

5. Access to Transportation Markets

The physical capability of the U.S. natural gas pipeline network is only one part of transportation deliverability. Just as important is the contractual structure governing the flow of gas along the network and the shipper's access to pipeline capacity. Under Federal Energy Regulatory Commission (FERC) Order 636, which was implemented in November 1993, market participants must make their own arrangements for shipping gas. The contract serves as the service agreement for the level, quality, location (e.g., receipt and delivery points), and price for the transportation service.

Shippers can contract for several types of transportation services, including high-quality firm services, such as firm transportation and no-notice service,⁹⁷ and those services subject to disruption, such as interruptible transportation and released capacity subject to recall.⁹⁸ The types of services selected depend on the purpose for which the gas is being moved. For example, a local distribution company responsible for supplying the gas needs of residential and commercial customers is likely to have a greater share of its transportation under firm contracts than an industrial shipper that can use interruptible service or easily switch to an alternative fuel.

The value of a particular type of transportation service to a shipper will depend on where and when it is available, its cost, and how it fits into the shipper's overall portfolio of services. If a shipper needs to have natural gas delivered to a particular point next week, it would contract for service along a line that has the capacity and services available to make that delivery. Similar services along a pipeline segment in another area or for a different time period would not have the same value to the shipper. The availability of each type of transportation service depends on the physical capability of the pipeline network, how much of that capacity is reserved by shippers, the terms and types of the contracts in place, and the extent to which current contract holders use the system.⁹⁹ All of these factors must be considered when assessing the overall deliverability of the pipeline transportation system.

This chapter provides a general picture of how shippers use the interstate transportation system and estimates the unused capability of the system, on the basis of data for a sample of 46 interstate pipeline companies that accounted for 97 percent of interstate transportation deliveries in 1996. The chapter examines how shippers reserve interstate pipeline capacity in today's marketplace and identifies how much capacity is controlled by primary shippers holding firm contracts. It also calculates capacity release levels to identify the portion of reserved capacity that may be accessed on the release market. Since the ownership of system capability does not necessarily indicate utilization, the volume of gas transported under firm and interruptible services is also studied to complete the picture of transportation market accessibility.

Other parts of the interstate natural gas delivery system can also influence the level of a customer's reliance on the transportation market, such as the type and availability of storage and hub services. While these services may supplement transportation services, they cannot fully substitute for supply-to-market transportation of natural gas. Therefore, the focus of this chapter is on the services used for long-haul transportation. In the chapter, capacity and capacity trading are measured on a heat content or Btu basis to be consistent with the units generally used in natural gas contracts.

Estimating Capacity Availability

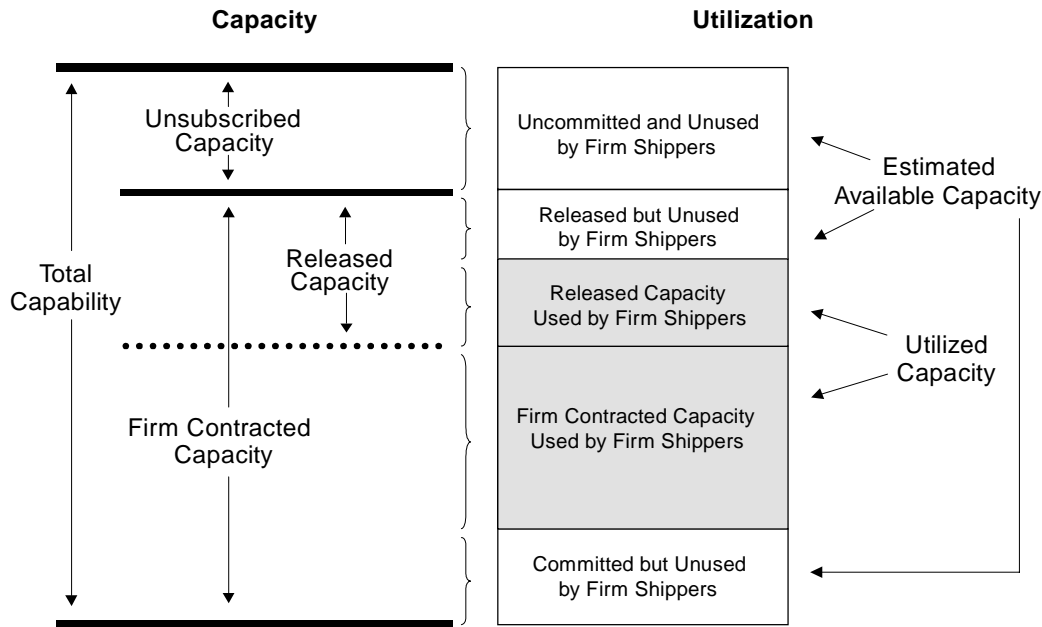
A question that is often raised is how much of the existing pipeline transmission capacity is available to meet additional firm service demand. In this analysis, the estimated available capacity (unused firm service capability) of the current system to transport natural gas is considered the sum of the amounts of unreserved capacity, unused released capacity, and unused firm contracted capacity. The total capability of the system can be divided between the reserved or committed capacity and the unsubscribed capacity. A subset of the reserved capacity can be identified as capacity released to other shippers. Although a significant amount of pipeline capacity is used throughout the year, some remains unused. The relationship between capability and utilization is illustrated in Figure 20. This particular example is not derived from actual information and may not resemble the scale of services, capacity, and utilization on any specific pipeline system. However, the chapter uses the concepts displayed in Figure 20 to analyze shippers' ability to access transportation services on a regional and systemwide basis.

⁹⁷No-notice service is generally a combination of firm transportation and storage services used to re-create the quality of service that customers previously received through pipeline company sales service (see Glossary). It allows shippers to use their full capacity commitment without advanced scheduling.

⁹⁸About 40 and 35 percent of the released capacity during the 1996 nonheating season and 1996-97 heating season, respectively, were not subject to recall and thus may be considered high-quality firm service.

⁹⁹If current capacity holders do not nominate to the pipeline to use their capacity (see p. 81), the pipeline company may offer the unused capacity to other shippers.

Figure 20. Relationship of Capacity and Utilization



Note: A firm shipper is one using firm transportation services.
 Source: Energy Information Administration, Office of Oil and Gas.

The maximum capability of the pipeline system is used in this analysis as the basis against which all other variables are measured to determine accessibility. The analysis uses a slightly different approach to determine maximum capability than that of Chapter 3, which estimates pipeline capacity on the basis of design throughput capability at State border crossings.¹⁰⁰ This chapter considers maximum capability to be the ability of the system to satisfy the maximum market demands at the pipeline system delivery points. This measurement assumes that if a demand can be met at the delivery point, then the transportation system can move that volume of gas.¹⁰¹

In the analysis, the maximum transportation capability of the interstate pipeline system is estimated on the basis of capacity data for a sample of 46 major pipeline companies that accounted for 97 percent of interstate transportation deliveries in 1996. The sample was selected to ensure that adequate and

uniform data on peak-day and monthly transportation were available for each company. The estimated maximum capacity of each company was determined by choosing the largest reported amount from the group of four sources of capacity information used in this analysis (see “Transportation System Access,” Appendix D).¹⁰² A pipeline company was considered to be located in the region in which it delivered the most gas.

The sample pipeline companies have a total maximum capability of 127 trillion Btu per day (Table 14). Thus, theoretically, they could deliver more than 46 quadrillion Btu of gas annually, or almost 1.6 times the total gas transported by major interstate pipeline companies in 1996. While this figure may provide a relatively good estimate for maximum capability, the extent to which shippers reserve and use this capacity provides a better indication of its availability.

¹⁰⁰Chapter 3 discusses the capability of pipeline systems to move gas from production to market areas. Therefore, system capability is estimated by measuring the amount of natural gas that can flow across State borders in a given day to determine the utilization of interregional transportation. It includes data only for those pipeline segments that reported gas flow.

¹⁰¹It should be noted that most pipeline companies’ systems handle loads through a series of receipt and delivery points and that all gas received by the pipeline does not enter at a single point. Nor does a pipeline company deliver all its customers’ maximum demands on the same day.

¹⁰²Several sources of information are used to develop a picture of transportation capability and use, including: annual capacity reports and accompanying Format 567, “System Flow Diagrams,” filed annually with the Federal Energy Regulatory Commission (FERC) by major interstate pipeline companies under 18 CFR §284.12 and §260.8; FERC Index of Customers filing; FERC Form 2, “Annual Report of Major Natural Gas Companies”; FERC Form 11, “Natural Gas Pipeline Company Quarterly Statement of Monthly Data”; and Energy Information Administration, Office of Oil and Gas, Capacity Release Awards dataset. See Appendix D for more detailed information on data sources.

Table 14. Reserved Firm Transportation Capacity by Region, July 1996 and January 1997

Region	Maximum Capability (trillion Btu per day)	Firm Transportation Contracts			
		As of July 1, 1996		As of January 1, 1997	
		Capacity (trillion Btu per day)	Concentration Ratio (percent)	Capacity (trillion Btu per day)	Concentration Ratio (percent)
Central	16.6	13.7	82	16.0	96
Midwest	31.1	24.2	78	28.4	91
Northeast	44.2	33.4	76	37.1	84
Southeast	6.0	5.1	85	4.9	81
Southwest	12.6	5.9	47	6.2	49
Western	16.6	14.3	86	14.0	84
U.S. Total	127.0	96.6	76	106.6	84

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

Sources: Energy Information Administration (EIA), Office of Oil and Gas, derived from pipeline company reports filed with the Federal Energy Regulatory Commission (FERC): 1996 Peak-Day Capacity Report (18 CFR §284.12); Index of Customers (April 1, 1996–April 1, 1997); Format FERC 567, “System Flow Diagrams” (1995); and FERC Form 2, “Annual Report of Major Natural Gas Companies” (1996).

Transportation Market Activity

Shippers must first obtain capacity to effectuate movement of gas on a pipeline system. Therefore, all shippers must have access to the firm or interruptible capacity markets to meet their needs. There are three ways in which a shipper can obtain pipeline transportation service:

- **Contract for firm transportation service.**¹⁰³ The shipper reserves a specific amount of capacity via a contract with the pipeline company.
- **Contract for interruptible transportation service.** Capacity that is not committed to firm transportation service or capacity that remains unused by the holder of firm transportation capacity may be offered by the pipeline as interruptible service. These contracts are typically for short periods of time. Changes in market conditions affect the size and availability of interruptible service.
- **Obtain capacity via the capacity release market.** A shipper with unused capacity for firm transportation service may choose to trade that capacity on the release market. The releasing shipper may or may not subject the capacity to recall, thereby making the service quality similar to interruptible or firm transportation service.

Once a shipper has a right to use capacity, it *nominates*, in writing or electronic form, the daily amount of gas it wants to

be received, delivered, or stored by the pipeline company. The shipper nominates capacity at specific receipt and delivery points along the pipeline system. The nomination of daily volumes may be renewed or changed on a monthly, daily, or intraday basis and may be for any quantity up to the maximum daily quantity (MDQ) specified in the contract.

Next, the pipeline company *confirms* each shipper’s nomination and inquires into any needed changes. Because there are many shippers making nominations, the pipeline company must look at the aggregate quantities and determine whether the pipeline system can tolerate the overall level of nominations during the confirmation process.

Once the pipeline company ascertains that the system can handle all shipper nominations, it *schedules* the gas, specifying gas flows in and out of each receipt and delivery point. The pipeline company determines priorities based upon type of service. For example, firm service will be scheduled ahead of interruptible service.

During the 1996-97 heating year (the 12 months ended March 31, 1997), on average 78 percent of physical capacity was committed to firm transportation contracts, according to pipeline company information filed with the Federal Energy Regulatory Commission. Although the amount of reserved capacity changes over time, particularly as the seasons change, the share of physical capacity committed to firm transportation service remained fairly constant during 1996 and 1997. A portion of the firm capacity, approximately 20 percent, was traded during the year to replacement

¹⁰³Includes firm transportation service and no-notice service.

shippers via the capacity release market.¹⁰⁴ Interruptible service accounted for 16 percent of transportation throughput during the 1996-97 heating year.¹⁰⁵

Activity in primary firm capacity markets,¹⁰⁶ which include firm transportation, no-notice service, and sales service,¹⁰⁷ has generally increased during the years since industry restructuring under FERC Order 636.¹⁰⁸ Since 1992, the volume of gas transported using firm services has grown at an average rate of 9 percent per year. Transportation under firm services increased from 11.5 quadrillion Btu in 1992 to 16 quadrillion Btu in 1996. Since its inception in 1993, the capacity release market has also grown dramatically. Although release activity declined slightly in 1996, it still represented 16 percent of the gas delivered for market at 3.6 quadrillion Btu. Unlike the firm and release markets, the interruptible transportation market has consistently declined since 1992. In 1996 only 2.9 quadrillion Btu was moved by interruptible transportation compared with 8.3 quadrillion Btu in 1992.

On the surface these results might imply that capacity markets are getting tighter, thus, squeezing out the nonfirm capacity market. However, transportation activity under various services provides only part of the story behind transportation market accessibility. In addition to throughput levels, the pipeline system's level of unsubscribed capacity must also be considered. For example, a pipeline system may have enough excess capacity to create a discounted firm transportation service that competes with interruptible transportation. Likewise, deliverability on the U.S. pipeline system is as much a product of availability as it is physical capacity. All the physical space on a pipeline system may be reserved under contract (fully subscribed), but if the reserved space is not in use by the firm shipper, it may be accessed by another shipper using interruptible or short-term firm service offered by the pipeline company. The underutilization of the pipeline system may also promote a strong market for released capacity. Therefore, all of these components should be reviewed to characterize the availability and accessibility of various transportation services.

¹⁰⁴Includes capacity subject to recall and that not subject to recall.

¹⁰⁵Based on information compiled by the Energy Information Administration from FERC Form 11, "Natural Gas Pipeline Company Quarterly Statement of Monthly Data" (1996).

¹⁰⁶"Primary" refers to firm service obtained directly from the pipeline company.

¹⁰⁷The volume of gas moved under pipeline company sales service has been virtually zero since 1995.

¹⁰⁸Interstate Natural Gas Association of America (INGAA), *Gas Transportation Through 1996* (May 1997).

Firm Transportation Service

As previously discussed, most gas deliveries in 1996 were under firm transportation contracts. Shippers may elect to contract for firm transportation service on an annual or seasonal basis. With a firm transportation contract, the shipper may reserve, what it estimates to be, the highest demand it will incur on the pipeline system on any given day.¹⁰⁹ Correspondingly, the pipeline company agrees to make that amount of capacity available to the shipper on a daily basis.

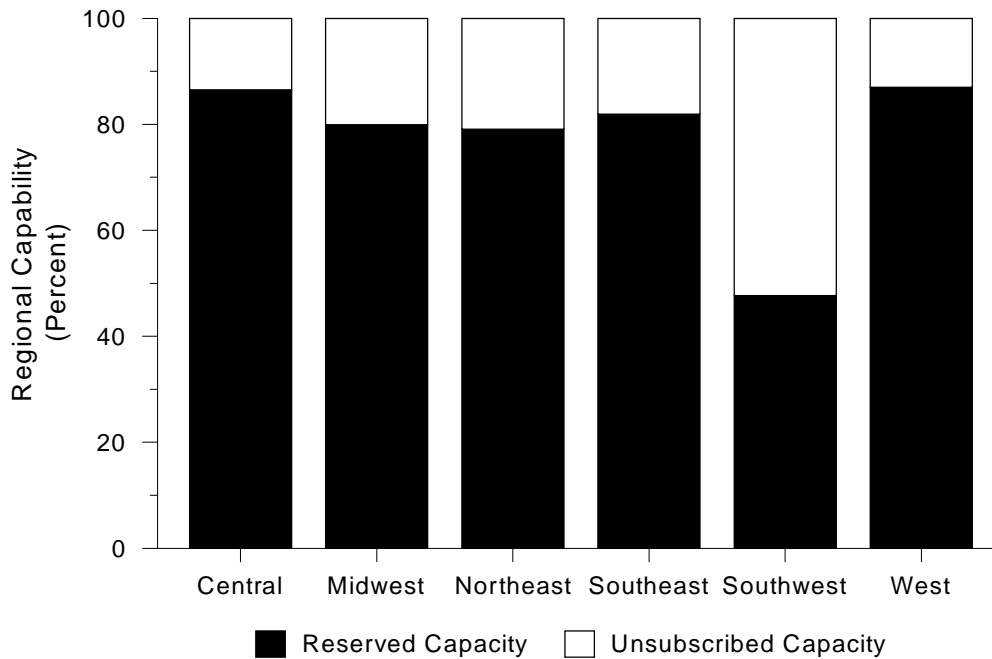
Pipeline companies disclose the amount of capacity reserved by each firm customer in the quarterly Index of Customers filing to the FERC. For each firm contract that is effective the first day of the calendar quarter, pipeline companies are required to provide: the name of the shipper, the amount of capacity reserved, the rate schedule under which service is provided, the beginning and ending dates of the contract, and whether the contract contains a rollover clause. The Index of Customers' filing provides the measurement of the reserved portion of the pipeline company's system capacity.

Data from these quarterly filings indicate that a large amount of pipeline capacity is reserved under firm contracts (Figure 21). In fact, the reservation concentration ratios—the percentage of maximum capability that is under a firm service contract—for the nonheating season (April through October) range from 76 to 86 percent in five of the six regions. The exception lies in the Southwest Region, which has a subscription rate of only 47 percent (Table 14). Subscription rates increased significantly during the heating season in the Central (from 82 to 96 percent), Midwest (from 78 to 91 percent), and Northeast (from 76 to 84 percent) regions, while all other regions experienced little change in reservation concentration between seasons.

Concentration ratios in the Southwest are lower than in the other regions because of the abundance of capacity on several production-oriented pipelines located in the region. Excluding these pipeline companies from the analysis would increase the concentration ratios in the Southwest from 47 to 73 percent for the nonheating season and from 49 to 77 percent for the heating season. However, removing these companies from the sample would not significantly alter the national concentration ratios; the ratios for the nonheating and heating seasons as well as the heating year would increase by 3 percentage points to 79, 87, and 81 percent, respectively.

¹⁰⁹A few pipeline companies allow customers to elect different amounts of service for the heating and non-heating seasons. This enables a heating load customer to subscribe to the required winter capacity without holding unneeded capacity in the summer.

Figure 21. Concentration of Reserved Firm Capacity by Region, April 1996 - April 1997



Note: Includes contracts for no-notice and firm transportation services.

Sources: Energy Information Administration (EIA), Office of Oil and Gas, derived from pipeline company reports filed with the Federal Energy Regulatory Commission (FERC): 1996 Peak-Day Capacity Report (18 CFR §284.12); Index of Customers (April 1, 1996-April 1, 1997); Format FERC 567, "System Flow Diagrams" (1995); and FERC Form 2, "Annual Report of Major Natural Gas Companies" (1996).

Since shippers base their contracted amounts on their maximum demand for any given day, they will frequently have unused capacity during the course of a year. In addition, the average price of firm capacity tends to be high because of the cost classification and allocation methods used by the Federal Energy Regulatory Commission to determine maximum transportation rates. Shippers pay to reserve capacity whether it is used or not. Primary firm shippers frequently release their unused capacity to mitigate the high reservation charges.

Capacity Release Market

The capacity release market, established under FERC Order 636, provides shippers a method to resell unused capacity on either a prearranged or open bid basis.¹¹⁰ Release transactions take place when a primary shipper places a notice on the

pipeline company electronic bulletin board¹¹¹ that it has available capacity.¹¹² Interested parties then submit sealed bids to the pipeline company, which evaluates the bids and selects the winning replacement shipper based on selection criteria approved by the releasing shipper. This mechanism provides prospective shippers' access to firm capacity that otherwise may not have been available.

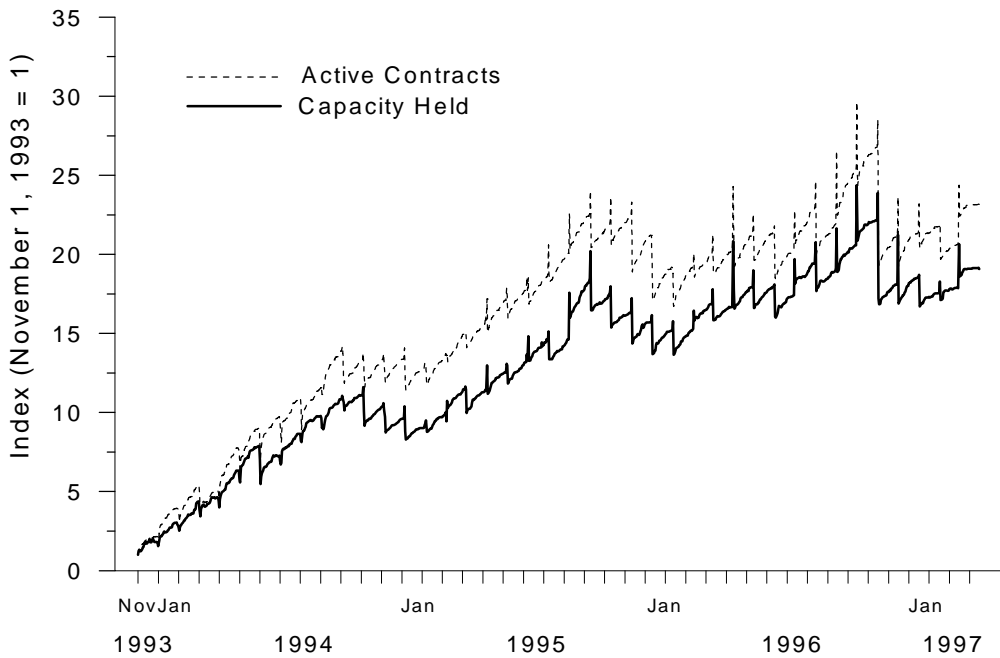
The growth in the capacity release market indicates that shippers are embracing this capacity trading system. The amount of capacity held daily by replacement shippers has grown significantly since the beginning of the capacity release market (Figure 22). The amount of capacity held by replacement shippers during the 12-month period ending March 1997 totaled 7.4 quadrillion Btu, a 22-percent increase over the previous 12-month period and almost double the level for the 12 months ending March 1995 (Figure 23).

¹¹⁰Releasing shippers have the option of (1) prearranging a release for 1 month or less or for any length of time at maximum costs, or (2) posting a notice of capacity availability on the pipeline company's electronic bulletin board for open bidding.

¹¹¹FERC Order 587-B (Docket RM 96-1-003) required that pipeline companies begin offering capacity release and other transactions through their Internet sites by June 1997.

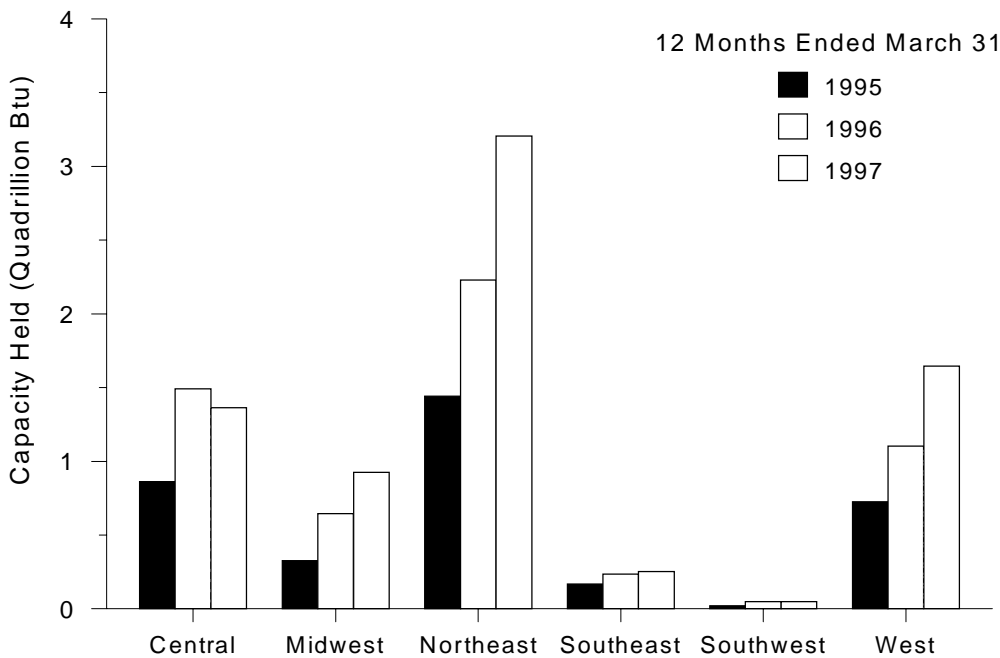
¹¹²A primary shipper may release all or part of its capacity on a long-term or short-term basis and receive credit from the release to its pipeline company account.

Figure 22. Growth in the Capacity Release Market, November 1993 - March 1997



Source: Energy Information Administration, Office of Oil and Gas, derived from: **November 1993 - July 1994:** Pasha Publications, Inc. **July 1994 - March 1997:** Federal Energy Regulatory Commission, Electronic Data Interchange (EDI) data.

Figure 23. Capacity Held by Replacement Shippers, by Region and Heating Years, 1994-95 – 1996-97



Source: Energy Information Administration, Office of Oil and Gas, derived from Federal Energy Regulatory Commission, Electronic Data Interchange (EDI) data.

The activity in the capacity release market provides a measure of the reserved capacity that is unused by the primary shipper and is of value to the replacement shipper. The most comprehensive information available on the release market concerns data on capacity that is awarded to replacement shippers. While actual utilization cannot be accurately determined, a substantial amount of gas could be transported by use of released capacity. For example, if all the capacity held by replacement shippers (Figure 24) were fully utilized, 36 percent of the 20.4 quadrillion Btu of gas delivered to consumers during the 12 months ended March 31, 1997, could have moved under released capacity.

The amount of capacity held by replacement shippers¹¹³ generally declines during the heating season, but it still represents a sizeable amount. Based on capacity held, replacement shippers could have moved 28 percent of the 10.4 quadrillion Btu of gas delivered to consumers during the 1996-97 heating season by using released capacity. These levels of released capacity are not shared equally among all of the U.S. regions. The Northeast, which had 44 percent of the capacity held by replacement shippers, led other regions in the amount of capacity awarded during the year ended March 31, 1997 (Figures 23 and 24). The Southwest had the least amount of capacity awards in a region; less than 1 percent of the capacity held by replacement shippers occurred on pipeline companies that primarily serve the Southwest Region (Figure 24). Although the amount of capacity awarded varied between the heating and nonheating seasons, the regional proportion of capacity held by replacement shippers was essentially the same as that for the 12-month period ended March 1997.

Data from April 1994 through March 1997 indicate that the capacity release market provides a significant amount of access to transportation service in many areas of the United States. However, these data do not indicate whether these levels of capacity awards will be sustained or increase. There are indications that the market for released capacity in some regions may be maturing while considerable growth may continue in other regions. For example, the Northeast Region, in addition to having the highest level of awarded capacity, is experiencing substantial growth in the market for released capacity. The amount of capacity held in the Northeast increased by 977 trillion Btu, or 44 percent, between the 1995-96 and 1996-97 heating years (Figure 23).

¹¹³The total volume of released capacity held by replacement shippers during a season is the sum of the capacity effective on each day of the season. For example, if a 60-day contract for Z thousand cubic feet per day is effective within a season, then the sum of capacity held for the season would include Z thousand cubic feet 60 times for that contract. If that 60-day contract were only effective, for example, for the last 20 days of the season, then the sum for the season would include Z thousand cubic feet 20 times, and the sum for the next season would include Z thousand cubic feet 40 times for that contract.

The West and Midwest regions also experienced significant percentage increases over their 1995-96 levels, although the capacity amounts are less than those of the Northeast Region. The amount of capacity held by replacement shippers in the West during the 1996-97 heating year increased by almost 50 percent over the 1995-96 level. The 50-percent increase was the result of an additional 542 trillion Btu of capacity held in the West Region during 1996-97. The capacity held by replacement shippers in the Midwest Region in 1996-97 increased by 280 trillion Btu, or 43 percent over the 1995-96 level.

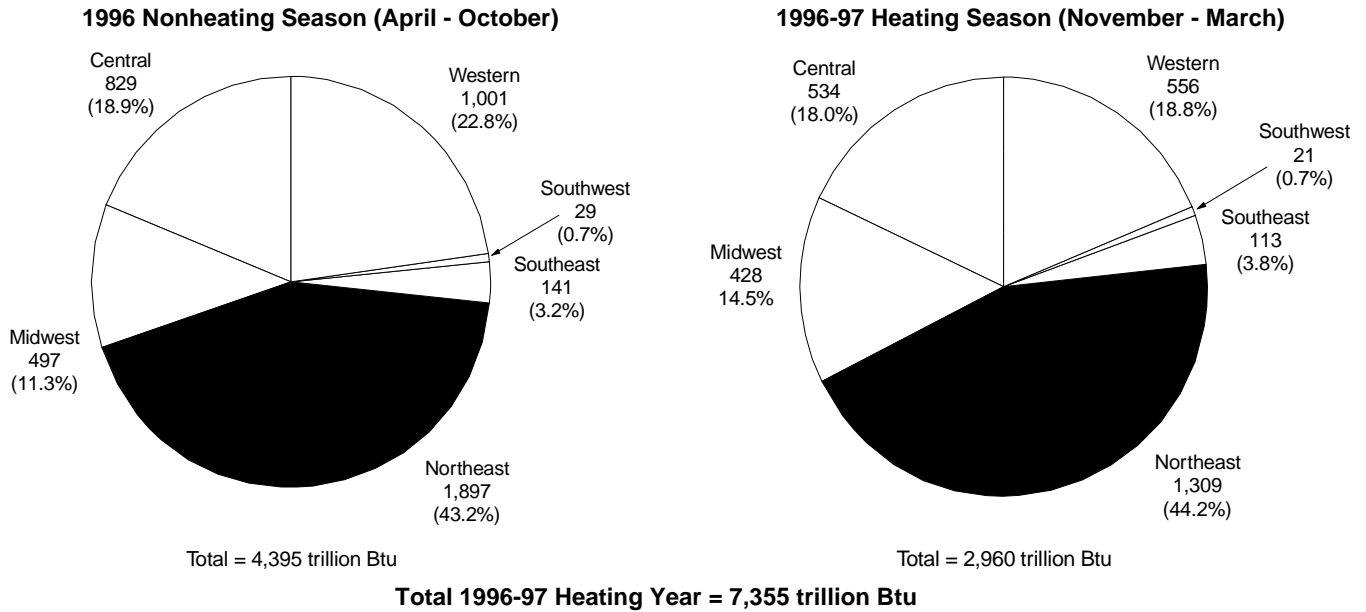
In contrast to the Northeast, West, and Midwest regions, the Central and Southwest regions experienced declines in capacity release activity. In the Central Region, the amount of capacity held by replacement shippers decreased by 9 percent (128 trillion Btu) from the 1995-96 heating year level and the number of capacity awards decreased by 52 percent (1,911 fewer awards). While the declines in the Southwest were not as large as those in the Central in absolute terms, they still represented significant percentage reductions for the regions (Figure 23).

The reduction in capacity release awards in certain regions may not necessarily indicate a lack of available capacity in those regions. For example, in the past few years the Southwest has experienced a series of capacity turnbacks in which primary shippers notified the pipeline companies of their intent to reduce the amount of firm capacity reserved on the systems. While the settlements in these cases resulted in an allocation of the turnback costs among the parties, much of the physical space of the pipeline systems was no longer reserved. The shippers that turned back the capacity would not have as much excess capacity to release on the market; however, it would not affect the total capability on the pipeline system. Since this excess capacity is no longer reserved, shippers may be able to deliver more gas using interruptible transportation service.

Interruptible Transportation Service

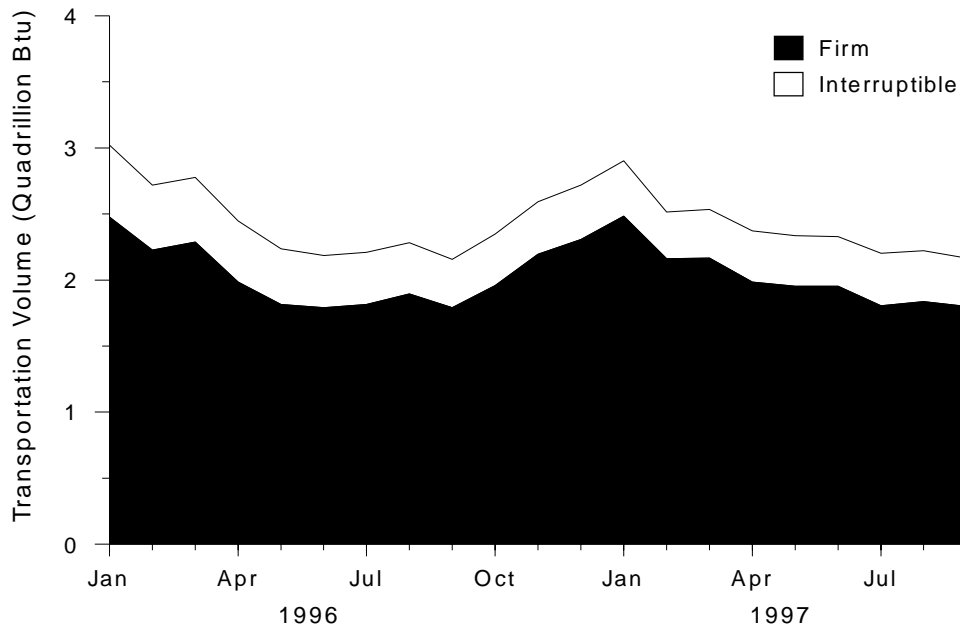
A look at the utilization of interruptible service provides the perspective needed to complete an assessment of transportation deliverability. While amounts vary throughout the year and across regions, interruptible service represents a relatively constant share of national transportation throughput (Figure 25). More than 4,700 trillion Btu (TBtu) of gas was transported by use of interruptible service during the 1996-97 heating year (the 12 months ended March 31, 1997), representing 16 percent of the 29,135 TBtu total transportation throughput.

Figure 24. Capacity Held by Replacement Shippers During the Nonheating and Heating Seasons, by Region
(Trillion Btu)



Source: Energy Information Administration, Office of Oil and Gas, derived from Federal Energy Regulatory Commission, Electronic Data Interchange (EDI) data.

Figure 25. Natural Gas Pipeline Throughput Under Firm and Interruptible Service, January 1996 - September 1997



Note: Throughput volumes exclude natural gas transported for storage.

Source: Energy Information Administration, Office of Oil and Gas, derived from Federal Energy Regulatory Commission, FERC Form 11, "Natural Gas Pipeline Company Quarterly Statement of Monthly Data."

Even during the heating season, when capacity is more apt to be constrained, almost 2,000 TBtu, or 15 percent, of gas moved under interruptible service. The share of interruptible service during the 1996-97 heating year varied across regions from a low of 7 percent of total transportation in the West to a high of 49 percent in the Southwest. The significant use of interruptible service clearly indicates that it represents a viable service option for shippers. Based on a 100-percent load factor, interruptible service represented an average daily capacity of about 13 TBtu per day for the sample pipeline companies.

The future availability and use of interruptible service will in large part depend on the contracting practices of shippers. As the transportation market matures, terms or lengths of contract agreements may become shorter. The likelihood that contracts will be terminated upon reaching their expiration date will depend largely on the type, options, and requirements of the shipper holding the contract.

Characteristics of Firm Capacity Held by Different Types of Shippers

Shippers will contract for firm pipeline capacity for different quantities and terms, depending on the purpose for which the gas is being moved. For example, a local distribution company that is responsible for supplying the gas needs of core residential and commercial customers is likely to have a greater share of its transportation under firm contracts than an industrial shipper that can use interruptible service or easily switch to an alternate fuel. As another example of how shipper's needs differ, an industrial company, with well-defined and steady requirements for natural gas, may have contracts with longer terms than those of a marketer who values flexibility and needs to offer service to many types of customers.

To examine these and other characteristics of firm capacity, shippers were classified according to six different categories:¹¹⁴

- Electric utilities (including combination electric and natural gas utilities for which natural gas is the primary or alternative source of fuel for generating electricity)

- Industrial companies (including independent power producers, cogenerators, and commercial firms)
- Local distribution companies (including intrastate pipeline companies and combination electric and natural gas utilities for which natural gas is not the primary or alternative source of fuel for generating electricity)
- Marketers
- Interstate pipeline companies
- Other (including producers, gatherers, and other companies).

Differences between these types of shippers were then examined, focusing on the data for April 1, 1997. The findings include:

- Local distribution companies (LDCs) held the largest portion of firm capacity, 44 percent. This was more than twice that of the next largest portion held by electric utilities.
- Virtually all (96 percent) of the firm capacity was held under long-term contracts (those with terms of 1 year or more).
- The average lengths of the long-term contracts ranged from 6.7 years for marketers to 11.9 years for pipeline companies.
- Marketers held 75 percent of the firm capacity under short-term contracts (those with terms of less than 1 year), while LDCs held the largest proportion of capacity under long-term contracts, 46 percent.
- The average size of long-term contracts varied widely, from 57.0 billion Btu per day per contract for pipeline companies to 7.6 billion Btu per day for industrial shippers.
- The greatest shares of total firm capacity were held in the Northeast (36 percent) and the Midwest (25 percent). LDCs held the largest proportion of firm capacity within each region except for the Western Region, where marketers held the largest share.
- New contracts that became effective April 1, 1996, through April 1, 1997, accounted for 31 percent more firm transportation capacity than was associated with contracts that expired during the period.

¹¹⁴The Index of Customers lists only the names of shippers without identifying the company types. Thus, shipper types were identified by Energy Information Administration (EIA) staff by cross-referencing shipper names with other information sources and through Internet searches (see Appendix D).

Capacity and Contract Terms

Shippers held 101 trillion Btu per day of firm capacity on April 1, 1997, based on the sample of pipeline companies examined in this analysis (Table 15).¹¹⁵ The sample includes 63 interstate pipeline companies, 17 more than in the analysis of transportation system access presented earlier in the chapter. LDCs accounted for the largest portion of this capacity, 44 percent (Figure 26), more than twice that of the next largest portion, 21 percent, which was held by electric utilities.

Industrial companies had the smallest share of firm capacity, 5 percent, but industrial companies probably had indirect access to more firm capacity than is implied by this statistic. As end users, industrial companies are likely to have had access to other firm capacity through contracts with marketers and LDCs or any of the other types of shippers listed. Consider that in 1996, 5.5 quadrillion Btu of natural gas consumed by industrial companies was delivered under firm contracts.¹¹⁶ Assuming a 100-percent load factor, this is equivalent to an average of 15 trillion Btu per day. On April 1, 1997, industrial companies held just over 5 trillion Btu per day in firm capacity, which is only about one-third the amount of actual firm consumption in 1996. One must use caution when making direct comparisons between consumption and capacity because companies must often reserve capacity on different segments of a pipeline even though not all segments are used for every delivery of natural gas. Still, even this rough comparison shows that industrial companies use more firm gas supplies than can be provided through the firm capacity contracts they own directly.

The relative shares of firm capacity held by shippers are similar whether it is the middle of the winter, when demand for natural gas for space heating is high, or in the summer, when capacity is more readily available and a shipper could more likely receive interruptible service. On January 1, 1997, LDCs held 43 percent of total firm capacity, and industrial users held only 5 percent (total firm capacity was 108 trillion Btu per day). On July 1, 1997, LDCs held 42 percent and industrials held 6 percent of firm capacity (which totaled 94 trillion Btu per day).

Almost all of the firm capacity held by shippers on April 1, 1997, 96 percent, was held under long-term contracts (1 year

or longer). The overall average length of these contracts for all shippers was 9.1 years. The distribution of long-term capacity among the different types of shippers was almost identical to that of total capacity—LDCs held the most, 46 percent, followed by electric utilities, which held 21 percent, and industrials held the least, 5 percent.

The average lengths of these long-term contracts were quite varied among the different types of shippers (Figure 27). Average terms ranged from 6.7 years for marketers, reflecting their need for flexibility, to 11.9 years for pipeline companies. Pipeline companies held a relatively small amount of the total firm capacity, 6.6 trillion Btu, or 7 percent of the total. They typically reserve capacity on other pipeline systems to assist in the operational control of natural gas flows on their own systems.¹¹⁷ Most pipeline companies have had decades of experience in moving large volumes of gas. Their capacity requirements are fairly stable over time and they are thus able to benefit from longer length contracts. The average length of long-term firm contracts held by LDCs, which had the largest proportion of capacity, was 9.7 years.

The characterization of what type of shipper holds capacity changes dramatically for short-term contracts (less than 1 year long). Here, marketers held the overwhelming amount of short-term capacity, 75 percent. The next largest share was only 8 percent held by shippers in the “Other” category. Industrial companies again held 5 percent of capacity, but in this case they were only the second smallest group. Pipeline companies held no short-term capacity at all. The 6.6 trillion Btu per day of firm capacity held by pipeline companies was all long term.¹¹⁸

The average length of short-term contracts was 3.5 months and ranged from 2.2 to 4.0 months among the different types of shippers. Marketers, with the largest volume, have the longest average term and industrials, the shortest. Even with the predominant role played by marketers in the area of short-term contracts, marketers still had 81 percent of their total firm capacity of 17.5 trillion Btu per day under long-term contracts as of April 1, 1997.

There are seasonal variations in the average length of short-term contracts held by some types of shippers. For example, as of January 1, 1997, a date toward the middle of the heating season, both electric utilities and marketers held short-term firm capacity contracts that averaged just over 5 months in length, matching the length of the heating season. As of

¹¹⁵The 63 pipeline companies included in this sample are those companies that file Index of Customers (IOC) information with the Federal Energy Regulatory Commission for which there was complete and consistent information for each of the quarters from April 1, 1996, to April 1, 1997. This resulted in the exclusion of data for eight companies that file IOC information.

¹¹⁶Energy Information Administration, *Natural Gas Annual 1996*, DOE/EIA-0131(96) (Washington, DC, September 1997), Table 22.

¹¹⁷Pipeline companies also retain control over a certain amount of capacity on their own systems for purposes of operational control. These capacity amounts are not part of the data contained in the Index of Customers because pipeline companies are not considered to be shippers on their own systems.

¹¹⁸Pipeline companies did hold short-term capacity contracts in all the other 3-month periods examined for this study.

Table 15. Characteristics of Firm Contract Capacity as of April 1, 1997, by Shipper

Shipper Type	All Contracts			Long-Term Contracts ^a			Short-Term Contracts ^b		
	Capacity (trillion Btu per day)	Number of Contracts	Average Term (years)	Capacity (trillion Btu per day)	Number of Contracts	Average Term (years)	Capacity (trillion Btu per day)	Number of Contracts	Average Term (months)
Electric Utility	20.7	645	10.1	20.4	620	10.5	0.2	25	2.6
Industrial	5.5	739	7.1	5.3	690	7.6	0.2	49	2.2
LDC	44.2	2,544	9.5	43.9	2,486	9.7	0.3	58	3.5
Marketer	17.5	938	5.1	14.2	704	6.7	3.3	234	4.0
Other ^c	6.4	349	7.7	6.1	293	9.1	0.3	56	2.6
Pipeline Company	6.6	115	11.9	6.6	115	11.9	0.0	0	NA
Total	100.8	5,330	8.4	96.4	4,908	9.1	4.4	422	3.5

^aLong-term contracts are for 1 year or longer.

^bShort-term contracts are for less than 1 year.

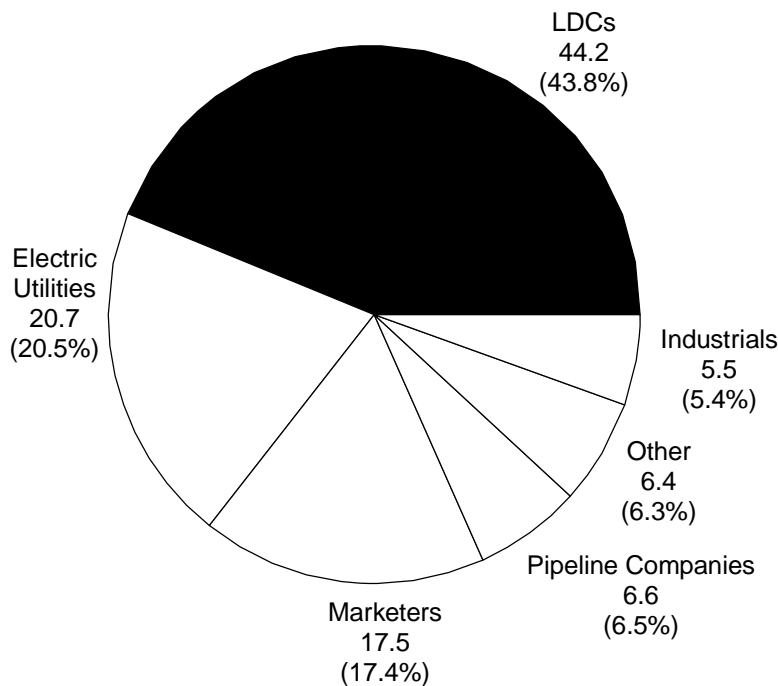
^cOther includes producers, gatherers, and those shippers for which a category could not be determined.

LDC = Local distribution company. NA = Not available.

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

Source: Energy Information Administration, Office of Oil and Gas, derived from Federal Regulatory Energy Commission (FERC) Index of Customers.

Figure 26. Share of Total Firm Capacity Held on April 1, 1997, by Type of Shipper
(Capacity in Trillion Btu per Day)



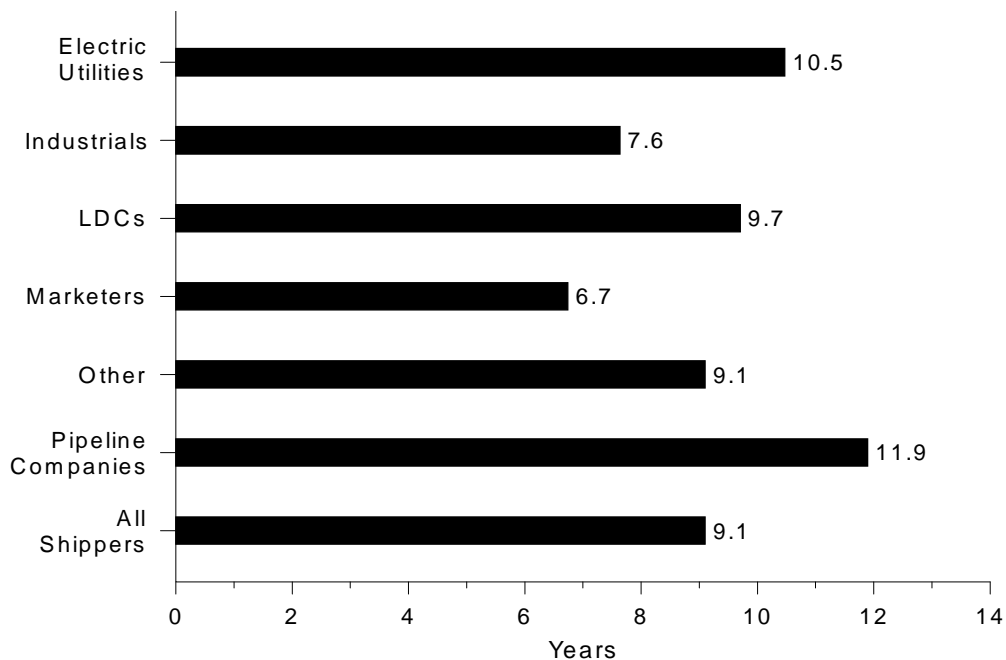
Total firm capacity is 101 trillion Btu

LDC = Local distribution company.

Note: Sum of percentage does not equal 100 percent because of independent rounding.

Source: Energy Information Administration, Office of Oil and Gas, derived from Federal Energy Regulatory Commission (FERC) Index of Customers.

Figure 27. Average Length of Long-Term Firm Contracts as of April 1, 1997



LDC = Local distribution company.

Note: Long-term contracts are for 1 year or longer.

Source: Energy Information Administration, Office of Oil and Gas, derived from Federal Energy Regulatory Commission (FERC) Index of Customers.

April 1, 1997, the beginning of the refill season, the average length of short-term contracts fell to 2.6 months for electric utilities and to 4.0 months for marketers (Figure 28).

The average length of short-term contracts declined between January and April because of the increased proportion of contracts with terms of 1 month or less as the heating season ended. For example, as of January 1, 1997, electric utilities did not hold any short-term capacity under contracts that were for terms of 1 month or less; however, as of April 1, 1997, 38 percent of their total short-term capacity was under 30-day contracts. The situation is similar for marketers, who on January 1, 1997, held only 6 percent of short-term capacity under contracts for 1 month or less but held 25 percent of their short-term capacity under such contracts on April 1, 1997.

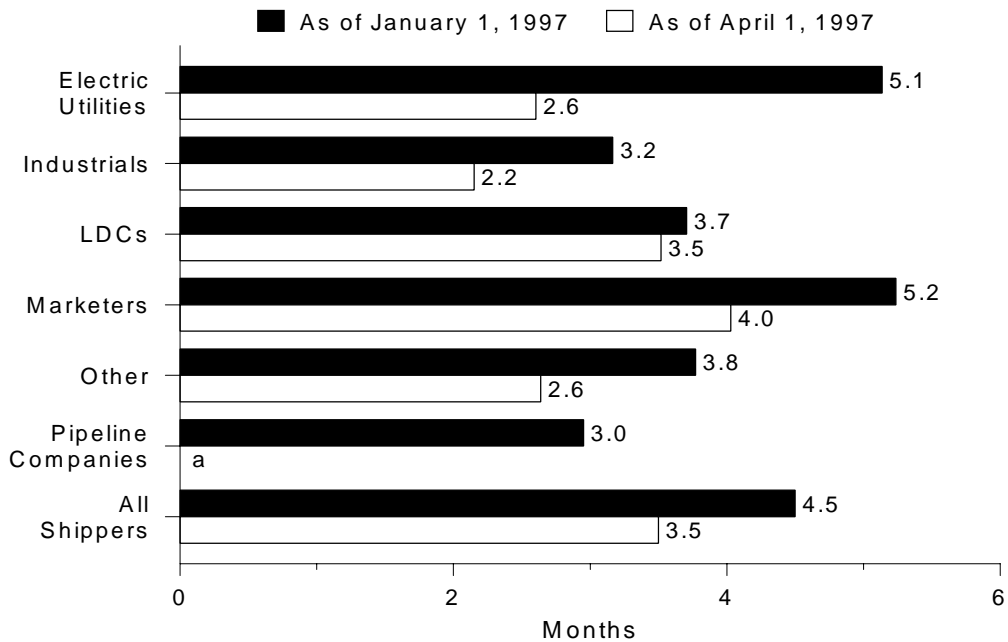
Total capacity held by different types of shippers provides one view of the firm capacity market, but the average capacity per contract provides another view of the contracting practices of firm shippers. For all types of shippers, the average amount of capacity under long-term contracts is much larger than under short-term contracts, reflecting the general use of short-term firm capacity to meet incremental loads or to meet unexpected demand.

When considering the long-term contracts, LDCs held the greatest total amount of firm daily capacity, yet the average capacity per contract for LDCs was much lower than for either pipeline companies or electric utilities (Figure 29). Also, the average daily capacity of LDC contracts, 17.7 billion Btu, was close to, but still smaller than that of contracts held by both marketers and companies in the Other category. Pipeline companies held the highest capacity long-term contracts, averaging 57.0 billion Btu per day per contract. Even though pipeline companies held a relatively small proportion of total firm capacity, the large amount of capacity per contract may reflect their role as movers of large volumes of gas from producing to consuming areas of the country. Electric utilities held the second highest capacity contracts, averaging 33.0 billion Btu per day per contract. The smallest contracts, averaging 7.6 billion Btu per day each, were held by industrial companies.

Regional Shipper Characteristics

Shippers hold the most firm capacity in those regions with larger populations and colder temperatures and that are farthest away from both domestic and Canadian sources of supply—the Northeast and the Midwest. LDCs, which are

Figure 28. Average Length of Short-Term Firm Contracts, January and April 1997



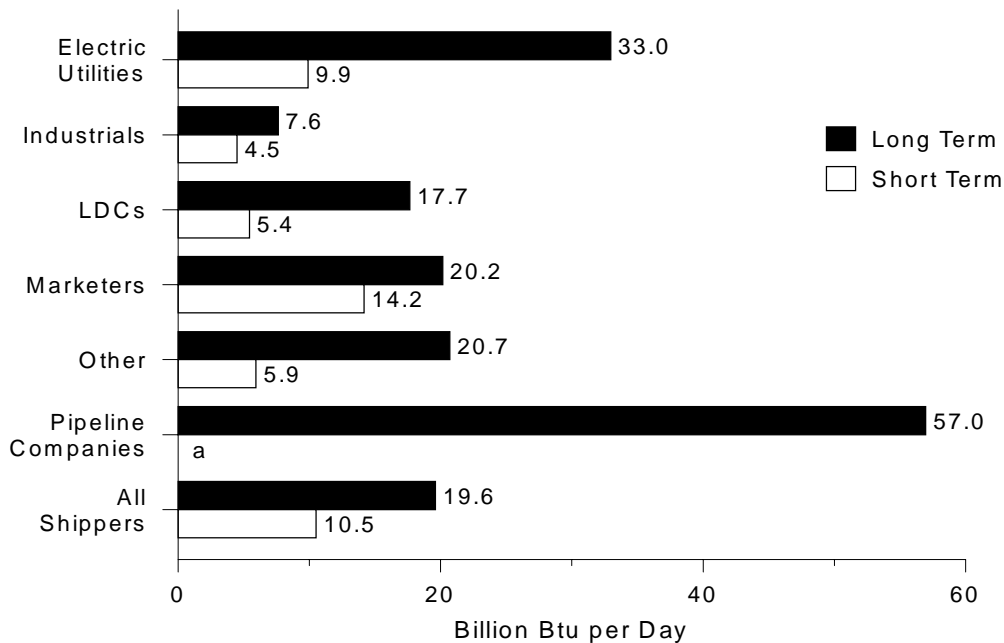
^aPipeline companies did not have any contracts for short-term, firm capacity on April 1, 1997.

LDC = Local distribution company.

Note: Short-term contracts are for less than 1 year.

Source: Energy Information Administration, Office of Oil and Gas, derived from Federal Energy Regulatory Commission (FERC) Index of Customers.

Figure 29. Average Firm Capacity per Contract as of April 1, 1997



^aPipeline companies did not have any contracts for short-term firm capacity on April 1, 1997.

LDC = Local distribution company.

Notes: Long-term contracts are for 1 year or longer. Short-term contracts are for less than 1 year.

Source: Energy Information Administration, Office of Oil and Gas, derived from Federal Energy Regulatory Commission (FERC) Index of Customers.

often the only source of natural gas for weather-sensitive residential and commercial users, held the largest proportion of firm capacity in almost every region, sometimes far exceeding that held by the second largest shipper in the region. Electric utilities (which include combination electric and gas utilities) and marketers also tend to hold larger shares of regional firm capacity compared with other types of shippers.

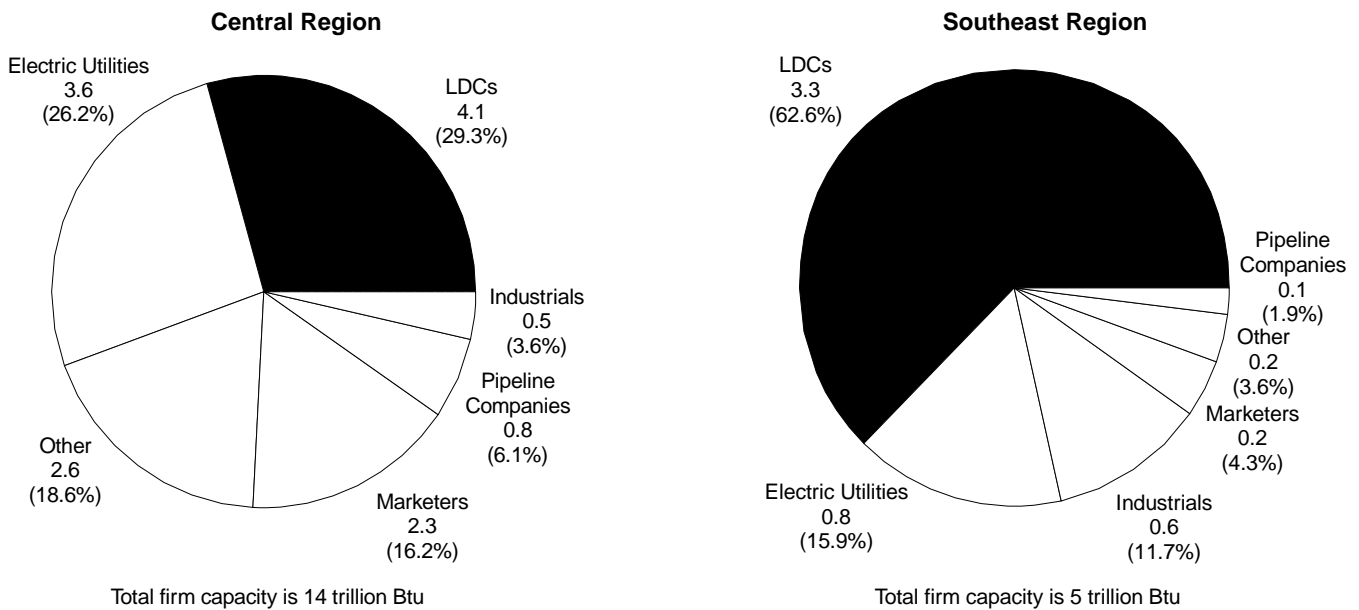
Of the 101 trillion Btu per day in firm capacity held on April 1, 1997, the largest share, 36 percent, was held on pipelines that deliver most of their gas in the Northeast Region. The next largest share, 25 percent, was in the Midwest. These regions rank first and third, respectively, in terms of 1995 population (Table 11, Chapter 4) and they were the third and second coldest, respectively, in 1996 (Table 10, Chapter 4).

These two regions alone accounted for 58 percent of the total residential and commercial consumption of natural gas in 1996 (Table 12, Chapter 4), and LDCs held the largest share of firm capacity in both regions. In the Northeast, LDCs held

21.3 trillion Btu (TBtu), or 59 percent of regional firm daily capacity. This was nearly three times the 7.2 TBtu held by the second-place electric utilities in the Northeast. In the Midwest, LDCs held 8.6 TBtu of firm daily capacity, or 34 percent of the regional total. Marketers played a greater role as holders of firm capacity in this region, having the second highest level, at 5.8 TBtu (23 percent of the regional total). In the Northeast, marketers held only 8 percent of regional firm capacity.

The Central Region had the most uniform distribution of contracted capacity among the different types of shippers (Figure 30). In part, this may be because the natural gas delivered in the region is destined for final delivery in the Midwest or Northeast rather than for consumption within the region. The Central Region acts as a conduit of gas from Rocky Mountain producers and for some imports from Canada. LDCs still held the largest share of regional firm capacity, 29 percent, but shippers in the Other category, which includes producers, held the third largest proportion, 19 percent.

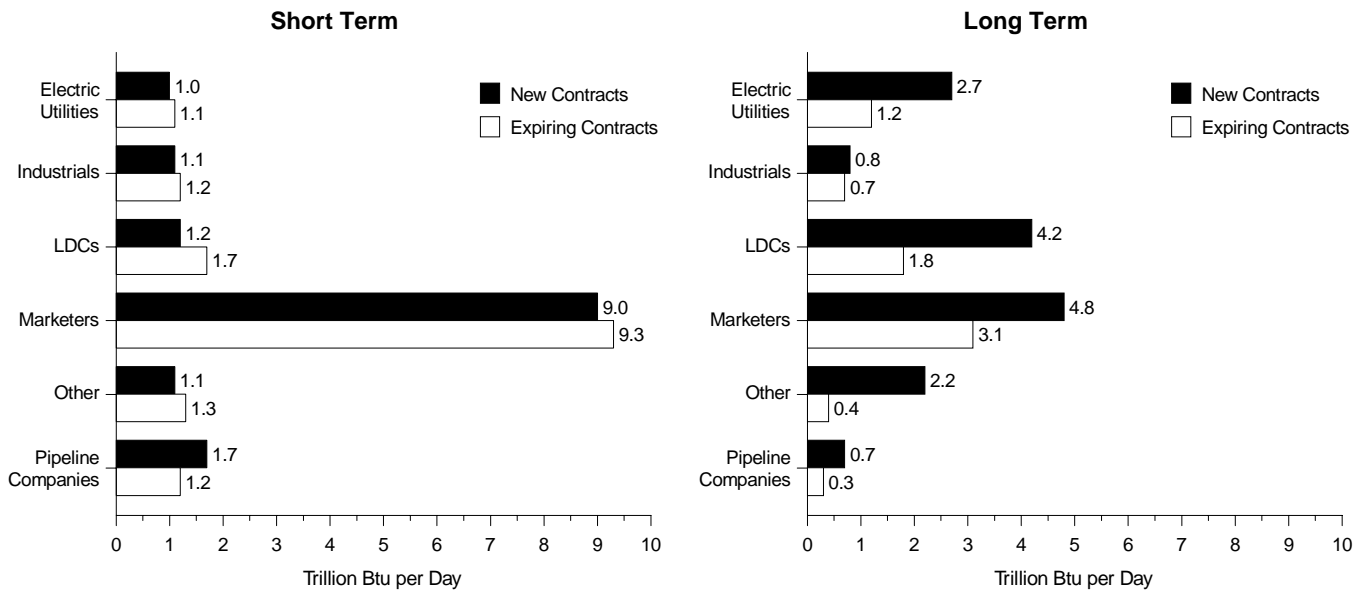
Figure 30. Share of Regional Firm Capacity as of April 1, 1997, by Shipper for Selected Regions
(Capacity in Trillion Btu per Day)



LDC = Local distribution company.

Source: Energy Information Administration, Office of Oil and Gas, derived from Federal Energy Regulatory Commission (FERC) Index of Customers.

Figure 31. Capacity Under New and Expiring Firm Contracts, April 1, 1996 - April 1, 1997



LDC = Local distribution company.

Notes: Short-term contracts are for less than 1 year. Long-term contracts are for 1 year or longer.

Source: Energy Information Administration, Office of Oil and Gas, derived from Federal Energy Regulatory Commission (FERC) Index of Customers.

The Southeast Region had the greatest concentration of contracted capacity assigned to a single type of shipper. The 3.3 TBtu per day held by LDCs accounted for 63 percent of the regional total and was approximately four times the amount held by the shippers in second place, electric utilities (16 percent). The high concentration of capacity held by LDCs may be caused by two circumstances that exist in the Southeast Region. First, many of the LDCs whose service areas are in the Northeast Region hold capacity on Southeast pipelines. Second, the Southeast may not have implemented retail unbundling initiatives to the same extent as other regions. Thus, LDCs must continue to serve the majority of customers' needs. This would also explain the low share of firm capacity held by marketers in this region, only 4 percent.

In contrast, marketers held the largest proportion of firm capacity in the Western Region, 33 percent (4.8 TBtu per day). The Western Region includes California, where retail unbundling began as early as 1986. In the West, electric utilities held the second highest proportion of firm capacity, 27 percent, followed closely by LDCs with 26 percent.

New and Expiring Long-Term Contracts

Contract expiration is of particular interest in the natural gas industry today. To see if there are differences between types

of shippers when it comes to contract expiration or the initiation of new contracts, data from the Index of Customers were examined for the 12-month period of April 1, 1996 through April 1, 1997.¹¹⁹ During this time, new contracts for 30.4 trillion Btu (TBtu) per day of firm transportation capacity became effective, while contracts accounting for 23.1 TBtu per day expired. Thus, newly contracted capacity exceeded expiring capacity by 31 percent. Marketers accounted for the largest shares of both new and expiring capacity, but the relative shares among the different types of shippers varied, depending on whether the contracts were short- or long-term.

Marketers totally dominated short-term capacity under both new and expiring contracts during the period (Figure 31). Marketers accounted for 60 percent of the 15.0 TBtu per day of new short-term firm capacity and for 59 percent of the 15.7 TBtu per day of expiring capacity. The shippers with the next largest share of new short-term capacity were the pipeline companies, with 11 percent of the total. For the expiring contracts, LDCs held the next largest share, which was also 11 percent.

¹¹⁹New contracts are those that started any time from April 2, 1996, through April 1, 1997. Expiring contracts are those that ended any time from April 1, 1996, through March 31, 1997.

Capacity under new short-term contracts was almost equal to that under expiring contracts during the period, but for long-term contracts, new capacity was more than double that under expiring contracts. Thus, shippers showed a preference for longer term contracts as they increased their holdings of firm transportation capacity during the period. New long-term contracts accounted for 15.4 TBtu per day of firm capacity, while long-term contracts for 7.5 TBtu of daily capacity expired. As with short-term contracts, marketers held the largest shares of both new and expiring capacity under long-term contracts, but both LDCs and electric utilities also held significant shares of each.

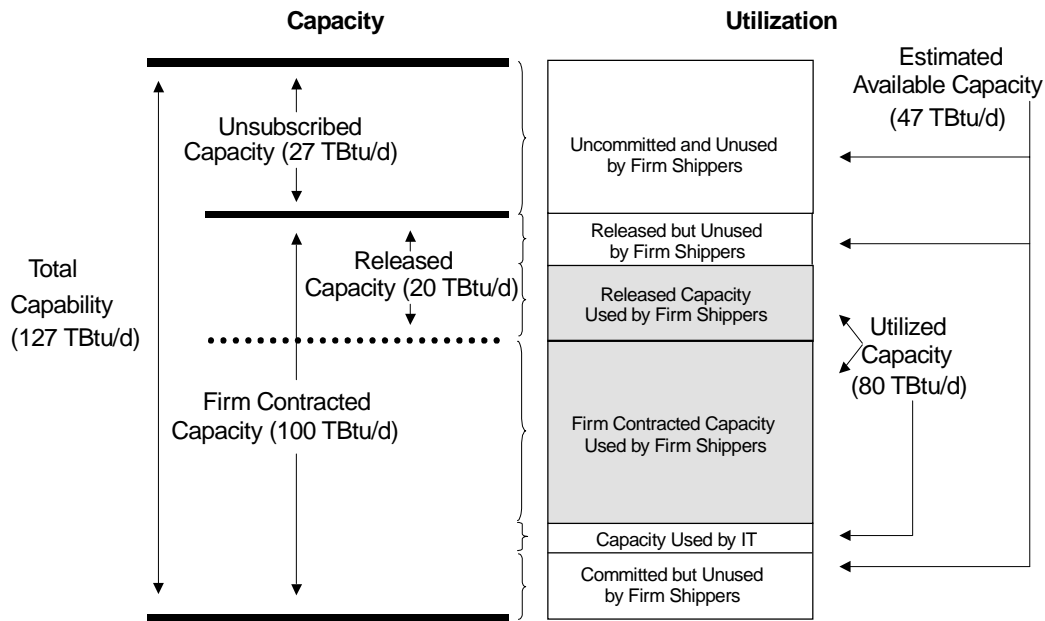
Marketers held 4.8 TBtu per day of firm capacity under new long-term contracts, 31 percent of the total. This new capacity was 56 percent more than that held by marketers under expiring contracts during the period. LDCs held 4.2 TBtu per day of new capacity under long-term contracts, accounting for 27 percent of the total. The new capacity held by LDCs was more than double that held under expiring contracts. New capacity held by electric utilities during the period was also more than double the amount held by these shippers under

expiring contracts. With 2.7 TBtu, electric utilities held 18 percent of the new, long-term daily capacity that became effective during the period.

Summary

The unused capability of the interstate pipeline system for transportation service appears to be substantial. Based on an estimated maximum system capability of 127 trillion Btu (TBtu) per day, on average, 37 percent or 47 TBtu per day of the pipeline system capability was unused during the 1996-97 heating year (Figure 32). Shippers using firm transportation services accounted for an average of 67 TBtu of gas per day, utilizing only 53 percent of the system capability and only 67 percent of the reserved capacity during the 1996-97 heating year. This allowed interruptible shippers to move an average of 13 TBtu per day, which represented 10 percent of the system capability. While 100 TBtu per day, or 78 percent of the system capability, was reserved during 1996-97, 20 TBtu of that was released to other firm shippers.

Figure 32. Reserved, Utilized, and Available Capacity for the 1996-97 Heating Year



TBtu/d = Trillion Btu per day. IT = Interruptible transportation service.

Note: A firm shipper is one using firm transportation services.

Source: Energy Information Administration, Office of Oil and Gas.

Transportation access during the heating season was less than the 12-month average, but market conditions indicate that the system can support significant additional load during this period as well. On average, 31 percent or 39 TBtu per day of the pipeline system capability was unused during the 1996-97 heating season. An average of 75 TBtu of gas per day was transported under firm transportation services, utilizing 59 percent of the system capability and 70 percent of the reserved capacity. Interestingly, interruptible service capacity utilization during the heating season was at the same level as during the nonheating season, 13 TBtu per day. The amount of reserved capacity increased to 107 TBtu per day during the heating season, but 20 TBtu per day was still released to secondary shippers.

Whether these levels of unsubscribed and accessible capacity remain unchanged in the future will largely depend on what happens when firm transportation capacity contracts come up for renewal. If significant capacity is turned back to the system, shippers may respond by transporting more gas using interruptible service.

As of April 1997, virtually all (96 percent) of the firm capacity was held under long-term contracts (those with terms of 1 year or more), with local distribution companies holding the largest portion of firm capacity, 44 percent. The greatest shares of total firm capacity were held in the Northeast (36 percent) and the Midwest (25 percent).