Expansion of the U.S. Natural Gas Pipeline Network: Additions in 2008 and Projects through 2011

This report examines new natural gas pipeline capacity added to the U.S. natural gas pipeline system during 2008. In addition, it discusses and analyzes proposed natural gas pipeline projects that may be developed between 2009 and 2011, and the market factors supporting these initiatives. Questions or comments on this article should be directed to Damien Gaul at damien.gaul@eia.doe.gov or (202) 586-2073.

Robust construction of natural gas infrastructure in 2008 resulted in the completion of 84 pipeline projects in the lower 48 States, adding close to 4,000 miles of natural gas pipeline. These completions of new natural gas pipelines and expansions of existing pipelines in the United States represented the greatest amount of pipeline construction activity in more than 10 years.

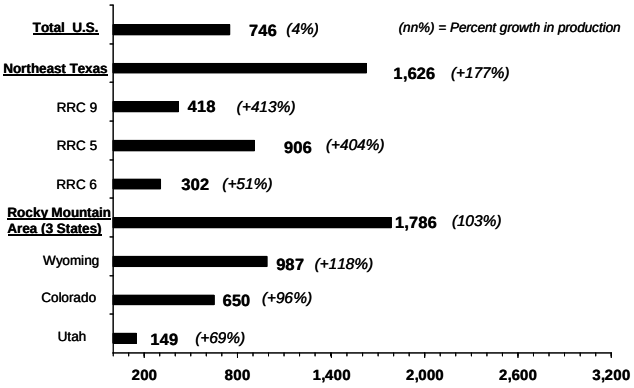
Increased access to growing supplies continued to drive the high level of pipeline construction during the year. The push for access to new supply sources has led to rapid infrastructure growth in relatively undeveloped production regions such as the Rocky Mountains, as well as additions to well-established natural gas transportation corridors such as in Northeast Texas, where industry is exploiting unconventional resources. Furthermore, infrastructure additions related to imports of natural gas, including liquefied natural gas (LNG), were substantial in 2008.

Pipeline construction activity tends to mirror long-term trends in the natural gas industry because of a lengthy regulatory approval process and the need for substantial capital investment. In fact, the substantial pipeline construction activity recorded in 2008 reflects the natural gas business climate earlier this decade, when domestic production was declining and industry began searching for and investing in alternatives to the then-current conventional production base.

The impact of this year's slate of completed transportation projects on natural gas production and proved reserves has been dramatic. Between 1998 and 2007, natural gas production in the most rapidly expanding production areas of the Nation (northeast Texas, Wyoming, Colorado, and Utah (Figure 1)) increased by 129 percent overall, while proved natural gas reserves grew by 188 percent.[1] These areas contributed to a 4-percent increase in production and a 45-percent increase in proved reserves for the nation.

The number of proposed pipeline projects suggests that construction activity will remain strong over the next several years. For example, the 78 proposed projects scheduled for completion in 2009 indicate that the second-highest level of capacity additions in the last decade could be completed during the year.[2] However, the on-schedule completion of all currently anticipated projects as designed is very unlikely. The current economic downturn has limited financing options for projects and contributed to a significant decline in natural gas spot prices. Nonetheless, the fundamental conditions for the build-out of the pipeline system remain intact, given the need to access and exploit unconventional resources such as tight gas, coal-bed methane, and natural gas from shale formations.

Figure 1. Natural Gas Production Growth, 1998 to 2007 (Billion cubic feet)



Note: RRC = Texas Railroad Commission District.
Source: Energy Information Administration, U.S. Crude Oil and Natural Gas, and Natural Gas Liquids Reserves: 1998 and 2007 Annual Reports.

The Energy Information Administration projects that natural gas production from unconventional resources in the United States will increase 35 percent, or 3.2 trillion cubic feet (Tcf), between 2007 and 2030.[3] The largest increase in unconventional production is expected to come from the development of shale formations in the lower 48 States. Shale production is occurring primarily in four fields in the Southwest (Barnett, Woodford, Fayetteville, and Haynesville formations in Texas, Oklahoma, Arkansas, and Louisiana, respectively) and one field in the Northeast (Marcellus, located primarily in Pennsylvania and New York). In 2008, industry continued to achieve substantial success producing from these shale formations, leading to a massive increase in EIA's estimate of an unproved shale resource base of 267 Tcf.[4]

Highlights

In 2008, 84 completed pipeline projects added 44.6 billion cubic feet (Bcf) per day of capacity to the pipeline grid (Figure 2). The additions, which cost an estimated $11.4

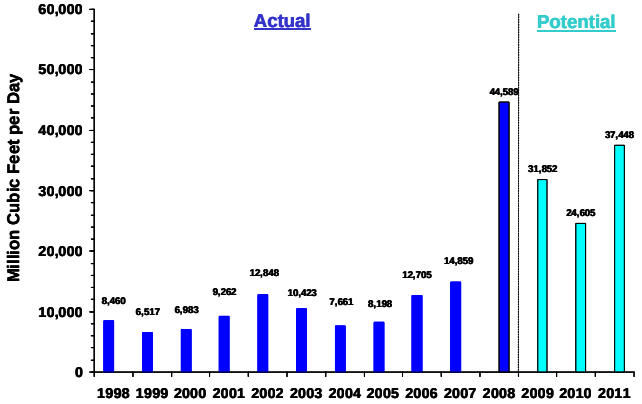
[1]Based on data from the Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report* 2007 and 1998, Table 8 (November 2008) and (November 1999), http://www.eia.doe.gov/oil_gas/natural_gas/data_publications/crude_oil_natural_gas_reserves/reserves_historical.html.

[2]Energy Information Administration, GasTran Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database, 2009.

[3]Energy Information Administration, *Updated Annual Energy Outlook 2009 (Reference Case Service Report)*, Table 14, (Washington DC, April 2009), http://www.eia.doe.gov/oiaf/servicerpt/stimulus/index.html.

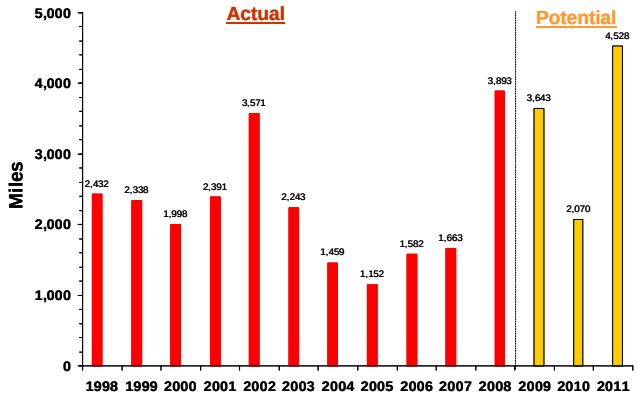
[4]Energy Information Administration, *Assumptions to the Annual Energy Outlook 2009* (Washington DC, March 2009), http://www.eia.doe.gov/oiaf/aeo/assumption/oil_gas.html.

Figure 2. Natural Gas Pipeline Capacity Additions, 1998-2011



Note: Only projects under construction or approved that were judged to have the most likelihood of being completed in 2009 were included in 2009.
Source: Energy Information Administration, GasTran Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database, as of May 2009.

Figure 3. Additions to Pipeline Mileage, 1998-2011



Note: Only projects under construction or approved that were judged to have the most likelihood of being completed in 2009 were included in 2009.
Source: Energy Information Administration, GasTran Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database, as of May 2009.

billion, included both long-haul pipeline additions and shorter, though large-diameter, extensions to access three new LNG terminals and several underground storage fields. These figures represent a nearly three-fold increase over 2007, when $4.3 billion was spent to complete 50 projects that added 14.9 Bcf per day of capacity to the network.

The scale of the natural gas pipeline projects completed in 2008 was exceptional. The added capacity for each of the top 15 projects exceeded 1 Bcf per day, the largest being 2.6 Bcf per day. The average added capacity per project overall was 522 million cubic feet (MMcf) per day, compared with only 290 MMcf per day in 2007, which was the second largest construction year in the last 10 years.

Construction activity between market regions in the lower 48 States was particularly vigorous, with 3,893 miles of new pipeline added in 2008, more than double the 1,663 miles of pipeline added in 2007 (Figure 3). The average added miles of pipeline laid per project (for projects with greater than 5 miles of new pipeline) was 69 miles compared with only 47 miles in 2007.

Many individual projects that were completed in 2008 had industry-wide implications because of their size and scope. This article will highlight these projects, as well as others that are indicative of significant trends in the natural gas industry. For instance:

- In February 2008, Cheniere Energy Inc. completed its Sabine Pass LNG Line with a capacity of 2.6 Bcf per day leading from the Sabine Pass LNG terminal on the Gulf Coast in Cameron Parish, Louisiana, to Southwest Louisiana. The 92-mile pipeline, with interconnections with six interstate pipelines, allows for flexibility in marketing LNG supplies delivered to the region.[5] The Sabine Pass LNG Line was one of three natural gas pipeline construction projects completed in 2008 that connected LNG terminals to the pipeline grid and underground storage fields.

- In terms of added miles, the largest natural gas pipeline project completed in 2008 was the 718-mile, Rockies Express West (REX-West) Pipeline system. Commencing at the Cheyenne Hub in northeastern Colorado and terminating in eastern Missouri, this pipeline links expanding natural gas production from Wyoming and western Colorado to the Midwest region. REX-West represents only a portion of the entire Rockies Express Pipeline project, which will eventually connect Rockies producing fields with markets in the northeastern United States.

- The Southeast Supply Header System began transporting supplies from the Perryville Hub in Delhi, Louisiana, to Florida Gas Transmission's interconnect at Lucedale, Mississippi. in September 2008. The 270-mile, 42-inch diameter pipeline has the capacity to transport 1 Bcf per day of natural gas from northern Louisiana to premium Southeast markets. The project was originally conceived as an alternative source of supply during hurricane-related disruptions in the Gulf of Mexico, but it has since also become an important outlet for growing unconventional supplies into the Perryville Hub from the Barnett Shale and other shale formations.

These construction projects, as well as other transportation additions out of the North Texas and Rockies producing regions and additions related to LNG projects, have already had an impact on regional pricing dynamics. For example, REX-West has allowed for greater integration of the Rockies and Midcontinent markets, such that prices in the two regions appear to trade in sync, with only

[5]As often occurs with pipeline projects, this project involves numerous phases. For the purposes of accounting of yearly mileage additions in this article, only 16 miles of this pipeline is represented in 2008 (See Table 7). The remaining 69 miles of this pipeline is accounted for as part of a larger project that is expected to be completed in 2009.

transportation costs separating price quotes on average. In fact, the transportation improvements discussed in this report will likely enhance continent-wide competition among supply basins, possibly causing relative prices among regional markets in the lower 48 States to adjust.[6]

National Overview

Overall, the interstate natural gas pipeline grid consists of about 183 Bcf per day of capacity and approximately 217,000 miles of pipeline (Table 1). The Federal Energy Regulatory Commission (FERC) regulates interstate pipeline companies as common carriers, or transportation-service companies. Additionally, State authorities regulate substantial pipeline capacity considered "intrastate" that exist in individual States for economic regulatory purposes. Unlike FERC-regulated entities, intrastate pipeline operators often own supplies transported on their systems and act as natural gas merchants. EIA estimates that intrastate capacity exceeds 32 Bcf per day and intrastate pipeline systems extend over 76,000 miles.[7]

Most Additions Occurred On The Interstate Grid. In 2008, 65 of the 84 completed projects involved expansion of the interstate natural gas pipeline network, adding 35.2 Bcf per day of new capacity to the grid. The remaining 19 projects, representing 9.4 Bcf per day of capacity, improved capacity and transportation service on intrastate pipelines.

More than one-third of the pipeline projects in 2008 addressed a growing need for additional natural gas pipeline capacity to support transportation of new natural gas production to regional markets, adding 16.3 Bcf per day of pipeline capacity overall. Such projects were concentrated in the expanding natural gas production areas of Wyoming, western Colorado, and the Barnett shale formation in northeast Texas. About 10 percent of all newly added natural gas pipeline capacity for 2008, or 4.6 Bcf per day, was attributable to new intrastate pipelines built to transport expanding Barnett shale production specifically. This layer of infrastructure primarily provided access to local markets and interconnections with the interstate natural gas pipeline network.

Several major interstate pipeline projects were constructed to continue the flow of natural gas from the Barnett Shale beyond east Texas to interstate pipeline interconnections in Louisiana, Mississippi, and Alabama. These included the new Southeast Supply Header Pipeline (Louisiana to Mississippi), the new Gulf South Southeast Extension (Mississippi to Alabama), and the Gulf South Texas to Mississippi Expansion. These projects added more than 4.1 Bcf per day to capacity in the Gulf Coast region.

The major natural gas pipeline additions of 2008 included several large-capacity pipelines, linking the interstate natural gas pipeline network to several LNG import terminals that were newly commissioned or expanded during the year. Such projects accounted for 10.9 Bcf per day of new natural gas pipeline capacity, or about 24 percent of total new capacity. Nine major bidirectional header systems built to support new natural gas underground storage facilities accounted for another 8.5 Bcf per day, or 19 percent of new pipeline capacity.

Regional Dynamics Changed With Additions. The network of connecting natural gas pipelines now links most production regions across North America, including those in Canada, to multiple market centers and associated consuming regions. The transportation of natural gas through the U.S. pipeline grid generally occurs along several major corridors, such as from the Gulf of Mexico region to the Northeast or from the Rockies to the U.S. West Coast. Corridors from the Southwest to the Northeast and from the Southwest to Midwest have been the major paths for natural gas flows since the construction boom in the years following World War II.

In 2008, the vast majority of expansions and capacity additions were built to expand transportation capability in established corridors (Figure 4). However, industry completed a new corridor from the Rocky Mountain region to the Midwest that will be extended in the Northeast in 2009. The construction of the Rockies Express Pipeline (REX) is occurring in three stages, two of which are now complete. The first stage, often referred to as the Entrega Pipeline, was completed in 2007, providing local infrastructure enhancements within the Rockies producing region. In 2008, REX began initial flows for the interstate portion of the project with the completion of REX-West, providing service from the Cheyenne Hub in Colorado to Aubrain, Missouri. This new pipeline allows Rockies supplies to compete directly with Midcontinent supplies. Eventually, REX will transport Rockies-area supplies east of the Mississippi River, possibly as far as Pennsylvania.

EIA's Natural Gas Pipeline Capacity Database divides the lower 48 States into six regions: Northeast, Southeast, Midwest, Southwest, Central, and West (Figure 5). Each of the market regions has distinct characteristics, such as the very large population centers in the Northeast or the vast production capability in the Southwest. Understanding the supply and demand of the separate regions provides insight regarding future transportation requirements. In 2008, only 7 of the 84 completed projects crossed regional boundaries, slightly more than in recent years, but nonetheless reflecting an emphasis on localized expansions or upgrades. Additions to interregional capacity during the year totaled 3.6 Bcf per day overall, significantly more than the 2007 level of just 1.1 Bcf per day.

[6]See, for example, Bentek Energy, LLC, *Catch the Wave*, Consultant Report (February 2009). Portions available on the Internet at: http://www.bentekenergy.com/Bentek/CatchTheWave.aspx.

[7]Energy Information Administration, GasTran Natural Gas Transportation Information System.

Table 1. Thirty Largest U.S. Interstate Natural Gas Pipeline Systems, 2008

(Ranked by system capacity, million cubic feet per day (MMcf/d))

Pipeline Name	Market Regions Served	Primary Supply Regions	States in Which Pipeline Operates	Transported in 2007 (million decatherm) [1]	System Capacity (MMcf/d) [2]	System Mileage
Columbia Gas Transmission Co.	Northeast	Southwest, Appalachia	DE, PA, MD, KY, NC, NJ, NY, OH, VA, WV	1,849	9,350	10,365
Transcontinental Gas Pipeline Co.	Northeast, Southeast	Southwest	AL, GA, LA, MD, MS, NC, NY, SC, TX, VA, GM	2,670	8,466	10,450
Northern Natural Gas Co.	Central, Midwest	Southwest	IA, IL, KS, NE, NM, OK, SD, TX, WI, GM	1,055	7,442	15,874
Texas Eastern Transmission Corp.	Northeast	Southwest	AL, AR, IL, IN, KS, KY, LA, MI, MO, MS, NJ, NY, OH, OK, PA, TX, WV, GM	1,438	7,332	9,212
ANR Pipeline Co.	Midwest	Southwest	AR, IA, IL, IN, KS, KY, LA, MI, MO, MS, NE, OH, OK, WI, GM	2,044	7,129	10,600
Tennessee Gas Pipeline Co.	Northeast, Midwest	Southwest, Canada	AR, KY, LA, MA, NY, OH, PA, TN, TX, WV, GM	1,801	6,686	14,463
Dominion Transmission Co.	Northeast	Southwest, Appalachia	PA, MD, NY, OH, VA, WV	621	6,655	3,505
Gulf South Pipeline Co.	Southeast, Southwest	Southwest	AL, FL, LA, MS, TX, GM	676	6,260	6,886
El Paso Natural Gas Co.	Western, Southwest	Southwest	AZ, CO, NM, TX	1,638	6,182	10,302
Centerpoint Gas Transmission Co.	Southwest	Southwest	AR, KS, LA, OK, TX	960	5,385	6,374
Northwest Pipeline Corp.	Western	Canada, Central	CO, ID, OR, UT, WA, WY	812	4,950	3,880
Natural Gas Pipeline Co. of America	Midwest	Southwest	AR, IA, IL, KS, LA, MO, NE, OK, TX, GM	1,783	4,848	9,306
Colorado Interstate Gas Co.	Central	Central, Southwest	CO, KS, OK, TX, WY	854	4,099	4,143
Texas Gas Transmission Corp.	Midwest	Southwest	AR, IN, KY, LA, MS, OH, TN	784	4,065	5,671
Southern Natural Gas Co.	Southeast	Southwest	AL, GA, LA, MS, SC, TN, TX, GM	867	3,967	7,635
Algonquin Gas Transmission Co.	Northeast	Southwest	CT, MA, NJ, NY, RI	366	3,347	1,128
Questar Pipeline Co.	Central	Central	CO, UT, WY	408	3,192	1,858
Trunkline Gas Co.	Midwest Southeast	Southwest	AR, IL, IN, KY, LA, MS, TN, TX, GM	646	3,025	4,202
Great Lakes Gas Transmission Co.	Midwest	Canada	MI, MN, WI	833	2,958	2,115
Panhandle Eastern Pipeline Co.	Midwest	Southwest	IL, IN, KS, MI, MO, OH, OK, TX	662	2,840	6,445
Southern Star Central Pipeline Co.	Central	Central	CO, KS, MO, NE, OK, TX, WY	318	2,801	5,803
Wyoming Interstate Gas Co.	Central	Central	CO, WY	756	2,736	848
Gas Transmission Northwest Corp.	Western	Canada	ID, OR, WA	838	2,636	1,356
Northern Border Pipeline Co.	Midwest, Central	Canada	IA, IL, IN, MN, MT, ND, SD	886	2,626	1,400
Transwestern Gas Co.	Western	Southwest, Central	AZ, CO, NM, TX	645	2,439	2,387
Columbia Gulf Transmission Co.	Southeast, Northeast	Southwest	KY, LA, MS, TN, GM	1,113	2,386	4,124
National Fuel Gas Supply Co.	Northeast	Canada, Appalachia	NY, PA	307	2,312	1,481
Florida Gas Transmission Co.	Southeast	Southwest	AL, FL, LA, MS, TX, GM	750	2,217	4,889
Alliance Pipeline Co. (US)	Midwest	Canada	ND, MN, IA, IL	632	2,053	888
Kern River Gas Transmission Co.	Western	Central	CA, NV, UT, WY	826	1,833	1,680
Sub-total				29,838	132,217	169,270
Other Interstate Systems	- -	- -	- -	6,868	50,673	48,036
Total				36,706	182,890	217,306

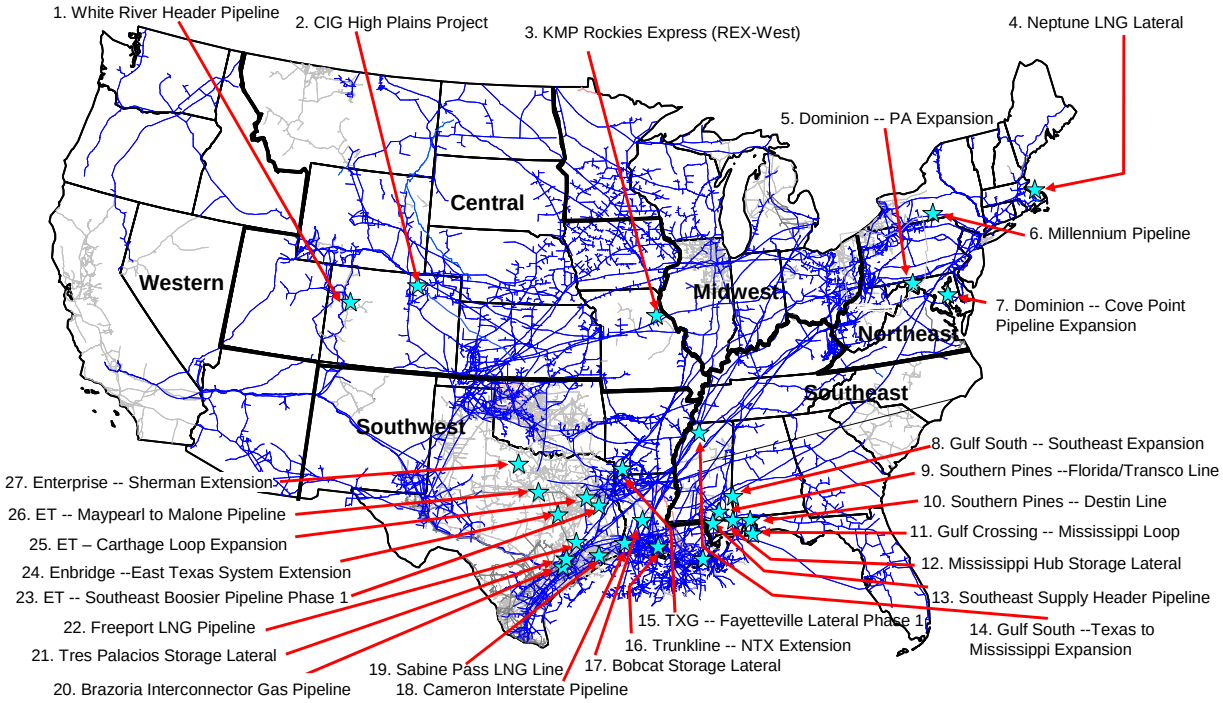
[1] This figure, found on Line 19 of Gas Accounts in FERC Form 2, Page 520, represents throughput "transported for others" only. It does not include natural gas transported in association with gathering, distribution, or storage operations.

[2] Capacity levels are reported to FERC in Btu, decatherms, 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 decatherms per day) = 1 Bbtu/d (billion btus per day).

Note: GM = Gulf of Mexico.

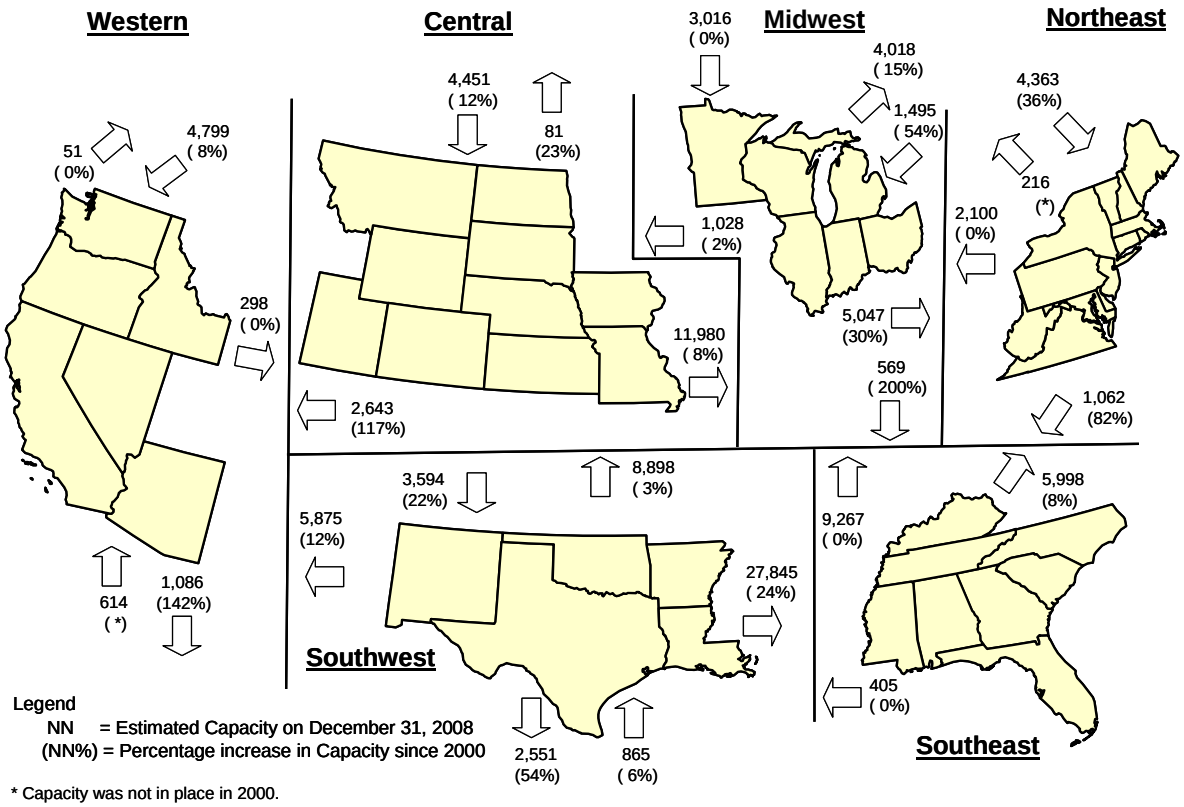
Source: Federal Energy Regulatory Commission (FERC), Capacity: FERC Annual Peak Day Capacity Report Section 284.13(d); Mileage & Transport: FERC Form 2 & 2A "Major and Non-major Natural Gas Pipeline Annual Report," 2007, adjusted for natural gas pipeline projects completed in 2008, as found in the Energy Information Administration, Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database, as of December 31, 2008.

Figure 4. General Locations of Natural Gas Pipeline Construction Projects Completed in 2008, With Capacity of 500 Million Cubic Feet per Day and Larger



Notes: Map keyed to Tables 3 through 8. **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. ET = Energy Transfer LP, CIG = Colorado Interstate Pipeline Co., KMP = Kinder Morgan Partners.
Source: Energy Information Administration, GasTran Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database.

Figure 5. Natural Gas Pipeline Capacity Between Regions, 2009
(Volumes shown are in million cubic feet per day (MMcf/d))



* Capacity was not in place in 2000.
Source: Energy Information Administration, GasTran Gas Transportation Information System, Natural Gas Pipeline Capacity Database, January 2009.

Table 2. Recent and Proposed Regional Natural Gas Pipeline Additions and Expansions, 2009 - 2011

Region (within or into)	Completed in 2007			Completed in 2008			Scheduled/Proposed for 2009[1]			Proposed for 2010[1]			Proposed for 2011[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	4,280	1,607	619	6,515	2,452	1,088	2,558	470	243	3,655	1,820	871	1,528	491	290
Midwest	460	27	13	311	102	42	3,049	3,694	606	0	0	0	2,067	1,416	254
Northeast	1,749	784	134	4,987	1,952	491	2,382	1,194	112	2,491	1,276	249	4,318	2,465	569
Southeast	430	304	184	10,092	3,497	891	3,403	845	260	9,911	2,006	601	9,364	3,748	1,000
Southwest	6,971	1,471	700	22,553	3,307	1,382	19,684	4,855	2,113	6,283	577	293	13,915	2,162	688
Western	723	39	13	70	41	0	671	821	309	345	107	27	5,276	5,377	1,686
Mexico/Canada	245	70	0	60	1	0	105	37	0	1,920	NA	29	980	49	41
U.S. Total	**14,859**	**4,302**	**1,663**	**44,589**	**11,352**	**3,893**	**31,852**	**11,916**	**3,643**	**24,605**	**5,786**	**2,070**	**37,448**	**15,707**	**4,528**

[1]Only projects that were approved or under construction prior to May 1, 2009, and which have a proposed completion date in 2009 are included under "Scheduled for 2009." All other projects that have a proposed completion date in 2010 through 2011, other than those canceled or on-hold, are included under 2010 or 2011.

[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 decatherms per day) = 1 Bbtu/d (billion btus per day).

Notes: 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.

Source: Energy Information Administration, GasTran Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database, as of May, 2009.

Pipeline companies often operate as individual entities, but larger corporations own many "families" of pipelines. For example, El Paso Corporation currently owns the largest family, consisting of 43,000 miles of pipeline. El Paso owns Tennessee Gas Pipeline, Colorado Interstate Gas (CIG), Wyoming Interstate Gas, and El Paso Natural Gas. Kinder Morgan Incorporated, one of the developers of Rockies Express, also owns a variety of interstate and intrastate pipelines, such as Natural Gas Pipeline of America (NGPL) and KM Interstate Transmission. Williams Companies owns Transcontinental Gas Pipeline Company and Northwest Pipeline Corporation.

The pipeline with the greatest deliverability, or potential volume that can be delivered to customers at full operation, is the Columbia Gas Transmission system, which has 10,365 miles of pipeline and can transport up to 9.4 Bcf per day. Columbia Gas, which Indiana-based NiSource Inc owns, transports supplies to customers in the Northeast from production fields in the Appalachian Basin, as well as from the Gulf of Mexico region through a connection with affiliate Columbia Gulf Transmission at Leach, Kentucky.

The number of proposed natural gas pipeline expansion projects indicates that pipeline construction activity in the United States is expected to continue at an elevated pace through 2011 and will involve the largest transportation providers in the country. Approximately 180 projects, representing a potential 10,200 miles of new large pipeline and approximately 94 Bcf per day of capacity, already are being planned or have been approved by U.S. regulatory authorities (Table 2). However, competition among projects for markets results in the rejection of some project proposals. The current slate of proposed projects would provide about 3.5 percent more pipeline miles to the national pipeline grid. Current estimates for the cost of this total effort are close to $33 billion, but costs can vary considerably under different economic conditions.

Regional Overview

Central Region

The natural gas industry completed 15 projects in the Central region in 2008, adding 6.5 Bcf per day of capacity Table 3). This capacity addition was the region's largest in EIA's 11-year database of pipeline additions. It also continues a trend of significant growth in pipeline infrastructure in the region as producers have increased supplies, including unconventional production in the form of coalbed methane and natural gas from tight-gas formations. Between 1998 and 2008, 24.8 Bcf per day of capacity was added to the Central region's grid.

Infrastructure expansion out of the region has been critical for producers in recent years because demand growth in the region is significantly lower than the growth in available supplies. This imbalance has resulted in numerous new pipeline projects, such as the expansion of the Kern River Pipeline to the west and the Cheyenne Plains Pipeline to the east. In 2008, a portion of the REX project, the newest pipeline further integrating Rockies supplies with markets outside the region, came on-line. A joint venture of Kinder Morgan Energy Partners, Sempra Energy, and Conoco, Inc. completed the 718-mile western portion of REX, which was the largest factor in overall pipeline mileage additions reaching 1,088 miles.

Other significant infrastructure projects during 2008 included the creation of the White River Hub, a new market center in Colorado, and several compression upgrades boosting capacity at existing pipelines. Altogether, the infrastructure improvements in the Central region in 2008 cost more than an estimated $2.4 billion, compared with overall expenditures of $1.6 billion in 2007. Eleven of the 15 projects completed improved interstate pipeline infrastructure, with the remaining 4 projects improving intrastate infrastructure.

REX-West Expands Corridor To The Midcontinent. Most receipt and delivery points on REX-West became operational on January 8, 2008, providing a direct connection between the Rockies supply region and the Midcontinent. However, the completion of the entire REX-West from Rio Blanco Country, Colorado, to Audrain, Missouri, occurred in May 2008 with the completion of an interconnection with Panhandle Eastern Pipe Line. The construction of REX-West cost $1.9 billion. Although REX-West started operations at a capacity of 1.5 Bcf per day, available capacity will eventually increase to 1.8 Bcf per day when the entire REX project is complete. This producer-led pipeline project had an immediate impact on upstream prices and transportation routes in long-established market regions in the lower 48 States. As a result, direct price competition between Rockies supplies and supplies from basins ranging from the Midcontinent to West Texas and Canada has emerged.

After flows on REX increased rapidly in the spring of 2008, the pipeline generally operated near targeted capacity levels with the exception of a maintenance-related capacity reduction in September. As the lowest-priced supply in the lower 48 States, the steady flow of Rockies production into the Midcontinent region through REX has resulted in a relative decline in prices in the Midcontinent region. Direct price competition has also displaced some traditional flows in the Midcontinent to other parts of the pipeline network, in part because interstate pipelines with which REX-West has interconnections formally were transporting supplies at near capacity for deliveries into the Midwest.

The completion of REX-East, the third phase of the REX project, is expected by the end of 2009, extending the pipeline an additional 639 miles eastward. The pipeline's terminus will be located in Clarington, Ohio, near the border with West Virginia, where REX will interconnect with several interstate pipelines. The completion of REX-East will allow Rockies production to compete with existing sources of supplies in the U.S. Northeast. However, as with REX-West, the REX-East segment will begin service in stages. The first major milestone in the construction process was completed in June 2009, providing transportation service through Lebanon, Ohio.

The completion of REX-East, the final leg of the massive REX project, will provide Rockies producers direct access to eastern markets for the first time. As with REX interconnections with other pipelines in the Midcontinent, REX supplies will compete directly with established supply routes, possibly displacing existing supplies with a lower-cost alternative. In total, REX will interconnect with more than 25 intrastate and interstate pipelines transporting natural gas from the Gulf region as well as from the Midcontinent.

Intraregional Additions Create New Hub. During 2008, Questar Corporation completed its $58-million White River Header Pipeline project, a 6-mile pipeline segment with a very large capacity of more than 2.5 Bcf per day. The lateral connects several major interstate pipelines in the Rockies, including Wyoming Interstate, Questar Pipeline, and Northwest Pipeline, allowing for greater flexibility for shippers to market supplies outside the region. In fact, the new lateral was part of several infrastructure enhancements in the area, creating a new major trading hub called the White River Hub. As a result, Enterprise Product Partners LP doubled its capacity at its Meeker processing plant to 1.5 Bcf per day to process increased flows from the Piceance Basin. In addition,

Table 3. Natural Gas Pipeline Construction Projects Completed in 2008, Central Region

(Map Key references Figure 4)

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)
Central										
CO	CO	Central	1	Questar – 'White River Header Pipeline	CP08-398	Lateral	15-Nov-08	58	6	2,565
CO	CO	Central	2	CIG – High Plains Project	CP07-207	New line	15-Nov-08	216	164	900
CO	CO	Central	–	EnCana -- East Dry Hollow Loop Pipeline	Not applicable	Gathering Lateral	1-Nov-08	12	7	250
CO	CO	Central	–	Kinder Morgan -- Colorado Lateral Project	CP07-430	Lateral	1-Dec-08	30	41	74
CO	UT	Central	–	Questar – Greesewood/Meeker Expansion	Not applicable	Compression	15-Jan-08	12	0	75
CO	WY	Central	–	WIG – Medicine Bow 08 Expansion	CP07-395	Compression	29-Oct-08	32	0	330
IA	IA	Central	–	Northern Natural – East Leg I Expansion	CP08-95	Looping	1-Nov-08	7	8	13
KS	CO	Central	–	Cheyenne Plains Kirk Compressor Station	CP07-128	Compression	15-Aug-08	20	0	90
MO	CO	Central	3	Rockies Express (REX-West)	CP06-354	New Pipeline	15-Apr-08	1,930	718	1,500
ND	WY	Central	–	WB East/West Mondak Subsystem Expansion	CP08-154	Compression	1-Nov-08	7	0	41
NE	NE	Central	–	Kinder Morgan -- Grand Island Expansion	Blanket Certif	Looping/Compression	7-Nov-08	23	26	22
NE	NE	Central	–	Northern Natural – West Leg II Expansion	CP08-97	Looping	1-Nov-08	9	12	11
WY	WY	Central	–	Fort Union -- Gathering Header Expansion	Not applicable	Gathering Header	15-May-08	69	106	450
WY	WY	Central	–	WIG – Mainline Expansion	CP07-14	Compression	5-Feb-08	22	0	150
WY	WY	Central	–	MIGC -- Southern (Python) Expansion	CP07-178	Compression	15-Feb-08	4	0	45
							Total	**2,452**	**1,088**	**6,515**

Notes: Totals may not sum due to independent rounding. See final page for a discussion of naming conventions used in this table.

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

Questar Pipeline increased capacity by 75 MMcf per day through new compression at a cost of $12 million.

Also in the Central region, Colorado Interstate Gas Company (CIG) completed its High Plains Project, laying about 164 miles of 24-inch and 30-inch pipeline and associated compressor facilities in Weld, Adams, and Morgan counties in Colorado. The expansion increased CIG's capacity by 900 MMcf per day to meet growing demand in the Denver metropolitan area. A joint venture of CIG and Xcel Energy called WYCO Development funded the $216-million project.

Activity Will Remain Elevated. Infrastructure growth in the Central region is likely to stay elevated over the next several years. Industry has scheduled projects representing about 2.6 Bcf per day of added capacity over the next 3 years at a combined estimated cost of $2.8 billion. These projects include Questar Pipeline's plans for a large looping project for its mainline in Utah, as well as the REX owners' plans to build further capacity out of the Rockies to the Chicago area in the form of a new pipeline, Chicago Express. In addition, El Paso is currently navigating FERC's regulatory process in order to construct Ruby Pipeline, a 1.5-Bcf-per-day pipeline from Wyoming to the California-Oregon border.[8]

Wyoming Interstate Company (WIC) is progressing with an expansion of its system in the Piceance Basin. WIC is adding compression at its Greasewood Station in Rio Blanco County, Colorado, to boost capacity by 50 MMcf per day. After the completion of this upgrade, the construction of a new Snake River Compressor Station in Moffat County, Colorado, will commence, providing the system an additional 180 MMcf per day of capacity.

Midwest Region

Only three pipeline projects were completed in the Midwest region in 2008, accounting for just 311 MMcf per day of new capacity. The Midwest was one of only two regions in which pipeline capacity additions in 2008 were lower than in 2007. However, expenditures related to infrastructure development were considerably higher ($102 million in 2008 in comparison to just $27 million in 2007). The higher expenditures related to more pipeline mileage additions. Approximately, 42 miles of new pipeline was added to the region in 2008, compared to 13 miles in 2007 (Table 4).

In terms of cost and added capacity, the largest project in the Midwest region was Michigan Consolidated Gas Company's 16-mile pipeline lateral in western Michigan.. The project, which cost $80 million, added capacity of 120 MMcf per day for greater service reliability to the southern Grand Rapids region. Secondly, We Energies, Inc., a local utility in eastern Wisconsin, constructed a new 13-mile lateral from the interstate Guardian Pipeline, in the Green Bay area, to enhance service to the city at a cost of $15 million. Finally, Greater Minnesota Transmission, LLC completed a 13-mile lateral in Dakota County, Minnesota, with a capacity of 91 MMcf per day.

Infrastructure Additions Are Expected to Grow. Although relatively modest over the past several years, infrastructure activity in the Midwest region is expected to increase significantly in the coming years, particularly with the completion of the eastern portion of Rockies Express. A portion of REX-East was completed in June 2009, bringing an additional 1.5 Bcf per day of capacity into the Midwest to areas south of Chicago. By the end of 2009, REX-East will reach its terminus at Clarington Hub in Ohio.

Over the next couple of years, significant capacity additions in the Midwest region may occur with expansions of NGPL and Rockies Express into the Chicago area. The two pipeline companies, owned in part by Kinder Morgan, will expand their respective systems and construct a joint pipeline, with first operations expected in 2010. The system improvement will provide up to 1 Bcf per day of incremental capacity from production areas in the Rockies through Iowa, but the pipeline will eventually provide

Table 4. Natural Gas Pipeline Construction Projects Completed in 2008, Midwest Region

(Map Key references Figure 4)

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)
Midwest										
MI	MI	Midwest	–	MichCon – Jamestown Pipeline	Not applicable	Lateral	1-Sep-08	80	16	120
MN	MN	Midwest	–	Greater Minnesota – Cannon Falls Pipeline	Not applicable	Lateral	15-Apr-08	7	13	91
WI	WI	Midwest	–	We – Fox Valley Lateral	Not applicable	Lateral	20-Nov-08	15	13	100
							Total	**102**	**42**	**311**

Notes: Totals may not sum due to independent rounding. See final page for a discussion of naming conventions used in this table.

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

[8] For the purposes of this report, the capacity addition from the Ruby Pipeline is calculated as occurring in the Western region. Infrastructure additions that cross regional boundaries are tabulated only according to their ending region in order to avoid double-counting.

Table 5. Natural Gas Pipeline Construction Projects Completed in 2008, Northeast Region

(Map Key references Figure 4)

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)
Northeast										
CT	NJ	Northeast	–	Algonquin – Ramapco Expansion	CP06-76	Compression/Line upgrade	1-Nov-08	192	5	325
CT	NY	Northeast	–	Iroquois – 08/09 Expn Phase 1	CP07-457	Looping	15-Nov-08	58	9	95
DE	PA	Northeast	–	Eastern Shore -- Expansion	CP06-53	Looping/Compression	15-Nov-08	8	9	11
MA	MA	Northeast	4	Neptune -- LNG Lateral	Coast Guard	Lateral	15-Oct-08	23	13	750
MA	**NB**	**Canada**	–	**Maritimes & Northeast Phase IV LNG**	**CP06-335**	**Looping/Compression**	**15-Dec-08**	**321**	**2**	**420**
MD	PA	Northeast	5	Dominion -- PA Expansion	CP05-131	Looping/Extension	1-Nov-08	175	113	700
NJ	**OH**	**Midwest**	–	**TETCO -- TIME II Expansion Phase 2**	**CP06-115**	**Looping/Compression**	**1-Nov-08**	**54**	**10**	**150**
NJ	PA	Northeast	–	Transco -- Sentinel Expansion Phase I	CP08-31	Looping/Compression	15-Dec-08	33	4	40
NY	CT	Northeast	–	Iroquois – MarketAccess Project	CP02-31	Compression	5-Nov-08	42	0	100
NY	NY	Northeast	6	Millennium Pipeline	CP98-150	New Pipeline	22-Dec-08	664	182	525
NY	NY	Northeast	–	Wycott -- Greyhawk North Lateral	CP03-33	Lateral	1-Aug-08	5	4	400
NY	NY	Northeast	–	Central New York -- Stagecoach Lateral	CP06-64	Lateral	1-Dec-08	16	9	400
NY	NY	Northeast	–	Empire/Millennium Expansion	CP06-5/6/7	Compression/Extension	15-Dec-08	187	78	250
VA	MD	Northeast	7	Dominion -- Cove Point Expansion	CP05-132	Looping/Compression	15-Dec-08	160	48	800
WV	WV	Northeast	--	Dominion -- TL-263 Expansion Project	CP07-10	Looping/Compression	1-Nov-08	15	6	21
							Total	**1,952**	**491**	**4,987**

Notes: Interregional project is in **bold print.** In the table, a project that crosses interregional boundaries is included in the region in which it terminates. Totals may not sum due to independent rounding. See final page for a discussion of naming conventions used in this table.

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

greater capacity through the Midwest to Michigan. Supplies for this project would likely come from the Rockies producing fields. As a result, the viability of the proposed project will depend on growth in Rockies production, as well as competition from other companies that have proposed new outlets for Rockies production.

In 2009, Guardian Pipeline LLC, which commenced operations in 2002, will provide service to Green Bay, Wisconsin, for the first time, through the completion of a 119-mile extension from Guardian's current terminus near Ionia, Wisconsin. The expansion would add about 550 MMcf per day of capacity into the Green Bay area at a cost of between $200 and $250 million. As noted above, We Energies, a local utility in the Green Bay area, has completed construction of infrastructure to receive shipments from Guardian's expansion.

Northeast Region

Fifteen pipeline projects were completed in the Northeast region in 2008, representing 5.0 Bcf per day of additional capacity and 491 miles of new pipeline (Table 5). As was the case with several of the regions in 2008, these new mileage and capacity additions were at least double the level of the previous year and were the highest for this region in EIA's 11-year database of pipeline construction activity. Based on current construction and announced projects, EIA anticipates growing construction activity in the Northeast through 2011 and beyond, even if some planned projects are not completed.

LNG-Related Projects Begin Operations. The largest projects completed in the Northeast during 2008 in terms of capacity were related to bringing regasified natural gas to market from LNG import terminals. Dominion Corporation completed an integrated pipeline project that increased pipeline capacity from the Cove Point LNG terminal in Southern Maryland (which also was upgraded during the year). At a cost of $160 million, Dominion constructed 48 miles of new pipeline from the LNG terminal to interstate pipeline connections in Virginia that will allow the gas to reach the Perulack Compressor Station in Juniata County, Pennsylvania. Secondly, the company added 113 miles of pipeline facilities extending northward from the Perulak station to Dominion's Leidy Hub complex in Clinton County, Pennsylvania. Dominion Cove Point Pipeline now has a capacity to transport 1.8 Bcf per day, an increase of 800 MMcf per day.

Suez LNG North America, Inc. completed a pipeline project to support its Neptune LNG offshore port, which will be located about 10 miles offshore Gloucester, Massachusetts. Similar to other offshore ports currently active in the United States and the United Kingdom, the facility does not have storage capacity. In fact, the port more closely resembles a buoy than a full-scale LNG terminal complex. Nonetheless, Neptune LNG will have the capacity to send out 750 MMcf per day of natural gas to the pipeline grid. The $23-million pipeline project included the installation of a 13-mile sub-sea pipeline that connects the Neptune LNG facility with the existing Spectra Energy HubLine.

Intraregional Projects Dominate Activity. Notwithstanding these LNG-related projects, pipeline expansions in the Northeast region in 2008 served primarily to improve service within the region itself. In the past few years, building long-haul capacity into the region has proved difficult, in part because of opposition from local communities and environmental organizations. While all of the projects completed in 2008 connected with to interstate pipelines, they did not extend beyond the Northeast region.

The Millennium Pipeline, a 182-mile, 30-inch line across southern New York, was completed after many years in the planning process. The pipeline serves markets along its route through the lower Hudson Valley and provides service to New York City markets through interconnections with other

interstate pipelines. Millennium, which NiSource, Inc., KeySpan Corporation, and DTE Energy Company own, can transport up to 525 MMcf per day.

In association with the opening of Millennium, two current pipeline operators in the Northeast expanded their facilities in order to receive increased flows on their systems from interconnections with the new pipeline. Algonquin Gas Transmission Company completed its $192-million Ramapo system expansion, which included a new compressor station in Oxford, Connecticut; upgrades to existing compressor stations; and the replacement of pipeline facilities near Ramapo, New York. Secondly, Empire Pipeline, which originates at the United States-Canadian border near Buffalo, New York, began service on an 78-mile, 24-inch pipeline called the Empire Connector. This pipeline extends from near Rochester, New York, south to Corning, where it connects with Millennium Pipeline. The $187 million project has a capacity of 250 MMcf per day.

Transcontinental Gas Pipeline Corp. (Transco) in 2008 began a major system expansion involving additional compression and replacement of existing pipeline in the Mid-Atlantic. Transco's Sentinel Expansion Project will provide an additional transportation capacity of 142 MMcf per day from Transco's existing point of interconnection in Fairfax County, Virginia, to delivery points in Pennsylvania, Delaware, New Jersey, and New York. In 2008, Transco completed the first phase of the expansion, adding 40 MMcf per day in capacity. The second phase of the project will be completed in 2009, adding 102 MMcf per day in capacity. The estimated total cost for the Sentinel Expansion is $155 million.

Expansion Of Grid Poised To Continue. The level of pipeline construction in the Northeast is likely to increase in the next few years as long-planned system expansions take place and flows from new LNG facilities and existing LNG facility expansions commence. Thirty-two pipeline projects, totaling as much as 8.5 Bcf per day of new capacity, have been announced, submitted for regulatory review, or approved for development between 2009 and 2011. However, the completion of many of these projects is far from certain, especially those that have yet to be filed with FERC.

The development of the Marcellus Shale in New York and Pennsylvania is spurring the construction of pipeline infrastructure in the region, particularly large-scale expansions of existing pipelines. Much of the region's existing pipeline grid was built to transport flows from the Gulf of Mexico. The Marcellus shale encompasses more than 10,500 square miles and contains significant undeveloped resources, necessitating a re-orientation of the region's existing pipeline grid as well as new gathering pipelines. For example, El Paso's Tennessee Gas Pipeline plans to construct approximately 125 miles of 30-inch pipeline and add approximately 46,000 horsepower of compression facilities in its existing pipeline corridor in Pennsylvania to transport growing Appalachian production to Northeast markets. The project will add capacity of 200 MMcf per day.

Numerous proposals to expand existing infrastructure to provide an outlet for increased supplies from the Rockies are also under consideration. Once the REX-East is complete, Rockies supplies will have access to many interstate pipelines from the pipeline's terminus in Clarington, Ohio. However, expansion of existing interstate pipelines in the region is required to transport increased supplies. For example, Texas Eastern Transmission, LP, has an application pending at FERC seeking a certificate to expand the capacity of its system by 395 MMcf per day from a supply point in Clarington, Ohio, and by 60 MMcf per day from the Oakford storage facility in Westmoreland County, Pennsylvania.

National Fuel Gas Company has proposed a 324-mile pipeline to deliver Rockies gas from Ohio to Corning, New York. In addition, Williams Companies' proposed Rockies Connector Pipeline would extend approximately 250 miles, connecting its Transco Station 195 in York County, Pennsylvania, to the eastern terminus of the REX-East in Ohio. The owners of REX have also proposed extending the pipeline further east to Linden, New Jersey, by 2011.

Southeast

After several years of minimal capacity additions, numerous large-scale pipelines were completed in the Southeast region in 2008. The capacity additions related to several market trends developing in both the Southeast region specifically and the country as a whole. Capacity into the Southeast region grew in part because of the need to build pipeline capacity out of the adjacent Southwest region, where supply growth from new unconventional resource development in northeastern Texas (Barnett Shale) and parts of Oklahoma and Arkansas (Fayetteville and Woodford Shales) has been significant. Capacity into the Florida market increased and several underground storage fields began operations, requiring related large-diameter pipeline infrastructure.

Nineteen pipeline expansions were completed in the Southeast region in 2008, representing 10.1 Bcf per day of additional capacity and 891 miles of new pipeline (Table 6). The added capacity, which cost an estimated $3.5 billion, was greater than that of any year in the last decade. Although pipeline construction activity has been relatively limited in recent years compared with other regions, the increased activity in 2008 is expected to continue through 2011 and beyond, even if some planned projects are not completed.

New Capacity Provides Outlet For Supplies. Among the completed pipeline projects providing new access to growing unconventional supplies from the west was Southeast Supply Header Pipeline (SESH), a new $842-million interstate pipeline constructed by a joint venture of Spectra Energy and CenterPoint Energy Gas Transmission. SESH began full service in October 2008, providing 1.1 Bcf per day of

Table 6. Natural Gas Pipeline Construction Projects Completed in 2008, Southeast Region

(Map Key references Figure 4)

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)
Southeast										
AL	AL	Southeast	--	Gulf South – Mobile Compressor Expansion	CP07-396	Compression	31-Aug-08	23	0	250
AL	MS	Southeast	8	Gulf South – Southeast Expansion	CP07-32	Extension	1-Jun-08	1,296	111	1,272
AL	MS	Southeast	9	Southern Pines -- Florida/Transco Header	CP02-229	New Pipeline	15-Nov-08	52	26	1,000
AL	**LA**	**Southwest**	13	**Southeast Supply Header Pipeline**	**CP07-44**	**New Pipeline**	**5-Oct-08**	**842**	**270**	**1,140**
FL	AL	Southeast	--	Gulfstream -- Phase 4 (Bartow)	CP07-51	New pipeline	1-Dec-08	117	18	155
FL	FL	Southeast	--	Gulfstream -- Bayside Lateral	Not applicable	Lateral	1-Dec-08	30	28	200
FL	FL	Southeast	--	Gulfstream -- Phase 3a Expansion	CP00-06-014	Extension	1-Sep-08	129	34	185
FL	FL	Southeast	--	Florida Gas -- East Leg Expansion	CP07-82	Looping	1-Jul-08	16	7	10
GA	GA	Southeast	--	SONAT – Cypress Phase 2	CP05-388	Compression	1-Apr-08	21	0	100
KY	KY	Southeast	--	Equitrans – Big Sandy Pipeline Phase I	CP06-275	New Pipeline	1-Apr-08	60	68	70
KY	KY	Southeast	--	Equitrans - Big Sandy Pipeline Phase II	CP06-275	Compression	1-Apr-08	20	0	60
MS	MS	Southeast	10	Southern Pines -- Destin Line	CP02-229	New Pipeline	15-Nov-08	6	3	1,000
MS	MS	Southeast	11	Gulf Crossing -- Mississippi Loop	CP07-401	Looping/Compression	18-Dec-08	25	18	1,000
MS	MS	Southeast	12	Mississippi Hub -- Storage Lateral	CP07-4	Lateral	15-Dec-08	0	11	1,200
MS	MS	Southeast	--	Monroe Storage Field -- TETCO Lateral	CP07-406	Lateral	15-Dec-08	42	23	465
MS	**TX**	**Southwest**	**14**	**Gulf South – Texas to Mississippi Exp.**	**CP06-446**	**New pipeline**	**31-Jan-08**	**767**	**243**	**1,700**
NC	**VA**	**Northeast**	--	**East Tennessee – CNX Increase**	**CP08-35**	**Compression**	**1-Sep-08**	**5**	**0**	**90**
NC	**VA**	**Northeast**	--	**East Tennessee – Patriot Extension III**	**CP01-415**	**Compression**	**15-Oct-08**	**20**	**0**	**75**
TN	TN	Southeast	--	Midwestern -- Eastern Extension Project	CP05-372	Extension	15-Apr-08	26	31	120
							Total	**3,497**	**891**	**10,092**

Notes: Interregional project is in **bold print.** In the table, a project that crosses interregional boundaries is included in the region in which it terminates. See final page for a discussion of naming conventions used in this table.

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

capacity from CenterPoint's Perryville Hub in northeast Louisiana to interconnections with Florida Gas Transmission (FGT) in Mississippi and the Gulfstream Natural Gas System in Coden, Alabama. SESH interconnects with several interstate natural gas pipelines along its 270-mile route, providing opportunities for unconventional supplies to reach Southeast and Northeast markets as well as several storage facilities. SESH capacity has also been marketed to Florida utilities as a valuable alternative to offshore Gulf of Mexico supply, which has experienced intermittent disruptions in recent years during hurricane season.

At a cost of $767 million, Gulf South Pipeline Company LLP completed a large-scale expansion of its system in the region to provide a similar outlet for Southwestern supplies. Gulf South's Texas-to-Mississippi expansion, including about 243 miles of high-pressure pipeline, came online in January 2008. The expansion connects the company's existing system in DeSoto Parish in northwest Louisiana to its 30-inch diameter pipeline in Simpson County, Mississippi. With the addition of 110,604 horsepower of compression as well as the pipeline facilities, the project is capable of transporting up to 1.7 Bcf per day from the pipeline-constrained production areas in Texas to interconnections with other interstate pipelines along its path for eventual delivery to the Midwest, Northeast, and Southeast.

Additionally, significant pipeline capacity was added in the Southeast region in 2008 in conjunction with the completion of new underground storage capacity. Near Jackson, Mississippi, EnergySouth, Inc. completed the Mississippi Hub, a large, new underground salt-dome storage complex that will eventually be able to hold 30 Bcf. Related to this development, the owners of the complex constructed a 11-mile pipeline lateral with a capacity of 1.2 Bcf per day. Additionally, SG Resources Mississippi, LLC constructed the Southern Pines Energy Center in Greene County, Mississippi. The new complex includes 29 miles of dual 24-inch bidirectional natural gas pipelines and associated facilities connecting with the FGT system and Transco.

Capacity additions in the Southeast in 2008 were also related to the ongoing expansion of the El Paso Corp.-owned Southern LNG terminal located on Elba Island, Georgia. Southern Natural Gas Company (SNG), which owns the interstate pipeline network that connects to the LNG terminal, completed a second phase of the new 167-mile Cypress Pipeline. This pipeline extends from the SNG system into southern Georgia and northern Florida, interconnecting with FGT near Jacksonville, Florida. The construction activity in 2008 added 100 MMcf per day of capacity to the new line. The third phase of the project is intended to boost Cypress Pipeline's capacity through the installation of additional compressor units, resulting in more than 250 MMcf per day of incremental transportation capability.

New Projects Are On The Horizon. Construction activity in the Southeast is likely to remain elevated in the near-term as industry continues to seek market outlets in the Southwest forgrowing unconventional supplies. For example, Texas Gas Transmission (TGT), which is a 5,900-mile pipeline that Boardwalk Pipeline Partners owns, intends to increase the capacity of its proposed Fayetteville and Greenville laterals to 1.7 Bcf per day from the initial design capacity for each project of 800 MMcf per day. The lateral projects, which were placed into service in early 2009, provide takeaway capacity for natural gas from the Fayetteville Shale area in north-central Arkansas. The Fayetteville lateral is a 100-mile, 36-inch pipeline traversing several counties in Arkansas and interconnecting with TGT's mainline in Coahoma County, Mississippi. The Greenville lateral is a 96-mile pipeline extending from TGT's mainline near Greenville, Mississippi, east to Kosciusko, Mississippi.

In total, EIA is tracking 39 proposed infrastructure projects for the region over the next 3 years. If all were to be completed, the increase in the region's capacity would be 22.7 Bcf per day, while 1,860 miles would be added to the pipeline grid. The estimated cost of these additions is $6.6 billion.

Southwest and the Gulf of Mexico

In the Southwest, infrastructure additions were massive in 2008, as the industry responded to the need for more capacity following increases in regional production, particularly in the Barnett Shale in Northeast Texas, as well as potential increased volumes of regasified natural gas from newly constructed LNG terminals in the region. Pipeline construction activity resulted in 30 pipeline completions, which together amounted to the largest-scale infrastructure addition in any region in the 11-year history of EIA's data of construction activity (Table 7).

In 2008, capacity additions of 22.6 Bcf per day were three times the level of the previous year, while the 1,382 miles of new pipeline was nearly double the previous year's addition of 700 miles of pipeline. The estimated cost of the infrastructure additions was $3.3 billion, compared with the 2007 total of $1.5 billion. Of the 30 pipeline projects constructed in the Southwest, 13 were related to new pipelines or expansions in the northeast Texas area or to new flows from development of supplies from the Barnett, Woodford, or Fayetteville Shale formations. These expansions accounted for approximately 72 percent (1,001 miles) of the added pipeline mileage in the region and 30 percent (6.7 Bcf per day) of the added capacity in the region.

Projects Enhanced Takeaway Capacity. Completed projects in 2008 included several enhancements to the interstate grid and new connections between market centers. The most significant projects took place on intrastate systems that Enterprise Product Partners and Energy Transfer Partners, LP own.

Table 7. Natural Gas Pipeline Construction Projects Completed in 2008, Southwest Region

(Map Key references Figure 4)

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)
Southwest										
AR	AR	Southwest	15	TXG – Fayetteville Lateral Phase 1	CP07-417	New Pipeline	15-Sep-08	205	66	967
AR	AR	Southwest	–	Centerpoint -- Cove Compressor Station	CP07-437	Compression	1-Nov-08	26	0	200
AR	AR	Southwest	–	Ozark – Standing Rock Compressor	CP08-20	Compression	15-Nov-08	19	0	100
GM	GM	Offshore	–	Enbridge --Neptune Deepwater Project	Not applicable	Gathering Lateral	15-Feb-08	50	29	200
GM	GM	Offshore	–	Williams – Blind Faith Extension	Not applicable	Gathering	1-Nov-08	255	71	200
LA	LA	Southwest	16	Port Barre – Bobcat Storage Lateral	CP06-66/67/68	Laterals	15-Oct-08	30	20	1,200
LA	LA	Southwest	17	Trunkline -- NTX Extension	CP06-452	Extension	1-Feb-08	20	14	625
LA	LA	Southwest	18	Sempra --Cameron Interstate Pipeline	CP05-119	Lateral	1-Sep-08	115	36	2,350
LA	LA	Southwest	19	Cheniere -- Sabine Pass LNG Line	CP07-426	Lateral	15-Feb-08	350	16	2,600
LA	LA	Southwest	–	PetroLogistics -- Choctaw II Storage Lateral	CP07-427	Lateral	15-Oct-08	15	10	300
LA	LA	Southwest	–	Columbia Gulf – Henry Hub Expansion	Not applicable	Compression	15-Mar-08	25		230
LA	TX	Southwest	–	Centerpoint Perryville Expansion Phase 3	CP07-41	Compression	2-May-08	41	0	316
LA	TX	Southwest	–	NGPL -- Louisiana/Gulf Coast Line Expansion	CP07-03	Looping/Compression	14-Feb-08	69	5	200
NM	NM	Southwest	–	TW San Juan Lateral Expansion	CP06-459	Looping	22-Jul-08	72	25	375
NM	NM	Southwest	–	MarkWest -- Lea County Expansion	CP08-01	Looping	15-Sep-08	3	3	110
OK	OK	Southwest	–	Enogex --Woodford Shale Gathering Header	Not applicable	Lateral	1-May-08	50	30	350
TX	TX	Southwest	20	Freeport LNG – Brazoria Interconnector	Not applicable	Lateral	1-Apr-08	56	30	2,600
TX	TX	Southwest	21	NGS – Tres Palacios Storage Lateral	CP07-90	Lateral	1-Oct-08	60	42	2,500
TX	TX	Southwest	22	Freeport LNG Pipeline	CP03-75	Lateral	1-Apr-08	18	10	1,750
TX	TX	Southwest	23	Energy Transfer -- SE Boosier Pipeline Phase 1	Not applicable	New Pipeline	28-Apr-08	360	165	900
TX	TX	Southwest	24	Enbridge -- East Texas System Extension	Not applicable	Extension	15-Apr-08	465	190	700
TX	TX	Southwest	25	Energy Transfer -- Carthage Loop Expansion	Not applicable	Looping/Compression	10-Sep-08	94	32	500
TX	TX	Southwest	26	Energy Transfer -- Maypearl to Malone	Not applicable	New Pipeline	1-Aug-08	50	25	600
TX	TX	Southwest	27	Enterprise Products -- Sherman Extension	Not applicable	Extension	15-Dec-08	400	178	1,100
TX	TX	Southwest	–	Energy Transfer -- SE Boosier Pipeline Phase 2	Not applicable	Compression	1-Nov-08	70	165	400
TX	TX	Southwest	–	TETCO Cedar Bayou Lateral Project	CP07-411	Lateral	28-May-08	17	4	360
TX	TX	Southwest	–	Energy Transfer -- Northside to Paris Loop	Not applicable	Expansion	1-Aug-08	260	145	350
TX	TX	Southwest	–	Kinder Morgan -- Tejas/Texas Pipeline Link	Not applicable	New line	15-Sep-08	72	58	225
TX	TX	Southwest	–	El Paso -- Hobbs Lateral	CP08-14	Lateral	26-Nov-08	17	7	150
TX	TX	Southwest	–	Trunkline -- Field Zone Expansion II	CP08-99	Lateral	15-Nov-08	23	7	95
							Total	**3,307**	**1,382**	**22,553**
Mexico										
MX	**TX**	**Southwest**	–	**Encinal – 'Petrolero Project**	**CP07-418**	**Border Crossing**	**30-Jun-08**	**1**	**0**	**60**
							Total	**1**	**0**	**60**

Notes: Interregional project is in **bold print**. In the table, a project that crosses interregional boundaries is included in the region in which it terminates. See final page for a discussion of naming conventions used in this table.

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

Enterprise Product Partners completed a portion of its Sherman Extension project, which in total is one of the larger infrastructure projects slated for northeast Texas in recent years. The 178-mile pipeline extends Enterprise's Texas intrastate system from Barnett production sites in Erath County, Texas, to Grayson County, Texas, where there will be access to points eastward through an interconnection with the Gulf Crossing interstate pipeline. The $400-million project provides Barnett producers access to markets in the Southeast, Midwest, and Northeast. By the end of 2009, Enterprise intends to build a 40-mile supply lateral that would extend from the Sherman Extension to the Trinity River Basin north of Arlington, Texas. The lateral would provide up to 1 Bcf per day of gas takeaway capacity for producers in Tarrant and Denton counties, according to the company.

Energy Transfer Partners, LP, was also one of the more active companies adding infrastructure to the Southwest region during the year, completing 532 miles of new pipeline with a combined capacity of 2.8 Bcf per day. Among other projects, the company's completions during the year included the 165-mile Bossier Pipeline with a capacity of 900 MMcf per day; the 145-mile Paris Loop expansion with a capacity of 350 MMcf per day; and the 32-mile Carthage Loop Expansion with a capacity of 500 MMcf per day. These pipelines are located in Central and Northeast Texas.

LNG-Related Projects Were Completed. Capacity additions in the Southwest region resulting from increased investment in LNG infrastructure were significant in 2008. Two new LNG terminals opened during 2008 and a third has opened in 2009. Related pipeline infrastructure completed during the course of 2008 represented an investment of $539 million. Although the pipeline infrastructure related to LNG terminals was quite short in terms of added mileage at a combined 130 miles, the infrastructure additions generally involved 42-inch pipeline with very large capacities in order to transport the massive send-out potential from LNG terminals. During 2008, approximately 9.3 Bcf per day of capacity additions were completed relating to LNG terminals in the region.

Related to the Sabine Pass LNG terminal in Cameron Parrish, Louisiana is the $572-million Creole Trail Pipeline, which Cheniere Energy owns and operates. This new pipeline connects the Sabine Pass LNG and Creole Trail LNG facilities, both of which Cheniere owns, and then connects to multiple interstate pipelines in southern Louisiana. The total length of the line is just 16 miles, but it adds capacity of 2.6 Bcf per day to the network. Another LNG-related infrastructure enhancement involved Freeport LNG. In early 2008, Freeport LNG completed a 10-mile pipeline associated with its sendout of regasified LNG. With a capacity of 1.8 Bcf per day, the Freeport LNG Pipeline can transport natural gas to Stratton Ridge, Texas, where the pipeline interconnects with several intrastate systems.

The level of pipeline construction in the Southwest is likely to remain elevated in the next few years as long-planned system expansions take place and flows from new LNG facilities and existing facility expansions commence. Forty-seven projects, totaling as much as 40 Bcf per day of new capacity, have been announced, submitted for regulatory review, or approved for development between 2009 and 2011. If all were to be completed, the increase in the region's capacity would be 40 Bcf per day, while 3,100 miles would be added to the pipeline grid. The estimated cost of these additions would be $7.6 billion. However, the completion of many of these projects is far from certain, especially those that have yet to be filed with the FERC.

West

Very little capacity was added to the West region infrastructure in 2008. Only two natural gas pipeline projects, together adding 70 MMcf per day of capacity at a combined cost of $41 million, were completed in the region during the year (Table 8). This was the fourth consecutive year in which there was little activity in the West region, which is primarily characterized as a consuming region with extensive demand in the electric power sector.

Both infrastructure projects added compression to existing pipelines in the region. El Paso Natural Gas Company upgraded its system in Pinal County, Arizona, adding 30 MMcf per day of capacity to its Phoenix Lateral. The compression project cost $24 million. According to the company, the project was undertaken because of significant growth in demand for natural gas service in the western areas

Table 8. Natural Gas Pipeline Construction Projects Completed in 2008, Western Region

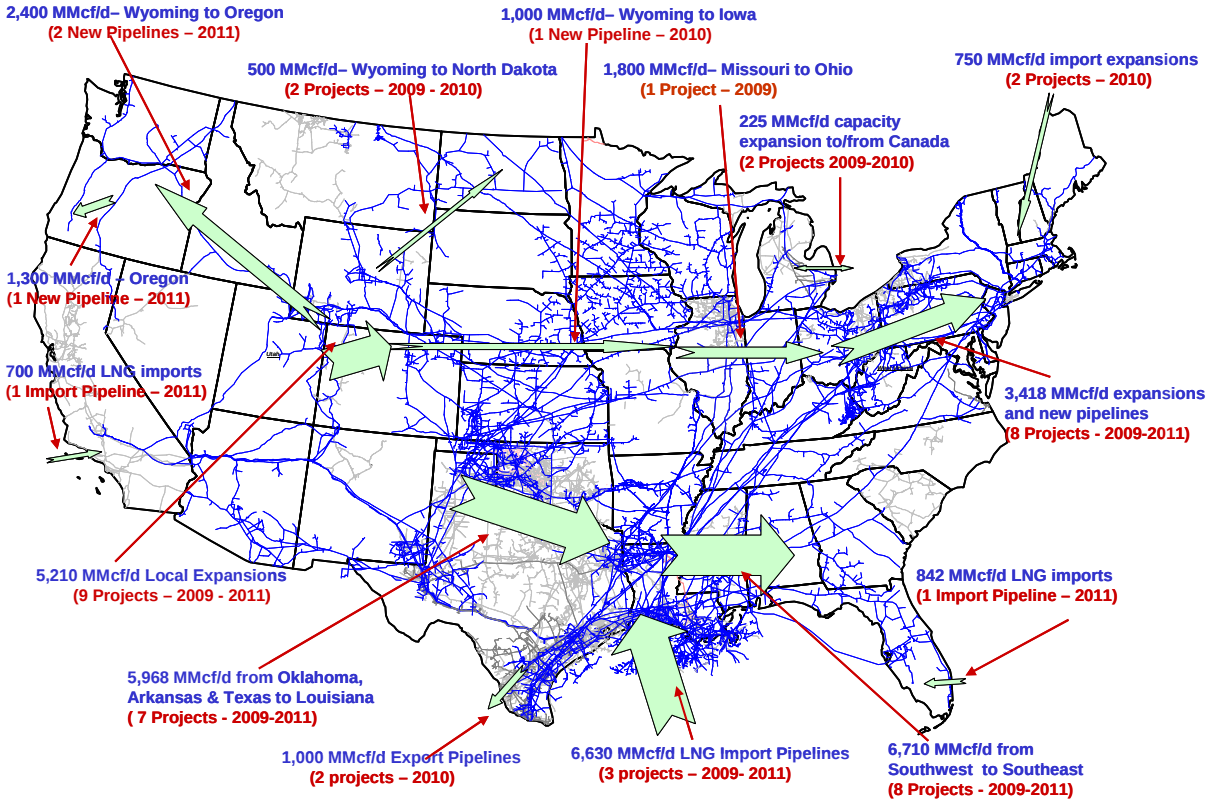
(Map Key references Figure 4)

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)
Western										
AZ	AZ	Western	–	El Paso -- Picacho Compressor Station	CP07-448	Compression	1-Dec-08	24	0	30
NV	NV	Western	–	Tuscarora -- System Expansion	CP07-27	Compression	1-Apr-08	17	0	40
							Total	**41**	**0**	**70**

Notes: Totals may not sum due to independent rounding. See final page for a discussion of naming conventions used in this table.

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

Figure 6. Major Potential Natural Gas Pipeline Expansions, 2009-2011



MMcf/d = million cubic feet per day. LNG = liquefied natural gas.
Source: Energy Information Administration, GasTran Gas Transportation Information System, Natural Gas Pipeline Projects Database, May 2009.

El Paso serves, particularly in the Phoenix metropolitan area. Tuscarora Gas Transmission Company constructed a new compressor station on its existing interstate pipeline system in Modoc County, California, to provide 40 MMcf per day of capacity to Sierra Pacific Power Company. Sierra Pacific will use the new capacity entitlement to fuel its new 514-megawatt Tracy Combined Cycle Power Plant.

Capacity Increases Needed for Rockies Supplies. Although pipeline construction activity in the West region will likely continue to be limited in the next few years, several significant projects are underway. The largest project currently proposed for the region is El Paso Corporation's Ruby Pipeline, which will transport Rockies natural gas to a terminus near Malin, Oregon. The 680-mile pipeline, which could begin operations as early as 2011, will have an initial capacity of 1.5 Bcf per day, according to El Paso.

A consortium of Williams Gas Pipeline Company LLC, TransCanada Pipeline USA, Ltd., and Sempra Pipelines & Storage Corporation launched a similar proposal to move Rockies supplies to the Northwest region of the country. The proposed Sunstone Pipeline would require construction of approximately 601 miles of 42-inch pipeline extending from Opal, Wyoming, to an interconnect with an existing pipeline near Stanfield, Oregon.

A host of LNG-related projects are also still active in the West region, most of which would involve construction of new pipeline in some form. However, project timelines have extended beyond 2011. FERC has issued final environmental approval for the LNG import terminal proposed by Jordan Cove Energy Project, LP (Jordan Cove), and the associated send-out natural gas pipeline proposed by Pacific Connector Gas Pipeline, LP (Pacific Connector). Jordan Cove's LNG terminal would be located on the bay side of the North Spit of Coos Bay in southern Oregon. Pacific Connector's proposed 36-inch sendout pipeline would extend from Jordan Cove's LNG terminal about 234 miles southeast across Coos, Douglas, Jackson, and Klamath counties to a terminus near Malin, Oregon, where it would interconnect with several existing interstate pipeline systems.

Observations and Outlook

Pipeline infrastructure expansion activity in the lower 48 States will likely remain elevated in the near-term, with most activity dedicated to increasing capacity from the Rockies and Midcontinent developing production fields to major consuming areas to the east (Figure 6). Natural gas pipeline capacity added during 2008, totaling 45 Bcf per day was substantially higher than the additions of prior years, going back at least to 1998. The current inventory of 180 project proposals for the 3 years ending 2011 would bring an additional 94 Bcf per day of capacity to the grid with average capacity of about 575 MMcf per day for each project.

While only a portion of these scheduled projects are likely to be completed, EIA expects at least several more years of large-scale additions to the pipeline grid. The scheduled projects for the near-term (2009-2011), which account for more than 10,200 miles of potential new natural gas pipeline, will continue to be mostly oriented around the addition and expansion of capacity from new supply sources. A substantial amount of pipeline capacity additions over the next 3 years will come from the intense development activity in the Rockies and the northeast Texas producing areas (Table 9).

EIA also forecasts domestic production, particularly production from unconventional sources, to continue to show gains in the long-term. In the *Annual Energy Outlook*, natural gas in tight sandstone formations is the largest source of unconventional production, accounting for 29 percent of total U.S. production in 2030. Production from shale formations is the fastest growing source, expected to grow over 200 percent to 3.7 Tcf per year.[9] However, the expected growth in natural gas production from shale formations is far from certain, and continued exploration is needed to provide additional information on the resource potential. EIA projects that the expected continued development of domestic resources will require steady additions to the pipeline grid in the long-term.

[9] Energy Information Administration, *Updated Annual Energy Outlook 2009 (Reference Case Service Report)*, Table 14, (Washington DC, April 2009).

Table 9. Largest 20 Planned Natural Gas Pipeline Projects for 2009, 2010, and 2011, 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 2009)	Miles	Additional Capacity (MMcf/d)[1]
2009	TX	LA	Southwest	Golden Pass LNG Terminal LP	Golden Pass LNG Laterals	CP04-400	Lateral	Completed	70	2,500
2009	LA	LA	Southwest	Kinder Morgan Louisiana PL Co	Sabine Pass LNG Leg 1	CP06-449	New Pipeline	Construction	135	2,130
2009	LA	LA	Southwest	Cheniere Creole Trail LLP	Creole Trail Pipeline	CP07-426	Lateral	Construction	117	2,000
2009	MO	OH	Midwest	Kinder Morgan Energy Partners	Rockies Express (REX East)	CP07-208	New Pipeline	Construction	439	1,800
2009	OK	LA	Southwest	Gulf Crossing Pipeline Co LLC	Gulf Crossing Pipeline Project	CP07-398	New Pipeline	Completed	356	1,712
2009	LA	LA	Southwest	Spectra Energy Inc (MHP)	Egan Storage Lateral Loop	CP07-88	Looping	Construction	17	1,700
2009	OK	TX	Southwest	Midcontinent Express Pipeline	Midcontinent Express Pipeline System	CP08-06	New Pipeline	Completed	506	1,500
2009	TX	TX	Southwest	Energy Transfer Co	Texas Independence Pipeline	Not applicable	New Pipeline	Construction	160	1,100
2009	LA	LA	Southwest	Kinder Morgan Louisiana PL Co	Sabine Pass LNG Leg 2	CP06-449	Lateral	Construction	1	1,065
2009	TX	TX	Southwest	Enterprise Product Partners LP	Trinity River Supply Lateral	Not applicable	Lateral	Construction	40	1,000
2009	AR	MS	Southeast	Texas Gas Transmission Co	Fayetteville Lateral Phase 2	CP07-417	New Pipeline	Completed	100	967
2009	LA	LA	Southwest	Regency Intrastate Pipeline Co	Elm Grove Bienville Pipeline	CP09-82	Looping/Compression	Construction	121	800
2009	MS	MS	Southeast	Texas Gas Transmission Co	Greenville Lateral	CP07-417	New Pipeline	Completed	96	750
2009	MA	CT	Northeast	Algonquin Gas Trans Co	East-to-West (EW2) Expansion	CP08-420	Looping/Compression	Applied	31	746
2009	CO	CO	Central	Enterprise Product Partners LP	Collbran Valley Pipeline	Not applicable	Gathering Lateral	Construction	22	650
2009	OK	OK	Southwest	MarkWest Pioneer LLC	Arkoma Connector Pipeline Project	CP08-404	Lateral	Completed	50	638
2009	TX	TX	Southwest	Energy Transfer Co	Cleburne to Tolar Extension	Not applicable	Extension	Completed	35	600
2009	TX	TX	Southwest	Energy Transfer Co	Southern Shale	Not applicable	New Pipeline	Completed	31	600
2009	WI	WI	Midwest	Guardian Pipeline Co	GII Expansion	CP07-08	Extension	Construction	119	537
2009	WV	PA	Northeast	Chestnut Ridge Storage LLC	Uniontown Lateral	CP08-36	Lateral	Applied	17	500
2009	--	--	--	--	Others (58 projects)	--	--	--	1,181	8,557
Total									**3,643**	**31,852**
2010	MS	MS	Southeast	NGS Investments LLC	Leaf River Dome Headers	CP08-08	Lateral	Approved	7	2500
2010	AL	AL	Southeast	McMoran Exploration Inc	Coden Onshore Pipeline	CP04-68	New Pipeline	Approved	5	1600
2010	AR	MS	Southeast	Fayetteville Express Pipeline	Fayetteville Express Pipeline	PF09-4	New pipeline	Applied (NEPA)	187	1600
2010	LA	LA	Southwest	DCP Midstream Partners LP	Haynesville Connector	None yet	New line	Planning	150	1500
2010	GA	GA	Southeast	Southern Natural Gas Co	Elba Express III	CP06-470	Extension	Approved	189	1175
2010	TX	TX	Southwest	Enbridge/Atmos Energy	BIG Pipeline Project	Not applicable	New line	Planning	100	1000
2010	TX	TX	Southwest	ENSTOR Energy	Houston Energy Center Header Line	CP07-390	New Pipeline	Construction	2	1000
2010	LA	LA	Southwest	Liberty Gas Storage LLC	Liberty Storage Pipeline Expansion	CP08-454	Lateral	Applied	5	1000
2010	WY	IA	Central	Kinder Morgan Energy Partners	REX/NGPL Phase 1	None yet	New Line	Planning	175	1000
2010	WY	WY	Central	Questar Overthrust Pipeline Co	Overthrust Wamsutter/Opal	PF09-6	Looping	Applied (NEPA)	43	800
2010	LA	LA	Southwest	Stark Gas Storage LLC	Stark Storage Pipeline	CP05-08	Lateral	Construction	35	800
2010	ME	ME	Northeast	Downeast LNG LLC	Downeast LNG Lateral	CP07-52/55	Lateral	Applied	30	625
2010	MS	MS	Southeast	Southeast Gas Storage LLC	Black Warrior Field Lateral	CP08-418	Lateral	Approved	5	500
2010	TX	MX	Mexico	Sonora Pipeline LLC	Burgos Hub Mission Line (US Portion)	CP07-74	New Border Crossing	Approved	16	500
2010	LA	LA	Southeast	Gulf South Pipeline Co	Haynesville/Perryville Expansion	None yet	Compression	Planning	0	500
2010	ON	CT	Northeast	Iroquois Pipeline Co	MetroExpress Project	None yet	Looping/Compression	Planning	0	500
2010	TX	MX	Mexico	Sonora Pipeline LLC	Northeast Hub Progresso Line (US Portion)	CP07-74	New Border Crossing	Approved	13	500
2010	WY	MT	Central	Bison Pipeline LLC	Bison Pipeline Project	PF08-23	New Pipeline	Applied (NEPA)	289	400
2010	MI	ON	Canada	Great Lakes Gas Trans Co	Dawn Eclipse Pipeline Proeject	None yet	Compression	Planning	0	400
2010	MI	ON	Canada	Spectra Energy Inc	Dawn Gateway Project	None yet	Compression	Planning	0	400
2010	--	--	--	--	Others (35 projects)	--	--	--	819	6,305
Total									**2,070**	**24,605**
2011	LA	LA	Southwest	Henry Gas Storage LLC	Henry Storage Lateral	PF08-28	Lateral	Applied (NEPA)	12	2600
2011	MS	MS	Southeast	NGS Investments LLC	Leaf River East-West Header	CP08-08	Lateral	Approved	37	2500
2011	LA	LA	Southwest	NGS Investments LLC	Gulf Coast Connector	Planning	Lateral	Planning	40	2000
2011	LA	LA	Southwest	Port Barre Investments LLC	Bobcat Storage Expansion	CP09-19	Laterals	Applied	20	1800
2011	LA	LA	Southwest	Atmos Pipeline and Storage LLC	Fort Necessity Storage Lateral	PF08-10	Lateral	Applied (NEPA)	7.5	1500
2011	MS	MS	Southeast	Gulf LNG Pipeline LLC	Gulf Landing Pipeline	CP06-12/13/14	New Pipeline	Construction	5.02	1500
2011	OH	NJ	Northeast	Kinder Morgan Energy Partners	REX Northeast Express Project	None yet	New Pipeline	Planning	415	1500
2011	WY	OR	Western	El Paso/Bear Energy	Ruby Pipeline Project	CP09-54	New Line	Applied	680	1500
2011	OR	OR	Western	Palomar Gas Pipeline LLC	Palomar Gas Transmission Line	CP09-35	New Pipeline	Applied	217	1300
2011	NY	NY	Northeast	Broadwater Energy LLC	Broadwater Energy Pipeline	CP06-54/55/56	New Pipeline	Approved	21.7	1250
2011	TX	LA	Southwest	Energy Transfer Co	Tiger Pipleline	PF09-9	New line	Applied (NEPA)	180	1250
2011	LA	LA	Southwest	Black Bayou Storage LLC	Black Bayou Storage Lateral	CP07-451	Lateral	Applied	7.15	1200
2011	WY	OR	Western	Sunstone Pipeline LLC	Sunstone Pipeline Project	PF09-2	New Pipeline	Applied (NEPA)	601	1200
2011	LA	FL	Southeast	Cheniere Energy Co	Southern Trail LNG Line	CP05-357	New line	Applied	348	1050
2011	OK	OK	Southwest	Enogex LLC	Heartland Crossing	Not applicable	New Pipeline	Announced	0	1000
2011	OH	OH	Midwest	Kinder Morgan Energy Partners	REX Northeast Express Phase	None yet	Compression	Planning	0	1000
2011	TX	LA	Southwest	Enbridge Pipeline Co	LaCrosse Pipeline	None yet	New line	Announced	300	1000
2011	IA	IL	Midwest	Kinder Morgan Energy Partners	REX/NGPL Joint Project Phase 2	None yet	New Line	Planning	240	1000
2011	TX	TX	Southwest	Pivotal Energy Development	Golden Triangle Storage Lateral	CP07-414	Lateral	Construction	9	900
2011	BH	FL	Southeast	AES Ocean Express Pipeline LLP	Ocean Express Offshore Pipeline Project	CP02-90	New Pipeline	Approved	46.1	842
2011	--	--	--	--	Others (27 projects)	--	--	--	1,342	9,556
Total									**4,528**	**37,448**
3-Year Total					**180 Projects**				**10,242**	**93,905**

[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).

MMcf/d = million cubic feet per day. ON = Ontario, Canada, BH = Bahamas.

Source: Energy Information Administration, GasTran Natural Gas Transportation Information System, Natural Gas Pipeline Projects Database, as of May 2009.

Note on Terminology used in the Tables

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 (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 decatherms per day) = 1 Bbtu/d (billion btu per day). Projects referred to as compressor projects 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. Looping refers to the installation of another segment of pipeline parallel to an existing pipeline segment. Looping is used as a means of quickly increasing overall pipeline capacity and/or increasing line-packing (temporary storage) on a pipeline system. 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. 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. Projects referred to as new pipelines are entirely new pipeline entities that are not an extension of, or a lateral off of, an existing pipeline system.