

Natural Gas Pipeline and System Expansions

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This special report examines recent expansions to the North American natural gas pipeline network and the nature and type of proposed pipeline projects announced or approved for construction during the next several years in the United States. It includes those projects in Canada and Mexico that tie in with U.S. markets or projects.

During 1996, 26 pipeline expansion projects were completed and placed in service in the United States. These projects either added capacity directly to the interstate network, improved local intrastate service, or expanded access to producing fields or natural gas market centers. Eight of the projects added capacity that increased interregional transmission capability by 687 million cubic feet (MMcf) per day: 487 MMcf per day in the United States and 200 MMcf per day into Canada (Table SR1). These eight projects plus four others increased daily interstate capability by 1,282 million cubic feet. This amount, however, was only 85 percent as much as the interstate capacity added in 1995. Moreover, while the total number of completed projects was slightly more than in 1995 (26 vs. 21), the total amount of pipeline capacity added, 2,548 MMcf per day, was well below the previous year's 3,450 MMcf per day, reflecting the smaller size of the 1996 projects.

Nevertheless, on an individual basis several significant projects were completed in 1996, including:

- **Completion of the lower section of the TransColorado pipeline system.** The southern 25-mile section of this proposed 266-mile pipeline system is now capable of moving 120 MMcf per day from the Ignacio area of the southern Colorado San Juan Basin to the Blanco hub in northern New Mexico (Figure SR1). When the northern section of the system is completed (proposed late 1998),¹ this recently completed section will expand its capability to more than 300 MMcf per day.
- **Completion of Transwestern Pipeline Company's San Juan Basin expansion.** The finish of this project has expanded capacity on the New Mexico side of the basin, thus relieving a bottleneck that has hindered the flow of production out of the area for several years. It has also improved producer access to customers located in the eastern and midwestern markets of the United States. During 1996, Transwestern also acquired the pipeline assets of Northwest Pipeline Company located between the Ignacio area of the San Juan Basin and the Blanco hub (which is operated by Transwestern). A consequence of this acquisition has been a greater integration of gathering and processing capabilities in the area and the elimination of some flow bottlenecks and production constraints.
- **Completion of the MidCon/TransTexas Pipeline from the North Bob West production field in south Texas to interconnections with the interstate system and market centers in the Katy area of east Texas.** The completion of this intrastate pipeline project (275 MMcf per day) links the largest new production area ever developed in south Texas and provides local producers access to the interstate marketplace for the disposition of their production. Production from, and linkages with, the Bob West field also figure predominately in the proposed development of several export pipelines to Mexico over the next several years.
- **Inauguration of the new offshore Shell Gas Pipeline and expansion of the Stingray system in the Gulf of Mexico.** This represents an additional 675 MMcf per day of access to the growing natural gas development in the deep waters of the Gulf. Although neither line is currently flowing at rated capabilities, these systems are expected to be fully supported within a year. Completion of these two projects represents the prelude to a massive proposed expansion of pipeline and gathering system development in the Gulf during the next several years. Fully 16 such projects are on the drawing board or are pending before the Federal Energy Regulatory Commission (FERC) or other jurisdictional agencies for approval (see next section).

¹The TransColorado Pipeline was originally slated for completion in mid-1992, but changing market conditions and other factors delayed construction until recently. The northern section will run from the Big Hole area of Rio Blanco County in northwest Colorado to the Ignacio area in southern La Plata County, Colorado.

Table SR1. Regional Summary of Interstate Pipeline Capacity and Planned Additions, 1995–2000

Region	Entering the Region ^a (MMcf/d)						Within the Region ^b (MMcf/d)					
	Capacity End of 1995	Added 1996	Capacity End of 1996	Percent Change from 1995	Proposed Additions to Capacity 1997-2000 ^c	Percent Change from 1996	Capacity End of 1995	Added 1996	Capacity End of 1996	Percent Change from 1995	Proposed Additions to Capacity 1997-2000	Percent Change from 1996
Western	10,080	0	10,080	0	0	0	26,129	0	26,129	0	13	^d
Southwest	2,520	375	2,895	15	180	6	57,512	899	58,411	2	3,836	7
Central	12,676	20	12,696	^d	1,437	11	37,077	42	37,119	^d	4,819	13
Midwest	24,682	55	24,736	^d	4,065	16	48,769	90	48,859	^d	11,558	24
Northeast	12,202	25	12,228	^d	1,862	15	45,881	75	45,956	^d	5,269	11
Southeast	21,586	12	21,598	1	87	^d	72,550	176	72,726	^d	1,682	2
U.S. Total	83,746	487	84,233	1	7,631	9	287,918	1,282	289,200	^d	27,177	9
Canada	2,409	200	2,609	8	0	0	NA	NA	NA	NA	NA	--
Mexico	889	0	889	0	1,200	47	NA	NA	NA	NA	NA	--

^aIncludes only the sum of capacity levels for the States and Canadian Provinces bounding the respective region.

^bRepresents the sum of the interstate pipeline capacity, or planned capacity, on a State-to-State basis as measured at individual State border crossing points. Does not include projects which are entirely within one State. Gulf of Mexico projects are considered within the Southwest or Southeast region.

^cNew capacity has been counted in only one region even though some projects may cross regional boundaries. In the case of a new line, the additional capacity has been included within the region in which it terminates. For an expansion project, the added capacity is included in the region where most of the expansion effort is focused.

^dLess than one-half of 1 percent.

MMcf/d = Million cubic feet per day. NA = Not available.

Sources: **Capacity:** Energy Information Administration (EIA), EIAGIS-NG Geographic Information System, Natural Gas Pipeline State Border Capacity Database, as of April 1, 1997. **Capacity Additions:** EIAGIS-NG Geographic Information System, Natural Gas Pipeline Construction Database, as of April 1, 1997, compiled from Federal Energy Regulatory Commission, Natural Gas Act Section 7(c) Filings, "Application for Certificate of Public Convenience and Necessity," and various natural gas industry news sources.

- Export capacity to Canada increased with the completion of two projects in the Midwest Region:** ANR Pipeline Company's "LINK" project (150 MMcf per day) and Great Lakes Gas Transmission Company's St. Clair Import Point Looping (50 MMcf per day). The LINK project supplies gas to a local Canadian distribution company, Niagara Gas Transmission Ltd. of Ontario, while the St. Clair project provides increased supply security and backup at the existing export point. Both projects improve the free flow of North American gas supplies and access to markets. A slight increase in capacity into the United States from Canada (20 MMcf per day) occurred with the completion of Viking Gas Transmission Company's Northern Looping project from Manitoba, Canada to Minnesota.
- Several multiyear projects were finally completed in 1996.** Northern Natural Gas Company's Iowa-Illinois expansion (107 MMcf per day) was finished in the latter part of the year, adding 35 MMcf per day in its final phase. Transcontinental Gas Pipeline Company completed the final phase of its Southeastern project covering a mainline capacity increase of 55 MMcf per day along its system

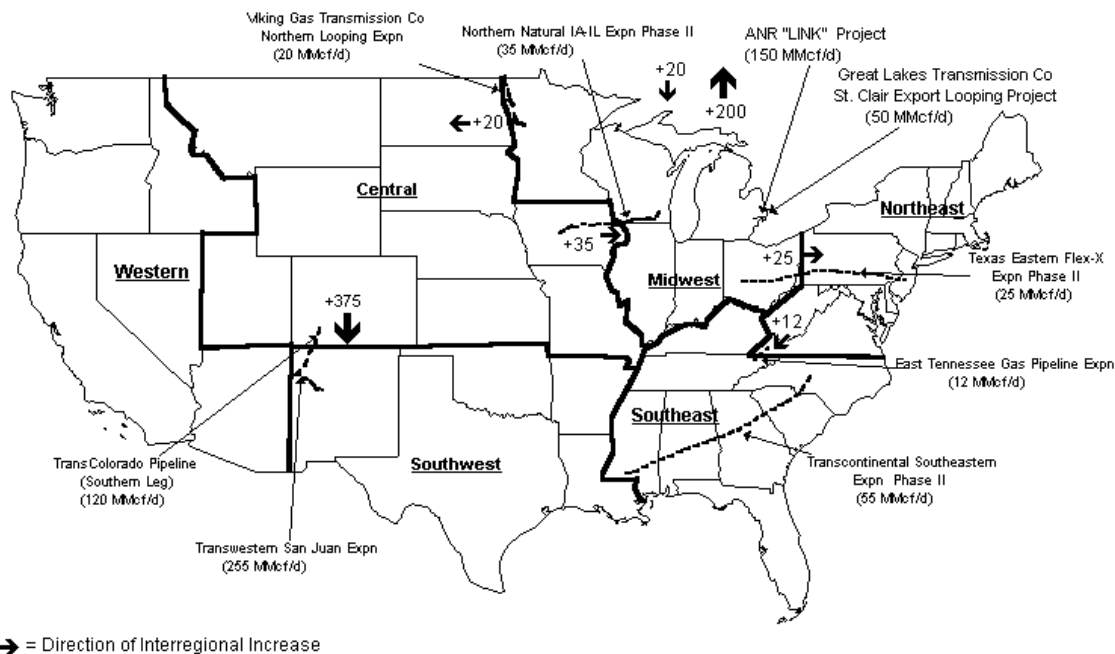
between Alabama and North Carolina. Texas Eastern Transmission Corporation's Flex-X and ITP projects were finalized with the completion of two local projects in Pennsylvania and added capacity on its line between Ohio and New Jersey.

The remainder of the projects completed in 1996 consisted of minor local projects that represented line or system upgrades of a specialized nature. In Kansas, for example, Western Resources Inc. constructed a 9-mile (55 MMcf per day) line between its Mid-Continent market center and local pipeline interconnections to improve the marketability of its services in the area.

Proposed Expansions

While the past several years have been a comparatively slow period for pipeline expansions, between now and the turn of the century a great deal of new pipeline capability is proposed for development throughout North America. Much of the proposed new pipeline construction can be grouped into several major focus areas. The most extensive development is focused on expanding the deliverability of Canadian gas to the U.S. Midwest and Northeast and to Canadian markets. Four

Figure SR1. Completed Interstate Pipeline Expansion Projects, 1996



Expn = Expansion.

Source: Energy Information Administration (EIA), EIAGIS-NG Geographic Information System, Natural Gas Pipeline State Border Capacity Database and Natural Gas Pipeline Construction Database, as of April 1, 1997.

new pipelines and several expansions are planned, which not only would improve access to natural gas supplies in western Canada but also to production from the developing Sable Island field in eastern Canada. The second-largest focus is on improving access to the increasing deep-water production in the Gulf of Mexico. Next are those projects whose objectives are to increase the flow of lower-cost supplies located in the Central United States to markets located primarily in the Midwest. Currently, the capability to do so is limited. The latter series of expansions will be competing, to some degree, with the projects slated to increase flows of western Canadian gas to the Midwest marketplace.

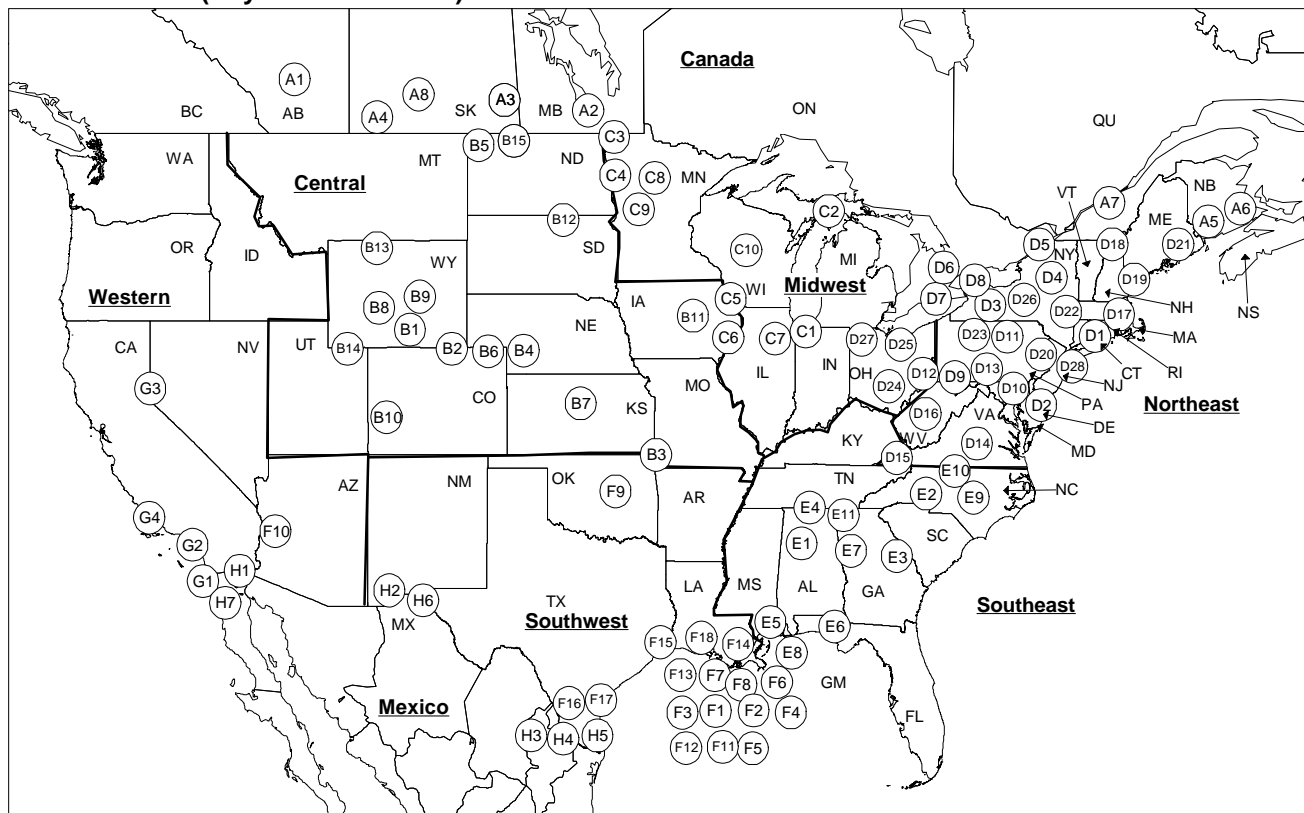
Although there is a question as to whether or not the market can support all these expansions, it must be kept in mind that these projects can proceed only if sufficient commitments are entered into by future customers.² Most

²Without firm customer commitments, neither the necessary regulatory approval nor any needed external financing will be forthcoming. Nevertheless, it is possible that some customers might back out of these commitments, which could leave the final implementation of a project in doubt.

of the proposed projects have undergone market testing through “open-season” offerings whereby potential customers have placed bids for future capacity on the proposed projects. The planned capacity of the proposed projects usually reflects the results of these open seasons and indicates that, at least at the moment, local distribution companies and other major customers believe demand will grow sufficiently to support the incremental supplies destined for these markets.

As of April 1, 1997, the Energy Information Administration was tracking approximately 88 proposed pipeline expansions and new pipeline projects at various stages of development in the United States, Canada, and Mexico (Figure SR2). Fourteen of these projects are slated to be phased in over several years or are jurisdictionally segmented (for instance, U.S. versus Canadian segments). If all U.S. projects were completed, the amount of new capacity would add more than 20 billion cubic feet of daily deliverability on the national network (six gathering system projects in the Gulf of Mexico, one project entirely in Mexico, and seven Canadian projects, some of which are counted in the U.S. projects, are not

Figure SR2. General Location of Major Proposed Pipeline Construction Projects, 1997–2000 (Keyed to Table SR2)



Source: Energy Information Administration (EIA), EIA GIS-NG Geographic Information System, Natural Gas Pipeline Construction Database, as of April 1, 1997.

included).³ Of all phases/projects (117 in total), 53 are tentatively scheduled for completion in 1997, 35 in 1998, 24 in 1999, and 5 in the year 2000.⁴ Forty-four of the projects call for development of new pipeline systems or facilities at new international border points.

Only 113 MMcf per day of additional pipeline capacity is proposed for the Western Region. This is not surprising since the region currently has an excess of interstate capacity. Between 1990 and 1995, interstate capacity within and into the region increased by 58 percent, from 16,545 to 26,129 MMcf per day, more than for any other

region. The Southeast has the next lowest amount of planned pipeline expansions, 2,695 MMcf per day, and only 13 proposed projects. Proposed capacity additions in the Southeast are geared, for the most part, toward improving specific services to customers in North and South Carolina, although four major projects are designed to increase regional access to deep water production in the Gulf of Mexico by as much as 1,650 MMcf per day by 1999.

Canadian Connections

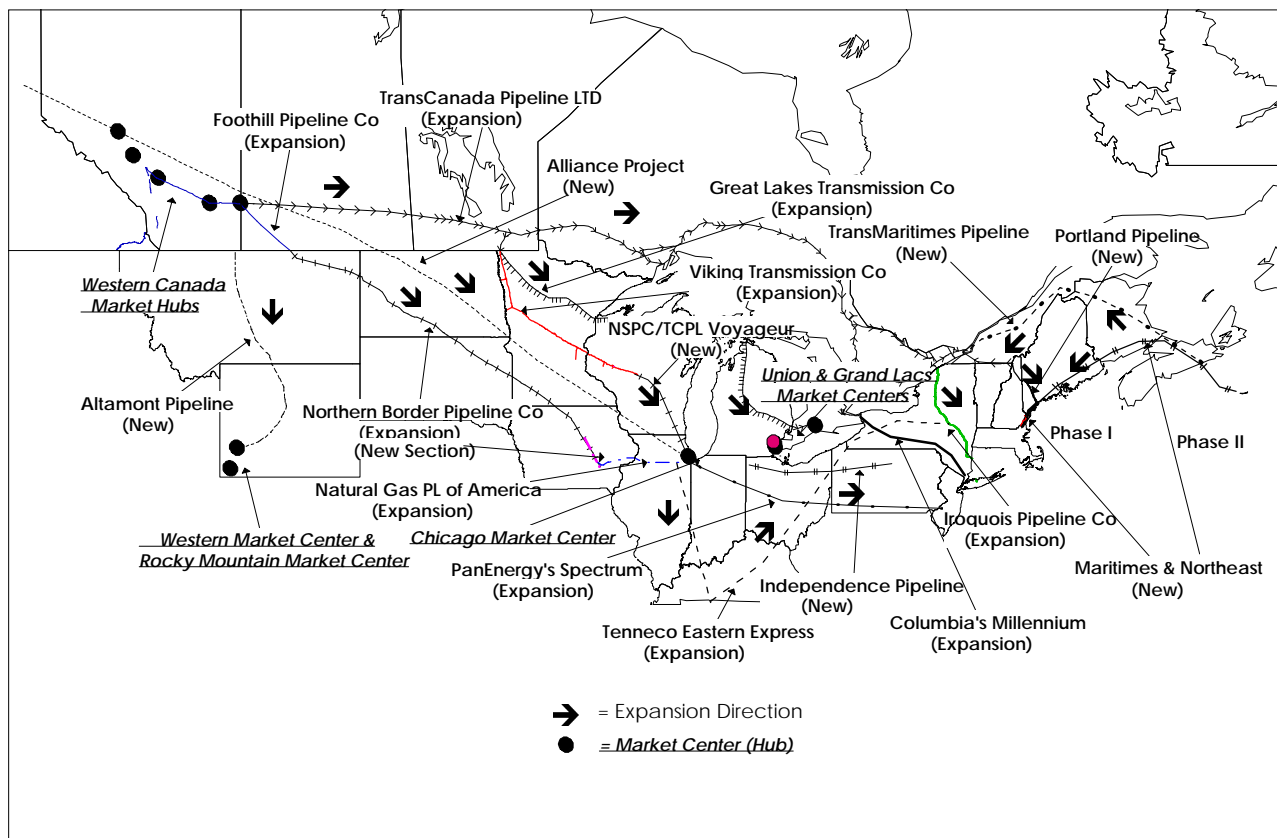
Sixteen projects have been proposed that would add more than 8,063 MMcf per day to U.S. import capacity from Canada over the next 4 years, an increase of 78

³For instance, 118 million cubic feet of the TransCanada Pipeline 1997-98 (non-Nexus) Expansion Project's 286 million cubic feet of daily deliverability represents planned increases to export capability.

⁴These numbers include four projects that are currently "on hold" and thus unlikely to be placed in service within the scheduled year.

⁵Does not include the potential import capacity that will be a part of the TransCanada Ltd. Nexus project.

Figure SR3. Planned Projects Related to Imports of Canadian Gas, 1997–2000



Source: Energy Information Administration (EIA), EIA GIS-NG Geographic Information System, Natural Gas Pipeline Construction Database, as of April 1, 1997.

percent from 1996 levels. The volume increase is almost double the total Canadian import capacity added from 1991 through 1996, 4,080 MMcf per day.⁶ This anticipated growth reflects the continuing U.S. demand for Canadian natural gas, especially in the Midwest and Northeast regions, and the desire on the part of western Canadian producers to expand further into these markets.

Within Canada, several projects are planned that will improve operational flows significantly, add to export capability, and enhance the business operations of some of the regional market centers. For instance, several western Canadian market centers are currently limited by available capacity on the TransCanada Pipeline system. Production capabilities in western Canada, especially in Alberta, exceed the amount of pipeline

capacity now existing on the system in that area. As a result, Canadian shippers are unable to reach their full potential market to the east. The Intra-Alberta, Empress, and AECO-C hubs in particular are well-positioned geographically but are restricted in their ability to expand operations.

To help alleviate the situation, several expansions and one new pipeline project have been proposed (Figure SR3). In the latter case, a new natural gas pipeline (the Alliance project) would bring gas from British Columbia to the Chicago, Illinois area along the right-of-way of an existing oil pipeline. Competing with this project are several others, including a potential partnership between TransCanada Pipeline Ltd. and Northern States Power Company (TCPL/NSPC) to develop a 1,200-MMcf-per-

⁶For information on capacity added through 1994, see Energy Information Administration, *Energy Policy Act Transportation Study: Interim Report on Natural Gas Flows and Rates*, DOE/EIA-0602 (Washington, DC, October 1995), p. 22. An additional 383 MMcf per day of import capability was added during 1995 and 1996.

⁷The application for another new system, the Palliser Pipeline, designed to expand and improve the capability of producers to transport their gas out of Alberta on other than the NOVA Gas System, is currently on hold (suspended) before the National Energy Board of Canada and may be canceled. It was to be constructed within the province of Alberta and linked to the TransCanada pipeline system.

day line between the Noyes, Minnesota import point and the Chicago, Illinois area. Moreover, Viking Gas Transmission Company has proposed an expansion to its import capability. Although much smaller in proposed added capacity (62 MMcf per day), the Viking route runs almost parallel to the proposed TransCanada/Northern States Power route.

Reflecting the growing demand for western Canadian supplies in eastern Canada and the United States, TransCanada Pipeline Ltd. applied to the Canadian National Energy Board in 1996 for permission to expand its facilities from Saskatchewan to Quebec (286 MMcf per day in 1996, with additional expansions in 1997 and 1998). Subsequently, in late 1996, TransCanada proposed to extend its expansion plans even further by adding a substantial 1,400 MMcf per day to its proposed system capabilities (Nexus project). The new capacity would be phased in over 2 years beginning in 1998. These expansion plans are targeted to meet the need of Alberta producers and other shippers and also support growth at Alberta hubs and several other market centers located along the proposed expansion corridors (Figure SR3). The Iroquois center (NY), and perhaps the Grand Lac (MI) and Union Gas (ON) centers, could benefit from TransCanada's expansion. The Chicago center could benefit if one or more of the proposed projects (Alliance, TCPL/NSPC, Viking) are completed and the appropriate interconnection(s) developed.

In August 1996, the Federal Energy Regulatory Commission approved construction of the Northern Border Pipeline Company expansion project, which would add 700 MMcf per day to import capacity at the Montana border. Correspondingly, Foothill Pipe Line Ltd. of Canada, which interconnects with Northern Border Pipeline at Monchy, Montana, would expand its eastern leg by the same amount. In February 1997, Foothills Pipeline Ltd. proposed to expand its system further and conducted an open season to gauge shipper demand.

On the Canadian east coast, several new pipelines have been proposed to move gas supplies being developed off the Canadian Atlantic coast near Sable Island to markets in Canada and the United States (Figure SR3). The TransMaritimes pipeline would move Sable Island supplies to the Quebec marketplace as well as eastern Ontario and the Northeastern United States via the Portland Gas Transmission System. The Maritimes &

⁸TransCanada Pipeline Ltd. is a partner in both the Portland Gas Transmission System and the TransMaritimes projects, as well as in the existing TransQuebec & Maritime Pipeline system which will link with and carry supplies for both.

Northeast pipeline project is also slated to transport gas from the Sable Island Offshore project, but its route will take it directly into the State of Maine and through New Hampshire to interconnections with the Tennessee Gas Pipeline system in Massachusetts. Both proposals are designed to serve some of the same markets, so some of the current marketing plans may have to be revised. The proponents of the two systems currently contend that anticipated market demand in the region will accommodate both pipelines.

Market Areas

Midwest

During the next several years, service to the Midwest Region will grow with 6,200 MMcf per day of new interstate capacity planned, the second highest of the six regions. But what really distinguishes the growth in the Midwest is that the vast majority of new capacity would be on newly built trunklines or extensions to existing pipelines bringing supplies from Canada. The Midwest will be the terminus for the Alliance project, which alone would increase area service by 1,325 MMcf per day. Coupled with the extension of the Northern Border Pipeline to Manhattan, Illinois (near Chicago) and Natural Gas Pipeline Company of America's (NGPL) Amarillo expansion (345 MMcf per day) destined for the same area,⁹ the Midwest Region's access to Canadian supplies would increase by more than 220 percent (4,769 MMcf per day) from 1990 levels (2,161 MMcf per day).¹¹

Within the region, in 1997 Great Lakes Gas Transmission Company plans to complete the system expansion that it began in the early 1990's. Further expansion has been proposed to tie in with the TransCanada system expansions and increase support to shippers wanting to transport gas to Ontario, Canada via an alternative to the northern TransCanada route. Besides adding to overall system capacity, the multiyear project emphasizes enhancement of system reliability and backup. The multiyear project is slated to add 126 MMcf per day of new system capacity (Table SR2).

⁹The border crossing to be built for the Alliance pipeline will be capable of moving up to 1,600 MMcf per day of gas if necessary.

¹⁰In March 1997, NGPL submitted an alternative (CP97-294) to its original Amarillo expansion proposal that would preclude the need for Northern Border to execute its own expansion between Harper, Iowa and Chicago. However, Northern Border has not withdrawn its original proposals.

¹¹Energy Information Administration, *Energy Policy Act Transportation Study: Interim Report on Natural Gas Flows and Rates*, DOE/EIA-0602 (Washington, DC, October 1995), Table 5, p. 32.

In conjunction with the planned expansion of the TransCanada Pipeline system, Great Lakes Transmission has proposed a 2,000 MMcf per day expansion on 1,000 miles of its system extending from Noyes, Minnesota to St. Clair, Michigan. This project not only would increase supplies to customers in the Midwest but also would provide an integral link in support of Columbia Gas Transmission Company's Millennium project, which has been proposed to begin gas deliveries in the fall of 1999 to customers in the Northeast (see next section). Great Lakes Transmission, which is a partner with Columbia and TransCanada in the Millennium project, will tranship supplies through Canada via TransCanada from the St. Clair export point to the Millennium pipeline at Niagara, New York.

Northeast

The large number of proposed projects slated to bring Canadian supplies into the Midwest has raised concern about excess capacity developing in the area. This possibility has spurred several companies to plan large-scale projects that would extend some of this new capacity further eastward to Northeast markets. For example, ANR Pipeline Company and Transcontinental Gas Pipeline Company have proposed the jointly owned Independence project, which could carry 900 MMcf per day from ANR's line in northwestern Ohio to a major interconnection with Transcontinental's line in Leidy, Pennsylvania, a major hub serving the northeastern marketplace. The new line would also be attractive to Canadian shippers seeking an alternative route to Northeast markets. It could also provide an alternative route and opportunity for shippers now moving gas from the Southwest to the Midwest to reach customers located in the Northeast.

Other projects that would move some of the new Midwestern pipeline supplies eastward include Tennessee Gas Pipeline Company's proposed Eastern Express project and PanEnergy Corporation's Spectrum project. These two projects alone represent a total of 1,100 MMcf per day of new capacity into the Northeast. Including the Independence and Millennium projects, as well as other import projects slated for development during the next several years, new capacity into the region could exceed 3,000 MMcf per day, adding significantly to the 12,202 MMcf per day existing in 1996 (Table SR1).

The Spectrum project (500 MMcf per day) would extend from the Chicago, Illinois area to New York and New England, mostly using expanded facilities along PanEnergy's affiliated pipelines: Panhandle Eastern,

Texas Eastern, and Algonquin Gas Transmission systems (west to east). In addition, an interconnection with another affiliate, Trunkline Gas Company, could be utilized to move gas supplies from the Southwest Region if appropriate (as could the Panhandle Eastern Pipeline system). The Eastern Express project (650 MMcf per day) would utilize Midwestern Gas Transmission Company (an affiliate of Tennessee Gas Pipeline Company) to ship supplies southward (or through displacement) to Tennessee Gas's interconnection in northern Tennessee and then, through expanded facilities on its existing system, transport supplies from the Midwest to the east coast. In addition, the Eastern Express project would include expansion of Tennessee Gas's pipeline between its Niagara, New York import point and its interconnections near Leidy, Pennsylvania and its northern line extending directly to New England.

The announced TransCanada Pipeline Ltd. Nexus expansion project, slated for development in 1998 and 1999, could result in expansions at several import points into the Northeastern United States and development of at least one new import point (for Columbia Gas Transmission's Millennium project). For instance, in anticipation of TransCanada's multiyear expansion plans, Iroquois Pipeline Company recently held an open season on its system, using an expansion figure of 200 MMcf per day as an initial reference. Combined with the Millennium import level of 650 MMcf per day and several import expansions related to other projects, TransCanada's export capacity to the U.S. Northeast could increase by 1,139 MMcf per day by the end of 1999, a 53-percent increase over 1996 levels. Adding in the anticipated 618 MMcf per day import capability of the Maritimes & Northeast and Portland pipelines, total Canadian import capacity into the Northeast Region could approach 4,000 MMcf per day by the end of the century.

Planned expansions in the Northeast Region are also somewhat unique in that a number represent cooperative efforts between regional pipeline systems. For example, the Texas Eastern expansion of service to some of its Virginia and eastern Pennsylvania service areas depends partly upon the completion of the CNG Transmission PL-1 line and Seasonal Service expansion projects, including improvements to storage deliverability. Columbia Gas Transmission, with its "Market Expansion" project, is also planning improvements (especially to storage services) on its system that would increase deliverability to several major interconnections with these same pipelines. National Fuel Gas Supply Company, another major regional system, has proposed upgrades to its system based upon the eventual completion of projects by Columbia, CNG, and Texas Eastern. In particular,

National Fuel's project will complement CNG's planned improvement to its system for flowing gas between Leidy, Pennsylvania, a major storage area and hub interconnection point, and Steuben County, New York and then northward, where CNG and National Fuel have major interconnections.

Of the 30 singular projects planned within the region representing 6,268 MMcf per day of new capacity, 17 are either directly or indirectly linked by mutual service needs or partnerships.¹² These projects constitute about 18 percent, or 1,115 MMcf per day, of the new capacity additions in the region.

U.S. Production Areas

Gulf of Mexico: Deep Water Access

One of the more significant events of the past several years has been the increased attention to development of gas resources in deeper waters (greater than 200 meters) in the Gulf of Mexico, off Louisiana and Mississippi. At least 16 projects,¹³ representing more than 6,457 MMcf per day of capacity, have been proposed for development during 1997 and 1998 that would reach into the deep water area of the Gulf to tap several new production sources being developed there—most notably in the Ship Shoal, Green Canyon, Destin Corridor, Garden Banks, and Mississippi Canyon areas. Companies such as Marathon Oil, Shell Oil, and Texaco are represented (Figure SR2). Two such projects, the Shell Offshore Pipeline (600 MMcf per day) and the Centena Main Pass/Viosca Knoll Gathering system (300 MMcf per day), were completed in 1996.

Other Southwest

Development of offshore and deep water pipeline-related projects represent 82 percent of the 5,882 MMcf per day of planned additions in the Southwest Region. The remaining onshore expansion projects are designed primarily to increase access to supplies in the Anadarko Basin located in central Oklahoma, and in the San Juan Basin of New Mexico. Several small projects in south

¹²Transcontinental Gas Pipeline Company and Tennessee Gas Pipeline Company also have several projects in the region that will benefit from and support the expansions in the region.

¹³Four projects would direct supply to the Southeast (Alabama and Mississippi) and six to the Southwest (Louisiana). The other projects would be gathering systems.

Texas are designed to support exports to Mexico, if and when the export crossings are finally put in place.

San Juan Basin Access

Until recently the pipeline capacity available to move gas from the San Juan Basin area eastward was limited. The rapid development of the area's coalbed methane and other supplies in the area during the late 1980's led to an excess in productive capacity. Originally the new production was expected to be consumed in the California market, and pipeline capacity was developed with that in mind. Today, however, the emphasis is on finding ways to move some of this supply eastward to link with market centers in the Waha area of Texas, from which the gas could be redirected through northern and eastern Texas to Midwest and Northeast markets. The two major interstate pipeline companies in the area, Transwestern Pipeline Company and El Paso Natural Gas Company, have undertaken efforts to expand and enhance facilities located on their respective systems, which would allow them to direct more production eastward to the Waha/Permian Basin centers. Transwestern Pipeline Company completed its efforts in 1996.

El Paso Natural Gas Company's response to the problem has been the proposed Havasu Crossover expansion. This project would use currently available capacity on the westward-bound portion of the system to move supplies that would eventually be redirected eastward (either physically or by displacement) just east of the California border. The expansion would entail upgrades of the Havasu Crossover, which currently links the north and south parts of the El Paso system but with limited capacity. The expansion would allow El Paso to deliver an additional 180 MMcf per day in the Waha area of west Texas when completed. (Some preliminary work at the crossover was completed in 1996.)

In particular, these expansions will increase flows to the Blanco market center, which is strategically located at the terminus of the Transwestern and El Paso pipeline systems exiting the San Juan Basin in northern New Mexico. This center has been operating at full capacity and could grow significantly as additional capacity becomes available and the option to move greater volumes eastward increases. The most significant impact can be expected at the Waha area and Buffalo Wallow centers as they compete with each other to direct the additional flows to the eastern Texas area and beyond.

Anadarko Basin Access

The Oklahoma Anadarko Basin is another production area that has the potential for development of greater access to regional market centers, although currently only one major project, the Transok Pipeline Company's system-wide expansion project, is slated for the area. Nevertheless, this project would provide area producers 255 MMcf per day of additional access to market centers located in northern and eastern Texas and northern and southern Louisiana. The other regional pipelines, Ozark Gas Transmission Company and Texoma Pipeline System, also could be used as alternative routes for transshipping Anadarko production to higher priced markets via current and future market center interconnections.

Central

Proposed capacity additions are also significant in the Central Region, the other major gas-producing area in the United States. Two factors in particular contribute to this: (1) the approved expansion of the Northern Border Pipeline and possible completion of the long-delayed Altamont system connecting with supplies from Canada, and (2) the expansion of capacity out of the Rocky Mountain area toward the East (see below). In all, additions amounting to 5,053 MMcf per day of new capacity are planned.

The "Alliance Project" (Table SR2 under Midwest), planned for completion by 1999, could also potentially add to available deliverability in the Central Region. Its route from British Columbia to Illinois will take it through the Central Region, but no interconnections within the region have been announced.

Rocky Mountain Supplies

In the past, Wyoming and Utah supplies generally moved to a strong southern California gas market, but that market has developed an excess of pipeline capacity during the past several years and is currently considered a soft market for natural gas. With the emphasis on the western market, eastward pipeline capacity has been quite limited.

On the other hand, customers in the Midwest and East are very interested in having greater access to these

relatively lower priced supplies.¹⁴ The situation has generated planning on the part of several pipeline companies in the area to expand eastward capacity. For instance, KN Interstate has announced plans for the "Pony Express" line (255 MMcf per day), and Trailblazer/Overthrust/Wyoming Interstate system (100 to 200 MMcf per day) has filed expansion plans with the Federal Energy Regulatory Commission. The latter expansion would dovetail with Natural Gas Pipeline Company of America's plans to expand capacity on its Amarillo line moving supplies to the Midwest Region. The several market centers at either end of this expansion could be expected to benefit, although some centers located in the Waha and Texas Panhandle may experience greater competition for their Midwestern business.

Mexico Connections

Several projects have been proposed to add capacity to the export capability of U.S. natural gas companies located near the border with Mexico. None of the projects represent enhancements to import capabilities, currently at 350 MMcf per day, a figure that has not changed since the 1980's. All of the proposed projects are to support mostly industrial and power generation customers located in the border area.

If completed, the currently proposed projects would represent about 1,200 MMcf per day of additional export capacity. However, none of the projects proposed since 1991 (when export capacity to Mexico stood at 889 MMcf per day) have actually been implemented. Several of the projects are competing within and for the same market. For example, the MidCon-Texas Pipeline Company (Figure SR2) and Coastal States Gas Transmission Company are both seeking to negotiate with Mexican buyers for firm shipping agreements to essentially the same general area. Nevertheless, both companies view their projects as proceeding regardless of the outcome of negotiations. These two companies also have plans to construct pipelines within Mexico that will link with their border crossing project and Texas intrastate pipeline construction projects. If completed, these pipelines will be the first ones constructed in Mexico by U.S. companies in recent times.

¹⁴Producers in the Rocky Mountain area have had to endure low prices for their gas for the past several years because of this limited access. They hope that expanded access to these markets will bring them the prices currently experienced at the East Texas and Louisiana interconnections.

Most of the proposed projects have been proceeding slowly for environmental, economic, and regulatory reasons. One obstacle has been overcome with the installation of Mexico's newly formed regulatory authority, the Comisión de Energía (CRE). The CRE has issued less restrictive regulations on foreign investment in Mexico affecting the ownership and operation of pipeline facilities owned by others. In the fall of 1996, the CRE announced its first award of a (privatization) license permitting the development of a local gas distribution system in the Baha area of northern Mexico.¹⁵ This action may hasten the approval and final implementation of several similar local service development proposals, which are linked to pending U.S. export proposals that have remained dormant for several years.

Summary

The slowdown of pipeline expansion in the past 3 years appears to be over. The amount of new capacity proposed for development by the end of 2000 is significant, and if fully implemented would represent a 9-percent increase over 1996 levels. Although it is unlikely that all proposed expansions will be completed, more proposals are surfacing each week. In February 1996, for instance, at least six pipeline companies instituted open-season exercises with the expectation

¹⁵The award was made to a consortium consisting of Pacific Enterprises International (PEI), Enova International Corporation and Proxima. The license will permit the group to transport gas from PEI's local system in lower California into the city of Mexicali in northern Mexico.

that the market will support additional expansion plans.¹⁶ These proposals included expansions in all regions of the country.

Beyond what has already been proposed, there are areas of the country where additional pipeline expansion plans might develop in response to changing market profiles and the development of new supply sources. For instance, Gulf of Mexico deep-water development will continue over the next decade and with it could come additional complementary onshore expansions. In addition, Oklahoma's Anadarko Basin is another production area that has the potential for developing greater access to regional market centers, although currently only one major project, the Transok Pipeline Company's system-wide expansion project, is slated for the area.

The upcoming major increase in capacity from Canada to the U.S. Midwest may also spur additional development of new pipelines, or expansions of existing lines, that can provide alternative capacity for transshipment of some of this gas to the U.S. Northeastern marketplace. Already the proposed ANR/Transco Independence project is premised on the assumption that excess capacity into the Chicago, Illinois area could develop over the next several years, because so many projects are proposed to bring in Canadian supplies.

¹⁶They were: Iroquois Gas Pipeline Company, Natural Gas Pipeline Company of America, Transcontinental Gas Pipeline Company, Questar Pipeline Company, and Colorado Interstate Pipeline Company.

Table SR.2. Major Proposed Natural Gas Pipeline Construction Projects, by Terminating Region and Planned In-Service Year, 1997–2000

Year	Ends in State	Begins in State	Region	Map Key	Pipeline/Project Name	FERC Docket Number	Status As of 4-1-97 ^a	New or Expansion	Miles	Cost Estimate (million \$)	Added Capacity (MMcf/d)
Canada											
1998	AB	AB	Canada	A1	Palliser Pipeline	--	On Hold	New	590	219	1,200
1998	QU	SK	Canada	A2	TransCanada System Expn	--	Approved	Expn	128	900	286
1998	QU	SK	Canada	A3	TransCanada Nexus Phase I	--	Announced	Expn	NA	1,900	475
1998	SK	SK	Canada	A4	Foothills Pipeline Eastern Expn	--	Approved	New	70	18	700
1999	NB	NS	Canada	A5	Maritimes & Northeast Phase II	--	Pending	New	386	434	465
1999	QU	NS	Canada	A6	TransMaritimes (Sable Island) II	--	Pending	New	416	740	530
1999	QU	NS	Canada	A7	TransMaritimes Pipeline I	--	Pending	New	192	(b)	(b)
1999	SK	BC	Canada	A8	Alliance Pipeline (Canada Portion)	--	Approved	New	982	700	1,325
1999	QU	SK	Canada	A3	TransCanada Nexus Phase II	--	Announced	Expn	NA	NA	925
Total New Capacity^c											5,906
Central											
1997	CO	WY	Central	B1	Wyoming Interstate Eastward	CP96-288	Approved	Expn	NA	40	192
1997	KS	WY	Central	B2	Williams Gas WY-KS Expn	NA	Pending	Expn	NA	NA	30
1997	MO	KS	Central	B3	Williams Gas KS-MO Expn	NA	Pending	Expn	13	NA	15
1997	MO	WY	Central	B4	KN Interstate Pony Express	CP96-477	Pending	New	850	154	255
1997	ND	SK	Canada	B5	ISP "Solution gas" Imports	CP96-684	Approved	New	1	1	3
1997	NE	CO	Central	B6	Traillblazer Eastward Expn	CP96-506	Approved	Expn	445	NA	105
1997	NE	OK	Southwest	B7	NGPL Amarillo Upgrade	CP94-577	Approved	Expn	14	33	-25
1997	WY	WY	Central	B8	CIG Wind River Lateral Expn	CP96-289	Approved	Expn	NA	11	42
1997	WY	WY	Central	B9	KN Interstate Casper Loop	CP95-113	On Hold	Expn	52	15	47
1998	CO	CO	Central	B10	TransColorado Pipeline (Northern)	CP90-1777	Approved	New	266	184	300
1998	IA	IA	Central	B11	Northern Border Harper Expn	CP95-194	Approved	Expn	142	NA	962
1998	IA	SK	Canada	B12	Northern Border Monchy Expn	CP95-194	Approved	Expn	243	797	700
1998	WY	SK	Canada	B13	Altamont Pipeline	CP90-1372	Approved	New	620	139	737
1998	UT	WY	Central	B14	Questar Mainline (Line 58) Expn	CP96-820	Approved	Expn	41	18	90
1999	ND	SK	Canada	B15	Alliance Pipeline (Import Station)	CP97-169	Approved	New	1	NA	1,600
Total New Capacity^c											5,053
Midwest											
1997	MI	IL	Midwest	C1	ANR Michigan Leg Expn	CP96-641	Approved	Expn	120	19	135
1997	MI	MI	Midwest	C2	Great Lakes Security Looping II	CP96-297	Approved	Expn	25	44	0
1997	MN	SK	Canada	C3	TransCanada Import Expn	--	Approved	Expn	NA	NA	56
1997	WI	MB	Canada	C4	Viking System-Wide Expn	CP97-93	Pending	Expn	150	28	62
1997	WI	KS	Central	C5	Northern Natural Peak Day 2000 I	CP97-25	Pending	Expn	39	102	244
1998	WI	KS	Central	C5	Northern Natural Peak Day 2000 II	CP97-25	Pending	Expn	5	NA	23
1998	IL	IA	Central	C6	NGPL Amarillo Expn	CP96-27	Approved	Expn	85	85	345
1998	IL	IA	Central	C7	Northern Border Manhattan Extn	CP95-194	Approved	New	200	NA	684
1998	MI	MB	Canada	C8	Great Lakes System Wide Expn	CP95-647	Pending	Expn	72	149	126
1999	MI	MB	Canada	C8	Great Lakes System Expn II	--	Announced	Expn	1,000	2,500	2,000
1999	IL	SK	Canada	C9	Alliance Project (US Portion)	CP97-168	Pending	New	886	600	1,325
2000	IL	MB	Canada	C10	NSPC/TCPL Voyageur Project	NA	Announced	New	750	850	1,200
Total New Capacity^c											6,200
Northeast											
1997	CT	CT	Northeast	D1	Algonquin Electric Load Lateral	CP96-201	Approved	Expn	8	15	82
1997	MD	DE	Northeast	D2	Eastern Shore Bridgeville Expn	CP96-97	Approved	Expn	29	7	4
1997	NY	NY	Northeast	D3	CNG Woodhull/Avoca Line	CP96-493	On Hold	New	NA	NA	100
1997	NY	NY	Northeast	D4	Iroquois Import Expn	CP96-687	Pending	Expn	200	22	35
1997	NY	QU	Canada	D5	TransCanada Import (Iroquois)	--	Pending	Expn	NA	NA	24
1997	NY	QU	Canada	D6	TransCanada Import (Chippawa)	--	Pending	Expn	NA	NA	48
1997	NY	QU	Canada	D7	TransCanada Import (Niagara)	--	Pending	Expn	NA	NA	39
1997	PA	NY	Northeast	D8	National Fuel Niagara Expn	CP96-545	Pending	Expn	139	11	48
1997	PA	PA	Northeast	D9	Texas Eastern Winternet I	CP96-606	Pending	Expn	NA	NA	20
1997	PA	PA	Northeast	D10	Texas Eastern Columbia Expn	CP96-559	Pending	Expn	81	67	142
1997	PA	PA	Northeast	D10	Texas Eastern Line 1-A Expn	CP97-276	Pending	Expn	23	13	128
1997	PA	PA	Northeast	D11	Transco Pocono Project	NA	Announced	Expn	NA	NA	35
1997	PA	WV	Northeast	D12	CNG Seasonal Service Expn	CP96-492	Pending	Expn	NA	NA	100
1997	VA	PA	Northeast	D13	CNG PL-1 Phase I	CP96-492	Pending	Expn	NA	NA	15
1997	VA	VA	Northeast	D14	Commonwealth PL Expn	NA	Approved	Expn	NA	NA	18
1997	VA	TN	Southeast	D15	East Tennessee System Wide	CP96-696	Pending	Expn	NA	13	33
1997	VA	PA	Northeast	D16	Columbia Gas Market Expn I	CP96-213	Pending	Expn	379	22	232

Table SR.2. Major Proposed Natural Gas Pipeline Construction Projects, by Terminating Region and Planned In-Service Year, 1997–2000 (Continued)

Year	Ends in State	Begins in State	Region	Map Key	Pipeline/Project Name	FERC Docket Number	Status As of 4-1-97 ^a	New or Expansion	Miles	Cost Estimate (million \$)	Added Capacity (MMcf/d)
Northeast (Continued)											
1998	PA	NY	Northeast	D8	National Fuel Niagara/Leidy I	--	Announced	Expn	139	NA	100
1998	PA	PA	Northeast	D9	Texas Eastern Winternet II	CP96-606	Pending	Expn	NA	NA	20
1998	VA	PA	Northeast	D13	CNG PL-1 Phase II	CP96-492	Pending	Expn	NA	NA	25
1998	VA	VA	Northeast	D14	Virginia Natural Saltville Line	--	Pending	Expn	NA	NA	25
1998	VA	PA	Northeast	D16	Columbia Gas Market Expn II	CP96-213	Pending	Expn	379	20	167
1998	MA	MA	Northeast	D17	Tenneco/DOMAC	CP96-164	Pending	New	8	26	55
1998	ME	QU	Canada	D18	Portland Pipeline	CP95-248	Approved	New	190	303	178
1998	ME	MA	Northeast	D19	Portland/Maritimes & Northeast I	CP97-238	Approved	New	100	175	631
1998	NY	PA	Northeast	D20	Transco Seaboard Expn	CP96-545	Pending	Expn	36	106	115
1999	PA	NY	Northeast	D8	National Fuel Niagara/Leidy II	--	Announced	Expn	139	NA	650
1999	PA	PA	Northeast	D9	Texas Eastern Winternet III	CP96-606	Pending	Expn	NA	NA	12
1999	VA	PA	Northeast	D13	CNG PL-1 Phase III	CP96-492	Pending	Expn	NA	NA	25
1999	VA	PA	Northeast	D16	Columbia Gas Market Expn III	CP96-213	Pending	Expn	379	20	108
1999	ME	NB	Canada	D21	Maritimes & Northeast II (US Portion)	CP96-809	Pending	New	386	425	440
1999	NY	QU	Canada	D22	Iroquois NY City Expn	--	Announced	Expn	NA	NA	200
1999	PA	NY	Northeast	D23	Tenneco Niagara-Leidy Expn	--	Announced	Expn	NA	NA	200
1999	NY	PA	Northeast	D23	Transco MarketLink Expn	--	Announced	Expn	2	NA	400
1999	PA	TN	Southeast	D24	Tenneco Eastern Express	--	Announced	Expn	NA	NA	200
1999	PA	OH	Midwest	D25	ANR/Transco Independence PL	--	Announced	New	370	600	900
1999	NY	ON	Canada	D26	Columbia's Millennium PL	--	Announced	New	380	600	650
2000	NY	IL	Midwest	D27	PanEnergy's Spectrum PL	--	Announced	New	NA	NA	500
2000	NY	NJ	Northeast	D28	Texas Eastern Excelsior Project	--	Announced	New	44	NA	500
2000	PA	PA	Northeast	D9	Texas Eastern Winternet IV	CP96-606	Pending	Expn	NA	NA	12
Total New Capacity^c											7,418
Southeast											
1997	AL	AL	Southeast	E1	SONAT Zone 3 AL	CP96-153	Approved	Expn	119	53	76
1997	NC	NC	Southeast	E2	Transco Maiden Lateral Expn	CP97-193	Pending	Expn	18	13	38
1997	SC	GA	Southeast	E3	SONAT Zone 3 GA-SC-TN	CP96-541	Pending	Expn	27	36	45
1997	AL	TN	Southeast	E4	U.S. Gypsum Lateral	CP97-202	Approved	New	15	4	21
1997	AL	GM	Offshore	E5	DIGS (Dauphin Island) Expn	CP97-300	Pending	Expn	13	54	100
1998	MS	GM	Offshore	E5	Transco Mobile Bay Expn	NA	Approved	Expn	198	NA	350
1998	FL	AL	Southeast	E6	Florida Gas Phase IV	--	On Hold	Expn	NA	32	37
1998	GA	AL	Southeast	E7	Transco Cherokee Project	--	Announced	Expn	NA	70	87
1999	MS	GM	Offshore	E8	Chandeleur Main Pass Expn	--	Announced	Expn	30	NA	200
1999	MS	GM	Offshore	E8	Destin Corridor Offshore	CP96-655	Approved	New	220	294	1,000
1999	NC	NC	Southeast	E9	Cardinal Pipeline	--	Announced	Expn	67	98	140
1999	NC	NC	Southeast	E10	Transco Pine Needle LNG Link	CP96-134	Approved	New	1	1	400
2000	TN	GA	Southeast	E11	Cumberland Pipeline	--	Pending	Expn	NA	NA	200
Total New Capacity^c											2,695
Southwest											
1997	GM	GM	Offshore	F1	Garden Banks Offshore System	CP96-113	Approved	New	50	NA	600
1997	GM	GM	Offshore	F2	Manta Ray Gathering System	CP96-796	Approved	New	47	60	300
1997	GM	GM	Offshore	F3	Transco Sealeg Project I	CP96-758	Approved	Expn	51	80	380
1997	GM	GM	Offshore	F4	DIGS Main Pass Gathering	CP97-300	Pending	New	63	54	200
1997	LA	GM	Offshore	F5	Green Canyon System	CP96-557	Pending	New	133	200	515
1997	LA	GM	Offshore	F6	Koch South Pass Area Expn	CP96-572	Approved	New	16	NA	300
1997	LA	GM	Offshore	F7	Nautilus System	CP96-790	Approved	New	87	121	600
1997	LA	GM	Offshore	F8	Discovery Pipeline	CP96-712	Approved	New	147	189	600
1997	OK	OK	Southwest	F9	Transok West-to-East System Expn	--	Announced	Expn	130	75	255
1997	TX	AZ	Western	F10	El Paso Havasu Crossover	CP96-321	Pending	Expn	98	20	180
1998	GM	GM	Offshore	F11	Transco Sealeg Project II	CP96-758	Approved	Expn	27	49	279
1998	GM	GM	Offshore	F12	Williams Natural Gas Genesis Expn	--	Pending	New	35	NA	72
1998	LA	GM	Offshore	F13	ANR Conch Project	CP97-71	Approved	Expn	37	51	461
1998	LA	GM	Offshore	F14	Trunkline Terrebone Expn	CP97-105	Pending	Expn	145	52	500
1998	LA	TX	Southwest	F15	ANR Katy Project	--	Announced	New	220	NA	200
1998	TX	TX	Southwest	F16	Coastal States Roma Export Line	--	Announced	New	18	NA	170
1998	TX	TX	Southwest	F17	MidCon Texas Pipeline	CP96-140	Approved	New	15	1	270
Total New Capacity^c											5,882

Table SR2. Major Proposed Natural Gas Pipeline Construction Projects, by Terminating Region and Planned In-Service Year, 1997–2000 (Continued)

Year	Ends in State	Begins in State	Region	Map Key	Pipeline/Project Name	FERC Docket Number	Status As of 4-1-97 ^a	New or Expansion	Miles	Cost Estimate (million \$)	Added Capacity (MMcf/d)
Western											
1997	CA	CA	Western	G1	San Diego G&E Pipeline 2000	CP93-117	Approved	New	80	85	40
1997	CA	CA	Western	G2	Tenneco Baja SoCal Interconnect	CP96-140	Pending	New	16	NA	40
1997	CA	NV	Western	G3	Paiute Pipeline North Tahoe Lateral	CP94-29	Approved	Expn	23	11	13
1998	CA	CA	Western	G4	Pacific Offshore Santa Barbara Expn	--	Approved	Expn	NA	NA	20
Total New Capacity^c											113
Mexico											
1997	MX	CA	<u>Western</u>	H1	Tenneco Baja Mexacali Export	CP96-140	Approved	New	1	NA	40
1997	MX	NM	<u>Southwest</u>	H2	Public Service Co of NM Export	CP93-98	Approved	New	NA	NA	12
1997	MX	MX	Mexico	H3	MidCon Texas Mexico Project	--	Approved	New	92	40	270
1997	MX	TX	<u>Southwest</u>	H4	MidCon Texas Roma Export Point	CP96-583	Pending	Expn	1	NA	270
1998	MX	TX	<u>Southwest</u>	H5	Coastal States Roma Export Point	CP96-770	Pending	New	1	NA	170
1998	MX	TX	<u>Southwest</u>	H6	El Paso Samalayucca II	CP93-252	Approved	Expn	21	15	208
1999	MX	CA	<u>Western</u>	H7	SoCal Project Vecinos	CP94-207	Approved	New	8	100	500
Total New Capacity^c											1,470

^aAnnounced = Prior to filing with regulatory authorities. Pending = Before regulatory authority for review and acceptance. Approved = Fully or conditionally approved by regulating authority; may or may not be under construction. On Hold = May be canceled or postponed due to changed market or regulatory conditions.

^bCost and added capacity are the same for this and previous line item.

^cExcludes "On Hold" projects.

MMcf/d = Million cubic feet per day. Expn = Expansion. NA = Not available. -- = Not applicable. Extn = Extension.

CIG = Colorado Interstate Gas Co.; CNG = CNG Transmission Co; DIGS = Dauphin Island Gathering System; NGPL = Natural Gas Pipeline Co. of America; NSPC = Northern States Power Co.; SoCal = Southern California Gas Co.; SONAT = Southern Natural Gas Co.; Tenneco = Tennessee Gas Pipeline Co.; TCPL = TransCanada Pipeline Ltd.; Transco = Transcontinental Gas Pipeline Co.;

Note: Underlined items indicate project crosses regional boundary.

Source: Energy Information Administration, EIAGIS-NG Geographic Information System, Natural Gas Proposed Pipeline Construction Database, as of April 1, 1997, compiled from Federal Energy Regulatory Commission filings and various industry news sources.