

Tulsa Law Review

Volume 25
Number 3 *Mineral Law Symposium*

Spring 1990

The Counterproductive Effect of Cogeneration

Kent L. Crowl

Follow this and additional works at: <https://digitalcommons.law.utulsa.edu/tlr>



Part of the [Law Commons](#)

Recommended Citation

Kent L. Crowl, *The Counterproductive Effect of Cogeneration*, 25 Tulsa L. J. 601 (2013).

Available at: <https://digitalcommons.law.utulsa.edu/tlr/vol25/iss3/4>

This Casenote/Comment is brought to you for free and open access by TU Law Digital Commons. It has been accepted for inclusion in Tulsa Law Review by an authorized editor of TU Law Digital Commons. For more information, please contact megan-donald@utulsa.edu.

NOTES AND COMMENTS

THE COUNTERPRODUCTIVE EFFECT OF COGENERATION

I. INTRODUCTION

Martha O. Hesse, chairman of the Federal Energy Regulatory Commission, stated that cogeneration developed from a small energy conservation tool into a multi-billion dollar power industry providing several large areas of the nation with a majority of their new electricity requirements.¹ The questions that must be asked are: Did Congress intend to create this "billion dollar" industry when it passed the National Energy Act in 1978, and do the conservation efficiencies of cogeneration remain a sufficient justification for granting preferred status to an entire industry. With power shortages predicted for the mid-1990s, proponents of cogeneration argue that the public benefits from having a broad base of energy efficient power producers rather than large, centralized utilities.² Opponents, however, claim cogeneration under current regulatory application is not an effective conservation device. Because cogeneration prevents utilities from developing long-term capacity plans, it is damaging to the future supply of electricity.³

The answers to the questions are, under current Federal Energy Regulatory Commission (the FERC) application, the Public Utilities Regulatory Policy Act (PURPA) was not intended to create a separate power industry, and is off its conservation track. Therefore, a decision between two actions must be made. Currently, cogeneration is thriving under its protected status as an energy conservation device when, in reality and as regulated, it may not be a conservation mechanism that warrants such protection. To defend cogeneration under PURPA as a

1. *Public Utilities Regulatory Policy Act: Hearings Before the Subcomm. on Energy and Power of the House Comm. on Energy and Commerce*, 100th Cong., 1st Sess. 9 (1987) (prepared statement of Martha O. Hesse, chairman of the Federal Energy Regulatory Commission).

2. See generally Morris & Grutsch, *The Upcoming Boom in Cogeneration*, PUB. UTIL. FORT., May 30, 1985, at 17.

3. See generally Simmons, *Section 210 of PURPA: Are Mid-Course Corrections Needed?*, NAT. RESOURCES & ENV'T, Spring 1987, at 25.

method of energy conservation, the regulations implementing PURPA must be tightened with respect to fuel use and energy efficiency. On the other hand, if energy conservation in light of the current surplus of natural gas and low oil prices no longer makes sense, then cogenerators should yield their protected status under PURPA and truly compete to provide utilities with a less expensive source of electricity.

II. THE COGENERATION PROCESS

Cogeneration is a power production process in which electricity and thermal energy, heat or steam, are created simultaneously.⁴ There are various types of cogeneration processes. Topping Cycle is the process in which thermal energy is created by using waste heat from the generation of electricity.⁵ Bottoming Cycle, on the other hand, generates electricity by using leftover thermal energy from an industrial process.⁶ This utilization of waste steam and heat is not a new idea.⁷ Because it is possible to use less fuel when electricity and thermal energy are generated simultaneously than when the same amounts of electricity and thermal energy are generated separately,⁸ cogeneration has occurred for a long time for purely economic reasons.⁹

4. *American Elec. Power Serv. Corp. v. FERC*, 675 F.2d 1226, 1229 (D.C. Cir. 1982), *rev'd sub nom. American Paper Inst., Inc. v. American Elec. Power Serv. Corp.*, 461 U.S. 402 (1983). "Electric utilities are cogenerators when they use heat that would otherwise be dissipated into the atmosphere after they generate electricity, and industries are cogenerators when they convert steam or heat from their industrial processes into electrical energy." Note, *Energy Conservation—A New Factor in Certain Utility Rate Regulation*, 24 NAT. RESOURCES J. 487, 487 (1984).

5. Note, *supra* note 4, at 487. Topping Cycle can be illustrated by examining the typical electric generator. Fuel, usually natural gas or coal, is burned to heat boilers and produce steam which turns turbines to generate the electricity. During this process there is a certain amount of steam and heat that cannot efficiently be recycled to create additional electricity. Rather than vent that excess heat and steam, it is sent to a secondary purchaser who has a need for the heat or steam.

6. *American Elec.*, 675 F.2d at 1229-30. Bottoming Cycle can be illustrated by examining any industry that relies primarily on heat in its manufacturing process. A fuel is burned to generate the heat or steam. After the thermal energy is used in the manufacturing process, the waste steam or heat, instead of being released, is used to turn electric generators.

7. Reinsch, *The Significance of Cogeneration*, PUB. UTIL. FORT., June 13, 1985, at 106, 106.

8. Charo, Stearns & Mallory, *Alternative Energy Power Production: The Impact of the Public Utility Regulatory Policy Act*, 11 COLUM. J. ENVTL. L. 447, 448 (1986). "This recycling of energy is estimated to result in generation systems that are sixty to eighty percent efficient, as compared with the thirty-three percent efficiency experienced from most centralized electric plants." *Id.*

9. Reinsch, *supra* note 7, at 106.

III. PUBLIC UTILITIES REGULATORY POLICY ACT AND COGENERATION

While cogeneration may make sense from a purely economic standpoint,¹⁰ its use declined especially in areas where utility rates were relatively inexpensive.¹¹ However, increases in utility prices and the passage of PURPA revived interest in cogeneration.¹²

A. *Foundation for PURPA*

In the late 1970s, Congress enacted the National Energy Act¹³ with the intent that the new statutory provisions would permit the United States to make the transition to a period of expensive energy resources.¹⁴ Its focus was to shift Americans away from their dependence on the then-increasingly expensive and scarce oil and gas resources.¹⁵ One of the tools to facilitate the transition away from oil and natural gas was PURPA.¹⁶

1. Energy Situation and Projections When the National Energy Act Was Enacted

The energy crisis of the early '70s, with its high electric rates and threatened shortage of fuel supplies, forced the United States to rethink its methods of power generation.¹⁷ At the time the National Energy Act was proposed and enacted, oil and gas production was declining, dependence on foreign energy sources was increasing, and instability in the world oil market was projected for the mid-1980s. Congress noted that production of oil and gas in the United States, except Alaska and the Outer Continental Shelf, was declining.¹⁸ Congress also recognized that

10. Charo, Stearns & Mallory, *supra* note 8, at 448.

11. American Elec. Power Serv. Corp. v. FERC, 675 F.2d 1226, 1230 (D.C. Cir. 1982), *rev'd sub nom.* American Paper Inst., Inc. v. American Elec. Power Serv. Corp., 461 U.S. 402 (1983).

12. *Id.*

13. PURPA, Pub. L. No. 95-617, 92 Stat. 3117 (1978); National Energy Conservation Policy Act of 1978, Pub. L. No. 95-619, 92 Stat. 3206; Natural Gas Policy Act of 1978, Pub. L. No. 95-621, 92 Stat. 3350; Energy Tax Act of 1978, Pub. L. No. 95-618, 92 Stat. 3174; Powerplant and Industrial Fuel Use Act of 1978, Pub. L. No. 95-620, 92 Stat. 3289.

14. H.R. REP. NO. 543, 95th Cong., 2d Sess. 6, *reprinted in* 1978 U.S. CODE CONG. & ADMIN. NEWS 7659, 7677.

15. *Id.*

16. Wooster, *Cogeneration: Revival Through Legislation?*, 87 DICK. L. REV. 705, 716-17 (1982).

17. Charo, Stearns & Mallory, *supra* note 8, at 448.

18. H.R. REP. NO. 543, 95th Cong., 2d Sess. 6, *reprinted in* 1978 U.S. CODE CONG. & ADMIN. NEWS 7659, 7674.

while the United States' production declined, foreign oil imports increased to the point that forty-five to fifty percent of the United States' oil requirement was imported.¹⁹ The significance of this dependence on foreign oil lay not only in the sheer quantity of oil imported, but also in the rate at which the nation's dependence on the foreign oil increased. The forty-five to fifty percent importation rate in 1977 represented a twenty-three percent increase in the amount of oil imported since 1970 when the United States' domestic production peaked and began its decline.²⁰ This dependence was projected to continue increasing unless governmental policies and public practices regarding energy use were changed.²¹ The fear produced by these projections was magnified by predictions that the world's oil supply would not meet its demand in the mid-1980s.²²

2. Goals of the National Energy Act

Three objectives were sought to be accomplished by the National Energy Act. These objectives were the conservation of energy, the conversion to coal, and the development of incentives for production of energy resources.²³ Congress stated that energy conservation was to be one of the most important objectives behind the National Energy Act because "[t]he Nation must substantially improve the efficiency with which it

19. *Id.*

20. *Id.*

21. *Id.* In 1976 the United States consumed 17.4 million barrels of oil per day (mmbd). Demand was projected to increase to 21.1 mmbd in 1980, 22.8 mmbd in 1985, and 24.9 mmbd in 1990. "These levels of demand will imply imports of 10.2 mmbd in 1980 (48 percent of consumption), 11.5 mmbd in 1985 (50 percent of consumption), and 14.5 mmbd in 1990 (58 percent of consumption)." *Id.*

22. *Id.* at 7674-75.

At that point [the mid-1980's] the world's oil supply will be straining to meet world demands with serious implications for both international security and world economy. Sudden disruptive prices, accompanied by arbitrary curtailments of supply, will generate shocks to the national security and economic stability of each oil importing country. This is a development that each country should strive to avoid.

Id. at 7675.

23. *Id.* at 7678. To attain the three objectives (conservation, conversion to coal-fired power generation, and production incentives), Congress intended the National Energy Act to accomplish six goals. These goals were:

1. To reduce the average growth rate of energy consumption to 2 percent per annum.
2. To reduce the oil imports level to less than 6 million barrels a day.
3. To achieve a 10 percent reduction in gasoline consumption from the 1977 level.
4. To retrofit for energy conservation purposes 90 percent of the residential and commercial buildings in the United States.
5. To increase coal production by at least 400 million tons annually over the 1976 levels.
6. To use solar energy in more than 2 1/2 million homes.

Id.

consumes its limited supplies of energy."²⁴

The National Energy Act encompassed seven strategies intended to meet the objectives of conservation, conversion to coal, and increased production.²⁵ The strategy that provided incentives to cogeneration was to implement policies directed at public utility regulation.²⁶ Specifically, the incentives for cogeneration were designed to increase the efficiency of and to maintain competition in the production and transmission of electricity.²⁷

3. PURPA: Intended Accomplishment of the National Energy Act's Conservation Goal

PURPA, one of five statutes passed as the National Energy Act in the late 1970s,²⁸ was designed to encourage energy production from cogenerators as well as from small power producers.²⁹ During the congressional hearings which preceded the enactment of the National Energy Act, cogeneration was repeatedly mentioned as a known method of energy conservation.³⁰ In fact, of the five statutes passed as the National Energy Act, four contained provisions addressing cogeneration.³¹ The Energy Tax Act was the only National Energy Act statute which did not contain a cogeneration provision.³²

4. PURPA: Statutory and Regulatory Incentives for Cogeneration

Once cogeneration was identified as a viable conservation method,³³ Congress and the FERC needed to encourage participants to engage in cogeneration activities. In many ways this task involved a compromise. Congress and the FERC wanted to foster cogeneration, but they also had to maintain their conservation goals. If the standards to qualify as a

24. *Id.* at 7677.

25. *Id.* at 7678.

26. *Id.* at 7679 & 7690.

27. *Id.* at 7690.

28. *American Elec. Power Serv. Corp. v. FERC*, 675 F.2d 1226, 1230 (D.C. Cir. 1982), *rev'd sub nom. American Paper Inst., Inc. v. American Elec. Power Serv. Corp.*, 461 U.S. 402 (1983). The five energy statutes include: PURPA, Pub. L. No. 95-617, 92 Stat. 3117 (1978); National Energy Conservation Policy Act of 1978, Pub. L. No. 95-619, 92 Stat. 3206; Natural Gas Policy Act of 1978, Pub. L. No. 95-621, 92 Stat. 3350; Energy Tax Act of 1978, Pub. L. No. 95-618, 92 Stat. 3174; Powerplant and Industrial Fuel Use Act of 1978, Pub. L. No. 95-620, 92 Stat. 3289. *Id.* at 1230 n.7.

29. *Id.* at 1230.

30. Wooster, *supra* note 16, at 716-17.

31. Wooster, *supra* note 16, at 717.

32. Wooster, *supra* note 16, at 717 n.53.

33. *See supra* note 31 and accompanying text.

cogenerator were too high, individuals would be reluctant to enter the cogeneration field. However, if the qualifying standards were too low, the conservation goal would be lost.

PURPA provides four specific incentives to the cogeneration industry. The first, and primary, incentive is the requirement that utilities offer to purchase the electricity produced by the cogenerator.³⁴ This requirement exists so long as the individual or entity qualifies as a cogenerator.³⁵ Status as a cogenerator is commonly referred to as a "Qualifying Facility" or "QF."³⁶ PURPA provides that the electric utility must purchase the electricity generated by a Qualifying Facility at the utility's avoided cost.³⁷ This avoided cost is the cost the utility would incur if it generated and supplied the electricity produced by the cogenerator.³⁸

The second incentive is the right to interconnect with the utility to transmit the cogenerated electricity.³⁹ This right ensures the cogenerator access to the utility to send and receive electricity. Receipt of electricity from the utility is the third incentive of PURPA.⁴⁰ Under this incentive, cogenerators have the right to receive standby power from the utility when the cogeneration facility is shut down.⁴¹ The fourth incentive is the exemptions cogenerators receive from certain statutes and utility regulations.⁴²

34. 16 U.S.C. § 824a-3(a) (1988).

35. *American Elec. Power Serv. Corp. v. FERC*, 675 F.2d 1226, 1230 (D.C. Cir. 1982), *rev'd sub nom.* *American Paper Inst., Inc. v. American Elec. Power Serv. Corp.*, 461 U.S. 402 (1983).

36. 16 U.S.C. § 796(18) (1988). Cogenerators are Qualifying Facilities when they produce less than 80 megawatts of electricity. *Id.* § 796(17)(a)(ii). "Although a facility is automatically a qualifying facility if it meets the requirements of the rules, the owner or operator seeking qualifying benefits is required to file an information report with the Commission, known as a notice of qualifying status." Federal Energy Regulatory Commission, *The Qualifying Facilities Report: A Cumulative List of Filings Made for Small Power Production and Cogeneration Facilities Through June 30, 1987*, i (July 1, 1987) (SuDoc E2.12/3:987).

37. 18 C.F.R. § 292.304(b)(2)-(4) (1989).

38. *American Elec.*, 675 F.2d at 1231.

39. Zimmer & Feldman, *The Future of Independent Power Production*, NAT. RESOURCES & ENV'T, Spring 1987, at 28, 28.

40. *Id.*

41. *Id.* Prior to the enactment of PURPA, cogenerators had to have two generation systems. Morris & Grutsch, *supra* note 2, at 17. The first system was the primary generator and the second system served as a backup to be used during power failures and mechanical shutdowns. *Id.*

42. Zimmer & Feldman, *supra* note 39, at 28.

5. Other Encouragements for Cogeneration

Permanent exemption from the Fuel Use Act⁴³ is another encouragement to cogeneration. The Fuel Use Act was designed to prevent petroleum and natural gas from being used in the production of steam and electricity.⁴⁴ However, the exemption permits the cogenerator to use natural gas or petroleum if the cogenerator can show less petroleum or natural gas will be used in the cogeneration process than would be used if the thermal energy and electricity were separately produced.⁴⁵ This burden is not difficult to satisfy because the cogeneration process is inherently more efficient than individual thermal and electrical generation processes.⁴⁶

An additional incentive to cogenerators that is not available to utilities is exemption from the "used and useful" requirement. When a utility intends to increase its generating capacity, it must prove that the new, additional power will be "used and useful."⁴⁷ However, cogenerators need not satisfy this requirement;⁴⁸ thus, they are free to produce additional electricity without first proving there is a demand.

Exemption from the duty imposed on utilities to serve the public is another encouragement to cogenerators. Utilities are under a legal obligation to serve the public by providing power to anyone within the boundaries of their service zone.⁴⁹ Consequently, if it becomes uneconomical to continue the cogeneration process, cogenerators can stop selling power to the utility without obligation to the public whereas the utilities may not.⁵⁰

Finally, cogeneration opponents argue that the avoided costs, the revenues paid to the cogenerator, are in many cases a windfall that serves to encourage participation in the cogeneration industry. Calculation of the utility's avoided costs has been a significant issue since the passage of

43. Powerplant and Industrial Fuel Use Act, Pub. L. No. 95-620, 92 Stat. 3289 (1978) (codified in scattered sections at 15, 42, and 45 U.S.C.).

44. 42 U.S.C. § 8301(a)(2) (1982). One purpose of the Fuel Use Act is "to encourage and foster the greater use of coal and other alternative fuels, in lieu of natural gas and petroleum, as a primary energy source." *Id.* § 8301(b)(2).

45. Polsky, *Cogeneration Versus Generation*, PUB. UTIL. FORT., May 30, 1985, at 20, 20.

46. *See id.* at 21. "Any true cogeneration cycle results in substantially higher fuel utilization efficiency than separate energy production. This is attributed to the fact that cogeneration is a sequential production of electrical and thermal energy, thus utilizing rejected energy from one process as useful energy input into another." *Id.*

47. Simmons, *supra* note 3, at 26.

48. Simmons, *supra* note 3, at 26.

49. Simmons, *supra* note 3, at 26. This service includes providing power to cogenerators when their facilities experience power failures or are not operating. *Id.*

50. Simmons, *supra* note 3, at 26.

PURPA and its accompanying rate regulations.⁵¹ This issue is significant for utilities which must calculate their avoided costs,⁵² but the issue is also significant for cogenerators because a utility's avoided cost constitutes a cogenerator's revenue. Utilities want a low avoided cost while cogenerators want the utilities to have a high avoided cost.

Determination of the avoided costs is computed by using the "but for" test:⁵³ "[b]ut for the presence of the QF, what costs would the utility have incurred to generate an equal amount of electricity?"⁵⁴ The actual process of answering this question varies among the utility commissions.⁵⁵ While there is no set procedure, avoided costs are usually obtained by examining the utility's avoided fixed cost and avoided variable cost.⁵⁶ Typically, avoided variable cost, the running or operating cost of the utility, is the larger of the two costs.⁵⁷ Among the elements of the running cost, the most expensive is the fuel.⁵⁸ Therefore, revenues paid to the cogenerator by the utility vary significantly depending on the price of fossil fuel.⁵⁹

In many instances the avoided cost of the utility is based on costs associated with solid-fuel generators.⁶⁰ The windfall occurs when the cogenerator can install a gas-fired generator that costs one-third the amount of a solid-fuel generator.⁶¹ However, the utility is paying the cogenerator based on the avoided costs of operating an expensive generator.⁶² One could argue, if a cogenerator can supply a utility with power for less money than the utility expends to generate the same energy, then

51. Parmesano, *Avoided Cost Payments to Qualifying Facilities: Debate Goes On*, PUB. UTIL. FORT., Sept. 17, 1987, at 34, 34.

52. To determine avoided cost, a utility must provide the state's power commission with an estimation of the utility's avoided costs calculated annually in increments of 100 megawatts and based on cents per kilowatt hour. 18 C.F.R. § 292.302 (1989). This avoided cost estimate must also represent plans the utility has to add capacity, projected purchases of capacity, and the utilities anticipated capacity requirements. *Id.* § 292.302(b)(2).

53. Dansky, *Qualifying Facilities Need Not Lead a Marginal Existence*, PUB. UTIL. FORT., Sept. 17, 1987, at 31, 31.

54. *Id.*

55. *Id.*

56. *Id.*

57. *Id.*

58. *Id.* "For most utilities, the marginal fuel is a fossil fuel during on-peak hours (particularly No. 6 residual oil and natural gas), and for many utilities, the marginal fuel is a fossil fuel twenty-four hours a day." *Id.*

59. *Id.*

60. Simmons, *supra* note 3, at 53.

61. Simmons, *supra* note 3, at 53.

62. Bruce, *Let's Take Another Look at Small Power Production*, PUB. UTIL. FORT., June 21, 1984, at 96, 96.

the cogenerator should be entitled to reap those profits. However, utilities argue that because they have a surplus of cogenerated power,⁶³ they cannot demonstrate the need for new, less expensive generating facilities.⁶⁴ Consequently, utilities, and ultimately consumers, must pay cogenerators artificially high avoided costs.⁶⁵

B. *Effect of Cogeneration Incentives: PURPA Machines and Increased Dependence on Natural Gas*

Cogeneration's opponents point to PURPA Machines⁶⁶ as the epitome of everything wrong with the cogeneration industry. Traditional cogeneration, as opposed to PURPA Machines, is generation built in industrial areas, such as the Gulf Coast with its large petrochemical plants, where there is a natural market for the cogenerated steam and electricity.⁶⁷ PURPA Machines, on the other hand, are often built primarily to generate electricity rather than to "maximize energy conservation."⁶⁸ Many of these cogenerators are built in areas with relatively small needs for steam.⁶⁹ Opponents argue PURPA provides the PURPA Machines with a "guaranteed market for their electricity," and they are not, therefore, dependent upon consumer demand to maintain profitability.⁷⁰ Thus, opponents claim PURPA fosters an unnatural and harmful growth in the cogeneration industry. They argue the effect of the cogeneration boom burdens utilities with excess capacity and forces consumers to pay higher rates for inefficient production of electricity.⁷¹

Another flaw in the current cogeneration industry is the extensive use of natural gas by cogenerators. Ironically, one of the primary goals of the National Energy Act was to prevent using natural gas to generate electricity.⁷² Despite this goal, studies indicated forty-nine percent of

63. See Griggs, *Competitive Bidding and Independent Power Producers: Is Deregulation Coming to the Electric Utility Industry?*, 9 ENERGY L.J. 415, 418-19 (1988).

64. See *supra* notes 47-48 and accompanying text which discuss the "used and useful" requirement that utilities must satisfy before constructing additional generating capacity.

65. See, Bruce, *supra* note 62, at 96.

66. Simmons, *supra* note 3, at 26. Simmons defines PURPA Machines as cogeneration facilities "designed primarily to capitalize on the liberal operating standards for cogenerators and the contrived economics created by federal laws that force utilities to buy the electrical output of these units whether they need it or not." *Id.*

67. Bruce, *supra* note 62, at 96.

68. Polsky, *Cogeneration Versus Generation*, PUB. UTIL. FORT., May 30, 1985, at 20, 20.

69. Simmons, *supra* note 3, at 26.

70. Simmons, *supra* note 3, at 26. "No other business in America enjoys a guaranteed market for any volume of its product irrespective of need." *Id.*

71. See Griggs, *supra* note 63, at 418-19.

72. See *supra* notes 30-32 and accompanying text which discuss the emphasis placed on cogeneration as a means to conserve natural gas.

cogenerated power was fueled by natural gas.⁷³ Examination of the filings made by cogenerators for Qualifying Status also shows substantial dependence on natural gas as a cogeneration fuel source. As of July 30, 1987, the FERC received applications for Qualifying Status from 1,569 cogenerators.⁷⁴ Of these 1,569 cogeneration facilities, 1,106 were fired by natural gas.⁷⁵

Cogeneration's critics argue the substantial use of natural gas is fostered by the relatively low energy efficiency standards the FERC established for Qualifying Facilities. To obtain status as a qualifying cogeneration facility, cogenerators burning petroleum or natural gas have to satisfy two thermal requirements.⁷⁶ First, there must be a thermal efficiency of forty-five percent.⁷⁷ And second, the facility must produce at least five percent of useful thermal energy.⁷⁸ However, the requirements vary if electricity is produced first or second in the cogeneration process. When electricity is produced first (Topping Cycle), the efficiency standard is 42.5%.⁷⁹ Under this standard, the electrical output plus one-half of the thermal output must be at least 42.5% of the fuel input.⁸⁰ However, when electricity is produced second (Bottoming Cycle), the efficiency standard must be at least forty-five percent.⁸¹ Therefore, forty-five percent of the fuel used to fire the cogenerator must result in a useful energy output.⁸²

73. *Questions Seen for U.S. Cogeneration*, OIL & GAS J., Jan. 18, 1988, at 21.

74. Federal Energy Regulatory Commission, *The Qualifying Facilities Report: A Cumulative List of Filings Made for Small Power Production and Cogeneration Facilities Through June 30, 1987*, i (July 1, 1987) (SuDoc E2.12/3:987).

75. *Id.* The following chart shows the type of fuel used and the number of cogenerators using that fuel that have filed for status as a Qualifying Facility:

<u>FUEL</u>	<u>QUALIFYING FACILITIES</u>
Coal	182
Natural Gas	1106
Biomass	141
Waste	49
F06/F02	55
Nuclear or Solar	36

Id.

76. Polsky, *supra* note 68, at 21.

77. Polsky, *supra* note 68, at 21.

78. Polsky, *supra* note 68, at 21.

79. Griggs, *supra* note 63, at 423.

80. Griggs, *supra* note 63, at 423.

81. Griggs, *supra* note 63, at 423.

82. Griggs, *supra* note 63, at 423.

IV. OPTIONS TO CORRECT PURPA'S FAILURE TO ACCOMPLISH ITS CONSERVATION GOAL

Congress and the FERC must take one of two actions to correct the current direction in which cogeneration is proceeding under PURPA and its regulations. Cogeneration has been⁸³ and appears to be an important element in the nation's electricity producing system.⁸⁴ However, it is obvious that what began as a measure to conserve energy has grown into a huge industry that scarcely resembles the original concept.⁸⁵

A. Option 1—Refocus on Conservation

Increasing the efficiency standards⁸⁶ for oil- and natural gas-fired cogenerators can be an effective approach to refocusing PURPA's cogeneration industry. Amending the FERC's efficiency standards will provide PURPA incentives to cogenerators who are truly energy efficient. Increased standards may also curb or reduce the growth of PURPA Machines, cogenerators designed primarily to produce electricity.⁸⁷ These increased efficiency standards, like the current standards, will affect only those cogenerators burning oil or natural gas.⁸⁸ Such amendments will be directly in line with the National Energy Act's goal of reducing the nation's dependence on oil and natural gas for the production of electricity.⁸⁹

83. Wooster, *supra* note 16, at 706.

At the turn of the century, over fifty percent of the electricity consumed in this country was cogenerated. Electricity was primarily produced by reciprocating engines, which exhausted steam as a waste by-product. Many industries found it cost-effective to install these engines to supply steam for space heating or process needs as well as for electricity. Any surplus electricity was sold to other concerns nearby—usually in the same block, giving rise to the term "block plant." Electric utilities, which had to use engines of similar size and type, found it difficult to compete with these industrial concerns unless they also could recoup some of the cost of the plant from the sales of the waste steam. Thus, Consolidated Edison, which opened the first central station generation plant in 1882 in New York City, purchased the New York Steam Company and entered into the district heating business the same year.

Id. (footnotes omitted).

84. McCarthy, *The Public Interest in Cogeneration*, PUB. UTIL. FORT., Sept. 15, 1988, at 13, 13.

85. *Public Utilities Regulatory Policy Act: Hearings Before the Subcomm. on Energy and Power of the House Comm. on Energy and Commerce*, 100th Cong., 1st Sess. 9 (1987) (prepared statement of Martha O. Hesse, chairman of Federal Energy Regulatory Commission).

86. The FERC's efficiency standards for Qualifying Facility cogenerators are found in 18 C.F.R. § 292.205 (1989).

87. See *supra* notes 67-70 and accompanying text which discuss PURPA Machines.

88. See 18 C.F.R. § 292.205(a)(2)(ii) (1989) (providing there are no efficiency standards for cogenerators that do not burn oil or natural gas).

89. See *supra* notes 28-32 and accompanying text discussing the conservation goals of the National Energy Act.

A restraint in increasing efficiency standards will be the potential reduction in the amount of electricity contributed by cogenerators. As stated above, one positive effect of increased standards will be a reduction in the number of gas-fired PURPA Machines. Without the PURPA Machines, fewer cogenerators will produce electricity. Similarly, the possibility exists that PURPA Machines may never be completely replaced by more energy efficient cogenerators because of the industrial and commercial sectors' reluctance to engage in cogeneration.⁹⁰ This possibility will be a trade-off for the long term benefits of energy conservation.

B. *Option 2—Remove Protected Status from Cogenerators*

Under PURPA there are numerous ways in which cogenerators could lose their protected status. The most extreme method would be to repeal PURPA and return cogeneration to its pre-1978 condition. This approach may have its merits, but is probably not the most effective means of dealing with the PURPA Machine dilemma.⁹¹ While there are those who deny cogeneration and small power production can replace the traditional utility system of power generation,⁹² the fact that cogeneration currently supplies a portion of the nation's electricity demands cannot be ignored.⁹³ Abolition of PURPA could upset the future supply of electricity because construction of new power plants is almost nonexistent,⁹⁴ and power shortages are predicted for the remainder of the

90. Numark & Cooper, *Prospects for Utility Ownership of Cogeneration*, PUB. UTIL. FORT., Feb. 2, 1984, at 24, 24. This reluctance stems from the fact that most industrial and commercial managers know little about power production and hesitate to invest resources in projects which do not directly impact productivity. *Id.*

91. See Griggs, *supra* note 63, at 427. "There appears to be a general consensus in the electric utility industry that PURPA problems are problems of implementation and that they can be solved with 'fine-tuning' of the regulations." *Id.*

92. Simmons, *supra* note 3, at 53.

93. Zimmer & Feldman, *supra* note 39, at 28. In 1987, cogeneration produced 22,000 megawatts of electricity. *Id.*

94. *Electric Powerplant Construction: Hearing Before the Subcomm. on Energy and Power of the House Comm. on Energy and Commerce*, 100th Cong., 1st Sess. 1 (1987) (statement of Philip R. Sharp, chairman of the Subcomm. on Energy and Power). "Today's hearing is about electric powerplant construction or the lack thereof. We focus today on the stark fact that construction of new central powerplants has ground to a virtual halt over the past decade." *Id.* Mr. Stark cited three factors which may have reduced construction of new power plants. First, the unpopularity of nuclear power after the Three-Mile Island accident. Second, restrictions on new coal-fired electrical generators created by the New Source Performance Standards of the Clean Air Act. And third, the Fuel Use Act which virtually prohibited natural gas and petroleum from being used as power plant fuel. However, Mr. Sharp also stated even the presence of these factors cannot explain the halt of power plant construction when all the supply, demand, and regulatory factors indicate that new electrical power plants should be under construction. *Id.*

century.⁹⁵

Perhaps the most sensible method of removing some of cogeneration's protected status is to subject the industry to competitive bidding.⁹⁶ Even opponents of cogeneration appear to favor competitive bidding as a means to correct current injustices in the cogeneration industry.⁹⁷ In fact, the possibility of such an approach may be likely given that Martha O. Hesse, chairman of the FERC, proposed competitive bidding as a future direction for cogeneration.⁹⁸

Under a competitive bidding approach to cogeneration, the avoided cost component would become the subject of the bidding.⁹⁹ A few states currently use competitive bidding to determine avoided costs, and more states want competitive bidding implemented.¹⁰⁰ However, concerns exist whether current PURPA regulations permit bidding.¹⁰¹ Although competitive bidding is not precluded under present PURPA regulations,¹⁰² the regulations must specifically require bidding in order to ensure states uniformly apply avoided cost calculations.¹⁰³

95. *Id.* at 4 (prepared statement of Dr. Marie R. Corio, President of Applied Economic Research Co., Inc.). Dr. Corio's studies concluded that the nation's electricity supply is adequate through 1990. However, in 1995 the Southeast and South-central portions of the nation can expect shortages of electricity. The Mid-West and Mid-Atlantic regions have a fifty percent probability of experiencing shortages in 1995. And, by the year 2000 all areas of the United States will suffer shortages of electricity. *Id.*

96. See Griggs, *supra* note 63, at 436-37. Competitive bidding refers to the sale of electrical power at deregulated prices. Such a sale would theoretically involve several sellers competing against each other to market an electric power commodity to a public utility. The rationale for the proposal is that competition, rather than regulation, would prevent a seller from dictating the price to be paid, and would enable utilities to select the most efficient generating resources at the lowest reasonable cost. *Id.*

97. See, e.g., *Electric Powerplant Construction: Hearing Before the Subcomm. on Energy and Power, 100th Cong., 1st Sess. 60 (1987)* (answer of Jack H. Ferguson); *Public Utilities Regulatory Policy Act: Hearing Before the Subcomm. on Energy and Power of the House Comm. on Energy and Commerce, 100th Cong., 1st Sess. 277 (1987)* (prepared statement of William T. McCormick, Jr., Chief Exec. Officer, Consumers Power Co.); Polsky, *Cogeneration Versus Generation*, PUB. UTIL. FORT., May 30, 1985, at 20, 23; Simmons, *Section 210 of PURPA: Are Mid-Course Corrections Needed?*, NAT. RESOURCES & ENV'T, Spring 1987, at 25, 53; Zimmer & Feldman, *The Future of Independent Power Production*, NAT. RESOURCES & ENV'T, Spring 1987, at 28, 30.

98. *Public Utilities Regulatory Policy Act: Hearing Before the Subcomm. on Energy and Power of the House Comm. on Energy and Commerce, 100th Cong., 1st Sess. 9 (1987)* (prepared statement of Martha O. Hesse, chairman of the Federal Energy Regulatory Commission).

99. See Griggs, *supra* note 63, at 440.

100. *Electric Powerplant Construction: Hearing Before the Subcomm. on Energy and Power of the House Comm. on Energy and Commerce, 100th Cong., 1st Sess. 27, (1987)* (prepared statement of Jack H. Ferguson).

101. *Id.*

102. Griggs, *supra* note 63, at 440, (citing Meade, *Competitive Bidding and the Regulatory Balancing Act*, PUB. UTIL. FORT., Sept. 17, 1987, at 22, 22; Haman-Guild & Pfeffer, *Competitive Bidding for New Electric Power Supplies: Deregulation or Reregulation?*, PUB. UTIL. FORT., Sept. 17, 1987, at 9, 9).

103. See Simmons, *supra* note 3, at 25.

1. Benefits of Competitive Bidding

Benefits of the competitive bidding approach will include cost savings to utility consumers and increased efficiency in the operation of cogeneration units.¹⁰⁴ The cost savings to consumers will occur because utilities can better calculate the future supply of electricity and can obtain competitive prices for the cogenerated electricity. If the utility needs additional electricity, it can then solicit bids based on the type of capacity required.¹⁰⁵ If the cogenerated electricity is not less costly than the traditional utility generated electricity, or electricity from a noncogeneration source, a utility will not be obligated to buy the more expensive electricity.¹⁰⁶ Consumers will also benefit from the utilities' opportunity to escape avoided costs which are often calculated at inflated rates. These inflated avoided costs usually result from calculations based on expensive generating plants.¹⁰⁷ Utilities traditionally have dealt with expensive generating plants by selling the plant, mothballing the plant, or simply closing it.¹⁰⁸ However, under current PURPA regulations a utility must purchase cogenerated electricity based on the operation of the expensive generating plant.¹⁰⁹

2. Drawbacks of Competitive Bidding

One restraint to competitive bidding, from an energy conservation standpoint, is the potential increase in natural gas consumption. Critics of competitive bidding claim such bidding will cause greater dependence on petroleum or natural gas as a generator fuel.¹¹⁰ This dependence will stem from the cogenerator's extensive and increasing use of gas-fired generators.¹¹¹ In fact, forty percent of the 118 billion kilowatt hours projected to be supplied by nonutilities in the year 2000 will be fired by natural gas.¹¹² Because PURPA was designed to encourage methods of

104. Simmons, *supra* note 3, at 25.

105. *Public Utilities Regulatory Policy Act: Hearing Before the Subcomm. on Energy and Power of the House Comm. on Energy and Commerce*, 100th Cong., 1st Sess. 13 (1987) (prepared statement of Martha O. Hesse, chairman of the Federal Energy Regulatory Commission).

106. Griggs, *supra* note 63, at 442.

107. Bruce, *supra* note 62, at 96.

108. Bruce, *supra* note 62, at 96.

109. Bruce, *supra* note 62, at 96.

110. Griggs, *supra* note 63, at 443 (citing Opinion of Commissioner Charles A. Trabandt, *concurring in part and dissenting in part*, IV F.E.R.C. STATS. & REG. ¶ 32,455, at 32,080 (1986)).

111. See *supra* note 61 and accompanying text discussing gas-fired generators.

112. Energy Information Administration, *Department of Energy Annual Energy Outlook: Long Term Projections*, 28 (Jan. 10, 1989) (Sudoc E3.1/4:989).

generating electricity which do not use natural gas or petroleum, competitive bidding will conflict with the conservation theme upon which PURPA was based.¹¹³

Another drawback to competitive bidding and its encouragement of gas-fired cogeneration is the uncertainty that exists in the natural gas market. Although there has been an upturn in domestic production of natural gas, domestic production is not projected to be able to satisfy the increasing demand.¹¹⁴ This supply and demand gap will result in the importation of 2.3 trillion cubic feet of natural gas by the year 2000.¹¹⁵ Part of the uncertainty in the gas market stems from increased competition among suppliers of natural gas.¹¹⁶ Most gas sales were, and are, committed to long-term contracts; however, in the future there will be a greater tendency to purchase gas on the spot market.¹¹⁷ Because cogeneration is viewed as a current and future source of electricity, the nation will be faced with power shortages if suddenly it becomes unprofitable for cogenerators to continue producing electricity. Subjecting cogeneration, fired predominately by natural gas, to the competitive market will closely tie the price and supply of electricity to shifts in the natural gas market.¹¹⁸

V. CONCLUSION

Regardless of the method chosen to refocus PURPA toward its energy conservation goal, the importance lies not in the short-term effects on the cogeneration industry, but in the long-term benefits of energy conservation. In 1988, the United States consumed approximately seventeen million barrels of oil a day, which was the highest energy use in this nation's history.¹¹⁹ Consumption of natural gas in 1988 was 17.8 trillion cubic feet,¹²⁰ and projections show the United States will use 20.3 trillion

113. Griggs, *supra* note 63, at 443.

114. Energy Information Administration, *Department of Energy Annual Energy Outlook: Long Term Projections*, 20 (Jan. 10, 1989) (Sudoc E3.1/4:989).

115. *Id.*

116. *Id.* at 21 (noting that increases in the natural gas supply, price deregulation, regulatory promotion of interstate transportation of gas not owned by the pipeline companies, and the ability of gas consumers to switch energy suppliers has led to increased competition in the gas market.) *Id.*

117. *Id.*

118. Simmons, *supra* note 3, at 26.

119. Energy Information Administration, *Department of Energy Annual Energy Outlook: Long Term Projections*, 21 (Jan. 10, 1989) (Sudoc E3.1/4:989).

120. *Id.* at 20.

cubic feet of gas per year by the year 2000.¹²¹ These statistics demonstrate that the conservation goals of the National Energy Act have not been reached.¹²² The Legislature, in enacting the National Energy Act, realized the conservation goals it set out were ambitious and may not be attainable.¹²³ However, the legislators also stated "that we [must] periodically reexamine our progress toward achieving these goals, to see whether stronger action is necessary or desirable."¹²⁴ Refocusing PURPA's cogeneration industry on conservation is an example of this reexamination.

Kent L. Crowl

121. *Id.*

122. See *supra* notes 23-27 and accompanying text which discuss the goals of the National Energy Act.

123. H.R. REP. NO. 543, 95th Cong., 2d Sess. 9, reprinted in 1978 U.S. CODE CONG. & ADMIN. NEWS 7659, 7678.

124. *Id.*