Transmission

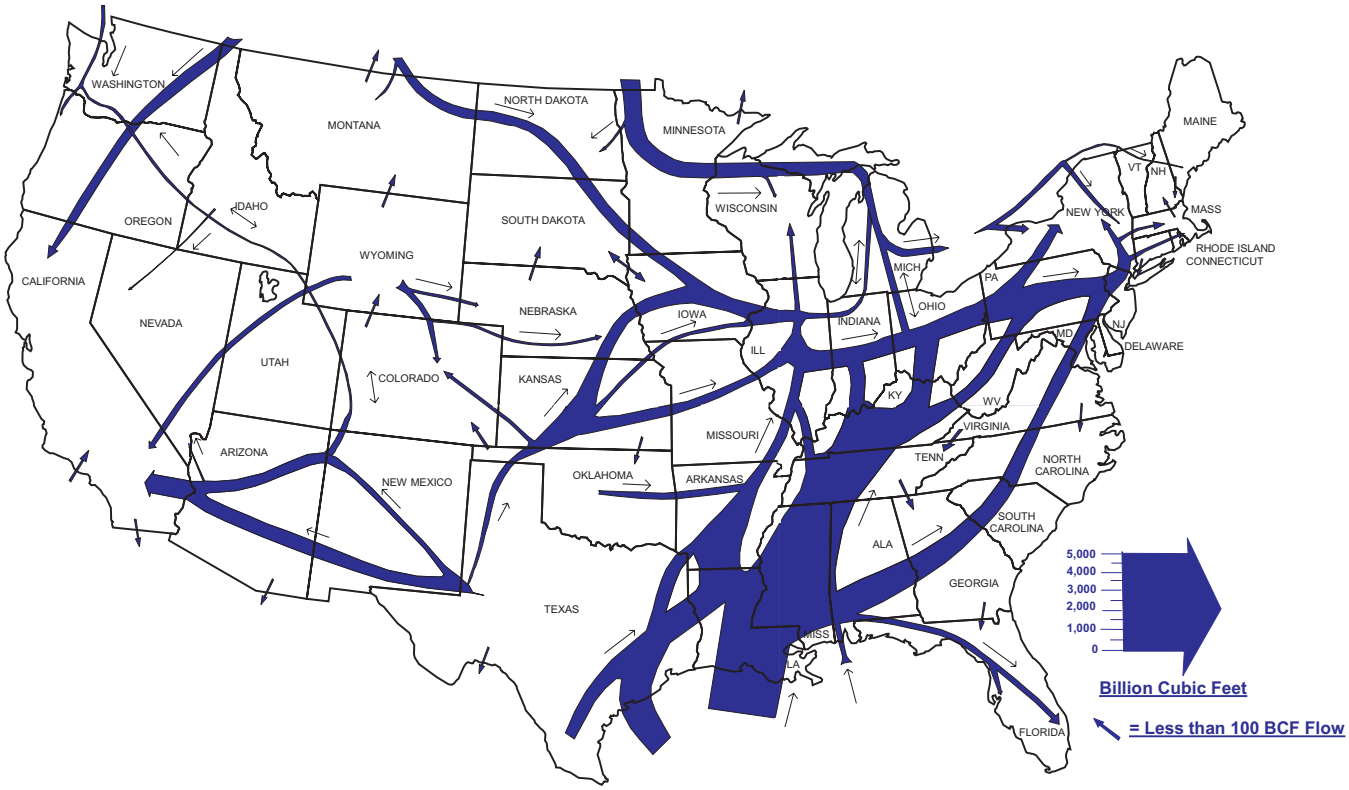
A complex grid of natural gas pipelines crisscrosses the nation and provides for the transmission and delivery of natural gas to customers in the Lower 48 States. Natural gas predominantly flows northeastward from the major producing areas in Texas, Louisiana, and the Gulf of Mexico, and to a lesser extent from producing areas in Oklahoma and New Mexico. At the northern U.S. border, Canadian pipelines interconnect with the U.S. network to reach into California and the northern States of the Midwest and the Northeast. This pipeline network also extends into Mexico at the southern U.S. border making an integrated market for the North American continent.

Interstate movements of natural gas provide an indication of market activities (Table 8):

- During the early and mid 1990's, in the western region of the United States, the amount of gas flowing to the California natural gas market decreased because of a lessening in demand. This forced producers in the San Juan Basin of New Mexico/Colorado to redirect their expanding production to markets to the east, primarily through pipeline capacity increases on routes into the Waha area of west Texas and the several natural gas market centers located there. Market improvement in California in recent years, however, has brought about a reversal in that trend. Current interstate flows of gas out of the San Juan Basin show greater amounts of the basin's gas moving westward to California while the amount of gas flowing to west Texas out of the basin has fallen off substantially.

- Throughout the Northeast and Midwest regions, the level of interstate movements of natural gas in 1998 reflects the drop in consumption brought about by the milder winter temperatures that occurred in these two regions over the past several years. In almost all cases,

Figure 6. Principal Interstate Natural Gas Flow Summary, 1998



movements to and from every State in the two regions reflect a significant drop in throughput volumes.

- Over the past several years, coalbed gas production has been increasing in Wyoming and areas adjacent to the Rocky Mountains, and several pipelines have expanded to accommodate the growth in productive capacity. Interstate natural gas flows in 1998 in the several States in the region not only reflect the greater production but also the expanded pipeline capacity on such systems as the KN Interstate Pipeline (with its new Pony Express line) and the Trailblazer System, both completed during the latter months of 1997. These two pipelines bring gas from the Rocky Mountain area to markets from Denver to Chicago.

Imports and Exports

Highlights of the developments in natural gas import and export crossborder trade during 1998 are presented below. More detailed information, including monthly data, can be found in the Feature Article, "U.S. Natural Gas Imports and Exports–1998," which appeared in the August 1999 issue of the *Natural Gas Monthly*.

- During 1998, net imports of natural gas increased for the 12th consecutive year, accounting for 14 percent of 1998 U.S. natural gas consumption.

- Canada continued to be by far the primary supplier of imported gas. Canadian imports increased significantly in 1998, reaching 3.1 trillion cubic feet and accounting for 97 percent of total U.S. imports. With greater utilization of existing pipeline capacity and the completion of several pipeline expansions, imports from Canada grew by 5 percent from 1997 to 1998.

- The average price of imports from Canada dropped to $1.95 per thousand cubic feet, 9 percent below the 1997 price of $2.15 per thousand cubic feet. The decrease in Canadian import prices followed the trend in the U.S. wellhead prices. The 1998 wellhead price in the United States was 16 percent less than the 1997 price.

- Three pipeline expansion projects in 1998 added substantial amounts of new import capacity from Canada to the United States. The Great Lakes Gas Transmission expansion project, completed in November 1998, added 126 million cubic feet per day of firm transportation capacity. It extends from Manitoba, Canada, to St. Clair, Michigan. Northern Border's Chicago Project was completed in December 1998 and began flowing gas into the United States in 1999. This project increased capacity from the U.S. Canadian border at Port of Morgan, Montana, into Iowa by 700 million cubic feet per day and extended the Norther Border pipeline system from eastern Iowa into Illinois just south of Chicago. In the Northeast, the Iroquois Gas Transmission System added 35 million cubic feet per day of import capability.

- Natural gas exports to Canada fell to 40 billion cubic feet, a 29-percent decrease from the 1997 level. Over 90 percent of these exports crossed the border in Michigan. The average price was $2.25 per thousand cubic feet, 11 percent less than the 1997 price. Exports to Canada represented 43 percent of total U.S. natural gas pipeline exports during 1998.

- The United States exported 53.1 billion cubic feet of natural gas to Mexico in 1998, the highest level since 1995. The price was $2.04 per thousand cubic feet, 17 percent lower than in 1997. More than half of the exports to Mexico crossed the border at Clint, Texas, on the Samalayuca Pipeline, which began operations in December 1997. Exports of U.S. gas to Mexico primarily provide supplies to manufacturing/service industries and a growing number of electric generating plants in northern Mexico.

- Also during 1998, a small amount of liquefied natural gas (LNG), 33 million cubic feet, was exported to Mexico for the first time. The LNG originated at a new liquefaction, storage, and distribution facility near Topock, Arizona. It was sent to Sonora, Mexico, by truck and sold to industrial consumers.

- The United States imported 15 billion cubic feet of gas from Mexico, 16 percent less than in 1997. This drop in imports occurred despite a decline in price of 12 percent. Energy officials from Petroleos Mexicanos (PEMEX), the state-owned Mexican national energy company, indicated that they could have exported more but could not find shipping capacity available on the U.S. side of the border.

- Liquefied natural gas imports reached 85 billion cubic feet, the highest level since 1983 and 10 percent above the 1997 level. Algeria supplied 80 percent of the imports in 1998 under long-term agreements. The other 20 percent were spot purchases from Australia and the United Arab Emirates. The 1998 LNG imports accounted for 3 percent of all U.S. gas imports, but less than 1 percent of total U.S. gas consumption.

- The price of LNG imported from Algeria declined from 1997 to 1998 by 6 percent to $2.51 per thousand cubic feet. The price of United Arab Emirates imports also decreased, by 30 percent, to $2.63 per thousand cubic feet. In contrast, the price of Australian imports moved up 13 percent, from $2.92 per thousand cubic feet in 1997 to an average $3.30 in 1998.

- LNG is exported from southern Alaska to Japan under long-term agreements. During 1998, 66 billion cubic feet of LNG was exported, 6 percent more than in 1997. However, the price of these exports fell by 24 percent to $2.91 per thousand cubic feet. The sharp drop in price is directly attributed to the overall decline in world oil prices, as the price of this LNG supply is based on the weighted average cost of all crude oil imported by Japan.[1]

Storage

Natural gas storage activity is important to natural gas markets on a seasonal basis. For example, a period of unusually cold weather early in the heating season (November through March) may cause higher-than-usual withdrawals that can put upward pressure on wellhead prices. Data and analysis of monthly storage activities can be found in the Energy Information Administration's *Natural Gas Monthly*. Annual storage activities are included in the *Natural Gas Annual 1998* to provide the complete picture of supply and disposition of natural gas during the year. Data on activities at liquefied natural gas (LNG) storage facilities (Table 10) are only available on an annual basis, but LNG additions and withdrawals account for a very small amount (2 percent), of total storage activities during 1998. LNG is most commonly used by local distribution companies to meet periods of particularly high demand ("peak shaving") and is typically stored in above-ground facilities on site.

- Natural gas underground storage capacity at the end of 1998 was 8,179 billion cubic feet (Table 11). This is 153 billion cubic feet or 2 percent lower than at the end of 1997. Michigan continues to have the greatest capacity, with 1,022 billion cubic feet or 12 percent of the U.S. Total.

- Both Michigan and Montana increased their underground storage capacity by 29 billion cubic feet during 1998. This was a 3 percent increase for Michigan and an 8 percent increase for Montana. Also, two States that reported no underground storage capacity in 1997 began new fields in 1998. Tennessee had one active field with 1 billion cubic feet of capacity and Virginia had two active fields with a total of 5 billion cubic feet of capacity.

Pipeline Expansions

During 1998, the interstate natural gas pipeline network continued to grow to meet the increasing demand for natural gas. At least 46 discrete natural gas pipeline projects were completed during the year, adding more than 7.6 billion cubic feet per day of new capacity to the national pipeline grid. The majority of this new capacity (57 percent) resulted from expansions and upgrades to existing pipeline systems, although 11 new pipelines systems, of varying sizes, were added to the nation's natural gas pipeline network. Pipeline development in the Gulf of Mexico represented the most sizeable regional addition of new capacity (2.6 billion cubic feet per day, 34 percent of all new capacity) as expansion of production resources necessitated the installation of new lines to bring additional supplies onshore.

Planned expansions for 1999-2000 would add approximately 3.1 billion cubic feet per day of Canadian export capacity, primarily into the U.S. Midwest and Northeast. These proposals are principally driven by the general increase in demand in U.S. markets in recent years and by Canadian natural gas producers seeking market outlets for their expanding production capabilities.

Some additional highlights of U.S. pipeline expansions are:

- The Northern Border Pipeline Company expansion project, the largest addition, was completed in December 1998. This 243-mile expansion will bring an additional 700 million cubic feet per day of capacity from Canada to markets in Montana and Iowa. As part of the project, the Northern Border Pipeline system was extended 200 miles to reach customers in the Chicago, Illinois, area, supplying them with up to 650 million cubic feet per day of new natural gas supplies.

- Several projects increased supplies out of the expanding coalbed gas production fields within Rocky Mountain region. The largest, the Colorado Interstate Pipeline Company's Campo Lateral, went into service in July 1998. This project consisted of a new 115-mile pipeline capable of flowing 100 million cubic feet per day from Trinidad, Colorado eastward to the Campo, Colorado area and to interconnections with several major interstate pipeline systems. Another, Public Service Company of Colorado's Front Range project, was completed in November 1998 and has the capability to move 269 million cubic feet per day along its 53-mile

[1] U.S. Department of Energy, Office of Fossil Energy, *Natural Gas Imports and Exports, Fourth Quarter Report 1998*, DOE/FE-0388 (March 1999), p. *vii.*

length from Chalk Bluff, Colorado to Windsor, Colorado. Complementing the Front Range project was the completion of Wyoming Interstate Gas' System Expansion, which was accomplished by the installation of new compression, adding 52 million cubic feet per day of new capacity in central Wyoming.

- The largest single new pipeline project (in terms of capacity) completed in the United States in 1998 was the Destin Pipeline System. Placed in service in July 1998, this 230-mile pipeline system is capable of flowing up to 1 billion cubic feet per day from the deep-water Destin Dome area in the Gulf of Mexico onshore to interconnections with five interstate pipelines in Mississippi.

- The Portland Natural Gas Transmission System (PNGTS) project, originally scheduled to be in service by late 1998 but delayed until March 1999, is capable of importing up to 178 million cubic feet per day at the U.S./Canadian border near Pittsburgh, New Hampshire. The destination of the line is Westbrook, Maine, where it connects with the recently completed joint PNGTS/Maritimes and Northeast Pipeline located in southeastern Maine. The Portland project replaces the existing Portland Pipeline, a reconditioned oil pipeline that is now being converted back to oil use.

- In 1999, supplies from Canada will be augmented with production from the Sable Island offshore project in the northern Atlantic. This project is seen as a change with potentially far-reaching consequences as it will be the first commercial production of natural gas from a major Atlantic field off North America. The Maritimes and Northeast Pipeline System will bring these gas supplies to New England beginning in November 1999. It will be capable of transporting up to 440 million cubic feet per day of gas.

- In 2000, the Alliance Pipeline, designed to bring rising levels of production from western Canada into the U.S. Midwest, will add 1.3 billion cubic feet per day of capacity. The terminus of the line will be south of Chicago, Illinois. This project is enhanced by its unique ability to ship "wet" natural gas, which is natural gas that has not been processed to remove hydrocarbon liquids. Capacity additions within the United States are also proposed for moving Canadian and domestic gas from the Midwest to the Northeast.

Table 8. Interstate Movements and Movements Across U.S. Borders of Natural Gas by State, 1998
(Million Cubic Feet)

State	State or Country From/To	Volume		
		Receipts/ Imports From	Deliveries/ Exports To	Net[a]
Alabama				
	Florida	0	455,199	-455,199
	Georgia	0	1,511,671	-1,511,671
	Louisiana	0	[b]1	-1
	Mississippi	2,868,594	[b]*	2,868,594
	Oklahoma	0	[b]*	*
	South Carolina	0	[b]7	-7
	Tennessee	395	1,103,063	-1,102,668
	Texas	0	[b]1	-1
	Total	**2,868,989**	**3,069,942**	**-200,953**
Alaska				
	Japan	0	[c]65,951	-65,951
	Total	**0**	**65,951**	**-65,951**
Arizona				
	California	0	946,692	-946,692
	Mexico	0	4,166	-4,166
	Nevada	0	35,825	-35,825
	New Mexico	1,069,361	0	1,069,361
	Total	**1,069,361**	**986,683**	**82,678**
Arkansas				
	Louisiana	1,752,707	156,161	1,596,545
	Mississippi	0	1,659,451	-1,659,451
	Missouri	2,161	594,622	-592,462
	Oklahoma	312,540	202	312,338
	Texas	443,415	3,670	439,744
	Total	**2,510,822**	**2,414,107**	**96,715**
California				
	Arizona	946,692	0	946,692
	Mexico	0	2,067	-2,067
	Nevada	236,624	0	236,624
	Oregon	637,117	0	637,117
	Total	**1,820,433**	**2,067**	**1,818,366**
Colorado				
	Kansas	0	106,521	-106,521
	Nebraska	180,048	207,051	-27,003
	New Mexico	0	287,827	-287,827
	Oklahoma	3,926	57,878	-53,952
	Utah	82,073	17,500	64,574
	Wyoming	466,368	252,249	214,119
	Total	**732,416**	**929,026**	**-196,610**
Connecticut				
	Massachusetts	1,228	0	1,228
	New York	341,254	78,692	262,561
	Rhode Island	0	148,952	-148,952
	Total	**342,482**	**227,644**	**114,837**
Delaware				
	Maryland	0	3,308	-3,308
	Pennsylvania	40,057	0	40,057
	Total	**40,057**	**3,308**	**36,749**
District of Columbia				
	Maryland	11,135	0	11,135
	Virginia	20,029	0	20,029
	Total	**31,164**	**0**	**31,164**

See footnotes at end of table.

Table 8. Interstate Movements and Movements Across U.S. Borders of Natural Gas by State, 1998 (Continued)

(Million Cubic Feet)

State	State or Country From/To	Volume		
		Receipts/ Imports From	Deliveries/ Exports To	Net[a]
Florida				
	Alabama	455,199	0	455,199
	Georgia	17,434	0	17,434
	Total	**472,632**	**0**	**472,632**
Georgia				
	Alabama	1,511,671	0	1,511,671
	Florida	0	17,434	-17,434
	South Carolina	0	1,091,913	-1,091,913
	Tennessee	0	7,500	-7,500
	Total	**1,511,671**	**1,116,847**	**394,824**
Idaho				
	Canada	879,840	0	879,840
	Nevada	0	43,092	-43,092
	Oregon	103,240	0	103,240
	Utah	148	0	148
	Washington	76	892,007	-891,931
	Total	**983,304**	**935,098**	**48,205**
Illinois				
	Indiana	76,515	1,030,674	-954,160
	Iowa	832,177	28,133	804,044
	Kentucky	355,850	0	355,850
	Missouri	831,469	0	831,469
	Wisconsin	65,820	162,529	-96,709
	Total	**2,161,831**	**1,221,336**	**940,495**
Indiana				
	Illinois	1,030,674	76,515	954,160
	Kentucky	793,968	0	793,968
	Michigan	21,530	368,236	-346,706
	Ohio	22,938	883,606	-860,668
	Total	**1,869,111**	**1,328,356**	**540,755**
Iowa				
	Illinois	28,133	832,177	-804,044
	Minnesota	530,154	192,518	337,636
	Missouri	218,644	0	218,644
	Nebraska	515,531	0	515,531
	South Dakota	238	5	233
	Total	**1,292,698**	**1,024,700**	**267,998**
Kansas				
	Colorado	106,521	0	106,521
	Missouri	0	474,343	-474,343
	Nebraska	58,670	676,817	-618,147
	Oklahoma	905,739	651	905,088
	Total	**1,070,930**	**1,151,812**	**-80,882**
Kentucky				
	Illinois	0	355,850	-355,850
	Indiana	0	793,968	-793,968
	Ohio	4,611	1,005,985	-1,001,373
	Tennessee	3,058,358	0	3,058,358
	West Virginia	0	720,373	-720,373
	Total	**3,062,969**	**2,876,176**	**186,793**
Louisiana				
	Alabama	[b]1	0	1
	Algeria	[c]30,561	0	30,561
	Arkansas	156,161	1,752,707	-1,596,545
	Australia	[c]7,110	0	7,110
	Mississippi	303	3,437,603	-3,437,300

See footnotes at end of table.

Table 8. Interstate Movements and Movements Across U.S. Borders of Natural Gas by State, 1998 (Continued)

(Million Cubic Feet)

State	State or Country From/To	Volume		
		Receipts/ Imports From	Deliveries/ Exports To	Net[a]
	Texas	1,515,814	24,635	1,491,179
	United Arab Emirates	[c]5,252	0	5,252
	Total	**1,715,202**	**5,214,945**	**-3,499,743**
Maine				
	Massachusetts	[b]6	0	6
	New Hampshire	5,728	0	5,728
	Total	**5,734**	**0**	**5,734**
Maryland				
	Delaware	3,308	0	3,308
	District of Columbia	0	11,135	-11,135
	Pennsylvania	45,978	681,056	-635,078
	Virginia	845,244	21,886	823,358
	Total	**894,531**	**714,077**	**180,453**
Massachusetts				
	Algeria	[c]38,007	0	38,007
	Australia	[c]4,524	0	4,524
	Connecticut	0	1,228	-1,228
	Maine	0	[b]6	-6
	New Hampshire	0	18,774	-18,774
	New York	244,052	0	244,052
	Rhode Island	106,096	52,351	53,745
	Total	**392,679**	**72,360**	**320,320**
Michigan				
	Canada	47,343	499,144	-451,801
	Indiana	368,236	21,530	346,706
	Ohio	198,704	0	198,704
	Wisconsin	739,478	129,211	610,267
	Total	**1,353,760**	**649,885**	**703,875**
Minnesota				
	Canada	956,733	0	956,733
	Iowa	192,518	530,154	-337,636
	North Dakota	0	10,796	-10,796
	South Dakota	598,004	0	598,004
	Wisconsin	595	876,281	-875,686
	Total	**1,747,850**	**1,417,230**	**330,620**
Mississippi				
	Alabama	[b]*	2,868,594	-2,868,594
	Arkansas	1,659,451	0	1,659,451
	Louisiana	3,437,603	303	3,437,300
	Tennessee	1,051	2,217,587	-2,216,536
	Total	**5,098,105**	**5,086,484**	**11,621**
Missouri				
	Arkansas	594,622	2,161	592,462
	Illinois	0	831,469	-831,469
	Iowa	0	218,644	-218,644
	Kansas	474,343	0	474,343
	Nebraska	221,512	0	221,512
	Total	**1,290,478**	**1,052,273**	**238,205**
Montana				
	Canada	580,548	0	580,548
	North Dakota	10,304	567,489	-557,185
	South Dakota	0	4,908	-4,908
	Wyoming	6,106	246	5,859
	Total	**596,958**	**572,643**	**24,315**

See footnotes at end of table.

Table 8. Interstate Movements and Movements Across U.S. Borders of Natural Gas by State, 1998 (Continued)

(Million Cubic Feet)

State	State or Country From/To	Volume		
		Receipts/ Imports From	Deliveries/ Exports To	Net[a]
Nebraska				
	Colorado	207,051	180,048	27,003
	Iowa	0	515,531	-515,531
	Kansas	676,817	58,670	618,147
	Missouri	0	221,512	-221,512
	South Dakota	0	12,210	-12,210
	Wyoming	257,640	0	257,640
	Total	**1,141,508**	**987,971**	**153,537**
Nevada				
	Arizona	35,825	0	35,825
	California	0	236,624	-236,624
	Idaho	43,092	0	43,092
	Utah	278,778	0	278,778
	Total	**357,695**	**236,624**	**121,071**
New Hampshire				
	Maine	0	5,728	-5,728
	Massachusetts	18,774	0	18,774
	Vermont	11,319	0	11,319
	Total	**30,093**	**5,728**	**24,365**
New Jersey				
	New York	0	630,054	-630,054
	Pennsylvania	1,154,761	0	1,154,761
	Total	**1,154,761**	**630,054**	**524,708**
New Mexico				
	Arizona	0	1,069,361	-1,069,361
	Colorado	287,827	0	287,827
	Texas	4,470	389,821	-385,351
	Total	**292,297**	**1,459,182**	**-1,166,885**
New York				
	Canada	666,256	0	666,256
	Connecticut	78,692	341,254	-262,561
	Massachusetts	0	244,052	-244,052
	New Jersey	630,054	0	630,054
	Pennsylvania	333,540	101,576	231,964
	Total	**1,708,542**	**686,882**	**1,021,660**
North Carolina				
	South Carolina	957,525	0	957,525
	Virginia	5,019	721,564	-716,545
	Total	**962,544**	**721,564**	**240,980**
North Dakota				
	Canada	9,268	0	9,268
	Minnesota	10,796	0	10,796
	Montana	567,489	10,304	557,185
	South Dakota	0	616,740	-616,740
	Total	**587,553**	**627,044**	**-39,491**
Ohio				
	Indiana	883,606	22,938	860,668
	Kentucky	1,005,985	4,611	1,001,373
	Michigan	0	198,704	-198,704
	Pennsylvania	7,911	409,375	-401,464
	West Virginia	210,788	705,933	-495,145
	Total	**2,108,289**	**1,341,561**	**766,728**

See footnotes at end of table.

Table 8. Interstate Movements and Movements Across U.S. Borders of Natural Gas by State, 1998 (Continued)

(Million Cubic Feet)

State	State or Country From/To	Volume		
		Receipts/ Imports From	Deliveries/ Exports To	Net[a]
Oklahoma				
	Alabama	[b]*	0	*
	Arkansas	202	312,540	-312,338
	Colorado	57,878	3,926	53,952
	Kansas	651	905,739	-905,088
	Texas	598,571	316,414	282,157
	Total	**657,304**	**1,538,619**	**-881,316**
Oregon				
	California	0	637,117	-637,117
	Idaho	0	103,240	-103,240
	Washington	957,810	76	957,734
	Total	**957,810**	**740,433**	**217,378**
Pennsylvania				
	Delaware	0	40,057	-40,057
	Maryland	681,056	45,978	635,078
	New Jersey	0	1,154,761	-1,154,761
	New York	101,576	333,540	-231,964
	Ohio	409,375	7,911	401,464
	West Virginia	1,011,395	8,907	1,002,488
	Total	**2,203,403**	**1,591,154**	**612,248**
Rhode Island				
	Connecticut	148,952	0	148,952
	Massachusetts	52,351	106,096	-53,745
	Total	**201,303**	**106,096**	**95,207**
South Carolina				
	Alabama	[b]7	0	7
	Georgia	1,091,913	0	1,091,913
	North Carolina	0	957,525	-957,525
	Total	**1,091,920**	**957,525**	**134,395**
South Dakota				
	Iowa	5	238	-233
	Minnesota	0	598,004	-598,004
	Montana	4,908	0	4,908
	Nebraska	12,210	0	12,210
	North Dakota	616,740	0	616,740
	Wyoming	0	231	-231
	Total	**633,863**	**598,472**	**35,390**
Tennessee				
	Alabama	1,103,063	395	1,102,668
	Georgia	7,500	0	7,500
	Kentucky	0	3,058,358	-3,058,358
	Mississippi	2,217,587	1,051	2,216,536
	Virginia	0	181	-181
	Total	**3,328,150**	**3,059,985**	**268,165**
Texas				
	Alabama	[b]1	0	1
	Arkansas	3,670	443,415	-439,744
	Louisiana	24,635	1,515,814	-1,491,179
	Mexico	14,532	46,933	-32,401
	New Mexico	389,821	4,470	385,351
	Oklahoma	316,414	598,571	-282,157
	Total	**749,073**	**2,609,203**	**-1,860,129**
Utah				
	Colorado	17,500	82,073	-64,574
	Idaho	0	148	-148
	Nevada	0	278,778	-278,778

See footnotes at end of table.

Table 8. Interstate Movements and Movements Across U.S. Borders of Natural Gas by State, 1998 (Continued)

(Million Cubic Feet)

State	State or Country From/To	Volume		
		Receipts/ Imports From	Deliveries/ Exports To	Net[a]
	Wyoming	402,512	15,225	387,288
	Total	**420,012**	**376,224**	**43,788**
Vermont				
	Canada	18,998	0	18,998
	New Hampshire	0	11,319	-11,319
	Total	**18,998**	**11,319**	**7,679**
Virginia				
	District of Columbia	0	20,029	-20,029
	Maryland	21,886	845,244	-823,358
	North Carolina	721,564	5,019	716,545
	Tennessee	181	0	181
	West Virginia	348,206	2,259	345,947
	Total	**1,091,838**	**872,552**	**219,286**
Washington				
	Canada	374,666	208	374,458
	Idaho	892,007	76	891,931
	Oregon	76	957,810	-957,734
	Total	**1,266,748**	**958,094**	**308,654**
West Virginia				
	Kentucky	720,373	0	720,373
	Ohio	705,933	210,788	495,145
	Pennsylvania	8,907	1,011,395	-1,002,488
	Virginia	2,259	348,206	-345,947
	Total	**1,437,472**	**1,570,388**	**-132,917**
Wisconsin				
	Illinois	162,529	65,820	96,709
	Michigan	129,211	739,478	-610,267
	Minnesota	876,281	595	875,686
	Total	**1,168,021**	**805,893**	**362,128**
Wyoming				
	Colorado	252,249	466,368	-214,119
	Montana	246	6,106	-5,859
	Nebraska	0	257,640	-257,640
	South Dakota	231	0	231
	Utah	15,225	402,512	-387,288
	Total	**267,950**	**1,132,626**	**-864,676**
Total Natural Gas Movements		**58,773,312**	**55,758,142**	**3,015,170**
Movements Across U.S. Borders		**[d]3,633,638**	**[e]618,468**	**3,015,170**
U.S. Interstate Movements		**55,139,674**	**55,139,674**	**0**

* = Volume is less than 500,000 cubic feet.

[a] Positive numbers denote net receipts; negative numbers denote net deliveries.

[b] Natural gas transported by truck either as liquefied natural gas (LNG) or compressed natural gas (CNG).

[c] LNG transported by ship.

[d] Volumes include 3,152,058 million cubic feet of imports from Mexico, Algeria, United Arab Emirates, Australia, and Canada, and 481,581 million cubic feet of intransit receipts from Canada.

[e] Volumes include 159,007 million cubic feet of exports to Japan, Mexico, and Canada, and 459,461 million cubic feet of intransit natural gas deliveries to Canada.

Note: Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration (EIA), Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition."

ENERGY INFORMATION ADMINISTRATION

Interstate Movements of Natural Gas in the United States, 1998

(Volumes Reported in Million Cubic Feet)

Supplemental Data

From	Volume	To	From	Volume	To
(T) AL	7	SC	(T) MA	6	ME
(T) AL	1	LA	MA	18,774	NH
(T) AL	1	TX	MD	11,135	DC
CT	148,952	RI	RI	53,745	MA
DE	3,308	MD	VA	20,029	DC
MA	1,228	CT			

(T) Trucked

Source: Energy Information Administration (EIA), Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition."

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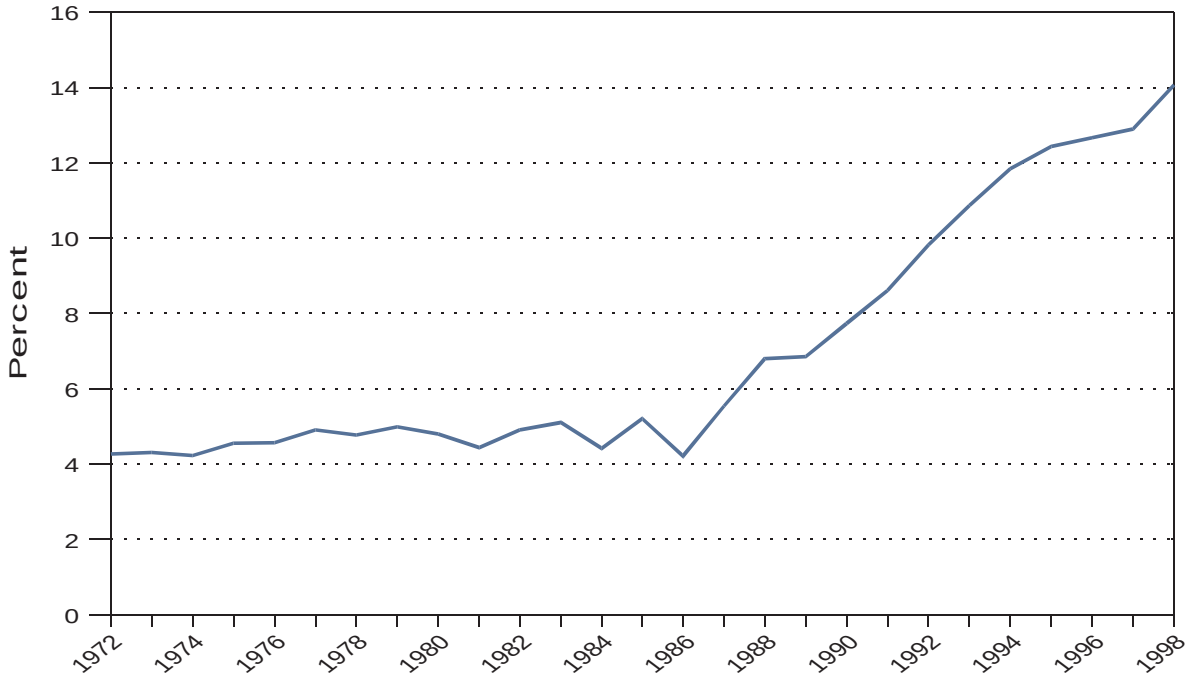
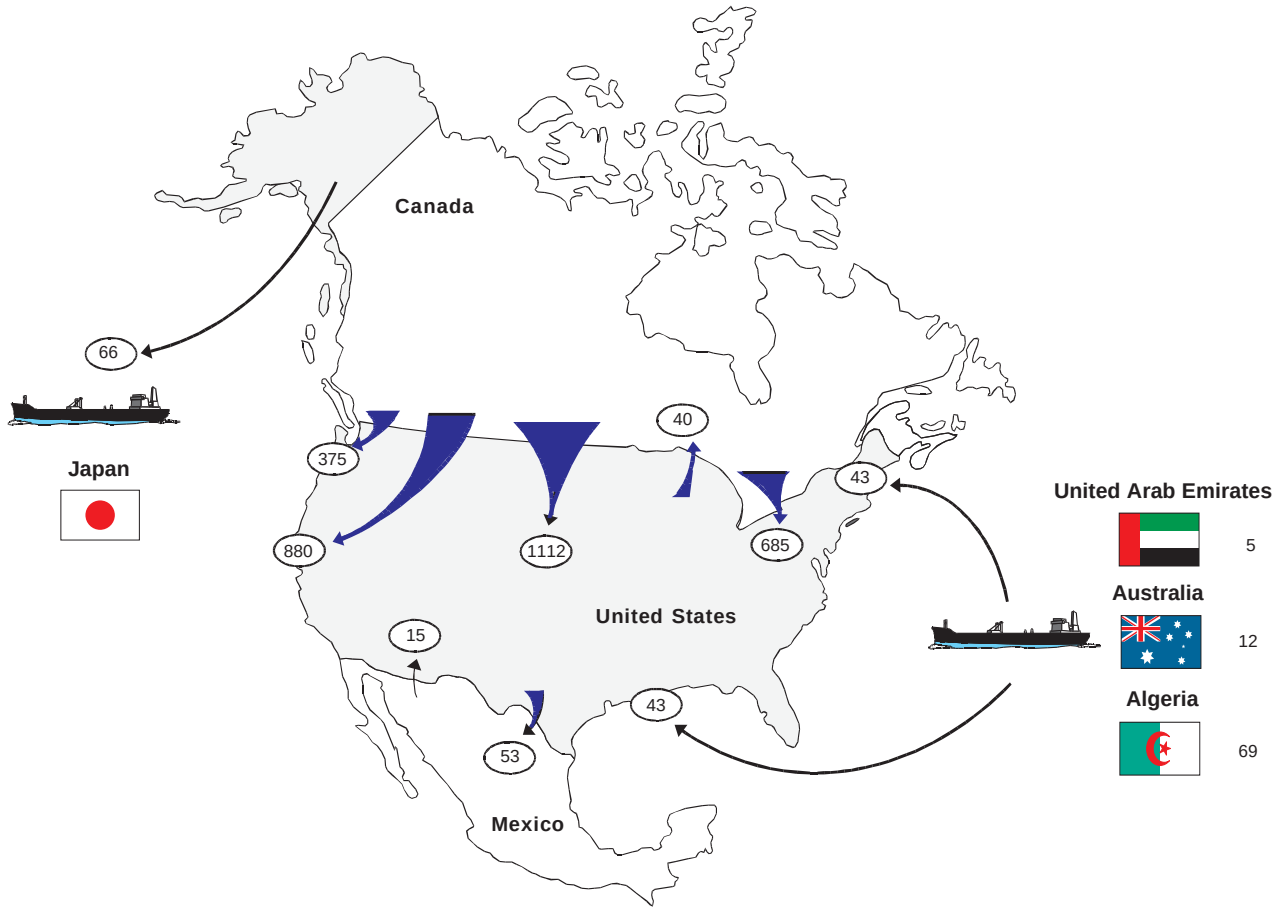
Energy Information Administration / Natural Gas Annual 1998

Figure 7. Net Imports as a Percentage of Total Consumption of Natural Gas, 1972-1998



Sources: 1972-1975: Bureau of Mines, *Minerals Yearbook*, "Natural Gas" chapter. 1976-1978: Energy Information Administration (EIA), Energy Data Reports, *Natural Gas Annual*. 1979: EIA, *Natural Gas Production 1979*. 1980-1989: EIA, Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition"; Form EIA-759, "Monthly Power Plant Report"; and Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas"; 1990: EIA, Form EIA-176, Form EIA-759, Form FPC-14, and Form EIA-64A, "Annual Report of the Origin of Natural Gas Liquids Production"; 1991-1994: EIA, Form EIA-176, Form EIA-759, Form FPC-14, Form EIA-64A, and Form EIA-627, "Annual Quantity and Value of Natural Gas Report"; 1995: EIA, Form EIA-176, Form EIA-759, Form EIA-64A, Form EIA-627, and Office of Fossil Energy, U.S. Department of Energy, Natural Gas Imports and Exports; 1996 through 1998: EIA, Form EIA-176, Form EIA-759, Form EIA-64A, Form EIA-895, "Monthly Quantity and Value of Natural Gas Report," and Office of Fossil Energy.

Figure 8. Flow of Natural Gas Imports and Exports, 1998
(Billion Cubic Feet)



Source: Office of Fossil Energy, U.S. Department of Energy, Natural Gas Imports and Exports.

Table 9. Summary of U.S. Natural Gas Imports and Exports, 1994-1998

	1994	1995	1996	1997	1998
Imports					
Volume (million cubic feet)					
Pipeline					
Canada	2,566,049	2,816,408	2,883,277	2,899,152	3,052,073
Mexico	7,013	6,722	13,862	17,243	14,532
Total Pipeline Imports	**2,573,061**	**2,823,130**	**2,897,138**	**2,916,394**	**3,066,605**
LNG					
Algeria	50,778	17,918	35,325	65,675	68,567
Australia	0	0	0	9,686	11,634
United Arab Emirates	0	0	4,949	2,417	5,252
Total LNG Imports	**50,778**	**17,918**	**40,274**	**77,778**	**85,453**
Total Imports	**2,623,839**	**2,841,048**	**2,937,413**	**2,994,173**	**3,152,058**
Average Price (dollars per thousand cubic feet)					
Pipeline					
Canada	1.86	1.48	1.96	2.15	1.95
Mexico	1.99	1.53	2.25	2.31	2.03
Total Pipeline Imports	**1.86**	**1.48**	**1.96**	**2.15**	**1.95**
LNG					
Algeria	2.28	2.30	2.70	2.67	2.51
Australia	—	—	—	2.92	3.30
United Arab Emirates	—	—	3.46	3.74	2.63
Total LNG Imports	**2.28**	**2.30**	**2.80**	**2.74**	**2.63**
Total Imports	**1.87**	**1.49**	**1.97**	**2.17**	**1.97**
Exports					
Volume (million cubic feet)					
Pipeline					
Canada	52,556	27,554	51,905	56,447	39,891
Mexico	46,500	61,283	33,840	38,372	53,133
Total Pipeline Exports	**99,057**	**88,836**	**85,745**	**94,818**	**93,023**
LNG					
Japan	62,682	65,283	67,648	62,187	65,951
Mexico	0	0	0	0	33
Total LNG Exports	**62,682**	**65,283**	**67,648**	**62,187**	**65,984**
Total Exports	**161,738**	**154,119**	**153,393**	**157,006**	**159,007**
Average Price (dollars per thousand cubic feet)					
Canada	2.42	1.96	2.67	2.52	2.25
Mexico	1.68	1.50	2.11	2.46	2.04
Total Pipeline Exports	**2.08**	**1.64**	**2.45**	**2.49**	**2.13**
LNG					
Japan	3.18	3.41	3.65	3.83	2.91
Mexico	—	—	—	—	5.69
Total LNG Exports	**3.18**	**3.41**	**3.65**	**3.83**	**2.91**
Total Exports	**2.50**	**2.39**	**2.97**	**3.02**	**2.45**

— = Not applicable.

Notes: Prices for LNG imports are reported as "landed," received at the terminal, or "tailgate," after regasification at the terminal. Generally the reporting of LNG import prices varies by point of entry, and the average prices are calculated from a combination of both types of prices. The price of LNG exports to Japan is the "landed" price, defined as received at the terminal in Japan. Details concerning the reporting of LNG prices are given in the Special Report, "U.S. Natural Gas Imports and Exports – 1998," in the August 1999 issue of the *Natural Gas Monthly*. Totals may not equal sum of components due to independent rounding.

Sources: Energy Information Administration, Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas" (1994), and Office of Fossil Energy, U.S. Department of Energy, Natural Gas Imports and Exports (1995 through 1998).

Table 10. Additions to and Withdrawals from Gas Storage by State, 1998
(Million Cubic Feet)

State	Underground Storage			LNG Storage			Net Change in Storage
	Injections	Withdrawals	Net	Additions	Withdrawals	Net	
Alabama	2,220	1,774	447	501	469	32	478
Arkansas	6,951	5,178	1,774	64	62	2	1,776
California	172,343	131,374	40,969	37	150	-114	40,855
Colorado	39,789	34,717	5,072	0	0	0	5,072
Connecticut	0	0	0	447	381	66	66
Delaware	0	0	0	77	70	8	8
Georgia	0	0	0	1,760	2,458	-698	-698
Idaho	0	0	0	776	1,236	-460	-460
Illinois	225,089	215,309	9,780	60	410	-351	9,430
Indiana	22,034	21,113	921	1,589	1,102	486	1,407
Iowa	70,001	67,047	2,954	1,269	989	280	3,234
Kansas	117,235	98,402	18,833	0	0	0	18,833
Kentucky	65,267	53,567	11,700	0	0	0	11,700
Louisiana	321,681	238,821	82,860	30,385	16,515	13,871	96,731
Maine	0	0	0	61	44	17	17
Maryland	14,627	13,751	876	813	29	785	1,660
Massachusetts	0	0	0	2,712	9,955	-7,243	-7,243
Michigan	391,041	316,201	74,840	0	0	0	74,840
Minnesota	1,291	1,663	-372	1,233	1,269	-36	-408
Mississippi	69,268	59,083	10,185	0	0	0	10,185
Missouri	2,670	2,843	-173	0	0	0	-173
Montana	23,876	23,476	400	0	0	0	400
Nebraska	5,264	6,730	-1,466	0	351	-351	-1,817
Nevada	0	0	0	92	124	-31	-31
New Jersey	0	0	0	4,922	4,305	617	617
New Mexico	16,821	10,342	6,479	0	0	0	6,479
New York	63,298	52,642	10,656	318	260	58	10,715
North Carolina	0	0	0	1,286	1,083	203	203
Ohio	191,831	165,159	26,672	0	0	0	26,672
Oklahoma	165,631	117,623	48,008	0	0	0	48,008
Oregon	5,673	4,395	1,278	757	1,014	-256	1,022
Pennsylvania	328,118	288,109	40,009	5,092	4,559	533	40,541
Rhode Island	0	0	0	102	851	-749	-749
South Carolina	0	0	0	56	406	-350	-350
South Dakota	0	0	0	44	53	-9	-9
Tennessee	453	391	62	1,816	3,562	-1,746	-1,684
Texas	344,461	242,343	102,118	0	0	0	102,118
Utah	23,744	24,420	-676	0	0	0	-676
Virginia	2,369	1,859	510	632	774	-142	368
Washington	23,136	22,597	539	902	1,779	-877	-338
West Virginia	172,191	143,924	28,267	0	0	0	28,267
Wisconsin	0	0	0	85	106	-21	-21
Wyoming	15,212	12,493	2,719	0	0	0	2,719
Total	**2,903,585**	**2,377,344**	**526,241**	**57,887**	**54,365**	**3,522**	**529,763**

Note: Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration, Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition."

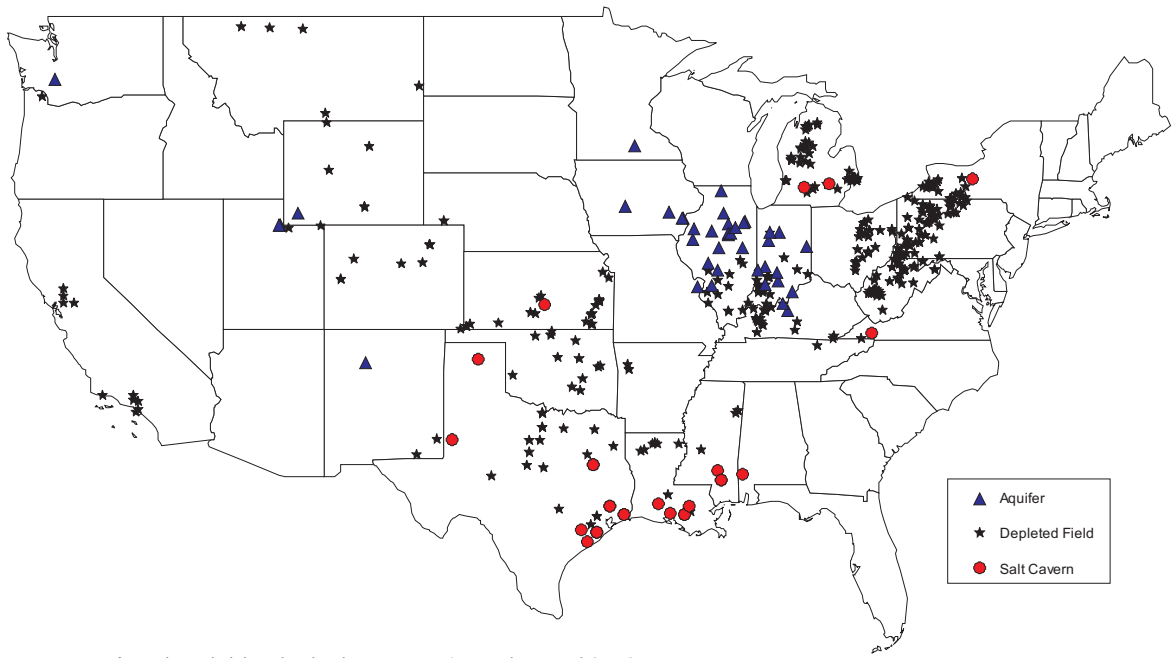
Table 11. Underground Natural Gas Storage Capacity by State, December 31, 1998
(Capacity in Billion Cubic Feet)

State	Interstate Companies		Intrastate Companies		Independent Companies		Total		
	Number of Active Fields	Capacity	Number of Active Fields	Capacity	Number of Active Fields	Capacity	Number of Active Fields	Capacity	Percent of U.S. Capacity
Alabama	0	0	1	3	0	0	1	3	0.04
Arkansas	0	0	2	24	0	0	2	24	0.30
California	0	0	9	388	0	0	9	388	4.75
Colorado	4	66	5	34	0	0	9	100	1.22
Illinois	6	259	24	639	0	0	30	899	10.99
Indiana	6	16	22	97	0	0	28	113	1.38
Iowa	4	273	0	0	0	0	4	273	3.34
Kansas	16	294	2	8	0	0	18	301	3.68
Kentucky	6	167	19	53	0	0	25	220	2.69
Louisiana	8	530	5	33	0	0	13	564	6.89
Maryland	1	62	0	0	0	0	1	62	0.76
Michigan	30	779	18	242	0	0	48	1,022	12.49
Minnesota	0	0	1	7	0	0	1	7	0.09
Mississippi	3	121	4	13	0	0	7	134	1.64
Missouri	0	0	1	31	0	0	1	31	0.38
Montana	1	287	4	84	0	0	5	372	4.54
Nebraska	1	39	0	0	0	0	1	39	0.48
New Mexico	1	69	2	28	0	0	3	97	1.18
New York	20	165	2	10	0	0	22	175	2.14
Ohio	15	392	8	183	0	0	23	575	7.03
Oklahoma	6	213	3	57	4	124	13	395	4.83
Oregon	0	0	3	12	0	0	3	12	0.14
Pennsylvania	34	624	18	38	7	23	59	685	8.37
Tennessee	0	0	1	1	0	0	1	1	0.02
Texas	10	240	23	442	1	3	34	684	8.37
Utah	3	122	0	0	0	0	3	122	1.49
Virginia	0	0	2	5	0	0	2	5	0.06
Washington	1	37	0	0	0	0	1	37	0.46
West Virginia	26	692	0	0	10	41	36	733	8.96
Wyoming	3	76	4	30	0	0	7	106	1.29
Total	**205**	**5,525**	**183**	**2,462**	**22**	**191**	**410**	**8,179**	**100.00**

Note: Totals may not equal sum of components due to independent rounding.

Source: Energy Information Administration (EIA), Form EIA-191, "Underground Gas Storage Report."

Figure 9. Locations of Existing Natural Gas Underground Storage Fields in the United States



Source: Energy Information Administration (EIA), Form EIA-191, "Underground Gas Storage Report."

Table 12. Supplemental Gas Supplies by State, 1998
(Million Cubic Feet)

State	Synthetic Natural Gas	Propane-Air	Refinery Gas	Biomass Gas	Other	Total
Alabama	0	2	0	0	0	2
Colorado	0	6	0	0	[a]5,285	5,292
Connecticut	0	33	0	0	0	33
Georgia	0	16	0	0	0	16
Hawaii	2,715	0	0	0	0	2,715
Illinois	0	50	2,686	0	0	2,736
Indiana	0	716	0	0	[b]2,433	3,149
Iowa	0	17	0	0	0	17
Kentucky	0	2	0	0	0	2
Maine	0	24	0	0	0	24
Maryland	0	80	0	0	0	80
Massachusetts	0	68	0	0	0	68
Michigan	0	0	0	0	[c]21,967	21,967
Minnesota	0	50	0	0	0	50
Missouri	0	40	0	0	0	40
Nebraska	0	11	0	0	0	11
New Hampshire	0	103	0	0	0	103
New Jersey	0	0	8,214	869	0	9,082
New York	0	7	0	692	0	699
North Dakota	54,672	0	0	0	0	54,672
Ohio	0	24	0	1,170	0	1,194
Oregon	0	2	0	0	0	2
Pennsylvania	0	80	0	0	0	80
Rhode Island	0	1	0	0	0	1
South Dakota	0	4	0	0	0	4
Tennessee	0	4	0	0	0	4
Virginia	0	148	0	0	0	148
Total	**57,387**	**1,488**	**10,900**	**2,731**	**29,685**	**102,189**

[a] Air injection for Btu stabilization.
[b] Coke oven gas.
[c] Blast furnace gas.

Note: Totals may not equal sum of components due to independent rounding.
Source: Energy Information Administration (EIA), Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition."