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THE NATURAL GAS POLICY ACT OF 1978

PAUL W. MacAVOY*

The enactment of natural gas legislation in 1978 was a massive undertaking, requiring thousands of hours of effort by energy subcommittees of the House and Senate, by a special conference committee, and by senior officials in the Executive Office of the President concerned with energy matters. The Natural Gas Policy Act (NGPA)¹ took so long and required so much effort because it was the first building block in the Carter Administration's "Plan" to increase supply while reducing domestic consumption of energy. But the act also involved a prolonged and costly process because of the necessity for "trading off" gains and losses of various consumer groups given that supplies were short and that any change in existing policy, while alleviating the shortage for some, would also make those with plenty of gas worse off.

It was those gas consumers with sufficient supply that heard the call of the *New Republic* when that magazine feared that

[t]he great gas compromise, consecrated with a fanfare on May 24th, may prove to be one of the lesser achievements of the 95th Congress. . . . [I]t was not a compromise at all but rather a defeat for the buyers of natural gas . . . [and] a defeat for the federal government in that it set a date certain for the government to surrender its power to control the price of natural gas. In the future, if this compromise is enacted, that power will rest exclusively with the gas companies.²

To the contrary, for those left out by the shortage, *Harper's* magazine was more to the point: "[G]overnment involvement in natural gas pricing has been a disaster. It is particularly discouraging to consider how much larger the natural gas market might have grown . . . if the rigid price controls . . . had not been in place, resulting frequently in the shunning of new gas customers."³ Both views were

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1. 15 U.S.C.A. § 3301-3432 (Supp. 1979).

2. *A Lingering Death*, THE NEW REPUBLIC, June 10, 1978, at 5.

3. Bethell, *The Gas Price Fixers*, HARPER'S, June 1979, at 105.

correct. Gas policy had kept prices too low, causing shortages for new customers but also extraordinarily cheap supplies for existing customers. Changes proposed by the NGPA included higher prices that made new customers better off and old customers worse off.

The NGPA purports to eliminate the shortage by setting out schedules of increased prices for gas at the wellhead that will increase supplies and reduce demands. The NGPA also intends to eliminate the shortage equitably by dampening the impact of these increases in wellhead prices on particular groups of final consumers by phasing the changes into the mid-1980s.

The question to be asked of this legislation is whether it will achieve deregulation. Congress and the Federal Energy Regulatory Commission could succeed in the sense that, by the end of the phasing period, there would be no more shortage and therefore no need for continued regulation.⁴ At that time, additional supplies and reduced demands generated by the higher prices would clear markets of any excess demands. On the other hand, market conditions could be such that the shortage would be as extensive at the end of the transition period as it is at the present time. If so, then there would have to be more "phasing" or an extension of the act to achieve present goals.

In the transition period, the question is whether the adjustments are "equitable." There are as many definitions of "equitable" as there are plans for the gas industry. Without choosing among them, it can be agreed that, if the goal is to solve the shortage problem, any set of prices has to arrive finally at market equilibrium. This requires a "fair" plan to have (a) those being benefitted by the elimination of the shortage pay the costs of marginal supply and (b) those now benefitting from the shortage by buying at too low prices pay the full market clearing prices. That set of prices achieving these goals with the least surprise and the smallest annual adjustments would be one scheme that might qualify as "equitable." In order to speculate as to whether these would be the likely results, the next sections of this review describe conditions as of 1978 and the likely effects of the new regulations.

THE FRAMEWORK FOR NEW GAS POLICY

During the last 25 years, various agencies of the federal government have tried to set prices and sales conditions for producers of

4. A qualification on this, of course, is that the price at the end of that period is not above the long-run competitive equilibrium level. With a variety of prices that preclude shortages, the one chosen should be the least.

natural gas delivering to the interstate pipelines. In general, producers have sold inground reserves of natural gas by contracting to bring to the surface, gather, and refine methane on the pipeline's request. Contracts have been open-ended as to production volume, allowing the purchaser to take gas brought to the surface from reserves attributable to the producer's lease rights. These contracts have been price regulated by the Federal Power Commission (1954 to 1977) and the Federal Energy Regulatory Commission (1977 to date).

Interstate pipelines transport the regulated gas to retail gas distributing companies and industrial consumers to the east, north, and west of the major producing fields in Texas, Oklahoma, and Louisiana. These pipelines deliver some gas to large industrial areas, but most of their throughput goes to retail gas utility companies in the major cities of the country. These utilities supply the gas to thousands of residential and commercial gas users on their distribution lines. Also, at certain locations in the Southwest, gas has been bought for boiler use or space heating by a single company or industry located near the wellhead. In fact, in recent years wellhead or "intrastate" uses of natural gas, rather than large interstate pipelines, have been the most important growing source of demand for production from new gas fields.

On the supply side, gas markets have developed differently from other raw material and fuel markets. Natural gas reserves were accumulated as a by-product of the search for oil before retail markets developed, and in the years following World War II, producers provided gas to the new pipelines for prices not much more than the gathering and refining costs of that production. But when pipeline demands exceeded annual production rates from the reserves in those fields under contract, prices increased and the consequent profit incentives eventually led to exploration specifically for gas, and this led to expanded new reserve offerings.⁵ At the same time, the demand side of gas markets has grown in discontinuous steps as new pipelines were built and as industrial buyers moved to the producing states. The combination of fixed or slowly increasing supplies with rapidly increasing demands brought about large price increases in the 1950s.

The prices in interstate contracts were regulated by the Federal Power Commission (FPC) after a 1954 decision of the Supreme

5. This supply creation process has been quite uncertain, consisting of undertaking more exploration in prospect of finding additional reserves and then committing them under new contracts at higher prices. These steps in fact may not have been realized in every case, but additions to the supply of gas depended on prospective higher future prices. When the process works as expected, additional production has been forthcoming as contract commitments to the interstate pipelines or direct intrastate consumers have increased at higher prices.

Court held that the commission was responsible for wellhead prices of producers as well as for delivered gas prices of the large pipelines.⁶ In the 1960s, FPC regulation maintained producers' prices at approximately the level that was being realized in unregulated markets during the late 1950s. Confusing the sound regulatory objective of controlling monopoly power with the expediency of simply preventing price increases, the commission developed "area rates" that kept new contract prices at the level of average historical cost of new production from the reserves available in any region. In practice, somewhat higher rates were set on newly discovered reserves committed to the interstate lines than on renewals or extensions of previous contracts, as if the FPC were attempting to trace out the rising supply price of new gas. But the higher rates were always too little different from the rest, and were too often subject to regulatory restriction or reclassification, to serve as an incentive to search for additional supplies.

Practice aside, the "area rate" system could not conceivably have worked to achieve low prices and sufficient supplies at the same time. Demand increases, partly as a result of lower prices for gas relative to other fuels, had to be accompanied by reductions in reserve accumulations. Because the controlled prices were based in principle on average costs, and costs were rising, these prices had to be lower than the long-term marginal costs of sufficient supplies. To be sure, the actual shortages that inevitably followed this regulatory process were made large by the limited scope of the process itself. Since FPC controls did not extend to cover dedications of reserves to intrastate buyers in Texas, Oklahoma, and Louisiana, where most of the gas was available, producers withheld gas from the interstate market to make new contract dedications at prices higher than the regulated levels in intrastate industrial markets. This practice gave all the shortage to those interstate consumers supposed to be protected from higher prices.

The system of regulation made this situation worse by causing operating practices that themselves added to the shortage. The accounting methods for finding costs to set rates were in fact based on earlier prices, so that allowed price changes lagged behind even current cost and demand changes. In the first area rate decision relating to sales in the Permian Basin of West Texas, the FPC staff and the gas producers used information on exploration and development costs for a then-current year in which regulation had already been in

6. *Phillips Petroleum Co. v Wisconsin*, 347 U.S. 672 (1954).

effect.⁷ Thus these cost estimates, which were used to set ceiling prices, covered exploration and development expenditures based on the then-realized price. Past regulated prices determined those accounting costs which under regulation set present prices.⁸

The simultaneous use of historical and average cost estimates to set rates had to create a shortage because marginal costs were rising and exceeded average costs. Applying the process only to interstate sales had to give the shortage to one select group of consumers. The results were an impressive decline in reserve addition and eventually a failure of production to meet consumer demands.

THE SHORTAGE OF NATURAL GAS

Because of the peculiar institution of "reserve commitment," the shortage of natural gas was not observed and recognized as a problem until long after it existed. It began as a deficiency of reserves, as evidenced in an inability to contract for as much new gas as was demanded at the price levels prevailing in the middle and late 1960s. In the absence of enough new reserves, the pipelines reduced their reserve "backing" on existing deliveries by simply making additional deliveries of gas from existing reserves as more customers attached to the lines. The demands of new customers were met by selling gas from reserves which had been committed in principle to old customers. Eventually, as demands increased further the attempted draughts on committed reserves exceeded field producibility, so that production shortages began to appear at seasonal peaks of demand in the Upper Midwest and Atlantic Seaboard regions. The lack of additions in the early and middle 1960s curtailed production growth and even required some of those seeking gas to go to other fuels by the early 1970s.

The indication that this was going to occur could have been found in the reserve and production statistics (Table 1). Pipeline companies sought ten to twenty years of reserve backing for deliveries under long-term contract to wholesale industrial buyers or retail gas com-

7. Breyer & MacAvoy, *The Natural Gas Shortage and the Regulation of Natural Gas Producers*, 86 HARV. L. REV. 941 (1973), reprinted in revised form in ENERGY SUPPLY AND GOVERNMENT POLICY 77 (Kalter & Vogeley eds. 1976).

8. The process in that case biased the results further by using average rather than marginal costs so that those undertaking development of more risky deposits were precluded from receiving returns sufficient to justify undertaking marginal supply activities. To be sure, in the first area rate proceedings some attempt was made to add premiums to the ceiling prices in recognition of rising costs at the margin. But these premiums were based upon judgments of experts as to recent outlays for "high cost" supplies and the commission chose the low end of the range of these judgments so that the averaging process once again asserted control.

TABLE 1: RESERVES AND PRODUCTION OF NATURAL GAS
(Trillion Cubic Feet)

Year	(1)	(2)	(3)	(4)	(5)
	<i>Additions to Reserves</i>	<i>Marketed Production</i>	<i>Increases in Production</i>	<i>10-year Backing</i>	<i>Demand For Reserves 15-year Backing</i>
1955	11.9	9.4	n.a.	---	---
1956	14.0	10.1	0.7	7.0	10.5
1957	8.7	10.7	0.6	6.0	9.0
1958	7.5	11.0	0.3	3.0	4.5
1959	8.4	12.0	1.0	10.0	15.0
1960	1.2	12.8	0.8	8.0	12.0
1961	3.9	13.3	0.5	5.0	7.5
1962	6.0	13.9	0.6	6.0	9.0
1963	3.9	14.7	0.8	8.0	12.0
1964	5.1	15.5	0.8	8.0	12.0
1965	5.2	16.0	0.5	5.0	7.5
1966	2.9	17.2	1.2	12.0	18.0
1967	3.6	18.2	1.0	10.0	15.0
1968	(5.6)	19.3	1.1	11.0	16.5
1969	(12.2)	20.7	1.4	14.0	21.0
1970	15.6	21.9	1.2	12.0	18.0
1971	(11.9)	22.5	0.6	6.0	9.0
1972	(12.7)	22.5	0.0	0.0	0.0
1973	(16.1)	22.6	0.1	1.0	1.5
1974	(12.8)	21.6	(1.0)	n.a.	n.a.
1975	(8.9)	20.1	(1.5)	n.a.	n.a.
1976	(12.2)	20.0	(0.1)	n.a.	n.a.
1977	(7.1)	---	---	---	---

SOURCE: AMERICAN GAS ASSOCIATION, GAS FACTS 1977 DATA (1978).

NOTES:

Estimates in parentheses are reductions.

n.a.: not applicable

(1) p. 6; (2) p. 23; (3) difference between indicated year and preceding year; (4) ten times (3); (5) fifteen times (3).

panies. As they failed to obtain this backing while continuing to make commitments for delivery to new customers, reserves failed to grow as rapidly as production. By 1963, new reserves after regulation fell short of that sufficient to provide ten year backing for new production. A point was reached in 1968 when additions to reserves fell short of production, so that reserve accumulation for expanded production of a trillion cubic feet that year was negative. By 1970, 45 trillion cubic feet of demand for reserves was unmet (at ten years backing; 107 trillion cubic feet was unmet at the more conservative fifteen years backing). It had to be apparent that a year would even-

tually come in which the pipelines would not be able to deliver as much as their buyers would call for that year.⁹

There was in fact more shortage than indicated by reserve shortfalls. Those on the system should have been able to continue buying gas if they wished; they would have required ten trillion cubic feet of new reserves each year as their backing was used up. And after 1970, rules against connecting new gas customers left out the excess demand of those excluded from gas markets entirely. They were not listed as short of gas, and yet substantial numbers of potential new residential and commercial customers denied service by state and federal regulations were "short" by the entire amount of their energy demands. Those industrial buyers making investment and production plans contingent on gas as the source of process raw material or fuel were not shown as "short" of supply when these plans were abandoned. These purchasers put out of gas markets entirely were in addition to those that were getting gas but with reduced reserve backing.

The size of this shortage was important for deciding what to do about prices. If prices were too low but the resulting shortage was not very large, administrative adjustments could be made. But if the shortage was quite extensive, the whole system of regulation might have to be changed. Attempts were made at the time of NGPA to measure the magnitude of unsatisfied demands. The estimates of the size of the shortage varied greatly, as can be seen from only a partial compilation of these studies (as in Table 2); but even with considerable difference of opinion, it was possible to conclude that 20 percent more gas could have been produced and consumed in any year in the mid-1970s at regulated prices. Excess demand could have been as high as 40 percent or as low as 10 percent, but neither extreme seems likely because the pressure of shortages would have either been much more intense or not as noticeable as was observed at the time. In fact, there was an apparent and substantial shortage of production of one-fifth to one quarter of total demands, and the legislation in the works had to deal with institutions that could create that large a shortage.

THE POLICY PROBLEMS

The Federal Power Commission had already increased area rates substantially to deal with the shortage recognized in the early 1970s.

9. Discoveries increased in 1970, due to large finds in Alaska, so that total reserves were higher in 1970 than before or after; but this did not indicate new capability since these supplies were inaccessible to United States markets at the time.

TABLE 2: ESTIMATES OF THE NATURAL GAS SHORTAGE

Source	Time Period	Estimate or Forecast	Curtailments of Deliveries Because of Excess Demand (Trillions of Cubic Feet)	Shortage: Total Demand in Excess of Total Supply	Shortage: Percent of Total Demand
Federal Energy Administration ¹	Nov. 1975 to Nov. 1976	Forecast	2.9	—	12.7
American Gas Association ²	Apr. 1975 to Mar. 1976	Estimate	2.8	—	12.2
Federal Energy Administration ³	Nov. 1976 to Nov. 1977	Forecast	4.0	—	16.9
Federal Power Commission ⁴	Nov. 1976 to Mar. 1977	Estimate	1.6	—	7.5
Office of Technology Assessment, U.S. Congress ⁵	Calendar 1976	Estimate	4.0	—	16.7
MacAvoy-Pindyck Econometric Model ⁶	Calendar 1976	Forecast	—	5.9	22.8
MacAvoy-Pindyck Econometric Model ⁷	Calendar 1977	Forecast	—	7.2	26.8

¹ Briefing Paper provided to White House Staff and Cabinet (Dec. 1975).

² Cited in testimony of John D. Christie, Federal Energy Administration, before the House Committee on Interstate and Foreign Commerce, Subcommittee on Energy and Power (Nov. 6, 1976).

³ *Id.*

⁴ *Id.*

⁵ OFFICE OF TECHNOLOGICAL ASSESSMENT, U.S. CONGRESS, STATUS REPORT ON THE GAS POTENTIAL FROM DEVONIAN SHALES IN THE APPALACHIAN BASIN (Nov. 1977).

⁶ Pindyck, *Prices and Shortages: Policy Options for the Natural Gas Industry* in OPTIONS FOR U.S. ENERGY (1977).

⁷ *Id.*

The commission's rather abrupt changes in fact did take some of the pressure off the regulatory process. Moreover, market responses to the shortage were making regulation moot as producers left the regulated interstate markets to sell new supplies only in unregulated intrastate markets where prices were substantially higher. The FPC response to vanishing markets was to deregulate part of the interstate markets by allowing industrial buyers under curtailment to make short-term contracts in intrastate markets at whatever the level of prices required to lure away additional supplies.

These conditions and regulatory actions presented Congress with continued shortages and/or potentially large price increases. Reducing the shortages required either regulating prices in the intrastate markets into which the new supplies were going, or raising the prices in the interstate markets to comparable levels. The first merely shifted the shortage, and the second, while reducing the shortage, involved higher purchase costs for established interstate residential consumers and higher profits for gas producers. In effect, no solution to excess demand problems could be found without income transfers that constituted political problems for most congressmen.¹⁰

THE CONTENT OF THE POLICY ACT

The NGPA became a congressional landmark with the duration and extent of the struggles it created in the House, the Senate, and the conference committee required to resolve differences between House and Senate bills. The House in effect passed legislation that dealt with the gas shortage by means of new regulations, while the Senate deregulated field sales. The differences in policy were fundamental, and whether they were resolved is not at all clear from the Conference Report. The conference committee centered its findings on prices as follows:

The conference agreement reconciles these two very different bills by redefining what natural gas production qualifies as "new natural gas" and lengthening the period of time prior to the deregulation of most categories of natural gas. The initial price for new natural gas is comparable to the one provided in the House passed bill, though it

10. This is not to suggest the price increases to deal with these issues had to be initiated in 1978. Significant "deregulation" had been taking place, as noted. The Federal Power Commission in Decision No. 770A adopted "forward looking" and "comparative" cost data that justified increasing area rates on new contract gas in interstate commerce from \$.50 to \$1.42 per MCF. At the same time, the congressional "emergency" bills that allowed industrial and commercial consumers short of natural gas to buy in intrastate markets at unregulated prices raised interstate prices on sales to industrial consumers from two-thirds to parity with sales to retail consumers.

increases over time according to a new schedule . . . at a slower rate than the ceiling price for most of the gas that would have qualified as new natural gas under the Senate passed bill.¹¹

The reconciliation involved an explicit commitment to deregulation of new gas at the wellhead:

Natural gas produced from new onshore production wells (under sec. 103) producing from a completion location deeper than 5,000 feet is deregulated effective January 1, 1985, provided that such gas was not committed or dedicated to interstate commerce on April 20, 1977. Natural gas produced from new onshore production wells producing from a completion location shallower than 5,000 feet that was not dedicated to interstate commerce on April 20, 1977, is deregulated effective July 1, 1987, or as of the last date on which price controls are in effect if reimposed (under sec. 122), whichever is later. Gas produced from new onshore production wells committed or dedicated to interstate commerce on April 20, 1977, is not deregulated.¹²

This scheme seems to deregulate marginal supplies of gas in a way that eliminates the shortage by the late 1980s. But questions persist about whether the act was meant to raise field prices to market clearing levels. If not, then it cannot be expected to eliminate shortages.

Complete deregulation can eliminate excess demands by causing prices to rise above regulated levels until residential and industrial demands are reduced and until supplies of new reserves lead to production sufficient to meet the remaining excess demands. Deregulation can do all this in a few months or a few years, depending on the extent of the allowed price increases at the wellhead and on how these increases are passed on to final customers. Sufficient price increases could be put into effect by taking controls off all new contracts immediately and requiring that the decontrolled new supply prices be passed on entirely to new buyers. Or price increases could be phased in over longer periods and could be limited to types of gas not responsive to supply incentives. If these increases were then passed on to all consumers, especially in "averaged" retail prices, the shortage would be prolonged. In the extreme, "deregulation" could be proclaimed and price increases kept so small that resulting differences between NGPA scheduled and market closing

11. JOINT EXPLANATORY STATEMENT OF THE COMMITTEE ON CONFERENCE, THE CONFERENCE REPORT ON NATURAL GAS, S. REP. NO. 95-1126, 95th Cong., 2d Sess. 68 (1978).

12. *Id.* at 92.

prices in 1985-87 would require Congress to extend NGPA for another ten years. Thus, the intention of NGPA is not evident in the price schedules—indeed, the commitment to market clearing and elimination of the shortage is so unclear that one has to take recourse in forecasting the shortage likely to result from NGPA in order to gain hints as to what Congress wanted to do.

REGULATED PRICES IN THE NGPA

What is the structure of prices decreed by NGPA for the mid-1980s? Will it gradually and thus “equitably” make gas competitive with other fuels so as to do away with the excess demand for this fuel? Although more than thirty possible classifications of natural gas in each of eight general categories are specified in the act, only three involve supplies which would eventually be allowed to price up to market levels without regulation. The two quantitatively important categories are “new” and “offshore” gas, which are price deregulated under four different classifications based on depth and location of the reservoir.¹³

These categories and price schedules limit the volume of deregulated supplies. The specifications for gas subject to deregulation are quite exact: for example, new onshore production that qualifies for “special development incentives” is sub-classified according to whether the relevant wells are drilled to a depth less than or greater than 5,000 feet; and although both shallow and deep production wells are priced the same, each is deregulated at a different time (output from wells deeper than 5,000 feet is deregulated on January 1, 1985, while that from wells drilled less than 5,000 feet is not decontrolled until July 1, 1987).¹⁴ Price decontrolled gas offshore is limited to that committed under contracts dated after April 20, 1977, but onshore new gas is decontrolled if it comes from wells 2.5 miles beyond or 1,000 feet deeper than existing “marker” wells.¹⁵ Most flowing gas in 1978 did not fit these categories as a matter of course.

More important than the promise of eventual decontrol for some gas is the schedule of price increases designed to lead to decontrol. After all, decontrol can be promised, but when that point is reached it might be apparent that the last price step to an open market is

13. 15 U.S.C.A. §3312 (Supp. 1979).

14. *Id.* §3331. In contrast to old gas, consisting of reserves “dedicated to interstate commerce before November 9, 1978” which are not decontrolled and have price schedules that differ according to whether the gas is produced by small or large producer companies.

15. *Id.* §3312(c)(1)(B).

politically unacceptable. New gas prices are to increase from a level set at \$1.75 per million Btu on April 20, 1977, by 3.5 percent per year more than inflation until April 20, 1981, and by 4 percent per year more than inflation thereafter.¹⁶ Other gas, including dedicated interstate supplies, old offshore gas under new contracts, and north slope Alaskan gas, is priced at \$1.45 plus inflation but remains permanently under control.¹⁷ Production from old renegotiated contracts follows other regulated price schedules.¹⁸ The difference between these schedules implies that Congress believed that market clearing but "equitable" prices would be roughly 50 percent higher on new gas only in the middle 1980s.¹⁹

Price controls may be reimposed after the time when deregulation is to take effect. The controls can be reimposed under the NGPA only once for a period of 18 months between 1985 and 1987, and then only by presidential order or a concurrent resolution of the Houses of Congress.²⁰ To speculate, however, further legislation extending NGPA's price series or establishing another price series would likely be forthcoming in this period if the espoused series would not work to finish off the shortage.

On the whole, the purpose of these complicated schedules seems to be to increase prices for gas supplies that are "high cost" or subject to "special development incentives" or "newly discovered" to levels that allow markets for just these supplies to be deregulated by the late 1980s. Whether such deregulation occurs, however, is another thing. There will have to be no great price jump from the end of the price schedule to open market price levels. Otherwise, Congress will likely extend controls for the same reasons that, in 1978, the NGPA was established rather than allowing instantaneous deregulation. Thus, the question is whether the schedule is apt to produce that slowly increasing price level which will clear gas markets.

But as important as the price schedules are for decontrol, they are not sufficient. The rules in NGPA for allocation of gas and pricing to final consumers also determine whether markets clear. In general, supplies under contract to the interstate pipelines are assigned in NGPA first to residential consumers, with any remaining supplies

16. *Id.* §3312(b).

17. *Id.* §3319.

18. *Id.* §3316.

19. Both present and mid-1980s gas would be in 1978 dollars. Old gas "equitably" would be priced in 1985 at 1975 new gas price levels.

20. 15 U.S.C.A. § 3332(b)(1) and (2) (Supp. 1979).

being spread through a series of lower priority commercial and industrial consumers. The priority supplies are once again required by the act to be priced according to rather complicated and exacting resale price schedules, but essentially these supplies are assigned the lowest or "rolled in" average of all outstanding prices.²¹

To the contrary, gas resold to low priority final users is priced as "incremental" by passing through the deregulated new gas prices. This incremental price is the new gas field price plus transportation margins allowed under pipeline regulation.²² In practice, this high price is to be tempered, however, by allocating to a "reserve pool" those costs to the interstate pipeline from the higher price for new gas²³ in excess of the Btu-equivalent fuel oil price. And any pool amounts would then be allocated among all consumers in an average price schedule.²⁴ Thus, the alternative fuel oil price serves as an effective ceiling on gas prices to be charged the industrial customers.

This industrial gas price will vary by geographic region since it is to be based on number two distillate fuel price in some locations and residual fuel price in other locations.²⁵ The agency chooses the appropriate fuel oil price in a step critical for gas deregulation. Using the higher number two price will tend to shift less of the gas field price increase to residential consumers so that they are not induced to conserve gas and thereby reduce shortage, but it would lead to greater substitution by industrial customers of other fuels and thereby reduce the gas shortage. The Btu-equivalent price, if set high enough, will substantially reduce total demand and thereby cut back the shortage to low levels, perhaps even to the point where supplies are sufficient to meet all the remaining demands of these users.²⁶

21. *Id.* §§ 3341-3343.

22. *Id.*

23. Also included were the higher prices for gas from new LNG projects and from increased imports. The additional transportation costs for north slope Alaskan gas, along with the higher prices from existing SNG and currently approved LNG projects, would be "rolled in" or analyzed into existing price schedules for present consumers.

24. 15 U.S.C.A. § 3344 (Supp. 1979).

25. *Id.* § 3344(e).

26. The first steps in incremental pricing have been taken. According to WALL STREET JOURNAL, May 10, 1979, at 3, col. 3, the proposed FERC regulations for incremental pricing will use the cheapest oil available to industrial users in each region of the country. In most cases this is the number six oil price. FERC opted for the lower number 6 oil price for incremental pricing purposes in an unanimous 4-0 decision in the face of "overwhelming evidence" from gas utilities and government agencies that the higher number two price would lead to massive industrial conversion to easily substitutable cheaper number six oil. Before issuing final regulations, FERC is still trying to determine the extent to which a higher load factor using the number six price offsets the lower protection for residential and commercial users. FERC is required to issue a final incremental pricing rule for boiler fuel users by November 9, 1979.

ANTICIPATED AND REALIZED EFFECTS OF NGPA

Given these price schedules, will equitable deregulation be achieved in the late 1980s? The question almost falls of its own weight, given the complexity of the schedules and the uncertainties of future gas supplies, demands, and oil prices. But deregulation was the espoused intention of NGPA, so the response might be that Congress in 1978 presumably believed that controls would be eliminated as a result of the act. This was a credibly strong belief, however, only if it could have been expected at that time that the NGPA price schedule would reach that level necessary to clear gas markets in 1985.

The basis for expecting such results could have been the predictions of the industry experts advising Congress in 1978. At that time, the most influential source of forecast expertise was the Department of Energy, with its large-scale econometric model of the energy sector of the economy. This source indicated a quite plausible scenario of conditions in gas markets in the early 1980s (Table 3). The DOE expected that in the absence of NGPA there would be excess demand of approximately one quadrillion Btu or almost five percent of demand in 1985.²⁷ Assuming that the NGPA-prescribed price series were followed, and that economy-wide inflation was approximately five percent per annum, the average United States residential gas price would increase about six percent per year in current dollars between 1978 and 1985. The price of gas to commercial and industrial buyers, assuming incremental pricing from the "pool," would rise by almost nine percent per year even with cutoff for gas price increases at residual oil price levels (based on crude oil price escalation in real terms at seven percent per year). With the NGPA prices, industrial demand would be decreased by one-third of that amount, and supply would be increased by one-fifth, so that the shortage would be reduced by more than half that expected under continued regulation.

Of course, this was not the only prediction available to Congress in 1978. At the other end of the political spectrum, the industry trade association (the American Gas Association) used its TERA econometric model to predict that excess demands under continued regulation would increase by four quadrillion Btu if there were no curtailment program.²⁸ The AGA gas supply forecasts included both

27. U.S. DEP'T OF ENERGY, ENERGY SUPPLY AND DEMAND IN THE MID-TERM: 1985, 1990, AND 1995 (1979); U.S. DEP'T OF ENERGY, AN EVALUATION OF NATURAL GAS PRICING PROPOSALS (1978).

28. AMERICAN GAS ASSOCIATION, OFFSHORE GAS AND OIL SUPPLY MODEL (1977); AMERICAN GAS ASSOCIATION, ONSHORE GAS AND OIL SUPPLY MODEL

TABLE 3: FORECAST EFFECTS FROM THE NGPA

Market Condition	1985 Forecast Level Without NGPA	Increases in 1985 due to NGPA	
		(at low oil price) ¹	(at high oil price) ²
Supply (quad Btu)			
-conventional sources	16.7	+0.6%	+0.6%
-supplemental sources	2.6	+4.4	+4.9
Demand (quad Btu)			
-residential and commercial	7.9	+0.6%	+3.1%
-industrial	9.8	-3.4	+1.1
-other ³	2.5	+6.0	+7.0
Prices (\$1978/mm Btu)			
-residential	3.14	+5.4%	+15.3%
-industrial	3.31	+17.7	+14.4

SOURCES: U.S. DEP'T OF ENERGY, ENERGY SUPPLY AND DEMAND IN THE MID-TERM: 1985, 1990, AND 1995 (1979); U.S. DEP'T OF ENERGY, AN EVALUATION OF NATURAL GAS PRICING PROPOSALS (1978).

¹DOE Simulation Series "C-Low"—medium supply, medium demand, world oil at \$15.00 per barrel.

²DOE Simulation Series "C-High"—medium supply, medium demand, world oil at \$21.50 per barrel.

³Includes raw material, refinery, electric utility, and pipeline fuel use of natural gas.

conventional and supplemental supply additions, and showed that under NGPA the volume supplied from conventional sources would actually be reduced by two percent. Supplies from Canada and Mexico would be available, however, to expand total supplies by ten percent, SNG by five percent, LNG by eight percent, and gasification by one percent for a total of 24 percent. This would more than meet additional demands, but at prices of roughly \$5.00 per million Btu for Canadian and Mexican gas, \$5.70 for SNG, \$4.30 for LNG, and \$6.50 for coal gasification, most of which would be higher than Btu-equivalent petroleum product prices. AGA expected that supply would fall short of demand under NGPA, because petroleum prices of less than \$5.00 per MCF would set a cap on gas supply prices too low to allow the critical supplemental supplies to clear out gas industrial demands.

Thus, both government and industry experts predicted that there would be excess gas demands spilling over into petroleum consumption by industry. Congress would then not have been out of context to have expected the effect of NGPA to be to squeeze out excess demand into other markets, not to eliminate that excess demand.

(1978); AMERICAN GAS ASSOCIATION, DEMAND MARKET PLACE MODEL (1979) (vols. 1-3, respectively, of Total Energy Resource Analysis (TERA) Model documentation).

Residential and commercial consumers would reduce their gas demands in response to slightly higher prices, but most of the growth in residential and consumer demands would be met by NGPA allocating additional supplies to these sectors. This would require that gas destined for industrial consumers be reallocated, and with only very small total supply increases there would be continued shortages of industrial gas. That shortage would be reduced by incremental pricing of the new supplies but not eliminated at the ceiling set on gas prices by the Btu-equivalent oil prices. No consumer group would pay prices higher each year in real terms than present levels by more than three or four percent. But only industrial consumers would have excess demands (shown in Table 3 as a three percent decline in realized industrial demands). As a matter of course, this shortage would never be seen on gas wholesale and retail markets, because potential industrial consumers would invest in equipment to burn alternative fuels after failing to obtain gas supplies.

Thus, Congress conceivably expected the NGPA to meet and solve the shortage problem by shifting excess demand permanently to industrial users. Resale price controls on industrial gas consumption would require buyers to hold their bids for the scarce gas to levels too low to obtain all the supplies needed to meet demands. But these controls would allow elimination of ceiling prices on producers at the wellhead.

To be sure, Congress could have been in error. This underlying supply-demand imbalance implied by the NGPA could actually be eliminated by major changes now taking place in both the gas and other energy industries. First, new gas supplies have been greater than anticipated. This is because prices of natural gas in unregulated intrastate markets rose rapidly following the 1973-74 OPEC price increase, and the interstate regulated prices also increased after the rate increase decisions of the FPC in 1974 and 1976.²⁹ As a consequence, drilling increased—footage drilled almost tripled from 1970 to 1979—and more gas was discovered and brought to market than had been expected under continuance of the old regulation.³⁰

29. Opinion and Order Prescribing Uniform National Rate for Sales of Natural Gas Dedicated to Interstate Commerce on or After January 1, 1973 for the Period January 1, 1975 to December 31, 1976, 10 FED. POWER SERVICE 5-293 (July 27, 1976) (Federal Power Commission Opinion Number 770). The reader can find a history of the 1974 decision in this opinion.

30. As a result of these short term changes, a "gas bubble" of additional supply has developed for the interstate pipelines. The size of the "bubble" prior to the 1978-79 winter season was placed in the range of two to three quadrillion Btu. During the 1978-79 winter, at least 0.5 quadrillion Btu of the surplus deliverability was sold as emergency gas primarily to Pacific Lighting, United Gas, Transco, Northern Natural, and Texas Eastern, and lesser

The present new contract prices and prospects of still higher prices in the future have also reduced demands for gas. Residential consumers lowered the use of gas for space heating by about 15 percent in 1975-77 as compared with 1967-72 average.³¹ Also, the industrial market has been shrinking due to the impact of curtailments on choice of boiler type and due to higher gas prices.³² Over the 1973-77 period, residential and commercial consumption stayed almost even in volume terms, while industrial consumption was reduced by 22 percent of previous levels.³³ At the same time, utility use was down almost as much as well,³⁴ so that current prices and previous curtailments had reduced demands more than forecast for the late 1970s. With more supply and less demand, the residual claimant on the pipeline system under regulation—the industrial consumer—may not go short in the middle 1980s.

Changes in fuel oil markets could have more of a shortage-reducing effect. The fuel oil price is critical in setting the limit on the industrial gas price. In the existing scheme of things, NGPA would have shifted the excess industrial demands for gas to markets for petroleum products, because the ceiling resale industrial gas price for the pool would have been set lower than the marginal costs for gas imports, synthetic gas, and liquefied gas supplies. But now this might not be the result. Oil prices are well on their way to levels twice as high as those assumed in the forecasts, so that the ceiling resale prices for gas should exceed the costs of supplemental gas supplies.

Such results are at least hinted at by the DOE econometric model scenarios. As shown in the last column of Table 3, the higher oil price and the consequent 30 percent higher allowed gas price add to the satisfied demands for gas for industrial use. Thus, it is now likely that the shortage will be reduced or even eliminated by additional supplies of synthetic and liquefied gas. The NGPA could lessen and

amounts to Natural Gas Pipeline or others. These were mostly provided by Oklahoma Natural, Houston Pipeline, and Texas Oil and Gas Companies. The bubble will probably disappear fairly rapidly because of anticipated further oil shortages by industry and the increase in gas demands from the 30% increase in oil prices that occurred in the spring of 1979. There has also been a reversal of administration policy which had encouraged electric power stations to burn other fuels besides natural gas. By late spring, the surplus intrastate deliverability was more likely in the range of 1.5 quadrillion Btu. The expectation is that for all practical purposes it will become nonexistent by the spring of 1980 with the intrastate market absorbing a share of the overdeliverability industrial market in the South and of two year interruptable sales to interstate pipelines.

31. U.S. DEPT OF ENERGY, ENERGY SUPPLY AND DEMAND IN THE MID-TERM: 1985, 1990, AND 1995 (1979).

32. *Id.*

33. *Id.*

34. *Id.*

eventually dissipate the natural gas shortage with additional very high priced supplemental gas supplies.

The NGPA was not designed by Congress to solve but rather to institutionalize the gas shortage. But the act may have reduced the shortage far more than anticipated, to the point even of eliminating it altogether. Even so, the result would not be total deregulation. The two-price system of resale controls would have household users pay a lower price than industrial users in wholesale markets.³⁵ The industrial and residential markets continue to be kept apart by regulation to protect residential buyers from the price-raising proclivities of industry seeking this favored source of energy. This seems to sum up the NGPA—keeping gas prices low to residential users even if a shortage is necessary, or forcing industry to higher-cost supplemental supplies or to oil if necessary. The NGPA reveals congressional concern not for equity and efficiency in the use of natural resources, but rather for the most obvious and numerous group of voters.

35. These prices were equivalent in the early 1960s, once account was taken of cost of delivery differences and demand elasticity differences. MacAvoy & Noll, *Relative Prices on Regulated Transactions of the Natural Gas Pipelines*, 4 BELL J. ECON. AND MANAGEMENT SCI. 212 (1973).

If all controls were released in 1984, including controls on resale prices, industrial users would bid away additional supplies of newly discovered reserves. As this occurred, the replenishment and expansion of pipeline supplies for home consumers would either disappear or continue at higher prices comparable to those paid by the industrial user. Alternatively, the pipelines would reallocate supplies to the industrial wholesale buyers from those amounts then going to the retail gas utility buyers until the two wholesale prices once again were the same. The shock to the system from such price adjustments would clearly be as great as that envisioned from immediate deregulation in 1978. Since Congress avoided this last year with the NGPA, it would doubtless act to continue those parts of the act denying industrial users access to the cheaper conventional supplies.