QUARTERLY FOCUS:

PLANNED PROJECTS WHICH MAY PROMOTE NATURAL GAS TRADE WITH MEXICO

I. INTRODUCTION AND OVERVIEW

Introduction

The second quarter 1997 *Quarterly Report of Natural Gas Imports and Exports* featured a *Quarterly Focus* report on cross-border natural gas trade between the United States and Mexico. This *Quarterly Focus* article is a follow-up to the 1997 report. This report revisits and updates the status of some of the pipeline projects discussed in 1997, and examines a number of other planned cross-border pipeline facilities which were proposed subsequent to our 1997 report. A few of the existing and proposed pipelines are bi-directional and thus have the capability of serving either Mexico, or the United States, depending on market conditions and gas supply availability. These new projects, if completed, would greatly enhance the pipeline infrastructure on the U.S.-Mexico border and would increase gas pipeline throughput capacity for cross-border trade by more than 1 billion cubic feet (Bcf) per day.

The *Quarterly Focus* is comprised of **five sections**. **Section I** includes the introduction as well a brief historic overview of U.S./Mexican natural gas trade; a discussion of Mexico's energy regulatory structure; and a review of trade agreements and a 1992 legislative change which allows for freer cross-border gas trade in North America. **Section II** looks at initiatives that have been taken by the Mexican Government since 1995 to open its energy markets to greater competition and privatization. **Section III** reviews Mexican gas demand forecasts and looks at future opportunities for U.S. gas producers to supplement Mexico's indigenous supplies in order to meet the anticipated rapid growth in demand. **Section IV** examines the U.S.-Mexico natural gas trade in recent years. It also looks specifically at monthly import and export volumes and prices and identifies short-term trends in this trade. Finally, **Section V** reviews the existing and planned cross-border gas pipeline infrastructure. The section also specifically describes six planned pipelines intended to expand this pipeline network and their planned in-service dates.

Overview

The United States and Mexico have traded in natural gas since 1949; however, most the volumes have been typically minor in nature [National Petroleum Counsel's (NPC) 1992 study entitled *The Potential for Natural Gas in the United States*, Vol II, p. 188]. Since 1949, the United States has exported small volumes of gas to serve markets along the international border that were isolated from indigenous supplies due to the lack in pipeline infrastructure. Initially the United States exported between 10-15 Bcf a year, but that trade declined in the 1970's and 1980's to roughly 2 Bcf a year. For much of the same period, the United States imported an average of about 40 Bcf a year from Mexico between 1957 and 1971. Volumes of imports from Mexico doubled between 1980 and 1984 to 86 Bcf a year, reflecting a gas purchase contract between Border Gas, Inc., (a consortium comprised of 6 interstate pipeline companies) and Petroleos Mexicanos (PEMEX), Mexico's state-owned oil and gas company, to supply up to 300 MMcf/day, or 110 Bcf per year of gas.

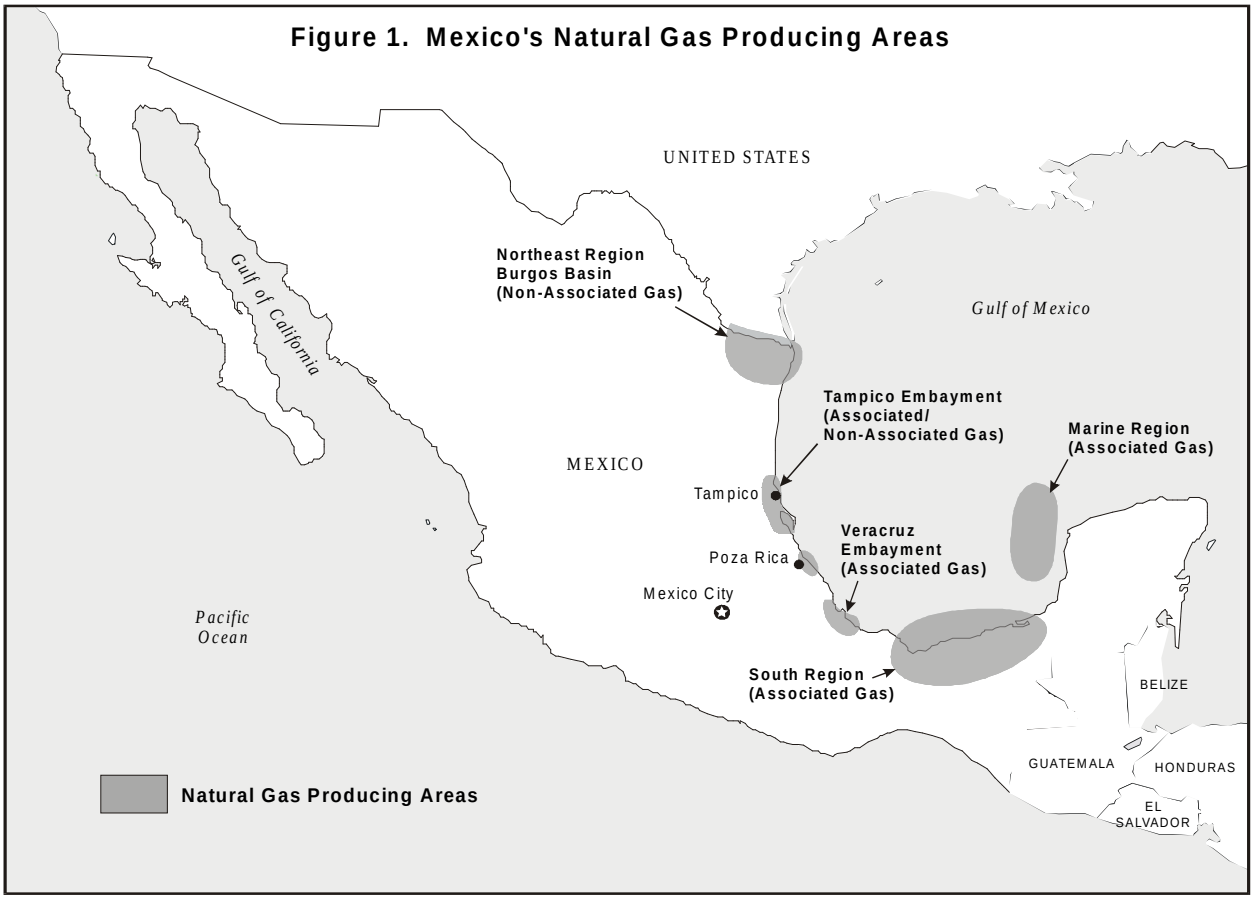
However, natural gas sales between Border Gas, Inc. and PEMEX were suspended in November 1984 following a request by PEMEX to Border Gas, Inc., to temporarily suspend sales. At this time, both the United States and Canadian gas prices were beginning to decline due to deregulation initiatives and PEMEX adopted a strategy of maximizing its crude oil exports because it could obtain a higher price for crude oil, on a Btu basis, than continuing its gas exports

to Border Gas, Inc. Natural gas sales to Border Gas, Inc. were never resumed. Although U.S. gas exports to Mexico climbed to as high as 95 Bcf in 1992, gas import trade with Mexico was totally suspended between 1985 - 1992, but resumed in December 1993 and has continued since then on a relatively small, but constant basis.

Historically, natural gas has not been a development priority for PEMEX and has largely viewed within the Mexican energy sector as an oil by-product that offered low investment returns. Throughout the 1970's and most of the 1980's Mexico preferred to restrict natural gas production in order that domestic gas not compete with and limit the net-backs on the price of its oil sales. Not until 1986, when world oil prices collapsed, did the Mexican Government adopt a more balanced stand in diversifying its energy resources by promoting greater development and use of its natural gas resources [Crossborder Services Inc., *Opportunities and Obstacles: Natural Gas Regulations, Infrastructure, and Markets in Mexico*, Nov. 1996, p. 11].

As shown in **Figure 1**, Mexico's natural gas reserves [currently estimated at over 30 trillion cubic feet (Tcf)] are largely concentrated near the lower central Gulf of Mexico regions, thus making delivery of natural gas to points west of Texas in the States of Baja California, Sonora and Chihuahua uncompetitive with U.S. gas supplies. According to Mexico's Energy Ministry, Mexico ranks fifth in world oil production and has initiated an effort over the past few years to increase the production and use of natural gas.

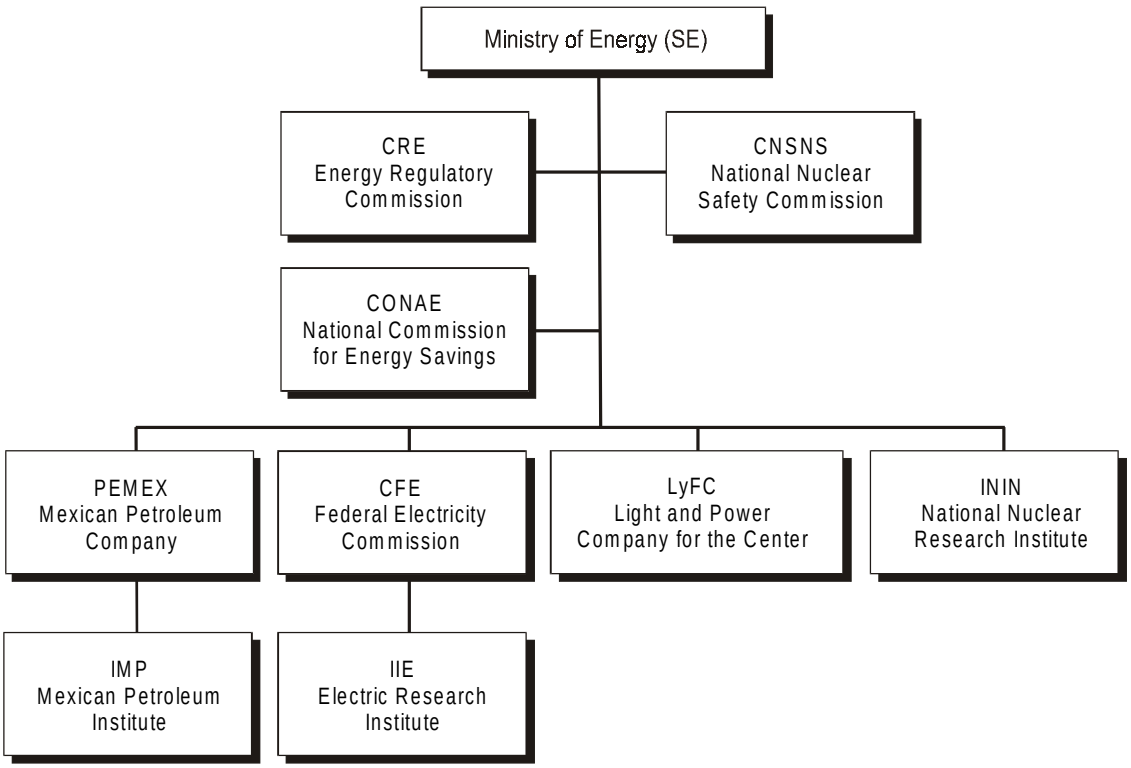
Figure 1. Mexico's Natural Gas Producing Areas



Mexico's Energy Regulatory Structure

Mexico's federal energy organization and structure, with the exception of maintaining its state-run oil and gas monopoly PEMEX, has some similarities to that of the United States. **Figure 2** reveals that Mexico has a cabinet level Ministry of Energy (SE) that functions much like the U.S. Department of Energy (DOE) whose mission includes such responsibilities as developing overall energy policy, developing and implementing medium and long-term planning, conducting international energy affairs, tracking and reporting energy supply and demand statistics, and identifying trends and issuing forecasts. In 1993, Mexico created the Energy Regulatory Commission (CRE). The CRE, similar to the DOE's Federal Energy Regulatory Commission (FERC) is an independent, autonomous agency responsible for regulating the siting, operation and ownership of electrical generating facilities, oil and natural gas transportation, storage and distribution systems. The establishment of CRE for the energy sector was unique to Mexico, and afforded for the first time stable, non-discriminatory policies, rules and procedures that could be used by the private sector to participate in the energy industry. The CRE also monitors the activities of both PEMEX and the Federal Electricity Commission (CFE). The CFE is solely responsible for permitting the generation, transmission and distribution of electricity and is wholly under the authority of Mexico's SE. Although CFE continues to be the only supplier of electric power for the general public, domestic and foreign investors may now invest in independent power production (IPP). The electricity generated from IPP may be sold to CFE, or used internally by the producer, e.g., cogeneration plant located near an industrial facility. The Mexican Government anticipates that much of the future growth in electricity production will come from IPP.

Figure 2: Mexico's Energy Regulatory Structure



Agreements Affecting U.S./Mexican Natural Gas Trade

The United States, Canada, and Mexico have taken a number of steps over the past fifteen years which has led to a more deregulated natural gas market in North America. Between 1984 and 1986, the United States and Canada adopted a more market-oriented gas trade policy where companies could freely negotiate gas import or export contracts with a minimal of government involvement. Between 1987 and 1989, the United States and Canada negotiated a Free Trade Agreement (FTA); implementation of this FTA began in January 1989. In general, the U.S.-Canada FTA was designed to ensure the freest possible bilateral trade, including nondiscriminatory access for U.S. consumers to Canadian energy supplies and secure market access for Canadian energy exports to the United States. The FTA provided the catalyst for a second round of free trade discussions between the U.S. and Mexican Governments, trade associations and major trading partners seeking a similar free trade agreement. However, Canada's interest to also establish greater free trade with Mexico resulted in the formation of a trilateral commission in January 1991; this commission included representatives from the United States, Canada and Mexico which ultimately sought to create a single North American trade zone. Subsequent negotiations led to the passage of the North American Free Trade Agreement (NAFTA), which became effective January 1, 1994.

Overall, NAFTA promoted freer cross-border trade; however, a drawback to NAFTA was its silence on free and open energy markets in Mexico. Even though NAFTA provided the phase-out on Mexico's natural gas import tariff by 2003, it did not provide guidance or time lines for Mexico to introduce competition and foreign participation in many of the functions under the control of PEMEX and CFE, i.e., refineries, petrochemical plants, electric generation operations. Furthermore, NAFTA did not provide definitive language on how Mexico would allow foreign companies to make competitive bids for new construction or ownership of oil and natural gas pipelines, distribution systems or utility generating facilities.

U.S. Efforts to Accommodate North American Natural Gas Trade

In light of the passage of the FTA in 1989, and recognizing the benefits of a freer cross-border natural gas trade, the U.S. Congress in 1992 sought to remove future regulatory hurdles for companies seeking to import and export natural gas from and to other countries with the passage of the Energy Policy Act of 1992 (EPACT). EPACT essentially states that natural gas trade with countries which the United States has in effect a free trade agreement requiring national treatment for trade in natural gas is deemed to be in the public interest. Prior to passage of EPACT, section 3 of the Natural Gas Act of 1938 required DOE to make a finding on whether an application to import or export natural gas was inconsistent with the public interest. With the enactment of EPACT, coupled with the implementation of NAFTA in January 1994, requests for approval to either import or export natural gas between the United States and Mexico are no longer subject to long administrative proceedings.

II. PROGRESS IN MEXICO'S EFFORTS TO OPEN ITS GAS MARKETS

Over the past five years (1995-1999), the Mexican Government has adopted a number of major legislative, policy, and regulatory initiatives aimed at strengthening its national energy sector in order to promote the level of development needed to support a sustainable growth in the economy and an improved standard of living for its citizens. The reforms undertaken by the Mexican Government were seen as critical to the expansion of its economy. All of these changes were designed to increase competition and encourage more private sector involvement.

The principal features of Mexico's new energy policy were outlined in the National Development Plan 1995-2000 (NDP), which was announced in May 1995. During the remainder of 1995, the Mexican Government enacted a series of institutional and regulatory changes which were designed to carry out the energy sector policy guidelines and strategies outlined in the NDP. The specific energy goal of the NDP was to foster

an environment which would promote fast and efficient expansion of the energy sector in order to meet the anticipated growth in the country's energy demand and infrastructure needs.

Prior to 1995, PEMEX controlled all facets of the oil and natural gas industry, including downstream activities such as the refining and distribution of product. In May 1995, several articles of the Regulatory Law of Article 27 (petroleum bylaws) of the Constitution were modified. By amending Article 27 of its Constitution, which had decreed energy development and distribution the sole province of PEMEX, private companies (including foreign) were given the right to participate in natural gas storage, transportation and distribution activities. With regard to natural gas, PEMEX's monopoly was now confined to exploration and production, gathering, basic petrochemicals, and "first-hand sales." Although Mexican energy law still gives PEMEX the sole right to explore and develop oil and gas resources, it allows non-Mexican firms to participate in joint ventures for up to 49% of its equity share.

Consistent with NAFTA's goals of promoting market-oriented cross-border trade and establishing a predictable and stable regulatory environment for private investment, the Mexican Government took additional steps to reduce PEMEX's monopoly role in October 1995 by redefining the role of the CRE. The CRE had its power expanded by giving it regulatory oversight of both the natural gas and electricity industries. The CRE now had authority to regulate the construction, operation and ownership of power generation and natural gas transportation, storage and distribution systems. In implementing its new authorities, the CRE adopted new rules in October 1995 designed to open certain oil and natural gas pipeline and distribution projects to a competitive bidding process.

Closely following the structural reforms of 1995, in February 1996, Mexico's Secretary of Energy announced a five-year plan entitled: *Programme for the Development and Restructuring of the Energy Sector 1995-2000*. Included in this plan was a directive to PEMEX stating that its two principal objectives during this five-year period would be to (1) eliminate activities that did not contribute significantly to improving its competitive position and (2) to sell off non-strategic operations to the private sector [*Regulatory Reform In Mexico's Natural Gas Sector*, International Energy Agency, 1996, p. 32].

Mexico's amended energy regulations now allow private firms to own and operate natural gas pipelines, natural gas distribution systems and gas storage facilities. For example, during 1998, the CRE awarded six distribution permits and 19 transportation permits. The CRE stated that these permits "...represent an investment of $790 million dollars for the next five years and the availability of natural gas to 1.5 million customers." [CRE's *Annual Report*, page13.] However, the Foreign Investment Law limits foreign participation in the construction of new natural gas pipelines to 49 percent of the costs. This 49 percent foreign investment limitation may be exceeded if approved by Mexico's Foreign Investment Commission [Source: CRE Web Site: www.cre.gob.mx (booklet 2, the regulation of natural gas in Mexico)].

On February 3, 1999, Mexico's President Zedillo submitted a proposal to Congress asking it to amend Articles 27 and 28 of the Mexican Constitution. The proposal is intended to be the basis for a major structural reform of the Mexican electricity industry by increasing the opportunity for private investment and introducing competition, especially in the areas of generation and marketing. Under the proposed framework, new merchant plants would be encouraged to enter into the marketplace and allowed to sell directly to distribution companies and large industrial customers. In addition, the reform program also would transform the current state-owned entities, e.g., CFE, into specialized generation companies and distribution companies, and a transmission company; create two new independent state-owned entities in charge of system and market operations and of nuclear generation; and develop regulations by which the CRE would regulate electrical transmission and distribution systems. The long-term goal of the proposal is to establish an electricity industry that is capable of providing a reliable, high quality and competitively priced commodity. The Mexican Government believes

structural reform is necessary in order for the electricity sector to meet the anticipated growth in demand of 13 gigawatts (GW) over the next six years. This represents about a third of the country's current electricity generation capacity. The Government estimates that $25 billion will be needed to increase the supply of electricity and to modernize the transmission and distribution systems. Much of this expected growth in electricity generation will be fueled by natural gas. The SE recently forecasted that the Mexican electricity industry will increase its natural gas consumption by 20 percent a year through 2007; this growth in demand is expected to come from the fuel conversion of existing plants and new power plants being built.

In June 1999, the CRE issued a new Directive outlining the manner in which PEMEX must provide natural gas transportation service through its nationwide system. The new rules, which are intended to increase competition in the natural gas sector, attempt to establish a balance between the rights and obligations of PEMEX and the users of the transportation system. The Directive establishes the general conditions for providing transportation services, including the terms for open access, description of available services, and the general methodology to be used in determining tariffs. The Directive also requires PEMEX to invest $436 million over the next five years in order to improve and expand its nationwide pipeline system under optimum safety standards. The CRE also plans to issue another Directive in the near future to cover the general conditions for PEMEX's "First Hand Sales", which is currently undergoing public consultation.

Lastly, a major hurdle was cleared on August 16, 1999, when Mexico's President Zedillo announced that Mexico would remove its controversial import tariff that was levied at 4% of the value of the gas imported. Although the tariff on gas imports was going through a gradual phase-out that would have been eliminated it by January 2003, many U.S. producers had argued that the tariff gave PEMEX an unfair advantage and was no longer consistent with Mexico's 1995 energy initiatives to transition from state-run energy monopolies to a more responsive free market system more apt to respond to the demands of the marketplace. This action, coupled with the earlier regulatory changes during the year, essentially establishes Mexico's basic natural gas regulatory framework.

III. OUTLOOK FOR U.S./MEXICO CROSS-BORDER GAS TRADE

As described in the previous section, Mexico's energy sector for the past five years has been undergoing fundamental policy and cultural changes which favor competition and private investment over its previous structure of a state-owned energy monopolies. This new, more open market approach has already produced tangible results. According to the CRE's *Annual Report*, between 1996 and 1998 the CRE issued 119 electricity generation and import permits, and 46 natural gas transportation and distribution permits. These permits accounted for private investments worth $3.77 billion to build and operate 5,460 MW of generating capacity and some $1.43 billion for the building and operation of 15,000 miles of pipeline within Mexico.

Based on data compiled by the U.S.-Mexico Chamber of Commerce, the total value of U.S.-Mexico trade increased by 113 percent between the years of 1993 and 1998. Currently, the Chamber states that Mexico has replaced Japan as the second largest export market for the United States – Canada is the largest [Trade press release]. Data released by the U.S. Department of Commerce indicate that trade with Mexico during the first six months of 1999 reached $91 billion, a 7 percent increase over the first six months of 1998. During the first half of 1999, the U.S. Chamber of Commerce calculated that Mexico bought about 12 percent of its total exports from the United States, while Mexican products represented about 11 percent of total U.S. imports.

Several energy forecasts remain extremely bullish with regard to expansion of the Mexican natural gas market. A recent study completed by the Mexican SE stated that national natural gas demand is expected to show an annual growth of 9.2 percent during the next nine years [*Investment Opportunities in the Natural Gas Market in Mexico*]. In comparison, the DOE's Energy Information Administration (EIA) estimates that

Mexican domestic natural gas demand will grow 3.8 percent annually, with about half of that demand by 2020 going to generate electricity [*International Energy Outlook 1999*]. The EIA, in its *Annual Energy Outlook,* estimates that U.S. net natural gas exports to Mexico will increase to 170 Bcf per year by 2020.

Like the United States, Mexico's growth in natural gas demand is expected to come largely from increased use of gas in generating electricity. In addition to the new gas-fired plants scheduled to come on-line during the next few years, Mexico also is in the process of converting many older fuel oil based powerplants to cleaner natural gas to comply with stricter air quality regulations that became effective in 1998. The Mexican SE recently estimated that between 1998 and 2007, natural gas use will grow the fastest in the electricity sector, with an annual growth rate of about 20 percent. Much of the growth in electricity and natural gas demand is expected to come from the *maquiladora* sector, or manufacturing and assembly plants located near the U.S./Mexico border set up to take imported raw goods and parts (mainly from the U.S.) for export of finished products to Mexico's trading partners. Those industries designated "maquiladora" status are exempt from paying tariffs on imported raw materials and components as long as the final product is exported back to the United States. Mexican President Ernesto Zedillo estimates that between 1995 and May 1999 the number of maquiladora plants increased from 2,100 to over 3,200 [press release, Office of the President, August 10, 1999]. The forecasted increases in energy demand in the maquiladora sector offers sales opportunities for the U.S. natural gas producers. U.S. gas producers are located near the areas of anticipated growth while Mexico's current pipeline infrastructure and gas production areas are not strategically located to meet this demand.

IV. U.S./MEXICAN GAS TRADE SINCE 1995

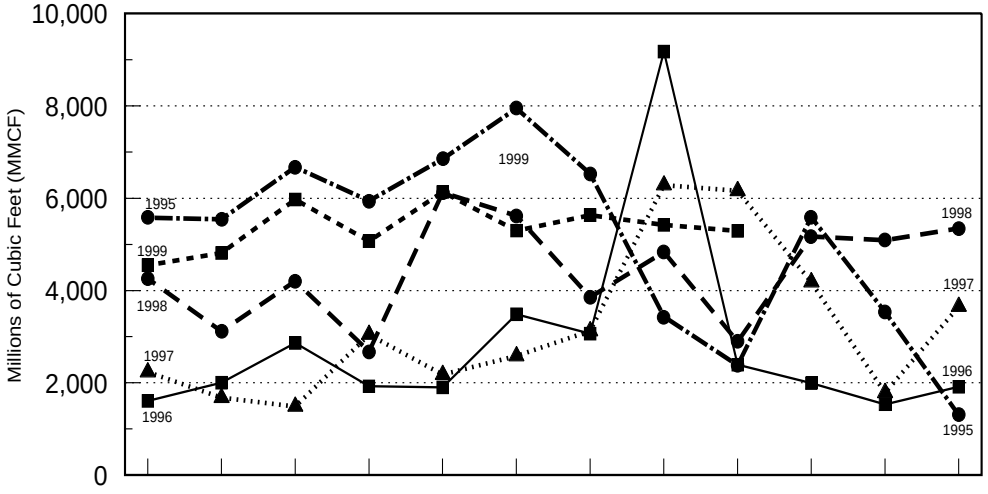
Figure 3 shows the monthly natural gas exports to Mexico from January 1995 through September 1999. After generally drifting lower in 1996 and 1997, U.S. natural gas exports to Mexico staged a recovery in 1998, reaching just over 53 Bcf. As shown, the highest annual level of gas exports took place in 1995. Most of the growth in gas exports in 1998 may be directly attributed to increased sales on the Samalayuca Pipeline near Clint, Texas. During its first full year of operation, this pipeline became the principal transporter of gas exports to Mexico, carrying more than 58 percent of the gas export volumes. Most of the gas exported on this pipeline is used to fuel the gas-fired Samalayuca Power Plants I and II (23 miles south of Ciudad Juarez). For the first three quarters of 1999, total natural gas exports to Mexico were at 48.2 Bcf – at this rate, gas exports for the year will total approximately 65 Bcf. During the first nine months of 1999, Clint, Texas, continues to be the dominant export point, with 33.6 Bcf, or almost 70 percent of all export volumes transported on these pipeline facilities. **Figure 4** shows that the pricing picture for gas exports has improved significantly for U.S. producers since 1995. Since 1995, the average export price of domestic gas sold to Mexico has increased from $1.48 per MMBtu to $2.19 per MMBtu for the first nine months of 1999 -- this represents a 48 percent increase.

Figure 3

NATURAL GAS EXPORTS TO MEXICO

1995 - 1999 (1ST THREE QUARTERS)

MONTHLY VOLUMES



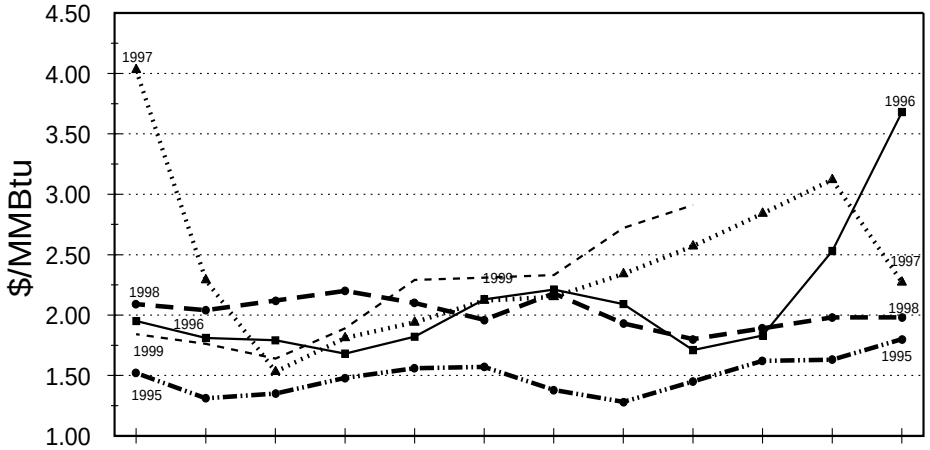
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1995	5,576	5,542	6,670	5,941	6,848	7,945	6,526	3,431	2,378	5,588	3,535	1,303	***61,283***
1996	1,607	2,000	2,860	1,924	1,899	3,486	3,062	9,176	2,389	1,990	1,533	1,914	***33,840***
1997	2,231	1,677	1,486	3,044	2,177	2,579	3,122	6,282	6,159	4,182	1,782	3,650	***38,372***
1998	4,257	3,117	4,202	2,675	6,119	5,617	3,852	4,835	2,892	5,170	5,088	5,342	***53,165***
1999	4,548	4,809	5,971	5,068	6,133	5,296	5,632	5,419	5,289	--	--	--	***48,165***

Figure 4

NATURAL GAS EXPORTS TO MEXICO

1995 - 1999 (1ST THREE QUARTERS)

WEIGHTED AVERAGE PRICE



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG
1995	1.52	1.31	1.35	1.48	1.56	1.57	1.38	1.28	1.45	1.62	1.63	1.80	***1.48***
1996	1.95	1.81	1.79	1.68	1.82	2.13	2.21	2.09	1.71	1.83	2.53	3.68	***2.09***
1997	4.03	2.29	1.53	1.81	1.94	2.12	2.15	2.34	2.57	2.84	3.12	2.27	***2.43***
1998	2.09	2.04	2.12	2.20	2.10	1.96	2.18	1.93	1.80	1.89	1.98	1.98	***2.02***
1999	1.84	1.76	1.64	1.89	2.29	2.31	2.33	2.72	2.91	--	--	--	***2.19***

Figure 5 identifies the 21 firms that exported a total of 48.2 Bcf during the first three quarters of 1999 and indicates the market share of the seven largest exporters. As shown, the largest exporter of natural gas to Mexico is Pemex Gas; its market share has grown from 10 percent in 1998 to 49 percent during the first three quarters of 1999.

Figure 6 depicts the level of gas imports from Mexico since 1996. The graph illustrates that gas imports experienced growth in all years with the exception of 1998. The most dramatic increase in gas imports is taking place this year. For the first nine months of the 1999, gas imports from Mexico have totaled 40.6 Bcf; or an increase of 233 percent over last year's level of 12.2 Bcf for the nine-monrh period. Although the import volume continues to be relatively modest, it already has exceeded the annual imports for the past 14 years. One has to go back to 1984 before the level of imports from Mexico exceeds the current level being imported. At the current import rate, it seems likely that gas imports from Mexico will closely match gas exports to Mexico through the year 2000. PEMEX officials believe that Mexico will be a net exporter in 2000, a net importer from 2001-2005, and a net exporter after 2005 [*Natural Gas Week* , October 4, 1999, p. 4]. **Figure 7** shows the monthly price of Mexican gas imports from January 1996 through the first nine months of 1999. Fossil Energy observes that even though Mexican gas import prices declined from $2.22 per MMBtu since 1996 to $2.09 per MMBtu for the first nine months of 1999, or about 5.9%, there was a 4.8% increase in U.S. gas export prices to Mexico for the same time period.

Figure 5

LEADING EXPORTERS TO MEXICO FOR 1ST THREE QUARTERS OF 1999

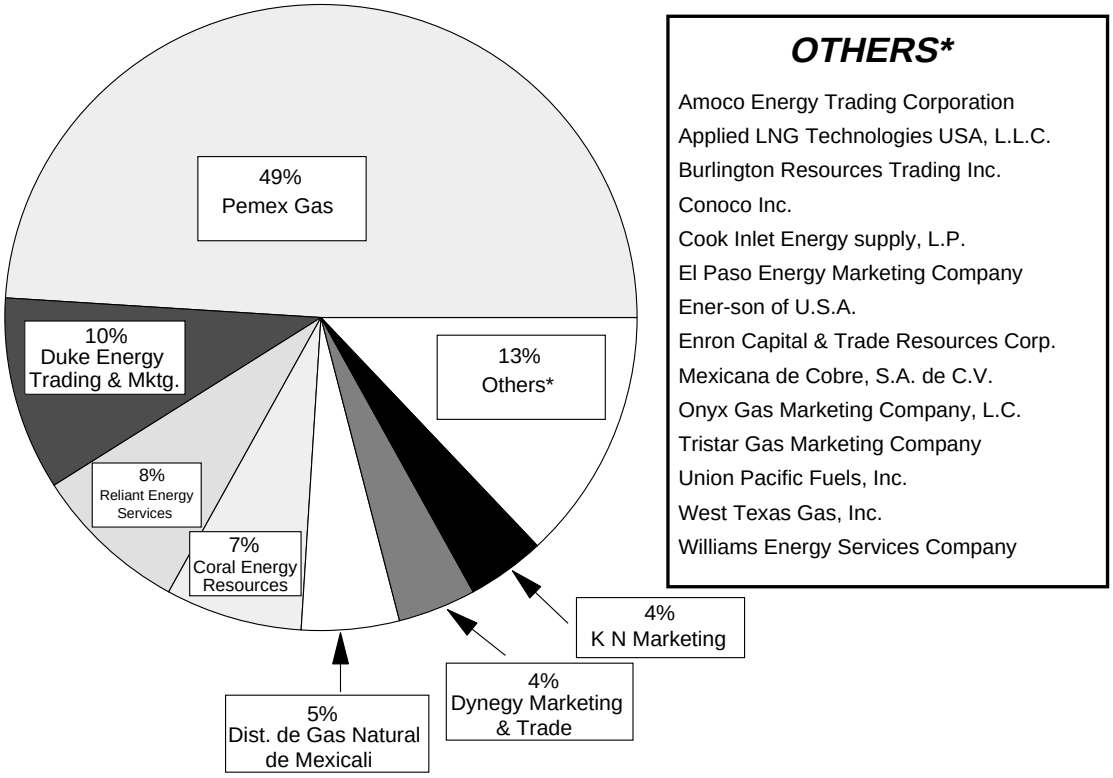
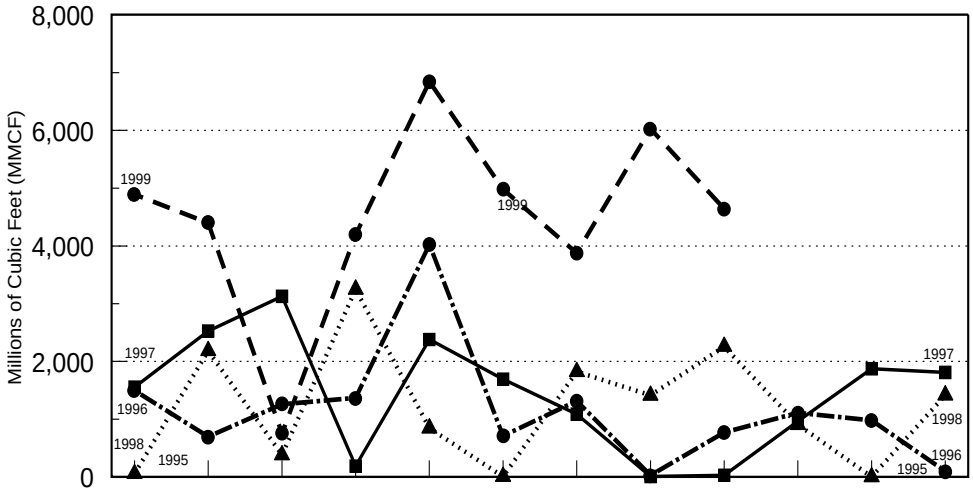


Figure 6

NATURAL GAS IMPORTS FROM MEXICO

1996 - 1999 (1ST THREE QUARTERS)

MONTHLY VOLUMES



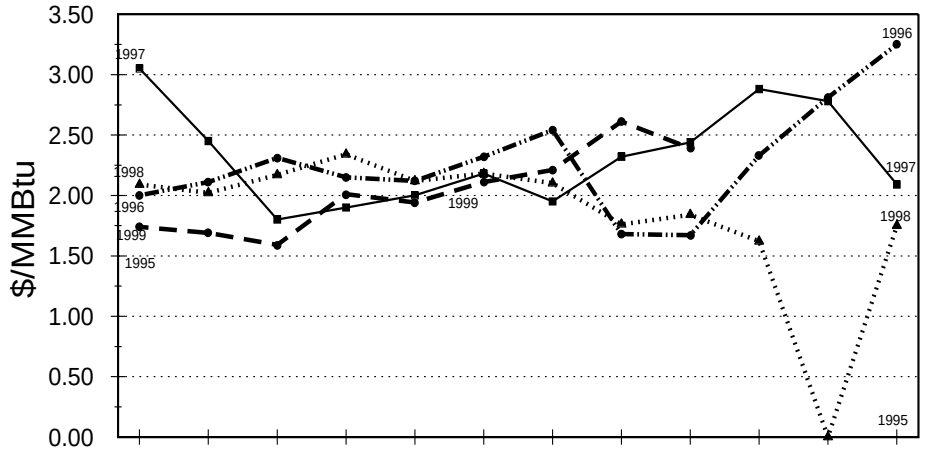
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	***TOTAL***
1996	1,498	697	1,259	1,368	4,024	711	1,313	29	770	1,109	981	96	***13,861***
1997	1,554	2,525	3,126	189	2,380	1,692	1,087	6	29	965	1,874	1,810	***17,243***
1998	55	2,183	380	3,248	845	5	1,820	1,412	2,257	905	0	1,417	***14,532***
1999	4,891	4,397	751	4,193	6,843	4,978	3,876	6,028	4,643	—	—	—	***40,601***

Figure 7

NATURAL GAS IMPORTS FROM MEXICO

1996 - 1999 (1ST THREE QUARTERS)

WEIGHTED AVERAGE PRICE



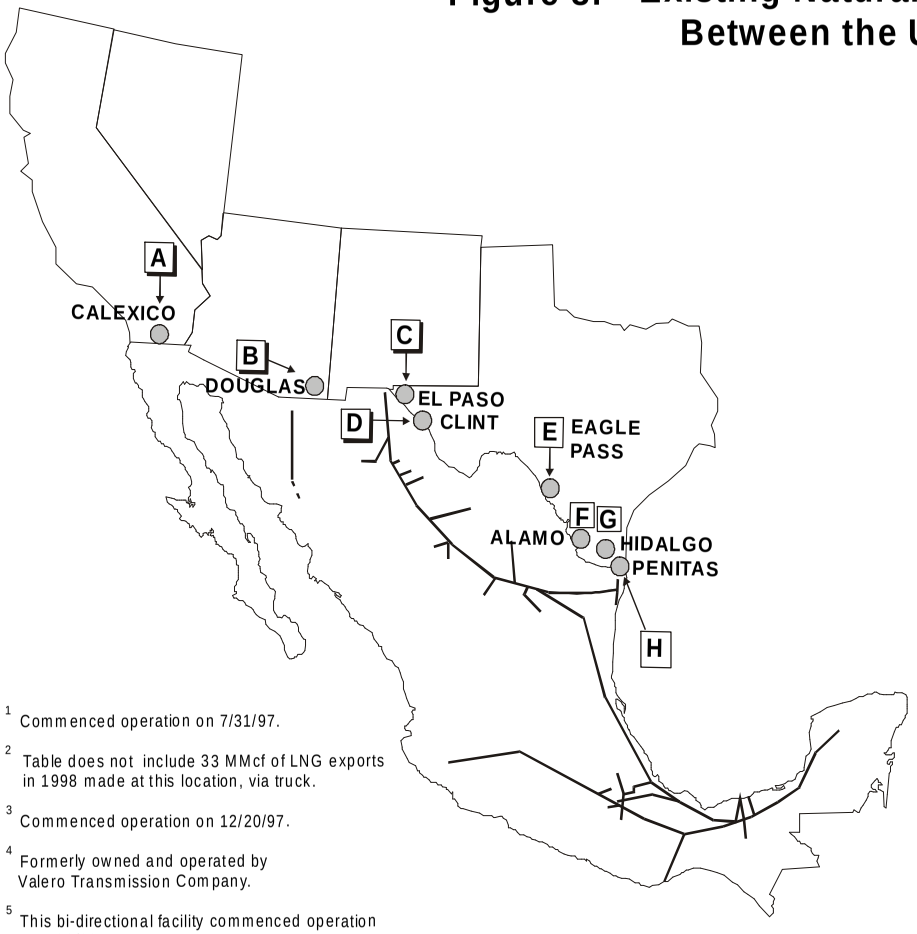
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	***AVG***
1996	2.00	2.11	2.31	2.15	2.12	2.32	2.54	1.68	1.67	2.33	2.81	3.25	***2.22***
1997	3.05	2.45	1.80	1.90	2.00	2.18	1.95	2.32	2.44	2.88	2.78	2.09	***2.28***
1998	2.09	2.02	2.17	2.34	2.12	2.18	2.10	1.76	1.84	1.62	0.00	1.75	***2.01***
1999	1.74	1.69	1.59	2.01	1.94	2.11	2.21	2.61	2.39	—	—	—	***2.09***

V. EXISTING AND PLANNED CROSS-BORDER GAS PIPELINE INFRASTRUCTURE

Figure 8 is a map showing the identity and general location of the eight existing natural gas pipelines used in transporting natural gas between Mexico and the United States. It is estimated that the aggregate cross-border pipeline capacity is 1,370 MMcf/day, or approximately 500 Bcf per year. Several of these pipelines are bi-directional and may be used for both exports and imports. In addition to the map, **Figure 8** also includes two Tables: one Table lists the pipelines used to export natural gas to Mexico over the past nine years and the second Table lists the pipelines used to import gas from Mexico during the same time period. Inasmuch as the Texas Eastern and PG&E Texas pipelines are used to import and export, they are included in both Tables. The two Tables show the estimated daily pipeline capacities for all eight pipelines and provides there actual average daily throughout for exports and imports from 1992 through the first nine months of 1999. The Tennessee Pipeline, which became operational on September 23, 1999, is also capable of both importing and exporting natural gas; however, it is currently only being used to import gas. Based on recent filings from natural gas importers, the average daily throughput on this new pipeline during the first seven days of commercial operation was about 140 MMcf/day.

During the past seven years, there have been quite a few proposals filed with the FERC to build additional pipeline capacity to serve the anticipated growth in Mexican gas demand. However, a number of these proposed projects are no longer viable because of company mergers, competition, and changing markets. **Figure 9** lists six proposed pipelines which are considered by their sponsors to be viable pipeline projects. If all of these pipelines were built, they would increase the average throughput capacity of the cross-border pipelines by 1040 MMcf/day, or by approximately 380 Bcf per year. The following pages provide brief descriptions of the six proposed pipeline projects. The project descriptions contain information on location, ownership/sponsorship, pipeline size and capacity characteristics, date of projected commercial start-up, capital costs, markets to be served, and project regulatory status.

Figure 8. Existing Natural Gas Pipeline Interconnects Between the United States and Mexico



[1] Commenced operation on 7/31/97.

[2] Table does not include 33 MMcf of LNG exports in 1998 made at this location, via truck.

[3] Commenced operation on 12/20/97.

[4] Formerly owned and operated by Valero Transmission Company.

[5] This bi-directional facility commenced operation on 9/23/99.

[6] Facility commenced operation on 8/1/92; formerly Valero Transmission.

[7] Both of these import points have facilities that are bi-directional, but are being used primarily to import natural gas from Mexico.

EXPORT POINTS

Existing Exit Points	Pipeline	Estimated Capacity (MMcf/d)	Est. Daily Load Factor							
			1992	1993	1994	1995	1996	1997	1998	1999
A. Calexico, CA [1]	SoCalGas	25	0	0	0	0	0	2	6	10
B. Douglas, AZ [2]	El Paso Nat Gas	35	4	4	4	7	9	11	11	10
C. El Paso, TX	Norteño Pipeline	90	45	25	31	40	37	49	20	18
D. Clint, TX [3]	Samalayuca	212	0	0	0	0	0	10	85	123
E. Eagle Pass, TX	West Texas Gas [4]	38	2	2	3	2	3	3	4	5
F. Alamo, Tx [5]	Tennessee Pipeline	220	0	0	0	0	0	0	0	0
G. Hidalgo, TX	Texas Eastern	350	147	21	30	31	21	33	16	9
H. Penitas, Tx [6]	PG&E Texas	400	62	52	62	88	23	8	3	0
	Totals:	1370	260	104	130	168	93	116	145	175

IMPORT POINTS

Existing Import Points	Pipeline	Estimated Capacity (MMcf/d)	Est. Daily Load Factor							
			1992	1993	1994	1995	1996	1997	1998	1999
F. Alamo, TX	Tennessee Pipeline	220	0	0	0	0	0	0	0	4
G. Hidalgo, TX [7]	Texas Eastern	350	0	3	5	16	37	47	40	145
H. Penitas, Tx [7]	PG&E Texas	400	0	0	0	2	1	0	.1	0
	Totals:	970	0	3	5	18	38	47	40	149

Sources: Data derived from quarterly reports filed with Fossil Energy by natural gas exporters and filings before the FERC.

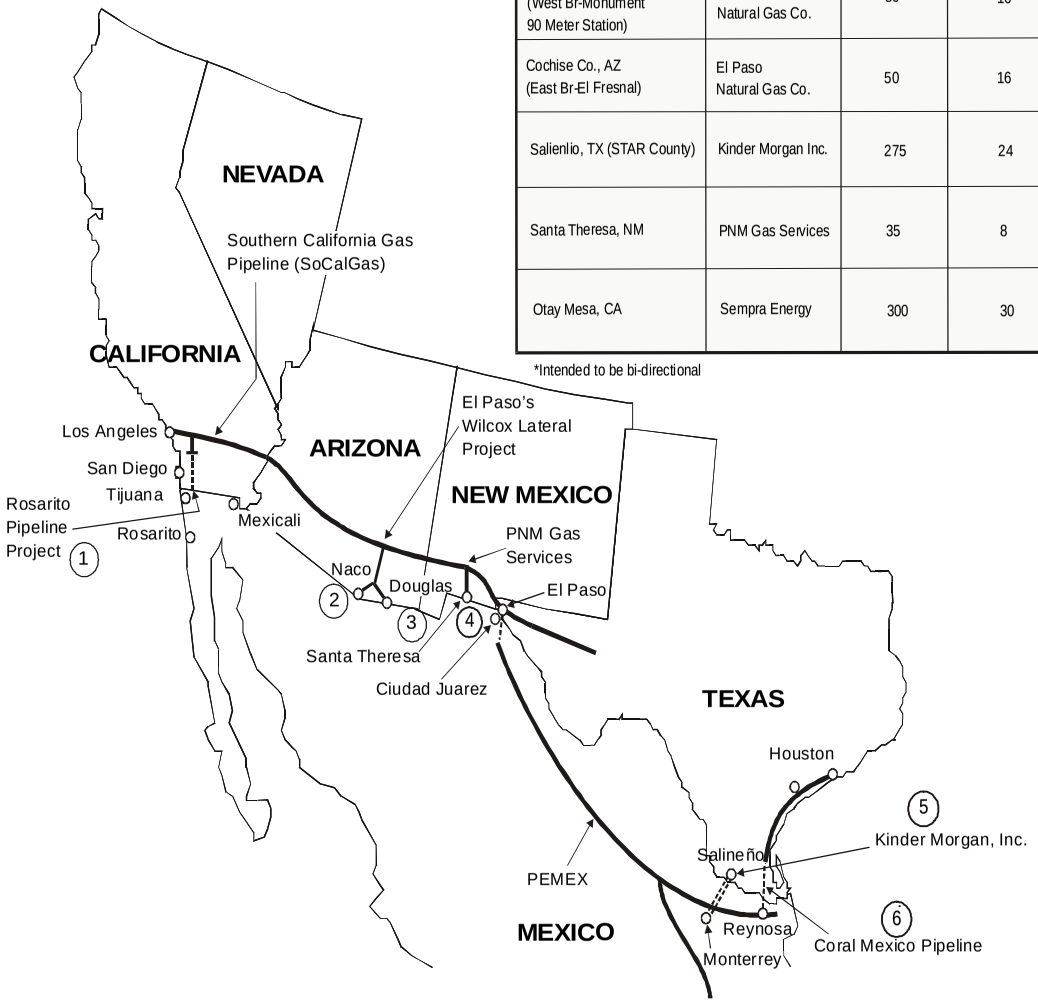
North American Gas Trade * North American Gas Trade * North American Gas Trade * North American Gas Trade * North American Gas Trade

Figure 9. Planned Natural Gas Pipeline Projects Designed to Facilitate Cross-Border Trade Through 2001

Proposed And Recently Completed Export Pipeline

Delivery Point	Pipeline Sponsor	Estimated Capacity (MMcf/D)	Pipeline Diameter (inches)	FERC Docket No.	Planned Markets	Status	Tentative Startup
*Hidalgo Co., TX (King Ranch Meter Station)	Coral Mexico Pipeline LLC	300	24	CP99-564	U.S. & Mexico	FERC Approval on 11/12/99	4th quarter 2000
Cochise Co., AZ (West Br-Monument 90 Meter Station)	El Paso Natural Gas Co.	80	16	CP99-322	Existing & planned power plants near the city of Hermosillo, Sonora (170 mi. SW of Naco, AZ)	Awaiting FERC Approval	4th quarter 2000
Cochise Co., AZ (East Br-El Fresnal)	El Paso Natural Gas Co.	50	16	CP99-323	Planned El Fresnal power plant located near city of Agua Prieta, Sonora (7 mi. S of Douglas, AZ)	Awaiting FERC Approval	4th quarter 2000
Salienlio, TX (STAR County)	Kinder Morgan Inc.	275	24	CP96-583	Monterrey, MX (LDLs, industrial users, power plants)	On 12/17/97, FERC issued Amended Sec 3 Authorization & Presidential Permit	3rd quarter 2000
Santa Theresa, NM	PNM Gas Services	35	8	CP93-98	Plans to save Santa Theresa Industrial Park in Chihuahua, Mexico	On 08/06/93, FERC issued a Sec 3 permit and Presidential Permit	1st quarter 2000
Otay Mesa, CA	Sempra Energy	300	30	CP93-117	Industrial and commercial users in Baja, CA (primarily the Rosarito Power Station, S of Tijuana)	On 12/17/97, FERC issued Amended Sec 3 Authorization & Presidential Permit	1st quarter 2000

*Intended to be bi-directional



North American Gas Trade * North American Gas Trade * North American Gas Trade * North American Gas Trade * North American Gas Trade

CORAL MEXICO PIPELINE, L.L.C.

Owner(s):	Coral Mexico Pipeline, L.L.C. (Coral) is a Delaware corporation located in Houston, Texas, and an indirect subsidiary of Tejas Energy, L.L.C.
Location/Description:	The proposed facilities will consist of 1,375 feet of 24-inch pipeline which will connect with existing and new natural gas pipelines operated in Mexico by Petroleos Mexicanos (PEMEX). Coral would build a 97-mile, 300,000 Mcf/day pipeline between Kleburg County and Hidalgo County, Texas to the border that will serve PEMEX downstream at Arguelles, Mexico.
Summary:	The 1,375 foot pipeline would be for a border crossing, whereas the new 97-mile pipeline would be operated wholly within two Texas counties which connect upstream with Tejas Energy pipeline facilities. In addition, Coral plans to construct 2 miles of pipeline south of the U.S./Texas border to Arguelles, Mexico for PEMEX to connect with PEMEX's pipeline facilities.
Length/Diameter:	97 miles (Kleburg County and Hidalgo County, Texas)
Projected In-Service Date:	November 2000
Daily Pipeline Capacity:	300 MMcf
Capital Costs:	$500,000 (border crossing)
Proposed Market(s):	Mexico and U.S. -- pipeline would be bi-directional allowing gas to be either exported of imported.
Status:	Coral filed an application with the FERC on June 18, 1999 (Docket No. CP99-564), for a Natural Gas Act section 3 authorization and Presidential Permit to construct natural gas pipeline facilities at the United States-Mexican border. FERC approved the project on November 12, 1999.

EL PASO NATURAL GAS (WILLCOX BRANCH LATERALS)

Owner(s):	El Paso Natural Gas Company (El Paso) is a subsidiary of El Paso Energy.
Location/Description:	El Paso's Willcox Lateral pipeline project consists of a 20-inch pipeline to be constructed 56-miles downstream from its California mainline where it would separate into two branch lines that will end about 15 miles apart at the U.S./Mexican border. The two 16-inch laterals, both in Cochise County, Arizona, consist of an eastern lateral that terminates near Naco, Arizona (known as the Willmex export point) and a western lateral which terminates near Douglas, Arizona (known as the El Fresnal export point).
Summary:	El Paso plans to export up to 130 MMcf/day to existing and proposed gas-fired electric powerplants located in the Mexican State of Sonora -- serving utilities near the cities of Hermosillo and Agua Prieta. While the eastern branch or Willmex export point will connect with existing PEMEX pipeline facilities, the western branch or El Fresnal export point will connect with new pipeline facilities not affiliated with PEMEX.
Length/Diameter:	The Willcox Lateral would be a 20-inch, 56-mile lateral that separates into two 16-inch branch lines ending at the Arizona/Mexican border. The West Branch line would be 2.9 miles and East Branch 12.2 miles.
Projected In-Service Date:	Fourth quarter 2000
Daily Pipeline Capacity:	80 MMcf -- West Branch 50 MMcf -- East Branch
Capital Costs:	$30.2 million
Proposed Market(s):	Gas-fired electric powerplants located near the cities of Hermosillo and Agua Prieta, Sonora, Mexico
Status:	On April 16, 1999, El Paso filed two applications with the Federal Energy Regulatory Commission (FERC) in dockets CP-322 and CP-323 for a certificate of public convenience and necessity authorizing the construction and operation of the Willcox Lateral facilities in Cochise County, Arizona. To date, the FERC has not yet issued a decision with regard to these two applications.

KN ENERGY MONTERREY PIPELINE

Owner(s):	KN Energy, Inc., of Lakewood, Colorado
Location/Description:	KN Energy plans to build a new cross-border natural gas pipeline near Salineño, Starr County, Texas, and Ciudad Miguel Aleman, Tamaulipas. The facilities would consist of an 800 foot, 24-inch diameter pipeline and meter. The proposed new cross-border facility would interconnect with 15-miles of new pipeline to be built upstream in Texas by KN Energy's MidCon Texas Intrastate Pipeline, and new pipeline facilities to be built in Mexico by KN Energy's Mexican affiliate, MidCon Gas Natural de Mexico, S.A. de C.V. (MidCon Mexico). MidCon Mexico would take delivery of the natural gas near Ciudad Miquel Aleman, and transport the gas 100 miles to Monterrey, Mexico.
Summary:	On June 19, 1996, MidCon Texas Pipeline Corporation (predecessor to KN Energy) filed an application with the FERC (CP96-583) for a Natural Gas Act section 3 authorization and Presidential Permit to construct and operate the proposed cross-border facilities.
Length/Diameter:	800 feet/24-inch
Proj. In-Service Date:	Mid-2000
Daily Pipeline Capacity:	275 MMcf
Capital Costs:	$50 million (cost for the entire pipeline system from Texas to Monterrey, Mexico)
Proposed Market(s):	Monterrey, Mexico (electric generating facilities, industrial users, LDCs)
Status:	On November 26, 1996, the FERC approved the proposed cross-border facilities. On July 11, 1997, MidCon Texas refiled with the FERC to amend its planned pipeline border crossing by moving it about two miles from the original export point. On December 17, 1997, the FERC issued an Order approving the revised proposal, with certain environmental conditions. On July 30, 1999, KN Energy completed its open season for the planned 108-mile Monterrey Pipeline, the pipeline which would connect its Texas intrastate system to customers in Monterrey, Mexico. Although the open season was relatively successful, there is current uncertainty concerning the timing of the project because KN Energy is currently in the process of merging with Kinder Morgan, Inc. The new company will be called Kinder Morgan, Inc. and has tentatively decided to sell off all of KN Energy's international assets, including this cross-border facility and proposed downstream pipeline to Monterrey.

PNM GAS SERVICES PROJECT

Owner(s):	Public Service Company of New Mexico
Location/Description:	PNM Gas Services (PNM-GS), a Division of Public Service Company of New Mexico, plans to construct and operate a new pipeline facility at the United States/Mexico border near Santa Theresa, New Mexico. The pipeline would connect with a PEMEX pipeline and would supply an industrial park just across the border in Chihuahua, Mexico. In order to facilitate these exports, PNM-GS also proposes to build a 22-mile pipeline connecting its existing distribution system around Sunland Park, New Mexico, to a new tap on El Paso Natural Gas Company's system. This would allow PNM-GS to serve existing and potential customers in New Mexico, in addition to Mexico.
Summary:	PNM-GS estimates that it would sell 4 Bcf of gas per year to customers of the industrial park in Mexico. However, PNM-GS does not have any contracts at this time.
Length/Diameter:	150 feet/8-inch
Projected In-Service Date:	Fourth Quarter 2000
Daily Pipeline Capacity:	35,000 Mcf
Capital Costs:	$3 million
Proposed Market(s):	Mexico (Santa Theresa Industrial Park), New Mexico
Status:	The FERC approved the new border lateral on August 6, 1993 (Docket No. CP93-98). To date, no construction has started on this project. In an Order issued September 16, 1997, DOE approved a request by the Public Service Company of New Mexico for a two-year blanket authorization to import up to 300 Bcf and export up to 300 Bcf of natural gas from and to Canada and Mexico (Order 1299, Docket 97-61-NG).

ROSARITO PIPELINE PROJECT

Owner(s):	San Diego Gas and Electric Company (SDG&E) and Sempra Energy International, subsidiaries of Sempra Energy
Location/Description:	SDG&E plans to construct and operate a new international border crossing facility at Otay Mesa, San Diego County, California for the export of natural gas to Mexico. The facility, located just north of Tijuana, will consist of a 100 foot by 120 foot meter station and 400 feet of 30-inch pipeline leading from the meter station to the International Border. In addition, SDG&E will construct a three mile-long upstream extension that will interconnect directly with the border-crossing facilities. At the international border, Sempra Energy International will construct a 23-mile pipeline to the *Presidente Juarez* power plant in Rosarito, Baja California, south of Tijuana.
Summary:	The project is designed to deliver up to 300 MMcf per day of natural gas to new power plant facilities located at Rosarito, Mexico. In addition, the new pipeline and interconnection at the U.S./Mexico border will make natural gas available for the first time to many businesses and residents in several nearby cities, as additional distribution systems are being planned to serve the cities of Tijuana, Tecate, and Ensenada.
Length/Diameter:	4 miles/30-inch -- from SDG&E facilities to the U.S./Mexico border near Otay Mesa, California 23 miles/30-inch -- from U.S./Mexico border to the power plant in Rosarito, Baja California
Projected In-Service Date:	First Quarter 2000
Daily Pipeline Capacity:	Up to 300 MMcf
Capital Costs:	$35 million
Proposed Market(s):	The Rosarito power plant and other industrial and commercial gas markets in northern Baja, California.
Status:	The FERC issued an order authorizing the project on August 6, 1993 (Docket No. CP93-117). On June 22, 1998, SDG&E submitted an application to the FERC amending the Section 3 authorization and Presidential Permit issued on August 6, 1993. In its application, SDG&E requested: 1) to move the location of the proposed border crossing 1.73 miles east; 2) to

include only those facilities in the immediate vicinity of the International Border; 3) to reduce the diameter of the pipeline from the proposed meter station to the international border from 36 inches to 30 inches; and 4) to reduce the maximum capacity of the proposed facility from 500 MMcf/day to 350 MMcf/day.

On August 27, 1998, the Mexican Federal Electric Commision awarded Sempra Energy International a 10-year contract to deliver 300 MMcf/day of natural gas to serve the Rosarito Power Plant and to construct a 23-mile pipeline from the U.S./Mexico border to that site.

In an Order issued October 19, 1998, the FERC approved the request of SDG&E amending the Section 3 Authorization and Presidential Permit originally issued on August 6, 1993.

On May 20, 1999, the FERC issued an Order authorizing SDG&E to commence the construction of the border facilities.

On June 4, 1999, the Office of Fossil Energy in DOE/FE Opinion and Order No. 1487 granted Sempra Energy Trading authority to import up to 300 Bcf of natural gas and export 300 Bcf of natural gas from and to Canada and Mexico for a two-year term beginning June 16, 1999.