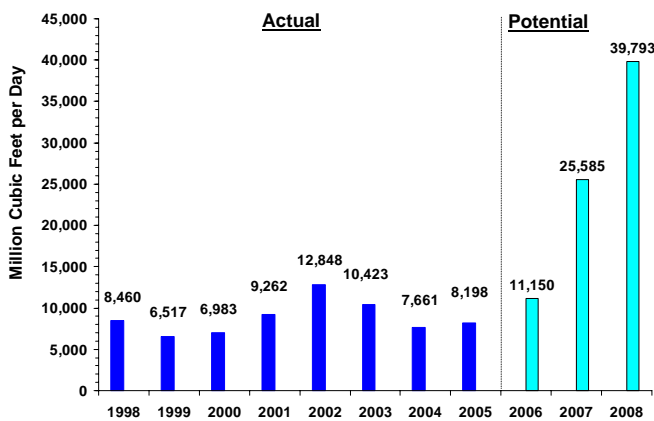


Additions to Capacity on the U.S. Natural Gas Pipeline Network: 2005

This report examines the amount of new natural gas pipeline capacity added to the U.S. natural gas pipeline system during 2005 and the areas of the country where those additions were concentrated. In addition, it discusses and analyzes proposed natural gas pipeline projects that may be developed between 2006 and 2008 and the market factors supporting these initiatives. Questions or comments on the contents of this article should be directed to James Tobin at james.tobin@eia.doe.gov or (202) 586-4835.

The addition to natural gas pipeline capacity in 2005 exceeded that of 2004 (Figure 1) although fewer miles of pipeline were installed (Figure 2). Miles of new natural gas pipeline (1,152) were 21 percent less than in 2004, even though pipeline capacity grew by 8.2 billion cubic feet per day (Bcf/d), a 7-percent increase in capacity additions (see Box, "Capacity Measures," p. 4). Indeed, less new natural gas pipeline mileage was added in 2005 than in any year during the past decade.¹

Figure 1. Natural Gas Pipeline Capacity Additions, 1998-2008



Source: Energy Information Administration, GasTran Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database.

In 2005, at least 31 natural gas pipeline projects of varying profiles² were completed in the lower 48 States and the Gulf of Mexico (Figure 3, Table 1). Of these, 15 were expansions (increases in capacity) on existing natural gas pipelines while the other 16 were 9 system extensions or laterals associated with existing natural gas pipelines, 5 new natural gas pipeline systems, and 2 oil pipeline conversions. Expenditures for natural gas pipeline development amounted to less than \$1.3 billion in 2005, a 40-percent drop from 2004 levels and well below the \$4.4 billion spent in the peak development year of 2002.³

¹In this review, project costs, capacity volumes, and mileage are based upon data accompanying project filings made with the Federal Energy Regulatory Commission (FERC) or State agencies, or cited in company press releases or trade press sources. Because these figures may be revised and/or adjusted as a project progresses, any volumes/mileage/costs cited herein may not agree with those in the approval certification or upon project completion.

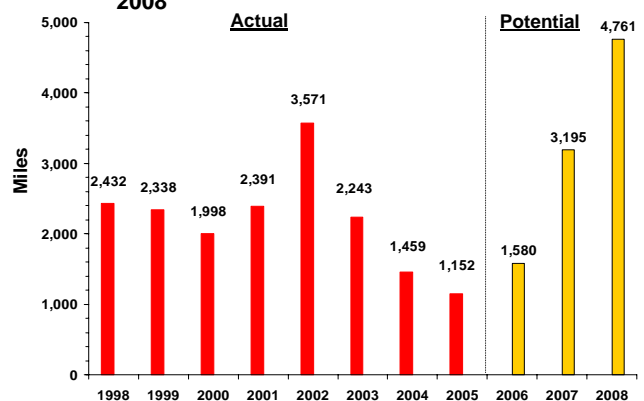
²Projects involving only small diameter pipeline (10-inch or less in diameter) were not included.

³See Energy Information Administration, *Expansion and Change on the U.S. Natural Gas Pipeline Network - 2002* (May 2003),

It appears, however, that 2004 and 2005 may be the bottom of a temporary trough in the natural gas pipeline development activity cycle. The current inventory of announced or approved natural gas pipeline projects indicates that natural gas pipeline capacity additions could increase significantly between 2006 and 2008 (Figure 1). Several factors are driving this anticipated growth, particularly the expanding development of natural gas production in the Fort Worth Basin of east Texas and the Piceance/Unita Basins of western Colorado and eastern Utah, and the need for natural gas pipeline expansions and new laterals to link potential liquefied natural gas (LNG) import facilities that may be developed along the U.S. coastline over the next decade.

Although scheduled natural gas pipeline development and expansion efforts during 2005 were well below those of previous years, unscheduled natural gas pipeline maintenance and reconstruction due to natural disasters was substantial. Hurricanes Katrina and Rita, for instance, which occurred in late August and late September 2005, damaged a number of natural gas pipelines situated in the Gulf of Mexico, southeast Texas, and southern Louisiana. Restoration of service was slow and is ongoing, with some natural gas pipeline segments yet to be fully restored. In fact, the Minerals Management Service of the U.S. Department of the Interior reported that at the end of April 2006 46 of the 76 offshore natural gas transportation pipeline segments reportedly damaged by the two storms were still shut-in.⁴

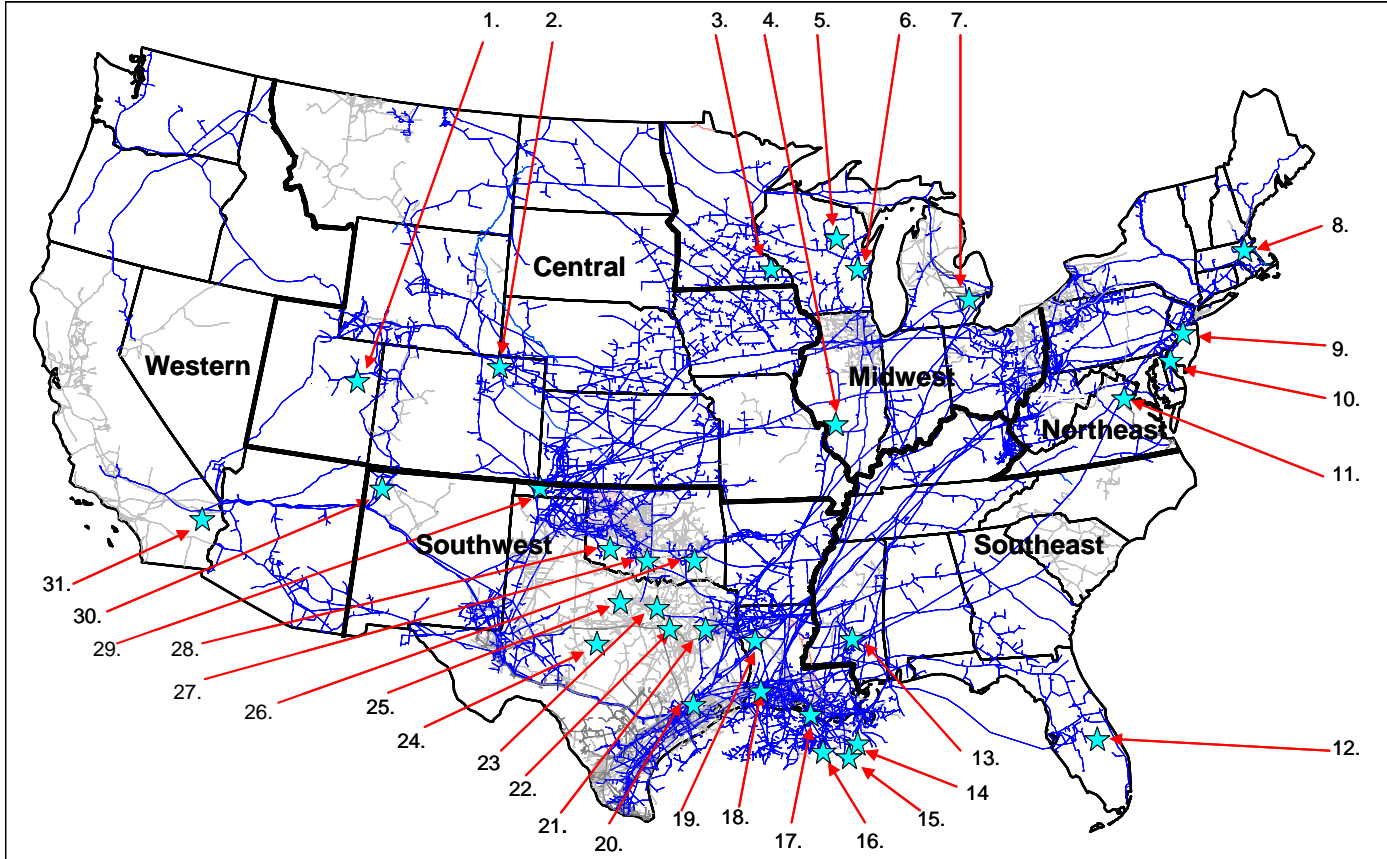
Figure 2. Additions to Natural Gas Pipeline Mileage, 1998-2008



Source: Energy Information Administration, GasTran Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database.

http://www.eia.doe.gov/pub/oil_gas/natural_gas/feature_articles/2003/Pipenet03/pipenet03.html

Figure 3. Locations of Natural Gas Pipeline Construction Projects Completed in 2005
 (Map keyed to Table 1)



Notes: **Security:** EIA has determined that publication of this figure does not raise security concerns, based on the application of Federal Geographic Data Committee's *Guidelines for Providing Appropriate Access to Geospatial Data in Response to Security Concerns*; **Regions:** The six U.S. regions shown in this figure are based in whole or in part upon the 10 Federal regions as defined by the U.S. Department of Labor's Bureau of Labor Statistics. Source: Energy Information Administration, GasTran Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database.

In addition, several natural gas pipeline companies operating onshore along coastal areas of the Gulf reported operational shut-ins of varying degrees as a result of one or both storms.⁵ In several instances, the infrastructure damage was so severe that emergency interconnections and natural gas pipeline bypasses had to be constructed to mitigate the loss of transportation services caused by indefinite natural gas pipeline shut-ins.

Highlights

Even though 10 fewer natural gas pipeline projects were completed in 2005 than in 2004, the average capacity addition per project increased from 187 million cubic feet per day (MMcf/d) to 264 MMcf/d, and average added natural gas

pipeline increased from 36 to 37 miles per project. Moreover, many of these individual projects accounted for significant improvements to the national natural gas pipeline grid. For instance:

- **Five new intrastate natural gas pipelines, comprising almost 1.6 Bcf/d of capacity, were installed in east Texas in 2005 (Table 1).** These new natural gas pipelines were installed to facilitate the transportation of expanding natural gas production from the East Texas and Fort Worth basins, particularly the Barnett Shale formation area found in the latter. The largest project, Energy Transfer Company's 650-MMcf/d Fort Worth Basin Pipeline, improved transportation services between the Fort Worth Basin and interconnections with other area natural gas pipelines. Demand for new capacity on this and other area natural gas pipelines prompted Energy Transfer to begin looping this new system almost immediately after placing it in service, to increase its capacity by an additional 400 MMcf/d by the end of 2006 (Table 2).

⁴Minerals Management Service News Release #3484, *MMS Updates Hurricanes Katrina and Rita Damage*, May 1, 2006, Tables 1 and 2.

⁵Most pipelines affected by the storms posted details of segment outages and shut-ins as well as recovery measures and the timeframe for repairs on their Internet "Informational Postings" page.

Table 1. Natural Gas Pipeline Construction Projects Completed in 2005, by Terminating Region
 (Map Key references Figure 3)

Ending Region & State	Begins in State -- Region	Map Key	Pipeline - Project Name	FERC Docket Number (Interstate Projects)	Type of Project	In Service Date	Estimated Cost (Million Dollars)	Miles	Additional Capacity (MMcf/d) ¹
Central									
UT	UT	Central	1 Questar - Southern System Expansion	CP05-05	Looping ² /Compression ³	01-Nov-05	55	19	102
KS	CO	Central	2 Cheyenne Plains Pipeline - Expansion	CP04-345	Compression	07-Nov-05	8	0	170
Subtotal							62	19	272
Midwest									
MN	MN	Midwest	3 Northern Natural - Bluff Creek/Tomah Expansion	CP05-49	Compression/Extension ⁴	01-Nov-05	8	3	2
IL	IL	Midwest	4 Mississippi River Trans - Horseshoe Lake Expansion	CP04-346	Lateral ⁵	01-May-05	18	4	134
WI	WI	Midwest	5 ANR Pipeline - NorthLeg Expansion	CP04-01	Compression	16-Dec-05	14	0	105
WI	WI	Midwest	6 ANR Pipeline - EastLeg Expansion	CP04-51	Looping/Compression	01-Nov-05	19	8	143
MI	MI	Midwest	7 Consumers Energy - Oakland East Project	Not applicable	New Pipeline	05-Nov-05	28	11	135
Subtotal							86	26	519
Northeast									
MA	MA	Northeast	8 Tenneco - Tewksbury Andover Lateral	CP04-60	Lateral	07-Oct-05	8	5	25
NJ	NJ	Northeast	9 Transco - Central New Jersey Expansion	CP04-396	Looping/Compression	01-Nov-05	12	4	105
DE	PA	Northeast	10 Eastern Shore - 2003-5 Expansion Phase 3	CP03-80	Looping	30-Nov-05	14	24	10
MD	VA	Northeast	11 Dominion - Cove Point East Project	CP03-74	Compression	29-Apr-05	44	0	433
Subtotal							78	33	573
Southeast									
FL	FL	Southeast	12 Gulfstream Pipeline - System Extension Phase 2	CP00-06	Extension	31-Dec-04	237	110	175
MS	MS	Southeast	13 Petal Gas Storage- Compressor Upgrade	CP04-424	Compression	01-May-05	1	0	620
Subtotal							238	110	795
Southwest									
GM	GM	Offshore	14 Excelerate - Energy Bridge Connector	Not applicable	Lateral	21-Mar-05	5	8	690
GM	GM	Offshore	15 Discovery - Hunt ST 254 Line	Not applicable	Lateral	01-Apr-05	4	3	15
GM	GM	Offshore	16 Discovery - Rock Creek ST 41 Line	Not applicable	Lateral	01-Apr-05	5	2	100
LA	GM	Offshore	17 Discovery - Market Expansion Project	CP03-342	Looping/Compression	06-Jul-05	11	3	150
LA	LA	Southwest	18 Trunkline - Lake Charles Lateral Loop	CP04-64	Looping	01-Oct-05	40	23	1,100
LA	LA	Southwest	19 Regency - Northern Louisiana Expansion	Not applicable	Looping/Compression	15-Dec-05	140	120	615
TX	TX	Southwest	20 Dominion South - FGT Interconnect	CP05-76	Lateral	16-Dec-05	2	0	200
TX	TX	Southwest	21 Enbridge Pipelines - East Texas Pipeline	Not applicable	New Pipeline	06-May-05	130	107	500
TX	TX	Southwest	22 Quicksilver Resources - Cowtown Gathering	Not applicable	New Pipeline	01-Jul-05	15	35	75
TX	TX	Southwest	23 Energy Transfer - Fort Worth Basin Pipeline	Not applicable	New Pipeline	01-Jun-05	53	54	650
TX	TX	Southwest	24 Kinder Morgan - Rancho Pipeline Phase II	Not applicable	Conversion ⁶	31-Oct-05	40	254	150
TX	TX	Southwest	25 Atmos Energy - North Side Loop (NSL) West Side	Not applicable	New Pipeline	01-May-05	24	22	200
OK	OK	Southwest	26 Ventura Pipeline - Gathering Lateral	Not applicable	Lateral	01-Sep-03	30	40	100
OK	OK	Southwest	27 CenterPoint - Line AD Expansion Project	CP05-03	Compression	30-Nov-05	32	0	113
OK	OK	Southwest	28 CenterPoint - Line2-AD-24 Childes Lateral	CP05-58	Lateral	14-Dec-05	4	24	400
OK	CO	Central	29 Colorado Interstate - Raton Basin Expansion	CP05-50	Looping/Compression	15-Dec-05	60	102	104
NM	NM	Southwest	30 Transwestern - San Juan 2005 Expansion	CP04-104	Looping/Compression	01-May-05	138	73	375
Subtotal							733	869	5,537
Western									
AZ	CA	Western	31 El Paso Natural - Line 1903 Conversion	CP05-02	Conversion	30-Dec-05	78	94	502
Subtotal							78	94	502
Total							1,274	1,152	8,198

¹ When announcing the design capacity for a proposed project or expansion, a pipeline company may provide either a volumetric (per cubic feet) or energy content (btus/therms) value. In this table, reported capacity figures are presented as volumetric (MMcf/d = million cubic feet per day) assuming a conversion factor of 1 MMcf/d = 1 MDth/d (thousand dekatherms per day) = 1 Bbtu/d (billion btus per day).

² Looping refers to the installation of another segment of pipeline parallel to an existing pipeline segment and is used as a means of quickly increasing overall pipeline capacity and/or increasing line-packing (temporary storage) on a pipeline system.

³ May include placing additional compressor units at an existing station, the upgrading of existing units, or adding one or more new compressor stations to an existing system.

⁴ An extension refers to the building of a new section of pipeline to a service area beyond the original termination point of the transmission system.

⁵ A lateral refers to a new pipeline segment built to interconnect a new customer to a local major pipeline or to a local distribution company (LDC) mainline.

⁶ Conversion of an oil and/or product pipeline to carry natural gas.
 GM = Gulf of Mexico.

Notes: Interregional project is in **bold print**. Excludes projects on hold as of December 2004. In the table, a project that crosses interregional boundaries is included in the region in which it terminates. Offshore projects are included in the Southwest region. Totals may not sum due to independent rounding.

Source: Energy Information Administration, GasTran Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database.

- **In the Gulf of Mexico, the first new U.S. LNG import terminal in over 20 years was completed, as well as an 8-mile natural gas pipeline lateral linking it to existing offshore-to-onshore systems.** The Excelerate Energy Bridge LNG facility, located 116 miles south of Louisiana in the Gulf of Mexico, can deliver up to 690 MMcf/d of vaporized LNG onshore via either the Sea

Robin or Bluewater offshore-to-onshore natural gas pipeline systems through its associated 20-inch diameter, 8-mile connecting lateral (Table 1).

- **Capacity of the Cheyenne Plains Pipeline, first placed in operation in 2004, was increased by 30 percent.** Initially designed to provide 560 MMcf/d, the capacity

of the Cheyenne Plains Pipeline system was increased by 170 MMcf/d through an upgrade of its only compressor station, located at its terminus in northeastern Colorado. Increased demand for natural gas pipeline capacity by natural gas producers in the expanding Wyoming/Colorado production areas, needing greater access to Midwest markets, necessitated this increase in capacity.

- **In California, the El Paso Natural Gas Pipeline system was upgraded to include a north-to-south flow capability with the conversion of a portion of a former oil pipeline to natural gas use.** The 502-MMcf/d Line 1903 conversion project provides shippers on El Paso's north system, and the Kern River Gas Transmission Pipeline, with the option (via the Mojave Pipeline system) of transporting their product from Cadiz, California, southward to Ehrenberg, Arizona. The 1903 line crossover will now provide shippers of Rocky Mountain natural gas supplies with the capability to extend their potential market beyond California, for instance, to Arizona or Mexico.

National Overview

The U.S. natural gas pipeline grid includes more than 210 mainline natural gas pipeline systems.⁶ Of these, 109 were classified as interstate systems by the Federal Energy Regulatory Commission (FERC) in 2005. The remaining 101 were intrastate natural gas pipeline systems; that is, their operations are confined to a single State. The combined natural gas pipeline capacity on mainline intrastate systems is only about 22 percent as much as interstate natural gas pipeline capacity, or about 33 Bcf/d.⁷

Interstate natural gas pipeline systems account for more than 148 Bcf/d of total U.S. natural gas transportation capacity and approximately 213,000 miles of natural gas pipeline (Table 3). Furthermore, the top 30 interstate natural gas pipeline companies alone account for more than 78 percent, or about 115 Bcf/d, of that interstate natural gas pipeline capacity. The largest systemwide capacity is found on the Columbia Gas Transmission system, which has primary operations in seven States in the Northeast and limited operations in Kentucky, North Carolina, and Ohio. Northern Natural Gas Pipeline system, which transports natural gas supplies from the Southwest to the Central and Midwest regions, consists of 15,854 pipeline miles, the greatest for a single natural gas pipeline company.

⁶That is, they are engaged in the transportation of natural gas from production area to market area. Field gathering systems and local gas distribution systems are excluded.

⁷Energy Information Administration, Natural Gas Pipeline Affiliations Database, 2006.

Capacity Measures

Natural gas pipeline capacity may be measured in several different ways. For the pipeline as a whole there is the systemwide design day deliverability volume, which is the maximum amount a pipeline system can theoretically deliver to all its customers on a peak-demand day. At the operational level, a pipeline also will provide measures of peak (design) day volumes that can be transported through, or at, a specific point on its system, such as at a compressor station, along a specific pipeline segment, or received or delivered at a specific point on its system. Interregional capacity, shown on Figure 6, represents an EIA estimate of the throughput capability of pipelines at State/regional border crossings. It provides an aggregate measure of the potential pipeline flow capability between regions and a view of where the interstate pipeline system has directed its growth.

In this article the focus is on new capacity added through pipeline construction, which is examined by project (Table 1) and in the aggregate (Table 4). Pipeline project capacity additions can take the form of (1) a completely new pipeline, in which case the added capacity will be equal to the system capacity, (2) the expansion or addition of one or more pipeline segments, or (3) upgrades to, or addition of, one or more compressor stations within a system.

In 2005, 61 percent (5.0 Bcf/d) of the added natural gas pipeline capacity was attributable to 20 interstate natural gas pipeline projects, of which all but one, El Paso's Line 1903 conversion in the Western region, were expansions or extensions to existing natural gas pipeline segments (Table 1). In 14 cases expansion was accomplished by adding new looping to portions of the system or by installing or upgrading compression stations or units. Of the remaining 6 projects, 1 was an oil-pipeline conversion, 4 were new natural gas pipeline laterals, and 1 a system extension which was built to extend an existing system into a new market area.

Only 1 of the 20 natural gas pipeline expansions of the interstate network completed in 2005 crossed regional boundaries, reflecting an emphasis on local area expansions or upgrades. Additions to interregional capacity during the year were only 104 MMcf/d overall, a decrease of 86 percent from the 2004 level of 768 MMcf/d when 5 projects added to interregional capacity.⁸

⁸Energy Information Administration, *Changes in U.S. Natural Gas Transportation Infrastructure in 2004*, Table 2 (June 2005), http://www.eia.doe.gov/pub/oil_gas/natural_gas/feature_articles/2005/ngtran/ngtrans.pdf

Table 2. Largest 20 Planned Natural Gas Pipeline Projects for 2006, 2007, and 2008, By Level of Added Capacity

Year Planned	State Begin	State End	Region End	Developer	Project Name	FERC Docket Number	Type of Project	Status (as of May 2006)	Miles	Additional Capacity (MMcf/d) ¹
2006	GM	GM	Offshore	Okeanos Gas Gathering Co.	Thunder Horse Segment	Not applicable	Extension	Construction	26	1,200
2006	LA	LA	Southwest	Liberty Gas Storage LLC	Liberty Storage Lateral	CP05-94	Lateral	Approved	23	1,000
2006	GM	GM	Offshore	Enterprise Products Partners LP	Independence Trails Offshore Line	Not applicable	New Pipeline	Construction	134	1,000
2006	CO	WY	Central	Kinder Morgan Energy Partners LP	Rockies Express (Entrega) Phase 1a	CP04-413	New Pipeline	Completed	132	750
2006	TX	TX	Southwest	Energy Transfer Co.	Barnett-Texoma Pipeline	Not applicable	New Pipeline	Construction	264	700
2006	WY	WY	Central	Jonah Gas Gathering Co.	Phase IV Expansion	Not applicable	Looping/Compression	Completed	45	400
2006	TX	TX	Southwest	Energy Transfer Co.	Fort Worth Basin Looping	Not applicable	Looping/Compression	Construction	24	400
2006	GM	GM	Offshore	Cleopatra Pipeline LLP	Cleopatra Gathering System Phase 2	Not applicable	Gathering Lateral	Construction	21	375
2006	CO	CO	Central	Wyoming Interstate Gas Co.	Piceance Line	CP05-54	Looping/Compression	Completed	142	341
2006	OH	OH	Midwest	Somerset Gas Transmission Inc.	NorthCoast Trans Ohio Expansion	Not applicable	Extension	Approved	140	300
2006	WY	WY	Central	Jonah Gas Gathering Co.	Phase V Expansion	Not applicable	Looping/Compression	Construction	25	300
2006	WY	WY	Central	Rendezvous Gas Services LLC	Kern River Lateral	CP05-40	Lateral	Approved	21	300
2006	CO	CO	Central	TransColorado Pipeline Co.	North Expansion Project	CP05-45	Compression	Completed	0	300
2006	WY	WY	Central	Windsor Energy Inc.	Windsor Energy Gathering Lateral	Not applicable	Lateral	Construction	21	300
2006	TX	TX	Southwest	Crosstex Energy Co.	Fort Worth Basin Pipeline	Not applicable	New Pipeline	Completed	122	250
2006	AL	AL	Southeast	Freebird Gas Storage LLC	Freebird Gas Storage Lateral	CP05-29	Lateral	Construction	4	250
2006	VA	VA	Northeast	East Tennessee Nat Gas Co.	Jewell Ridge Lateral	CP05-413	Lateral	Approved	32	235
2006	GM	GM	Offshore	Tennessee Gas Pipeline Co.	Triple-T Extension	CP05-416	Lateral	Approved	6	200
2006	TX	TX	Southwest	Atmos Energy Inc.	North Side Loop (NSL) East Side	Not applicable	New Pipeline	Approved	25	200
2006	GM	GM	Offshore	Enterprise Products Partners LP	Constitution Gathering Pipeline	Not applicable	Gathering	Completed	32	200
2006	--	--	--	--	Others (24 projects)	--	--	--	341	2,149
Total									1,580	11,150
2007	TX	LA	Southwest	Gulf South Pipeline Co.	East Texas Expansion	PF06-17	Looping/New Pipeline	NEPA Prefiling	180	1,500
2007	LA	MS	Southwest	Gulf South Pipeline Co.	Mississippi Expansion	PF06-23	Looping/Replacement	NEPA Prefiling	86	1,500
2007	TX	LA	Southwest	CenterPoint Energy Gas Trans Co.	Perryville Expansion Phase I & 2	CP06-85	New Pipeline	Applied	177	1,237
2007	GM	GM	Offshore	Tennessee Gas Pipeline Co.	Deepwater Link Project	CP05-100	New Pipeline	Approved	1	1,000
2007	TX	TX	Southwest	Energy Transfer Co.	Barnett-Texoma 2007 Expansion	Not applicable	Looping/Compression	Approved	157	950
2007	PA	NJ	Northeast	Texas Eastern Trans Corp.	Logan Lateral	CP04-416	Lateral	Applied	11	900
2007	MA	MA	Northeast	Algonquin Gas Trans Co.	Northeast Gateway LNG	CP05-383	Lateral	Applied	16	800
2007	WY	CO	Central	Kinder Morgan Energy Partners LP	Entrega Pipeline (Rockies Express) Phase 1b	CP04-413	New Pipeline	Approved	191	750
2007	CO	CO	Central	Kinder Morgan Energy Partners LP	Entrega Pipeline (Rockies Express) Phase 2	CP04-413	Compression	Approved	0	750
2007	WY	WY	Central	Questar Overthrust Pipeline Co.	Wamsutter Expansion Project	PF06-19	Compression/Lateral	NEPA Prefiling	77	750
2007	LA	LA	Southwest	Crosstex Energy Co.	LIG Extension	Not applicable	Extension	Planning	65	700
2007	TX	LA	Southwest	Kinder Morgan Energy Partners LP	Carthage Line	None yet	New Pipeline	Planning	38	700
2007	TX	TX	Southwest	Enbridge Energy Pipeline Co.	East Texas System Extension	Not applicable	Extension	Approved	290	700
2007	MS	MS	Southeast	SGR Holding Corporation	Southern Pines Storage Line Extn	CP02-229	Extension	Construction	32	600
2007	LA	LA	Southwest	Pine Praire Corridors LLC	Pine Praire Storage Laterals	CP04-379	Looped Lateral	Construction	24	600
2007	MX	AZ	Western	North Baja Pipeline LLC	Expansion Phase I	PF06-61	Looping	NEPA Prefiling	81	572
2007	WY	WY	Central	Questar Overthrust Pipeline Co.	Overthrust Extension	PF06-09	Extension	NEPA Prefiling	28	550
2007	NY	NY	Northeast	Millennium Pipeline Co LP	Millennium Pipeline Phase I	CP98-150	New Pipeline	Applied	186	525
2007	LA	MS	Southwest	Columbia Gulf Trans Co.	East Lateral Extension	None yet	Extension	Planning	90	500
2007	NY	NY	Northeast	Central New York Oil & Gas LLC	Stagecoach North Lateral	CP06-64	Lateral	Applied	15	500
2007	--	--	--	--	Others (49 projects)	--	--	--	1,450	9,501
Total									3,195	25,585
2008	LA	LA	Southwest	Creole Trail LLP	Creole Trail LNG Pipeline	CP05-357	Lateral	Applied	230	3,300
2008	TX	TX	Southwest	Corpus Christi Pipeline Co.	Corpus Christi LNG Line	CP04-44	Lateral	Construction	24	2,700
2008	LA	LA	Southwest	Sabine Pass Pipeline Co.	Sabine Pass LNG Line	CP04-38	Lateral	Approved	16	2,700
2008	LA	LA	Southwest	Kinder Morgan Energy Partners LP	Louisiana Pipeline Leg 1	PF06-16	New Pipeline	NEPA Prefiling	137	2,130
2008	TX	LA	Southwest	Golden Pass LNG Terminal LP	Golden Pass LNG System	CP04-400	Lateral	Approved	70	2,000
2008	TX	TX	Southwest	Freeport LNG Development LP	Freeport LNG Line	CP03-75	Lateral	Approved	10	1,750
2008	CO	MO	Central	Kinder Morgan Energy Partners LP	Rockies Express (REX-West)	CP06-354	New Pipeline	Applied	713	1,500
2008	TX	AL	Southeast	Kinder Morgan Energy Partners LP	Mid-Continent Express	None yet	New Pipeline	Planning	780	1,500
2008	LA	LA	Southwest	Sempra Energy Inc.	Cameron Interstate Pipeline	CP02-374	Lateral	Construction	35	1,500
2008	TX	TX	Southwest	Vista del Sol Pipeline LP	Vista del Sol LNG Line	CP04-405	Lateral	Planning	25	1,400
2008	CA	CA	Western	Calpine/Crystal Energy	Clearwater LNG Facility Pipeline	Not applicable	Compression	Applied	26	1,200
2008	TX	AL	Southeast	CenterPoint Energy Gas Trans Co.	Mid-Continent Pipeline	None yet	New Pipeline	Planning	800	1,200
2008	GM	AL	Southeast	Compass Pass Pipeline LLC	Compass Pass Pipeline Project	CP04-114	New Pipeline	Applied	5	1,000
2008	WY	LA	Southwest	El Paso Corp.	Continental Connector	PF06-27	New Pipelines	NEPA Prefiling	650	1,000
2008	TX	TX	Southwest	Port Comfort Pipeline Co.	Port Comfort LNG Line	CP05-380	Lateral	Applied	27	1,000
2008	TX	TX	Southwest	San Patricio Pipeline LLC	Ingleside LNG Line	CP05-11	Lateral	Approved	26	1,000
2008	LA	MS	Southeast	CenterPoint Energy Gas Trans Co.	CEGT Southeast Supply Header Pipeline	PF06-28	New Pipeline	NEPA Prefiling	250	1,000
2008	FL	FL	Southeast	AES Ocean Express Pipeline LLP	Ocean Express Onshore Project	CP02-90	New Pipeline	Approved	6	842
2008	MD	VA	Northeast	Dominion Cove Point LNG PL Co.	Cove Point PL 2008 Expansion	CP05-132	Looping/Compression	Applied	36	800
2008	PA	MD	Northeast	Dominion Transmission Inc.	Dominion 2008 PA Expansion	CP05-131	Looping/Extension	Applied	81	800
2008	--	--	--	--	Others (24 projects)	--	--	--	814	9,471
Total									4,761	39,793
3-Year Total					157 Projects				9,536	76,528

¹When announcing the design capacity for a proposed project or expansion, a pipeline company may provide either a volumetric (per cubic feet) or energy content (btus/therms) value. In this table, reported capacity figures are presented as volumetric (MMcf/d = million cubic feet per day) assuming a conversion factor of 1 MMcf/d = 1 MDth/d (thousand dekatherms per day) = 1 Bbtu/d (billion btus per day).

MMcf/d = million cubic feet per day. GM = Gulf of Mexico.

Source: Energy Information Administration, GasTran Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database, as of June 30, 2006.

Table 3. Thirty Largest U.S. Interstate Natural Gas Pipeline Systems, 2005
 (Ranked by 2005 system capacity, million cubic feet per day (MMcf/d))

Pipeline Name	Market Regions Served	Primary Supply Regions	States in Which Pipeline Operates	2005 System Capacity (MMcf/d) ¹	2005 System Mileage
Columbia Gas Transmission Co.	Northeast	Southwest, Appalachia	DE, PA, MD, KY, NC, NJ, NY, OH, VA, WV	8,700	10,354
Transcontinental Gas Pipeline Co.	Northeast, Southeast	Southwest	AL, GA, LA, MD, MS, NC, NY, SC, TX, VA, GM	8,161	10,469
Northern Natural Gas Co.	Central, Midwest	Southwest	IA, IL, KS, NE, NM, OK, SD, TX, WI, GM	7,923	15,854
ANR Pipeline Co.	Midwest	Southwest	AR, IA, IL, IN, KS, KY, LA, MI, MO, MS, NE, OH, OK, WI, GM	6,844	9,616
Tennessee Gas Pipeline Co.	Northeast, Midwest	Southwest, Canada	AR, KY, LA, MA, NY, OH, PA, TN, TX, WV, GM	6,686	13,302
Texas Eastern Transmission Corp.	Northeast	Southwest	AL, AR, IL, IN, KS, KY, LA, MI, MO, MS, NJ, NY, OH, OK, PA, TX, WV, GM	6,523	9,179
El Paso Natural Gas Co.	Western, Southwest	Southwest	AZ, CO, NM, TX	6,152	10,661
Dominion Transmission Co.	Northeast	Southwest, Appalachia	PA, MD, NY, OH, VA, WV	5,734	3,142
Northwest Pipeline Corp.	Western	Canada, Central	CO, ID, OR, UT, WA, WY	4,500	4,046
Natural Gas Pipeline Co. of America	Midwest	Southwest	AR, IA, IL, KS, LA, MO, NE, OK, TX, GM	4,485	9,111
Southern Natural Gas Co. (SONAT)	Southeast	Southwest	AL, GA, LA, MS, SC, TN, TX, GM	3,365	7,671
Centerpoint Gas Transmission Co.	Southwest	Southwest	AR, KS, LA, OK, TX	3,339	6,182
Gulf South Pipeline Co.	Southeast, Southwest	Southwest	AL, FL, LA, MS, TX, GM	3,038	6,580
Colorado Interstate Gas Co.	Central	Central, Southwest	CO, KS, OK, TX, WY	3,000	3,996
Texas Gas Transmission Corp.	Midwest	Southwest	AR, IN, KY, LA, MS, OH, TN	2,979	5,643
Great Lakes Gas Transmission Co.	Midwest	Canada	MI, MN, WI	2,859	2,115
Panhandle Eastern Pipeline Co.	Midwest	Southwest	IL, IN, KS, MI, MO, OH, OK, TX	2,840	6,445
Gas Transmission Northwest Corp.	Western	Canada	ID, OR, WA	2,636	1,356
Northern Border Pipeline Co.	Midwest, Central	Canada	IA, IL, IN, MN, MT, ND, SD	2,496	1,399
Southern Star Central Pipeline Co.	Central	Central	CO, KS, MO, NE, OK, TX, WY	2,451	5,788
National Fuel Gas Supply Co.	Northeast	Canada, Appalachia	NY, PA	2,312	1,504
Questar Pipeline Co.	Central	Central	CO, UT, WY	2,192	1,745
Florida Gas Transmission Co.	Southeast	Southwest	AL, FL, LA, MS, TX, GM	2,190	4,867
Algonquin Gas Transmission Co.	Northeast	Southwest	CT, MA, NJ, NY, RI	2,174	1,103
Columbia Gulf Transmission Co.	Southeast, Northeast	Southwest	KY, LA, MS, TN, GM	2,156	4,105
Alliance Pipeline Co. (US)	Midwest	Canada	ND, MN, IA, IL	2,053	888
Wyoming Interstate Gas Co.	Central	Central	CO, WY	1,997	585
Kern River Gas Transmission Co.	Western	Central	CA, NV, UT, WY	1,833	1,680
High Island Offshore System	Southwest	Gulf of Mexico	LA, GM	1,800	212
Trunkline Gas Co.	Midwest	Southwest	AR, IL, IN, KY, LA, MS, OH, TN, TX	1,680	3,558
Sub-total				115,098	163,156
Other Interstate Pipeline Systems (79)	--	--	--	33,235	49,531
Total				148,333	212,687

¹ Capacity levels are reported to FERC in Btu, dekatherms, or volumetric units. For this presentation, reported capacity figures are presented as volumetric (MMcf/d = million cubic feet per day) assuming a conversion factor of 1 MMcf/d = 1 MDth/d (thousand dekatherms per day) = 1 Bbtu/d (billion btus per day).

Note: GM = Gulf of Mexico.

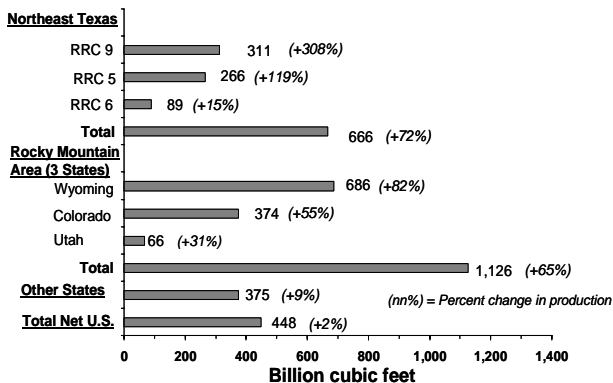
Source: Federal Energy Regulatory Commission (FERC), **Mileage**: FERC Form 2 & 2A "Major and Non-major Natural Gas Pipeline Annual Report," **Capacity**: FERC Annual Peak Day Capacity Report Section 284.13(d).

The 11 non-interstate projects completed in 2005 represented new intrastate natural gas pipelines or gathering system laterals designed to alleviate potential and developing natural gas pipeline capacity constraints in expanding production areas such as east Texas and the Rocky Mountain States of Colorado, Utah, and Wyoming. Fewer intrastate natural gas pipeline projects were completed than interstate, however. On average, the volume of new capacity added by intrastate projects exceeded that of interstate projects (294 MMcf/d versus 248 MMcf/d).

Indeed, increased natural gas production demands appear to have been the driving force behind most of the natural gas pipeline capacity additions of 2005 and much of the proposed additional natural gas pipeline capacity slated for installation over the next several years. Between 1998 and 2004, natural gas production in the most rapidly expanding production areas of the country (northeast Texas, Wyoming, Colorado, and Utah (Figure 4)) increased by 68 percent overall, while proved natural gas reserves grew by 83 percent.⁹ For the country as a whole (including these areas), however, production and proved reserves increased by only 2 and 17 percent, respectively.

In 2005, 18 of the 31 projects, accounting for 57 percent of added capacity (4.7 Bcf/d), were production-area oriented while only 10 projects, accounting for 16 percent of new capacity, were oriented toward market areas; the other 3 projects, accounting for 27 percent of new natural gas pipeline capacity, were tied to LNG import support.

Figure 4. Natural Gas Production Growth Between 1998 and 2004



Note: RRC = Texas Railroad Commission District.
 Source: Energy Information Administration, U.S. Crude Oil and Natural Gas, and Natural Gas Liquids Reserves: 1998 and 2004 Annual Reports.

⁹Based on data from the Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report 2004 and 1998*, Table 8 (November 2005) and (November 1999). http://www.eia.doe.gov/oil_gas/natural_gas/data_publications/crude_oil_natural_gas_reserves/reserves_historical.html

Related to the growth in intrastate and gathering systems in meeting production area need for exit capacity, interstate natural gas pipeline companies have responded with proposals to expand their own systems, or build new ones, to move this new production to distant market areas. Reflecting this accommodation, a number of interstate natural gas pipelines, operating in the east Texas area in particular, have initiated plans to add capacity on existing routes that interconnect local production areas, or proposals to build extensions that would link their current interstate network with expanding intrastate systems (Figure 5). For instance, interstate natural gas pipeline companies such as Gulf South Pipeline, Natural Gas Pipeline Company of America, and CenterPoint Energy Gas Transmission Company have announced plans, or have already applied to FERC, to develop capacity additions to integrate expanding east Texas production with their systems in Texas, Louisiana, Mississippi, and Alabama.

Regional Review

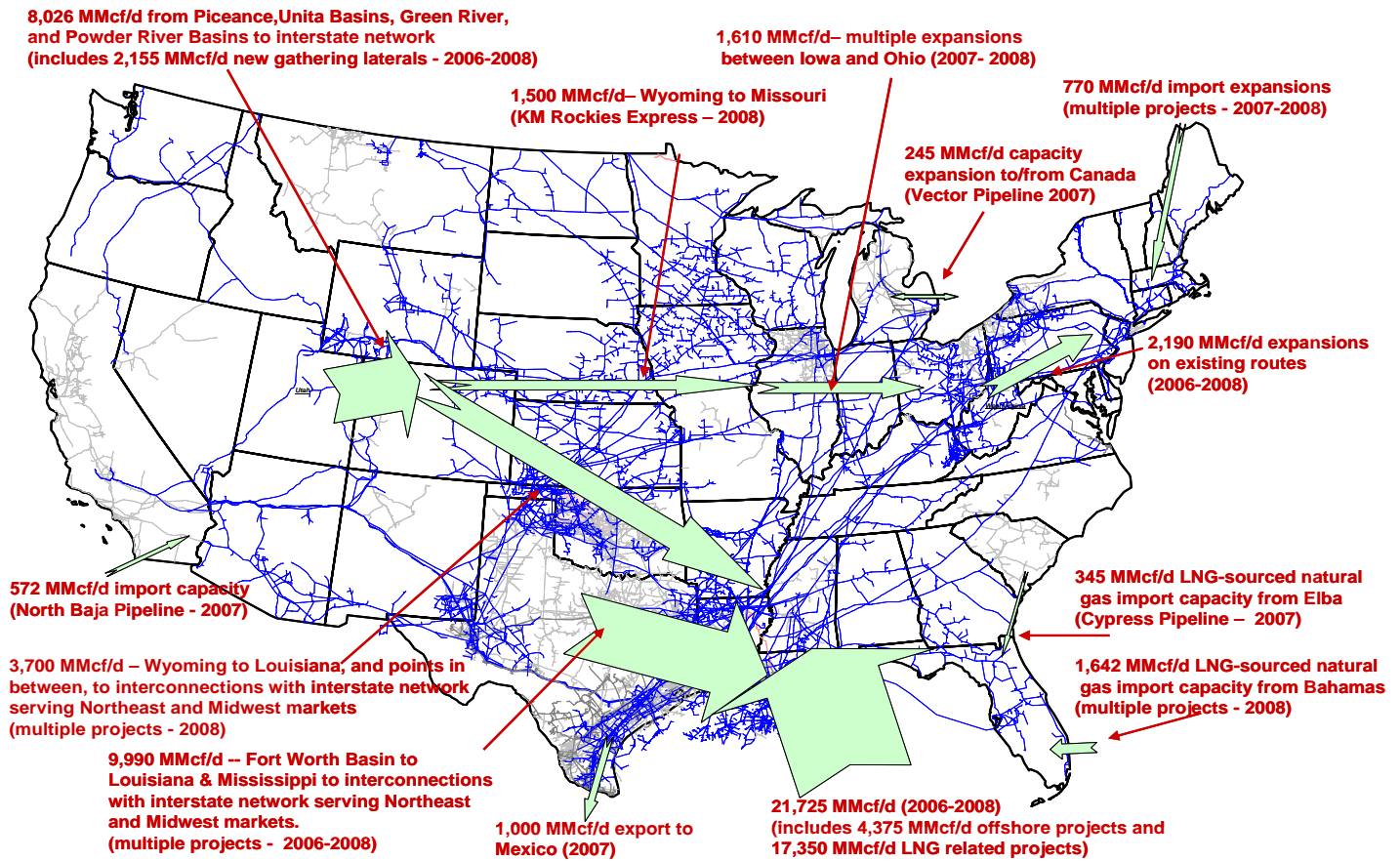
Most of the major natural gas producing areas of the country are located in either the Central or Southwest regions. Consequently, these two regions are also the starting point for many of the major interstate pipeline companies that transport natural gas to the major markets located in the Midwest, Northeast, Southeast, and West regions (Table 3).

Of the 30 largest interstate pipeline systems in the lower 48 States, 15 begin in the Southwest region. Eleven of these 15 systems direct about 23.5 Bcf/d of their transportation capacity that exits the Southwest to markets in the Southeast, Northeast, and Midwest regions (Figure 6). The largest of these systems, Transcontinental Gas Pipeline Company (Transco), extends over 1,700 miles from southeast Texas near the Mexican border, to New York City, exiting the region with over 3.4 Bcf/d of capacity. The Natural Gas Pipeline Company of America (NGPL) system, which is one of the largest movers of natural gas to the Midwest region, transports natural gas supplies from both the panhandle of northern Texas and the Louisiana/Texas Gulf Coast region, with over 1.7 Bcf/d of capacity exiting the Southwest region.

Although the level of natural gas pipeline capacity leaving the Southwest region did not grow in 2005, it is currently 8 percent greater than in 1998, partly because of expansions on systems such as Transco, Florida Gas Transmission, El Paso Natural Gas, and Southern Star Central over the period. The Central region, which also has several major natural gas pipelines traversing it between Canada and the Midwest (e.g., Northern Border Pipeline and Alliance Pipeline), currently has 15.2 Bcf/d of net domestic exit capacity compared with 13.3 Bcf/d in 1998, a 14-percent increase.¹⁰

¹⁰Energy Information Administration, *Expansion and Change on the U.S. Natural Gas Pipeline Network - 2002*, Table 4 (May 2003),

Figure 5. Major Natural Gas Pipeline Corridor Expansions – 2006 through 2008



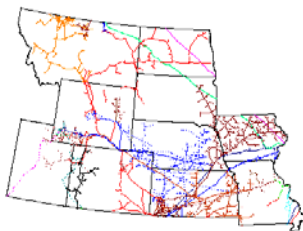
MMcf/d = million cubic feet per day.

Note: EIA has determined that publication of this figure does not raise security concerns, based on the application of Federal Geographic Data Committee's *Guidelines for Providing Appropriate Access to Geospatial Data in Response to Security Concerns*.

Source: Energy Information Administration, GasTran Gas Transportation Information System, Natural Gas Pipeline Projects Database.

Central Region

Despite the steadily increasing exploration and development activities and expansions of natural gas production within the major natural gas basins of the Rocky Mountain States, only two natural gas pipeline expansion projects were completed in the Central region in 2005 (Table 1). The two projects included additional compression on the Cheyenne Plains Pipeline, which increased its operational capacity by 170 MMcf/d or 30 percent, and Questar's Southern System expansion in eastern Utah, which increased its deliverability by 102 MMcf/d through looping of 19 miles of the existing system.



The relatively low level of capacity additions in the region in 2005, however, merely reflects the regional natural gas pipeline expansion activity of the previous 7 years. Between 1998 and 2004, 10.2 Bcf/d of natural gas pipeline capacity was added in the 10 States that make up the Central region (Table 4). That level represented more than 16 percent of all natural gas pipeline incorporated into the national network during that time, the third largest regional capacity level and the second in the number of miles of new natural gas pipeline.

Underlying the high level of natural gas pipeline expansion activity between 1998 and 2004 was the growth in production and proved reserves in the Rocky Mountain area during that time. Between 1998 and 2004, the level of natural gas production in Wyoming, Colorado, and Utah increased by 82, 55, and 31 percent, respectively, while proved natural gas reserves grew by 66, 87, and 62 percent.¹¹ In absolute terms,

http://www.eia.doe.gov/pub/oil_gas/natural_gas/feature_articles/2003/Pipenet03/pipenet03.html

¹¹Based on data from the Energy Information Administration *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report* 2004 and 1998, Table 8 (November 2005) and (November 1999).

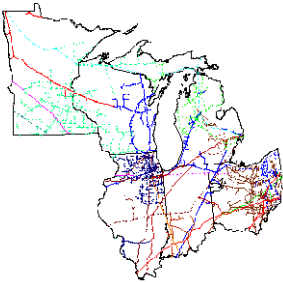
EnCana Ltd. to transport its own natural gas production to Cheyenne Hub for delivery on the general interstate network. Entrega will have a capacity of 1.5 Bcf/d when completed in late 2007. Besides the Entrega project, several other interstate natural gas pipeline companies are expanding their operations and system capacity in the Piceance Basin area in anticipation of serving the Rockies Express Project and expansions on other interstate systems directed to Midwest markets.

For example, during the first half of 2006 the Wyoming Interstate Pipeline Company completed its 341-MMcf/d "Piceance Line" while the TransColorado Gas Transmission Company completed a 300 MMcf/d northward expansion of its system. Both projects are designed to provide transportation of expanding Piceance Basin area production to future pipeline interconnections with links to the Cheyenne Hub. In addition, the Questar Overthrust Pipeline Company has proposed its Wamsutter Expansion Project which would support the transportation of another 750 MMcf/d of area natural gas production through Wyoming to the Cheyenne Hub by late 2007 (Figure 5).

Also seeking the opportunity to provide transportation services for the large volume of new natural gas production expected to arrive at the Cheyenne Hub area in 2008, El Paso Corporation has proposed its Continental Connector Pipeline system (Table 2). The Connector would be a 1 Bcf/d system that would extend from the Cheyenne Hub southward to northern Louisiana's Perryville Hub, where it would interconnect with other interstate natural gas pipelines serving the Midwest, Southeast, and Northeast markets. On its route through Texas, it would also be able to receive natural gas production from the expanding Fort Worth Basin (Barnett Shale formation). The system would be a combination of 650 miles of new natural gas pipeline, looping of the existing Cheyenne Plains Pipeline, and the leasing of capacity on the OGE\Enogex intrastate system in Oklahoma.

Midwest

Five relatively small natural gas pipeline projects were completed in the Midwest region in 2005, accounting for only 26 miles of new natural gas pipeline and 519 MMcf/d of new capacity, about half of that which was added in 2004. Nevertheless, the projects that were completed during the year, though limited, provided needed improvements for specific local customers and system capabilities (Table 1).



Two of the completed projects were undertaken to meet the natural gas demands of several regional natural gas-fired

electric power generation plants. The larger of the two was ANR Pipeline Company's (ANR) EastLeg expansion project, which increased ANR's system capacity by 143 MMcf/d in northeastern Wisconsin, enabling it to provide additional supplies to two natural gas-fired electric generation plants. The other project was Mississippi River Transmission Company's (MRT) 134-MMcf/d Horseshoe Lake expansion, which was undertaken to provide additional service to an existing natural gas-fired electric generation plant that was expanding its use of natural gas as a fuel source. The added service required the installation of a new compressor station in southwest Illinois and a 4-mile replacement lateral from MRT's mainline to the plant.

A second project by ANR, the NorthLeg expansion, was initiated to improve system reliability on the north central segment of ANR's Wisconsin system. The 105-MMcf/d capacity addition was accomplished through increased compression and was initiated to replace capacity previously available from an interconnection with Viking Gas Transmission's system that was terminated.

In Michigan, Consumers Energy completed the first phase of a two-phase expansion of its natural gas infrastructure in West Oakland County. The overall project is intended to satisfy growing customer demand for natural gas in the county and to alleviate a natural gas pipeline "bottleneck" in the area. With completion of this first phase of the initiative, Consumers Energy has 11 miles of new 36-inch natural gas pipeline, which increases capacity into the eastern portion of Oakland County by 135 MMcf/d. Current plans call for completion of the second phase by the end of 2008, extending the natural gas pipeline by an additional 13 miles to the west side of Oakland County.

Continuing a trend begun in 2002, annual additions to natural gas pipeline capacity in the Midwest are expected to remain below 1.5 Bcf/d through 2008. Although five projects are scheduled for completion in 2006, only two are currently in the inventory for 2007, and three for 2008. Moreover, the five projects scheduled for 2006 are relatively small, with their potential added capacity totaling only 778 MMcf/d. All but 3 of the 10 potential projects proposed for completion through 2008 begin and end within the Midwest region, providing improvements mainly on a localized basis.

Only three of the proposed projects are interstate expansion projects which would increase natural gas pipeline capacity into the Midwest region. The Northern Border Pipeline's Chicago Expansion III expansion, which was placed in service in May 2006, has already increased capacity on the portion of the system between Iowa and Indiana by 130 MMcf/d. The Vector Pipeline's expansion-by-compression of 245 MMcf/d, scheduled for 2007, would provide greater flexibility and system reliability for Vector customers seeking additional natural gas transportation between the Chicago Hub and the Dawn Hub in Ontario, and vice versa (Figure 5).

Table 4. Recent and Proposed Regional Natural Gas Pipeline Additions and Expansions, 1998 - 2008

Region (within or into)	Completed Between 1998 & 2004			Completed in 2005			Scheduled for 2006 ¹			Scheduled/Proposed for 2007 ¹			Proposed for 2008 ¹		
	Added Capacity (MMcf/d) ²	Estimated Cost (Million Dollars)	Miles	Added Capacity (MMcf/d) ²	Estimated Cost (Million Dollars)	Miles	Added Capacity (MMcf/d) ²	Estimated Cost (Million Dollars)	Miles	Added Capacity (MMcf/d) ²	Estimated Cost (Million Dollars)	Miles	Added Capacity (MMcf/d) ²	Estimated Cost (Million Dollars)	Miles
Central	10,210	3,040	3,422	272	62	19	2,946	704	461	5,000	1,095	815	1,850	1,919	713
Midwest	8,989	2,861	2,271	519	86	26	778	277	197	360	13	28	1,250	330	318
Northeast	8,139	3,129	2,274	573	78	33	534	242	140	5,737	1,625	537	2,846	465	187
Southeast	10,828	4,353	2,655	795	238	110	450	57	45	1,773	621	436	9,667	3,528	2,177
Southwest	13,198	1,636	1,755	5,537	733	869	6,156	1,302	721	10,898	2,739	1,264	21,780	1,983	1,310
Western	7,072	3,047	3,688	502	78	94	286	19	16	572	98	81	2,400	61	56
Mexico/Canada	1,449	144	61	0	0	0	0	0	0	1,245	70	35	0	0	0
U.S. Total	61,974	18,421	16,316	8,198	1,275	1,151	11,150	2,601	1,580	25,585	6,261	3,196	39,793	8,286	4,761

¹ Only projects that were approved or under regulatory review prior to January 1, 2006 and which have a proposed completion date in 2006 are included under "Scheduled for 2006". Projects that have yet to be filed for regulatory review but which have a proposed completion date in 2007-2008 are included under those periods.

² When announcing the design capacity for a proposed project or expansion, a pipeline company may provide either a volumetric (per cubic feet) or energy content (btus/therms) value. In this table, reported capacity figures are presented as volumetric (MMcf/d = million cubic feet per day) assuming a conversion factor of 1 MMcf/d = 1 MDth/d ((thousand dekatherms per day) = 1 Bbtu/d (billion btus per day)).

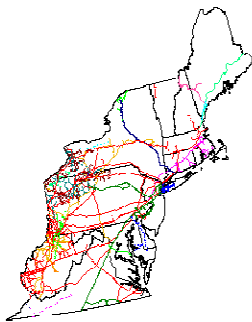
Notes: Excludes projects on hold as of December 2005. In the table, a project that crosses interregional boundaries is included in the region in which it terminates. Offshore Gulf of Mexico projects are included in the Southwest region. Totals may not agree with those in Tables 1 or 2 due to independent rounding.

Source: Energy Information Administration, GasTran Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database, as of June 30, 2006.

The remaining project is the Panhandle Eastern Pipeline Company's "Midwest Expansion." The Panhandle system, which originates in the Texas Panhandle and has access to natural gas production in the Anadarko, Permian, and San Juan basins, as well as the Rocky Mountain producing region, proposes to increase its system capacity between Missouri and Michigan by at least 750 MMcf by early 2008. Panhandle cites customer demand for greater access to the Chicago Hub as a prime initiative, in addition to growing local demands downstream of the Chicago Hub area. An interconnection in eastern Missouri with the Panhandle system in 2008 also will be the termination point for the first phase (REX-West) of the Kinder Morgan Rockies Express natural gas pipeline project.

It appears that natural gas pipeline expansion activity in the region could increase substantially in 2006 through 2008. The current inventory of 33 proposed natural gas pipeline expansion projects represents about 9.1 Bcf/d of additional capacity and 864 miles of new natural gas pipeline or looping. If all these projects were completed, new capacity during the 3-year period would exceed the volume added in the 8 years from 1998 through 2005 (Table 4). Moreover, 29 of the 33 projects, accounting for over 90 percent of the proposed additional capacity, are already under review or have been approved by regulatory authorities, greatly improving their chances of eventually being implemented by 2008. Two of the projects are currently (June 2006) under construction.

Northeast



Only four natural gas pipeline expansions were completed in the Northeast region in 2005, accounting for only 573 MMcf/d of additional natural gas pipeline capacity, a 32-percent decrease from additions in 2004 (Table 1). This was the lowest level of natural gas pipeline expansion in the region since 2000, when only 345 MMcf/d of capacity was added.¹²

Yet, several major projects in the Northeast, although approved by FERC, have been held up because of public opposition or non-FERC regulatory interventions. For instance, the Millennium Pipeline project, which was originally proposed with a completion date of 1990, was stalled for years due to opposition. Consequently, in 2003, the project was revised to reflect a shorter two-phase, sectioned project design, which its sponsors hoped would generate less opposition and quicken its development, or at least a portion of it. While its sponsors originally scheduled the first phase (525 MMcf/d) for completion by the end of 2007, the project has yet to be approved by FERC in its revised form.¹³ Moreover, the second phase is currently on hold indefinitely as a result of market changes and increased natural gas pipeline competition in the New York City metropolitan area. At least three other proposed expansion projects, representing more than 675 MMcf/d of potential expansion capacity, are strategically linked to the successful completion of the first phase of the Millennium project.

¹²Energy Information Administration, *Expansion and Change on the U.S. Natural Gas Pipeline Network - 2002*, Table 1, (May 2003), http://www.eia.doe.gov/pub/oil_gas/natural_gas/feature_articles/2003/Pipenet03/pipeenet03.html

¹³In mid July 2006, the sponsors of the Millennium Pipeline project conceded in a notification to the FERC that completion of it and its associated expansion projects would in all likelihood be delayed until 2008.

Similarly, the Islander East Pipeline proposal to build a 50-mile, 250-MMcf/d natural gas pipeline from Connecticut to New York's Long Island under Long Island Sound has been delayed since 2002. Although its construction was approved by FERC for installation in 2004, the go-ahead for construction was halted almost immediately when the State of Connecticut took the pipeline company to court concerning environmental issues related to the route the natural gas pipeline would take under Long Island Sound. A tie-in project, an Algonquin Gas Transmission expansion of 280 MMcf/d, designed to interconnect with the Islander East Pipeline and approved by FERC at the same time, has also been halted.

Each of the four natural gas pipeline companies that completed a project in 2005 also has one or more expansions slated for development between 2006 and 2008. Transcontinental Gas Pipeline has three projects totaling more than 515 MMcf/d, Tennessee Gas Pipeline also has three totaling 320 MMcf/d, Eastern Shore Pipeline has three with 47 MMcf/d, and Dominion Cove Point has one with 800 MMcf/d. As in 2005, the lion's share of the proposed natural gas pipeline expansion projects slated for 2006-2008 will be confined to improving service in specific areas of the region rather than expanding capacity into the region.

Several years ago, when production of natural gas from Canada's Sable Island offshore area was expected to increase substantially, the Maritimes and Northeast Pipeline Company (M&NE) had submitted several proposals to FERC to expand its system capacity as Canadian supply levels grew. Subsequently, these proposals were withdrawn when disappointing exploration efforts found less potential production than initially anticipated. Seizing the opportunity to mitigate an expected drop in future Sable Island production levels, several LNG import projects have been proposed that would help meet future New England natural gas market growth needs. Two would be located in eastern Canada and three in Maine. Currently, the Repsol Energy's Canaport LNG Terminal in New Brunswick, Canada (750 MMcf/d) is under construction with an anticipated completion date in 2008. The other proposed facilities are scheduled for 2009 or later.

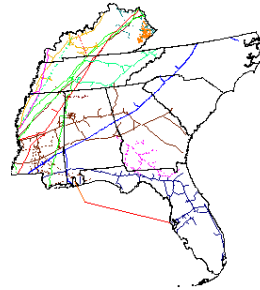
M&NE has proposed a 420-MMcf/d expansion of its system to coincide with the completion of the Canaport terminal.¹⁴ The M&NE Phase IV LNG system expansion would include the installation of five new compressor stations, upgrades to several existing compressor stations in northern Maine, and construction of a short section of looping near the Canadian border. The expansion would also increase transportation services to other natural gas pipelines in the New England

¹⁴The difference between the 750 MMcf/d output of the Canaport LNG facility and the 420 MMcf/d of expansion capacity would come from 330 MMcf/d of turnback capacity.

area, particularly those serving the growing market needs of the Boston, Massachusetts area.

Southeast

In the Southeast region only two natural gas pipeline expansion projects were completed in 2005, although added capacity was slightly higher than it was in 2004. While



capacity additions in 2006 are expected to be even less, in 2007 and 2008 they are expected to grow significantly (Table 4). The magnitude of this growth, in 2008 in particular, depends on the successful completion of several proposed large-scale conventional storage sites and at least three proposed LNG import facilities in

the region. The continued development of new natural gas-fired electric power generation, especially in Florida, will also be a factor.

The latter was the driving force for one of the two projects completed in the region in 2005, an extension of the Gulfstream Natural Gas Pipeline System (Table 1). Originally planned for construction in 2004, the project was postponed until 2005 because of a delay in building several proposed natural gas-fired power plants in the service area. The project involved the building of a 110-mile, 175-MMcf/d extension lateral to Florida Power and Light Company's Martin (county) power plant near Florida's east coast. Also part of the project was a 350-MMcf/d Martin County interconnect, which will permit future delivery of natural gas to the next phase of the project, extensions to St. Lucie and Palm Beach counties, currently scheduled for 2007.

The fast-growing natural gas market in Florida, especially in supporting new and planned natural gas-fired electric power generation plants, has necessitated six expansions of the Florida Gas Transmission Pipeline system in as many years, and two extensions of the Gulfstream Natural Gas Pipeline System since it was initially installed in 2002.¹⁵ Both transportation systems also have scheduled expansions for 2007 as well.

In addition, three projects to transport natural gas from LNG facilities located in the Bahamian Islands to south Florida are scheduled for implementation in 2008. Each of the three is designed primarily to supply planned and existing natural

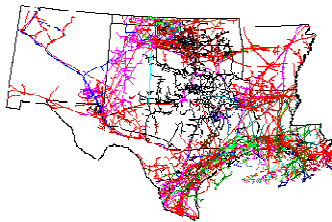
¹⁵Between 1998 and 2004, total natural gas consumption in the State of Florida increased by 46 percent, from 503 Bcf to 733 Bcf. Gas-fired electric generation usage alone increased by 81 percent, while commercial usage increased 51 percent and residential use 14 percent. Although industrial use of natural gas fell by 48 percent, or 59 Bcf, gas-fired electric generation usage increased 262 Bcf for this period. Energy Information Administration, *Natural Gas Annual 2004*, and 2002, Table 35. http://www.eia.doe.gov/oil_gas/natural_gas/data_publications/natural_gas_annual/nga_historical.html

gas-fired power plants in south Florida and to provide additional supplies for the intrastate distribution network in Florida as well. However, while the jurisdictional portions of these projects have been approved by FERC, little progress has been made by project sponsors in getting Bahamian authorities to permit the building of the LNG facilities that would feed the proposed natural gas pipelines. At least one project sponsor has proposed to revise its project design to receive LNG supplies from a planned LNG offloading terminal located just offshore of southern Florida rather than waiting for Bahamian facilities to be permitted. If this new course is taken, however, the completion date for this one project will be delayed until 2010.

Currently (June 2006) 26 natural gas pipeline expansion projects related to the Southeast region have been proposed, totaling 11.9 Bcf/d of potential new natural gas pipeline capacity for the region between 2006 and 2008, 81 percent of it in 2008 (Table 4). However, it is unlikely that all will be constructed. About one-third of this new capacity would come from two other LNG-related natural gas pipeline projects, both of which would transport natural gas from proposed LNG import facilities in the eastern Gulf of Mexico to interconnections with regional natural gas pipelines in Alabama. Another 22 percent represents capacity on new laterals, which would be built in association with five proposed underground storage facilities, several of which face an uncertain future.

Southwest and Gulf of Mexico

Unlike 2004, when a majority of natural gas pipeline projects in the Southwest region involved the installation of new gathering systems in the Gulf of Mexico, only four relatively short natural gas pipeline segments were built in the Gulf in 2005. Instead, the primary natural gas pipeline expansion activity in the Southwest region shifted from the offshore to onshore northeast Texas. In 2005, more than half of the



new natural gas pipeline laid in the region, 472 miles, was installed in northeast Texas (Table 1) with the completion of five intrastate natural gas pipeline projects. Although these five projects accounted for only about 28 percent of the additional natural gas pipeline capacity created in the Southwest region, they were double the amount of new capacity and new natural gas pipeline mileage built in 2004 in the east Texas area.

Increasing natural gas development and production in the region, particularly in the Barnett Shale play¹⁶ of the Fort

¹⁶ The currently most prolific portions of the Barnett Shale formation are located in Tarrant, Wise, Denton, and Dallas counties, which abut each other

Worth Basin and other areas of northeast Texas, has created a greater demand for take-away capacity from the area and more interconnections to the natural gas transportation grid, particularly to the interstate network. Indeed, between 1998 and 2004, the level of natural gas production in the Texas Railroad Commission Districts (RRC) encompassing most of the Fort Worth Basin and northeast Texas (RRCs 9, 5 and 6) increased by 72 percent while proved natural gas reserves grew by 113 percent.¹⁷ In absolute terms, natural gas production in these three RRCs increased by 311 Bcf, 266 Bcf, and 89 Bcf, respectively, more than in any State or subdivision except Wyoming and Colorado (Figure 4).

Of the 16 natural gas pipeline projects scheduled for development in the Southwest region in 2006, 9 are related to new pipeline builds or expansions in the northeast Texas area. If all of these 9 projects are completed on schedule, natural gas pipeline capacity additions in the northeast Texas area in 2006 will outpace those created in 2005 by 34 percent, or 536 MMcf/d.

The interstate natural gas pipeline systems traversing the Fort Worth Basin, which would potentially receive supplies in the east Texas area from these new intrastate and gathering systems, have responded by offering their own expansion plans to complement the growth in natural gas production in the area. Several interstate natural gas pipeline companies that currently do not have access to those portions of east Texas with expanding natural gas production have proposed new natural gas pipeline systems or extensions that would increase their exposure in the area and offer additional transportation services to area producers (Figure 5).

For instance, Gulf South Pipeline Company's Carthage-to-Keatchie Pipeline Loop project would expand this existing route between the Carthage Hub in eastern Texas and northern Louisiana. This 122-MMcf/d expansion is designed to alleviate current capacity restraints in the area. On a longer-term basis, Gulf South has also proposed to build, by the end of 2007, a new 1.5-Bcf/d natural gas pipeline from the Carthage area to the Perryville Hub in northeast Louisiana and interconnections with other interstates such as ANR Pipeline Company, Tennessee Gas Pipeline Company, and Columbia Gulf Transmission Pipeline Company (Table 2). The proposal also includes an extension of this new natural gas pipeline 86 miles eastward to Jackson, Mississippi, where it would interconnect with the Transcontinental Gas Pipeline system, allowing its shippers the opportunity to access Northeast and Southeast markets as well.

in Texas Railroad Commission Districts 9 and 5.

¹⁷Based on data from the Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report 2004 and 1998*, Table 8 (November 2005) and (November 1999). http://www.eia.doe.gov/oil_gas/natural_gas/data_publications/crude_oil_natural_gas_reserves/reserves_historical.html

A similar proposal from CenterPoint Energy Gas Transmission Company would construct a new 177-mile, 1.2-Bcf/d, natural gas pipeline from the same general area of east Texas to the Perryville Hub, but terminate at that location. In addition to the Gulf South and CenterPoint proposals, Kinder Morgan Energy Partners LP plans to build a new 38-mile "Carthage Pipeline" that would provide up to 700 MMcf/d of exit capacity from the producing area around Carthage, Texas to northwestern Louisiana. A subsidiary of Kinder Morgan, Natural Gas Pipeline Company of America, is also planning to expand its Louisiana and Gulf Coast systems (by 200 MMcf/d in 2008) to accommodate this expanding production.

Although natural gas pipeline expansion activity in the Gulf of Mexico was limited in 2005, activities in 2006 have taken an upturn. Five large-scale gathering systems and/or laterals, accounting for 48 percent of the 6.2 Bcf/d of scheduled new capacity additions in the region, are planned for completion by the end of 2006. New offshore systems such as Enterprise Products Partners LP's Constitution Gathering Pipeline (200 MMcf/d) and its Independence Trails Offshore Line (1 Bcf/d) tie-in are both linked to new deepwater production scheduled to come on line in 2006. In addition, the completion of the 375-MMcf/d, 21-mile, second phase of the 115-mile Cleopatra Gathering System (initially in service 2004) and the 1.2-Bcf/d Thunder Horse Segment of the Okeanos Gathering System (initially in service 2003) are also scheduled for 2006 (Table 2). However, by 2007 and 2008 natural gas pipeline development in the Gulf of Mexico again drops off, with only 3 small-mileage projects, amounting to 2.4 Bcf/d of new capacity, being proposed to date.

Several LNG import facility development proposals have been approved for installation along the Texas-Louisiana coastline, but to date only one interstate natural gas pipeline company has advanced a specific proposal to expand its system to accommodate the additional natural gas supply from these facilities. The one company, Kinder Morgan Energy Partners, has proposed a 137-mile KMP Louisiana Pipeline (2.1 Bcf/d) that would interconnect with Cheniere Energy's Sabine Pass LNG facility, which is also scheduled for completion in 2008. Unless there is significant underutilized natural gas pipeline capacity in the vicinity of these new LNG facilities, the expectation is that interstate natural gas pipelines in the area will seek approval of complementary expansion proposals as additional LNG sites near completion status.

By the close of 2008, the five LNG import facilities currently under construction in the region¹⁸ could deliver as much as 17.4 Bcf/d of vaporized LNG into the existing natural gas pipeline network in the region, most of it into the interstate network (Figure 5). Linking these LNG facilities to the network interconnections will be a combined 463 miles of

¹⁸Two additional LNG facilities, with 2.0 Bcf/d of deliverability, have been approved for completion in 2008 but as of June 2006 construction had not yet begun.

new natural gas header (lateral) pipelines that are included in the project development plans for each. The longest, and one of largest capacity, of these header projects is that of the Golden Pass LNG facility, to be located near Port Arthur, Texas (Table 2). The header system consists of a 2.0-Bcf/d lateral comprising 70 miles of natural gas pipeline connecting the facility with the Sabine Pipeline and Transcontinental Gas Pipeline interstate systems, and the ExxonMobil refinery in nearby Beaumont, Texas.

Between 2006 and 2008, as much as 38.8 Bcf/d of new natural gas pipeline capacity has been proposed for development in the Southwest region (Table 4). That level of capacity addition is slightly more than half the total capacity that is estimated to be installed in the entire country during the 2006-2008 timeframe (Table 2).

West

In 2005, only one interstate natural gas pipeline project, amounting to only 502 MMcf/d of added capacity and 94 miles of additional natural gas pipeline mileage, was completed in the Western region (Table 1).



The El Paso Natural Gas Company's Line 1903 (oil pipeline) conversion in southern California now provides shippers on El Paso's north system and the Kern River Gas Transmission pipeline with the option of having their natural gas supplies transported southward, via interconnections with the Mojave Pipeline system, from Cadiz, California, to Ehrenberg, Arizona (Figure 3).

Although the Line 1903 crossover will initially operate on a north-to-south basis only, permitting shippers of Rocky Mountain gas supplies to extend their market beyond California, to Arizona and even Mexico, it has been designed with a bidirectional capability as well.

The Line 1903 conversion complements the El Paso Natural Gas Power-up expansion project which was completed in 2004. The Power-up expansion has provided shippers on El Paso's southern system with an increased capability to deliver supplies to the Arizona marketplace and the California border, and has enabled its customers using the North Baja Pipeline route to ship their natural gas to northwest Mexico. With the Line 1903 completed, north system shippers now have this optional route to Arizona and southern California open to them as well.

The Line 1903 conversion may also serve as an alternative route for shippers that sign-on to North Baja Pipeline Company's plan to include a reverse-flow capability on its system simultaneously with the 2008 completion of the Energia Costa Azul LNG terminal located north of Ensenada, Baja Mexico (Figure 5). The bi-directional capability, which would initially provide transportation for up to 572 MMcf/d of LNG-sourced natural gas from Mexico, would be

accomplished by installing 80 miles of 36-inch or 42-inch natural gas pipeline loop ("B-Line") adjacent to its existing 36-inch and 30-inch pipeline segments in California.¹⁹ A new lateral and interconnection at Blythe, California (near Ehrenberg, Arizona), would provide shippers with the opportunity to transport their natural gas northward into the Line 1903 route for delivery into Arizona.

In addition to the two expansion projects associated with the North Baja Pipeline reversal, six other projects are slated for development in the region between 2006 and 2008 as well. However, two of these six projects are associated with, and depend upon, the eventual installation of proposed LNG import facilities along the coast of southern California and northern Mexico. Any delay in granting final approval or actual completion of construction at one or more of these LNG sites, would, of course, affect the installation of the complementary natural gas pipeline as well.

Among the other projects that are expected to be constructed in the region between 2006 and 2008 are two new natural gas pipeline laterals that would transport natural gas to and from underground natural gas storage facilities located in northern California and one lateral supplying a new natural gas-fired electric power plant in Oregon. One of Pacific Gas and Electric Company's (PG&E) proposed laterals in northern California is designed to assure continued access to its McDonald Island underground storage facility, in case its current single access line is ever damaged. PG&E would build a 6-mile lateral (Line 57C) as an alternative route to the current single lateral (Line 57B), which now provides the only transportation link between McDonald Island and PG&E's northern California mainline system. The second lateral project, associated with the retrofitting and expansion of the Kirby Hills reservoir near the Lodi natural gas storage field in California, will involve the construction of a 10-mile, 50 MMcf/d lateral to connect the Lodi Gas Storage's Kirby Hills site with PG&E's Line 400.

A third pipeline lateral project, planned by the KB Pipeline Company in Oregon, would provide for the construction of a short, 36-MMcf/d capacity pipeline segment between an interconnection with the Northwest Pipeline system and a proposed natural gas-fired electric generation plan located at Port Westward.

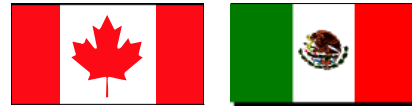
Another project, originally scheduled for 2008 but recently slipped to 2009, is Pacific Texas Pipeline Corporation's 880-mile, 1-Bcf/d, Picacho Pipeline. The Picacho Pipeline would link shippers in the Waha area of west Texas and the San Juan Basin in New Mexico with California and Arizona markets. Moreover, since the final 95 miles of the system between Phoenix, Arizona, and the California border would be designed as bi-directional, it may also be tied in with the

¹⁹ Although the initial North Baja Pipeline reversal project will initially provide 572 MMcf/d of capacity from Mexico to the United States in 2008, the company plans to increase that capability to more than 2.0 Bcf/d in 2010.

North Baja Pipeline reversal project, which would give North Baja shippers the opportunity to use the Picacho system to deliver Mexican LNG-sourced natural gas into the Phoenix marketplace. Although the Picacho Pipeline proposal has been pre-filed (National Environmental Policy Act (NEPA))²⁰ with FERC, the project has not been submitted for final regulatory review.

Import/Export Pipeline Capacity

In 2005, for the first time in a decade, no additional natural gas pipeline import/export capacity between the United States and Canada or Mexico was installed.



Between 2006 and 2008, however, the pace of creating additional natural gas pipeline import/export capacity could pick up. To date (June 2006), six cross-border projects, three expansions and three new crossings, have been proposed for implementation during the period. Completion of these natural gas pipeline projects could potentially increase import natural gas pipeline capacity by as much as 2.9 Bcf/d and export capacity by 1.8 Bcf/d.

In the Midwest region, the Vector Pipeline Company has applied to the FERC for approval of an expansion of 245-MMcf/d to its system between Chicago, Illinois, and Ontario, Canada. It would be completed in 2007 and provide greater flexibility and system reliability for customers seeking natural gas transportation services between the Chicago Hub and the Dawn Hub in Ontario, and vice versa.

In the Northeast region, the Maritimes and Northeast Pipeline Company (M&NE) has proposed a 420-MMcf/d expansion of its system between New Brunswick, Canada, and northern Massachusetts which would coincide with the 2008 completion of an LNG import facility currently under construction in New Brunswick, Canada. Originally proposed as a 1 Bcf/d system expansion to accommodate still another new interconnecting LNG facility located in Nova Scotia, Canada, the size of the expansion was scaled back when the scheduled in-service date of a second proposed LNG import facility was postponed beyond 2008.

Also planning an expansion of import capacity into the Northeast region are the Iroquois Gas Transmission and Empire Gas Pipeline systems which currently have a

²⁰ For a detailed review of the NEPA (National Environmental Policy Act) pre-filing process, its rationale, background, and procedures, see "Processes for the Environmental and Historic Preservation Review of Proposed Interstate Natural Gas Facilities" at <http://www.ferc.gov/industries/gas/enviro/gasprocess.pdf>

combined total of 1.7 Bcf/d of natural gas import capacity through Ontario, Canada. Iroquois will add 100 MMcf/d capacity as part of its MarketAccess project and Empire will increase its natural gas pipeline import capacity from 525 MMcf/d to 775 MMcf/d in order to provide needed deliverability to the Millennium Pipeline Project. Both projects are scheduled for completion in 2007.

Along the border between the U.S. and Mexico, two new pipeline/border crossing projects have been proposed for 2007. The Tidelands Oil and Gas Company has proposed two new 500-MMcf/d natural gas pipelines, the Progresso and Mission lines, each partly in Texas and partly in Mexico, to link with a planned 1-Bcf/d (Terranova Oriente) pipeline within Mexico.²¹ The United States portion of the Burgos Hub system would include links to a natural gas processing plant and several natural gas pipeline systems located in south Texas near the border.

Finally, phase I of the North Baja Pipeline expansion project, scheduled for completion in 2007, would provide that system with the capability to deliver natural gas from Mexico to the United States in addition to its current singular ability to deliver natural gas to Mexico. The bidirectional capability of 572 MMcf/d would be slightly larger than the current export flow maximum of 500 MMcf/d. This reversal capability will permit the North Baja Pipeline to attract LNG import customers who will be importing LNG into facilities located on the coast of northern Baja California, Mexico, and who want to reach natural gas markets in Arizona and California. In 2010, the North Baja Pipeline Company expects to increase its capability to deliver LNG sourced natural gas to U.S. markets to more than 2 Bcf/d.

If the above projects are completed as planned, by the close of 2008 natural gas pipeline cross-border capacity could potentially increase by 17 percent above current levels, while export capacity could increase by 23 percent.

Observations and Outlook

Although the amount of natural gas pipeline capacity added during 2005 was only 7 percent above the 2004 level, which was the smallest annual level since 2000, the current inventory of project proposals indicates that a reversal can be anticipated over the next several years. As much as 77 Bcf/d of natural gas pipeline capacity would be added to the national network between 2006 and 2008, if all current proposals were completed as designed and as scheduled (Figure 1, Table 2), although this is unlikely. This estimated potential increase over 3 years is 23 percent greater than that which occurred between the 7 years spanning 1998 and 2004 (Table 4).

²¹ Initially the project will support the export of natural gas to Mexico but will be designed with a bidirectional capability to handle imports if that market develops in the future.

Overall, 157 natural gas pipeline projects have been proposed for development between 2006 and 2008 in the United States (as of June 2006). These projects account for more than 9,500 miles of potential new natural gas pipeline (Table 2). To date, 71 projects have been approved by regulating authorities and have begun, or are permitted to begin, construction, with 8 of the projects scheduled for early 2006 already completed. While 28 projects are still only in the planning, or post-open season stage, 58 have been submitted to various regulatory authorities for review. Nineteen of the latter have been submitted to FERC under the NEPA pre-filing process.

There are several key reasons for this change in direction. One is the potential development of a number of proposed new LNG import facilities along the coastline of the United States, as well as some in Canada and Mexico. Each of these facilities requires new natural gas pipeline laterals to transport vaporized LNG to interconnections with existing interstate and intrastate natural gas pipelines.²²

For the period 2006 through 2008, 18 natural gas pipeline projects associated with proposed new LNG import facilities along the Gulf coast, California coast, and eastern seaboard, have been proposed, with eight currently before the FERC (or Coast Guard) for review, and five others approved. Five more are already under construction. The majority of these LNG import facilities are designed to regasify volumes at a high daily rate, 1 Bcf/d to 2.5 Bcf/d or greater. Therefore, the natural gas pipelines built to transport their output to interconnections with the existing natural gas pipeline grid are also designed for similar load capacities. Indeed, the associated natural gas pipeline projects proposed for completion through 2008 total 33.4 Bcf/d in capacity, an average daily deliverability rate of 1.67 Bcf.²³

Another reason for the substantial increase in potential natural gas pipeline capacity additions over the 3 years is the building of new natural gas pipelines out of the two major expanding natural gas production areas in the United States, northeast Texas and the Rocky Mountain area. In the Unita/Piceance Basin of western Colorado/eastern Utah and Green River and Powder River Basins of Wyoming, for instance, more than 9.8 Bcf/d of new natural gas pipeline capacity has been proposed that would increase natural gas pipeline exit capacity from the region between 2006 and 2008. Additionally, in the northeast Texas area, particularly the Barnett Shale and Bossier Formations of the Fort Worth Basin, increasing production and the discovery of additional proved natural gas reserves have resulted in more than 2.7

²²More than 50 proposals for new LNG import facilities have been put forth for development in the lower-48 States between 2006 and 2010 (as of May 2006). The largest number, 17, would be located in the Southwest region along the Gulf coast of Texas and Louisiana, 15 would be located in the Northeast region, 12 in the Western region, and 7 in the Southeast region. Of these, 10 have been approved, 5 of which are under construction.

²³Several of the proposed LNG import site proposals include more than one lateral exiting the proposed import facility.

Bcf/d of natural gas pipeline capacity being proposed for development over the next several years. Most of the latter capacity will be directed toward interconnections with the interstate natural gas pipeline network in Louisiana and Mississippi that serves the Midwest, Northeast, and Southeast regional markets. Not only has the expanding development in these producing areas increased the demand for additional

natural gas pipeline capacity per se, the economic need to reach additional far-off markets and network interconnections has motivated the design of more long-distance natural gas pipeline projects (Table 2). In 2008 alone, the average number of miles of new pipeline per project could average 108 miles,²⁴ with nine of the new natural gas pipelines exceeding 100 miles in length, seven of which are associated with transportation from these production areas.

²⁴In 2006 the average is expected to be about 24 miles per project, while in 2007 that could climb to 46 miles per project.