources. However, when standard offers are added to the scheme, the utility must purchase energy as it becomes available from the QFs,<sup>185</sup> without consideration of alternative, less costly sources. As a result, the utility may be forced to purchase higher cost energy.<sup>186</sup>

The infusion of QF power into the energy market also increases competition with utilities as suppliers of electricity to consumers. PURPA encourages many industries to turn to cogeneration or other forms of small power production to fuel their factories less expensively and to generate income by selling their excess capacity to the utilities.<sup>187</sup> As a result, the utilities lose many large customers who decide to generate electricity for their own use and sell the

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183. The QF is motivated to reduce costs and increase efficiency to maximize profits. However, it is not motivated to the same extent as it would be in a more competitive atmosphere. If QFs were forced to compete, failure to economize when others were more efficient would result in business failure. Under the standard offer scenario, the QF simply makes less profit than competitors.

184. Under SO1 and SO3, the utility is obligated to purchase energy or capacity as it becomes available. See *supra* notes 90-91 and accompanying text.

185. *Id.*

186. A study conducted for the U.S. Department of Energy reports that all three major California utilities, PG&E, SDG&E and Edison, have purchased electricity from cogenerators and small power producers at prices either near or exceeding the cost of utility self-generated electricity. HAGLER, BAILLY & CO., POTENTIAL DETRIMENTAL EFFECTS OF COGENERATION DEVELOPMENT ON UTILITIES COSTS: A PRELIMINARY ASSESSMENT 18 (prepared for the U.S. Dep't of Energy) reprinted in *PURPA Oversight Hearings*, *supra* note 1, at 261, 279.

187. An industry could choose to cogenerate or independently produce power prior to PURPA. However, the Act creates a more favorable climate for independent power production by deregulation and by requiring utilities to purchase power from QFs. See *supra* notes 31-36.

excess energy to the utilities.<sup>188</sup> In response, the utilities lower industrial energy rates in an attempt to lure back those customers.<sup>189</sup>

While the choice between purchasing energy at reduced rates from the utility or self-generating the electricity may offer a benefit to large industrial customers, it presents problems for both the utilities and other smaller consumers. The QFs have a competitive advantage over the regulated utilities in the battle for large industrial customers. Utilities are obligated to serve all profitable and unprofitable consumers of electricity and are limited in the rate of return on that service.<sup>190</sup> Conversely, independent producers of electricity are not required to supply energy to small unprofitable consumers, and are free to produce power only for the most profitable consumers.<sup>191</sup> QFs are free to skim the cream from the most profitable energy consumers.<sup>192</sup>

Moreover, utilities are obligated to serve QFs with back-up and maintenance power during planned and unplanned outages,<sup>193</sup> thus freeing QFs from investing in costly back-up systems. For example, if a cogenerator which serves a large industrial plant suffers an outage, the utility is required to supply power to the plant. The capital investment in building and running the QF is therefore lower. The utility itself is required to provide its competitor with an advantage.

However, QF projects do have risks which tend to minimize their competitive advantage. The QF is an independent investment by private developers and is not protected from construction overruns or delays as utilities are. If a QF project costs more than planned, or is delayed from operating and earning revenue, the losses come from the developer's pocket. In contrast, utilities often pass excess capital costs on to their consumers through rate adjustments.<sup>194</sup> As a result, the QF investment is a greater risk to the private developer than a similar investment is for a utility. The risk of capital overruns and construction delays weakens the competitive advantage that QFs enjoy over utilities.

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188. In 1987, PG&E lost \$370 million dollars in revenues as a result of large industrial users departing from the system and producing their own electric power. *Utility Faces Changed Market, Cutbacks*, San Francisco Exam., Mar. 15, 1987, at D1, col. 2. PG&E estimates the annual loss of revenue could reach one billion dollars by 1990. *Id.*

189. *Id.*

190. See *PURPA Oversight Hearings*, *supra* note 1, at 18, 45 (testimony of D.E. Simmons, Houston Lighting and Power Co.).

191. For example, the entities most encouraged to turn to cogeneration or small power production are large industrial users. As a result, previously large, profitable consumers abandon the traditional energy systems. As cogenerators, they may also sell power to the utilities. The 10 largest sellers of QF power in 1985 to PG&E were Santa Fe Geothermal, Dow Chemical, Simpson Paper Company, Crown Zellerbach, Union Oil Company, U.S. Windpower, Witco, Procter & Gamble, Texaco Oil, and Chevron Oil. See *PURPA Oversight Hearings*, *supra* note 1, 1148, 1193 (statement of PG&E).

192. *Id.*

193. The FERC regulations provide that "[e]ach electric utility shall sell to any qualifying facility, in accordance with § 292.305, any energy and capacity requested by the qualifying facility." 18 C.F.R. § 292.303(b) (1986).

194. This right is limited, as utilities cannot charge the ratepayers for unreasonable costs in constructing new facilities. For example, the costs for PG&E's \$5.8 billion Diablo Canyon nuclear power plant are currently being examined by the CPUC. *Utility Faces Changed Market, Cutbacks*, *supra* note 188, at D1, col. 2. Consumer groups claim \$3 billion of the costs are excessive and can be attributed to design and construction mistakes. PG&E acknowledges liability for \$68 million. Costs found to be unreasonable will be charged to the utility rather than the ratepayers. *Id.*

The rates utilities charge must be approved by the CPUC. Therefore, a utility can compete with QFs only if the CPUC allows it to compete.<sup>195</sup> The Commission's decisions over rates are often decided on political rather than economic grounds. For example, the CPUC engages in social planning by subsidizing favored groups through lower rates at the expense of other groups.<sup>196</sup> Currently, industrial rates are set higher so that residential rates may be held low.<sup>197</sup> Utilities must lower industrial rates if they are to effectively compete with cogenerators for large industrial consumers. This action may result in a rise in small consumer rates to make up for the loss of revenue.<sup>198</sup>

Two obstacles prevent the utilities from effectively competing with QFs. First, the utilities must persuade the Commission to allow them to compete with QFs, a group the Commission has favored through its development plan. Second, the utilities must persuade the Commission to allow them to lower industrial rates, an act which could result in higher rates to another CPUC favored group, the small consumer. It is unlikely that the Commission will allow the utilities to compete with one favored group—QFs—at the expense of another favored group—the small consumer. Under either choice, small consumer rates may increase. If the Commission does not permit the utilities to compete, and the utilities continue to lose large customers, rates for small consumers will increase to compensate for lost revenue. The Commission's scheme is flawed because it assumes that introducing QF power through the stacked deck of standard offers will approximate market conditions in the regulated environment of the energy market.

The Commission argues that stimulation of QF development is necessary to accrue the benefits of QF power. The benefits which underlie the CPUC's policy are not clear cut, but the CPUC encourages this development regardless. Since the benefits of QF power promised by the CPUC are more illusory than real, the CPUC has overstimulated QF development in California.

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195. For example, PG&E must obtain the approval of the CPUC in order to offer a discount to an industrial customer. *Id.* at D-2.

196. See PAC. GAS & ELEC. CO., 1986 ANNUAL REPORT 9.

197. *Id.* For example, as of March 1987, industrial consumers with demands of 500 kilowatts or more are charged a minimum of \$100, compared with a minimum \$5 charge to residential consumers. PAC. GAS & ELEC. CO., CAL. P.U.C. SHEET NO. 9924-E, COMMERCIAL/INDUSTRIAL/GENERAL SCHEDULE E-20—SERVICE TO CUSTOMERS WITH DEMANDS OF 500 KILOWATTS OR MORE (Mar. 16, 1987). Industrial consumers are also charged higher per kilowatt rates and higher demand charges than residential consumers. PAC. GAS & ELEC. CO., CAL. P.U.C. SHEET NO. 12196-G, SCHEDULE G-1—RESIDENTIAL SERVICE (Jan. 1, 1987).

198. Small consumer rates may not have to be raised. The utility can choose to compete with the cogenerators by cutting costs, lowering its rate of return, or operating at a deficit.

PG&E Chairman Richard Clarke estimates that by 1990 the loss of revenue from large industrial consumers will lead to an average 7-8% rate increase to all remaining customers. The company is undertaking cost cutting measures in order to lower rates to its 3,600 remaining industrial customers. *Utility Faces Changed Market, Cutbacks*, *supra* note 188, at D1, col. 2.

## B. Does SO4 Solve the Problems the CPUC Encountered Earlier In The Process?

SO4 is the culminating effort of the Commission's implementation of the PURPA mandate. Three problems plague previous standard offers: (1) basing long term contracts on speculative forecasts; (2) overvaluing capacity costs; and (3) bringing too much power on-line. If SO4 is to be effective, these problems must be solved. The approach offered in SO4 improves upon the earlier standard offers, but does not fully solve these problems.

### 1. Basing Long Term Contracts on Speculative Forecasts

The Commission learned from SO2 and Interim Standard Offer Four that long term fixed contracts overvalue energy and capacity and can be costly and inefficient.<sup>199</sup> Although the Commission suspended both offers, the utilities are saddled with the existing overvalued contracts for the remainder of their terms, lasting as long as thirty years.<sup>200</sup> Furthermore, the risks taken by a QF and by a utility of misforecasting value are not symmetrical. A utility bound to an overvalued long term contract is required to perform for the remainder of the term.<sup>201</sup> The QF facility, which exists to earn profits for its investors, is not bound and can breach the contract if it becomes unprofitable.<sup>202</sup>

SO4 attempts to solve this problem by limiting the period-two portion<sup>203</sup> of the contract to fifteen years.<sup>204</sup> This shorter maximum term is an improvement over SO2 and Interim Standard Offer Four. However, SO4 does not solve the dilemma of misforecasting. A fifteen year forecast is unlikely to predict future trends with sufficient accuracy, especially in relation to future fuel costs. Under SO4, utilities may still be tied to overvalued contracts for fifteen year terms; no mechanism in the offer adjusts overvalued contracts.

### 2. Valuing Capacity Costs

The short-run avoided cost offers based capacity payments to the QFs on the capital costs of a generic combustion turbine resource.<sup>205</sup> The Commission

199. See *supra* notes 99-101 and accompanying text.

200. Under Interim Standard Offer Four, PG&E is bound by signed contracts for 5,367 megawatts of long term QF power, comprising 64% of all megawatts under QF contracts as of March 31, 1986. *PURPA Oversight Hearings, supra* note 1, at 1148, 1187 (statement of PG&E). In addition, the company is obligated to another 750.4 megawatts of long term energy under SO2, which represents another 9% of all megawatts under QF contracts. *Id.*

201. *Id.* at 1148, 1168.

202. Cf. Goetz & Scott, *Liquidated Damages, Penalties and the Just Compensation Principle: Some Notes on an Enforcement Model and a Theory of Efficient Breach*, 77 COLUM. L. REV. 554, 558 (1977) (noting premise in contract law that a contractual obligation constitutes a choice between performance and payment of compensatory damages for breach).

203. Period two begins once the avoided resource comes on-line and lasts until the resource is retired. See *supra* note 137 and accompanying text.

204. See *supra* note 138 and accompanying text.

205. See *supra* note 90 and accompanying text.

argues that as utilities avoid building or using combustion turbine resources when QF power is introduced into the system, the QFs should receive payments based on the costs of such units.<sup>206</sup> However, these payments do not reflect the actual costs avoided by the utilities.

SO4 significantly improves the valuation of capacity costs compared to the prior standard offers. Under SO4, the Commission awards capacity payments based on specific resources determined by the utility to be constructed.<sup>207</sup> Thus, QFs avoid specific plants and are paid capacity costs based on the value of those plants avoided.<sup>208</sup> The new plan, in theory, accurately defines capacity values.

However, in applying SO4, two fictions distort the application of a valuation based on specific plants avoided. First, the twelve year forecast contained in the resource plan and determinative of future planned resources is simply a guess.<sup>209</sup> Thus, the Commission must rely on estimates of both the magnitude of plant construction and the corresponding costs. Second, given forecast uncertainty, the utility is encouraged to maximize its negotiating position concerning QF development. When a future need for energy arises, the utility must include a plan to develop more energy in its resource plan. The utility realizes that its plan to construct new plants will probably be replaced by the Commission with substitute QF power. Hence, the utility assumes that the proposed plant will never be built and suggests a plant with capital costs that allow payment to the replacement QF at the lowest rate possible. For example, if a utility anticipates a large demand for energy in 10 years, it forecasts a resource construction project to supply that demand. If the forecast recommends the construction of a plant with high capital costs, such as a new nuclear plant, the utility is instead encouraged to submit a forecast plan with a less expensive alternative, such as an oil burning combustion turbine. Since the capital costs of the turbine are lower than the nuclear plant, the capacity payments to the replacement QFs are lower and the utility saves money. Therefore, the process may encourage the utilities to forecast a resource plan representing the cheapest cost rather than its actual need.<sup>210</sup>

### 3. *Bringing Too Much QF Power On-Line*

The Commission did not limit the availability of the long term and short term offers.<sup>211</sup> As a result, SO2 and Interim Offer Four were oversubscribed and had to be suspended.<sup>212</sup> SO4 remedies this situation by allowing QFs to avoid

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206. Decision 82-12-120, Order Instituting Ratemaking No. 2, 10 C.P.U.C.2d 553, 602 (1982) (rules on standard offers for cogeneration).

207. These resources are included in the utility's resource plan. See *supra* notes 122-124 and accompanying text.

208. See *supra* note 128 and accompanying text.

209. See *supra* text accompanying notes 122-124.

210. The Commission reserves the right to review the forecasts and allows other parties to comment on proposed utility forecasts. To some extent, this right may check a utility's ability to fabricate a plan. See *supra* note 125 and accompanying text.

211. See *supra* note 87 and accompanying text.

212. See *supra* notes 99-101, 107 and accompanying text.

only specific plants included by the utilities in the resource plan.<sup>213</sup> Thus, only the amount of energy forecast by the resource plan is brought on-line.

Furthermore, the process calls for a second price auction when a resource is oversubscribed by QF bidders. Consequently, the number of QFs offered contracts is limited, and the QFs are paid a rate below full avoided cost.<sup>214</sup> This approach alleviates the problem of oversubscription to long-term contracts.

### C. Can SO4 Be Improved?

The development of QF power may not provide as extensive benefits promised by the CPUC, but it can contribute benefits if the existing terms of SO4 are modified. These modifications consist of (1) fostering competition among QFs; (2) guaranteeing system reliability; and (3) changing forecast procedures to insure more reliable forecasts. If modified, SO4 can accommodate the interests of all concerned parties by successfully encouraging QF development and benefiting ratepayers through QF competition and system reliability.

#### 1. Make QFs Compete

Under SO4, the level of QF development should correlate to the actual need for QF power. The system should not operate in a vacuum; rather, it should respond to competitive pressure. This response will result if prices for QF energy are set competitively by extending the oversubscription competitive bidding process to all QF projects.

SO4 currently promises to pay QFs one hundred percent of the avoided resource's capacity cost.<sup>215</sup> If the project is oversubscribed because too many QFs bid for the project, SO4 requires the QFs to bid the lowest percentage of the avoided plant's capacity cost that the QF would accept.<sup>216</sup> The lowest bidders are then selected to avoid the project at the percentage bid by the lowest losing QF.<sup>217</sup> For example, if there are fifteen QF bidders, all of whom are capable of producing ten megawatts, and the resource they are bidding to replace generates a total of one hundred megawatts, then only ten bidders are selected. Since the project is oversubscribed, the Commission selects the ten QFs which bid the lowest, and the winners are paid the percentage of avoided cost bid by number eleven, the lowest losing bidder. Thus, if QFs one through ten bid 50% of the avoided cost and eleven bid 65%, all selected QFs would be paid 65%.

Extending this competitive bidding process to all QF projects provides a better way to determine the true market price of the power. Furthermore, each QF should be paid at the rate it bid, rather than at the rate bid by the lowest loser. If a QF believes it can make a profit at 50% of the avoided cost, then the

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213. See *supra* notes 122-124 and accompanying text.

214. See *supra* note 132 and accompanying text.

215. See *supra* notes 131-132.

216. See *supra* notes 128-132 and accompanying text.

217. See *supra* notes 129-132 and accompanying text.

QF should be paid at that rate.<sup>218</sup> Under this modified SO4, QFs would be forced to compete among themselves for all projects. The cost-efficient and presumably technically superior facilities would survive. Utilities would purchase QF power at lower prices and would be able to pass the savings on to the ratepayers.

If competition among QFs increases, the supply of QF power would be regulated by market pressures rather than by administrative decisions of the CPUC. QFs would come on-line only when their product profitably earns the avoided cost. If a QF is less efficient than other QFs or the avoided cost is too low, that QF would not come on-line.

For example, under market conditions where fuel is relatively inexpensive and avoided costs are low, little additional QF power is required. Only a few QFs would be encouraged to enter the market. However, when crises such as the Arab Oil Embargo threaten utilities or when inefficiencies cause avoided costs to climb, QFs would be encouraged through SO4 to enter the market and take advantage of the high avoided cost price. Since the barriers that traditionally hindered QFs from entering the market are removed by PURPA,<sup>219</sup> cost-efficient QFs would not be prevented from entering the market. The system would respond rationally; as utility costs climb, QFs would supply energy to the utilities to fill the void. Competition would stimulate QF development rather than the Commission.

## 2. *Guarantee System Reliability*

In current form, SO4 threatens a utility's ability to efficiently and economically operate because QFs are not required to emulate the performance standards of the resource they replace. QFs should be required to meet a utility's performance standards to guarantee system reliability.

The utility must meet certain performance standards to operate the system reliably.<sup>220</sup> However, through adders to the contract, SO4 requires utilities to pay more than the avoided cost to meet these requirements.<sup>221</sup> Thus, SO4 is uneconomical. SO4 requires utilities to pay a set price for an inferior product or a yet higher price for a comparable product.

Requiring QFs to emulate the avoided resource would allow the utility to efficiently operate and meet the demands of the system. Furthermore, the utility would get the full value of the money invested. It is not required to pay the price of a superior utility resource for an inferior QF product. Thus, SO4 would price energy more efficiently and does not penalize the ratepayer.

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218. If a project is undersubscribed, the bidding QFs should still be paid at the percentage of avoided cost they bid, rather than at the 100% of avoided cost that the Commission would currently approve. Under SO4, less profitable QFs which are not able to operate at less than 100% of the avoided cost could bid 100%. If the project is undersubscribed, the bids are selected at that cost. The current SO4 rewards low bidders with a windfall higher price just because the project is undersubscribed. The plan does not encourage other QFs to bid or help the project become oversubscribed. No benefit is gained by paying more to bidders of undersubscribed projects.

219. See *supra* notes 31-36 and accompanying text.

220. See *supra* note 159.

221. See *supra* note 135 and accompanying text.

The utility should be allowed to supply a minimum percentage of the system's baseload power.<sup>222</sup> This permit guarantees that future utility-maintained resources are constructed and system reliability is insured. The utilities need to retain a portion of the system's baseload power to maintain flexibility in dispatching power and efficiency in meeting demand.

### 3. *Forecast More Accurately*

The greatest fault of SO4 is the inability to modify overvalued long term contracts due to forecasting errors. SO4 creates difficulties in forecasting whether: (1) the system actually requires additional power when the planned resource is scheduled to come on-line; and (2) the value or cost of the resource is actually the value or cost forecast. The first forecast error results in payments for resources not required to fulfill demand. The second forecast error results in either overpayment or underpayment for the capacity.

The problems of long term forecasting can be reduced by making QF contracts only when the utility would have begun construction of the avoided project within two years, and by including a variable measure to periodically update the avoided cost. For example, if the current resource plan states that the utility plans to build a hydroelectric plant in 1995, contracts with QFs are not signed until 1993. In 1993, the Commission is in a better position to gauge whether the power is actually needed. Thus, rather than committing QFs to projects eight years in advance, the QFs are brought on-line when the avoided utility resource would have begun generating power.<sup>223</sup>

Although any time frame is somewhat arbitrary, a two year lead time is more efficient for two reasons. First, the decision whether to build the plant, avoid it with QF power, or do nothing is based on more knowledge. A two year lead time is more reliable and realistic than a twelve year forecast. Second, the two year period is long enough to give all parties time to develop plans for the resource selected. Hence, the QF comes on-line at the same time that the utility's resource would have begun generating power. In contrast, under the current system a utility can be forced to contract with a QF for a resource not needed until year eight of the plan, but which the QF may only need eighteen to twenty-four months to construct.<sup>224</sup>

If the Commission decides to allow the utility to construct its proposed resource, the utility has two years to prepare for the start of construction. If the Commission decides to avoid the resource with QF power, the QFs have two years to finish plant design, arrange financing, and plan for construction. Either way, the party selected to build a facility has enough time to prepare and to come on-line in accordance with the resource plan.

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222. See *supra* note 171 and accompanying text.

223. The CPUC decided to award contracts on resources that become cost effective in the first eight years of the 12 year plan. See *supra* note 127. The utilities argue for a five to seven year planning horizon. *Re Pacific Gas & Elec. Co.*, 76 P.U.R.4th 1, 29 (1986).

224. Gas-fired cogenerating facilities can be completed in 18 to 24 months. Telephone conversation with Frank Rierson, Supervising Civil Engineer, Cogeneration and Qualifying Facilities Contract Department, PG&E (Oct. 2, 1987).

The second forecasting error concerning the value of power in the future is more difficult to correct. The offer now includes a measure for cogenerators which updates prices based on fuel rate fluctuations,<sup>225</sup> but this is the only market fluctuation taken into account. Other measures of the avoided cost are set when the contract is signed and stand for the term of the contract.<sup>226</sup> As a result, the utility or QF can be bound to a contract that, due to changing market conditions, undervalues or overvalues the contract price. A variable measure can be included in the contract to update the avoided cost price periodically. Thus, long run contracts adjust over time to market fluctuations. The avoided cost payments are based on actual avoided costs rather than long term forecasts of avoided costs. This approach might discourage QFs who are deprived of price stability, since without a guarantee of certain levels of income, QFs have a difficult time arranging project financing.<sup>227</sup> However, a price floor below and above the initial avoided cost can be installed to guarantee stability.

### CONCLUSION

The CPUC plan encourages the development of cogeneration and small power production and results in the infusion of unparalleled quantities of QF power into California's energy system. The CPUC aggressively encourages QF development as a means of benefiting Californians. However, it is uncertain whether a large infusion of QF power into the energy system is an economically or environmentally desirable alternative to utility produced power.

The CPUC's standard offer scheme overvalues QF power and stimulates more QF development than is warranted by the benefits it provides. The current SO4 scheme should be modified so that competition among QFs drives down avoided costs and regulates the supply of QF development. Moreover, the addition of QF power should not threaten the utility's ability to efficiently and reliably operate the energy system. QFs should emulate the performance of the utility resources they avoid, and the utility should be guaranteed ownership of a minimum percentage of the system baseload plants. Furthermore, expensive forecasting errors that can overvalue QF power or encourage a glut of QF development should be avoided. SO4 forecast periods should be shortened and updated periodically to account for fluctuations in energy demand and fuel costs.

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225. See *supra* note 137.

226. See *supra* note 137.

227. Contracting with QFs under a variable price scheme subjects the QF to risks of market fluctuation to which the utility is not subject to if it builds its own plant. Once a project is approved, the utility is allowed to pass the reasonable capital costs on to the ratepayers. See *supra* note 194 and accompanying text. Thus, the QF is subject to market fluctuations while the utility is not.

QF power can valuably contribute to California's energy market. However, the CPUC must avoid overstimulating QF development. If modified, SO4 rationally develops QF power according to reliable energy system forecasts. The supply of QFs would be limited to QFs that generate energy at a profit vis-a-vis other QFs and the utility's avoided costs. As a result, a limited number of technically superior QFs will generate power less expensively and ratepayers, utilities, and QFs will all benefit.

