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# THE U.S. NATURAL GAS SITUATION

## ECONOMICS & POLITICS IN THE 1980's

by

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I would like to start my discussion about the U.S. natural gas industry with some comparative data about its size and growth.

The U.S. is by far, the largest gas consumer in the world. Last year it used 44% more gas than the world's second largest consumer, the Soviet Union, and 31% more than the entire non-communist world* outside the U.S. In gas production the U.S.'s dominance is somewhat smaller but still impressive: 21% above the USSR and 22% above the rest of the non-communist world.

Yet, the U.S.'s superiority is being whittled down. Between 1973 and 1981 U.S. gas consumption declined by 13% while that of the rest of the non-communist world grew by 52% and that of the USSR by 80%. Production figures for the three areas changed by similar magnitudes. This suggests that the U.S. gas industry is in transition which makes it an interesting industry to analyze.

Another reason to focus on U.S. gas is that it is currently the only fuel in the U.S. still involved in an active political controversy. Until 1980 that privilege belonged primarily to the oil industry but the end of oil allocations and oil price controls in the U.S. and the absence of foreign oil price increases since the spring of 1981 have more or less ended the big oil debate. But gas is currently more wrapped up in red

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* Non-communist world excludes the Soviet Bloc and China.

tape than oil ever was and its price has been rising steeply. So, the gas debate is heating up; and it is not just regulator vs. regulated. As is usually the case with such issues, some regulators want less regulation while some of the regulated want more, some want none, with everyone else in between.

In short, the U.S. natural gas policy debate is vibrant, has big stakes and will last for some time. Also, it is of direct concern not only to Americans but also the U.S.'s current foreign gas suppliers--Canada, Mexico and Algeria--as well as any potential supplier.

Let us start with a very brief description of how the U.S. gas industry got where it is today. U.S. gas production and consumption peaked in 1973. From 1960 until 1973 both rose at an annual rate of about 4.6%, somewhat faster than total U.S. energy demand. The rapid increase in gas demand was in large part the result of the government controls imposed in 1954 over wellhead prices of all natural gas sold in interstate commerce. The controlled prices were, and still are, substantially below the market clearing level, i.e., the parity price at the point of consumption with the principal competing energy source, namely fuel oil.

The artificially low price was of course a disincentive to the search for new gas supplies. But for a long time this

was not a constraining factor because of the high level of reserves relative to production at the beginning of the period and the seeming ease of adding reserves until the mid-1960's. However, from 1968 on the price incentive on consumption and disincentive on locating supplies began to show up as gross reserves started to decline. They have done so in every year* until 1981 when for the first time in 13 years more gas was added to reserves than was produced.

Eventually the decline in reserves and consequent reduction in the reserve/production ratio started to constrain gas supplies. From 1974 to 1978 gas consumption at prevailing prices was clearly limited by available supply. The 16% increase in both residual fuel oil and distillate fuel oil demand during that period (1974-78) reflects largely the insufficient supply of natural gas at prevailing controlled prices which had to be offset by more oil.

Since 1978 the situation appears to have turned around. What was at first dismissed as a very temporary "gas bubble", due to short-term market imbalances, has become a steady surplus for the past 4 years and is not about to end. There are no official government or industry data on the surplus. But most informed estimates place it in excess of 2 tcf which is equal

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* excluding the Alaskan North Slope reserves added in 1970.

to roughly 10% of the U.S. marketed gas production. This is a significant but hardly excessive surplus, particularly since some of it is not connected and therefore not readily available for consumption.

Yet, the surplus has acted as a disincentive to gas drilling activities and has been a factor in the recent decline of decontrolled gas prices. What is at work here is the phenomenon of the disproportionate impact of small supply/demand imbalances on market forces at the margin. We saw the same phenomenon at work in the oil market where a small shortage resulted in large price increases for marginal supplies.

The gas surplus is due primarily to demand reductions rather than to supply increases. Last year demand was about 2 tcf below 1974 and this year it will be down by another 0.3-0.4 tcf. The decline in demand is due to a combination of circumstances such as consumer reactions to the sharp increase in gas prices (well-head prices rose 560% and residential retail prices 260% between 1974 and 1981); federal and state administrative and legislative restrictions on the use of gas, primarily to assure adequate supplies to existing residential consumers; and the impact of the current general economic recession on gas demand.

The first of these factors, rising prices, will have relatively little additional impact in the next few years, since under existing legislation wellhead prices will probably rise much more slowly from 1982 through 1984 than previously. The second factor, governmental restrictions on the use of gas, is becoming progressively less significant due to recent relaxations of these restrictions. The third factor, the present recession will

hopefully be over by next year in which case gas consuming industries can be expected to increase their consumption.

Taking all these factors together, it seems likely that the decline in gas consumption of the last few years (including this year) will level off in 1983 after which demand may rise again for a while. This could eliminate the existing gas surplus within 2-4 years. Beyond that time, additional demand growth would depend on the availability of new gas supplies at competitive prices.

The principal energy source with which gas must be able to compete is oil used for heating and power generation. Gas competes of course also with coal and electric power in end-use markets. But since U.S. coal now costs so much less than gas and electricity so much more, gas cannot compete on a price basis with coal nor can electricity compete with gas. While current oil-gas competition extends through the whole range of stationary uses of these fuels, it is strongest in the industrial and electric power market which is much better equipped to switch large volumes at short notice from one fuel to another than the U.S. residential-commercial market.

Last year 59% of all gas and nearly 20% of all oil consumed in the U.S. went into the industrial (steam and process heat) and electric utility market. Not all of these fuels compete

by any means directly with each other. But a large volume does. As an illustration, facilities scheduled for "interruptible" gas sales do so; of necessity they have dual fuel capability. The principal alternate fuel, by far, in installations using interruptible gas, is residual fuel oil. This year total interruptible gas sales may amount to 4 tcf, equal to over 20% of total U.S. gas sales. This indicates that if either fuel should become uncompetitive the other would make rapid and substantial inroads into the uncompetitive fuel's market.

This brings us to the current and future price for natural gas which lies at the center of the gas policy debate. Broadly, the Natural Gas Policy Act (NGPA) of 1978 provides that most U.S. gas produced from wells operating before April 20, 1977 will remain permanently under price control while most gas produced from wells put into operation after that date will be decontrolled on January 1, 1985. Some new gas from deep geological formations has already been decontrolled. Obviously, the legislation has created at least a two-tier, but because of the complexities of the law, in effect a multi-tier pricing system.

Since the market does of course not make allowance for such price differentials of a homogeneous commodity, the average price of gas in 1985 must be competitive with that of fuel oil at the point of consumption. Since the Gulf Coast is the country's principal gas producing and surplus region, the 1985 wellhead price for natural gas will be a netback based on residual fuel oil in the lowest value oil-competitive market for which Gulf Coast gas is available. In 1985 this market will be located at some distance from the Gulf Coast region. If we make the assumption that residual fuel oil prices in 1985 will not be significantly different (in constant dollars) from what they are now, the average hypothetical Gulf Coast gas wellhead price would have to be in the $3.00-3.50/Mcf range in 1985 (in 1982 dollars). This compares with an estimated mid-year 1982 average price of about $2.35.

I would like to make clear that this is not a forecast of the actual wellhead price in the real world in 1985 but a hypothetical parity price calculation. A number of factors, such as contractual price escalation and "most-favored nation" clauses and contracts without "market out" clauses could well raise it above that level. But in a hypothetical perfect market where prices are determined at the margin of interfuel competition this would be the average wellhead price in 1985.

The essence of the gas price controversy, however, is not the average wellhead price in 1985, which may not be very different with NGPA than without it, but the multi-tier pricing system which would be maintained under the Act as long as old gas wells continue to flow. This system creates inequities among producers, transporters, distributors and consumers, since the mix of price controlled and uncontrolled gas volumes will vary greatly within and between each group. The system is reminiscent of the now defunct oil price allocations scheme which also established several price tiers. However, in that case the government recognized the inherent inequity of assigning different prices for different companies using the same commodity. It therefore established the "entitlement" program to offset the price differences. The program worked badly and caused many distortions of its own. But there was general agreement that as long as the government insisted on maintaining different prices for old oil, new oil and imported oil, all refiners had to be given approximately equal access to these categories.

This is not the case under NGPA. With recent prices ranging from under $1.00 to over $8/Mcf and average pipeline acquisition costs ranging from $2 to over $5/Mcf, the distortion between producing companies as well as between their pipeline customers is obvious. So is the fact that these distortions will have a regional impact, since different regions are supplied by different pipelines.

Producers with large volumes of low-cost old gas are of course opposed to the Act since it gives them less than market value for this gas, while those producing mainly uncontrolled gas favor it, since the price-controlled old gas gives their customers a "cushion" to absorb the cost of gas which exceeds the parity price. By 1985 we estimate that for the U.S. as a whole about 35%-40% of total gas supplies (including imports) will be priced below the parity price and thus provide a cushion to pay for high cost gas. However, for individual interstate pipeline companies the share of old gas has been estimated to range from 11% to 64%, according to an estimate by an industry group*. By 1990 we estimate the cushion will apply to 15%-20% of total supplies. Thus, under the NGPA the price control on old gas would continue to cause significant price differentials and permit some uncontrolled gas to be priced significantly above the parity level until the early 1990's.

Most of the opponents to NGPA argue for a phased decontrol of all gas prices over the next few years. Congress will definitely take the issue up in 1983 but whether and how it will act is unpredictable as of now. Decontrol would act as a disincentive for the exploration for deep gas (below 15,000 ft.), most of which could probably not be profitably produced at or

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* Process Gas Consumer Group, as quoted in the Oil and Gas Journal April 26, 1981.

near our hypothetical parity price range, if all costs are taken into account. On the other hand, decontrol prior to 1985 would encourage the exploration for gas in shallower formations. Decontrol would also give producers of old gas incentives to maintain their production through investment in a variety of techniques and equipment which could keep the wells flowing longer.

The question of decontrol vs. NGPA is of course of direct importance to the U.S.'s foreign natural gas suppliers which last year provided 5% of total U.S. supplies, 90% of it from Canada and the rest from Mexico and Algeria. U.S. imports account for about 20% of international gas trade. The current border price from the two neighboring countries is $4.94/MM Btu. This is substantially higher than the delivered price of domestic gas in all markets where Canadian and Mexican gas are sold. Thus, the availability of the NGPA price cushion to U.S. importers clearly makes this gas more attractive than it would be without it.

But even with the cushion, only 55% of the 1.4 tcf of Canadian gas authorized for export was actually taken by U.S. importers last year. Yet, Canadian companies have already requested increases in export authorization to 2.4 tcf for 1985. It is not at all clear where and whether they will be able to sell this additional gas. If the relative price of Canadian gas remains unchanged, they will clearly be unable to do so. Mexico may also have more gas available for the U.S. Thus, for the next 5 years at least the U.S. is likely to be offered potentially more foreign gas than it will be able to take.

To conclude, in the mid and late 1970's it was widely believed that the U.S. gas market had entered an irreversible decline phase. This belief has now turned out to be wrong or at least premature. The decline in both output and demand has been halted and we are likely to see a modest increase over the next few years. If during this period gas prices should be fully decontrolled the market will, on the whole, function more efficiently than under the existing price control legislation. However, some gas producers, transporters, distributors and consumers are clearly better off under the existing legislation. This is the essence of the U.S. gas controversy.