

# Expansion and Change on the U.S. Natural Gas Pipeline Network – 2002

This special report looks at the level of new capacity added to the national natural gas pipeline network in 2002 and the current capability of that network to transport supplies from production areas to U.S. markets. In addition, it examines the amount of additional capacity proposed for development during the next several years and to what degree various proposed projects will improve the deliverability of natural gas to key market areas. Questions or comments on the contents of this article should be directed to James Tobin at [james.tobin@eia.doe.gov](mailto:james.tobin@eia.doe.gov) or (202) 586-4835.

Despite a national economic slowdown and a 4.9 percent drop in overall U.S. natural gas consumption in 2001,<sup>1</sup> more than 3,571 miles of pipeline and a record 12.8 billion cubic feet per day (Bcf/d) of natural gas pipeline capacity were added to the national pipeline network during 2002 (Table 1). The estimated cost was \$4.4 billion.

Overall, 54 natural gas pipeline projects were completed during 2002 (Figure 1, Table 2).<sup>2</sup> Of these, 34 were expansions of existing pipeline systems or segments (see Box, “Gas Pipeline Capacity Development”). The other 20 included 9 new pipeline systems, 3 new gathering (header) systems, and 8 new large laterals that extend from existing pipeline systems. Expansions to existing systems added 6.9 Bcf/d to overall capacity, while new pipelines/laterals added 5.9 Bcf/d.

Over the past three years, the annual level of natural gas pipeline capacity additions (Table 1) has grown steadily, a trend that has been maintained since the early 1990s.<sup>3</sup> While the current inventory of proposed additions for 2003 and for 2004–2005 indicates a continuing increase in the rate of annual capacity additions, there are indications that these levels will probably not be fully realized. Indeed, signs point to a drop in the rate of new capacity additions over the next several years or at least to their number leveling off.

Since late 2001, many of the market factors that helped fuel the large growth in new pipeline capacity additions have changed significantly. For instance, economic growth has slowed and many proposals to add new gas-fired electric generation capacity have been delayed or canceled. As a result, the need for new natural gas capacity has also weakened.

The deteriorating financial condition of a number of energy companies over the past year and the cessation of gas trading as a line of business by a number of others have caused some pipeline company subsidiaries to re-evaluate their commitment to specific pipeline expansion proposals. And, since a number of expansion proposals have been predicated upon the building of new gas-fired electric power plants, a number of which have been suspended, postponed, or canceled, the cancellation of related pipeline laterals and even some long-haul transmission projects might be anticipated also.

The need for new import pipeline capacity from Canada also appears to have reached a temporary plateau. Since 2000, only 207 million cubic feet per day (MMcf/d) of new import pipeline capacity (Table 2) has been added (into the Western region) and a proposed 163 MMcf/d import capacity expansion to the Western region was recently canceled. Moreover, no additional new projects have been proposed to increase import capacity from Canada into the Midwest or Central regions through 2005. Import capacity development into the Northeast region, however, is a potential exception to the trend. Six import expansion proposals have been announced, with a combined increase of 2,109 MMcf/d of capacity through 2005. For the most part, this new capacity is slated to support new and proposed gas-fired power plants in the Boston and New York metropolitan areas

## Overview/Trends

**Five major new natural gas pipeline systems were completed and placed in operation during 2002** (Figure 2). They were: Gulfstream Pipeline, 1,130 MMcf/d–560 miles, which carries natural gas under the Gulf of Mexico from gas-processing facilities located on the gulf coasts of the States of Mississippi and Alabama to west central Florida; North Baja Pipeline, 500 MMcf/d–80 miles (in U.S.), which exports gas to electric power plants located in Baja California, Mexico; Questar Southern Trails Pipeline, 87 MMcf/d–405 miles, which transports gas from the four-corners area of New Mexico/Utah (San Juan Basin) to the California/Arizona border area; and the Guardian, 750 MMcf/d–142 miles, and Horizon, 380 MMcf/d–29 miles, pipelines, which expanded the flow of gas supplies between the Chicago (Illinois) hub and the growing market of northern Illinois and southern Wisconsin. Completion of

<sup>1</sup> Energy Information Administration, *Natural Gas Annual 2001*, DOE/EIA-0131(01) (Washington, DC, February 2003), Table 1. Through October 2002, year-to-date natural gas consumption in the United States continued to decline, relative to 2001, falling from 17.3 Bcf through October 2001 to 16.6 Bcf in 2002. Energy Information Administration, *Natural Gas Monthly*, DOE/EIA-0130(2003/01) (Washington, DC, January 2003), Table 3.

<sup>2</sup> All known inter- and intrastate gas pipeline projects (including large gathering headers and delivery laterals) that have added, or may add, substantial new capacity to the national pipeline grid are included in this review.

<sup>3</sup> Energy Information Administration, *Natural Gas Monthly*, “Status of Natural Gas Pipeline System Capacity Entering the 2000–2001 Heating Season,” DOE/EIA-0130(2000/10) (Washington, DC, October 2000), Figure SR4.

## Gas Pipeline Capacity Development

The need for new or additional pipeline capacity to satisfy a growing demand for natural gas can be met in several ways: build an entirely new pipeline; convert an oil or product pipeline; or expand an existing natural gas pipeline system. Building an entirely new pipeline involves many more cost factors than the latter two methods; new rights of ways must be acquired, new compressor stations must be built, and an extensive new receipt, delivery and interconnect infrastructure must be incorporated.

Expanding or converting an existing system, on the other hand, is less expensive since it only involves modifying or adding to a portion of a pipeline system, such as laying a new parallel pipeline (looping), replacing old pipe with larger diameter pipe, adding a new compressor station/unit, or upgrading an existing compressor station/unit. Constructing an extension from the terminus of an existing pipeline system, or constructing a large lateral to, or from, an existing mainline system, will reflect characteristics of both an expansion and new pipeline project. Usually, while no new compressor stations may be required, routing has to be optimized and rights-of-way have to be acquired. Moreover, when a large lateral/extension is constructed, the mainline pipeline itself may have to be expanded, perhaps as far back as the original source of supply.

Because each pipeline project has its own unique profile, it is difficult to develop a comparison of pipeline capacity development based on any combined measures of cost, mileage, and capacity. Indeed, most pipeline projects are a mix of development/expansion methods. Nevertheless, for purposes of this review, the daily design throughput is used as a common unit of measure.

This report examines existing and proposed gas pipeline capacity at three distinct levels: (1) interregional flow capacity, (2) systemwide design day deliverability of individual pipelines; and (3) the amount of new capacity added through new pipeline construction or expansion of existing systems. Interregional capacity represents an EIA estimate of the design throughput capability of pipelines at regional border crossings, based on "System Flow Diagrams" filed annually with FERC by interstate pipeline companies. It provides an aggregate measure of the potential pipeline flow capability between regions and a historical view of how and where the interstate pipeline system has directed its growth. Systemwide capacity, which represents the system peak-day deliverability as reported to FERC annually by interstate pipeline companies, provides a snapshot of the individual pipeline capability when it is fully loaded. This measure, which may differ from the FERC certificated capacity of the pipeline, provides an overall measure of a pipeline system's capability, irrespective of regions served or the distances involved. New capacity added through individual new pipeline construction or expansion, on the other hand, which is the principal focus of this report, is examined singularly by project and in the aggregate by region. Because the design and capacity of a specific pipeline or expansion project might not alter the overall capacity of the full pipeline system or cross regional boundaries, their respective added capacities would not necessarily affect the systemwide or interregional measures. Rather, their additional capacity is more specific and has impact on local production or the pipeline's ability to deliver gas for shippers.

(For further information on pipeline deliverability measures, see the EIA report, *Deliverability on the Interstate Natural Gas Pipeline System*, DOE/EIA-0618(98) (Washington, DC, May 1998).

these five pipelines accounted for 22 percent of all new natural gas pipeline capacity installed in the United States in 2002 and 34 percent of the total new gas pipeline mileage.

**A number of major short-haul, though large-capacity, pipeline laterals were constructed** and placed in operation in 2002 (Table 2, Figure 1). Most of these pipeline segments were built to connect existing pipeline systems to new gas-fired electric power generation plants. Twelve such lines, totaling 303 miles, accounted for 3,280 MMcf/d, or 26 percent, of the total new natural gas pipeline capacity added to the network in 2002. An undetermined number of smaller pipeline laterals that were constructed to supply new gas-fired power plants were also placed in service in

2002. However, their interconnections with the existing natural gas pipeline system were nearby and the cost of their construction fell below the blanket certificate threshold (\$7.5 million)<sup>4</sup> for needing FERC or other regulatory approval for construction. Such projects are normally carried out under blanket certificate authority.<sup>5</sup>

<sup>4</sup> The monetary limit for blanket certificate coverage is adjusted annually by the Federal Energy Regulatory Commission (FERC) to account for inflation. In 2001, the limit was \$7.5 million.

<sup>5</sup> Blanket certification can be used for relatively small projects. A blanket certificate approves a series of similar actions in one authorization. For instance, construction of small additions to a pipeline may be authorized by a blanket certificate, provided the total cost does not exceed some threshold level and other eligibility criteria are met.

**Table 1. Recent and Proposed Natural Gas Pipeline Additions**

Region	Capacity Additions (Million cubic feet per day)														
	Completed in 2000			Completed in 2001			Completed in 2002			Scheduled for 2003			Scheduled for 2004/5		
	Additional Capacity	Estimated Cost (Million\$)	Miles	Additional Capacity	Estimated Cost (Million\$)	Miles	Additional Capacity	Estimated Cost (Million\$)	Miles	Additional Capacity	Estimated Cost (Million\$)	Miles	Additional Capacity	Estimated Cost (Million\$)	Miles
Central	853	86	243	1,429	319	384	1,876	234	340	1,260	148	361	1,615	375	1,195
Midwest	2,398	1,813	1,270	1,236	155	87	2,058	374	236	382	104	66	220	42	33
Northeast	345	39	26	2,163	371	191	1,500	611	189	2,715	804	275	2,901	1,863	911
Southeast	510	175	182	1,822	499	408	3,056	1,842	915	2,617	856	611	6,144	1,036	1,249
Southwest	1,400	161	234	2,157	204	316	882	331	145	3,285	364	544	2,275	97	282
Western	157	29	22	310	96	922	2,852	830	1,660	1,949	1,708	1,034	5,690	1,947	1,809
To Mexico/ Canada	1,320	31	20	145	32	84	624	148	86	729	42	20	94	95	47
<b>U.S. Total</b>	<b>6,983</b>	<b>2,334</b>	<b>1,998</b>	<b>9,262</b>	<b>1,677</b>	<b>2,391</b>	<b>12,848</b>	<b>4,370</b>	<b>3,571</b>	<b>12,937</b>	<b>4,026</b>	<b>2,911</b>	<b>18,939</b>	<b>5,455</b>	<b>5,526</b>

Note: Excludes projects on hold as of November 2002. 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.

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

**Ten major pipeline project proposals were canceled during the year.** The canceled projects, representing 4,827 MMcf/d of potential capacity and 1,450 miles of pipeline, initially were scheduled to be placed in service between 2002 and 2004. In most instances, changed market conditions were cited by the project sponsors as the reason for the cancellations.<sup>6</sup> The most prominent of those canceled was the Independence Pipeline project (1,000 MMcf/d–400 miles), and the associated ANR Supply Link project (750 MMcf/d–73 miles), which would have created a new transportation corridor from the Chicago, Illinois, area to eastern Pennsylvania (Leidy area). Although finally approved by FERC in 2000 (initially filed in 1996), the Independence project was dropped by its sponsor, with a lack of current and future market support cited as a reason.

**The Southeast and Western regions had the largest increase in natural gas pipeline capacity in 2002.** The installation of the Gulfstream Pipeline system and the completion of a 478 MMcf/d expansion of the Florida Gas Transmission system in the Southeast contributed to making that region the leader in new natural gas pipeline capacity (3,056 MMcf/d), added miles of pipe (915), and total expenditures (\$1.8 billion) (Table 2). Yet, the rapid installation of new pipeline capacity in the Western region, in response to the 2000–2001 energy crisis in that region, resulted in new capacity additions of 2,852 MMcf/d, closely approximating those seen in the Southeast region. However, expenditures were less than half that of the Southeast region, \$0.8 billion, primarily because 5 of the 12 completed projects were short-haul laterals that supported

new gas-fired electric power plants, and 4 were relatively less expensive compression or looping projects

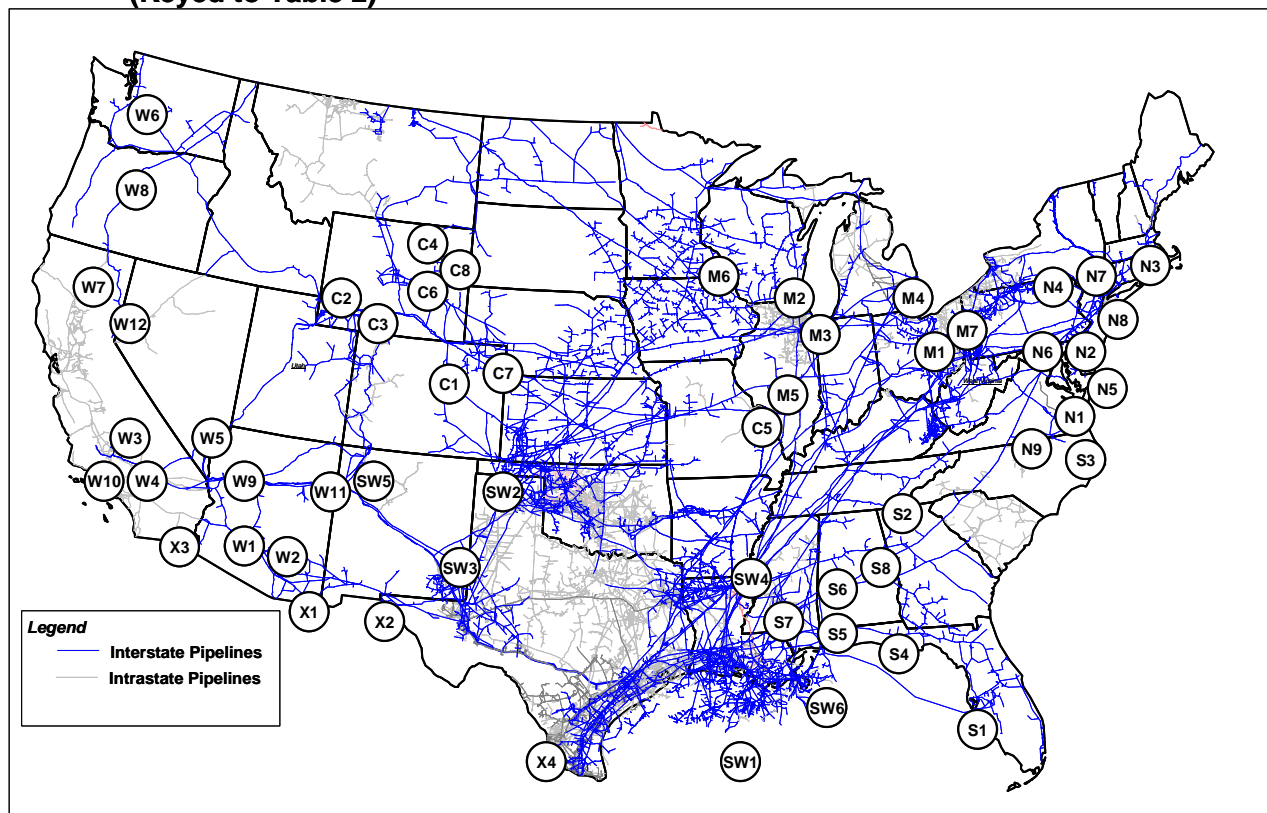
**The Southwest region had the smallest amount of added capacity because of a temporary drop in deepwater pipeline development in the Gulf of Mexico.** In 2002, the Southwest region saw a 59-percent decrease in added capacity, 882 MMcf/d versus 2,157 MMcf/d in 2001, following several years of expansion activity (Table 1). Another reason for the low growth level was the relative small size and number of completed onshore expansion projects, owing to slower growth in both regional gas production and regional gas demand.

**Major transfers of pipeline assets occurred in 2002** as the financial problems of many parent companies of natural gas pipeline companies deepened. Several of them found it necessary to sell natural gas pipeline assets that they had purchased over the past decade as part of efforts to build a national or regional transportation network in support of trading operations (Table 3).<sup>7</sup> For example, The Williams Companies, Inc., sold its Kern River Transmission System (a key transporter of Wyoming natural gas to California) to MidAmerican Energy Holdings, Inc. The Williams Companies also sold its Williams Gas Pipeline Central Company (a major regional pipeline system with operations in Kansas, Missouri, Oklahoma) to Southern Star Central Corporation, and its Cove Point LNG facilities and pipeline to Dominion Resources, Inc. Financial difficulties also forced Dynegy Inc. to sell the Northern Natural Gas Pipeline (which it had acquired from bankrupt Enron Corporation in 2001) to MidAmerican Energy Holdings Company.

<sup>6</sup> The recent downgrading of credit ratings of a number of pipeline parent companies or sponsors may have been a factor as well. The dramatic fall in the stock prices of many energy companies and the lowering of their bond-ratings by the S&P and other bond-rating services have made it harder for some pipeline companies to raise the capital for pipeline expansions.

<sup>7</sup> Natural Gas Intelligence Press, *The Weekly Gas Market Newsletter*, "Williams Ensures Liquidity with \$3.4B Deals, Sacrificing Heavy-Duty Assets" (August 5, 2002).

**Figure 1. Natural Gas Pipeline Projects Completed in 2002 with Approximate Locations (Keyed to Table 2)**



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

## Growth in the National Network

At the close of 2002, the 85 companies that make up the U.S. interstate natural gas mainline transportation network operated about 212,000 miles of pipeline and had the capability to deliver more than 133 Bcf/d of gas (Table 3).<sup>8</sup> This represented a 2-percent increase in mileage from the 2001 level and an 11-percent increase in interstate pipeline capacity.

Compared with 2001, the installation of new natural gas pipeline capacity was up 39 percent, with construction expenditures up 161 percent (Table 1). In part, this sizeable expansion reflected the quick industry response to the energy crises in the Western region in late 2000 and early 2001, and the growing demand for additional natural gas service in the Southeast region. In 2002, more new natural gas pipeline capacity was added to the Western regional network than had been installed during any one year of the previous decade, as the region's interstate pipeline companies increased their capabilities to deliver gas to California. In addition, the two major California intrastate pipelines increased their capability to receive gas from the

interstate system and to deliver that gas to their respective service territories.

Interstate natural gas pipeline capacity into California has increased by 10 percent since 2000, much of it added in 2002 (Figure 3, Table 2). Among the 2002 projects contributing to this growth were a 207 MMcf/d expansion of the PG&E Gas Transmission–Northwest pipeline between California and Canada and a 230 MMcf/d expansion of the El Paso Natural Gas Company's South System in New Mexico and Arizona (Table 2).

Gas pipeline capacity from Wyoming's Power River Basin and other areas in the State increased by 19 percent between 2000 and 2002 (Figure 3). One of the most important expansion projects completed during 2002 in the Central region was the 324 MMcf/d expansion of the Trailblazer Pipeline system (from 522 MMcf/d previously). With the completion of this project (Table 2), gas transportation between northeastern Colorado and interconnections with major interstate pipelines in eastern Nebraska<sup>9</sup> increased significantly. The addition of this new capacity has provided an outlet for increased gas production flowing from the several major new gas gathering systems and laterals built within the coalbed methane producing basins

<sup>8</sup> Interstate pipeline companies file an annual capacity report (18 CFR §284.12) with the Federal Energy Regulatory Commission (FERC) that reports their daily system capacity based on a design estimate of how much their system can deliver for current shippers on a systemwide peak day. Total capacity on these systems usually represents the sum of capacity at all delivery points, including interconnections with other interstate pipelines.

<sup>9</sup> These interconnections provide Trailblazer Pipeline shippers with access to Midwest markets.

**Table 2. Natural Gas Pipeline Construction Projects Completed in 2002**

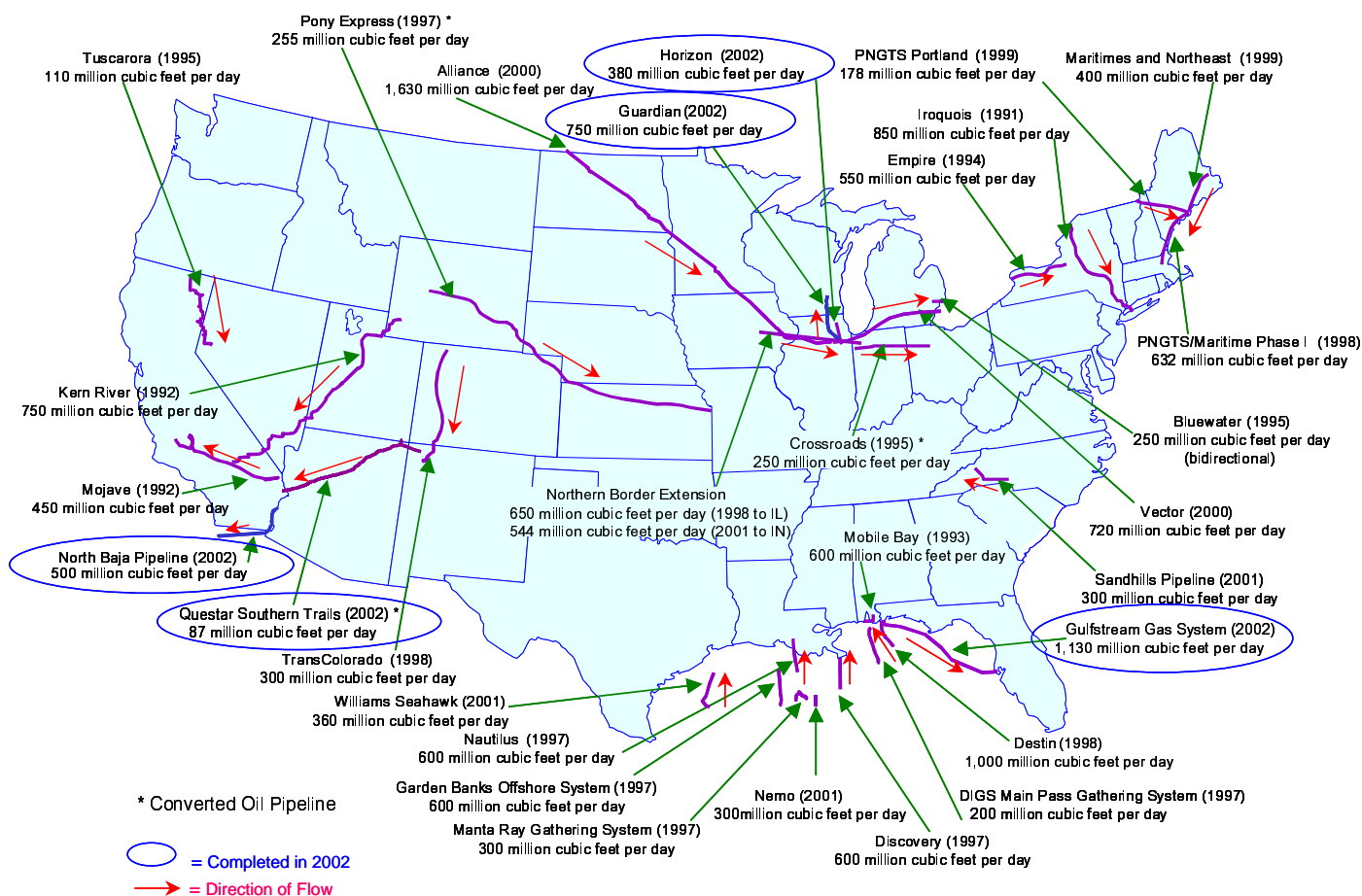
Ending Region & State	Begins in State -- Region	Map Key	Pipeline/Project Name	FERC Docket Number	In Service Date	New or Expansion Project	Estimated Cost (Million\$)	Miles	Additional Capacity (MMcf/d)
<b>Central</b>									
CO	CO Central	C1	CIG Valley Line Expansion	CP01-45	1-Nov-02	EXP	72	119	282
WY	WY Central	C2	Rimrock Pipeline Expansion	Non-Interstate	23-Apr-02	EXP	17	50	350
WY	WY Central	C3	Jonah Opal Loop Project	Non-Interstate	15-Jan-02	EXP	0	50	400
WY	WY Central	C4	Jonah Pinedale Expansion	Non-Interstate	1-Nov-02	EXP	45	43	200
MO	IL Midwest	<b>C5</b>	<b>Missouri Interstate Gas Pipeline</b>	<b>CP02-399</b>	<b>1-Nov-02</b>	<b>NEW</b>	<b>13</b>	<b>7</b>	<b>20</b>
WY	WY Central	C6	Rendezvous Gathering Pipeline	Non-Interstate	01-Jun-02	EXP	16	39	275
NE	CO Central	C7	Trailblazer 2002 System Expansion	CP01-54	10-May-02	EXP	59	0	324
WY	WY Central	C8	WFS Merna Trench Line	Non-Interstate	01-Nov-02	NEW	13	32	25
						<b>Total</b>	<b>234</b>	<b>340</b>	<b>1,876</b>
<b>Mexico</b>									
MX	AZ Western	X1	EP Ductos De Nogales Project	CP01-41	26-Feb-02	NEW	0	1	9
MX	TX Southwest	X2	EP Samalayuca Expansion	CP93-253-004	01-Jun-02	EXP	0	0	100
MX	AZ Western	X3	North Baja Pipeline (US Portion)	CP22/24/25	01-Oct-02	NEW	146	80	500
MX	TX Southwest	X4	Tidelands Eagle Pass Export Crossing	CP02-67	1-Nov-02	NEW	2	5	15
						<b>Total</b>	<b>148</b>	<b>86</b>	<b>624</b>
<b>Midwest</b>									
OH	OH Midwest	M1	Columbia Gas Ohio 2002 Expansion	CP01-70	01-Jul-02	EXP	11	0	140
WI	IL Midwest	M2	Guardian Pipeline Project	CP00-36	1-Nov-02	NEW	238	142	750
IL	IL Midwest	M3	Horizon Pipeline Project	CP00-129	10-May-02	NEW	75	29	380
MI	MI Midwest	M4	MichCon Renaissance Lateral	Non-Interstate	31-Jan-02	NEW	0	9	110
IL	IL Midwest	M5	NGPL East St Louis Extension	CP02-289	1-Nov-02	EXP	35	47	300
IA	MN Central	<b>M6</b>	<b>NNG Beatrice Station Expansion</b>	<b>CP02-139</b>	<b>1-Nov-02</b>	<b>EXP</b>	<b>0</b>	<b>0</b>	<b>90</b>
OH	OH Midwest	M7	TETCO Hanging Rock Lateral	CP02-45	1-Nov-02	EXP	15	10	289
						<b>Total</b>	<b>374</b>	<b>236</b>	<b>2,058</b>
<b>Northeast</b>									
VA	VA Northeast	N1	Dominion Resources Possum Point Lateral	Non-Interstate	01-Nov-02	NEW	22	14	300
DE	PA Northeast	N2	Eastern Shore Pipeline 2002 Expansion	CP02-76	1-Nov-02	EXP	3	3	5
RI	RI Northeast	N3	Tenneco Rhode Island Lateral Expansion	CP01-404	01-Sep-02	EXP	14	0	100
PA	NY Northeast	N4	Tenneco Stagecoach Lateral	CP00-65	23-Jun-02	NEW	87	24	487
NJ	NJ Northeast	N5	TETCO Freehold Lateral	CP02-17	1-Nov-02	EXP	28	13	25
NJ	WV Northeast	N6	TETCO TIME Expansion	CP02-32	1-Nov-02	EXP	75	36	100
NY	PA Northeast	N7	Transco Leidy East Expansion	CP01-389	1-Nov-02	EXP	128	31	126
NY	NJ Northeast	N8	Transco MarketLink Phase II	CP98-540	1-Nov-02	EXP	120	30	127
VA	LA Southwest	<b>N9</b>	<b>Transco Sundance Expansion</b>	<b>CP00-165</b>	<b>01-May-02</b>	<b>EXP</b>	<b>135</b>	<b>38</b>	<b>230</b>
						<b>Total</b>	<b>611</b>	<b>189</b>	<b>1,500</b>
<b>Southeast</b>									
FL	MS Southeast	S1	Gulfstream Pipeline Phase 1	CP00-06	15-Jun-02	NEW	1,257	560	1,130
GA	TN Southeast	S2	East Tennessee Pipeline Murray Project	CP01-80	01-Sep-02	EXP	69	27	160
NC	NC Southeast	S3	Eastern North Carolina Gas System	Non-Interstate	01-Aug-02	NEW	12	72	72
FL	MS Southeast	S4	FGT Phase V Stages 1-2-3	CP00-40	01-Dec-02	EXP	333	79	478
AL	AL Southeast	S5	Gulf South Pipeline/Gulfstream Interconnect	CP02-407	1-Nov-02	EXP	0	29	236
AL	AL Southeast	S6	MidCoast Decatur Power Lateral	Non-Interstate	1-Nov-02	NEW	23	50	160
MS	MS Southeast	S7	Petal Gas Storage Extension	CP01-69	01-Jul-02	EXP	94	59	680
GA	MS Southeast	S8	SONAT South System Expansion I Phase 1	CP00-233	01-Jun-02	EXP	54	39	140
						<b>Total</b>	<b>1,842</b>	<b>915</b>	<b>3,056</b>
<b>Southwest</b>									
GM	GM Offshore	SW1	Canyon Express Pipeline	Non-Interstate	15-Jul-02	NEW	300	55	500
OK	CO Central	<b>SW2</b>	<b>CIG Raton Basin 2002 Expansion</b>	<b>CP02-6</b>	<b>1-Nov-02</b>	<b>EXP</b>	<b>22</b>	<b>54</b>	<b>47</b>
NM	NM Southwest	SW3	NGPL Indian Basin Expansion	CP00-122	31-Jan-02	EXP	1	0	60
AR	AR Southwest	SW4	CP Line J Expansion	CP02-80	1-Nov-02	EXP	8	0	105
NM	NM Southwest	SW5	Transwestern Bloomfield Station Expansion	CP02-134	01-Jun-02	EXP	0	0	10
GM	GM Offshore	SW6	Deepwater Trend Pipeline	Non-Interstate	1-Nov-02	NEW	0	37	160
						<b>Total</b>	<b>331</b>	<b>146</b>	<b>882</b>
<b>Western</b>									
CA	TX Southwest	<b>W1</b>	<b>EP Line 2000 Project</b>	<b>CP00-422</b>	<b>1-Nov-02</b>	<b>EXP</b>	<b>204</b>	<b>1,088</b>	<b>230</b>
AZ	AZ Western	W2	EP Pinnacle West Lateral	CP01-90	01-Jul-02	NEW	6	6	620
CA	CA Western	W3	KRT High Desert Lateral	CP01-405	01-Sep-02	EXP	29	32	275
CA	CA Western	W4	KRT Kramer Junction Interconnect	CP02-15	01-Apr-02	EXP	2	0	500
NV	NV Western	W5	KRT Moapa Lateral	CP01-380	1-Nov-02	NEW	4	4	219
WA	WA Western	W6	Northwest Pipeline Gray Harbor Lateral	CP01-361	1-Nov-02	NEW	75	49	160
CA	CA Western	W7	Pacific Gas & Electric Redwood Path	Non-Interstate	01-Oct-02	EXP	40	14	180
CA	BC Canada	<b>W8</b>	<b>PG&amp;E-NW 2002 Expansion</b>	<b>CP01-141</b>	<b>1-Nov-02</b>	<b>EXP</b>	<b>121</b>	<b>21</b>	<b>207</b>
CA	NM Southwest	<b>W9</b>	<b>Questar Southern Trails Pipeline</b>	<b>CP99-163</b>	<b>01-Jul-02</b>	<b>NEW</b>	<b>100</b>	<b>405</b>	<b>87</b>
CA	CA Western	W10	SoCal Adelanto Lateral	Non-Interstate	01-Feb-02	NEW	40	32	200
CA	NM Western	W11	Transwestern Red Rock Expansion	CP01-115	17-Jun-02	EXP	93	0	120
NV	OR Western	W12	Tuscarora System Expansion Phase I	CP01-153	1-Nov-02	EXP	36	11	54
						<b>Total</b>	<b>750</b>	<b>1,661</b>	<b>2,852</b>
<b>Total US</b>							<b>4,290</b>	<b>3,571</b>	<b>12,848</b>

CP=CenterPoint Energy Gas Transmission Company, CIG = Colorado Interstate Pipeline Company, EP = El Paso Natural Gas Company, FGT = Florida Gas Transmission Company, KRT = Kern River Gas Transmission Company, NGPL = Natural Gas Pipeline Company of America, NNG = Northern Natural Gas Company, NBP = Northern Border Pipeline, SoCal=Southern California Gas Company, SONAT = Southern Natural Gas Company, PG&E-NW=PG&E Gas Transmission-NW, Tenneco=Tennessee Gas Pipeline Company, TETCO=Texas Eastern Transmission Company, Transco = Transcontinental Gas Pipeline Company, WBP = Williston Basin Interstate Pipeline, WFS = Williams Field Services.

Note: Interregional projects are in **bold print**. Excludes projects on hold as of November 2002. 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.

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

**Figure 2. Major New U.S. Natural Gas Pipeline Systems, 1990 - 2002**



Note: Routes are only approximations.

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

of Wyoming in the past several years.<sup>10</sup> Despite this capacity increase, many market analysts believe that even more interstate pipeline capacity is required to utilize completely the productive capacity of the producing fields in the Rocky Mountain area.<sup>11</sup>

## Interregional Growth Capacity

Of the more than 50 natural gas pipeline projects completed in 2002, most were short-haul in nature. Only 11 projects (Table 2) increased pipeline capacity across regional boundaries (Figure 4). Most of the interregional increase occurred on interstate pipeline systems transporting gas

from the Southwest region to other regions: 317 MMcf/d to the Western region, 230 MMcf/d to the Northeast (via the Southeast) region, and 115 MMcf/d to Mexico. Additions to interregional capacity in 2002 amounted to only 1,535 MMcf/d overall, the smallest annual level in 10 years.

The largest amount of interregional transport capacity remains with the 13 interstate pipeline systems transporting gas from the Southwest region to the Southeast region, 22,001 MMcf/d, while the second largest is on eight interstate pipeline systems operating between the Central region and the Midwest region, 15,187 MMcf/d (Table 4). The sizable growth in the latter – it was 11,728 MMcf/d in 1998 – reflects the large amount of new pipeline capacity from Canada added over the past several years, as represented by the new Alliance Pipeline and the several expansions of the Northern Border system between Montana and Illinois.

<sup>10</sup> These gathering system laterals connect the expanding Wyoming production areas with the pipeline systems that serve the area: Kern River Gas Transmission Pipeline, Questar Pipeline, Northwest Pipeline, Wyoming Interstate Pipeline, and Colorado Interstate Gas Pipeline. The latter two systems interconnect with the Trailblazer system, while the others serve markets in Utah and the Western region.

<sup>11</sup> Energy Information Administration, *Natural Gas Productive Capacity for the Lower 48 States 1985-2003*, web site [www.eia.doe.gov/pub/oil\\_gas/natural\\_gas/analysis\\_publications/ngcap2003/ngcap2003.html](http://www.eia.doe.gov/pub/oil_gas/natural_gas/analysis_publications/ngcap2003/ngcap2003.html) (March 31, 2003).

**Table 3. Interstate Natural Gas Pipeline Companies and Their Parent Companies, 2002**

Pipeline Name	Parent Company	Previous Owner -- (Year of Sale)	Principal Market	System Capacity <sup>a</sup> (MMcf/d)	System Mileage
Algonquin Gas Transmission Co	Duke Energy Inc		Northeast	2,154	1,073
Alliance Pipeline Co	Alliance Pipeline LP		Midwest	1,767	887 US
ANR Pipeline Co	El Paso Corp	Coastal Corp (2000)	Midwest	6,667	10,600
ANR Storage Co	El Paso Corp	Coastal Corp (2000)	Midwest	na	24
Black Marlin Pipeline Co	Williams Field Services Inc	Blue Dolphin Energy et al (2001)	Southwest	200	75
Blue Dolphin Pipeline Co	Blue Dolphin Energy Corp	Shell Energy Corp (1999)	Southwest	235	121
Canyon Creek Compression Co	Kinder Morgan Corp		Central	245	1
Carnegie Natural Gas Co	Equitable Resources Inc		Northeast	40	670
CenterPoint Energy Gas Trans Co	CenterPoint Energy Corp	(formerly Reliant Gas Trans Co)	Southwest	2,797	6,228
Centra Pipelines Minnesota	Centra Pipelines Minnesota Inc		Midwest	63	66
Chandeleur Pipeline Co	Chevron USA		Southeast	321	172
Colorado Interstate Gas Co	El Paso Corp	Coastal Corp (2000)	Southwest	2,612	4,535
Columbia Gas Transmission Corp	NiSource Corp	Columbia Energy Group (2000)	Northeast	7,276	11,215
Columbia Gulf Transmission Co	NiSource Corp	Columbia Energy Group (2000)	Southeast	2,602	4,237
Cove Point LNG LP	Dominion Resources Inc	Williams Companies (2002)	Northeast	1,000	90
Crossroads Pipeline Co	NiSource Corp		Midwest	250	205
Destin Pipeline Co	Destin Pipeline LLC		Southeast	1,200	263
Discovery Pipeline Co	Discovery Producers Services LLC	Texaco/Chevron sold 33% 2002	Southwest	600	221
Dominion Transmission Co	Dominion Resources Inc	CNG Transmission (1999)	Northeast	6,275	10,000
East Tennessee Natural Gas Co	Duke Energy Inc	El Paso Energy Co (2000)	Northeast	738	1,143
Eastern Shore Natural Gas Co	Chesapeake Utilities Inc		Northeast	111	284
El Paso Natural Gas Co	El Paso Corp		Western	4,882	10,200
Enbridge Pipeline (UTOS)	Enbridge Inc	KN Energy Corp (2001)	Southwest	1,200	30
Enbridge Pipelines (AlaTenn)	Enbridge Inc	Midcoast Energy Corp (2002)	Southeast	200	281
Enbridge Pipelines (KPC)	Enbridge Inc		Central	155	1,120
Enbridge Pipelines (Midla)	Enbridge Inc	Enron Corp (2002)	Southwest	198	405
Equitrans Inc	Equitable Resources Inc		Northeast	822	513
Florida Gas Transmission Co	Citrus Corp		Southeast	1,742	5,342
Granite State Gas Transmission Co	NiSource Corp	Granite State Gas (2000)	Northeast	150	43
Great Lakes Gas Transmission Ltd	Great Lakes Gas Transmission LP		Midwest	2,895	2,115
Guardian Pipeline Co	Guardian Pipeline LLC		Midwest	750	142
Gulf South Pipeline Co	Gulf South Pipeline Company LP		Southeast	3,782	7,278
Gulf States Pipeline System	El Paso Corp.		Southwest	100	175
Gulfstream Natural Gas System	Gulfstream Pipeline Co LLC		Southeast	1,130	444
High Island Offshore System	El Paso Energy Partners LP	KN Energy et al (2001)	Southwest	1,800	204
Horizon Pipeline Co	Horizon Pipeline Co LLC		Midwest	380	95
Iroquois Pipeline Co	Iroquois Pipeline Operating Co		Northeast	850	375
Kern River Gas Transmission Co	MidAmerican Energy Holdings Co	Williams Companies (2002)	Western	898	922
Kinder Morgan Interstate Gas Co	Kinder Morgan, Inc Corp	KN Energy Corp (2000)	Southwest	1,075	6,018
Maritimes & Northeast Pipeline Co	Maritimes & Northeast Pipeline LLC		Northeast	440	304 US
Michcon Gas Co	DTE Energy Corp		Midwest	na	1,502
Michigan Gas Storage Co	CMS Energy Corp		Midwest	na	530
Midwestern Gas Transmission Co	Northern Border Partners LP	El Paso Energy Co (2001)	Midwest	748	359
MIGC Pipeline Co	Western Gas Resources Inc		Central	130	75
Mississippi Canyon Gathering System	Shell Gas Transmission LLC		Offshore	800	45
Mississippi River Transmission Corp	CenterPoint Energy Corp		Midwest	1,670	1,976
Mojave Pipeline Co	El Paso Corp		Western	400	400
National Fuel Gas Supply Co	National Fuel Gas Co		Northeast	2,168	1,613
Natural Gas Pipeline Co of America	Kinder Morgan Corp		Midwest	5,001	10,076
Nautilus Pipeline Co	Nautilus Pipeline Co LLC	El Paso Energy (2001)	Southwest	600	101
Northern Border Pipeline Co	Northern Border Partners LP		Midwest	3,094	1,248
Northern Natural Gas Co	MidAmerican Energy Holdings Co	Dynegy(2002)-Enron Corp (2001)	Midwest	3,904	15,671
Northwest Pipeline Corp	The Williams Companies Inc		Western	2,900	3,932
NorthWestern Energy	NorthWestern Corporation	Montana Power (2001)	Central	na	2,819
Overthrust Pipeline Co	Questar Corp		Central	227	88
Ozark Gas Transmission LLC	Enogex Energy\Southwest Energy	Ozark Gas Transmission (2001)	Southwest	330	749
Paiute Pipeline Co	Southwest Gas Corp		Western	160	816
Panhandle Eastern PL Co	Southern Union Co	CMS Energy(2003)/Duke Energy(1999)	Midwest	2,765	6,467
Penn York Energy Corp	Penn York Energy Corp		Northeast	na	14
PG&E Transmission Co - Northwest	Pacific Gas & Electric Co		Western	2,700	1,336
Portland Natural Gas Transmission Co	Portland Natural Gas Trans (PNGTS)		Northeast	178	296
Questar Pipeline Co	Questar Corp		Central	1,945	1,808
Sea Robin Pipeline Co	CMS Energy Corp		Southwest	1,038	470
Sabine Pipeline Co	Texaco Inc		Southwest	1,380	189



**Table 3. Interstate Natural Gas Pipeline Companies and Their Parent Companies, 2002 (Continued)**

Pipeline Name	Parent Company	Previous Owner -- (Year of Sale)	Principal Market	System Capacity <sup>a</sup> (MMcf/d)	System Mileage
South Georgia Natural Gas Co	El Paso Corp	Sonat Inc (1999)	Southeast	146	903
Southern Natural Gas Co	El Paso Corp	Sonat Inc (1999)	Southeast	2,834	8,200
Southern Star Central Gas Pipeline Co	Southern Star Central Corp (AIG)	Williams Companies (2002)	Central	2,143	5,611
St Lawrence Gas Co	Enbridge Inc		Northeast	62	134
Stingray Pipeline Co	Starfish Pipeline Co LLC	El Paso Energy (2001)	Southwest	1,132	417
Tennessee Gas Pipeline Co	El Paso Corp		Northeast	7,271	14,761
Texas Eastern Transmission Corp	Duke Energy Inc	PanEnergy Corp (1998)	Northeast	6,438	12,118
Texas Gas Transmission Co	The Williams Companies Inc		Southwest	2,800	5,926
Trailblazer Pipeline Co	Kinder Morgan LP	MidCon Corp et al (2000)	Central	522	436
TransColorado Gas Transmission Co	Transcolorado Gas Transmission LP	Questar Corp sold 50% stake (2002)	Southwest	300	295
Transcontinental Gas PL Co	The Williams Companies Inc		Northeast	7,362	10,636
Trans-Union Pipeline Co	Panda Energy International Inc		Southwest	427	41
Transwestern Pipeline Co	Enron Corp		Western	2,836	2,532
Trunkline Gas Co	Southern Union Co	CMS Energy (2003)/Duke Energy (1999)	Midwest	1,884	4,134
Tuscarora Gas Transmission Co	Tuscarora Gas Transmission Co		Western	120	245
USG Pipeline Co	United States Gypsum Co		Southeast	21	15
Vector Pipeline Co	Vector Pipeline LLP		Canada	1,010	348 US
Vermont Gas System Inc	Gaz Metropolitan Ltd		Northeast	49	165
Viking Gas Transmission Co	Xcel Energy Corp	Northern States Power (2000)	Midwest	543	667
Williston Basin Interstate PL Co	MDU Resources Group Inc		Central	540	3,129
Wyoming Interstate Co	El Paso Corp	Coastal Corp (2000)	Central	1,850	580
			Total	133,030	211,989

<sup>a</sup> Based on system peak day capacity or coincidental peak day deliveries occurring during the months of November through February of the 2001-2002 heating season and reported to the Federal Energy Regulatory Commission (FERC) by interstate pipeline companies in March 2002. This value may not always be the same as the FERC certificated system capacity.

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

Source: **Ownership/mileage:** Energy Information Administration, GasTran Gas Transportation Information System, Natural Gas Pipeline Profile Database;

**System Capacity:** Federal Energy Regulatory Commission (FERC), Annual Peak Day Capacity Report 18 CFR 284.13(d)(2).

## Central Region (Including Rocky Mountain Area) Expansions

While a significant amount of gas pipeline capacity has been built in the Central region over the past several years, the expanding production in the Wyoming/Utah coalbed methane and deep-gas fields has outpaced the installation of new interstate takeaway capacity in the region. The 2002 Trailblazer System expansion helped to alleviate the area's capacity constraint situation somewhat. However, capacity constraints in the area will likely continue until the completion of the Kern River Transmission system expansion (900 MMcf/d), which is scheduled for May 2003. This project will double the capability of the Kern River Transmission system to transport natural gas from Wyoming to California and Nevada.

Meanwhile, the apparent lack of adequate takeaway interstate capacity has created an oversupply problem relative to available pipeline capacity in the area. As a consequence, natural gas producers without contracts for reserved interstate pipeline capacity, or without access to the very limited interruptible capacity with one or more of the interstate pipelines in the area, have experienced lower prices (well below spot price levels found elsewhere in the United States and Canada) to move their production. The relative abundance of coalbed gas in this region also has contributed to the situation.

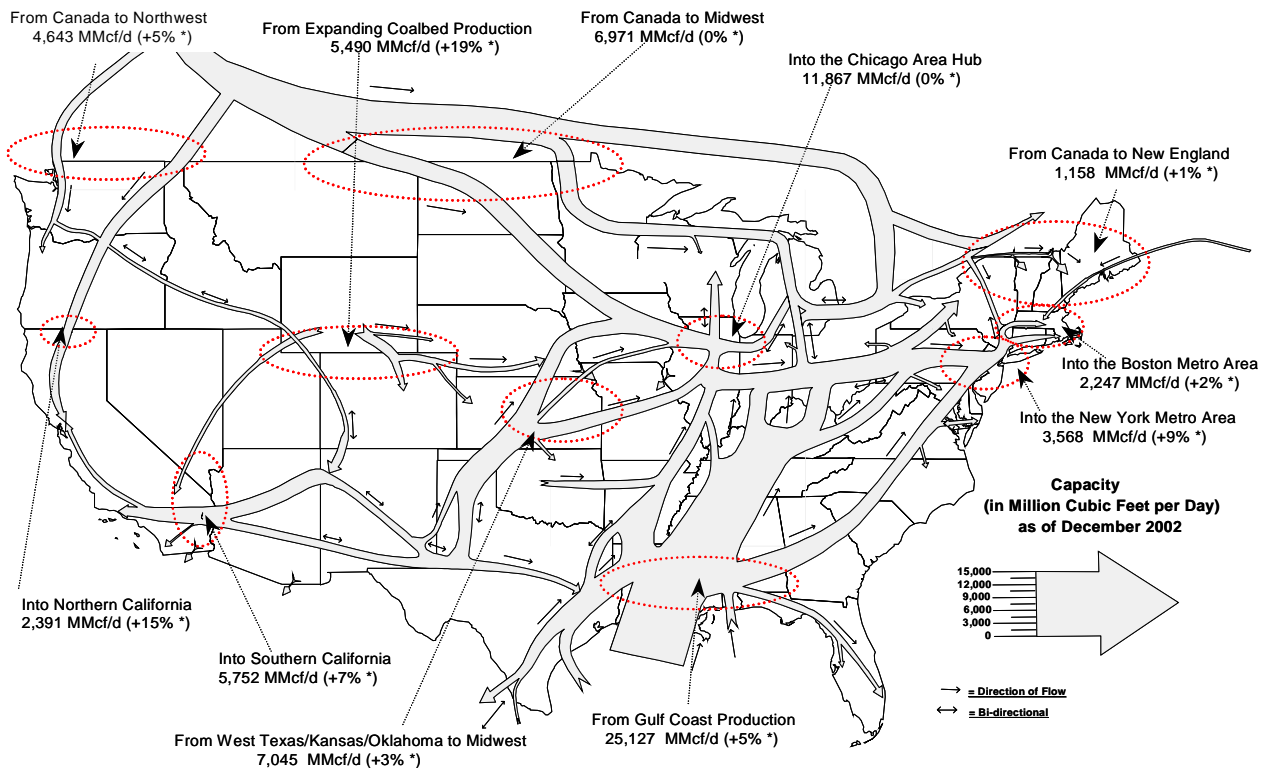
During 2002, seven of the eight pipeline projects completed in the Central region, representing 1,856 MMcf/d of new pipeline capacity, were in the Rocky Mountain area of the region (Table 2). Two of these, the Colorado Interstate Gas Company's Valley Line and Trailblazer System expansions, increased capacity on the interstate pipeline system, while five others added to the intrastate gas gathering pipeline infrastructure. The largest of these intrastate projects, the Jonah Opal Loop Project, added 400 MMcf/d to the existing pipeline that now connects the expanding Jonah field in southwest Wyoming with the Williams' Companies Opal Gas Processing plant (with access to the Northwest Pipeline and Kern River Transmission systems).

Interestingly, pipeline capacity from the North Texas and Oklahoma Panhandle areas into the Central region has increased by 3 percent since 2000 (Figure 3). But this new capacity was not directed to the Midwest region as it might have been in the past. A large portion of this new capacity has been directed into the Central region's St. Louis, Missouri, metropolitan area. Moreover, natural gas from increased coalbed methane development in southeast Colorado is being routed through Texas and Oklahoma to reach this growing market, in addition to serving new gas-fired power plants in the Southwest.<sup>12</sup>

<sup>12</sup> The Colorado Interstate Gas Company expanded (130 MMcf/d) its system in the Raton Basin of southeast Colorado in 2001 and 2002 to accommodate increased coalbed methane production in the area.



**Figure 3. Major Natural Gas Transportation Routes and Capacity Levels at Selected Key Locations, 2002**



\* Percent change since 2000.

Source: Energy Information Administration, GasTran Gas Transportation Information System, Natural Gas Pipeline State Border Capacity Database.

As of March 2003, 20 natural gas pipeline projects, representing 2,786 MMcf/d of potential new interstate gas pipeline capacity for Central region shippers, have been proposed or approved for installation between 2003 and 2005. Included among these 20 projects are four new pipeline systems,<sup>13</sup> each of which exceeds 200 miles in length and has a capacity of at least 120 MMcf/d. They will target markets in the Midwest with gas production coming from the coalbed methane and deep-gas fields located in Wyoming, Colorado, Utah, and Montana. In addition, another four large-scale pipeline projects<sup>14</sup> are slated to expand existing capacity by 1,975 MMcf/d between these fields and markets in the Western region.

In January 2003, Wyoming Interstate Gas Company announced its intention to build a 60-mile pipeline parallel to its existing system that would be capable of moving between 300 and 600 MMcf/d of coalbed methane gas

production from eastern Wyoming to western Wyoming to interconnect with Kern River Transmission and Questar pipelines. Installation of such a line would greatly enhance the flexibility of gas movements in the State and, for the first time, provide Western markets significant access to Powder River Basin supplies.

## Midwest Expansions

Interstate natural gas pipeline capacity into and out of the Midwest region has not increased significantly since 2000, when service began on the Alliance Pipeline (1,630 MMcf/d) between British Columbia, Canada, and Joliet, Illinois, and on the Vector Pipeline (720 MMcf/d) between Joliet, Illinois, and Ontario, Canada (Figure 2).

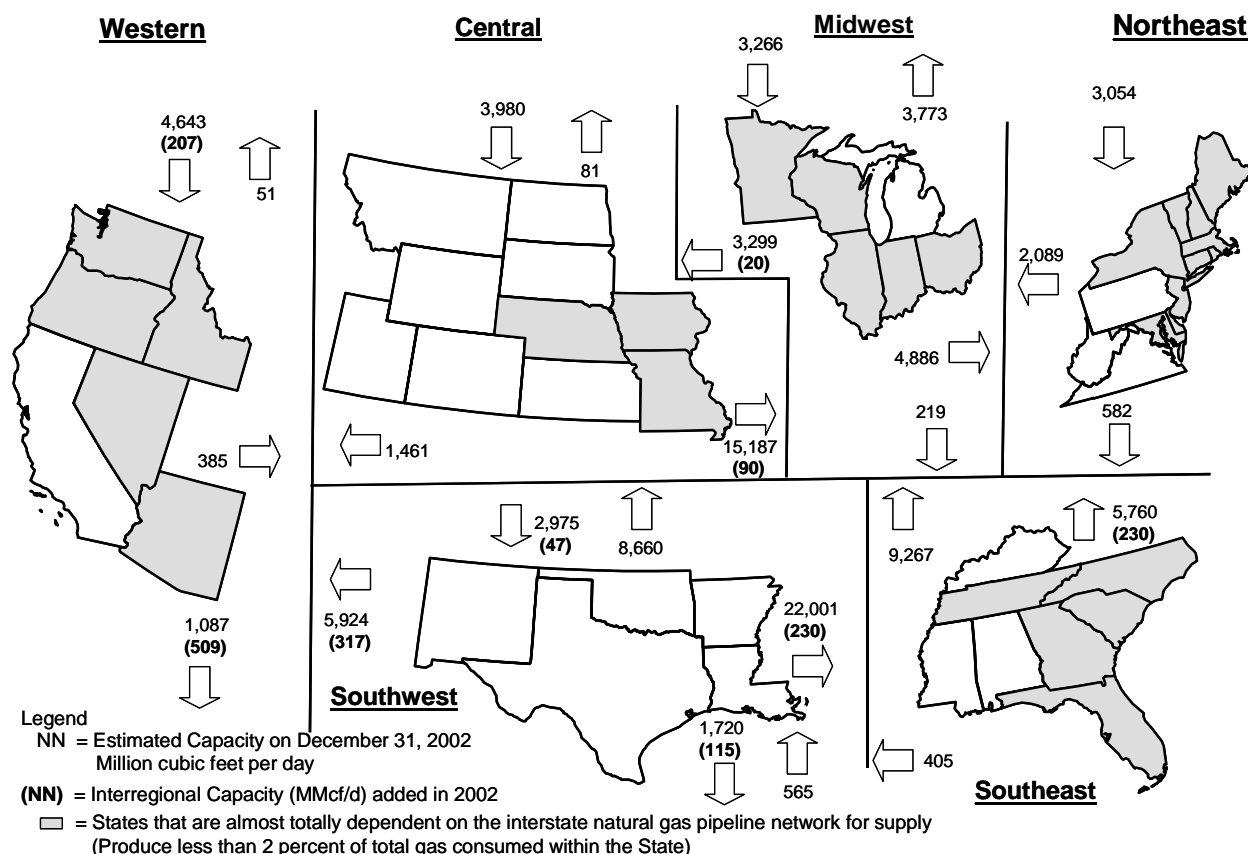
The emphasis in the region in recent years has been to direct additional capacity from the Chicago Hub to expanding markets within the region, particularly northeast Illinois and southern Wisconsin. Two new pipelines, the Horizon Pipeline (380 MMcf/d—29 miles), and the Guardian Pipeline (750 MMcf/d—142 miles), were installed in 2002 to serve these areas (Figure 2).

Another section of the Midwest region that experienced recent pipeline expansion, albeit not large, has been in the southwest Illinois area. In 2002, several projects were

<sup>13</sup> They are: the Colorado Interstate Gas Company's Cheyenne Plains Pipeline (500 MMcf/d—2005), Kinder Morgan Advantage Pipeline (330 MMcf/d—2004), Northern Border Pipeline's Bison Project (250 MMcf/d—2004), and Williston Basin Interstate Pipeline's Grasslands Project (180 MMcf/d—2004-05).

<sup>14</sup> They are: Kern River Gas Transmission's System Expansion (900 MMcf/d—2003), Northwest Pipeline Company's Rockies expansion (175 MMcf/d—2003), TransColorado Gas Transmission's Window Rock Lateral (150 MMcf/d—2005), and Kinder Morgan Interstate's Silver Canyon Pipeline (750 MMcf/d—2006).

**Figure 4. Region-to-Region Natural Gas Pipeline Capacity, 2002**



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

completed that expanded gas service in the East St. Louis, Illinois, and adjacent St. Louis, Missouri, area by 320 MMcf/d (Table 2). The steadily growing demand for natural gas in the St. Louis metropolitan area also has attracted several pipeline expansions originating from the west, including transportation of supply from as far as the Rocky Mountain area of Wyoming and Colorado.

In 2002, 2,058 MMcf/d of capacity was added within the Midwest region with the completion of seven gas pipeline projects (Table 2, Figure 1). In addition to the completion of the new Guardian and Horizon in northern Illinois, two new laterals, the MichCon Renaissance Line (110 MMcf/d) in central Michigan and the Texas Eastern Transmission Hanging Rock (289 MMcf/d) line in southeastern Ohio, were installed and now provide local service to several gas-fired electric generation plants.

For the short term (2003–2005), only five gas pipeline projects have been proposed for development in the region to date. No new expansions have been proposed within the region east of Chicago, Illinois. The five projects, totaling only 602 MMcf/d of new capacity (Table 1), are located in northern Illinois, southern Wisconsin, and southern Minnesota. All are either expansions to existing laterals or new laterals supplying new gas-fired electric generation

facilities. No new pipelines, or major expansions, have been announced so far. The ANR Pipeline Company's West Leg expansion proposal (of its Madison lateral), 220 MMcf/d, is the largest project of the group. The WeEnergy's Guardian lateral (38-mile–65 MMcf/d) is slated to be in service in the spring of 2003 and represents the final service interconnection for the Guardian Pipeline, completed in 2002 (Figure 2).

## Northeast Expansions

Natural gas pipeline capacity in the Northeast region has increased during the past two years with added capacity focused on serving the Boston and New York City metropolitan areas (Figure 3). Capacity into the New York City area increased by 9 percent between January 2001 and December 2002. While the increase into the Boston area during that time was only 2 percent, several projects are planned for 2003–2004, which would add an additional 1,245 MMcf/d to natural gas pipeline service in the area, a further 55-percent increase in capacity.

In 2002, nine gas pipeline expansion projects were completed in the Northeast region (Table 2, Figure 1). Combined, they added 1,500 MMcf/d to gas pipeline

**Table 4. Interregional Pipeline Capacity and Average Daily Flows, 1990, 1998, and 2001**

Receiving Region	Sending Region	Capacity (MMcf/d)			Percent Change in Capacity		Average Daily Flows (MMcf/d)			Percent Change in Average Daily Flow	
		1990	1998	2002	1990 to 1998	1998 to 2002	1990	1998	2001 (Latest Available)	1998 to 2001	1990 to 2001
<u>Canada</u>	Central	66	66	81	0	23	44	0	61	--	39
	Midwest	1,211	2,773	3,773	129	36	960	1,381	1,984	44	107
	Western	0	0	51	NA	NA	0	0	0	--	--
<b>Total U.S. to Canada</b>		<b>1,277</b>	<b>2,839</b>	<b>3,905</b>	<b>122</b>	<b>38</b>	<b>1,004</b>	<b>1,381</b>	<b>2,045</b>	<b>48</b>	<b>104</b>
<u>Mexico</u>	Southwest	354	1,090	1,720	208	58	74	163	165	1	123
	Western	45	70	1,087	56	1,452	5	17	96	465	1,820
<b>Total U.S. to Mexico</b>		<b>399</b>	<b>1,160</b>	<b>2,807</b>	<b>191</b>	<b>142</b>	<b>79</b>	<b>180</b>	<b>261</b>	<b>45</b>	<b>230</b>
<u>Central</u>	Canada	1,185	2,320	3,980	96	72	943	1,636	3,623	121	284
	Midwest	2,015	3,279	3,299	63	1	1,049	1,553	2,115	36	102
	Southwest	8,874	8,652	8,660	-3	0	4,136	4,201	3,904	-7	-6
	Western	250	298	385	19	29	196	85	0	-100	-100
<b>Total to Central Region</b>		<b>12,324</b>	<b>14,549</b>	<b>16,324</b>	<b>18</b>	<b>12</b>	<b>6,324</b>	<b>7,475</b>	<b>9,642</b>	<b>29</b>	<b>52</b>
<u>Midwest</u>	Canada	2,161	3,238	3,266	50	1	1,733	2,762	2,368	-14	37
	Central	9,013	11,728	15,187	30	29	5,733	6,719	10,380	54	81
	Northeast	2,053	2,089	2,089	2	0	728	608	684	13	-6
	Southeast	9,346	9,522	9,267	2	-3	6,133	5,911	6,021	2	-2
<b>Total to Midwest Region</b>		<b>22,573</b>	<b>26,577</b>	<b>29,809</b>	<b>18</b>	<b>12</b>	<b>14,327</b>	<b>16,000</b>	<b>19,453</b>	<b>22</b>	<b>36</b>
<u>Northeast</u>	Canada	467	2,431	3,054	421	26	309	1,893	2,094	11	578
	Midwest	4,583	4,887	4,886	7	0	3,474	3,055	3,451	13	-1
	Southeast	5,020	5,223	5,760	4	10	4,091	3,952	4,036	2	-1
<b>Total to Northeast Region</b>		<b>10,070</b>	<b>12,541</b>	<b>13,700</b>	<b>25</b>	<b>9</b>	<b>7,874</b>	<b>8,900</b>	<b>9,581</b>	<b>8</b>	<b>22</b>
<u>Southeast</u>	Midwest	219	219	219	0	0	0	0	36	--	--
	Northeast	113	582	582	415	0	62	13	13	0	-79
	Southwest	20,090	21,391	22,001	6	3	14,769	14,538	14,448	-1	-2
<b>Total to Southeast Region</b>		<b>20,422</b>	<b>22,192</b>	<b>22,802</b>	<b>9</b>	<b>3</b>	<b>14,831</b>	<b>14,551</b>	<b>14,497</b>	<b>0</b>	<b>-2</b>
<u>Southwest</u>	Central	1,393	2,584	2,975	85	15	721	1,284	1,403	9	95
	Mexico	350	350	565	0	61	0	32	0	-100	--
	Southeast	405	405	405	0	0	75	13	13	0	-83
<b>Total to Southwest Region</b>		<b>2,148</b>	<b>3,339</b>	<b>3,945</b>	<b>55</b>	<b>18</b>	<b>796</b>	<b>1,329</b>	<b>1,416</b>	<b>7</b>	<b>78</b>
<u>Western</u>	Canada	2,631	4,436	4,643	69	5	1,874	3,507	2,262	-36	21
	Central	365	1,219	1,461	234	20	0	812	1,276	57	--
	Southwest	4,340	5,351	5,924	23	11	3,910	2,929	3,916	34	0
<b>Total to Western Region</b>		<b>7,336</b>	<b>11,006</b>	<b>12,028</b>	<b>50</b>	<b>9</b>	<b>5,784</b>	<b>7,248</b>	<b>7,454</b>	<b>3</b>	<b>29</b>
<b>Total Between U.S. Regions</b>		<b>74,873</b>	<b>90,204</b>	<b>98,608</b>	<b>20</b>	<b>9</b>	<b>49,936</b>	<b>55,503</b>	<b>62,043</b>	<b>12</b>	<b>24</b>

MMcf/d = Million cubic feet per day. -- = Not applicable.

Sources: Energy Information Administration (EIA). **Pipeline Capacity:** GasTran Gas Transportation Information System, Natural Gas Pipeline State Border Capacity Database. **Average Flow:** Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition."

capacity in the region. About 60 percent of the increase in capacity in 2002 came from the creation of new laterals, or expansion to existing ones (mainly slated to serve new gas-fired electrical generation plant needs). The remainder represented a sizable expansion of mainline transmission capacity (Table 2).

Transcontinental Gas Pipe Line Company increased its mainline capacity into the region by 230 MMcf/d with the completion of its Sundance Expansion between Louisiana and Virginia, and within the region with the completion of the Leidy East project (126 MMcf/d) and the related last phase of its 289 MMcf/d Market Link project (127 MMcf/d added in 2002). Tennessee Gas Pipeline Company also

increased its capability to serve growing peak-day demand in New England and other areas of the Northeast. Its completion of a new 487 MMcf/d lateral from the newly opened Stagecoach underground gas storage field in south central New York, and its related expansion of its northern Pennsylvania mainline, have improved its transportation service between Leidy (Hub) and its East Coast markets. Within New England, Tennessee Gas Pipeline Company also added 100 MMcf/d to its Rhode Island mainline to provide service to a new gas-fired power plant located in the State. These two pipeline companies have also announced several proposals that will continue their expansion in the Northeast. Together, the two companies represent 28 percent of the overall proposed Northeast region pipeline capacity increases between 2003 and 2005.

Between 2003 and 2005, 24 pipeline expansion projects, representing 5,616 MMcf/d of potential new capacity, have been proposed to upgrade and improve gas service in the Northeast region. The proposed increase for 2003 is almost twice as much as the 2002 level, ranking the region second in expected capacity increases in 2003. Potential increases to regional capacity in 2004–05 place it third among regions for capacity growth during that period. In 2003, 18 percent of total new regional gas pipeline capacity is slated to come from Canada (see below), while in 2004 that figure jumps to 67 percent.

Overall, almost 42 percent (2,344 MMcf) of the proposed new regional pipeline capacity is slated to improve service to the New York City area, while another 32 percent (1,820 MMcf/d) is slated for the Boston metropolitan area. Some of the additional capacity into the New York City area represents new pipeline capacity fed by the planned increase in pipeline capacity that will come south from Canada via expansion routes through New England. Most of the remaining new pipeline capacity could come from several pipeline proposals that include increasing capacity to the Leidy (Pennsylvania) area and to the New York City area.

The New York City area itself is slated to increase its incoming pipeline capacity substantially between 2003 and 2005. Specifically, the long-delayed 714 MMcf/d Millennium Pipeline project could be placed in service sometime in late 2004 while several other projects are scheduled to add as much as 1,080 MMcf/d in 2003. Combined, possible expansions in 2003–2005 could increase incoming pipeline capacity by more than 53 percent (1,894 MMcf/d) over 2002 levels (Table 1). Projects completed over the past several years in the area have helped relieve many of the localized capacity constraint points that developed in the New York City area over the past 5 to 10 years. In addition, some of these recently completed projects are providing needed capacity to support new gas-fired electric power plants that are being built to feed the PJM power grid and the growing metropolitan area industrial base.

With the slated increase in gas pipeline capacity scheduled for installation in the next several years, it is expected that enough new capacity will be available to handle existing and new demand in the area. However, if delays are encountered, or any of these projects are canceled, it is possible that some localized capacity constraint problems could redevelop.

## Southeast Expansions

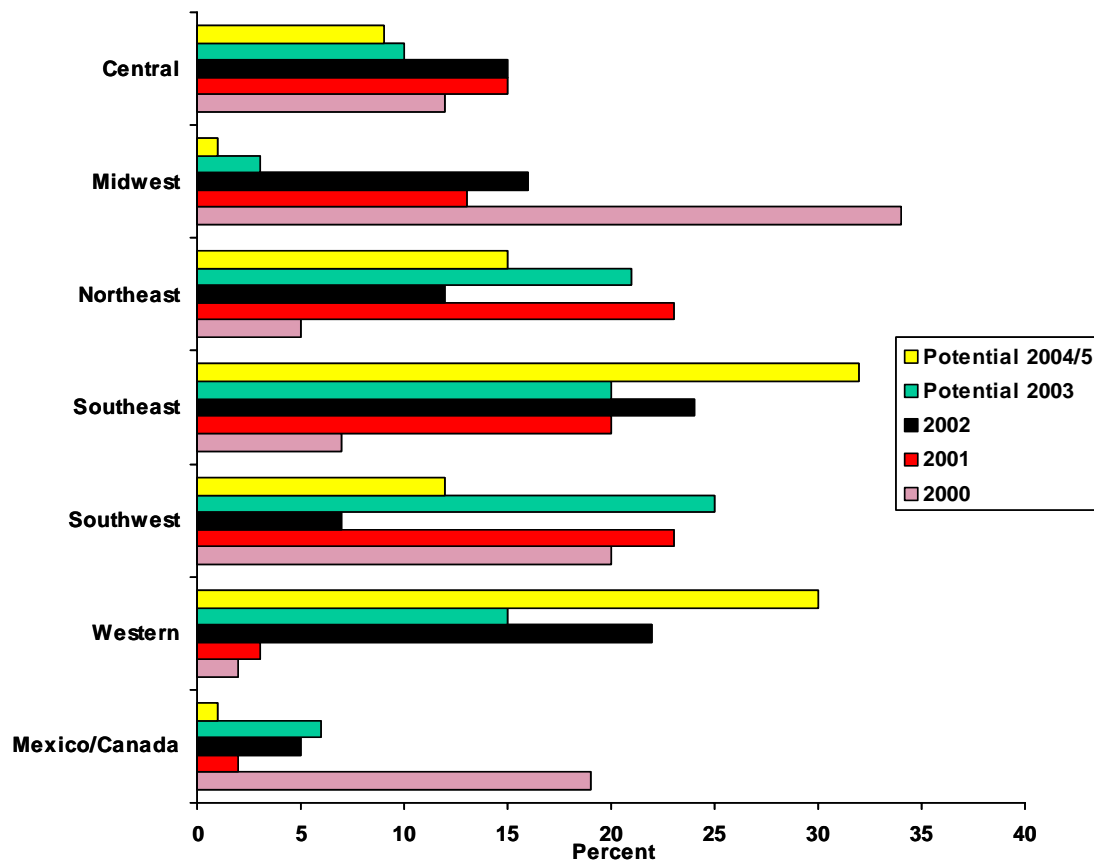
In 2002, eight pipeline expansion projects, representing 3,056 MMcf/d of new gas pipeline capacity, were completed in the Southeast region. The largest of these, and the most significant, was the new Gulfstream Pipeline System (Figure 2), which has the capability to deliver up to 1,130 MMcf/d to central Florida from Alabama/Mississippi via the Gulf of Mexico. Gulfstream also completed an interconnection with the Gulf South Pipeline in Alabama to provide regional gas shippers with greater flexibility in shipping gas via its system.

Between 2003 and 2005, 22 proposed pipeline expansion projects, or project phases, could potentially add as much as 8,761 MMcf/d to gas pipeline capacity in the Southeast region. If this level is reached, the Southeast region would lead the nation in new capacity additions during the period. However, a sizable portion of this potential capacity comes from several large competing proposals (where only one might survive) and several other large pipeline projects that still remain in their planning stage. For example, three proposals, each to build 700–800 MMcf/d capacity pipelines between LNG vaporization facilities located in the Bahama Islands and South Florida, are competing for similar markets and are predicated upon the future development of several new gas-fired power plants in the area.

Nevertheless, the need for new pipeline capacity is strong in the region. At least five storage-related pipeline expansion projects, including a new 185 MMcf/d pipeline to provide greater access to the recently reactivated Elba Island LNG import facility, are very likely to be completed as designed. Several high-deliverability (salt cavern) underground gas storage facilities are being built in the region to support the growing variable load needs of such customers as gas-fired power plant operators. Two such facilities, the Richton (2004) and Southern Pines (2003) storage sites in Mississippi, will interconnect with the interstate pipeline system via three separate 600 MMcf/d capacity laterals.

The Southern Natural Gas Company and Florida Gas Transmission Company (despite increased competition in its Florida market from Gulfstream Pipeline) continue to schedule expansions to their respective systems in the region. Southern has completed at least one expansion project each year since 1996 and plans three more through 2005. Although most of its expansions, with the exception

**Figure 5. Percent of New U.S. Natural Gas Pipeline Capacity Addition by Geographic Region, 2000-2005**



Note: Capacity for projects terminating at the Mexico/U.S. border were included in the region in which they began.

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

of two planned for 2003, represented less than 100 MMcf/d each in new capacity, demand growth in Southern Natural's service territory has necessitated a steady increase in expansion capacity. Similarly, gas demand growth in Alabama and particularly in Florida has necessitated capacity expansions on Florida Gas Transmission's system each year since 2000, including two more scheduled for 2003 (all greater than 100 MMcf/d in added capacity).<sup>15</sup>

## Western Expansions

In 2002, 2,852 MMcf/d of gas pipeline capacity was added in the Western region with the completion of 12 major projects (Table 2). New pipeline capacity in the Western region accounted for about 22 percent of all gas pipeline capacity additions in the Lower 48 States in 2002, compared with only 2 and 3 percent in 2000 and 2001, respectively (Figure 5). Contributing to this large jump was that four of the five major interstate natural gas pipeline systems in the region underwent capacity expansions of from 5 to 10 percent in 2002, while two entirely new interstate natural gas pipeline systems were also placed into

service. In addition, the opening of several new gas-fired electric generating plants in the region required the installation of five new lateral (feeder) pipelines and the expansion of several mainline pipeline segments.

Completion of the El Paso Natural Gas Company's Line 2000 project, which entailed the conversion of an oil pipeline to replace a major portion of its vintage South System, was not originally slated to include an expansion of capacity. But as gas demand in Arizona and southern California grew during the 2000–2001 energy shortfall, the project was modified to include an upgrading of several gas compressor stations along the route, with an increase in capacity of 230 MMcf/d.

Addressing the same demand for increased interstate gas pipeline capacity into California, the Transwestern Pipeline Company also improved its system capacity between New Mexico and California with an increase of 120 MMcf/d. For similar reasons, PG&E Gas Transmission–Northwest increased its system capability by 207 MMcf/d (of Canadian import capacity) into Northern California, while the Northwest Pipeline Company increased its regional capacity by 160 MMcf/d in 2002, and plans to add another 443 MMcf/d in 2003.

<sup>15</sup> Florida Gas Transmission Company's previous major increase in system capacity (by 65 percent) occurred in 1995.

Within California, the two major intrastate pipeline companies, Southern California Gas (SoCal) and Pacific Gas and Electric (PG&E), upgraded their respective mainline systems to improve their takeoff capacity from the expanded interstate system. In addition, they upgraded their interconnections with California gas production fields and built several new laterals to supply the new gas-fired power plants that were brought online in the State in 2002. However, as energy demand stabilized in the region, especially within the State, the original intended market for several pipeline projects changed.

For instance, the Questar Southern Trails Pipeline (Figure 2), which was originally planned as a transporter of natural gas to customers within California, has redirected its deliveries to gas-fired power plants within Arizona instead. El Paso Natural Gas Company now also directs a sizable portion of its South System capacity to several new gas-fired power plants near Phoenix, Arizona, and to the North Baja Pipeline (Figure 2).

Reflecting a shift in short-term gas needs in the region, the 21 gas pipeline projects that have been proposed for 2003 through 2005 are now less focused on California and more on the northwest part of the region and the States of Arizona and Nevada. Indeed, only about 30 percent of the proposed capacity would directly impact California, compared with 70 percent in 2002.

Of the 21 proposed 2003–2005 projects, 8 are pipeline expansions or new laterals that would improve gas transportation services (1,463 MMcf/d) in the Northwest part of the region in the States of Washington, Oregon, or Idaho, while another 8 projects (3,956 MMcf/d) would, for the most part, improve service to Nevada and Arizona customers and provide additional service to exporting pipelines such as the North Baja Pipeline. The North Baja Pipeline (500 MMcf/d) runs from an interconnection with El Paso Natural Gas Company at the Arizona/California border south to the California/Mexico border, where it delivers natural gas to its Mexican counterpart for shipment to several gas-fired power plants located in Baja California, Mexico. El Paso Natural Gas Company has a two-phase project planned for 2004 and 2005 that would add 330 MMcf/d to its South System to support growing gas demand in Arizona and for the North Baja system.

As gas pipeline capacity (service) demand in the Western region continues to expand, the need for underground storage facilities to support this growth also is being addressed. In California, the proposed expansion of the Wild Goose storage facility in 2004 includes the building of a 700 MMcf/d, 25-mile lateral, to an interconnection with Pacific Gas and Electric Company's mainline transmission system. In Arizona, two new storage facilities, targeting shippers to the Arizona/California market, have been proposed that will necessitate the building of 331 miles of pipeline with 1,700 MMcf/d of capacity. Overall, more than 2,690 MMcf/d of proposed new pipeline capacity is related

to development of storage infrastructure in the Western region between 2003 and 2005.

## Southwest and Gulf of Mexico Developments

Only a relatively small amount of new natural gas pipeline capacity (882 MMcf/d) was installed in the Southwest region (including the Gulf of Mexico) in 2002. In fact, the region accounted for only 7 percent of the total new gas pipeline capacity installed in the Lower 48 States in 2002. Comparatively, in 2000 and 2001, the percentage was 20 and 23 percent, respectively (Figure 5). Moreover, Gulf of Mexico pipeline development (two projects) represented 75 percent of new capacity addition in the region in 2002, while onshore regional expansions (four projects) accounted for only 25 percent of new pipeline capacity.<sup>16</sup>

The only major interstate pipeline in the Southwest region to expand its regional exit capacity in 2002 was the Transcontinental Gas PipeLine Company, with the completion of its 230 MMcf/d Sundance expansion extending from Louisiana to Virginia. Otherwise, there has not been any significant increase in pipeline capacity on the other major interstate pipeline systems, such as Texas Eastern Transmission Corporation, Tennessee Gas Pipeline Company, Trunkline Gas Company, and ANR Pipeline Company, who provide the Midwest region with access to Gulf Coast production, in a number of years. Indeed, for the past five years, competition from Canadian natural gas imports into the Midwest has eliminated the need for any serious proposals for new pipeline capacity within the transportation corridor between the Southwest/Gulf of Mexico production and the Midwest.

Growing demand for natural gas in the Northeast region and the adjoining Southeast region, especially along the route of the Transcontinental Gas PipeLine system through the Atlantic Coast States, has supported the yearly expansion of the system over the past 10 years – with 430 MMcf/d added since 2000 alone. A major factor in these annual expansions has been that a number of new gas-fired power plants have been built along its route, which it now supplies. But, overall demand in the region has increased in other sectors as well, notably in industrial use, which has also supported these capacity increases. Other pipeline systems in the region have also benefited from this region-wide growth in new gas-fired electric power plant development. For instance, the Southern Natural Gas has added more than 180 MMcf/d (a 7-percent increase) to its regional capacity since 2000.

Through 2005, 15 gas pipeline projects, representing 5,560 MMcf/d of additional regional capacity, have been

<sup>16</sup> In contrast, in 2001, enough new capacity was installed to increase overall gas pipeline capacity (excluding gathering systems) in the Gulf alone by more than 5 percent.

proposed for the region and the offshore Gulf of Mexico. However, only 1,660 MMcf/d, or 30 percent, of that total represents proposed onshore pipeline capacity additions, all in 2003. In fact, to date, no additional onshore interstate pipeline expansion projects have been proposed beyond 2003. Nevertheless, the potential increase in new gas pipeline capacity in the Southwest region rises significantly in 2003 compared with 2002 (Table 1), bolstered by several large-scale offshore projects, although it does drop off again in 2004–2005.

## Growth in Import/Export Pipeline Capacity

The removal of gas tariffs between the United States and Canada in 1996 and between the United States and Mexico in 1998, under the North American Free Trade Agreement (NAFTA) of 1994, helped bring about major growth in new pipeline capacity from Canada to the United States and from the United States to Mexico (Figures 6 and 7). In the latter case, new industrial gas users initially were the underpinning for installation of the new capacity, but in recent years new gas-fired power plant development along the northern border area of Mexico has also supported the expansion. From 1990 to 2002, U.S. natural gas pipeline import capacity grew by 128 percent while U.S. export capacity grew by more than 300 percent (Table 4).

Besides the impact of NAFTA, relaxation of gas regulations and the creation of the Comisión Reguladora de Energía (CRE) in Mexico since 1995 have stimulated the expanded development of local gas distribution companies in the country and their relationship with U.S. pipeline exporters and marketers.

During 2002, 624 MMcf/d in additional export capacity to Mexico was installed at a cost of more than \$148 million, which does not include the cost of related facilities installed in Mexico itself (Table 2). Another 729 MMcf/d has been approved by FERC for installation in 2003 (Figure 6) although, to date, no further expansion projects have been announced, or applied for, that would increase pipeline export capacity in 2004 or beyond.

The large expansion of import pipeline capacity from Canada has been supported by two simultaneous, complementary situations, which were further supported by incentives contained in NAFTA. First, growing demand for natural gas in the U.S. Western, Midwest, and Northeast regions outstripped the capability of U.S. production in the Southwest to meet new demand levels. This situation stimulated exploration and development by Canadian energy producers who believed that they could respond to the U.S. natural gas shortfall successfully, especially under NAFTA.

Initially, during the mid-1990s, available gas productive capacity in existing Canadian gas production areas was directed toward expansions of existing U.S. natural gas pipeline systems such as PG&E Transmission–Northwest Company (formerly, Pacific Gas Transmission Company), Great Lakes Gas Transmission Limited, and Viking Gas Transmission Company. Several new importing pipelines, such as the Iroquois Gas Transmission system and the Empire Pipeline, were also built to reach growing U.S. markets. Subsequently, as the surplus existing production sources were tapped for export, new Canadian natural gas reserves were discovered and their production directed mostly to markets in the United States. This new Canadian productive capacity was found primarily in two areas, in northeast British Columbia and offshore eastern Canada.

The Alliance Pipeline was built in 2000 to tap the major natural gas discoveries within northern British Columbia, Canada, in areas such as the Ladyfern field. Even with NAFTA, however, to be economically successful, the Alliance system was designed to be able to transport “wet” natural gas to Midwest markets, where the liquids could be extracted locally (at the Aux Sable gas processing plant in Joliet, Illinois) and sold in the more profitable U.S. market (Figure 2). To date, the Alliance system has been operating at close to capacity. The new supplies of northeastern British Columbia have also helped supplement gas supplies directed to markets in the Western region as well.

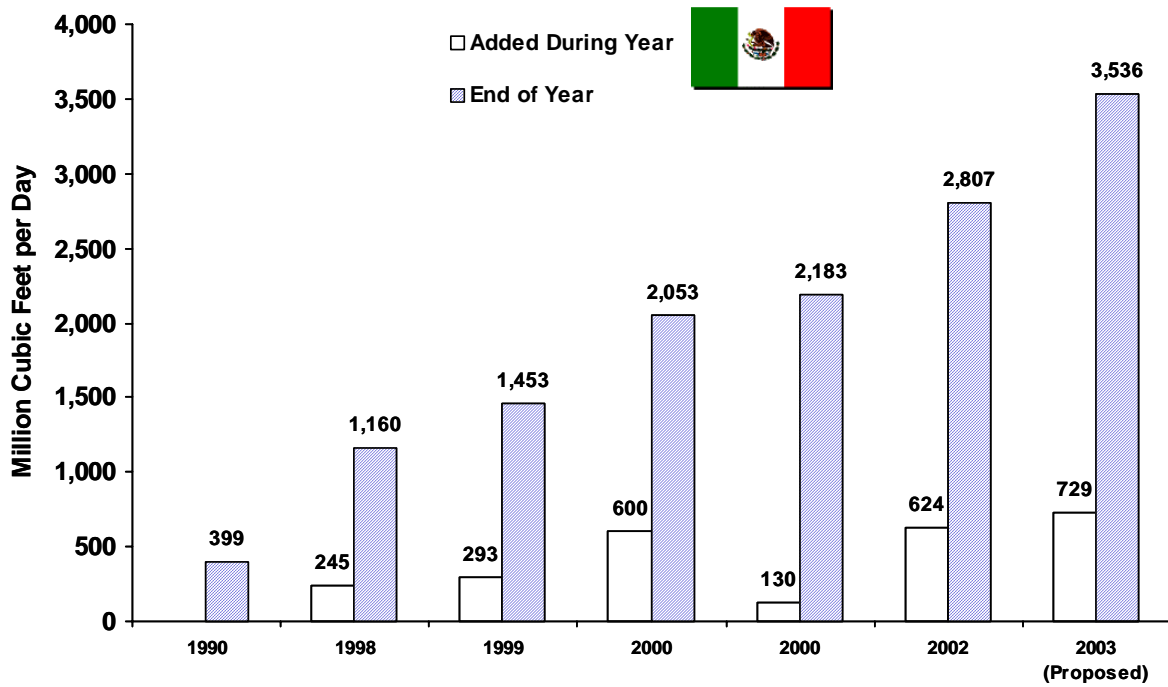
The Sable Island natural gas discoveries of the mid-1990s on the Scotian Shelf, offshore eastern Canada, led to the development of the 440 MMcf/d Maritimes and Northeast Pipeline system between Nova Scotia and Massachusetts in 1999. This system now serves markets in Maine, New Hampshire, and northern Massachusetts. In 2003, its reach will extend to the Boston metropolitan area with the completion of a 350 MMcf/d extension. A doubling of its capacity has been proposed (filed with FERC) for 2004.

And, despite the recent U.S. economic slowdown and the relatively mild weather conditions of the past several years, gas import volumes from Canada continue to increase. While monthly gas import levels did drop briefly during the 2001–2002 heating season (November through March), most likely because of mild temperatures in the U.S. Midwest and Northeast, import volumes resumed their steady month-to-month growth pattern during the latter part of 2002. Preliminary data indicate that in 2002 gas imports from Canada increased about 2.7 percent over 2001 levels.<sup>17</sup>

<sup>17</sup> Energy Information Administration, *Natural Gas Monthly*, Table 5, “U.S. Natural Gas Imports, by Country, 1996–2002,” DOE/EIA-0130(2003/02) (Washington, DC, February 2003).

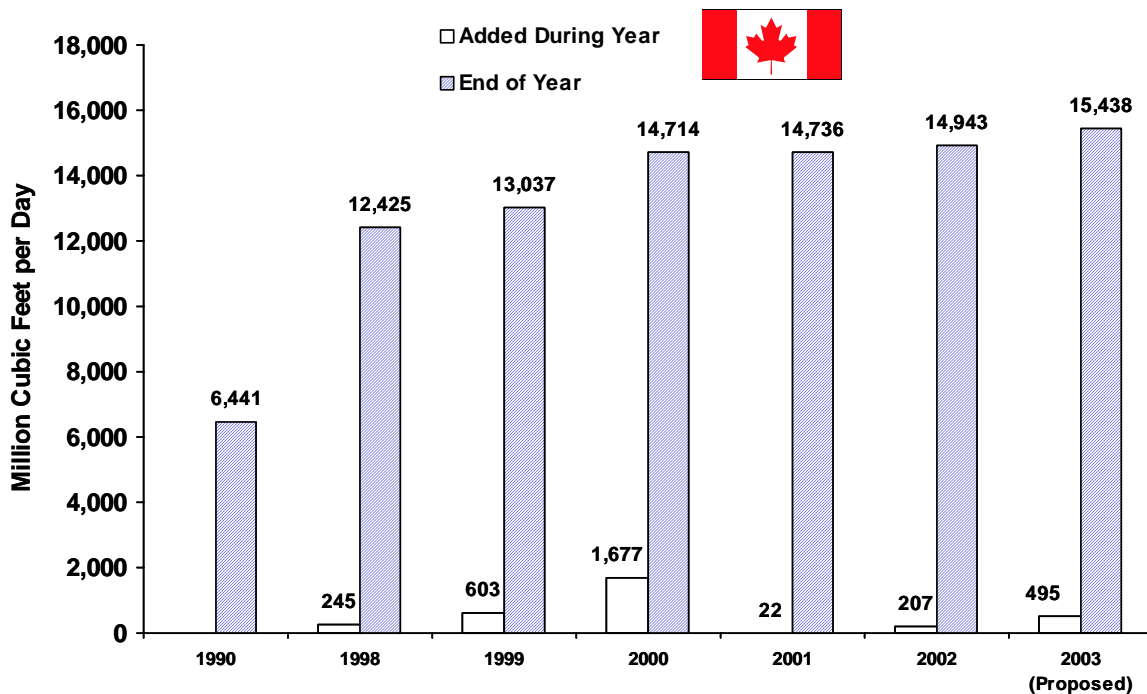


**Figure 6. Capacity Available to Export Natural Gas to Mexico, 1990 and 1998-2003**



Source: Energy Information Administration, GasTran Gas Transportation Information System, Natural Gas Pipeline Capacity and Projects Databases.

**Figure 7. Capacity Available to Import Canadian Natural Gas, 1990 and 1998-2003**



Source: Energy Information Administration, GasTran Gas Transportation Information System, Natural Gas Pipeline Capacity and Projects Databases.

Nevertheless, there are also some signs that development of new import capacity from Canada may be reaching a temporary zenith into several key U.S. markets. For instance, little or no additional import capacity has been built into the Midwest since 2000 and none has been proposed – at least through 2004. A similar situation exists in the Western region. While the PG&E Gas Transmission-Northwest completed a 207 MMcf/d expansion in 2002, it canceled a planned 163 MMcf/d 2003 expansion owing to the loss of the supporting customer, a gas-fired electric power plant that was to have been located in Oregon. The only other scheduled additional import capacity into the region is also based on supplying another gas-fired electric power plant. It should be noted, however, that the Sumas Energy 2 power plant, now scheduled for completion in 2004, and which would require up to 140 MMcf/d of pipeline capacity, had been postponed previously and could be again.

Currently, the only U.S. region that has any new natural gas pipeline import capacity from Canada proposed for 2003 (495 MMcf/d) is the Northeast (Figure 7). Moreover, beyond 2003, much of the proposed capacity into the region is supply, rather than demand, driven. The Maritimes & Northeast's 2004 expansion proposal is predicated largely upon the new production that is scheduled to be coming from the Scotian Shelf in eastern offshore Canada by then.<sup>18</sup> Currently, this pipeline expansion proposal also is geared toward supplying potential gas-fired power plants that are planned for the corridor between Nova Scotia and Massachusetts over the next five years. Yet, several of the other proposals to expand capacity to import Canadian gas into the Northeast are also predicated upon the same potential customer source.

While none of the other proposals is planned to extend into the Maritimes & Northeast pipeline's service territory, it is quite possible that, if current gas demand projections throughout the Northeast do not live up to expectations, the sponsors of the various active proposals will either have to scale back capacity expansion levels, cancel their project completely, or compete with other projects by expanding the scope of their service territories beyond the current boundaries.

## Outlook

As of March 2003, 112 natural gas pipeline expansion projects, in various stages of development, have been proposed for the Lower 48 States for 2003 through 2005. For 2003, 61 projects are planned; for 2004, 36; for 2005, only 15 to date.

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<sup>18</sup> On February 27, 2003, EnCana Corp. notified the Canadian National Energy Board (NEB) that it was delaying plans to develop its proposed 400 MMcf/d Deep Panuke project located under the Scotian Shelf. This action could temporarily limit the availability of gas supplies to any potential Maritimes & Northeast pipeline expansion.

Of the 61 projects planned for 2003, however, only 42 have been approved by regulatory authorities, as of March 2003. These approved projects represent a combined capacity level of 9,845 MMcf/d, or a little more than three-fourths of the total capacity additions proposed for 2003. While 13 additional projects have been filed with regulators and are awaiting a disposition, 6 projects (1,323 MMcf/d) have yet to be filed and remain in the planning stage. Some of these latter projects, which could be completed relatively quickly once approval is granted, have a chance of being completed in 2003. However, it is more likely that a substantial portion of the 1,323 MMcf/d represented by these 6 projects will not be installed in 2003, being either canceled, placed on indefinite hold or, more likely, postponed until 2004.

However, if 2003 is typical, some unannounced, quick turn-around projects that do not fall under FERC's jurisdiction will be completed during the year, compensating for some of the proposed capacity additions that will be deferred or dropped. The effect of this process in the past has been that about half of the potential loss of proposed capacity from cancellations and other reasons is made up during the year by completion of such projects. Thus, the original estimate of 12,937 MMcf/d (Table 1) of new capacity for 2003 could be eventually adjusted to about 12,000 MMcf/d.

Because of the current downturn of the national economy, it is also possible that the final figure for 2003 could fall to around 11,000 MMcf/d, as some approved projects are likely to be downsized or postponed as markets adjust to changes in local economies and/or some proposed gas-fired electric power plants are themselves postponed or canceled.<sup>19</sup>

For 2004–2005, as of March 2003, only 14 of the 51 proposed projects have been approved, and 13 more have been filed with regulatory authorities for review. The remaining 37 projects are still in the concept or planning stage.<sup>20</sup> Indeed, project specifications for more than 8,800 MMcf/d of the 18,939 MMcf/d capacity additions proposed to date have yet to be finalized. At this stage it is impossible to predict what portion of the current 19 Bcf/d estimate will eventually be developed, especially since many new pipelines or expansion projects are not filed until 18 months in advance of their proposed in-service date.

Between 1991 and 2001, more than 60 Bcf/d of capacity (through pipeline expansions and building of new pipelines) was incorporated into the Lower 48 interstate gas transmission network, an average of 6 Bcf/d per year. With the exception of the years (1994–1996) when the gas

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<sup>19</sup> In fact, on February 5, 2003, Transcontinental Gas PipeLine Company announced that it had requested permission from FERC to downsize its Momentum expansion project from 359,000 Dth/d to 323,000 Dth/d because of changes in the needs of several electric generation customers in the Southeast.

<sup>20</sup> It should also be kept in mind that estimated costs are nonexistent or unannounced for a number of pipeline expansion proposals that have yet to be filed with regulatory authorities. Consequently, the cost totals provided for 2003 and beyond in Table 1 should be considered low.

pipeline industry adopted a wait-and-see approach to expansion following the interstate pipeline restructuring mandated by FERC Order 636 in 1992, annual additions to interstate natural gas pipeline transmission capacity exceeded 5 Bcf/d in the 1990s. In 2001 capacity additions approached the 10 Bcf/d level. In 2002 they reached 12.8 Bcf/d (Table 1).

With the current economic slowdown in the United States, however, it is unlikely that this pace will be maintained in the short term. Despite the fact that a 12.9 Bcf/d increase in gas pipeline capacity has been proposed for 2003 and another 18.9 Bcf/d for 2004–2005, it is likely that only about 70 to 80 percent of the proposed capacity additions will eventually be completed.