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MEXICAN GAS: THE NORTHERN CONNECTION

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Energy is a relatively new and potentially fundamental element in U.S.-Mexican relations. For the United States, on the one hand, energy remains a gnawing, unrelenting problem. By mid-1978, the United States was in its fifth year of the energy crisis but still without a domestic policy. For the new administration in Washington, this fact represented, as The Economist put it, "a major setback for Mr. Carter, who made energy legislation the centre piece of his efforts at home this year."[1] In the absence of a domestic energy policy, foreign oil imports soared, reaching 47 percent of total oil consumption in 1977 (up from 36 percent just four years earlier) and precipitating an unprecedented balance-of-payments deficit. More and more of this oil came from potentially insecure Arab OPEC (Organization of Petroleum Exporting Countries) sources.

For Mexico, on the other hand, energy suddenly became a potential solution to its serious economic and political difficulties. In the middle of 1976, Mexico was embroiled in its worst economic and--judging from fleeting rumors of a coup--political crisis in recent history. By the end of 1977, after one year of the new administration in Mexico City, the country had made what most international observers characterized as "important progress" toward economic and political stability.[2] The reason, at least in part, was the discovery of enormous new oil and gas reserves in the Chiapas-Tabasco region of southeastern Mexico.

The principal market for this oil and gas, if economic considerations alone prevail, is the United States. From the U.S. point of view, Mexico is a relatively secure, non-OPEC source of foreign energy. And the United States, regardless of the course of its domestic energy politics, will remain heavily dependent on foreign imports for at least another decade.

Economic considerations alone, however, do not always prevail--at least not in the narrow sense of the term "economic." Energy is a profoundly political concern, and domestic issues on both sides of the border (as well as a host of international issues that are not directly energy-related) shape and condition policies and their outcomes. The initial phase of Mexico's "northern connection" well illustrates the continuing importance of this proposition.

The first step in the potential U.S.-Mexican energy connection was the proposed export of Mexican natural gas to the U.S. border via an 800-mile pipeline from Chiapas. This issue broke on the U.S. and

Mexican domestic scenes at a particularly critical and perhaps inopportune time. The United States was in the midst of a continuing and increasingly frustrating energy debate. Natural gas had suddenly taken center stage as a key tactical issue in the Congressional conference committee's consideration of a final compromise on a national energy bill. As the New York Times pointed out in December 1977,[3] the question of natural gas prices "is the pivot of the whole energy package. If a successful compromise can be struck on gas, then it appears likely that the Congressional conferees could quickly resolve their differences on the other major question outstanding."

So it appeared in December 1977. At that moment a letter of intent, signed by the Mexican Government and six U.S. gas-transmission companies, to import Mexican gas at a price of $2.60 per thousand cubic feet (Mcf) was due to expire. The U.S. Government had yet to approve the sale. The Mexican price was pegged to world oil prices on the U.S. East Coast and was substantially above both the ceiling on natural-gas prices recommended in the Administration's energy proposals and the price of natural gas then imported from Canada. Not surprisingly, the Mexican gas connection got caught in the cross fire of the debate on U.S. natural gas and broader energy issues. At the same time, the Mexican authorities and especially the officials of the state-owned petroleum company, PEMEX, were banking (literally as well as figuratively) on Mexican energy resources priced at world levels to revive the Mexican economy and to restore the country's credit worthiness on world financial markets--a critical factor in Mexico's future development plans. So eager were they to initiate action that they began construction of the gas pipeline even before a final arrangement on price had been reached with the U.S. Government.

The story is, however, even more complicated than the above fragments suggest. The history of the petroleum development in Mexico, long-standing aspects of the Mexican developmental crisis, the tangled web of U.S.-Mexican relations, the structure of U.S. banking and business interests in Mexico, and certain particularistic features of the gas-export project (known in Mexico as the gasoducto) are all involved. Although we shall not attempt a comprehensive airing of all of these factors, it should be borne in mind that all are relevant to an understanding of the significance of the northern connection for Mexico, for the United States, and for the relations between the two countries.[4]

The U.S. Energy Scene

Oil and gas currently supply 75 percent of U.S. energy consumption, up from 56 percent in 1950. The use of oil and gas increased as real energy costs in the United States declined from 1950 to 1970--principally because of the price regulation of natural gas and the declining real prices for oil imports.[5] For various reasons, summarized below by Richard Mancke, natural-gas consumption grew more rapidly than oil consumption, rising from 12 percent of the total in 1945 to 33 percent in 1972:

> The key to this Cinderella transformation was the steep reduction in the delivered price of natural gas because large new pipelines allowed even larger reductions in gas transmission costs. In addition to transportation economies, the switch to gas has been accelerated because relative to its principal competitors--coal and crude oil--its wellhead price was low, and it is an especially desirable fuel for processes where clean combustion is desirable.[6]

Moreover, beginning in the 1950's, Supreme Court decisions forced the Federal Power Commission to regulate the wellhead price of natural gas shipped in interstate markets. This policy reinforced the price advantage of natural gas over other fuels in interstate markets, but also created an interstate market in which gas remained unregulated. As the price disparity between these two markets widened with the dramatic energy price increases of the 1970's, more and more gas was diverted to unregulated markets, creating curtailments of supply in interstate pipelines.

Low prices and dual markets encouraged the use of natural gas for less essential purposes (such as boiler fuel in industry, and electricity production by utilities) and attracted industrial users to intrastate markets, where producers preferred to sell at unregulated prices.[7] Today, almost 60 percent of all natural gas is consumed by industry and utilities, although other fuels could be substituted in most cases--the exceptions being natural gas for agriculture, fertilizer and other petrochemical feedstock. The other 40 percent is consumed in residential and commercial heating, where in the short run conversion to oil or other fuels is impractical.[8] A large number of the residential and commercial users reside in the Northeast and Midwest and are supplied by interstate pipelines. Since federal regulations give priority of pipeline supplies to homes, hospitals, and schools, curtailments in interstate pipelines affect the industrial consumers in these regions, and put them at an economic disadvantage compared with their more fortunate counterparts in gas-producing states. If the curtailments are severe enough, schools, offices, and even homes may be threatened, as, for example, when some schools and commercial offices were closed during the gas shortages in the winter of 1976-77. Many of the bread-and-butter aspects of natural-gas politics in the United States can be understood in terms of these regional differences.

Oil in the United States is used predominantly for transportation; in 1976 this sector accounted for 54 percent of all oil consumed. Forty percent alone went for motor gasoline, the consumption of which has in fact increased since 1973 (from 6.7 to 7.2 million barrels per day). Though transportation uses could be reduced by eliminating nonessential travel (car pooling, mass transportation, etc.), there are no short- or medium-term substitutes for gasoline.[9] Moreover, another 20 percent of oil consumption goes for home heating, where oil is also nonsubstitutable in the short term. Thus the greatest flexibility in both oil and gas

consumption lies in the industrial and utility sectors. Even here, however, the prospects for rapid conversion to coal or nuclear power (as foreseen in the Carter Administration's energy plan) are constrained by financial as well as by environmental requirements.[10]

Given the increased consumption of oil and gas and the relative inflexibility of demand, what are the prospects for increased oil and gas production in the United States? Overall U.S. energy production has declined since 1972. Domestic oil production peaked in 1970 and natural-gas production in 1973. From 9.6 million barrels per day in 1970, oil production plummeted to 8.1 million barrels in 1976. Between 1973 and 1976, natural-gas production dropped from 22.6 to 19.9 trillion cubic feet. In 1977 the downward trends were modified. Oil production increased slightly to 8.2 million barrels per day, largely owing to the new influx of Alaskan oil. Gas production was roughly equal to 1976 levels.

Whether these trends could be further reversed, at least in the the short and medium run, by higher prices paid at the wellhead continues to be debated. Suffice it to note here that from 1973 to 1976 average wellhead prices for crude oil in the United States increased by two-thirds, from $4.68 per barrel to $7.78 per barrel in current 1975 dollars. Similarly, from 1973 to 1975 wellhead prices for natural gas increased by more than two-thirds, from $0.26 to $0.445 per Mcf in current dollars. Partial deregulation in 1976 further tripled the wellhead price to $1.42 Mcf in current dollars. Despite these increases, oil and gas production have not risen.[11]

In the absence of domestic increases, oil imports have skyrocketed and gas imports have reached a critical stage, with several large and, in the case of liquified natural gas, long-term import commitments pending decision in the near future. Table 1 shows increases in U.S. oil imports (crude and product) from 1970 to 1977. Not only have these imports more than doubled, averaging 47 percent of total oil consumption in 1977, but more than two-thirds of the total now comes from OPEC sources (compared with less than one-half in 1973), and over one-third comes from the least secure sources, namely Arab OPEC (compared with 14.6 percent in 1973). The increasing dependence on OPEC suppliers reflects both an overall increase in demand and reduction in imports from America's two traditional oil suppliers, Canada and Venezuela. As Table 2 shows, Canadian petroleum exports to the United States have declined since 1973 from 1.3 million to 514 thousand barrels per day, while Venezuelan exports have dropped from 1.6 million to 912 thousand barrels per day. In contrast, imports from the OPEC states of Nigeria and Saudi Arabia have nearly doubled (from 600-750 thousand to 1.2-1.5 million barrels per day), while imports have grown at similar rates tough on a smaller base from other OPEC states (principally Algeria, Libya, Indonesia, U.A.E. and Iran). The sharp increases in imports in 1976 and 1977 suggest the accelerating

import dependence faced by the United States as economic conditions returned to "normal" and domestic energy policies continued to drift.[12]

TABLE 1

U.S. OIL IMPORTS

	Total Imports (mbbl/d)	Imports (% of Demand)	OPEC Imports[a] (% of Total Imports)	OAPEC Imports[a] (% of Total Imports)
1970	3.4	23.3	37.8	5.7
1971	3.9	25.8	43.2	8.9
1972	4.7	29.0	43.6	11.2
1973	6.3	36.1	47.6	14.6
1974	6.1	36.8	53.3	12.2
1975	6.0	36.8	59.5	22.9
1976	7.3	42.0	67.2	32.1
1977[b]	8.7	47.0	70.3	35.4

SOURCE: FEA, Energy in Focus: Basic Data, May 1977, p. 6.

[a]Excludes indirect imports. See Table 2.

[b]1977 data from Monthly Energy Review, Washington, D.C., May 1978, pp. 12, 14-15.

Gas imports have remained constant since 1973 at around 1 trillion cubic feet per year, less than 5 percent of total domestic consumption. If pricing and other factors continue to favor the use of natural gas, however, these imports could increase sharply in the future. Canada has supplied most of the U.S. natural-gas imports in the past but is unlikely to increase and will probably reduce these amounts in the future, in line with its general energy-conservation policies. Additional supplies are expected to come from the Alaskan fields, totaling about 0.8 trillion cubic feet per year,[13] and from several large imports of liquefied natural gas (LNG), averaging some 2 trillion cubic feet per year. None of these projects is due for completion before 1985, and all current LNG projects originate in OPEC countries--Algeria, Indonesia and Iran. If approved, these projects alone could account for 20 percent or more of U.S. gas needs by 1985.[14]

A new factor in the picture of the short-term U.S. oil and gas requirements is the prospect of vastly increased oil and gas exports from Mexico, a non-OPEC country and bordering neighbor of the United

TABLE 2

U.S. PETROLEUM IMPORTS BY SOURCE
(Thousands of barrels per day averages)

	1973	1974	1975	1976	1977
OPEC					
Algeria	151.2	207.1	288.2	438.3	564.2
Indonesia	237.7	340.9	437.7	569.4	570.3
Iran	433.7	731.0	524.8	546.5	786.4
Libya	308.3	40.3	329.3	529.3	838.0
Nigeria	607.9	912.2	837.8	1,119.2	1,229.7
Saudi Arabia	740.3	675.2	891.6	1,365.8	1,523.8
U.A.E.	83.6	87.8	154.2	323.3	446.4
Venezuela	1,633.7	1,457.8	1,030.1	972.2	911.6
Other OPEC[a]	194.5	217.0	259.3	216.0	378.1
NON-OPEC					
Canada	1,312.9	1,067.6	845.2	599.3	513.9

SOURCE: Monthly Energy Review, Washington, D.C., May 1978, pp. 14-15.

[a]Includes Ecuador, Gabon, Iraq, Kuwait, and Qatar.

Note: Includes direct and indirect imports. Indirect imports refer to U.S. imports of petroleum products, primarily from Caribbean and European areas, that have been refined from crude oil produced in other areas. U.S. imports of these products have been prorated to each OPEC country of origin, based on the share of total crude oil supply in the Caribbean and European areas that was imported from each OPEC country.

States. If Mexican production plans are realized and U.S. markets become the principal recipient of enhanced production, gas exports to the United States could total 0.8 trillion cubic feet per year by 1982 (or the equivalent of gas deliveries from Alaska not expected until 1985). Additionally, oil exports could run as high as 1.1 million barrels per day by 1982 (or, according to recent Mexican announcements, by 1980)--i.e., about one-ninth of current U.S. oil import needs and one-sixth of these needs in 1985 as projected by the Carter Administration's extremely optimistic energy plan. Although these amounts will not provide a one-shot solution to this country's energy problems, they do suggest the enormous opportunities offered by the Mexican connection.

The Mexican Energy Scene

Mexican petroleum has a long history of conflict, and from an early stage this history has involved the United States. While Porfirio Díaz and his científicos reigned supreme in the late nineteenth and early twentieth centuries, significant exploration and drilling were already taking place. Commercial exploitation began in 1901 when over ten thousand barrels were produced in the state of San Luís Potosí. Mexican oil production was at first controlled primarily by British interests, but after the First World War U.S. interests became predominant. Even during the tumultuous years of the Mexican revolution, production kept increasing. When the Mexican Constitution was signed in 1917--with its famous Article 27 assuring state control of mineral and subsoil resources--production had already risen to over 125,000 barrels per day, most of which was exported to the United States.

During this same period, of course, the United States was making impressive gains in petroleum production. But demand was rising so rapidly north of the border--and so slowly south of the border--that by the early 1920's Mexico was the world's largest exporter of crude oil. Not surprisingly, given the geography and the involvement of U.S. oil companies in Mexican production, the majority of these exports went to the United States.

The relationship had never been an easy one, however, at least not since the Mexican revolution.[15] Production declined in the 1920's, and throughout the early 1930's recurrent tensions arose between the Mexican Government and Mexican workers, on the one hand, and the North American oil companies on the other. In 1937 these conflicts came to a head: Mexican oil workers struck for better wages and working conditions, and the Mexican Government under President Lázaro Cárdenas--rallying a very broadly based coalition under the banners of Mexican nationalism and subsoil rights--moved into the confrontation, finally nationalizing the industry on March 18, 1938. PEMEX, Petróleos Mexicanos, was born, the Mexicans were--or so it seemed--the owners of their oil, and the United States was inhibited from full retaliation by the pending struggle with the Axis and by various normative and political constraints deriving from President Roosevelt's Good Neighbor Policy. (Accustomed as we now are to nationalization of subsoil resources, the audacity of the Mexican action in the late 1930's should not pass unnoticed. Until that time, only the Soviet Union had nationalized its total hydrocarbon resources.)

Boycotted by the oil multinationals, PEMEX began a vigorous program of export to the Axis countries. The transatlantic connection was, however, short lived. Under pressure from the U.S. Government, a compensation formula was worked out; Mexico sided with the Allies, profited greatly from wartime demand for her products, and moved quickly into that stage of rapid aggregate industrial development known somewhat misleadingly as the "Mexican miracle."

Throughout the years of the greatest industrial, commercial, and agrarian expansion, Mexican petroleum production always managed to stay ahead of consumption. Despite low domestic prices for oil (which encouraged its substitution for other fuels) and a cautious policy in oil exploration and development, the curves of domestic supply and demand did not cross until 1968. At that point Mexican imports exceeded exports, a situation that persisted until late 1974.[17]

During the early 1970's, cracks also began to appear in the Mexican developmental model. By the mid-1970's Mexico was a nation in which long-standing social conflicts were intensifying, domestic and international confidence were declining, and the overall legitimacy of the complex set of compromisos holding the state and civil society together were in danger of crumbling. World inflationary and recessionary pressures were buffeting an already shaky economy and peso, aggregate growth was precipitously down from its historic average of about 6 percent, inflation was rising, and the IMF was negotiating a classic austerity package with the beleaguered Echeverría Government.[18]

The growth of this beleaguerement was nowhere more evident than in the statistics on the external public debt. In 1973 the total debt stood at about 6.5 billion dollars. One year later it was over 10 billion, rising steadily over the next two years to about 20 billion. In addition, the terms under which Mexico was borrowing abroad hardened considerably during this period, with shorter maturity for loans and interest levels at the higher end of the market. When President López Portillo took office at the end of 1976, the then outstanding total of debt service that he faced in the first five years of his term (1977-81) amounted to 19 billion dollars in loan amortization and interest payments. Equally formidable was the debt-service ratio, which had climbed steadily from 20 percent in 1974 to 34 percent by the end of 1976.[19]

It was in this general context that the final shocks of the Echeverría Administration hit:

> On August 31, 1976, in a move that caught many by surprise though it had been talked about for many years, the peso was devalued for the first time in 22 years. With the peso floating "like a stone" (according to a phrase often and bitterly repeated in Mexico City and elsewhere), multiple reactions and even panic ensued. While Mexican and foreign dailies headlined "turmoil," "hysteria," and "crisis," as much as four billion dollars fled the country seeking safe harbor in Texas banks and elsewhere. Investment slowed down, inflation accelerated, unemployment rose, and the whole complex set of mechanisms by which devaluation and resultant dislocations and hardships are passed disproportionately on to the poorer sectors of society came into play. Twelve days before leaving office, when Echeverría expropriated tens of thousands of acres

> of prime land in the northern state of Sonora and turned them over as small parcels to peasants, talk of a military coup was heard for the first time in recent memory.[20]

Onto this scene strode President López Portillo, holding an olive branch extended to both national and international critics of Echeverría in one hand, and a hydrocarbon ace in the other. From the first cautious mentions of Mexico's oil wealth in his inaugural address to the buoyant suggestion eleven months later that Mexico's hydrocarbon reserves might total 120 billion barrels, there was a steady campaign both at home and abroad to use the oil and gas to restore confidence in Mexico's future.[21]

In fact, spurred by rising imports and upward pressure on domestic prices, PEMEX professionals had already been moving for a number of years toward changes in Mexico's cautious exploration and development policies. Renewed exploration efforts undertaken during the Echeverría presidency had resulted in an increase in Mexico's proven petroleum reserves from 5.5 billion barrels at the end of 1973 to over 11 billion barrels by the time of López Portillo's inauguration. But it was the new president who came out of the closet, so to speak, with an aggressive campaign to tout Mexico's petroleum possibilities.[22]

Judging from the record of his first year in office, the official campaign was strikingly successful. In a matter of weeks after his inauguration, the word in international financial circles was that Mexico seemed to be back on the right track again. Credit eased--even though the real import earnings from oil were still years away--and in the fall of 1977, when the United States of Mexico (the central government) went in search of a 1.2-billion-dollar international loan, it was quickly oversubscribed--an unimaginable outcome except in the context of the predicted petroleum bonanza.[23]

The decision to push petroleum development and export was necessarily reflected in the new administration's initial programmatic announcements. By the end of January 1977, PEMEX had released a series of plans and budgets designed to make Mexico a major producer and exporter of hydrocarbons before López Portillo's six-year term was out. Based on a 15.5-billion-dollar budget for new capital investments for 1977-82, the program called for boosting oil production from less than 1 million to over 2.25 million barrels a day, increasing exports more than six-fold to include one-half of total production, and tripling petrochemical output through the building of 66 new plants. At the then current prices, the export of crude and refined products alone was projected to earn almost 21 billion dollars, more than enough to cover all the capital investments planned.[24]

The Gasoducto

At the outset, PEMEX was relatively silent on the role to be played by natural gas, aside from its clear place as a feedstock in the soon-to-be-expanded petrochemical industry. Yet as oil exploration and development moved ahead, key decisions about the uses to which the natural gas would be put could not be avoided. The main reasons were geological: the newly mapped Reforma (Chiapas-Tabasco) fields, the main source of supply causing the dramatic jump in proven reserves, promised or threatened to produce much more gas than Mexico could use domestically as either a fuel or a feedstock for petrochemicals, and more than could be pumped back into the ground to maintain pressure in the wells.[25] Gas-oil ratios in some wells were running as high as 6 to 7 thousand cubic feet per barrel of oil (cu. ft./bbl.), with an average of about 1,300. Originally, small surpluses were simply flared (burned off), but early in the year a massive export program for the additional gas came under consideration.

Natural gas, unlike oil, is not an easily stored or transported product. Either it must move overland through pipelines, or it must be liquefied by supercooling (condensing in volume by a factor of 600) and then shipped in specially constructed tankers. In the latter case, it must be regassified on arrival, once more to move through pipelines to its final destination. This liquefaction and regassification process is costly, potentially dangerous, and generally considered a process of last resort by producers and consumers alike.

In many cases (Algeria and Indonesia being prime examples), the decision to export natural gas automatically implies a decision to install liquefication plants. Geography and markets allow no other alternative. But in the case of Mexico, all roads lead "naturally" to the United States. Just as an export program was seen as essential, so a pipeline directly from the Reforma fields to the Texas border was seen as the only reasonable means of transport. The PEMEX case seemed compelling.

First there was a series of arguments, foreshadowed in the above discussion, about the lack of alternative uses for the gas. Even after an expanded petrochemical industry had been fed, all foreseeable domestic needs supplied, and thousands of gallons pumped back into the ground to maintain the productivity of the fields, large quantities of gas would still be left over. The only way to prevent such large gas surpluses would be to curtail oil production drastically--clearly not an acceptable alternative. Flaring the surplus gas was a blatant waste of the national patrimony. It had to be captured and exported.[26]

At this point, the economic case for exporting this gas to the United States moved to center stage: to install the liquefaction plants necessary to ship the projected quantities of surplus gas to overseas markets would cost between 7 and 8 billion dollars. Even if it were possible to raise capital in these amounts, the date of

first exports would be delayed and earnings per 1,000 cubic feet of gas (Mcf) would be cut from approximately $2.20 (via pipeline) to 27 cents (LNG transactions with Europe). In other words, the same amount of gas exported as LNG would earn only about 12 percent as much as it would if exported via pipeline, according to these calculations.[27] These dramatic figures in favor of pipeline export were based of course on the expectation that a $2.60 per Mcf price could be negotiated with the United States. But even at a lower price, the financial advantage of export via pipeline was seen to be immense.

But the economic arguments in favor of the pipeline became even more compelling when viewed in more detail. At an estimated cost of 1.5 billion dollars and a building time of 24 months, the pipeline would begin to earn foreign exchange at the rate of 3.3 million dollars a day at the outset.[28] In effect, during the first year of operation the pipeline would bring in 1 billion dollars, a figure that would increase each year up to a maximum of 5.2 million dollars a day when the pipeline reached full capacity. In less than two years the pipeline would have more than paid for itself, and the foreign exchange earned over its first six years would top 10 billion dollars. As a potential contributor to Mexico's balance of payments, the pipeline seemed foolproof. As a project on which foreign private and public banks might wish to lend, it could hardly have been more attractive. Few projects promise to generate a stream of foreign earnings equal to their total cost in as short a period as the first 18 months of their active life.[29]

Although nationalistic voices were raised in Mexico against such a clear physical link with the United States, and although charges of "dependence" and "we will be at the mercy of the gringos" were heard in some forums, the momentum and power--both economic and political--of the PEMEX case (particularly in the context of the indebtedness and economic fragility mentioned earlier) seemed overwhelming. Thus, on October 7, 1977, construction was begun on the southernmost section of the gasoducto.[30] As of that date, no pricing agreement had been reached with the United States, no final route to the border had been set, and much of the financing was still under negotiation. But the Mexican Government was so anxious to begin the gasoducto, and so sure a satisfactory pricing agreement could be obtained and all the necessary financing would be forthcoming, that the order was given to begin construction.

Alliances: Markets, Technology, Capital and Price

To begin construction at that point was not as reckless or precipitous an act as it might seem at first glance. On the contrary, it made good sense, given the strength of the international alliance of oil exploration and development firms, gas-transmission companies, capital-goods suppliers, bankers, and Mexican interests al favor del gasoducto that had by that time been forged. Although some imperfections in the alliance remained, and although critical voices both north and south of the border were still to be heard, the interests pushing the pipeline were impressive in their weight and coherence.

To understand this alliance, it is necessary to go back at least as far as the first days of the López Portillo Administration, that is, to the beginning of 1977.[31] The tumult of the inauguration was hardly over when PEMEX contracted the Dallas mineral-evaluation firm of DeGolyer and MacNaughten to cooperate in both the verification of recent Mexican hydrocarbon finds and the elaboration of development and export plans for the Mexican petroleum industry. It was a shrewd and in one sense a daring move. Shrewd, because DeGolyer and MacNaughten is world famous and respected in its specialty and thus highly credible to many who might otherwise take PEMEX's data with more than a grain of salt.[32] Daring, because to call in a U.S. firm to play such a prominent, early role in the most sensitive of all Mexican industries risked incurring the wrath of local nationalists--as well as the wrath of various opponents of the López Portillo Administration. But the gamble clearly paid off, for not only were few voices raised in protest at home, but the claim that Mexico now possessed new increments of proven reserves and very high levels of probable and potential reserves was almost everywhere and immediately accepted as honest--within the limits of probability that always attach to such estimates.

DeGolyer and MacNaughten was, however, only the advance guard of a small legion of U.S. firms that were soon to beat a path to Mexico City and PEMEX's door. The exact number of hydrocarbon pilgrims to Mexico City--and conversely, PEMEX pilgrims to Texas--during 1977 is known only to certain Mexican officials, but the contacts were extensive. For example, between February and July the president and high officials of Tennessee Gas Transmission (also known as Tenneco InterAmerica Inc.) met the top officials of PEMEX, including Díaz Serrano, no fewer than ten times (usually for two to three days) in Houston or Mexico City. It was during this period that the main outlines of the natural-gas deal with the United States were sketched out. On August 2 and 3, the representatives of all six U.S. gas-transmission companies involved met PEMEX in Mexico to sign the Memorandum of Intentions, which formalized the understanding that had already been reached, including a mutually agreed-upon purchase price of $2.60 per Mcf.

Needless to say, a marketing agreement, however firm, is only one small aspect of an undertaking as mammoth and potentially important as the gasoducto. The design and engineering of the project loomed large from the very beginning. DeGolyer and MacNaughten cooperated continuously with PEMEX on all phases of this, and Tenneco InterAmerica also prepared an extensive study for PEMEX, which covered everything from routing to technological requirements.[34] Multiple consultants and potential bidders were called in. One U.S. firm even went so far as to suggest that much of the pipeline ought to be laid offshore in shallow water--hardly a disinterested suggestion since this firm is a world leader in the relevant technology. The offshore argument was that, although the pipeline would be more expensive at the construction stage, it would be finished more rapidly and thus begin to earn foreign exchange earlier.

By the middle of 1977, despite still unresolved questions and details, the plans for the construction of the pipeline had taken shape. It was to be a 48-inch line, beginning in the oil town of Cactus in the state of Chiapas and running northward, roughly parallel to the Gulf Coast, some 800 miles, to the city of Reynosa, just south of the Texas border. Initially planned with four compressor stations, it would have a first-year capacity of 1.3 billion cubic feet of gas per day, almost doubling in the next six years as more gas became available and more compressors were added. In the absence of a pricing agreement with the United States, the final route of the gasoducto was announced only to the northern town of San Fernando, from which a spur would link it with an existing east-west pipeline serving the large northern Mexico industrial city of Monterrey. At this point, the spur was largely a bone thrown to nationalist sentiment, for the overall design of the main line made it clear that the gasoducto was primarily an export facility, not an addition to the existing national gas-transmission system.[35]

Although the pipeline does not cross particularly difficult terrain and although climatic conditions are not particularly harsh, the scale of the entire undertaking and the technology involved are impressive. The largest-diameter gas-transmission line now existing in the United States is 42 inches. In fact, until 1977, no steel mill in the United States could even produce 48-inch pipe. (The 48-inch pipe used in the Alaska oil pipeline was all imported--the gasoducto will require approximately 700,000 tons of pipe.) A length or "joint" of big pipe is 36 feet, and at times two joints are welded together before being laid. Obviously very heavy equipment is required to handle such operations. About 125 miles of the route cross swampy land. There the pipe must be blanketed in concrete so that it will not float on surface water, since natural gas, unlike crude oil, adds very little to the weight of the hollow pipe. The compressor stations needed to maintain line pressure are run by large gas turbines, and much additional equipment and technology are required to remove the sulfur (called "sweetening") and the liquids from the gas before it is pumped into the pipeline.[36]

Besides the pipe, capital goods, and technology that must be imported into Mexico to build the pipeline, a significant degree of expertise is called for. Although by law PEMEX must use Mexican contractors for the actual construction process, joint ventures and service agreements with foreign firms are permitted.[37] Fresh from the rigors and experience of building the Alaska pipeline and tied by geography and history to the large Mexican construction firms, it is thus not surprising that North American firms were the primary if not the only foreign associates involved in the initial stages of pipeline engineering and construction. In fact, early in the design phase, Tenneco InterAmerica signed an engineering service contract with PEMEX, and each Mexican construction firm to secure a piece of the action has associated itself with a North American firm. Overall engineering, testing, and management are in the hands of a joint venture named BICA, comprised

of a large Mexican construction firm, ICA, in association with the Bechtel Corporation.

If Mexico could not go it alone on the capital goods, technology, and know-how required to build the pipeline, the need for foreign assistance in financing the project was even more obvious. When construction was actually begun in October 1977, 1.5 billion dollars was the planning figure used as an estimate of total costs. Earlier in the year, however, when the capital requirements had been estimated at only 1 billion dollars, it had looked as if even this lower amount might be difficult to assemble. With international leaders still very cautious, with the IMF 1977 "additional borrowing" ceiling for Mexico set at 3 billion dollars, and with PEMEX's pricing strategy still uncrystallized--or at least unpublicized--the total financial package looked very uncertain.

Soon, however, the climate began to change. The leading factor was clearly the general restoration of confidence in the Mexican economy, referred to earlier. But also important was the rapidly changing perception of the economics of the pipeline itself. By deciding to price gas at the BTU equivalent of No. 2 fuel oil, off-loaded in New York (approximately $2.60 per 1000 cu. ft. at the time the decision was announced), PEMEX in effect added the necessary sweetening to a deal that was already looking good.[38] As noted earlier, at this price the pipeline would pay for itself in dollars in less than two years, even allowing for cost overruns in construction. From the perspective of international lenders, it had become in the words of one banker, "an absolutely golden deal."

By the middle of the year, the IMF borrowing limits on Mexico seemed to be the only remaining major obstacle. Although Mexico had the right (and might have been willing) to use up to one-half of its three-billion-dollar additional borrowing allotment to finance the pipeline, this would clearly have meant that other projects would have had to be displaced--a difficult although not impossible set of decisions. But while these decisions still loomed as a possibility, alternative schemes, bypassing the IMF limits, were also under consideration. The most serious and ingenious--although hardly new--was for the gas-transmission companies themselves to prepay for some percentage of the gas that they would be receiving several years later. This would be entered into the Mexican national accounts as export earnings, not as debt, and thus would technically fall outside the IMF borrowing limits. Using these prepayments, PEMEX could then finance the construction of the gasoducto--an effective way of putting the cart before the horse. Because the gas-transmission companies would themselves have to borrow the money for the prepayments, the overall cost to the Mexican Government might have been slightly higher than in the case of a direct loan. But so determined was the Mexican Government to build the line, so anxious were the companies to get the gas, and so willing were the banks to lend, that this alternative financing device was considered very seriously.

But as the summer heat eased in Mexico City, Chiapas, New York, Washington, and Texas, it became evident that no such strategy would be necessary. The IMF, as one informant said, "waved its magic wand," allowing the pipeline financing to be arranged outside the framework of the 3-billion-dollar ceiling. Quite apart from the multiple and mutually reinforcing signals that they were getting at that time from interested parties, it would have been inconsistent for officials at the IMF not to have done so. The gasoducto was golden from their point of view too. It was export-oriented, offered quick foreign exchange returns, clearly could be considered sound fiscal management, did not add inflationary pressures internally, and even promised to generate some jobs without swelling the public payrolls.[39]

Price, Politics, and the Standoff

Although the U.S. Government had still not accepted the Mexican price of $2.60 per Mcf for the gas, as the summer of 1977 drew to a close this appeared to be the only remaining problem. With the private banks lining up to lend, the IMF smiling on the project, and private construction firms and manufacturers gearing up to supply needed goods and services, only one major piece of the financial package remained to be put in place: U.S. Government funding in support of those capital goods and services that would be purchased in the United States.[40] This funding was announced shortly thereafter. In August, the Export-Import Bank reported that it had negotiated two credits with PEMEX. The first was for 250 million dollars to be used for projects in three general categories: exploration and development, refinery improvement and expansion, and natural-gas processing and petrochemical production. The Eximbank estimates were that this quarter-of-a-billion-dollar credit would provide the core financing for almost 600 million dollars of PEMEX purchases in the United States over the next 18 months. Repayments on the loan would not begin until 1983; and the annual interest rate would be 8 1/2 percent.

It was the second part of the Eximbank-PEMEX package, however, that was central to the gasoducto. Excerpts from the Eximbank's letter of intent to the U.S. Senate outline the loan and its rationale clearly.

> Eximbank is prepared to extend a direct credit of $340,000,000 to Petroleos Mexicanos (Pemex) to assist Pemex in financing the acquisition in the United States and exportation to Mexico of goods and services, all of United States manufacture or origin required by Pemex in connection with the construction of an 840-mile gas pipeline.
>
> It is expected that the total cost of U.S. goods and services to be supplied to the project will be approximately $400,000,000, of which 85% will be covered by the proposed Eximbank credit and 15% will be provided by Pemex in the form of a cash payment.

> It is expected that the type of goods which U.S. companies will be exporting will include larger diameter pipe, valves, meters, large compression equipment and chemical process equipment. In addition, U.S. companies are expected to provide certain technical services, such as engineering design and equipment procurement for the sweetener and natural gas liquids recovery plants. . . .
>
> It is anticipated that suppliers in most of the industrial countries will be submitting bids for the sale of goods and services for the project. Many if not all of such suppliers will be receiving strong support from the official export credit agencies in their countries. Eximbank has received information that the official credit agencies of Canada, Japan and the United Kingdom are willing to provide 85% coverage for the same term as Eximbank is proposing, in certain cases with interest rates lower than the Eximbank rate. . . .
>
> The proposed transaction offers substantial benefits to the United States because of the expected flow of gas through the pipeline to U.S. gas transmission companies for distribution to U.S. customers. . . .
>
> In view of the magnitude of the transaction, the repayment term, the existence of foreign competition and the benefit to the U.S. from the increased gas supply, Eximbank's credit is necessary to secure this sale for United States suppliers.[42]

The course of transnational relations, however, like the course of young love, never runs entirely smooth. The hitch in the "golden deal" turned out to be, not surprisingly, the gas-pricing arrangement sought by the Mexican Government. From the point of view of the banks, the gas-transmission companies, the U.S. suppliers of goods and services--not to mention PEMEX--there was unanimity on pricing: the BTU equivalent of No. 2 fuel oil in New York, or approximately $2.60 per Mcf. PEMEX's interest in this price was obvious. Almost equally so were the interests of everyone else mentioned so far. The larger the amount of foreign exchange earned by Mexico with the gasoducto, the more easily loans would be repaid, and the more surplus would be available for yet more purchases in the United States, and the more the promise of restored Mexican economic health would become a reality.[43] Even gas producers in the United States were not unhappy with the high price. On the contrary, it provided one more argument for the deregulation of domestic gas. "How can you justify holding our prices down," they could tell the U.S. Government, "when you are willing to let foreign gas enter at such high levels?"[44]

Although from the outset there had been rumblings from the U.S. Government on the projected price of Mexican gas, the first major flap was precipitated in the Congress, not in the executive branch.[45] A month after the Eximbank presented its two PEMEX loans to Congress, Senator Adlai Stevenson of Illinois, the head of the Senate subcommittee with oversight responsibilities, introduced the following concurrent resolution (excerpts):

> Whereas, the price currently being proposed for U.S. imports of Mexican natural gas to be delivered from the proposed pipeline is significantly greater than prices prevailing for current non-liquefied imports of natural gas and prices permitted for domestically-produced natural gas; . . . Whereas financing by the Export-Import Bank of the United States of the PEMEX natural gas project at such unreasonable prices for United States energy imports could set a dangerous precedent for prices of other U.S. energy imports--especially those that might be involved in other export financing by the Export-Import Bank; . . .
>
> Whereas, the American public has a right to be assured that financial resources of the United States are not used to develop and construct foreign energy projects that unwarrantedly increase the cost of U.S. energy imports; . . .
>
> Now, therefore, be it Resolved by the Senate (the House of Representatives concurring), That it is the sense of the Congress that the Export-Import Bank of the United States not provide financing to Petroleos Mexicanos (PEMEX) . . . unless and until it is established: . . . that the Secretary of Energy has approved the price at which such natural gas supplies may be imported into the U.S.; and . . . the Congress is assured of the reasonableness and fairness of such import prices in light of other prices currently prevailing for non-liquefied natural gas imports and prices permitted domestic producers of natural gas supplies within the United States.[46]

The reaction in Mexico City to the Stevenson resolution was predictable--nationalistic outrage that the gasoducto financing might be held up simply because Mexico was asking the OPEC price for gas. But the reactions in U.S. petroleum and banking circles were only slightly milder. Thus Mr. Jack H. Ray, the President of Tenneco InterAmerica wrote to Senator Stevenson in words that could only have been music to PEMEX's ears:

> It is generally agreed that the purpose of the United States Export-Import Bank is to foster U.S. exports by supplying credit to foreign customers on terms that match those available from other countries. The EXIM Bank is a successful profit-making government institution which paid a $50 million dividend into the U.S. Treasury last year. . . . Its success has been based on its nonpolitical nature and its adherence to good banking practices. There is no precedent whatsoever to support your suggestion that EXIM be used as an arm to regulate or negotiate energy prices. . . . Furthermore, the threat of removing EXIM credits really has no leverage toward obtaining lower prices for Mexican gas as PEMEX is not dependent on U.S. credit sources. The $600 million in goods and services can be obtained quite easily from other countries, with credit terms equal to those of EXIM Bank. At least five countries have offered total financing of the project. . . .

> As one of the largest gas transmission companies in the United States, we are working as hard as we can to obtain natural gas for our customers at competitive prices and help prevent crippling shortages such as occurred last winter. The large-scale importation of natural gas from Mexico is by far the most promising prospect we have to relieve those shortages and help our overall energy picture. Our negotiations with the PEMEX officials have been tough, and I assure you we have done our utmost to acquire gas at the best price. However, the Mexicans are well aware of the world price of energy and expect to get just that. In reality, it is politically unacceptable for them to accept anything less. Can you picture the President of Mexico announcing to the people that they must tighten their belts because he is going to sell off their natural resources to the United States at less than world prices and thus subsidize the U.S. economy? . . .[47]

Subsequently, other voices were joined to the chorus. In a lead editorial at the end of November, the Washington Post wrote:

> Mexico has large resources of gas and oil, and it makes altogether good sense for the U.S. government to lend the capital to develop them. Since the Eximbank's $340 million loan would support Mexico's purchase of some $400 million in U.S. equipment and services for this pipeline, there's every reason to go ahead with the project. What's a fair price for the gas? Mexico's wealth per capita is one-twelfth that of the United States, and Mexico is entitled to full market value. That means a price no less than that of oil.[48]

The Eximbank, caught between those applying multiple pressures to approve the loan on the one hand and on the other, impressive legislative and executive branch critics of the price Mexico was asking for the gas, had little room to maneuver in the short run.[49] The chairman of the Eximbank reassured Senator Stevenson that the matter of Eximbank credits would be further considered, and Senator Stevenson decided not to press for the adoption of his resolution "in the hopes that the two governments will resist the pressures of domestic politics and the temptations of short-term commercial considerations and make certain that their national interests are paramount."[50] This informal understanding put off the financing issue for several weeks while the Congress continued to wrangle over energy issues. With no resolution of this debate by the end of December, however, the Eximbank finally approved the credits.

In the short run, however, this approval made little difference, since the price negotiations between the U.S. and Mexican governments were not going well. For a brief period toward the end of November, the Departments of Energy and State thought that a compromise on price was within reach.[51] Since $2.16 per Mcf (the current price paid for

Canadian natural gas) was unacceptable to the Mexicans, a "face-saving" price of $2.60 was offered to be paid when the gas actually began to flow in quantity on the completion of the gasoducto. From the point of view of the Carter Administration, this pricing proposal had two great advantages. First, it postponed the paying of the $2.60 price until 1980 or perhaps even later when--given the expectation of higher prices for natural gas domestically--it would be more in line with other sources of supply. Second, and perhaps more important, it in effect untied the price of Mexican gas from OPEC oil prices since it was possible and in fact quite predictable that by 1980 the BTU equivalent of No. 2 fuel oil in New York would be significantly higher.

Although the details of the story are not entirely clear, it seems that the U.S. proposal was actively and positively considered by certain Mexican officials.[52] But what is not in doubt is that it was unacceptable to Díaz Serrano and López Portillo. Thus, despite a flurry of pre-Christmas activity, during which Díaz Serrano and Mexican Foreign Minister Santiago Roel came to Washington and saw Secretaries Schlesinger and Vance, the negotiations were broken off amidst a storm of Mexican criticism of the U.S. position, in part triggered by Secretary Schlesinger's rather impolitic statement that "soon or later" Mexico would have to sell its gas to the United States.[53] On December 22, President López Portillo ordered PEMEX not to renew the memorandum of intent that had been signed with the six American gas companies. Work was simultaneously stopped on the section of the gasoducto leading directly to the Texas border.[54] As the new year dawned, the golden deal was looking less viable than at any time since it had first hit the front pages almost a year previously.

With the gasoducto already under construction and the price negotiations suspended, the Mexican Government was in an embarrassing position. Having argued long and forcefully that Mexico would have to either flare or export the gas, PEMEX and the President now had to backtrack and say that it was both possible and correct to use the gas domestically. The gasoducto was thus quickly transformed into a pipeline to supply the northern industrial city of Monterrey (a secondary use that it would have had in any event), the volume of gas it would carry was reduced to 800 million cubic feet per day, and pipe and equipment imports were renegotiated to purchase as much as possible from non-U.S. sources.[55]

The contradictions of building a 48-inch pipeline to supply Monterrey with gas did not pass unnoticed by critics of the gasoducto. With a selling price of only 32 cents per Mcf domestically (one-eighth of the asked export price), the deal no longer looked particularly golden. As many critics pointed out, such a huge gasoducto to Monterrey would simply encourage the wasteful use of extremely low-price gas, amounting in effect to a continuing government subsidy to large industrial users.[56] It was claimed by some that the cost of transport would in fact exceed the selling price, thus undermining any rationale other than export for the gasoducto, despite the

nationalistic prose in which the project was being promoted. In the acerbic words of Heberto Castillo:

> How long will it take for the gasoducto to Monterrey to pay for itself if the selling price of the gas is seven cents lower than its transport costs? Is the gasoducto to Monterrey only so that we can lose money? Or is the idea to have a pipeline close to the United States?[57]

In response to the critics, PEMEX and the Mexican Government presented a case for bringing southern gas to northern Mexico even in the absence of immediate export possibilities. Among the advantages cited were the following:[58]

--Natural gas is to be preferred to oil as a fuel in most applications for both technical and environmental reasons. The gasoducto will enable Mexico to increase the proportion of natural gas in the national energy mix.

--Mexico badly needs a national gas-transmission network. (There is currently no north-south link.) The gasoducto will be the "spinal column" of that network.

--Large industrial energy consumers in the north can easily convert to natural gas from fuel oil. (Dual burning systems were originally installed in many locations.) Conversion will free large amounts of oil for export. Even though this is not high quality oil, with some further treatment it can be sold on international markets for about $11 a barrel. These additional export earnings will make the gasoducto profitable even if currently low domestic gas prices remain unchanged.

--The development and decentralization of industry, particularly along the Gulf Coast where the gasoducto will run, will be encouraged by the project.

--Large but widely dispersed fields of dry gas in the north, some of which are new discoveries and some of which are currently in use to supply northern Mexico, can be shut down once the gasoducto is in operation. Since dry gas is not associated with oil, there is no reason to tap it until such time as more gas is needed domestically, or export at the proper price to the United States becomes possible. Thus, rationality in the exploitation of Mexico's gas reserves is enhanced.

Despite the arguments of the Government, however, Heberto Castillo and other critics continued to find grounds for questioning the wisdom of the gasoducto.[59] Moreover, even some government officials admitted in private that for domestic purposes this was clearly the wrong pipeline, built to the wrong scale, and following the wrong route. But what was never in doubt was the Government's determination to continue the project.

Thus, by mid-1978 much of the line was already taking shape and a March 1979 completion date for the gasoducto had been announced. Whether it was the best solution to the use of Mexico's resources or not, southern gas was going to flow north, but now the northern connection would be made in Monterrey, not in Texas.

Mexican Gas Imports and U.S. Gas Policy

As the above story suggests, by the beginning of 1978 the northern connection for Mexican gas was deeply entangled in domestic politics and economics both north and south of the border. Particularly complex was the U.S. scene, where in somewhat unexpected fashion the question of Mexican gas imports had been dramatically precipitated into the domestic energy debate at the time when the Eximbank loans were first brought before the Congress. To understand the subsequent chain of events, it is necessary to analyze this scene more closely.

Mexican gas imports, and especially the question of price, raised three primary issues for U.S. gas policy. The first and most important had to do with the relationship between the price of imported gas and the price of new gas in the United States--an area that also included the questions of deregulation and dual gas markets in the United States. The second concerned the relationship between the price of Mexican gas imports and the price of gas imports from other foreign sources, principally from Canada, but also in the future, if LNG projects are approved, from Algeria, Indonesia, and Iran. The third issue involved the links between gas imports and the role of natural gas as a whole in future U.S. energy plans.

The first issue is perhaps the most complex. It takes its simplest form in the regional differences of supply and demand for natural gas that were discussed earlier. Congressional representatives from gas-consuming states in the Northeast, Midwest, West, and Southeast have generally led the fight for continued regulation of gas prices at rates no higher than the 1976 level of $1.42 per Mcf, whereas Congressmen from gas-producing states in the south and southwest have pressed the case for decontrol and market prices of about $2.50-3.00 per Mcf (the exact level is under dispute).[60] Interlaced with these regional differences are other divisions between free-market advocates and interventionists, supporters of industrial versus consumer interests, etc. In its energy plan, the Carter administration proposed a compromise between the extreme positions, calling for continued controls in the interstate market and extension of these controls to the intrastate market (eliminating the dual pricing system), while increasing the price of new gas to $1.75 per Mcf. The latter price was computed on the basis of the BTU equivalent (at the beginning of 1978) of the average refiner acquisition price (without tax) of all domestic crude oil.[61] As such, this price was considerably lower than the equivalent world oil price. Moreover, the Carter Administration did not propose a general tax on domestic natural gas (unlike domestic oil) to bring the final price to consumers up to world oil-price levels. Instead, the Carter proposals taxed only high-volume industrial and utility users of natural gas, proposing eventually to bring final prices to these customers to about one-third above the BTU

equivalent price of world oil. Meanwhile, high priority residential and commercial customers would continue to pay domestic gas prices considerably below world oil-price equivalents.

The House of Representatives approved the key features of the Administration's proposals for natural gas, including the $1.75 per Mcf price level for high priority gas consumers.[62] The Senate, on the other hand, approved a bill that deregulated new gas prices (for onshore gas, immediately; for offshore gas, by the end of 1982) and allocated regulated old gas to high priority customers only until the cost of new gas to low priority users equaled the reasonable cost of substitute fuel oil. In short, the Senate version ensured that low priority customers would never pay more than the substitute cost or world-price equivalent for natural gas, whereas high priority customers would continue to benefit from prices below world levels only as long as old gas contracts remained in force.

Given this wide divergence of pricing policies for natural gas, the price for Mexican natural-gas imports was unlikely to go unnoticed on Capitol Hill. Pegged to the price of No. 2 heating oil delivered in New York, the Mexican price was already higher than equivalent world crude-oil prices in New York (since No. 2 heating oil is a refined product). Moreover, the Mexican price applied at the Texas border. When transportation costs were added to ship the gas from Texas to New York, some estimates were that the actual price in New York would be as high as $3.50 per Mcf. Approving a price for Mexican gas at this level threatened to establish a precedent for pricing domestic gas at equivalent world oil prices, even though the clear intention of the Carter Administration, as well as the advocates of continued control, was to preserve a domestic gas price for high priority customers below equivalent world prices. Indeed, the $2.60 price could in fact have been used as a justification for gas prices above world oil prices. Senator Stevenson, as a staunch advocate of continued gas-price regulation, summarized this argument succinctly in a letter to the editor of the Washington Post.[63]

> When the costs required to integrate [Mexican] gas into the pipeline system and transport it are added, the cost of Mexican gas in New York would be about $3.60. . . . [This price] would be far in excess of the $1.75 proposed by President Carter as the wellhead price for newly discovered gas in the United States. That price of $1.75 is the BTU equivalent of the average price for domestic crude oil. The $2.60 price is even higher than the OPEC price for crude oil. . . .
>
> Instead of approving gas prices in excess of OPEC oil prices [the Department of Energy] should insist upon a reasonable price. . . . Natural gas prices in excess of $1.75 produce no more natural gas. They do produce inflation, recession, political instability, and windfall profits.[64]

The effect of the Mexican gas price on the price of other gas imports was also at issue. A decision to pay $2.60 for Mexican gas might have precipitated an immediate request from Canada to raise the price of its gas, selling at the U.S. border for $2.16 per Mcf. It might also have had the effect of easing the way in the future for even higher priced LNG imports, currently estimated at $3.50-5.00 per Mcf.

Although the economics of pipeline and LNG imports are substantially different, incremental pricing is an issue shared by both. None of these imports from whatever source could be marketed in the United States if they had to be priced to their final customers at the import or incremental (marginal) price level, which suggests, critics point out, that these imports are priced well above the marginal utility of natural gas. Instead, the practice in the past has been to allow roll-in of higher import prices with lower domestic prices, passing the gas on to the final consumers at an average price. As long as imports are relatively small, roll-in generally has a limited effect on the final price. But as imports and import prices increase, roll-in may significantly raise average prices, providing further justification for deregulation and still higher prices. Thus, to the extent that a policy of encouraging and approving high-priced gas imports over time raises the domestic price of gas, gas imports can be seen as a backhanded way of continuously raising domestic prices toward world price levels or, in short, deregulating natural gas.

The question of Mexican and other foreign gas imports raised a third and longer-term issue for U.S. Policy conerning the role of natural-gas supply and consumption in future U.S. energy plans. The Administration's energy plan called for a gradual transition from oil and natural-gas supplies to coal, nuclear power, and eventually nonconventional energy sources. On the supply side, the plan implicitly assumed that there was not much gas left in the United States (about a ten-year supply at current consumption rates).[65] Hence, a price for natural gas much above $1.75 per Mcf was unlikely to encourage substantial new gas production and would more probably accrue to domestic gas producers as windfall profits. The approval of a higher price than this for Mexican and other gas imports would have raised a number of contradictions to the Administration's plan. First, it might have encouraged greater gas supply but would also have increased dependence on foreign energy, a trend the Administration's plan sought to reverse. Second, if these imports were approved for roll-in pricing (and they would not be marketable otherwise), they would have increased domestic gas supplies selling on average below world price levels, thereby subsidizing the continued and perhaps accelerated consumption of an energy supply that the Administration's plan hoped to phase out. Third, paying higher prices to foreign producers, whose costs are frequently less than those of U.S. producers (and that is true in the case of Mexican gas from the Reforma fields), would have granted windfall profits to foreign producers that are denied to domestic producers. It is doubtful that the Administration could have sustained such a policy.

Similarly, on the demand side, a number of contradictions could be identified. The Administration plan, as we noted, called for a tax to discourage the consumption of natural gas by high volume industrial and utility users. If this tax works, these users will have probably switched to other fuels by the mid-1980's or so, when gas imports, approved now, would begin to arrive in substantial volumes. If these imports include LNG, they will involve long-term purchase commitments, since LNG projects, with their high initial investment costs, are only viable on a twenty-year or longer basis. The United States would be locked into buying high-priced foreign gas well into the 1990's. If, meanwhile, low priority customers had switched to other fuels, high priority residential and commercial customers would be left as the principal users of gas and would bear the primary brunt of increasingly higher average domestic gas prices (from roll-in of increasing, high-priced imports with declining, low-priced domestic gas). Yet these are the very customers that the Administration's plan sought to protect from increasingly higher prices.

The exact mix of these various issues in the Carter Administration's thinking about the importation of Mexican gas at the end of 1977 is difficult to reconstruct. But it is clear that all were present, and the sum of concerns and contradictions was sufficient to lead a resounding "no" to the request to import gas at $2.60 per Mcf. Additionally, there is evidence that the policy thicket in the United States is so tangled that even the passage of an energy bill in the Congress may not clear the ground for a dramatically softer price position by the Carter Administration. For example, Secretary of Energy Schlesinger hinted in November 1977, that the Administration was "inclining" against roll-in pricing--a move that would clearly affect the salability of gas imports since the full force of high prices would be borne by specific consumers rather than by the public in general.[66] And many of the other problems suggested above will remain even when (and if) a new package of energy legislation is passed.[67]

Some Implications of the Gasoducto: The Broader Context

It is tempting to see the gasoducto, the alliances that formed around it and against it, and the issues it raised as a representatitive of the future U.S.-Mexican energy relations. To some extent the temptation is justified, because the relationships and patterns established at the outset of an emerging scenario often have disproportionate weight in what comes later. But it is also true that significant options are still open, many tough decisions and much hard bargaining remain, and there is still time to extract from the gasoducto experience important lessons for the future of U.S.-Mexican energy relations.[68] Caveats aside, however, there are at least four broad problemáticas raised by the gasoducto story, problemáticas that will become increasingly present and controversial as Mexican hydrocarbon exploration and development accelerate and as the United States participates in this development, either as a supplier of capital and technology, or as a market for Mexican exports, or as both.

The Role of Foreign Capital, Technology, and Interests.--In his first State of the Nation message on September 1, 1977, President López Portillo made the following fine-sounding declaration:

> In the petroleum field we have 40 years of accumulated experience. This gives us a high degree of autonomy from foreigners, both in carrying out programs of exploration and exploitation and in technological matters.

In historical terms this was essentially a true statement. After the nationalization of the petroleum industry, Mexico certainly demonstrated that it was able to manage, modernize, and expand the industry using essentially its own resources.[69] The factors that have changed, however, are the scale, the pace, and some of the technological demands of the expansion that is now underway.

The gasoducto experience suggests the following changes in circumstances: Because it is a 48-inch line, the overwhelming majority of the capital goods and much of the technology and know-how must be imported. The share of the construction left to the Mexicans is largely in lighter capital goods, earth-moving, and large amounts of labor. Obviously if the project were delayed, if time were taken to install (for example) the mill capacity to produce 48-inch pipe domestically, a larger percentage of the finished product could be labeled "made in Mexico." But the economics of the situation--at least as conceptualized by those who are running the show--have militated against such trade-offs.

To some extent the situation in oil development is even more dramatic. Close to 50 percent of the recent Mexican finds are offshore, in the Gulf of Campeche. This is a new environment for PEMEX, requiring new combinations of skills, technology, and equipment. The scale--both physically and financially---required for offshore work is gargantuan, as anyone who has seen a multimillion-dollar offshore drilling platform can attest. From the outset, specialized U.S. companies have been deeply involved in working in this area with PEMEX. Because this involvement is a nationalistic embarrassment to the Mexican Government, data are difficult to assemble. But some idea of what is happening can be gleaned from the story of one U.S. corporation that managed to get in on the ground floor.

Brown and Root of Houston, Texas, a subsidiary of the Halliburton Company, is "among the world's largest and most diversified engineering and construction companies, with operations extending throughout the world."[70] Soon after the inauguration of López Portillo, Brown and Root formed a joint venture with one of the grand old men of Mexican petroleum, now retired from PEMEX. Under the name of Proyectos Marinos (Marine Projects), they then signed a contract with PEMEX for engineering and project management relating to offshore work in the Gulf of Campeche.[71]

Proyectos Marinos's major responsibility will be the construction and installation of offshore drilling platforms. Much of the actual construction will be sublet to local contractors--possibly associated in their own joint ventures with U.S. firms, as in the case of the pipeline. Again, given the technology involved (aside from the skeletons of the platforms themselves), a large percentage of it will undoubtedly be imported, almost surely predominantly from the United States. The U.S. labor force involved in all of this is being held to a minimum, and will perhaps never number more than about 100 engineers, supervisory personnel, and technicians. But it would be naive in the extreme to use the number of U.S. personnel as the index of the foreign presence. For many years to come, both as capital-goods suppliers and purveyors of technology and expertise, the United States is almost certain to be very deeply involved in Mexican petroleum development.[72]

Oil, Gas, and U.S.-Mexican Bargaining.--The flurry of hard bargaining about the price of gas is only the tip of an iceberg that is still in formation. Given the profundity of Mexico's problems, the size of her petroleum reserves, the energy situation in the United States and elsewhere, and the existing complexities of U.S.-Mexican relations, the new bargaining positions that will eventually emerge are difficult to discern. However, it is interesting to consider implications for one aspect of U.S.-Mexican energy relations, namely energy-pricing policies, and for one aspect of broader U.S.-Mexican foreign relations, namely the immigration issue.

The most controversial issue in world energy politics today is the pricing of future energy supplies (replacing to some extent the issue of nationalization, which preoccupied energy debates before 1973). How OPEC will price future supplies of crude oil is, of course, critical. The United States, Mexico, and other countries need not follow OPEC pricing policies, but they can hardly ignore the relationship between domestic and export prices and world market prices.

For the United States, present world oil prices do not appear to be intolerable, although their increase in recent years and prospective increases in the future trigger enormous and sometimes acrimonious debate among affected interest groups, resulting in such tangled complications as the gas-deregulation debate and the unwieldy crude-oil-entitlements program. As these divisions continue and perhaps deepen (and it is unlikely that they will disappear with a new energy bill any more than they did after the Energy Policy and Conservation Act of 1975), they could lead to increased frustration and the threat of toughened stances against foreign suppliers of oil and gas. In the case of Mexican gas, for example, Senator Stevenson argued that the $1.75 price, even though below the equivalent world oil price was "a reasonable price . . . high enough for PEMEX, a low-cost producer with no other markets."[73] The implication was that the base price for imported Mexican gas should be the U.S. domestic market price (since this is perceived to be the only conceivable market for that gas), rather than world market prices. Yet given the realities of Mexican politics and economics, accepting prices below world levels--however defined--for hydrocarbon exports is

not something that the Mexican Government can easily do. The domestic situation in both countries thus at present includes a confrontational dynamic.

The larger, long-term, energy-pricing context suggests a potential softening of this confrontational dynamic. Two trends are involved. First, up to now, the United States has resisted letting world energy prices determine domestic prices. However, as the United States and other consuming countries acquire greater confidence in OPEC pricing policies, and as the oil producers gain increasing influence in world economic and diplomatic institutions (for example, Saudi Arabia is now becoming the second largest creditor of the IMF and has assumed a permanent position on the Board of Directors), the disparity between world and domestic pricing levels should diminish. This is already evident in the Carter Administration's proposal to move to world energy prices for new domestic oil (with the proviso that tax increases would not keep p ace with world oil prices if the latter rose significantly faster than the general level of domestic prices). It will be further evident in U.S. policy toward natural gas, if the mid-1978 compromise to deregulate gas prices by 1985 holds. Second, as Mexican production and export expand to include a higher component of crude oil as opposed to natural gas, marketing flexibility will increase, and the question of price will be much less subject to bilateral bargaining. Even without membership, OPEC prices are Mexico's prices for crude oil, although lower transportation costs and hence higher profits offer some incentives to sell to the United States.

As has been repeatedly emphasized, however, U.S.-Mexican bargaining on energy policy is by no means a simple or isolated affair. At some level and in some fashion it will undoubtedly get entangled with other issues. An obvious candidate for such entanglement is the immigration issue, which, for both Mexico and the United States is not an easy question to address--at least not in anything approaching a public forum. In effect, over the next decade the Mexican attitude, stripped of all pretext, will be, "If you want a favorable hydrocarbon relationship with us, you must continue to offer us 'foreign aid' in the form of a relatively open border."[74] The specific content of a favorable hydrocarbon relationship will necessarily be open to multiple meanings and interpretations as times and circumstances change. So too will the notion of a relatively open border. Furthermore, on the Mexican side, a special hydrocarbon relationship with the United States will continue to be extremely difficult to construct for domestic political reasons. On the U.S. side, for a different set of political reasons, it will not be easy to maintain a relatively open border--at least as an expressed public policy goal as opposed to a living reality. But the logic of the situation dictates that Mexico will make serious efforts to link the two issues in one way and that the U.S. will attempt to link them in another--if at all. Coupled with the domestic explosiveness of the issues, these different perspectives on how they stand in relation to each other suggest years if not decades of controversy.

In reality, the overall bargaining situation is both more complex and more unbalanced than the above example suggests. Since capital, technology, markets, people, and military power are all disproportionately located north of the Rio Grande, even 120 billion barrels of hydrocarbon reserves will not balance the scales. But at least in the 1970's it has not been as easy for the United States to exploit successfully the traditional sources of bargaining power and coercion as was the case in the previous two decades. This may turn out to be even more true with Mexico (for reasons of history, proximity, culture, and the increasing importance of Hispanics in U.S. politics) than it was with more distant lands and peoples.

National Security.--When Díaz Serrano appeared before the Mexican Congress in October to defend the gasoducto, he was asked if it was possible that the United States would under certain circumstances "violate our sovereignty and invade Mexico to guarantee the supply of gas." He responded by saying that he thought that this was a very remote possibility and that he had confidence in "the philosophy articulated by President Carter and his enormous preoccupation with human rights." He then added, "I hope that this philosophy, this way of thinking, expresses the genuine desire of the North American people, and signifies for us a guarantee that we can work in peace."[75]

Mexican anxieties about their increased vulnerability because of the "fixed" nature of the gas pipeline do not necessarily reflect the realities of Pentagon contingency planning. It may in fact be the case that to date no ambitious young lieutenant or captain has presented to his superiors a Plan for Guaranteeing a Continuous Supply of Mexican Gas in an Era of Rising U.S.-Mexican Tensions. Be that as it may, the questions raised are real, deriving from two basic facts: First, as emphasized by U.S. officials from the president and the secretary of defense on down, U.S. dependence on foreign energy supplies is a primary national security concern.[76] Most attention is now being given to the Middle East--for obvious reasons. But to the extent that Mexico becomes an important supplier of oil and gas to the United States, it too will be involved in that set of concerns, with the "added attraction" of being a potentially much more secure source of energy than most other countries because of its close historical and geographic relationship with the United States. Second, Mexico is now regarded as the primary new source of hydrocarbons in the world, with major production coming on line just as the projected shortages of the mid-1980's are precipitated on a global scale. In other words, the marginal importance of Mexican production is seen as far larger than its proportional contribution to world petroleum supplies would suggest.[77] Even if the national security managers in the United States are not yet busy factoring all of this into energy and contingency planning, they may not be long in doing so.

Sowing the Oil.--The question of who will benefit from the Mexican petroleum bonanza is high on the agenda of almost everyone concerned. The experiences of other oil-rich, less developed countries are not particularly encouraging, at least when viewed from the perspective of those committed to reducing inequalities and establishing minimal quality-of-life conditions for today's impoverished citizens. Certainly neither the Algerian nor Venezuelan cases gives cause for optimism; nor does the Iranian situation suggest that solutions are easily found. At the very least, profound structural changes in both the public and private sectors are needed before oil riches might begin to be translated into the kinds of programs that will touch basic socio-economic problems. As stated in an earlier essay:

> Oil may allow Mexico to slip away from the IMF but not from history. Oil exports, the related relaxation of debt limits, and the easing of some aspects of the austerity program give breathing space, another chance for hard-pressed Mexican politicians. But oil by itself cannot respond to peasants' demands for land; nor can it create hundreds of thousands of new jobs each year; nor can it keep millions of Mexicans from crossing the border; nor make rapid inroads on redressing a distribution of income that is one of the most unequal in the world; nor reduce public and private corruption; nor deal with the human and social problems generated by a population that doubles in size every 20 years.[78]

But hope springs eternal, and already--in the context of the gasoducto controversy--mention has been made of the benefits that would flow to the Mexican people. Thus Díaz Serrano opened his gasoducto defense in the Congress by saying that Mexico's petroleum resources were sufficient not only to resolve her current economic difficulties, but also to create "a new country, permanently prosperous; a rich country where the right to a job would be a reality."[79] If not handled with care, there is substantial irony, if not the seeds of a destabilizing vicious circle, in this rhetoric and these claims. The oil bonanza, with its implied promise of great riches, weakens one of the classic arguments used by third-world elites when faced with popular demands: "We understand your plight, and if only we had the resources we would respond; in the meantime, be patient, for we are working on the problem."

In short, in every enthusiastic declaration of potential gas revenues, oil exports, petrochemical production, or rapidly expanding reserves, there is an implied political promise to the Mexican nation, particularly to the popular sectors. The statistics suggest to international bankers that their loans are going to be repaid and give the managers of PEMEX confidence in their ability to purchase the goods and services necessary to meet ambitious production goals; and the same statistics suggest to millions of other Mexicans that the coming years will not be as desperate as the present and past.

The resolution of these partially conflicting claims on the national patrimony lies in the 1980's. How, in whose favor, and at what rate they are resolved will in large measure determine not only Mexico's future, but also the future of U.S.-Mexican relations.

Conclusions.--Energy problems and solutions in the United States and Mexico are ultimately reflections of more fundamental patterns of politics and economic conditions in these two societies. Energy politics in the United States can be seen as a many-sided contest over the rapidly escalating economic value of energy resources, both among domestic producers, consumers and other groups, and among U.S. and foreign energy suppliers and importers. Energy politics in Mexico can be seen as a somewhat similar contest over the prospective spoils of a future energy bonanza. Existing structures of political and social life are likely to affect these energy contests at least as much as energy itself is likely to affect basic political and social developments. Thus, in the United States, energy problems do not present a situation that is the "moral equivalent of war," nor do energy reserves in Mexico automatically promise to reduce class conflict or resolve existing injustices.

Energy-related dealings between the two countries will inevitably reflect these broader social and political realities. Not surprisingly, the first attempts to negotiate a changed northern connection were not only somewhat unreal but also largely unsuccessful. Mexican officials made the most of oil and gas discoveries to refurbish their country's image in world financial and diplomatic circles. Meanwhile, massive problems continued at home. In the United States and elsewhere, banks and businesses reacted with characteristic fervor to take advantage of the new and more favorable climate in Mexico City and the boom opportunities offered by the dawning of the new petroleum-export age south of the border. At first, the U.S. Government slumbered, preoccupied with attempting to shape a domestic energy consensus, regarded as the prerequisite of any effective foreign energy policy. Then, stirred to action by an energy-stalled and increasingly frustrated U.S. Congress, the Carter Administration came down hard on a Mexican gas connection that threatened to contradict important aspects of its domestic energy policy.

Are there policy-relevant lessons to be drawn? Only very tenuously and somewhat indirectly. It is tempting to draw an analogy with another neighboring supplier of energy, Canada. U.S.-Canadian energy exchanges in recent years have benefited from an ongoing process of discussion and interaction among high officials. A framework has emerged in which thorny problems, such as the Canadian decision to cut back oil and gas exports to the United States, have been contained and dealt with in the broader context of U.S.-Canadian relations. Obviously such mechanisms would be useful in the Mexican case.[80] But the analogy has its weaknesses, for even a cursory examination of the broader context suggests that U.S.-Mexican relations are not the same as U.S.-Canadian relations. All indications are that a long and potentially tempestuous period lies ahead as both nations adjust to the new realities.

REFERENCES

[1]December 17, 1977, p. 35.

[2]See Washington Post, January 3, 1978.

[3]Editorial, December 23, 1977.

[4]Because our research advantage lies north of the border, we have concentrated on the U.S. economic, political, and energy context rather than on the Mexican. We have, however, attempted to at least suggest what aspects of the Mexican reality have and will continue to shape energy and other relations with the United States.

[5]Between 1950 and 1970 real energy costs in the United States decreased by 28 percent. See The National Energy Plan (Washington: Government Printing Office, April, 1977), p. 2.

[6]Richard B. Mancke, The Failure of U.S. Energy Policy (New York, 1974), pp. 106-107. On a per-capita-use basis, natural-gas consumption tripled from 1950 to 1975, while oil consumption increased by about 75 percent. Since 1972 natural-gas consumption has slipped back to 27 percent of the total, largely because of supply shortages. For this and other data used in this analysis, unless otherwise noted, see Federal Energy Administration, Energy in Focus: Basic Data (Washington, D.C., May, 1977).

[7]As a result, between 1973 and 1975, after the major energy price hikes, only 19 percent of all new gas-reserve additions was made available to the interstate market. A more recent estimate drops this figure to 13 percent. See Washington Post, January 25, 1978.

[8]Synthetic gas is the only usable substitute and its price makes it noncompetitive in the short and medium run.

[9] Gasohol (alcohol mixed with gasoline) comes the closest and is attracting increasing attention in some circles. Substitution is limited, however--without major engine modifications--to 10-20 percent of total gasoline consumption.

[10]For example, energy investments in the United States from 1973 to 1975 consumed 35 percent of all plant and equipment expenditures, compared with a 25-30 percent range before the energy crisis.

[11]It may be too early to draw any final conclusions from these statistics. Lead times are lengthy in the development of new oil and gas resources. But exploratory drilling has certainly increased dramatically.

[12]It should be noted that to some extent the 1977 increase was the result of commercial inventory buildup sparked by Saudi Arabia's increased production and lower export prices which reflected the price split in OPEC at the time. By the second half of 1977 there was a considerable surplus of oil on the world market.

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[13]The U.S. and Canadian governments signed an agreement in September 1977 authorizing construction of a 5,500 mile pipeline to carry this gas through Alaska and Canada to the U.S. Midwest. Financing, however, is yet to be arranged and is dependent in part on the outcome of the gas-price debate in the United States. Canada did announce in January 1978, that it might expand its gas exports to the United States by as much as 50 percent. But in return Canada would acquire the option to purchase Alaskan gas once the pipeline is completed. Thus the arrangement will result in an early consignment of Alaskan gas, not an increase in Canadian gas exports. See Washington Post, January 18, 1978.

[14]See Washington Post, November 17, 1977.

[15]For additional material see Lorenzo Meyer, Mexico and the United States in the Oil Controversy, 1917-1942 (Austin, 1977). See also the brief historical section in George W. Grayson, "Mexico's Opportunity: The Oil Boom," Foreign Policy, no. 29, Winter 1977-78, pp. 67 ff.

[16]Bolivia expropriated Standard Oil shortly before the Mexican expropriation. But as Meyer explains, the Bolivian action was less important in both its magnitude and its public policy implications. Mexico and the United States, p. 182.

[17]In September 1974, the dollar value of oil exports exceeded the dollar value of oil imports for the first time since 1968. The turn-around is documented (by volume) in the following table.

	1973	1974	1975	1976	1977
Average daily production (1,000 bbls/day)					
Crude Oil	452	575	717	80	981
Average Daily exports (1,000 bbls/day)					
Crude oil	0	16	94	94	202
Refined products	24	18	7	3	5
Average daily imports (1,000 bbls/day)					
Crude Oil	65	17	0	0	0
Refined products	63	45	50	22	10

SOURCE: PEMEX and IMF. See also Adrián Lajeus Vargas and Víctor Villa, "El Sector Petrolero Mexicano, 1970-1977: Estadísticas Básicas," Foro Internacional, no. 72, vol. 18, no. 4, April-June, 1978, pp. 747-82.

[18]For more details on this period see Richard R. Fagen, "The Realities of U.S.-Mexican Relations," Foreign Affairs, vol. 55, no. 4, July 1977, and Robert S. Drysdale, "What Mexico's President Inherited," Worldview, November 1977.

[19]All figures from IMF sources.

[20]Fagen, "The Realities of U.S.-Mexican Relations," p. 694. "Although there was never a consensus on who was supposed to 'do' the coup to whom, the predominant version was that Echeverría would use the armed forces to maintain himself in office." Ibid.

[21]The primary spokesperson, playing the hydrocarbon ace was the Director of PEMEX, Jorge Díaz Serrano. He mentioned the 120-billion-barrel potential reserve figure in a lengthy presentation to the Mexican Congress on October 26, 1977. It is important to bear in mind that hydrocarbon reserves are not the same as proven oil reserves. Furthermore, as much as 40 percent of Mexican reserves are gas and gas liquids. The Mexican potential reserve estimates are still, therefore, well below the Saudi proven oil reserves of 150 billion barrels.

[22]There are many hypotheses about why the Echeverría Administration was so cautious in announcing new hydrocarbon finds. Among the most frequently mentioned are: (1) The president did not want to weaken the case for the much needed domestic reforms by suggesting that an oil boom was just around the corner; (2) Mexico did not want to become a pawn in U.S. attempts to beat down OPEC prices--making more difficult and potentially undercutting other Echeverrista Third World policies; (3) Pemex itself, guided by traditional técnicos, was following its longstanding conservative and nationalistic policies of supplying Mexico's hydrocarbon needs, but not developing an export potential. All of these hypotheses may, of course, reflect part of the truth.

[23]In addition to the President and Díaz Serrano, the most visible international salesman for Mexico during this first year was Gustavo Romero Kolbeck, head of the Banco de Mexico (the Central Bank). See for example, "Kolbeck's road show: selling confidence in Mexico to the international banks," Euromoney, August, 1977, pp. 16-17. See also, "The great Mexican dream for a few barrels more," Euromoney, May, 1977, pp. 89-91, 93, and "Mexico: Everyone likes the professionals' touch," Euromoney, October, 1977, p. 83. The first major sign that the times were changing came in March, 1977, when a 350-million-dollar PEMEX loan was "taken up enthusiastically" by the international banks (ibid). The restoration of confidence, of course, did not derive solely from the promise of massive hydrocarbon export earnings. At least as important was the López Portillo Government's apparent commitment to "sound fiscal management."

[24]See the Oil and Gas Journal, February 7, 14, 28, and March 14, 1977 for more details. The capital investments programmed amounted to about one-third of PEMEX's (original) total budget for the 6 years.

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[25]In these fields the gas occurs in solution with the oil. If extracted, the latter is "automatically" left in the former. For more data see Oil and Gas Journal, June 27 and September 19, 1977. It should be emphasized that this line of argument and its implications, leading toward export to the United States, were not accepted by all sectors of Mexican opinion. For a left-nationalist critique see, for example, Heberto Castillo, "¡Como deseo estar equivocado!" Proceso, no. 48, October 3, 1977. See also Heberto Castillo and Rius, Huele a Gas: Los Misterios del Gasoducto (Mexico City, 1977) for a collection of critical articles by Castillo and cartoons by Rius and others.

[26]As noted below, these arguments subsequently came back to haunt PEMEX and the Mexican Government.

[27]See Díaz Serrano's speech to the Mexican Congress on October 26, 1977, available in Mexico City daily newspapers as well as in a PEMEX pamphlet somewhat misleadingly entitled, "Linea Troncal Nacional de Distribución de Gas Natural."

[28]Calculated at a daily volume of 1.3 billion cu. ft./day during the first year of operation and at a prices of $2.60 per Mcf.

[29]These calculations do not take into account the additional investment needed to process (sweeten) the gas before it is transmitted. Even if these investments were included, however, the return-on-investment figures would still be very impressive.

[30]Díaz Serrano to the Mexican Congress, October 26, 1977.

[31]The other sources cited in this and in the following section have been amplified by information gathered in interviews with high officials of the banking and petroleum communities in New York, Dallas, and Houston during late October and early November 1977.

[32]DeGolyer's credibility is enhanced by a company policy insisting that the firm act only as consultant. Equity involvment of any sort in mineral exploitation, development, or shipment is prohibited.

[33]Tenneco InterAmerica Inc. is the leading member of the six-company consortium that was attempting to buy and distribute the gas in the United States. The other members of the consortium are Texas Eastern Transmission, El Paso Natural Gas, Transcontinental Gas Pipeline, Southern Natural Gas, and Florida Gas Transmission. The consortium is known as "Border Gas." Data on its meetings with PEMEX come from the Tenneco InterAmerica filings with the Federal Energy Regulatory Commission, Washington, D.C.

[34]The Tenneco InterAmerica study for PEMEX was very broadly gauged, covering Mexico's energy needs to the year 2000, world supply and demand, etc. It concentrated, not surprisingly, on the rationale for and possibilities of exporting natural gas.

[35]Tightrope-walking at the edge of the truth, López Portillo described the routing as follows in his first State of the Nation address on September 1, 1977: "We have decided to construct a pipeline that will go from Cactus, Chiapas, to Monterrey, with a branch that will go to Chihuahua and eventually loop back to the capital. Also, it will have another branch that will go to Reynosa for exporting to the United States.

[36]An American company, Elcon, is fabricating two of the gas processing plants that will be installed by PEMEX.

[37]Left critics of PEMEX in Mexico point out that the gasoducto will in fact be a financial bonanza for the few large Mexican private firms in a position to bid on some of the aspects of construction. Although PEMEX has the "in-house" capacity to do certain kinds of petroleum-related construction, laying big pipe is not among them.

[38]The BTU (British Thermal Unit) equivalency formula is a way of tying the price of gas to the price of oil--in this case OPEC oil. Under the formula, 1000 cu. ft. of gas are priced the same as an "equal amount of fuel oil--"equal" being defined as the quantity that would have to be burned to produce the same BTU's as 1000 cu. ft. of natural gas. In addition to yielding a relatively higher price for gas, the formula has the advantage (from the seller's point of view) of indexing the price of gas to the (increasing) price of oil. As we note below, this pricing and indexing formula encountered strong opposition in both the U.S. executive and the Congress.

[39]In his speech of October 26, 1977, Díaz Serrano estimated that the gasoducto would "generate from 24,000 to 35,000 jobs during its construction."

[40]With the exception of the pipe itself (of which only about one-third could be produced in the United States given existing capacity), the Mexican Government wished to purchase a majority of the imported components for the gasoducto in the United States. The reasons were political, technological, and financial. At the same time, PEMEX also wished to diversify the sources of financing quite widely--in part for political reasons and in part to secure the best possible terms commensurate with the specific use to which the borrowed money would be put. As an example, it is obviously cheaper to purchase capital goods made in the United States with Eximbank credit than with a commercial loan floated on Eurocurrency markets. Additionally, Eximbank credits are only available for such purposes, whereas Eurocurrency loans can be put to almost any use once secured.

[41]Under U.S. law, Eximbank credits of 60 million dollars or more must be reported to the Congress at least 25 working days before final approval. If, at the expiration of that period, the Congress has not "dictated otherwise," the Bank may give final approval to the loan.

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[42]Letter from John L. Moore, Jr., President, Eximbank, to the Honorable Walter F. Mondale, September 9, 1977. Reprinted in Congressional Record, Senate, September 14, 1977, SI4899-14900. The two loans taken together, totalling 590 million dollars, constitute the largest single credit ever proposed by the Eximbank (as opposed to a package of credits and guarantees).

[43]The interest of the gas-transmission companies in the price was different although no less real than the interest of banks and the suppliers of capital goods and services. The transmission companies profit in direct proportion to the volume of gas moved. As long as demand stays strong, price is not a critical factor to them. Given gas shortages in the United States and the expectation that expensive foreign gas could be "rolled in" with existing lower-price- gas (and thus not jolt consumers too abruptly), the logic of their situation dictated "gas at [almost] any price." Above all, they did not want to be party to a price hassle with the Mexican Government. They had much to lose and nothing to gain by such a hassle. It should be emphasized, however, that for all concerned the economics of the pipeline remained attractive by comparative standards even at half the $2.60 price. No one ever argued that they would actually lose money at a lower price.

[44]For example, George P. Mitchell, Chairman of the Texas Independent Producers and Royalty Owners Association (TIPRO) argued, "We now have a system in which producers cannot receive adequate incentive to develop the nation's gas resources to the fullest, but one that encourages wasteful usage of gas. So now we're in a position of desperately needing imports, for which we'll pay more than if we had developed our own resources without price controls." He added, however, that "the independents aren't contesting the importation of the [Mexican] gas." See "Tipro wants to intervene in Mexican-gas case," The Oil and Gas Journal, September 12, 1977, p. 58.

[45]Perhaps sensing that U.S. Government financing was not assured Governor Edwin Edwards of Louisiana had earlier suggested that Louisiana, Texas, and a number of other states might think about supplying gasoducto credits should Washington fail to do so. See The Oil Daily, July 8, 1977, p. 8.

[46]Congressional Record, Senate, October 9, 1977, S17370-17371. It should be noted that a resolution is not binding on the parties involved.

[47]Quoted with the permission of Jack H. Ray. Letter of October 28, 1977.

[48]Washington Post, November 25, 1977, p. A-20.

[49]Interviews suggest that the Bank officials felt badly used in this situation, since the credits were being held hostage to concerns that were not organizationally "theirs"--and this on a loan that was not only the largest in Bank history, but also one of the best by conventional banking criteria! On the other hand, they were fully aware of the politics of the domestic energy situation in which they were enmeshed. If Eximbank could be said to have had an "official" position on the credit-price question, it was, "Let's give the credits now and argue about the price later, since it is a good deal at any foreseeable price."

[50]Congressional Record, Senate, October 26, 1977, S17834.

[51]Based on interviews with U.S. Government officials conducted in Washington, D.C. in late December 1977.

[52]Based on interviews in Washington, D.C. and Mexico City.

[53]See New York Times, January 6, 1978.

[54]See Washington Post, December 23, 1977, p. A-4.

[55]The major imported component of the gasoducto is the pipe itself, particularly if it only serves Monterrey, because with reduced line pressure, large imported compressors are not needed. PEMEX places its largest order for pipe in Japan, with other significant orders in France, Italy, and West Germany (see Oil Daily, October 12, 1977). The order that was to have gone to U.S. Steel was withdrawn. U.S. officials had feared strong protests from an industry beleaguered by foreign competition, but in this particular case they did not materialize because the one U.S. plant capable of fabricating 48-inch pipe was already over-committed and did not want--at least at that moment--the additional business. Other capital goods and technology suppliers in the United States who expect to do significant amounts of business with PEMEX under the Eximbank loans and other credits adopted a "wait and see" posture, expecting the current problems to be resolved in the near future.

[56]See, among others, José Reveles, "Pemex, atrapado por el gasoducto," Proceso, No. 62, January 9, 1978, pp. 16-17.

[57]"Pemex en evidencia," Proceso, no. 61, January 2, 1978, p. 34.

[58]This is a composite argument based on interviews in Mexico City and published statements of government officials. See in particular the press conference of Jorge Díaz Serrano, January 4, 1978, and his report on the occasion of the 40th anniversary of the oil nationalization, March 18, 1978. Both were published in most Mexico City newspapers on the following day. See also various statements by José Andréas Oteyza, Secretary of Resources and Industrial Development (Patrimonio y Fomento Industrial), for example in El Día (Mexico City), May 7, 1978, p. 9.

[59]See the continuing series of articles by Castillo in Proceso (Mexico City). See also, for example, Salvador Saenz Nieves, "La Política de Energéticos y el Ducto Cactus-Reynosa," in two parts, Oposición (Mexico City), February 4 and 11, 1978. The critique of the gasoducto is only one element, and ultimately not the most important, in the emerging energy debate in Mexico. For an important left-nationalist statement see "Frente de Defensa de los Recursos Naturales," Oposición, March 4, 1978, p. 12.

[60]Some advocates of continued control sought to roll back gas prices. A coalition of consumer, labor and liberal groups petitioned the Federal Energy Regulatory Commission in November, 1977 to reconsider among other things, the 1976 opinion of the Federal Power Commission that increased the price for new gas to interstate markets from $0.52 per Mcf to $1.42 per Mcf. See The Energy Daily, November 14, 1977.

[61]The regulated natural-gas price would then escalate after 1978 on the basis of increases in average domestic oil prices. The latter would increase, as the price of new oil was raised over a three-year period to 1977 world levels and then adjusted thereafter to keep pace with domestic price inflation.

[62]On the basis of the bill passed in the House, one estimate projected the same real gas price for residential users in 1985 as in 1977, whereas the price for major businesses would more than triple. See National Journal, September 10, 1977, p. 1419.

[63]December 12, 1977.

[64]These and other arguments made by Senator Stevenson did not pass unchallenged by U.S. supporters of the gasoducto and the $2.60 per Mcf price. For example, in a long letter dated January 3, 1978 to Senator Stevenson, Jack H. Ray, the President of Tennessee Gas Transmission (Tenneco InterAmerica) wrote a point-by-point rebuttal. Excerpts, quoted by permission, follow:

4. "It would be far in excess of the $1.75 proposed by President Carter. . . . That price of $1.75 is the BTU equivalent of the average price for domestic crude oil."

   My basic problem with this statement is not your referencing Mr. Carter's proposed price but your implication that the Mexican gas should be no higher than the equivalent regulated price of domestic crude oil. If the Mexicans had but one reason to drop the negotiations, it would be the presumption that they are expected to price their energy below its commodity value because the United States Government required its domestic producers to do so.

5. "The $2.60 price is even higher than the OPEC price for crude oil."

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> This is a factually true statistic but an irrelevant statement. Gas does not compete with crude oil in the marketplace--but with fuel oil which is a product of refining crude oil. The Mexican natural gas delivered at the United State border would be ready to use and, once more, its delivered price to the consumer should be compared to the delivered price of fuel oil to the consumer.

For a related although less specific critique, see "Lesson of the Year," Wall Street Journal, December 30, 1977, p. 4. It should be pointed out, of course, that for geographical reasons pipeline gas faces a more limited market than crude or fuel oil and therefore a somewhat different pricing situation.

[65]This view is of course disputed. See National Journal, September 10, 1977, p. 1419.

[66]See Energy Daily, November 28, 1977, and New York Times, December 17, 1977

[67]In the conclusion to this article we have discussed aspects of the 1978 energy debate in the United States (and the legislative tangle) that began on natural-gas pricing and U.S. energy relations with Mexico.

[68]As mentioned earlier, it should also always be borne in mind that gas and oil development and export scenarios are not the same--primarily because of the OPEC pricing umbrella under which oil is marketed and the much greater storage and transport options that exist for crude oil as opposed to gas. See discussion of this below.

[69]The exception has always been capital goods. From 1973 to 1976, for example, PEMEX was the largest public sector importer of merchandise in Mexico, challenged only by CONASUPO, the organization charged with organizing the distribution of consumer goods (largely food) to the sectores populares in Mexico. In 1973 PEMEX's imports of merchandise were 353 million dollars, rising to 740 million dollars by 1976. Statistics from IMF sources.

[70]From Brown & Root, Inc., International Operations, a company pamphlet. This publication lists scores of company projects, from Abu Dhabi and Alaska to Venezuela and Vietnam. Petroleum-related projects predominate, but roads, dams, hospitals, pulp and paper mills, and military bases are all mentioned. Offshore operations range from the Gulf of Mexico to the North Sea, Middle East, and Southeast Asia. Company contracts totaled 4.8 billion dollars in 1976.

[71]Although there is certain personalistic ring to the joint venture and the PEMEX contract, it should be emphasized that the arrangements described are absolutely legal and correct under Mexican law.

REFERENCES

[72]Although it is probably scant comfort to Mexican nationalists, even such imaginative and quasi-autarkical nations as the People's Republic of China have turned to the United States for technology and capital goods for offshore work. The largest and most recent sale was for two self-contained drilling rigs for fixed offshore platforms, at a total price of from 20 to 30 million dollars. See the Washington Post, November 27, 1977, p. A-23, and April 27, 1978, p. A-20. Unlike the Mexican deals, these are straight cash sales with no joint venture component.

[73]See letter to the editor of Washington Post, December 12, 1977.

[74]Trade issues are an important additional element in the bargaining secnario. An alternative to accepting additional Mexican immigrants is accepting additional Mexican products. U.S. restrictions on winter vegetables and fruits, as well as many manufactured exports from Mexico, however, continue to be an obstacle to the expansion of trade. See Washington Post, May 29, 1978.

[75]Proceso (Mexico City), no. 52, October 31, 1977, p. 11. In Mexican cartoons, the gasoducto is often portrayed as Mexico's Panama Canal, with all the implications and overtones of vulnerability that the Canal represents to Panama.

[76]For example, "I am also concerned as commander-in-chief of our country about the serious security implications of becoming increasingly dependent upon foreign oil supplies which may for some reason be interrupted" (President Carter, News Conference, October 13, 1977, Washington Post, October 14, 1977, p. A-8.)

Two weeks later, speaking to a conference of business executives, Defense Secretary Harold Brown said, "The present deficiency of assured energy resources is the single surest threat that the future poses to our security and to that of our allies, ... We now spend annually over $100 billion on our armed forces. . . . If we hand to others the capacity to strangle us and our allies by cutting off our and their oil supplies, then this expenditure does no more for us than to create a useless, encrusted modern-day Maginot line." New York Times, October 27, 1977, p. D-11.

[77]The CIA estimates that Mexican oil production will be between 3.0 and 4.5 million barrels per day in 1985, with a theoretical "top" of 5 to 6 million bbl/d in that year. See The International Energy Situation: Outlook to 1985 (Central Intelligence Agency, April, 1977), p. 11. For an extended analysis of Mexican oil and U.S. national security, see Richard R. Fagen, "El Petroleo Mexicano y la Seguridad Nacional de los Estades Unidas," Foro Internacional, no. 74, vol. 19, no. 2, October-December, 1978.

[78]Ibid., p. 698.

[79]Proceso, no. 52, October 31, 1977, p. 10. For useful materials on the debate on these issues in Mexico, see Foro Internacional, no. 72, vol. 18, no. 4, April-June, 1978; and El Economista Mexicano, vol. 62, no. 2, March-April, 1978.

[80]A bilateral commission and set of subcommissions were set up between the United States and Mexico after López Portillo's visit to the United States in February, 1977. These include a subcommission on energy. There are no indications to date, however, that it will play any significant role in addressing or resolving important issues.