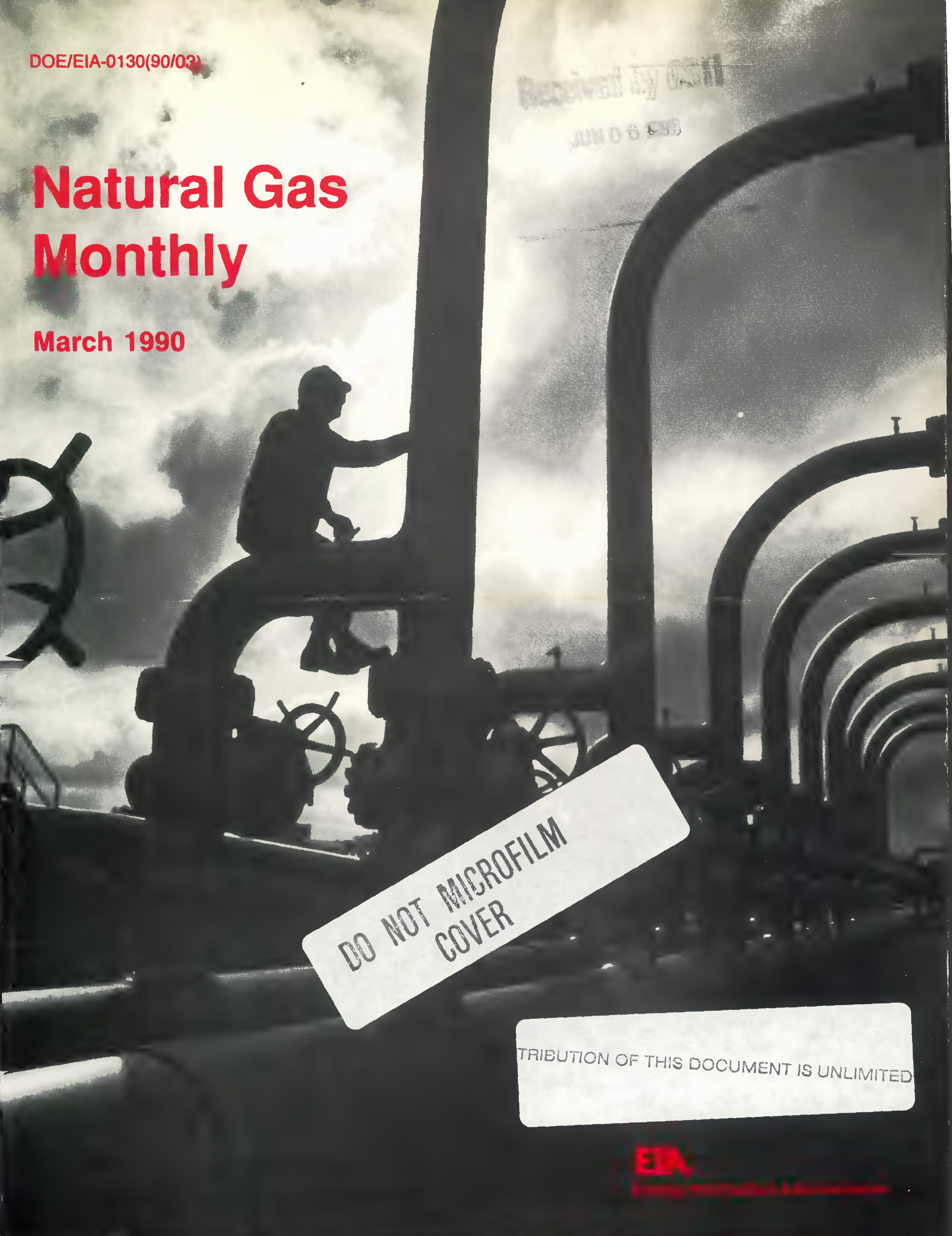
DOE/EIA-0130(90/03)

Natural Gas Monthly

March 1990



Received by OSTI
JUN 06 1990
DO NOT MICROFILM COVER
TRIBUTION OF THIS DOCUMENT IS UNLIMITED

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

This publication may be purchased from the Superintendent of Documents, U.S. Government Printing Office. Purchasing information for this or other Energy Information Administration (EIA) publications may be obtained from the Government Printing Office or EIA's National Energy Information Center. Questions on energy statistics should be directed to the Center by mail, telephone, or telecommunications device for the hearing impaired. Addresses, telephone numbers, and hours are as follows:

National Energy Information Center
Energy Information Administration
Forrestal Building, Room 1F-048
Washington, DC 20585
(202) 586-8800
Telecommunications Device for the
Hearing Impaired Only: (202) 586-1181
8 a.m. - 5 p.m., eastern time, M-F

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
(202) 783-3238
FAX 1-202-275-0019
8 a.m. - 5 p.m., eastern time, M-F

DO NOT MICROFILM
THIS PAGE

Released for Printing: May 24, 1990

The *Natural Gas Monthly* (ISSN 0737-1713) is published monthly by the Energy Information Administration, 1000 Independence Avenue, SW, Washington, DC 20585, and sells for $66.00 per year (price subject to change without advance notice). Second-class postage paid at Washington, DC 20066-9998, and additional mailing offices. POSTMASTER: Send address changes to *Natural Gas Monthly,* Energy Information Administration, EI-231, 1000 Independence Avenue, SW, Washington, DC 20585.

DOE/EIA--0130(90/03)

DE90 011843

Natural Gas Monthly

March 1990

Energy Information Administration
Office of Oil and Gas
U.S. Department of Energy
Washington, DC 20585

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

εb

This report was prepared by the Energy Information Administration, the independent statistical and analytical agency within the Department of Energy. The information contained herein should not be construed as advocating or reflecting any policy position of the Department of Energy or any other organization.

MASTER

Energy Information Administration
Electronic Publication System (EPUB)
User Instructions

Selected *Weekly Petroleum Status Report* (WPSR), *Petroleum Supply Monthly* (PSM), *Weekly Coal Production* (WCP), *Electric Power Monthly* (EPM), and *Natural Gas Monthly* (NGMR) statistics are now available electronically on the Energy Information Administration (EIA) Computer Facility. Public access to these machine-readable statistics is possible by dialing (202)586-8658 for 300 baud or 1200 baud line speeds. Communications are Asynchronous and require a standard ASCII-type terminal. There is no charge for this service. Although no password is required, you will be requested to use your telephone number as a user identifier. This service is available 7 days per week (8:00 a.m. - 11:00 p.m., Monday through Friday, and 10:00 a.m.-6:00 p.m., weekends and holidays). Weekly petroleum and coal statistics are updated on Wednesday (Thursday in the event of a holiday) after 5:00 p.m. Monthly petroleum supply data for the current month are also provided and are updated by 5:00 p.m. on the 24th of each month. Monthly statistics from the *Electric Power Monthly* are available on or about the first working day of each month. Monthly statistics from the *Natural Gas Monthly* are available on or about the 20th of each month. Questions or comments on petroleum data should be directed to Dale Bodzer at (202)586-1257. Questions or comments on coal data should be directed to Noel Balthasar at (202)586-5252. Questions or comments on electricity data should be directed to Deborah Bolden at (202)586-6872. Questions or comments on natural gas data should be directed to Jim Todaro at (202) 586-6305.

Access Instructions:

1) DIAL (202)586-8658.
2) HIT RETURN (CARRIAGE RETURN) TWO OR THREE TIMES UNTIL THE EPUB BANNER APPEARS.

```
***                                          ***
***              WELCOME TO THE              ***
***   ENERGY INFORMATION ADMINISTRATION      ***
***     ELECTRONIC PUBLICATION SYSTEM        ***
***                                          ***
```

3) SELECT THE STATISTICS YOU WISH FROM THE MENU.

THE FOLLOWING REPORTS ARE AVAILABLE:

WPSR -	WEEKLY PETROLEUM STATUS REPORT	QMCR -	QCR METRIC TABLE
PSMR -	PETROLEUM SUPPLY MONTHLY	QSCR -	QCR SHORT TONS TABLE
STKS -	PSM STATE STOCKS TABLE	CWWR -	WEEKLY COAL WORK TABLE
WCPR -	WEEKLY COAL PRODUCTION REPORT	MQWR -	QCR METRIC WORK TABLE
EPMS -	U.S. ELECTRIC POWER STATISTICS	SQWR -	QCR SHORT TONS WORK TABLE
NGMR-	NATURAL GAS MONTHLY		

PLEASE ENTER THE DESIRED REPORT ID... **PSMR**

4) ENTER YOUR 10 DIGIT PHONE NUMBER.

$WP1081 LOGON IN PROGRESS AT 13:23:22 ON MAY 9, 1989
PLEASE ENTER YOUR PHONE NUMBER...

5) YOU WILL THEN SEE A BANNER WHICH SHOWS THE REPORT YOU HAVE SELECTED AND PAUSES TO ALLOW AMPLE TIME TO GET READY TO RECEIVE OUTPUT.

YOU HAVE SELECTED MONTHLY STATISTICS FROM PETROLEUM SUPPLY MONTHLY (PSM) SYSTEM. THIS SYSTEM WILL DISPLAY THE MOST RECENT PSM DATA FOR TABLES 4, 16, 25, 41, AND 42. PLEASE TURN ON YOUR PRINTER NOW IF YOU WISH TO OBTAIN HARD COPY OUTPUT.

(PRINTING WILL BEGIN IN 20 SECONDS)

Note: Users who experience problems when first attempting to logon should check their terminal switch settings for the following:

- 7 Data Bits
- 1 Stop Bit
- Even Parity

Received by OSTI

JUN 0 6 1990

Preface

The *Natural Gas Monthly* (NGM) is prepared in the Data Operations Branch of the Reserves and Natural Gas Division, Office of Oil and Gas, Energy Information Administration (EIA), U.S. Department of Energy (DOE).

General questions and comments regarding the *NGM* may be referred to Kendrick E. Brown, Jr. (202) 586-6077, James M. Todaro, (202) 586-6305, or Eva M. Fleming, (202) 586-6113. Specific technical questions may be referred to the appropriate persons listed in Appendix E.

The *NGM* highlights activities, events, and analyses of interest to public and private sector organizations associated with the natural gas industry. Volume and price data are presented each month for natural gas production, distribution, consumption, and interstate pipeline activities. Producer-related activities and underground storage data are also reported. From time to time, the *NGM* features articles designed to assist readers in using and interpreting natural gas information.

The data in this publication are collected on surveys conducted by the EIA to fulfill its responsibilities for gathering and reporting energy data. Some of the data are collected under the authority of the Federal Energy Regulatory Commission (FERC), an independent commission within the DOE, which has jurisdiction primarily in the regulation of electric utilities and the interstate natural gas industry.

Explanatory Notes supplement the information found in tables of the report. A description of the data collection surveys that support the *NGM* is provided in the Data Sources section. A glossary of the terms used in this report is also provided to assist readers in understanding the data presented in this publication.

All natural gas volumes are reported at a pressure base of 14.73 pounds per square inch absolute (psia) and at 60 degrees Fahrenheit.

Common Acronyms Used in the Natural Gas Monthly

AGA	American Gas Association
Bbl	Barrels
BLS	Bureau of Labor Statistics, U.S. Department of Labor
Bcf	Billion Cubic Feet
BOM	Bureau of Mines, U.S. Department of the Interior
Btu	British Thermal Unit
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
EIA	Energy Information Administration, U.S. Department of Energy
FERC	Federal Energy Regulatory Commission
IOCC	Interstate Oil Compact Commission
LNG	Liquefied Natural Gas
Mcf	Thousand Cubic Feet
MMBtu	Million British Thermal Units
MMcf	Million Cubic Feet
MMS	United States Minerals Management Service, U.S. Department of the Interior
NGL	Natural Gas Liquids
NGPA	Natural Gas Policy Act of 1978
OCS	Outer Continental Shelf
PGA	Purchased Gas Adjustment
Tcf	Trillion Cubic Feet

Contents

Tables

Illustrations

Page

The Developing Natural Gas Futures Market and Its Potential Impact on Domestic Natural Gas Markets

By
Ned W. Dearborn

Background

Over the past twelve years, the domestic natural gas market has been undergoing a fundamental transformation--from one in which natural gas prices were largely controlled by various statutes and governmental regulatory policies to one in which prices are increasingly determined by basic forces of supply and demand. Another milestone in this continuing process occurred on April 3, 1990, when a natural gas futures market was opened by the New York Mercantile Exchange (NYMEX).

Such a market in natural gas futures contracts had been formally proposed to the Commodity Futures Trading Commission (CFTC) by the NYMEX in 1984--but it was not until 1990 that the CFTC finally approved a revised proposal, based in part on a careful review of the changes that had occurred to date in domestic natural gas markets. If the new futures market flourishes, it is expected to have significant impact on domestic natural gas markets.

A brief discussion of futures markets vs. physicals markets (which include spot markets) and a description of the basic mechanics of a futures-market transaction may be found in the technical notes appended to this article.

Prior to 1978, when the fundamental transformation of the domestic natural gas market environment first began with the passage of the Natural Gas Policy Act, domestic natural gas prices, heavily influenced by extensive regulation, were relatively stable:

- They were virtually immune to the frequent fluctuations that characterize the prices of many unregulated commodities;
- They were largely immune to the seasonal price changes that characterize many unregulated commodities whose supply or demand exhibits significant seasonal variation (demand for natural gas increases significantly during the winter heating season); and
- They showed only a limited response to longer-term supply-and-demand pressures that, for unregulated commodities, would most likely have produced larger price increases to ensure the development of natural gas supplies adequate to meet demand.

Such relatively stable but low administered prices resulted in limited supply development and, in the mid-1970's, sporadic supply shortages experienced throughout the nation during peak periods of demand.

Partly because of these shortages, a sequence of statutes, regulatory orders, court decisions, and industry actions was initiated that eased regulatory constraints in domestic natural gas markets. In particular, wellhead natural gas prices were gradually freed of virtually all price controls, and most natural gas pipeline companies were gradually induced to provide open, nondiscriminatory access to their transportation services.

Prior to the 1980's, pipeline transportation services were generally not made available by pipeline companies to parties who wished to ship natural gas not owned by the pipeline companies. As the 1980's progressed, however, open access to pipeline services became increasingly available. By 1990, virtually all major interstate pipeline companies were providing open-access transportation services.

The growth of open access to unbundled natural gas transportation services allowed the many participants in domestic natural gas markets to buy and sell directly from and to each other--at prices freely determined in open competition. During much of the 1980's, the price of gas offered for sale by the pipelines was relatively high. This price reflected the effects of high-priced, long-term supply contracts that many pipeline companies had signed in response to the shortages of the mid-1970's. The natural gas price offered by producers and other market participants for short-term deliveries of natural gas tended to be significantly lower. These pricing circumstances provided significant additional motivation for the numerous participants in domestic natural gas markets to contract directly with each other for the purchase and sale of natural gas, in turn encouraging the growth of third-party trading and brokerage businesses.

As a consequence, during the 1980's, the spot market in natural gas became increasingly important to the industry. Volumes traded on the spot market increased from less than 1 trillion cubic feet in 1983 to more than 12 trillion cubic feet in 1989, representing an increase from approximately 5 percent to approximately 75 percent of total domestic natural gas sales.[1]

As wellhead price decontrol and other regulatory reforms made domestic natural gas markets increasingly responsive to fundamental forces of supply and demand, natural gas spot-market price patterns increasingly began to resemble the price patterns of many unregulated commodities--showing more volatility, more seasonality, and more responsiveness to longer-term supply-and-demand pressures. Figure FE1 shows these price patterns from December 1983 to January 1990 for five regional spot markets, based on average monthly prices compiled from a wide range of sources. During this period, the volatility of the volumes of natural gas moving through the domestic natural gas system, which is closely related to price volatility, also increased significantly.

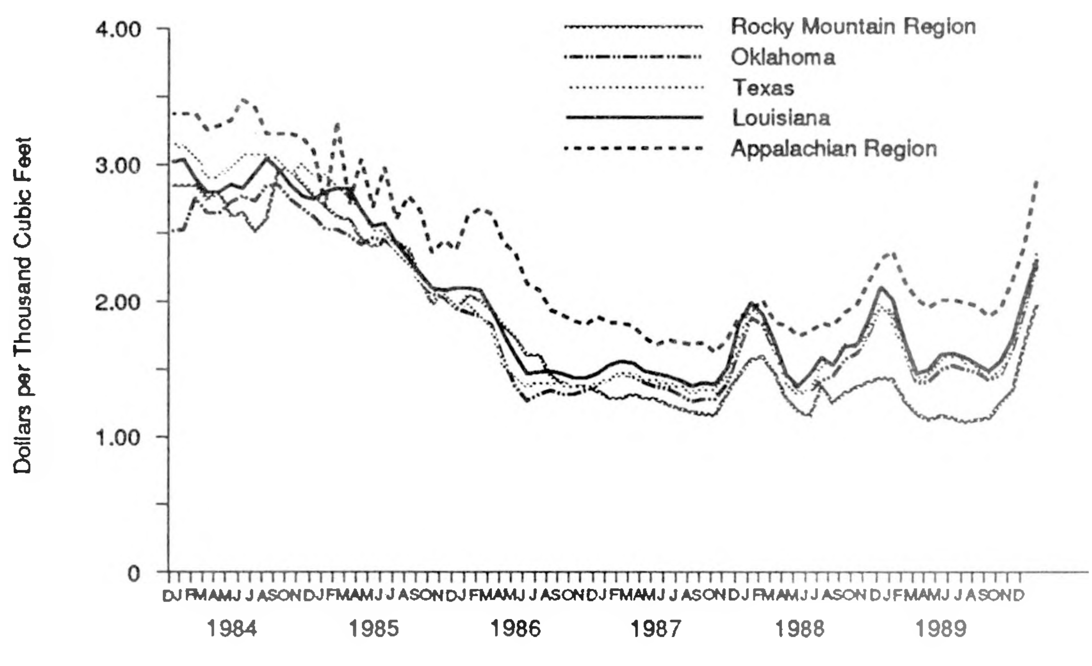
As may be seen in Figure FE1:

- From 1983 through early 1986, overall spot prices fell, in response to the excess supply of natural gas relative to demand; inter-regional price relationships were subject to considerable volatility during this severe decline, and strong seasonality was not clearly apparent;

- Then, over the remaining period, as prices stopped declining and a new price balance was attained, and as participation in the spot market grew, inter-regional price relationships became much more stable, and price seasonality became more clearly established.

The 1984 proposal to open a natural gas futures market was made before many of the legislative and regulatory changes were in effect. Therefore, the original proposal focused on the intrastate natural gas market in Texas, primarily because prices were much less subject to statutory and regulatory control within intrastate markets in general and because of the large size of the Texas intrastate market. By 1985, however, both the CFTC and the NYMEX had come to agree that further research was required before the proposal should be formally considered, including an assessment of the impact of regulatory developments.

Figure FE1. Historical Natural Gas Prices on Regional Spot Markets



Source: Energy Information Administration, Office of Oil and Gas. Composite spot prices compiled from the following industry sources: *Inside F.E.R.C.'s Gas Market Report*, *Natural Gas Intelligence*, *Gas Price Survey*, *Foster Natural Gas Report*, *Natural Gas Week*, and *Gas Price Report*.

[1] *NYMEX Natural Gas Futures Handbook*, New York Mercantile Exchange, Washington, D.C., February 28, 1990, pages C-6 to C-7.

In 1987, four pipelines applied to the Federal Energy Regulatory Commission (FERC) to establish a delivery service at Katy, Texas, that would be used for both spot market and futures market transactions. Katy was selected as the delivery site largely because of its proximity to interstate and intrastate pipeline interconnections, its access to Texas production and consumption areas, and the availability of underground storage. However, in 1989, the FERC dismissed this application as unnecessary, due to the increased availability of open-access transportation under existing statutes and regulatory orders.

Shortly thereafter, the NYMEX adjusted its original proposal to reflect spot-market developments over the intervening years, and switched the delivery site to be specified in natural gas futures contracts to the Sabine Pipe Line Company's Henry Hub, near Erath, Louisiana. Sabine (pronounced suh-BEAN) is a wholly owned subsidiary of Texaco, Inc., and is itself an open-access interstate pipeline company. The Henry Hub is a major natural gas interchange center in close proximity to major production and consumption areas. The transmission interchange has been operational since May 1988 and currently offers transportation service among seven interstate pipelines, two intrastate pipelines, and one gathering system, which are all interconnected at the site. Three additional pipeline connections are currently anticipated by Sabine. The switch from Katy to the Henry Hub was reportedly made primarily because of the Henry Hub's operating experience, whereas the Katy interchange was untested; the availability of underground storage was not a consideration in the decision. A map showing the location of the Henry Hub and a schematic diagram identifying its pipeline interconnections are presented in Figure FE2.

All service at the Henry Hub interchange, since its commencement, has been provided on an interruptible basis. Such service is offered to shippers under rate schedules or contracts that anticipate and permit interruption on short notice, generally at times of peak demand. Priority access to transportation is provided on a first-come, first-served basis; however, the interchange has a "no-bump" policy. According to this policy, shippers actively transporting gas during a given month are not interrupted in the event that another shipper with a higher priority requests service, after gas has begun flowing for shippers with a lower priority.

The futures contract currently traded has been carefully designed to enable the new market to carry out its anticipated role as effectively as possible. Its other terms include the following:

- Each contract provides for the delivery of 10,000 million Btu of natural gas, plus or minus 2 percent (roughly equivalent to 10 million cubic feet of natural gas or, in terms of heating value, 600 barrels of No. 2 heating oil);
- Prices are quoted in dollars and cents per million Btu (for example, $2.00 per million Btu), with a minimum price fluctuation of $0.001 per million Btu ($10 per contract); the maximum daily price fluctuation limit is $0.10 per million Btu ($1,000 per contract), with no limit during the contract month nearest to maturity;
- Contracts are traded for twelve consecutive months, with trading terminating at the close of business eight business days prior to the first day of the delivery month; deliveries must begin and end within the delivery month;
- Provisions are made for alternative delivery procedures and the exchange of futures for physicals (alternative methods of closing futures positions that are briefly described in the technical notes appended to this article); these and other special procedures tailored to meet the needs of the natural gas industry help minimize the risk of delivery default; and
- Positions taken by speculators who are not hedging a commercial transaction are limited to 350 contracts net long or short in the spot month and 5,000 contracts net long or short in any individual month and in all months combined; spot month goes into effect ten business days prior to the last day of trading.

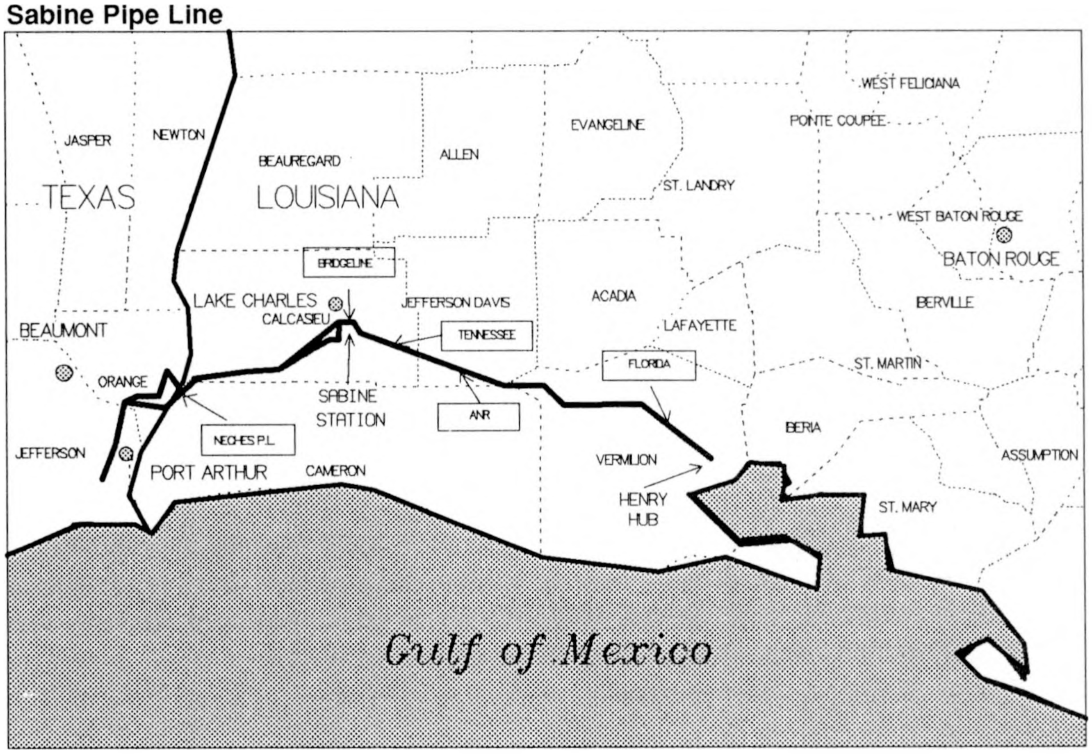
The CFTC's Division of Economic Analysis has found that the terms and conditions of the contract are generally in conformance with physicals market practices and that the contract is not likely to be readily susceptible to price manipulation or distortion. In particular, the Division found that the deliverable supply of natural gas at the Henry Hub interchange is sufficiently large to support the contract and that the supplies and access to transportation appear to be sufficient during both peak and non-peak demand periods to minimize the possibility of price manipulation or congestion. The Division further found that the terms of the contract can reasonably be expected to provide economic functions that will be in the public interest and are not contrary to the public interest. Many of these economic functions are discussed in the following section.

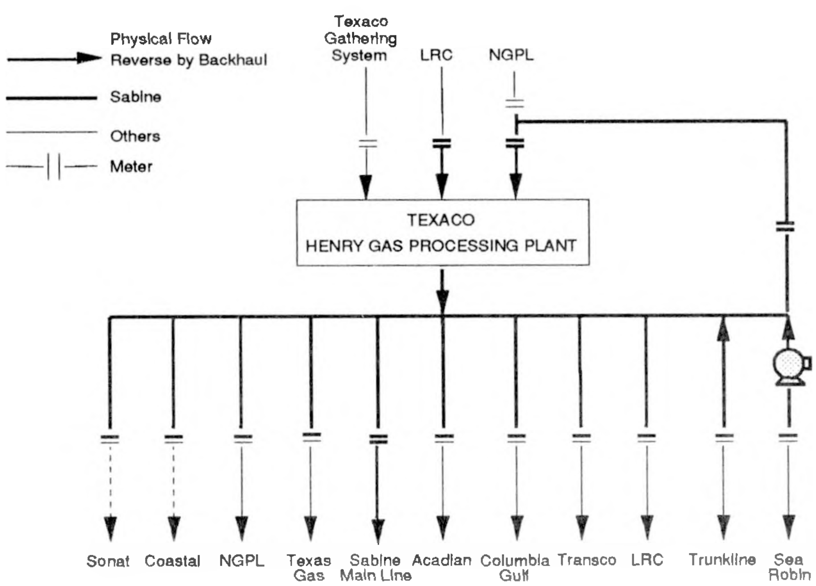
The Role of the Futures Market in this New Environment

The increasing price volatility of the new domestic natural gas environment has led many market participants to look for ways to meet two important requirements that have become increasingly urgent:

Figure FE2. Location and Pipeline Interconnections of the Henry Hub

Sabine Pipe Line





Source: Sabine Pipe Line Company, as presented in New York Mercantile Exchange, *Introducing the NYMEX Natural Gas Futures Contract*, New York, New York.

- The need for a reliable mechanism to improve the flow of information regarding current and expected natural gas prices to all domestic natural gas market participants; and

- The need for a reliable mechanism to facilitate the management of price risk.

The new natural gas futures market is widely regarded as a milestone in the continuing transformation of the domestic natural gas markets--in large part because, as its use develops, it is expected to help meet these requirements. In addition, by improving the flow of price information, the new natural gas futures market is widely expected to improve the economic efficiency of domestic natural gas markets; concomitantly, it is also expected to improve the accuracy with which market prices reflect informed opinions.

The need to improve the flow of price information requires the establishment of a way to discover, through a timely, reliable process, the current market price of natural gas, in order to improve business performance through informed decisionmaking. This need may be especially pressing at present, given the unprecedented changes affecting the industry. Domestic natural gas price levels are becoming increasingly responsive to changes in basic forces of supply and demand (and to changing expectations regarding those forces), and are thus becoming increasingly volatile and unpredictable. Such an established price-discovery process could also be referenced in contracts as a mechanism to ensure price adjustments that flexibly respond to unforeseeable changes.

The need to facilitate the management of price risk is also a pressing requirement of many participants, who need a way of reducing their exposure to unexpected price fluctuations, whose unanticipated impact might otherwise be financially difficult for them.

Improving the Flow of Price Information

Prices quoted with respect to futures markets, which are primarily used for financial management and speculation, differ significantly from prices quoted with respect to physicals markets, which are primarily used for the actual sale of a physical commodity. For example, futures-market prices are much more precisely defined than spot-market composite prices published in trade journals, for reasons discussed in the technical notes appended to this article; consequently, they more clearly articulate past trends and future expectations regarding prices. Futures-market prices are also far more widely, rapidly, and inexpensively disseminated. Such differences have, in the past, tended to cause futures-market prices to be used as reference prices in virtually all commodities markets that have futures markets--and presumably should have the same effect in natural gas markets.

The acceptance of the natural gas futures-market price as an industry-wide reference price should have many effects. For example, an established futures-market reference price should alert bidders and sellers in all other natural gas markets, almost instantly, to shifts in the basic forces of supply and demand affecting natural gas, thereby allowing bidders and sellers to adjust their bids and offers appropriately to reflect such shifts. The ready availability of a set of such prices extending a year into the future should also help firms make better decisions regarding prospective natural gas production, transmission, storage, and consumption. Of course, influences other than the basic forces of supply and demand can also influence futures-market prices, as noted below, under the heading, "Potential Risks Associated with the Futures Market."

A comparable tendency toward instant price adjustment is reported to have become increasingly prevalent in petroleum markets since 1978, when the NYMEX first opened a heating oil futures market--to be followed by futures markets in crude oil, unleaded gasoline, propane, and, most recently, residual fuel oil. In recent years, this instant-adjustment effect, coupled with the actions of arbitragers, is said to have resulted in a general tightening--or disciplining through use of a common reference price--of price relationships between various regions, time-periods, and closely-related energy commodities,[2] although this general tendency has been subject to important exceptions--particularly during 1989.[3] Volatility in inter-regional, inter-temporal, and inter-fuel relationships is thus reported to have been moderated by the new petroleum futures markets, despite an increase in overall petroleum-price volatility, as petroleum markets have increasingly come to resemble price-responsive markets for other commodities.

The extent to which the new petroleum futures markets may also have moderated or exacerbated the overall price volatility in petroleum spot markets--relative to the volatility that might otherwise have occurred in their absence--has been the subject of much debate. As noted in a relatively new study, "economic theory yields no clear conclusion about the effect of introducing futures trading on spot market volatility.... [*It*] can

[2]Hall, Andrew, "Globalization of Oil Markets," ***Energy in the News,*** New York Mercantile Exchange, Second Quarter, 1988, pages 25 to 27; Demler, Frederick R., "International Jet Fuels vs. NYMEX Basis Relationships," ***Energy in the News,*** New York Mercantile Exchange, Third Quarter, 1988.

[3]Gall, Liz, "How a Nonintegrated North Sea Producer Views Oil Price Risk," ***Oil and Gas Journal,*** January 22, 1990, page 39; ***The Oil Marketing Bulletin,*** Vol. 30, No. 1, January 8, 1990, page 1.

stabilize or destabilize spot prices, depending on market structure and the sources of uncertainty. The effect of futures markets is thus an empirical question." In the case of the futures market for West-Texas-Intermediate crude oil, the same study found "strong, but not unqualified support for the proposition that futures trading has increased the efficiency of operation of the crude oil market."[4]

The acceptance of the futures-market price for natural gas as an industry-wide reference price should facilitate price bidding on spot-market transactions--through reference to the futures-market price at the time of delivery, using a pre-determined formula specified in a given contract. In the past, the process of negotiating and bidding on natural gas spot deals has been complex, inefficient, and compressed into a limited time period (generally the last ten days of each month) for delivery over the next thirty to ninety days. If, during that period, supply and demand pressures moved against a party who had contracted to deliver some volume of natural gas but who had not yet made delivery, then that party had substantial incentive to find that his best efforts to deliver the gas were unsuccessful, leading to contract cancellation. Such opportunistic nonperformance was said to have been associated with the spot market last winter and could logically have been reduced, had it been possible to write contracts more flexibly, making use of a reliable futures-market reference price.

The acceptance of the futures-market price should also facilitate the flexible pricing of long-term contracts--through similar reference to the futures-market price at the time of delivery, using a pre-determined formula specified in a given contract. Such use would allow contracting parties to be assured of market-sensitive, competitive prices governing the continuing execution of their long-term contracts. Similar use of the futures-market price has also been suggested in several proposals for pricing gas inventory charges.

Such price referencing in both spot-market contracting and longer-term contracting could be based, for example, on either absolute price levels or relative percentage changes in absolute price levels and thus be formulated in relatively simple terms. Even such relatively simple price referencing, however, would typically take into account a variety of considerations regarding expected inter-regional, inter-temporal, and inter-fuel relationships. More complex price referencing could also take into account additional factors that might potentially affect spreads in a somewhat predictable manner, such as the time remaining before delivery on a referenced futures-contract price, seasonality, or long-term trending.

The estimation of such a relationship between a futures-market price and the price of a parallel transaction on a closely-related spot or other physicals market--a relationship known as "basis"--is also central to the second major need of participants in the changing domestic natural gas environment, as discussed below.

Managing Price Risk

The need for a reliable mechanism for the management of price risk is another pressing requirement of many participants in domestic natural gas markets, who need a way of reducing their exposure to unexpected price fluctuations. The natural gas futures market provides a means for meeting that need through a process known as "hedging."

In the old environment of natural gas markets, both short-term load-balancing and longer-term supply-and-demand balancing were generally managed by the natural gas pipeline companies. Relatively stable prices combined with traditional long-term contracting practices greatly minimized exposure to price risk. In the new environment, such balancing is increasingly performed within a competitive market, on a short-term basis with greater price instability. Exposure to price risk derived from changes in supply and demand is viewed as an important stimulus for more efficient management, thereby ensuring adequate supply development at reasonable prices.

"Hedging"--a practice greatly facilitated by the establishment of the new natural gas futures market--is an important, relatively inexpensive, market-oriented mechanism for transferring certain kinds of price risk from some participants in domestic natural gas markets to other participants in the new futures market more willing and able to bear the risk--or who have inverse risk profiles. Risk profiles are said to be inverse if a buyer's adverse exposure and aversion to unexpected price increases corresponds to a seller's adverse exposure and aversion to unexpected price decreases, enabling them to benefit from a mutual transfer of risk that minimizes both parties' exposure to unexpected gains and losses. Inventories that are hedged, moreover, can provide better security to lenders, who may thus increase amounts they are willing to lend against hedged inventories, thereby effectively increasing a firm's working capital.

Exposure to the risk of unexpected price changes can arise in a variety of commercial situations--for example, in the case of a trader, while:

[4]Dominguez, Kathryn M., Strong, John S., and Weiner, Robert J., ***Oil and Money: Coping with Price Risk through Financial Markets,*** Energy and Environmental Policy Center, Harvard University, Cambridge, 1989, pages 4 to 5.

- Holding title to an inventory for later sale (known as being "long" in the physicals market); or
- Contracting to deliver in the future at a set price (a "forward sale") an inventory that has not yet been acquired (known as being "short" in the physicals market).

If prices were to change adversely for a trader--that is, in the former case, if prices were to fall unexpectedly before the inventory was sold, or, in the latter case, if prices were to rise unexpectedly before the inventory was acquired--then profit margins could be severely impaired.

To reduce their exposure to the possibility of unexpected adverse price change, traders often use futures markets to hedge their inventories or unsecured forward sales. By setting up a hedge under these circumstances, traders attempt to lock-in a future price currently offered by the futures market. A hedge, in this context, is a procedure for reducing exposure to unexpected price changes by matching, to a given physicals-market transaction, a futures-market transaction that corresponds, with appropriate adjustments, to the given physicals-market transaction.

In the case of a "perfect" hedge--that is, a hedge that perfectly eliminates all risk of unexpected price change--the appropriately corresponding futures-market transaction is equal and opposite to the given physicals-market transaction. In other words, a short position in the futures market is established to match exactly a given long position in the physicals market, or a long position in the futures market is established to match exactly a given short position in the physicals market. A brief description of the basic mechanics of a perfect hedge may be found in the technical notes appended to this article.

Even in the case of a perfect hedge, price-risk reduction is limited. The hedger, for example, is restricted to locking-in a future price offered by the futures market; he cannot lock-in his own expectation of a future price that differs from that expected by the market. For this reason, a perfect hedge also offers no protection against a generally expected price change, which the market will already have factored into the current price of a futures contract. A perfect hedge will, however, eliminate exposure to an *unexpected* price fluctuation above or below the market's expected price.

A perfect hedge that is based on the use of futures-market contracts also offers only limited longer-term protection against exposure to price risk. Futures markets generally offer contracts that extend, at maximum, only 12 to 18 months into the future, with contracts that fall due in the longer-term months tending to provide far less market liquidity than contracts falling due in the near-term. Consequently, futures market hedging can offer little or no longer-term protection against unexpected price changes, beyond the limited risk smoothing that can be achieved through rolling-over contracts. Of course, numerous risk-reduction strategies outside the futures markets are available to physicals markets participants who wish to reduce their exposure to longer-term unexpected price fluctuations. These include such conventional methods as long-term contracting, portfolio diversification, and vertical integration. Another less-conventional method, relatively new to natural gas markets, is the commodity swap--a privately negotiated contract that can support longer-term hedging and be otherwise customized, while requiring no margin and allowing cash settlement. The major disadvantage of commodity-swap hedging, in comparison to futures-market hedging, is that it lacks the financial security offered by a futures exchange and its clearing members against contract abrogation.

Risk-reduction strategies are usually developed to meet the full portfolio of correlated and uncorrelated risks faced by a business and not by a concentration on just one form of risk. Most commercial firms are primarily concerned about overall profit-risk, of which the type of price-risk addressed by hedging is but one component. For example, futures-market hedging addresses price risk, not delivery risk--that is, the risk that commodities contracted will not be delivered. Hence, futures-market hedging should not, by itself, be relied upon to guard against delivery risk and thereby to substitute for the maintenance of adequate inventory levels.

Abrogation of a well-constructed hedge against a physicals market transaction, caused by delivery default, can leave the hedger far worse off than if the hedge had never been placed. Unfortunately for commercial participants in domestic natural gas markets, delivery risk is often greatest during periods of peak demand, when price risk is also great and the effects of both risks on overall profits magnified by the large volumes likely to be traded.

Unlike insurance, futures-market hedging addresses unexpected price-change exposure both above and below a given futures price. While unexpected losses may thus be averted, so may unexpected gains. More elaborate hedging strategies can modify this consequence by locking in various advantageous spreads between markets, time periods, and commodities as they occur. However, the use of such strategies begins to move the objective of hedging away from strictly reducing unexpected price risk, toward speculating for financial advantage. In actual practice, the purpose of most hedges does, in fact, lie somewhere between these two goals, for reasons discussed below.

Perfect hedges are useful for initial explanatory purposes, but they almost never occur in the real world for numerous reasons. For example, the terms of the anticipated physicals market transaction rarely match the standard terms of the futures market contract:

- The location of the physicals transaction may well differ significantly from that specified in the futures contract;
- The timing of the physicals transaction may well differ significantly from that available in contracts offered on the futures market; and
- Even the exact commodity being hedged in the physicals market may differ from the proxy commodity available in the futures market.

Moreover, even if the terms of the anticipated physicals market transaction do match the standard terms of the futures market contract exactly, the price of the futures contract at the time the hedge is liquidated is still likely to differ somewhat from the corresponding price on the physicals market, due to the inherent volatility of spreads between markets. For these reasons and a few others, there will almost certainly be a varying price difference between the commodity position being hedged on the physicals market and the futures-market position being used to complete the hedge.

Such a varying price difference, known as "basis," must be factored into the construction of a hedge. Clearly, in order for a hedge to work effectively, the basis used in the hedge must take the form of a reasonably predictable relationship (or be trivially small). Many texts suggest that the two prices must show a strong correlation of at least 0.8 for the basis relationship to be considered strong enough for a hedge to be effective. As noted above, however, a reliable basis relationship need not take the simple form of a constant absolute or percentage difference; such a relationship can be expressed as a more complex formulation that takes into account such potential influences as the time remaining before delivery on a referenced futures-contract price, seasonality, and long-term trending. A brief discussion and illustration of price risk vs. basis risk may be found in the technical notes appended to this article.

Typically, a useful basis relationship will be generally reliable, but will also fluctuate somewhat unpredictably. Hence, the essence of a hedge is the acceptance of basis risk in place of price risk. A well-constructed hedge will protect against an unexpected short-term fluctuation in the future price of a commodity, for example, but will not protect against an unexpected change in the relationship--the basis--between prices in the futures market and prices in the related physicals market for which the hedge has been created. Of course, such changes in basis relationships can be a source of profit rather than loss, if correctly anticipated by a market participant and acted upon advantageously.

A specific, relatively simple example of the way locational basis risk can significantly affect the nature of a short hedge is presented in Table FE1. This example illustrates the potential influence of basis risk on a short hedge that might have been created by a natural gas marketer with a long physicals-market position at a market distant from the Henry Hub. Such a hedge might have perfectly compensated for unexpected spot-market price declines, had the locational basis of the hedge (assumed, in the example published by the NYMEX, to be \$.10 per million Btu) remained constant.

However, in this example, the hedge provided only imperfect compensation because of changes in the locational basis of the hedge (that is, because the spot-market price of natural gas in a market distant from the Henry Hub declined at a rate different from the corresponding rate at the Henry Hub). In both cases, the futures market price dropped by \$.25 (the price risk), while the basis changed by either +\$.10 or -\$.10 (the basis risk). In Case A, where the locational basis moved from -\$.10 to \$0 (that is, the spot price declined more slowly than the futures price), thereby offsetting the unexpected spot-market price declines, the change was advantageous to the hedger. In Case B, where the basis moved from -\$.10 to -\$.20 (that is, the spot-price declined more rapidly than the futures price), thereby exaggerating the unexpected price declines, the change was adverse to the hedger. Note that in Table FE1, NYMEX analysts refer to a positive change in the basis as a widening of the basis, even though this may cause the basis to become smaller in absolute terms, and a negative change as a narrowing of the basis.

Many hedging strategies are far more complex than the example presented in Table FE1--often involving interrelated straddles and spreads. A futures straddle or spread, in this context, refers to the simultaneous purchase of one futures contract and sale of a different futures contract--for example, the purchase of one futures month against the sale of another futures month or a futures contract purchase in one market and a simultaneous sale of the same commodity in some other market. By bridging different regional markets, time periods, and fuels, such straddles tend to offset each other in ways that additionally limit exposure to price risk or take advantage of favorable market opportunities. For example (still somewhat simplified), a natural gas producer might initiate a gas-to-oil futures hedge in order to reduce his exposure to a potential fall in residual fuel prices that is not anticipated, at the time the hedge is set, in futures-market prices. Such an unexpected increase in gas-to-oil price ratios could cause many industrial customers to switch from natural gas to residual fuel, thereby reducing natural gas demand and prices on the spot market.

Table FE1. Example of Hedging with Basis Variation

Date	Cash Market	Futures Market
May 1	Owns 100,000 million Btu of gas, purchased at a spot price of $1.95 per million Btu.	Sells 10 June futures contracts at $2.05 per million Btu.
Case A: Basis Widens (from ($0.10) to 0) while Prices Decline		
May 8	Sold 50,000 million Btu at $1.90 plus $0.05 fee.	Buys back 5 June contracts at $1.95 per million Btu.
May 19	Sold remaining 50,000 million Btu at $1.80 plus fee.	Buys back 5 June contracts at $1.80 per million Btu.
Case B: Basis Narrows (from ($0.10) to ($0.20)) while Prices Decline		
May 8	Sold 50,000 million Btu at $1.80 plus fee.	Buys back 5 June contracts at $1.95 per million Btu.
May 19	Sold remaining 50,000 million Btu at $1.60 plus fee.	Buys back 5 June contracts at $1.80 per million Btu.

Results

Case A:	May 8	May 19	Total
"Expected" Revenue ((futures price + expected basis[1] + $0.05) x 100,000 million Btu)			$200,000
Cash Market Revenue (cash sale price x sale quantity)	$97,500	$92,500	$190,000
Futures Market Revenue ((sale price - buyback price) x sale quantity)	$5,000	$12,500	$17,500
Total Actual Revenue (cash + futures)	$102,500	$105,000	$207,500
Basis Change (actual - expected revenue)			$7,500

Case B:	May 8	May 19	Total
Expected Revenue ((futures price + expected basis[1] + $0.05) x 100,000 million Btu)			$200,000
Cash Market Revenue (cash sale price x sale quantity)	$92,500	$82,500	$175,000
Futures Market Revenue ((sale price - buyback price) x sale quantity)	$5,000	$12,500	$17,500
Total Actual Revenue (cash + futures)	$97,500	$95,000	$192,500
Basis Change (actual - expected revenue)			($7,500)

[1]Expected location basis is generally actual basis at time hedge is placed, i.e. $1.95 - $2.05 = ($0.10) per million Btu.
Source: New York Mercantile Exchange, *Natural Gas Futures Handbook*, Washington, D.C., February 28, 1990, page 3-8-3.

To protect himself against such a potential situation on the natural gas spot market, the producer might simultaneously purchase a set of contracts on the natural gas futures market while selling an equivalent set of contracts (in terms of Btu content) on the residual-fuel futures market. Alternatively, in the event of illiquidity problems affecting the residual-fuel futures market, the crude-oil futures market could be used as a proxy after making appropriate basis and other numeric adjustments. Such an inter-market futures spread would effectively lock-in the current ratio of gas-to-oil futures-market prices. Adverse future moves in the ratio in the physicals markets would be offset by favorable future moves in the equal and opposite positions taken in the futures markets (always allowing for basis variation).

In the event that the unexpected decline in residual fuel prices actually occurred, the producer could use his net profit on the futures markets to compensate for the lost profits he would incur on the spot market through lost sales volumes, if he chose not to reduce his natural gas prices competitively. Alternatively, he could use his net profit on the futures market to compensate for the lost profits he would incur on the spot market if he chose to reduce his natural gas prices competitively, thereby maintaining his sales volumes. Of course, placing such an inter-market hedge would also force the producer to forego many of the potential benefits of an unexpected increase in residual-fuel prices.

Somewhat more sophisticated hedging techniques include the bull straddle (a pair of opposite contracts, one near-term and one longer-term, in which the near-term contract is the long position), the bear straddle (a similar pair of opposite contracts, in which the near-term contract is the short position), and the butterfly spread (two sequential, opposite spreads, possibly overlapping, structured to create a spread between the spreads). Such techniques are, in turn, often used as elements within still more elaborate hedging strategies. Many professional hedgers are continuously engaged in the process of intermittently opening and closing positions in various markets, in response to changing circumstances and opportunities regarding fluctuating basis relationships. Speculators who are not hedging commercial positions (and who play an important market role in accepting the transfer of price risk and contributing to market liquidity) are often even more active in this regard.

Obviously, a professional hedging program requires considerable expertise in evaluating fluctuating basis relationships and building flexible, responsive strategies upon them. Not only must these theoretical relationships be reliably estimated and frequently adjusted as underlying circumstances change, but the prices currently offered in various markets must also be scanned continuously to assess whether or not current basis relationships are relatively favorable or unfavorable for the initiation or closing of particular hedges. Such considerations are of crucial importance in determining both the timing and magnitude of the futures transactions appropriate to matching the physicals-market transactions being hedged.

Hedging has been described as speculating in basis risk. This is, in part, because the successful hedger must consider not only established basis relationships, but also more immediate influences related to underlying patterns of supply and demand (known as "fundamental" influences--for example, seasonality)--as well as influences related to the statistics of market transactions (known as "technical" influences--for example, temporary trends exaggerated by temporary market illiquidity[5]). It is sometimes suggested that fundamental influences primarily affect decisions on whether or not to hedge particular commercial positions, whereas technical influences primarily affect the timing and magnitude of positions taken in the course of implementing those decisions. Based on the evaluation of such influences, many hedgers often engage in practices (variously known as "selective hedging," "discretionary hedging," "variable-margin hedging," "under-hedging," and "anticipatory hedging") that depart from perfectly matched hedging in order to take additional advantage of what they perceive as favorable basis opportunities.

Strictly conservative hedging--to minimize price risk--must thus be distinguished from strictly speculative hedging--to take advantage of perceived basis-risk opportunities--and recognition must be given to the fact that most hedging takes place in the vast middle ground between these extremes. This is because most firms are at least as interested in taking advantage of opportunities to increase profit as they are in opportunities to minimize risk.

It thus becomes extremely important for firms engaged in hedging to define and effectively administer policies that ensure that the objectives of hedging in practice conform as closely as practicable to the objectives of hedging as intended by senior management. Regulatory bodies overseeing firms that might benefit from hedging (or whose customers might benefit from hedging) also have a responsibility to provide clear guidance regarding prudent hedging practices, incentives, and disincentives. A professional hedging program is likely to require substantial, ongoing investment in expert staff, staff support, and senior-management oversight, but the rewards of such a program can far outweigh the costs.

[5]For overviews of the arcane principles of technical analysis, cf., Teweles, Richard J. and Jones, Frank J., ***The Futures Game: Who Wins? Who Loses? Why?*** Second Edition, McGraw-Hill Book Company, New York, 1987, pages 160 to 193; Fink, Robert E., and Feduniak, Robert B., ***Futures Trading: Concepts and Strategies,*** New York Institute of Finance, New York, 1988, pages 370 to 432.

How the Players in the Gas Market Might Use the Futures Market

The passages that follow within this frame have been excerpted from New York Mercantile Exchange, *Introducing the NYMEX Natural Gas Futures Contract*, New York, N.Y.

Natural gas futures can help each sector of the gas industry deal with the opportunities and challenges created by the evolution toward a free market for natural gas.

Producers

Hedging with natural gas futures can be used to smooth out seasonal price and production fluctuations. By selling futures, producers can protect against unexpected price declines. Producers can also use natural gas futures as a price reference for medium to long-term contracts, enabling them to ensure sales at competitive prices. For very short-term, fixed-price deals, the futures price can serve as a benchmark for evaluating spot transaction prices.

Pipelines

Pipelines with traditional long-term, fixed-price contracts are potentially at risk from large gas price moves in either direction. Should gas prices fall, sales could be lost to the spot market. But should they rise, sales could be lost to the oil market if its prices do not rise in step. Depending on the expected likelihood of a move and the financial risk of the exposure, the pipeline could hedge against either an absolute change in the price of gas or a change in the price of gas relative to that of oil. Pipelines purchasing on the spot market can use futures to lock in a current price or a favorable seasonal price relationship. Natural gas futures can also be used as the price basis for new or renegotiated contracts, or as the benchmark for fixed-price spot deals.

Local Distribution Companies (LDC's)

LDC's choosing between secure but potentially uncompetitive long-term contracts and less secure spot purchases can now consider long-term contracts at competitive, futures-based prices. Unexpected demand fluctuations can occur even with assured, competitively priced supply, but LDC's can reduce price risk by hedging gas outright or hedging the gas-oil price relationship. Like pipelines, LDC's can also use futures to hedge against increases in the price of their spot gas requirements.

Marketers

Marketers that take title to gas before they can sign up buyers can lay off the price risk by selling futures. Marketers with buyers but no guaranteed source of supply would place the opposite hedge, buying futures. Marketers seeking to diversify their trading portfolio will find that their experience with gas pricing dynamics will enable them to quickly identify trading opportunities.

End Users

End users can ensure both supply and competitive prices by negotiating futures-linked contracts. They can either sign medium to long-term contracts and hedge the gas to oil price relationship; or, rely on shorter-term purchase agreements, hedging for short periods against unanticipated price spikes.

Note: Regulated utilities will want to have reached an agreement with their regulating authority on the methodology for accounting for hedge gains and losses before they enter the futures market.

Potential Risks Associated with the Futures Market

The potential impact of the new natural gas futures market will be largely determined by whether it flourishes. The experience of other futures markets strongly suggests that neither the pace nor the extent of the new market's development should be taken for granted. Specifically, futures markets are not always successful, their initial terms often are improved based on experience and in response to changing physicals-market requirements, and even so, futures markets can take years to become a critical factor in related physicals markets.

For example, in 1978 the NYMEX attempted to open a residual fuel oil futures contract that was unsuccessful--in part, because the standardized futures contract specified delivery of low-sulfur fuel oil in New York harbor, despite the fact that, at that time, such low-sulfur fuel oil was rarely delivered to New York harbor. Early this year, the NYMEX crude oil futures contract was modified to reflect changing physicals-market requirements, and several industry sources have indicated that the NYMEX's new residual fuel futures contract may also be modified or discontinued, in response to illiquidity problems that may be due to its present delivery terms. Since 1978, several exchanges are reported to have listed various futures contracts on crude oil and petroleum products that have not succeeded and have been withdrawn. On the other hand, over the past few years, both the International Petroleum Exchange in London and the Singapore International Monetary Exchange have successfully opened trading in several petroleum futures contracts--the former, in Brent crude oil, gas oil, and heavy fuel oil, and the latter, in bunker fuel, with plans, reportedly, for a new contract in Dubai crude oil.

Assuming the new natural gas futures market is successfully established, it is still uncertain when, or even whether, the new futures market will develop into a major factor in domestic natural gas trade. NYMEX trading in crude-oil futures, for example, reportedly did not reach critical mass until the crude-oil price collapse of 1986, helped in part by some serious defaults in the crude-oil forwards market at that time.

The successful establishment and development of the new natural gas futures market will thus depend on many complex factors, only a few of which are noted below:

- The delivery procedures specified in the standard natural gas futures contract must work and be generally perceived to work--particularly during times of market stress, when many market participants might consider it advantageous to hold futures contracts for delivery, and some might attempt to manipulate the market. Such attempts are a recurrent theme in the history of futures markets and have succeeded on numerous occasions. One of the most famous futures-market defaults occurred in May 1976, when 50 million pounds of Maine potatoes were not delivered as required, upon expiration of futures contracts on the NYMEX. As a consequence, potato-contract default rules were revised and fourteen participants on both the long and short side were charged by the CFTC with market manipulation. Three years later, fearing another default, the NYMEX suspended most potato-futures trading amid much acrimony, and again revised the contract. Concerns have been raised by some in the industry, regarding the adequacy of the new natural gas contract's delivery mechanism, which the CFTC has summarized and to which it has responded;[6]
- Prices on spot markets must, prospectively, be reliably correlated with prices developed on the new futures market--in order for reference-pricing in spot and longer-term contracts to be acceptable to most contracting parties and for conservative hedging to be practicable. Such correlations may not be stable in an industry continuing a process of major transformation. Moreover, despite the market-responsive economic changes already achieved, the domestic natural gas industry continues to violate the economic-efficiency standard that states that price differences for a given commodity between two geographic points not exceed the cost of transporting the commodity between the two points. As a consequence, for example, the Oklahoma Independent Petroleum Association in 1989 asked the Oklahoma governor's office to conduct an investigation into the price differential between Oklahoma and Louisiana natural gas production;
- Regulatory prohibitions must be removed and regulatory uncertainty resolved for many participants in domestic natural gas markets to make use of price-referencing and hedging--inasmuch as a relatively large number of participants must find it feasible to use the market, in order for the new futures market to develop into a major factor in domestic natural gas trade. Many observers have suggested that regulatory positions regarding the use of futures markets are no more likely to be speedily and clearly taken than they were regarding the use of natural gas spot markets, where many issues still remain unresolved--particularly concerning guidelines for prudently determining an appropriate balance between spot and longer-term purchases. In addition, many utilities are said to have charters with restrictions on their investments that may include prohibitions on futures trading; and

[6] *New York Mercantile Exchange Designation Application for Natural Gas Futures,* Division of Economic Analysis, Commodity Futures Trading Commission, February 20, 1990, pages 26 to 33 and 54 to 62.

- The spot market price and the futures-market price at the time of delivery must reliably converge--not merely on the average, but particularly during times of unusual stress--since price-referencers and hedgers use futures markets primarily to guard against unusual and unpredictable situations. One notable example of futures-market and spot-market prices failing to converge during a period immediately prior to futures-contract maturity occurred during the unexpected cold snap last December in domestic markets for No. 2 fuel oil. According to trade reports, increasingly high price premiums on the spot prompt market (in some cases, as much as $.17 to $.20 per gallon above the price of the corresponding, expiring January futures contract) severely impaired many hedges, and led one trade publication to advise, "Watch for a move away from NYMEX-related bulk deals next year, back toward referencing such transactions to spot numbers in various oil publications."[7] Another notable example occurred during the summer of 1989, when the physicals-market price and futures-market price of crude oil reportedly diverged at settlement.[8]

Assuming the new natural gas futures market does become established and develops into a critical factor in related physicals markets (which include physicals markets for commodities that are complements to or substitutes for natural gas), there are still potential risks to be considered that might arise from imperfections in the flow-of- price-information and price-risk-management mechanisms previously discussed.

Such imperfections could arise from the discovery of a reference price that responds disproportionately to influences unrelated to fundamental supply and demand, caused by discrepancies between futures markets in theory and futures markets in practice:

- For this reason and others, three of the five FERC commissioners reportedly had significant reservations regarding the potential effects of the proposed natural gas futures market, prior to the FERC deciding that FERC approval was not required for the proposal.[9] Former FERC Chairman Martha Hesse, for example, was quoted earlier as saying, "I have questions about the value of a futures market. I want price to be set by buyers and sellers of a commodity, not by traders on Wall Street;"[10]

- Such reservations most likely took into account potential influences that could be either legal or illegal. Legal influences might include, for example, the program trading and other factors associated with the severe 1987 collapse of the stock-index futures market and the stock market itself.[11] Illegal influences might include, for example, the types of activity prompting major undercover investigations, disclosed in 1989, concerning a large number of futures-market participants active in various Chicago and New York futures-market exchanges.[12] Both these examples have occasioned much publicity, numerous studies, and many recommendations for improving exchange procedures and regulatory oversight.

Such imperfections could also arise from the establishment of hedging practices that facilitate shifts of price risk that are beneficial, when considered from the perspective of individual hedgers, but which are dysfunctional, when considered from an aggregate perspective:

- Such adverse impacts could arise because such risk-management mechanisms inevitably discriminate between broad classes of participants who *are* able to hedge--and thus become relatively insensitive to price signals--and broad classes of participants who *are not* able to hedge due to idiosyncracies in the structure of domestic natural gas markets or to their continuing regulation--and who thus become correspondingly over-sensitive to the same signals, for reasons noted below;

- For some futures-market participants, hedging can *damp* the effect of some unexpectedly changing price signals due to changes in basic forces of supply and demand, decreasing the ordinary price-responsiveness of one or both parties to a hedge--and this may not always be desirable. For example, in the absence of hedging, a natural gas consumer might deal with the potential prospect of unexpected, shortage-induced price increases by maintaining precautionary natural gas inventories, by preparing to substitute another fuel for natural gas, or by preparing to reduce energy consumption temporarily. However, with demand requirements hedged, the same consumer might not undertake the same precautionary program on the same scale, since his hedge would potentially make him less price-sensitive. The result for the overall economy would be less aggregate physical supply and more aggregate demand in a time of shortage than might otherwise have been the case;

[7] ***The Oil Marketing Bulletin,*** Vol. 30, No. 1, January 8, 1990, page 1.

[8] Gall, Liz, "How a Nonintegrated North Sea Producer Views Oil Price Risk," ***Oil and Gas Journal,*** January 22, 1990, page 39.

[9] "Gas Futures Proposal on FERC Agenda for Sept 13," ***The Reuter Financial Report,*** September 7, 1989.

[10] ***Energy User News,*** May 1989, page 53.

[11] Summarized, for example, in Jickling, Mark and Knight, Edward, ***The Stock Market Crash Revisited,*** Report 89-628 E, Congressional Research Service, Library of Congress, October 31, 1989.

[12] Summarized, for example, in Jickling, Mark and Winch, Kevin F., ***CFTC Reauthorization and the Futures Trading "Sting"***, Report IB89051, Congressional Research Service, Library of Congress, October 23, 1989.

- For other futures-market participants, hedging can *amplify* some effects due to basic forces of supply and demand, because of the potential augmentation of physical shortages noted above and concomitant price increases, effects that would most likely be exacerbated by the decreased price-responsiveness of hedged competitors in the marketplace--and this may not always be desirable. For example, if certain broad classes of participants in domestic natural gas markets are barred from participation in hedging--due either to regionally differentiated markets that do not have prospectively reliable basis relationships with the Henry Hub, or to regulatory prohibitions or regulatory uncertainty--and yet compete within the same system of interrelated physical supplies as hedged participants, then the consequence could be significant economic inefficiency and inequity.

Only time will tell whether the new natural gas futures market will become established as a significant force in natural gas market strategies. Most likely, discerning the impact of the new futures market will require several years, as the dependability of basis relationships and other aspects of the new market becomes more apparent and as participants and observers gain more experience and confidence.

Technical Notes

These notes discuss the following topics related to the new natural gas futures market:

- Futures markets vs. physicals markets;
- The basic mechanics of a futures-market transaction;
- The basic mechanics of a perfect hedge; and
- Price risk vs. basis risk.

Futures Markets vs. Physicals Markets

A futures market is a paper market--that is, a specialized market in contracts for the future delivery of a commodity under standard terms that are fairly rigidly specified. The standard terms of futures contracts are intended to facilitate their exchange--all bidding in futures markets is focused solely on price, thereby maximizing market liquidity and minimizing transaction cost. As a consequence of their standard terms, the vast majority of futures contracts are liquidated prior to delivery--because the standard terms, while representative of many contracts in the industry, are not likely to meet the exact needs of most industry transactions, particularly with regard to the location and timing of delivery. However, the possibility that delivery may actually be demanded under the standard terms of a futures contract theoretically disciplines the price of that futures contract to correspond closely at the time of delivery to the price of a comparable contract intended to result in the actual physical delivery of a commodity.

Natural gas futures contracts are thus highly specialized financial instruments designed to be used primarily for financial management and speculation, as are futures contracts in other commodities. Participants in futures markets typically open and close positions repeatedly, in response to their own changing needs and perceptions of market opportunity, with commodity volumes represented in open futures contracts for a given month often greatly exceeding the physical volumes of that commodity that will ultimately change hands that month.

Contracts that generally result in the actual physical delivery of a commodity are traded on on *physicals* markets, as opposed to *futures* markets. Such markets are also known as actuals, cash, or (in the case of energy commodities) wet markets. Physicals markets that are used for trades requiring nearly immediate delivery are known as spot-markets, while those requiring future delivery are known as forward markets. Note, however, that what is generally referred to as the natural gas "spot" market is technically a one-to-three-month "forward" market, inasmuch as natural gas spot trades are generally contracted during the last ten days of each month for delivery during the following thirty to ninety days, rather than "on the spot." In contrast, the "spot prompt price" in petroleum physicals markets refers to product that will move or become available within three to four days.

Trading in futures markets is conducted on the trading floor of a futures exchange by open-outcry auction, according to precisely specified rules, enforced by the sponsoring exchange and overseen by the U.S. CFTC. Financial performance on futures contracts is guaranteed by the sponsoring exchange and its clearing system, minimizing counterparty credit risk. Actual physical delivery under the formal terms of futures contracts, however, is not guaranteed by the exchange--only the cash value of the contracts.

Trading in physicals markets is much less formally structured, in part because there is no single spot-market trading floor. The term, "spot-market," instead refers to a diffuse, changing network of relationships among a wide variety of traders, brokers, and other spot-market participants, who are dispersed geographically. Sellers are reported to include most major and independent gas producers, processors, gas marketers, and marketing subsidiaries of gas producers, pipelines, and utilities. Buyers are reported to include gas trading companies, gas distributors, electric utilities, most major manufacturing industries, and numerous commercial establishments.[13]

These diverse participants are likely to be active in disparate regional domestic natural gas markets, whose varying supply-and-demand pressures and cost structures usually result in prices that exhibit significant, volatile inter-regional variation. Moreover, physicals-markets participants often lack timely or accurate information regarding each other's trades, relying in large part on statistics presented in a range of trade publications. This system facilitates the creation of contracts tailored to the contracting parties' exact needs, but it also means that delivery and payment under the terms of each individualized physicals contract are dependent on the good faith of the contracting parties and, ultimately, the courts.

In the natural gas industry, non-performance of physicals-market contracts is not unusual. Such non-performance is often due to a genuine inability to produce or transport the contracted natural gas, excused in accordance with standard contractual clauses that limit each contracting party's obligation to a "best effort" to perform. However, non-performance can also be due to opportunistic behavior. In particular, the contractual "best efforts" clause provides an opportunity for spot-market participants to abrogate contracts that have become disadvantageous between the time of execution and the time of required delivery.

The new natural gas futures market is expected to provide a reference price that can be used in flexibly written contracts to help minimize such physicals-market defaults; price-referencing is discussed above, under the heading, "Improving the Flow of Price Information." Some practical questions arise with respect to such price-referencing, however, concerning the extent to which futures-market prices represent *unbiased, efficient* estimates of future spot-market prices--or the extent to which, and circumstances under which, any potential bias or volatility in futures-market prices can be *estimated* or *predicted.* The answers to these questions are also of considerable practical consequence in using futures-market contracts to construct "hedges" that reduce exposure to price risk; "hedging" is discussed above, under the heading, "Managing Price Risk".

Unfortunately, the professional economic literature that addresses the issue of potential bias and volatility is, collectively, not well focused and often contradictory. Moreover, empirical assessments of competing theoretical hypotheses in particular circumstances are often in conflict.

For example, the Keynes-Hicks risk-transfer hypothesis regarding futures markets argues that speculative and hedging behavior is primarily governed by differences in risk-tolerance and that futures prices generally incorporate a risk premium to compensate for the transfer of risk; consequently, futures prices generally *are not* unbiased estimates of future spot prices. Many empirical studies tend to confirm this hypothesis. In contrast, the knowledgeable-forecasting hypothesis of Holbrook Working argues that speculative and hedging behavior is governed primarily by differences of belief and that futures prices generally *are* unbiased estimates of future spot prices, although some differences are likely to be present that are related to the price of storage. Other empirical studies tend to confirm the Working hypothesis. Many subsequent studies have further refined and expanded upon these hypotheses, and additional approaches directly related to evaluating this issue have been advanced and disputed. For example:

- The Johnson-Stein approach emphasizes the significance of market participants' use of discretionary hedging to maintain chosen risk-return portfolio positions;

- The Hirshleifer approach emphasizes the significance of market participants' consideration of the interaction of price-risk and delivery-risk in moving from prior to posterior positions in the market; and

- The Richard-Sundaresan approach emphasizes the significance of market participants' consideration of the interaction between risk associated with a futures contract's potential usefulness as a hedge and risk associated with its potential profitability;

Several studies have suggested that the presence, direction, and extent of potential bias may vary in different commodities markets and time periods, due to the interaction of various reinforcing or countervailing influences, whose combined effects are generally difficult to predict with any precision. Several studies have also indicated that potential volatility is also relative to complex interacting influences, although many agree that volatility generally tends to increase as futures contracts approach maturity, although just before maturity, the futures and physicals prices generally tend to converge.

The literature directly related to the issue of potential bias and volatility is substantial and is partially summarized, from diverse perspectives, in the following relatively recent publications (which include extensive bibliographies):

- Goss, B. A., and Yamey, B. S., ***The Economics of Futures Trading,*** Second Edition, John Wiley and Sons, New York, 1978, pages 27 to 59;

[13]Schlesinger, Benjamin, "Natural Gas Trading in Physicals and Futures Markets," ***Energy in the News,*** New York Mercantile Exchange, Winter 1990, page 3.

- Anderson, Ronald W., ***The Determinants of the Volatility of Futures Prices,*** Working Paper Series #CSFM-33, Center for for the Study of Futures Markets, Columbia Business School, New York, 1982;

- Taylor, Stephen J., "The Behaviour of Futures Prices Over Time," ***Applied Economics,*** 1985, Vol. 17, pages 713 to 734;

- Williams, Jeffrey, ***The Economic Function of Futures Markets,*** Cambridge University Press, Cambridge, Great Britain, 1986, pages 77 to 110;

- Teweles, Richard J., and Jones, Frank J., ***The Futures Game: Who Wins? Who Loses? Why?,*** McGraw-Hill Book Company, New York, 1987, pages 34 to 53 and 95 to 118; and

- Dominguez, Kathryn M., "The Volatility and Efficiency of Crude-Oil Futures Contracts," in Dominguez, Kathryn M., Strong, John S., and Weiner, Robert J., ***Oil and Money: Coping with Price Risk through Financial Markets,*** Energy and Environmental Policy Center, Harvard University, Cambridge, 1989, pages 48 to 80.

The Basic Mechanics of a Futures-Market Transaction

Participants in futures markets generally do not actually acquire futures contracts, any more than they take delivery of the commodities covered by the contracts. Instead, they establish market "positions"--using members of the appropriate futures exchange as their agents to buy and sell contracts on the exchange floor, through open outcry auction under the formal rules of the exchange. Participants' positions are recorded in the books of exchange members acting as agents, and the members' positions are recorded in the books of the exchange. Exchange members can also trade on their own accounts.

For example, a participant might use the futures market in June to purchase a contract to receive 10,000 million Btu of gas in September--known as a "long" position. If the market-determined price of the contract were $2.00 per million Btu at the time of purchase, the value of the contract would be $20,000; however, as long as the price remained at $2.00, the value of the long position would be null, since no profit or loss would be generated. Conversely, the participant who sold the exact same contract would have established a "short" position--the value of the contract would also be $20,000 and the value of the short position would also be null, as long as the price remained at $2.00. However, if the market price for a September natural gas futures contract were to change to $2.02 per million Btu, then the value of the contract would become $20,200, the value of the long position would become $200, and the value of the short position would become -$200.

In order to establish an initial position, either long or short, a participant is required to provide the exchange member acting as agent with a performance bond of about 5 to 15 percent of the contract's value, known as "original margin." This margin may be provided in the form of short-term U.S. Treasury bills valued at 90 percent of par value or approved letters of credit drawn in favor of the exchange, and can therefore continue to earn interest for the participant. Price moves that affect either long or short positions adversely (impairing a margin position, typically, by more than 30 percent) lead to "margin calls," in response to which the affected participants are required either to deposit additional margin (known as "variation margin") or to close their positions. The position will generally be closed by default if the additional margin is not forthcoming.

In the above example, if the long and the short (as the participants are known) were to close their positions at the $2.02 per million Btu price, then the long would receive his $20,000 deposit (retaining title to any interest accrued on it), plus a $200 profit, less a round-trip transaction fee of about $10 to $50 per contract--or a net profit of about $170. Conversely, the short would receive his $20,000 deposit (retaining title to any interest accrued on it), less a $200 loss, less a round-trip transaction fee of about $10 to $50 per contract--or a net loss of about $230. If, instead of rising, the price had dropped to $1.98 per million Btu, then the long would have incurred a net loss of about $230 and the short a net profit of about $170. Either way, or with no price movement, the exchange members acting as agents for the long and short would have earned fees of approximately $60 for the set of transactions.

There is no need, however, for the original buyer and seller of the contract to close their respective positions at the same time, inasmuch as the initial bond between the pair of contracts is almost instantly severed by the clearinghouse function performed by the exchange. Every day, at the close of business, the exchange "clears" all contracts traded that day--that is, it ensures that all transactions executed on the floor of the exchange are settled, using a process of matching purchases and sales. The matching procedure effectively inserts the exchange as a principal to each pair of transactions--that is, the exchange assumes the obligation of the seller to the buyer, and the obligation of the buyer to the seller.

In addition, at the same time, the exchange rewrites each outstanding contract (whether or not traded that day) to the closing price for that day, requiring that margin be transferred--from the margin account of the clearing member of the exchange against whom an adverse price move occurred, to the margin account of the clearing member of the exchange in favor of whom the same price move occurred. This process is known as "marking to market," and is also performed by each clearing member with respect to the positions that each member maintains as an agent on behalf of clients.

Positions may be liquidated (or "unwound") in several ways. Most commonly, an identical but opposite position is established (that is, a long sells an equivalent number of contracts, or a short purchases an equivalent number of contracts), and the futures exchange liquidates the matched positions. This is also what usually happens by default, when margin calls are not honored.

Positions can also be liquidated, with the exchange's approval, through two alternative procedures. An Alternative Delivery Procedure allows a buyer and seller, who have been matched for delivery by the NYMEX following the final close of trading in a particular futures contract, to agree mutually to settle their futures delivery obligations under terms and conditions that differ from those specified in the contract rules. An Exchange of Futures for or in connection with Product (EFP, often referred to as an Exchange for Physicals) allows a buyer and seller, who have matched themselves, to contract under the aegis of the NYMEX to assume equal and opposite positions on the futures market that "hedge" corresponding positions on the physicals market ("hedging" is discussed above, under the heading, "Managing Price Risk").

At the time an EFP is contracted, an arrangement for exchanging a pair of futures positions for a corresponding pair of physicals positions is specified. In particular, an EFP specifies a time at which a particular pair of futures positions will be presented to the exchange for liquidation at a specified price. At the time an EFP is contracted, the price must be approved by the exchange as not too distant from the current price of the relevant futures contract. As in the case of other futures market transactions, margin must be posted at the time the EFP is arranged, margin calls must be honored, and arbitration by the exchange must be accepted in the event of dispute with regard to the futures positions--thereby minimizing credit risk. The exchange does not, however, offer protection for obligations related to the physicals transaction. From the perspective of either party to the EFP, the end result of an EFP transaction--when other related transactions are taken into account--may be the initiation of a futures position, or swapping of a futures position for a physicals position, rather than the liquidation of a futures position.

EFP's offer hedging participants great flexibility with respect to their selection of trading partner, delivery location and timing, and price. For example, a buyer and seller can enter into an EFP at any time prior to the final close of trading in the referenced futures contract--in particular, either before or after establishing the futures positions agreed to in the EFP. As a consequence, each party is able individually to determine the most advantageous time to take its agreed-upon position prior to the time when, according to the EFP, the two positions must be paired for liquidation by the exchange.

Although the price at which the EFP is to be cleared must be submitted to the NYMEX, the price of the corresponding physicals transaction can remain entirely confidential. Because the futures clearing price has been previously set, that price is certain and not subject to execution risk--that is, risk that prices will change adversely between the time a decision is taken to execute a position and the time that execution is complete. In relatively illiquid markets, the execution of relatively large transactions can be the direct cause of such adverse price changes. EFP's protect against this possibility, among others. EFP's also facilitate the conduct of business outside of traditional business hours.

The Basic Mechanics of a Perfect Hedge

To see how a "perfect" hedge works, consider the following natural gas example of a short hedge. Suppose that:

- A person who is long in the physicals market--for example, a producer or pipeline--currently holds title (or will soon hold title) to an unsold inventory of 10,000 million Btu of natural gas, which he intends to sell three months from today at an expected price, to be determined by the market at that time, of about $2.00 per million Btu (that is, he expects to receive $20,000);
- The futures market supports his price expectation by pricing natural gas futures contracts (specified for delivery in slightly more than three months time from today) at $2.00 per million Btu on today's market; and
- He hedges, in order protect himself against the possibility that the physicals-market price might unexpectedly be lower than $2.00 per million Btu three months from today.

In order to hedge under these conditions, he takes a short position on the natural gas futures market--that is:

- Today, on the futures market, he sells a 10,000 million Btu futures contract at today's three-month futures price of $2.00 per million Btu--in other words, he posts an immediate credit of $20,000 to his futures-market position account in return for incurring an obligation to deliver 10,000 million Btu of natural gas in slightly more than three months time;
- Three months from today, he liquidates his short futures-market position by purchasing an identical futures contract at its price three months from today--in other words, he pays the going market

rate to free himself of his futures-market obligation to deliver 10,000 million Btu of natural gas; and

- Three months from today, he sells his inventory on the physicals market at the same price, let us assume, at which he liquidated his short position on the futures market.

If, three months from today, the market price is:

- Less than \$2.00 per million Btu--for example, \$1.80--then he will receive only \$18,000 for the sale of his inventory, due to the adverse change in the physicals-market price from its expected value; however, he will also gain \$2,000 from the opposite, favorable change in his futures-market position--the result of effectively repurchasing, for \$18,000, a contract that he had previously sold for \$20,000; consequently, he will net the \$20,000 he originally expected for his inventory (ignoring futures-market transaction costs).
- More than \$2.00 per million Btu--for example, \$2.20--then he will receive \$22,000 for the sale of his inventory, due to the favorable change in the physicals-market price from its expected value; however, he will also lose \$2,000 from the opposite, adverse change in his futures-market position--the result of effectively repurchasing, for \$22,000, a contract that he had previously sold for \$20,000; consequently, he will net the \$20,000 he originally expected for his inventory (ignoring futures-market transaction costs).
- Exactly \$2.00 per million Btu--then he will receive \$20,000 for the sale of his inventory and will neither gain nor lose with respect to his futures-market position--the result of effectively repurchasing, for \$20,000, a contract that he had previously sold for \$20,000; consequently, he will net the \$20,000 he originally expected for his inventory (ignoring futures-market transaction costs).

A long hedge can work much the same way, but with conditions and consequences reversed. A long hedge is not, however, always conceptually symmetrical to a short hedge. It is significantly asymmetrical, for example, in the case of hedging a forward purchase in the physicals market (the complement of a forward sale), as opposed to hedging a future spot purchase in the physicals market. The implications of this asymmetry are beyond the scope of this brief summary, but are well set forth in Gross, B.A., and Yamey, B.S., ***The Economics of Futures Trading,*** John Wiley and Sons, New York, 1978, pages 24 to 25.

Price Risk vs. Basis Risk

The following discussion makes use of regional spot-market prices pertaining to Louisiana, Oklahoma, and the Appalachian region in order to provide concrete, graphical illustrations of price risk and basis risk. The Louisiana prices were chosen as proxies for prices at the Henry Hub, near Erath, Louisiana, which is the delivery site specified in the new natural gas futures contracts. The Oklahoma prices were chosen as proxies for markets relatively near the Henry Hub, and the Appalachian-region prices were chosen as proxies for markets relatively far from the Henry Hub.

Price risk (in the context of futures trading, hedging, and the domestic natural gas industry) refers to the exposure of participants in domestic natural gas markets to the risk that natural gas *prices* will vary from their expected future values. Of course, individual participants are likely see themselves as facing different price risks depending on many factors, including their varying subjective assessments of future natural gas prices and varying commercial exposures to changes in those prices. For illustrative purposes, however, a basic sense of the nature of price risk can be gained from reviewing historical data regarding regional natural gas spot prices.

Figure FE1 (presented near the beginning of this article) shows the establishment of a clear pattern of annual seasonality beginning with the 1987-88 heating season. Figure FE3a, which superimposes 1987-88 and 1988-89 spot prices for Oklahoma, shows that despite the establishment of this annual pattern, significant price variation occurred between those two seasons for that regional market. Any participant who expected the 1987-88 price pattern to repeat itself exactly during the 1988-89 season would have encountered the unexpected seasonal price variation shown in Figure FE3b, with the positive variation approaching \$.40 per million Btu and the negative variation exceeding \$.20 per million Btu. Figure FE4a superimposes corresponding seasonal spot prices for the Appalachian region, with Figure FE4b showing the positive variation (given the same assumption regarding price expectations) on occasion to exceed \$.40 per million Btu.

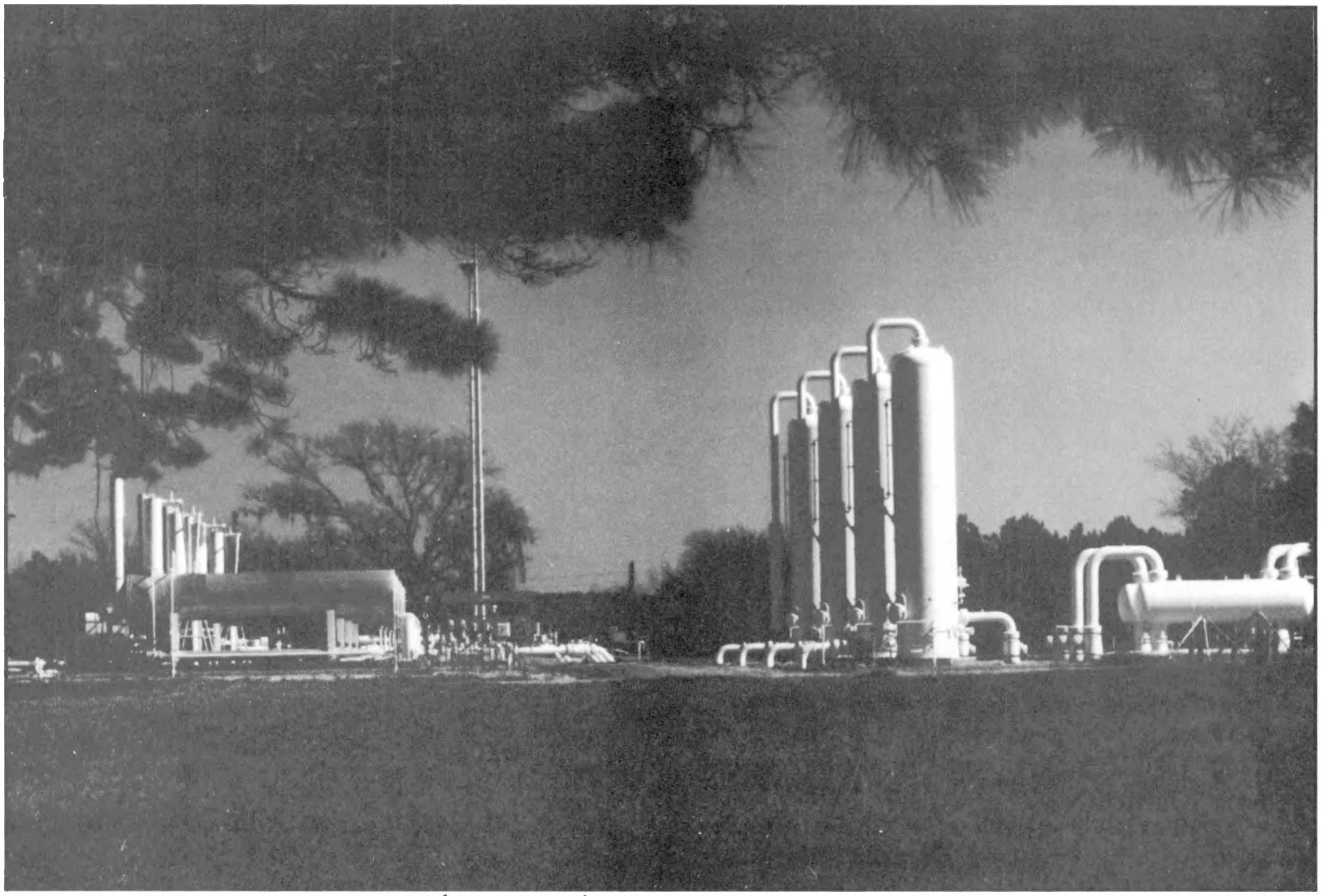
Basis risk (in the same context) refers to the exposure of participants in domestic natural gas markets to the risk that natural gas *price spreads* will vary from their expected future values. Of course, individual participants are likely to see themselves as facing different price-spread risks depending on many factors, including their varying subjective assessments of future natural gas price spreads and varying commercial exposures to changes in those price spreads. For illustrative purposes, however, a basic sense of the nature of basis risk can be gained from reviewing the historical data presented in Figures FE1, FE3, and FE4 regarding interregional differences in natural gas spot prices.

This is a significant oversimplification made for illustrative purposes. Basis risk, for example, properly concerns the difference between a spot and a futures price (vs. the difference between two spot prices), the difference between prices quoted for particular times (closing daily prices, for example, vs. average monthly prices), and more narrowly circumscribed regional markets (the Henry Hub vs. an average for all Louisiana).

Figure FE1 shows inter-regional price relationships becoming more stable by the beginning of the 1987-88 heating season. Figure FE3c shows the relatively close relationship between Oklahoma and Louisiana prices over the 1987-89 heating seasons, and Figure FE3d shows the difference (or price spread) between the two spot prices over the same period, which only rarely exceeded $.12 per million Btu. Figure FE3e, superimposes 1987-88 and 1988-89 price spreads presented in Figure FE3d. Any participant who expected the 1987-88 price-spread pattern to repeat itself exactly during the 1988-89 season would have encountered the variation in seasonal price spreads shown in Figure FE3f, with neither the positive nor negative variation exceeding $.06 per million Btu.

Figure FE4c shows the much more volatile relationship between Appalachian-region and Louisiana prices over the same two heating seasons, and Figure FE4d shows the corresponding price spread, which at one point exceeded $.50 per million Btu. Figure FE4e superimposes corresponding seasonal price spreads, with Figure FE4f showing the positive variation in price spreads (given the same naive assumption regarding price-spread expectations) on occasion to exceed $.40 per million Btu.

The historical spot market data thus suggest (allowing for illustrative simplification) that price risk is likely to exceed basis risk significantly in regional spot markets relatively near the Henry Hub. However, in regional spot markets relatively far from the Henry Hub, the substitution of basis risk for price risk may be far less advantageous as a method of reducing financial exposure.

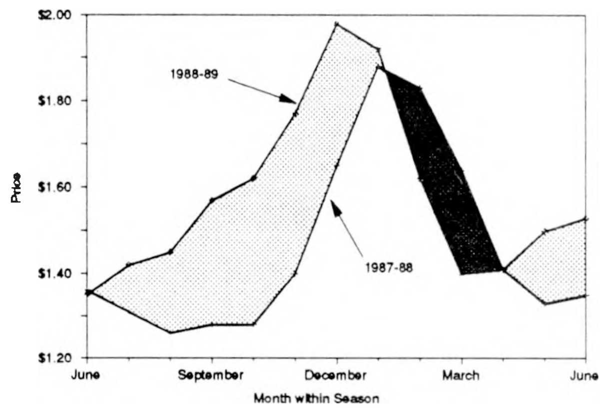


View of separating heaters at a natural gas processing plant located in East Texas.

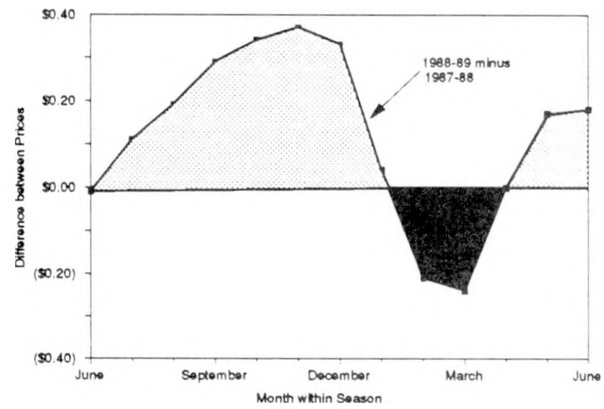
Figure FE3. Price Risk vs. Basis Risk, Oklahoma Example

Price Risk

FE3a. Seasonal Price Variation

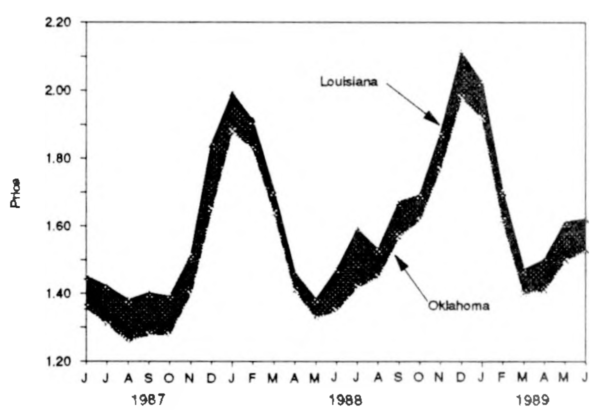


FE3b. Seasonal Price Variation

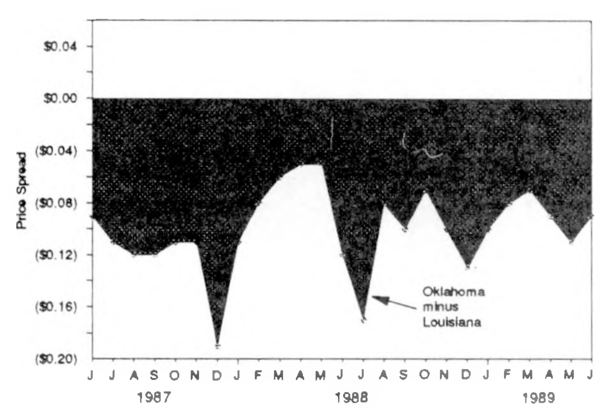


Basis Risk

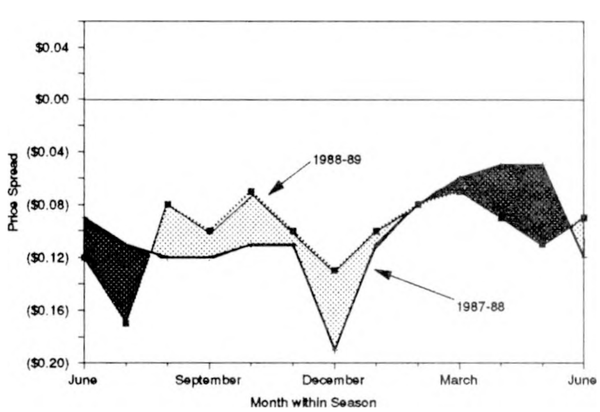
FE3c. Historical Prices



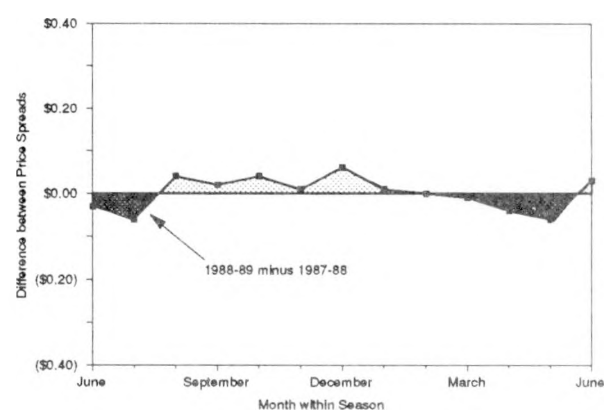
FE3d. Historical Price Spreads



FE3e. Seasonal Price Spread Variation



FE3f. Seasonal Price Spread Variation



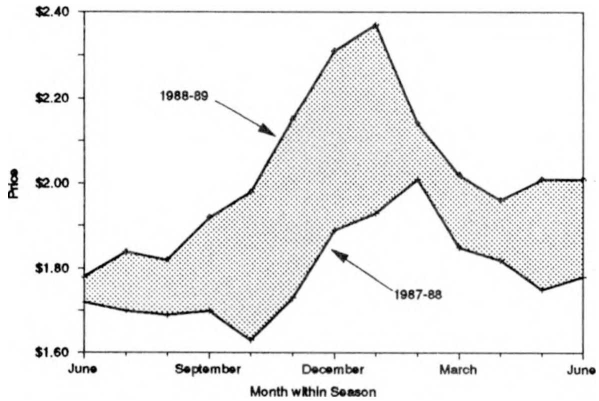
Notes: All dollar values represent current dollars per thousand cubic feet. See text for explanation of example.

Source: Energy Information Administration, Office of Oil and Gas. Composite spot prices compiled from the following industry sources: *Inside F.E.R.C.'s Gas Market Report*, *Natural Gas Intelligence*, *Gas Price Survey*, *Foster Natural Gas Report*, *Natural Gas Week*, and *Gas Price Report*.

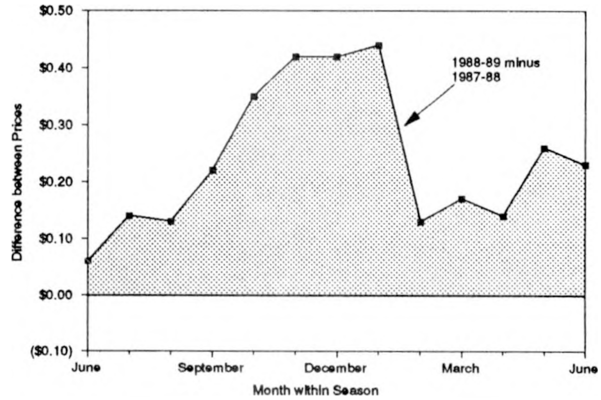
Figure FE4. Price Risk vs. Basis Risk, Appalachian Region Example

Price Risk

FE4a. Seasonal Price Variation

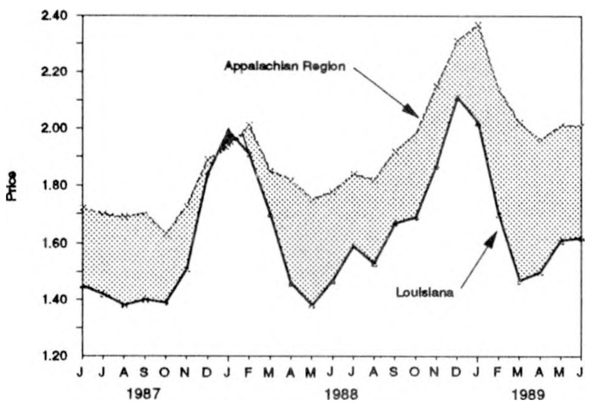


FE4b. Seasonal Price Variation

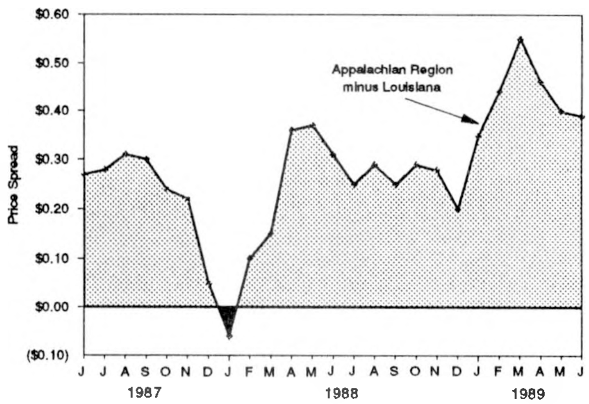


Basis Risk

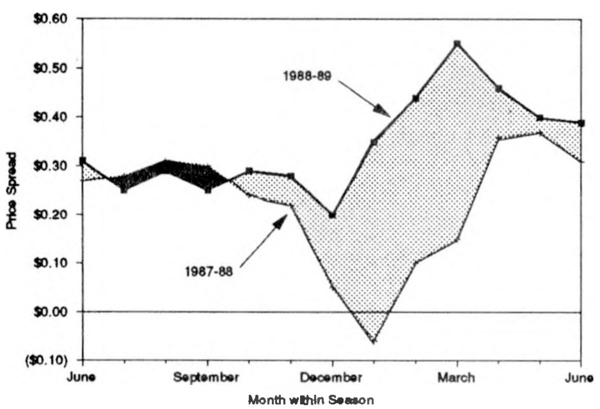
FE4c. Historical Prices



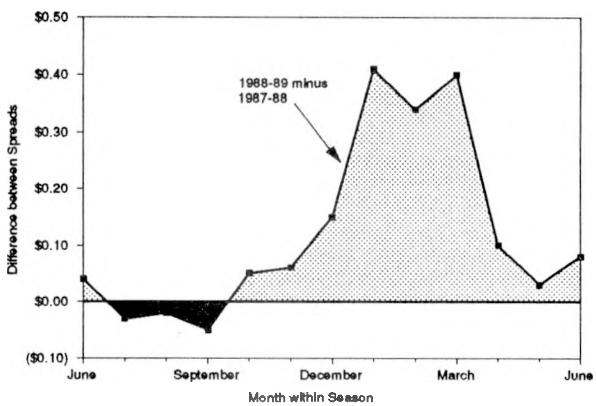
FE4d. Historical Price Spreads



FE4e. Seasonal Price Spread Variation



FE4f. Seasonal Price Spread Variation



Notes: All dollar values represent current dollars per thousand cubic feet. See text for explanation of example.

Source: Energy Information Administration, Office of Oil and Gas. Composite spot prices compiled from the following industry sources: *Inside F.E.R.C.'s Gas Market Report*, *Natural Gas Intelligence*, *Gas Price Survey*, *Foster Natural Gas Report*, *Natural Gas Week*, and *Gas Price Report*.

Highlights

- Dry gas production (wet marketed production minus extraction loss) during March 1990 was an estimated 1,452 billion cubic feet, 2.2 percent below the March 1989 dry gas production.
- Consumption of natural gas during March 1990 was an estimated 1,698 billion cubic feet, 14.3 percent below the March 1989 level.
- The average city-gate price for natural gas delivered to distribution service areas in February 1990 was $3.12 per thousand cubic feet, 0.3 percent above the February 1989 average.
- During the February 1990 billing cycle, residential consumers were billed an average of $5.61 per thousand cubic feet, commercial consumers, $5.04 per thousand cubic feet; and industrial consumers, $3.34 per thousand cubic feet. The residential average was up 4.3 percent, the commercial average was up 4.1 percent, and the industrial average was up 2.8 percent from the February 1989 billing cycle.
- Electric utilities paid an average of $3.01 per thousand cubic feet for gas purchased during January 1990, 14.0 percent above the January 1989 average.

Recent Developments

Annual Outlook for Oil and Gas 1990

The Office of Oil and Gas of the Energy Information Administration (EIA) has recently published the second *Annual Outlook for Oil and Gas 1990*(AOOG)*, DOE/EIA-0517(90). This report discusses recent events affecting oil and natural gas markets and what impact these events have through the year 2010. The natural gas portion of the report sees domestic natural gas production increasing from an estimated 17.0 trillion cubic feet in 1989 to a level greater than 20.6 trillion cubic feet by 2000 in response to increasing demand.

Following this peak, domestic production declines to 19.9 trillion cubic feet in 2010, due to declining demand. The sources for natural gas production are viewed as shifting during the next 20 years. Offshore gas production, which provided approximately 28 percent of total gas production in 1989, is projected to decline throughout the period and to be 16 percent of total production in 2010. Unconventional gas recovery, and gas from the Alaskan North Slope are viewed as the primary sources of new domestic production in the next century.

The price of natural gas at the wellhead is projected to remain comparatively low into the mid-1990's due to continued low world oil prices and increased competition in the natural gas industry. Average wellhead prices are expected to increase at an average annual rate of 5.9 percent, from the 1989 estimate of $1.71 to $5.69 per thousand cubic feet in 2010, expressed in 1989 dollars. During the forecast period, natural gas is projected to regain some markets that switched to oil in the early 1980's. In a high economic growth case, natural gas consumption is projected to reach 24.25 trillion cubic feet by the year 2005. Under this scenario natural gas imports would rise to 3.14 trillion cubic feet annually from the present estimated level of 1.38 trillion cubic feet. The AOOG also addresses several topics of current interest in the oil and gas markets. One of these, the natural gas futures market, is included as a feature article in this issue of the *Natural Gas Monthly*.

*See inside front cover for information on ordering the AOOG.

Overview

Supply and Disposition Summary

Gross withdrawals of natural gas (wet, after lease separation) from gas and oil wells in the United States during March 1990, were estimated at 1,775 billion cubic feet (Table 1). Of the total quantity, an estimated 204 billion cubic feet were returned to gas and oil reservoirs for repressuring, pressure maintenance, and cycling; 37 billion cubic feet of nonhydrocarbon gases were removed; and 11 billion cubic feet were vented or flared. The remaining wet marketed production totaled 1,523 billion cubic feet. Dry gas production (wet marketed production minus 71 billion cubic feet of extraction loss) totaled an estimated 1,452 billion cubic feet, 2.2 percent below the March 1989 level.

The total dry gas supply available for disposition in March 1990 was estimated at 1,834 billion cubic feet, including 250 billion cubic feet withdrawn from storage, 14 billion cubic feet of supplemental supplies, and 118 billion cubic feet that were imported (Table 2). In March 1989, dry gas available for disposition totaled 1,928 billion cubic feet. Of the total dry gas supply available for disposition in March 1990, an estimated 1,698 billion cubic feet were consumed, 119 billion cubic feet were injected into underground storage reservoirs, and 6 billion cubic feet were exported, leaving 11 billion cubic feet unaccounted for.

In February 1990, an estimated 1,674 billion cubic feet of dry gas were delivered to consumers nationally, 11.1 percent above deliveries to consumers in February 1989 (Table 3). Compared to February 1989, estimated deliveries to residential consumers were down 15.6 percent; to commercial consumers, down 13.9 percent; to industrial consumers were the same.

The total dry gas supply available for disposition in March 1990 was estimated at 1,834 billion cubic feet.

In February 1990, major interstate pipeline companies paid an average of $2.25 per thousand cubic feet for gas imported, 1.8 percent above the February 1989 average. The average price paid by major interstate pipeline companies for gas purchased from producers in February 1990 was $2.18 per thousand cubic feet, up 0.9 percent from the February 1989 average.

The average city-gate price paid by distributors for natural gas delivered to their service areas in February 1990 was an estimated $3.12 per thousand cubic feet, 0.3 percent above the February 1989 average.

Residential consumers were billed an estimated average of $5.61 per thousand cubic feet during the February 1990 billing cycle, compared to $5.38 during the February 1989 billing cycle. Commercial consumers' billings averaged an estimated $5.04 per thousand cubic feet during the February 1990 cycle compared to $4.84 during the February 1989 billing cycle. Industrial consumers' billings averaged an estimated $3.34 per thousand cubic feet during the February 1990 billing cycle, compared to $3.25 for the February 1989 cycle.

Electric utilities paid an average of $3.01 per thousand cubic feet for gas purchased during January 1990, 14.0 percent above the average for purchases during January 1989. The average price to all consumers billed during the January 1989 billing cycle was an estimated $4.76 per thousand cubic feet, 2.4 percent above the January 1989 cycle.

Based on the Purchased Gas Adjustment (PGA) data submitted by 41 interstate pipeline companies, the average wellhead purchased gas price projections for Old Gas (NGPA Sections 104, 105, and 106) in April 1990 was $1.77 per thousand cubic feet; for New Gas (NGPA Sections 102, 103, 108, and 109), $2.36 per thousand cubic feet; and for High-Cost Gas (NGPA Section 107), $2.73 per thousand cubic feet (Table 5). The average price projected for purchases under all Sections was $2.24 per thousand cubic feet. In April 1989, 41 interstate pipeline companies projected that the average price per thousand cubic feet would be $1.54 for Old Gas, $2.46 for New Gas, $2.58 for High-Cost Gas, and that the overall average price per thousand cubic feet would be $2.16.

Producer-Related Activities

Preliminary marketed (wet) production in January 1990, reported for 12 States and estimated for the Outer Continental Shelf and the remaining 20 producing States, was 1,643 billion cubic feet, 3.3 percent above production in January 1989 (Table 7).

Filings received by the Federal Energy Regulatory Commission, "Application for Determination of the Maximum Lawful Price under the Natural Gas Policy Act (NGPA)," totaled 1,177 in March 1990 based on preliminary summaries (Table 8). The number of applications for determinations under Section 102, "New Natural Gas and Certain Natural Gas Produced from the Outer Continental Shelf," totaled 122. Filings received for determinations that the wells qualified under Section 103, "New Onshore Production Wells;" Section 107, "High-Cost Natural Gas;" and Section 108, "Stripper Well Natural Gas;" totaled 291, 714, and 50, respectively.

Interstate Pipeline Activities

Major interstate pipeline companies sold a total of 584 billion cubic feet of natural gas during February 1990 (Table 12). The 51 major companies generated gas operating revenues totaling $2,501 million and incurred gas operating expenses totaling $2,240 million during the month.

During February 1990, the 51 major interstate pipeline companies sold 54 billion cubic feet of natural gas to industrial consumers at prices averaging $2.58 per thousand cubic feet, 54 billion cubic feet to other ultimate consumers at prices averaging $5.00 per thousand cubic feet, and 428 billion cubic feet for resale at prices averaging $2.59 per thousand cubic feet (Table 13).

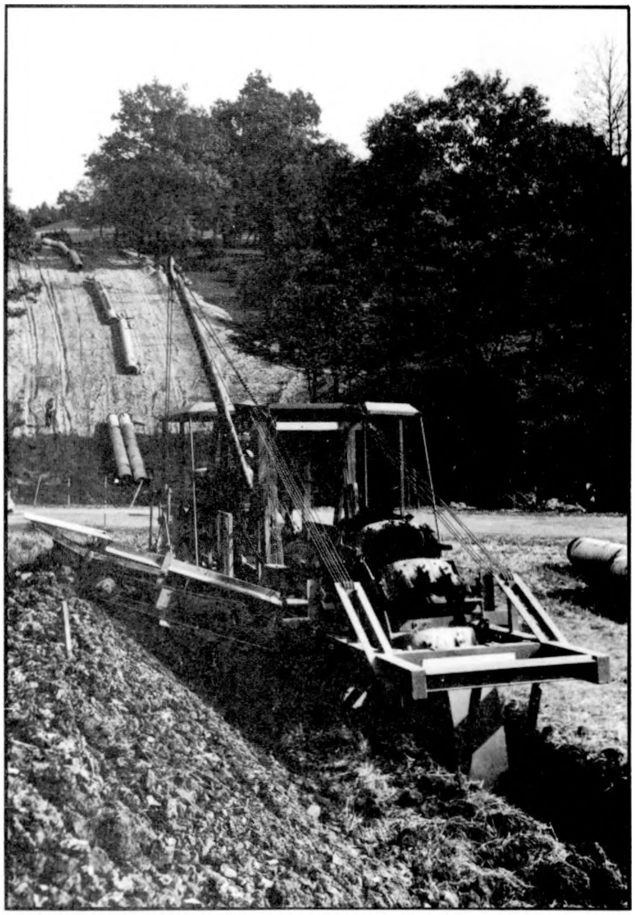
The major interstate pipeline companies purchased 356 billion cubic feet of natural gas from producers during February 1990 (Table 15). Imports by the majors totaled 77 billion cubic feet during the month.

Underground Storage

Total gas in underground storage reservoirs in the United States as of March 31, 1990, was 5,684 billion cubic feet, 1.9 percent above the total in storage at the end of March 1989 (Table 17). Working gas in underground storage totaled 1,871 billion cubic feet, 95 billion cubic feet or 5.3 percent above the level of working gas in storage at the end of March 1989.

The volume of working gas in underground storage reservoirs operated by interstate companies at the end of March 1990 was 1,369 billion cubic feet (Table 18). Working gas stored in reservoirs operated by intrastate companies and independent producers amounted to 502 billion cubic feet (Table 19). Compared to volumes at the end of March 1989, working gas in reservoirs operated by interstate companies was up 1.9 percent, and working gas in reservoirs operated by intrastate companies and independent producers was up 15.9 percent.

Total gas in underground storage ... as of March 31, 1990, ... was 1.9 percent below the total in storage at the end of March 1989.



This specially designed tractor is used to dig the trench to hold natural gas pipelines.

Table 1. Summary of Natural Gas Production
(Billion Cubic Feet)

Year and Month	Gross Withdrawals	Repressuring	Nonhydrocarbon Gases Removed[a]	Vented and Flared	Marketed Production (Wet)	Extraction Loss	Total Dry Gas Production[b]
1984 Total	20,192	1,630	224	108	18,230	838	17,392
1985 Total	19,534	1,915	326	95	17,198	816	16,382
1986 Total	19,063	1,838	337	98	16,791	800	15,991
1987 Total	20,056	2,208	376	124	17,349	812	16,536
1988							
January	1,921	215	40	12	1,654	76	1,578
February	1,749	195	36	12	1,506	69	1,437
March	1,822	200	40	12	1,570	72	1,498
April	1,681	192	39	12	1,438	66	1,372
May	1,721	204	33	12	1,472	67	1,405
June	1,652	202	39	12	1,399	64	1,335
July	1,671	204	37	13	1,417	65	1,352
August	1,688	203	36	12	1,437	66	1,371
September	1,606	200	38	12	1,356	62	1,294
October	1,743	216	42	12	1,473	67	1,406
November	1,768	216	38	12	1,502	69	1,433
December	1,861	224	42	11	1,584	73	1,511
Total	20,880	2,471	460	142	17,808	816	16,992
1989							
January	1,854	214	40	10	1,590	74	1,516
February	1,704	189	35	10	1,470	69	1,401
March	1,799	193	37	12	1,557	73	1,484
April	1,729	198	35	11	1,485	69	1,416
May	1,761	209	37	11	1,504	70	1,434
June	1,672	188	34	11	1,439	67	1,372
July	1,705	195	36	11	1,463	68	1,395
August	1,696	202	34	11	1,449	68	1,381
September	1,632	202	33	11	1,386	65	1,321
October	1,713	206	35	11	1,461	68	1,393
November	R 1,765	R 210	37	11	R 1,507	71	R 1,436
December	1,895	214	39	11	1,631	76	1,555
Total	R 20,925	R 2,420	432	131	R 17,943	841	R 17,102
1990							
January	R 1,919	R 225	R 39	R 12	R 1,643	R 77	R 1,566
February	E 1,704	E 192	E 35	E 10	E 1,467	E 69	E 1,398
March	E 1,775	E 204	E 37	E 11	E 1,523	E 71	E 1,452
1990 YTD	5,398	621	111	33	4,633	217	4,416
1989 YTD	5,357	596	112	32	4,618	216	4,401
1988 YTD	5,492	610	116	36	4,730	217	4,513

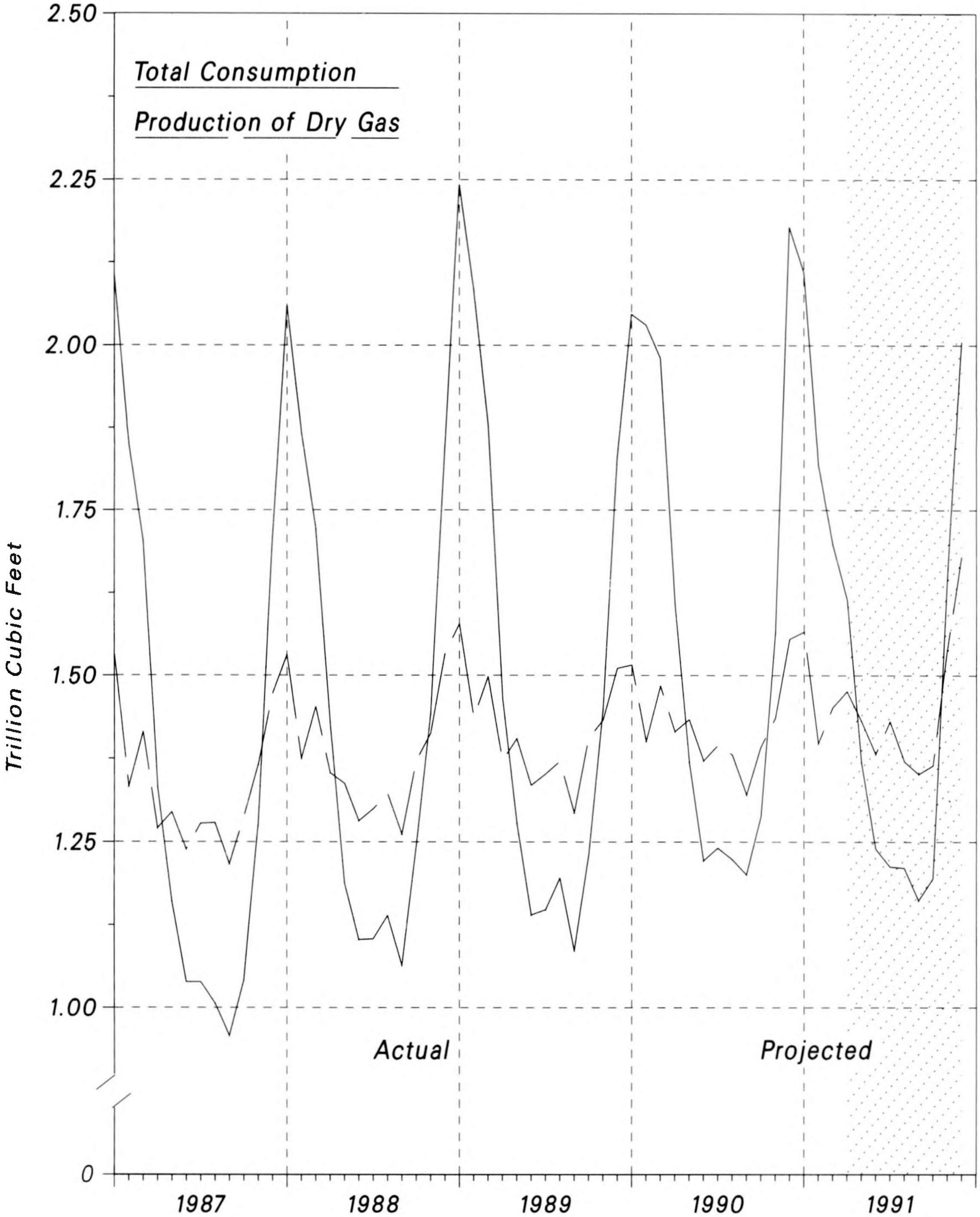
[a] See Appendix A, Explanatory Note 1 for a discussion of data on Nonhydrocarbon Gases Removed.
[b] Equal to marketed production (wet) minus extraction loss.
E = Estimated Data.
R = Revised Data.
Notes and Sources: See the last page of this section.

Table 2. Supply and Disposition of Dry Natural Gas
(Billion Cubic Feet)

Year and Month	Supply				Total Supply/ Disposition[b]	Disposition			
	Total Dry Gas Production	Withdrawals from Storage[a]	Supplemental Gaseous Fuels	Imports		Additions to Storage[a]	Exports	Consumption[c]	Unaccounted For[d]
1984 Total	17,392	2,098	110	843	20,443	2,295	55	17,951	143
1985 Total	16,382	2,397	126	950	19,855	2,163	55	17,281	356
1986 Total	15,991	1,837	113	750	18,692	1,984	61	16,221	427
1987 Total	16,536	1,905	101	993	19,534	1,911	54	17,211	359
1988									
January	1,578	586	12	139	2,315	47	5	2,242	21
February	1,437	462	10	117	2,026	50	5	2,083	-112
March	1,498	259	9	113	1,879	99	6	1,878	-104
April	1,372	92	8	96	1,568	165	6	1,466	-69
May	1,405	46	8	94	1,553	288	4	1,279	-18
June	1,335	36	7	93	1,471	280	8	1,140	43
July	1,352	42	6	100	1,500	300	5	1,148	47
August	1,371	52	7	94	1,524	288	6	1,196	34
September	1,294	46	7	95	1,442	314	7	1,086	35
October	1,406	92	8	106	1,612	202	6	1,229	175
November	1,433	159	8	121	1,721	117	7	1,449	148
December	1,511	397	10	127	2,045	62	9	1,831	143
Total	16,992	2,269	101	1,294	20,657	2,212	74	18,028	344
1989									
January	1,516	404	16	119	2,055	49	6	2,047	-47
February	1,401	546	15	107	2,069	28	5	2,031	5
March	1,484	314	14	116	1,928	96	6	1,981	-155
April	1,416	124	12	113	1,665	170	6	1,608	-119
May	1,434	62	12	106	1,614	279	4	1,370	-39
June	1,372	19	11	105	1,507	332	6	1,222	-53
July	1,395	24	12	101	1,532	321	6	1,241	-36
August	1,381	27	12	106	1,526	321	6	1,224	-25
September	1,321	34	10	116	1,481	283	6	1,201	-9
October	1,393	85	13	121	1,612	192	6	1,288	126
November	R 1,436	198	13	122	R 1,769	91	7	R 1,563	R 108
December	1,555	729	18	146	2,448	51	6	2,178	213
Total	R 17,102	2,566	157	1,378	R 21,204	2,213	70	R 18,956	R -35
1990									
January	R 1,566	329	16	149	R 2,060	92	6	2,110	R -148
February	E 1,398	340	14	R 118	R 1,870	85	5	R 1,820	R -40
March	E 1,452	250	14	118	1,834	119	6	1,698	11
1990 YTD	4,416	919	44	385	5,764	296	17	5,628	-177
1989 YTD	4,401	1,264	45	342	6,052	173	17	6,059	-197
1988 YTD	4,513	1,307	31	369	6,220	196	16	6,203	-195

[a] Monthly and annual data for 1984 through 1988 include underground storage and liquefied natural gas storage. Data for January 1989 forward include underground storage only. See Appendix A, Explanatory Note 7 for discussion of computation procedures.
[b] "Total" data for 1984 through 1988 do not equal equivalent data in Table 1 of the 1988 *Natural Gas Annual* due to the exclusion of intransit receipts and deliveries in the *NGM*.
[c] Consists of pipeline fuel use, lease and plant fuel use, and deliveries to consuming sectors as shown in Table 3.
[d] Represents quantities lost and imbalances in data due to differences among data sources. See Appendix A, Explanatory Note 11 for full discussion.
E = Estimated Data.
R = Revised Data.
Notes and Sources: See the last page of this section.

Figure 1. Production and Consumption of Natural Gas in the United States



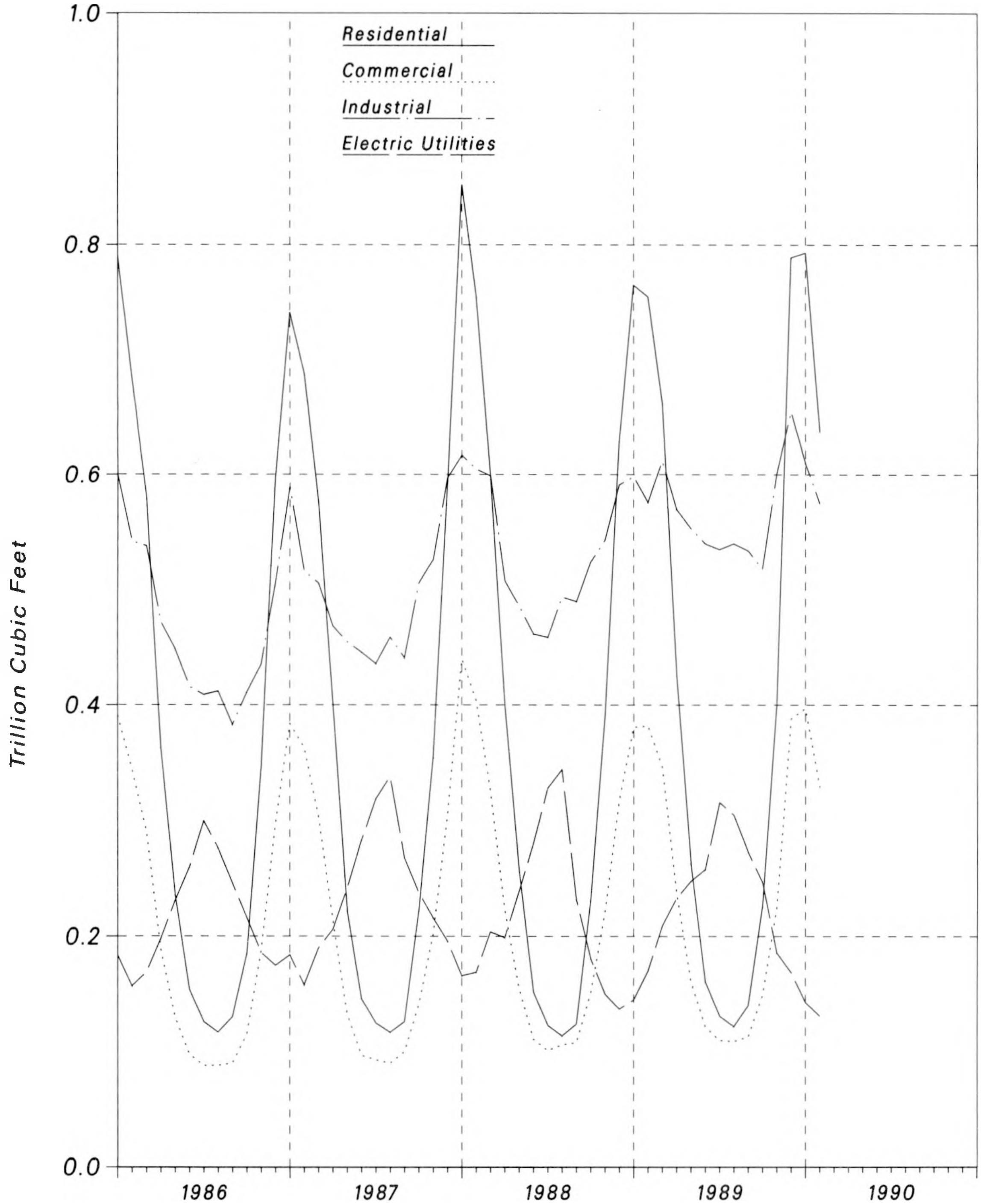
Source: *Natural Gas Annual* and the *Short Term Energy Outlook*.

Table 3. Natural Gas Consumption
(Billion Cubic Feet)

Year and Month	Lease and Plant Fuel	Pipeline Fuel	Delivered to Consumers					Total Consumption
			Residential	Commercial	Industrial	Electric Utilities	Total	
1984 Total	1,077	529	4,555	2,524	6,154	3,111	16,345	17,951
1985 Total	966	504	4,433	2,432	5,901	3,044	15,811	17,281
1986 Total	923	485	4,314	2,318	5,579	2,602	14,814	16,221
1987 Total	1,149	519	4,315	2,430	5,953	2,844	15,542	17,211
1988								
January	102	63	853	441	617	167	2,077	2,242
February	93	55	755	405	605	170	1,935	2,083
March	97	53	597	327	600	204	1,728	1,878
April	88	46	401	224	508	199	1,332	1,466
May	91	49	258	155	486	240	1,139	1,279
June	86	47	152	112	462	280	1,007	1,140
July	87	49	123	101	459	328	1,012	1,148
August	88	49	114	106	495	344	1,059	1,196
September	83	47	125	108	491	233	956	1,086
October	91	49	232	151	524	182	1,089	1,229
November	92	51	390	222	543	151	1,306	1,449
December	97	56	630	319	592	137	1,678	1,831
Total	1,095	614	4,630	2,670	6,383	2,635	16,319	18,028
1989								
January	105	51	765	381	599	146	1,891	2,047
February	97	50	756	382	576	171	1,884	2,031
March	103	48	662	346	612	209	1,830	1,981
April	98	43	425	238	571	233	1,467	1,608
May	100	43	264	161	553	249	1,227	1,370
June	95	44	161	122	540	259	1,083	1,222
July	97	49	131	111	535	317	1,095	1,241
August	96	49	123	110	540	306	1,079	1,224
September	92	47	141	113	534	274	1,062	1,201
October	97	49	227	149	518	248	1,142	1,288
November	R 100	50	400	225	602	187	1,413	R 1,563
December	108	66	789	389	656	170	2,004	2,178
Total	R 1,188	589	4,843	2,728	6,840	2,768	17,179	R 18,956
1990								
January	109	55	794	397	611	144	1,946	2,110
February	97	49	638	329	576	131	1,674	1,820
1990 YTD	206	104	1,432	727	1,187	275	3,620	3,930
1989 YTD	202	101	1,521	763	1,175	316	3,775	4,078
1988 YTD	195	118	1,608	845	1,223	337	4,013	4,325

R = Revised Data.
Notes and Sources: See the last page of this section.

Figure 2. Natural Gas Deliveries to Consumers



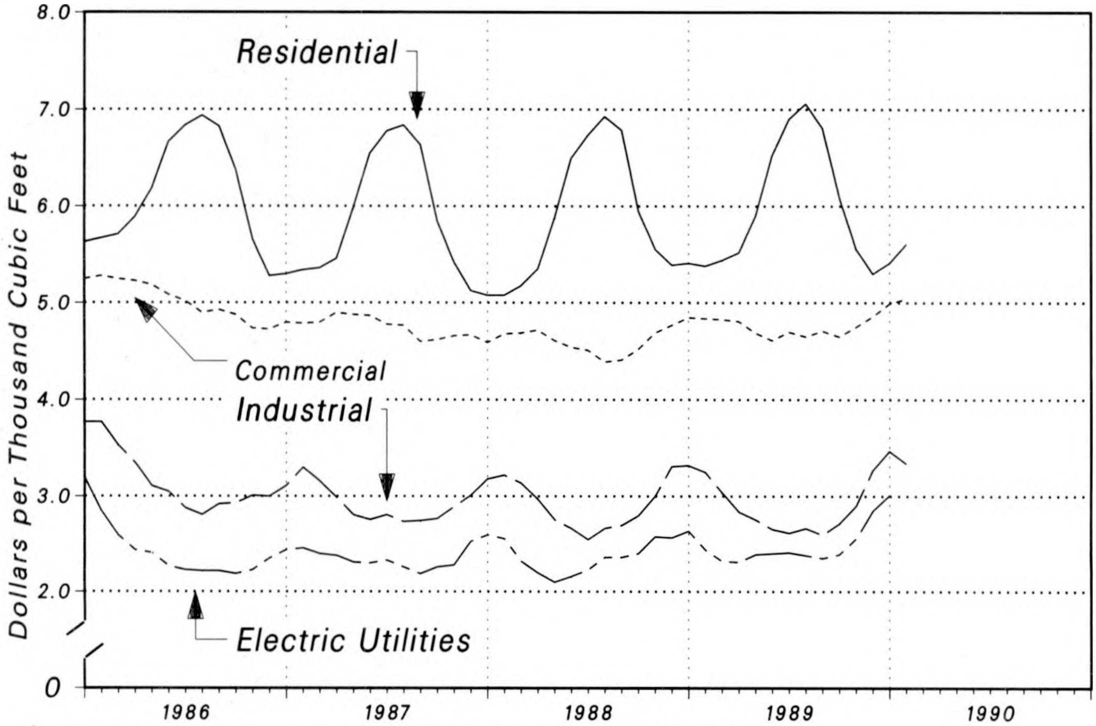
Source: *Natural Gas Annual*, Form EIA-857, and Form EIA-759.

Table 4. Selected National Average Natural Gas Prices
(Dollars per Thousand Cubic Feet)

Year and Month	Wellhead Price[a]	Major Interstate Pipeline Companies		City Gate	Delivered to Consumers				
		Imports[b]	Purchased from Producers[b]		Residential	Commercial[c]	Industrial[c]	Electric Utilities[d]	Overall Average[c]
1984 Annual Average	2.66	4.08	2.91	3.95	6.12	5.55	4.22	3.70	4.85
1985 Annual Average	2.51	3.19	2.85	3.75	6.12	5.50	3.95	3.55	4.72
1986 Annual Average	1.94	2.53	2.39	3.22	5.83	5.08	3.23	2.43	4.13
1987 Annual Average	1.67	2.17	2.10	2.87	5.54	4.77	2.94	2.32	4.05
1988									
January	1.96	1.64	2.04	2.92	5.08	4.59	3.18	2.60	4.41
February	1.84	2.03	2.22	2.95	5.08	4.68	3.22	2.56	4.39
March	1.70	2.09	2.03	2.87	5.18	4.69	3.14	2.32	4.26
April	1.59	2.01	2.12	2.79	5.35	4.72	2.97	2.20	4.10
May	1.52	2.02	2.17	2.75	5.88	4.61	2.76	2.10	3.84
June	1.53	1.98	2.05	2.88	6.50	4.54	2.67	2.16	3.54
July	1.56	2.34	1.94	2.87	6.74	4.51	2.55	2.23	3.36
August	1.62	1.88	2.09	2.93	6.93	4.39	2.67	2.36	3.39
September	1.53	2.00	2.13	3.05	6.79	4.41	2.70	2.36	3.60
October	1.68	1.94	2.31	2.92	5.95	4.52	2.80	2.40	3.94
November	1.76	1.98	2.19	2.98	5.56	4.69	3.00	2.58	4.31
December	1.89	2.14	2.25	3.08	5.39	4.77	3.31	2.57	4.55
Annual Average	1.69	2.00	2.13	2.93	5.47	4.63	2.95	2.34	4.09
1989									
January	2.00	1.77	2.35	3.16	5.41	4.85	3.32	2.64	4.65
February	1.82	2.21	2.16	3.11	5.38	4.84	3.25	2.44	4.58
March	1.70	1.99	2.17	2.89	5.44	4.83	3.04	2.32	4.42
April	1.57	2.01	2.22	2.83	5.52	4.81	2.84	2.31	4.13
May	1.62	2.02	2.11	2.94	5.90	4.69	2.76	2.39	3.91
June	1.65	2.04	2.04	2.98	6.53	4.61	2.66	2.40	3.67
July	1.66	1.88	1.99	3.08	6.90	4.70	2.62	2.41	3.52
August	1.62	2.24	2.05	3.04	7.06	4.65	2.67	2.38	3.53
September	1.59	2.02	2.07	2.99	6.81	4.71	2.60	2.35	3.60
October	1.62	2.17	2.04	2.84	6.09	4.65	2.72	2.39	3.83
November	1.72	2.13	2.23	2.97	5.56	4.75	2.90	2.56	4.24
December	1.91	2.08	2.39	3.09	5.30	4.86	3.27	2.85	4.58
Annual Average	1.71	2.04	2.17	3.01	5.63	4.79	2.92	2.43	4.18
1990									
January	2.13	2.04	2.42	3.25	5.41	4.99	3.47	3.01	4.76
February	NA	2.25	2.18	3.12	5.61	5.04	3.34	NA	NA
1990 YTD	NA	2.14	2.30	3.19	5.50	5.01	3.41	3.01	4.76
1989 YTD	NA	1.99	2.25	3.13	5.40	4.84	3.29	2.64	4.65
1988 YTD	NA	1.83	2.13	2.93	5.08	4.63	3.20	2.60	4.41

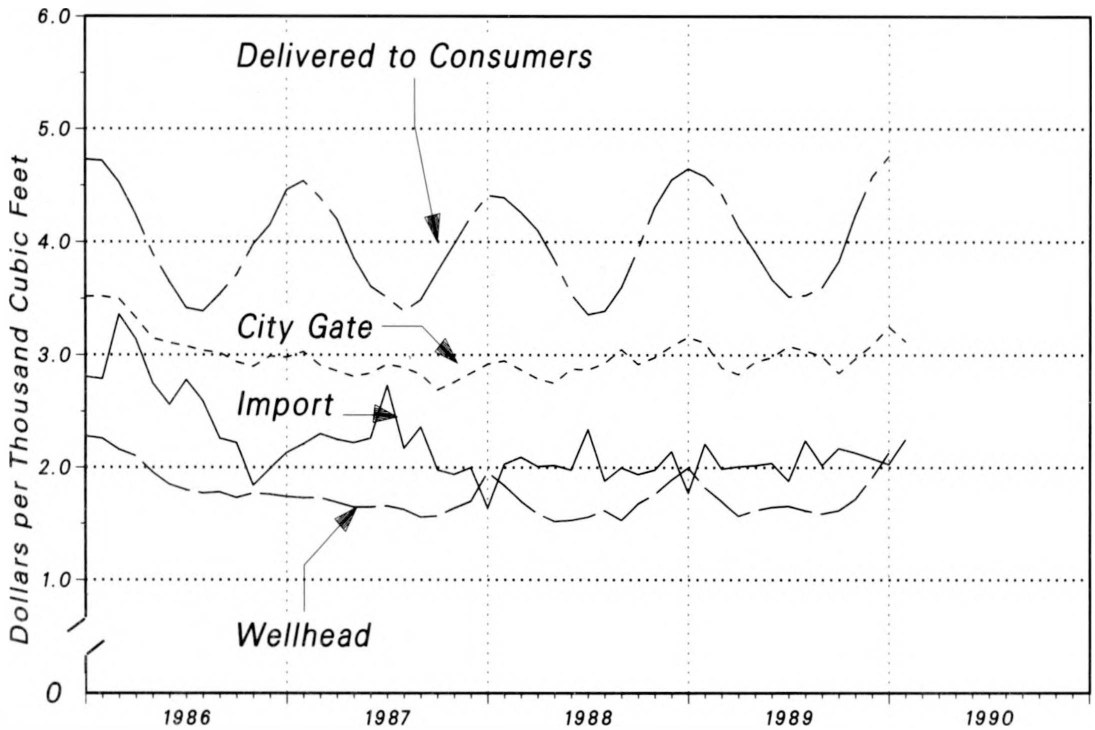
[a] See Appendix A, Explanatory Note 8 for discussion of wellhead price.
[b] See Appendix A, Explanatory Note 9 for discussion of major interstate pipeline company data.
[c] See Table Notes and Sources for explanation of break in series for consumer prices in 1987.
[d] Includes all steam electric utility generating plants with a combined capacity of 50 megawatts or greater.
NA = Not Available.
Notes and Sources: See the last page of this section.

Figure 3. Average Price of Natural Gas Delivered to Consumers



Source: *Natural Gas Annual*, Form FERC-11, and Form EIA-857.

Figure 4. Average Price of Natural Gas



Source: *Natural Gas Annual*, Form EIA-857, and Form FERC-423.

Table 5. Projected Volumes and Prices of Wellhead Purchases by NGPA Category

(Volumes in Billion Cubic Feet, Prices in Dollars per Thousand Cubic Feet)

Year and Month	Section 104[a]		Section 105[b]		Section 106[c]		Old Gas[d]	
	Volume	Price[m]	Volume	Price[m]	Volume	Price[m]	Volume	Price[m]
1984 Total	3,961	1.46	53	2.60	283	1.15	4,301	1.45
1985 Total	3,549	1.48	57	2.54	358	1.18	3,964	1.47
1986 Total	2,675	1.41	58	2.26	320	1.13	3,053	1.39
1987 Total	2,035	1.34	33	2.08	260	1.15	2,327	1.33
1988								
January	160	1.36	2	2.37	22	1.22	185	1.35
February	160	1.36	2	2.37	22	1.22	184	1.36
March	155	1.41	2	2.33	21	1.23	179	1.40
April	128	1.50	2	2.28	14	1.30	145	1.49
May	129	1.46	2	2.28	14	1.32	146	1.46
June	123	1.46	2	2.22	14	1.42	139	1.47
July	110	1.40	2	2.33	12	1.42	125	1.42
August	104	1.40	2	2.35	12	1.43	118	1.42
September	108	1.44	2	2.26	12	1.37	122	1.45
October	134	1.69	2	2.16	13	1.55	149	1.68
November	133	1.70	3	2.22	14	1.51	150	1.69
December	135	1.82	2	2.12	14	1.56	152	1.80
Total	1,579	1.49	25	2.27	184	1.35	1,794	1.49
1989								
January	134	1.94	2	1.83	13	1.61	149	1.91
February	135	1.96	2	1.79	12	1.67	149	1.94
March	128	1.89	2	1.79	12	1.63	141	1.86
April	85	1.55	2	2.01	9	1.43	96	1.54
May	76	1.51	1	2.09	8	1.49	85	1.52
June	71	1.41	1	2.09	8	1.46	80	1.43
July	68	1.42	1	1.80	7	1.51	75	1.43
August	67	1.39	*	1.76	7	1.49	74	1.41
September	65	1.43	1	1.83	7	1.52	73	1.44
October	79	1.51	1	1.97	8	1.51	88	1.51
November	76	1.80	1	1.97	8	1.56	86	1.78
December	77	1.81	1	1.97	8	1.52	86	1.79
Total	1,060	1.69	15	1.90	108	1.55	1,183	1.68
1990								
January	69	1.92	2	1.04	8	1.70	79	1.88
February	59	1.97	2	R .96	8	1.71	68	1.92
March	57	1.97	2	R 1.04	7	1.73	66	1.92
April	54	1.81	2	1.31	7	1.62	63	1.77

See footnotes at end of table.

Table 5. Projected Volumes and Prices of Wellhead Purchases by NGPA Category (Continued)

(Volumes in Billion Cubic Feet, Prices in Dollars per Thousand Cubic Feet)

Year and Month	Section 102[e]		Section 103[f]		Section 108[g]		Section 109[h]		New Gas[l]	
	Volume	Price[m]	Volume	Price[m]	Volume	Price[m]	Volume	Price[m]	Volume	Price[m]
1984 Total	2,587	3.84	913	3.26	189	4.17	191	2.58	3,879	3.65
1985 Total	2,780	3.73	945	3.39	207	4.27	257	2.80	4,189	3.62
1986 Total	1,907	3.13	723	3.03	173	3.92	204	2.51	3,007	3.11
1987 Total	1,494	2.64	500	2.61	175	3.30	191	2.29	2,360	2.65
1988										
January	120	2.39	35	2.46	14	3.35	13	2.29	182	2.47
February	119	2.40	35	2.45	14	3.36	12	2.31	180	2.47
March	119	2.40	35	2.46	14	3.34	12	2.34	179	2.48
April	114	2.32	36	2.39	11	3.35	12	2.17	174	2.39
May	114	2.31	37	2.41	12	3.38	12	2.19	176	2.40
June	102	2.30	37	2.40	15	2.64	12	2.11	165	2.34
July	95	2.29	31	2.31	14	2.61	11	2.10	152	2.31
August	84	2.34	30	2.30	14	2.51	11	2.02	139	2.33
September	84	2.39	31	2.39	12	2.80	12	2.02	139	2.40
October	97	2.46	33	2.47	13	2.88	12	2.10	155	2.47
November	122	2.38	33	2.49	10	3.20	11	2.18	176	2.43
December	124	2.44	33	2.45	10	3.15	12	2.13	179	2.47
Total	1,295	2.37	406	2.41	153	3.03	142	2.16	1,996	2.41
1989										
January	124	2.49	32	2.50	10	3.30	12	2.17	178	2.51
February	117	2.66	33	2.50	11	3.31	14	2.18	175	2.63
March	114	2.61	31	2.48	10	3.27	13	2.21	169	2.60
April	100	2.48	29	2.32	10	3.14	13	2.10	151	2.46
May	73	2.45	27	2.28	8	3.23	10	2.02	119	2.43
June	67	2.39	27	2.26	9	3.01	10	2.04	112	2.38
July	58	2.42	25	2.17	9	2.95	9	1.97	101	2.36
August	60	2.60	23	2.09	8	2.78	8	2.08	100	2.45
September	59	2.64	22	2.15	9	2.87	8	2.14	99	2.51
October	66	2.68	29	2.11	9	2.90	12	2.34	116	2.52
November	89	2.33	33	2.18	10	3.04	33	2.20	165	2.32
December	91	2.33	34	2.16	10	3.09	34	2.17	169	2.31
Total	1,018	2.51	346	2.28	113	3.08	176	2.15	1,653	2.46
1990										
January	85	2.41	32	2.29	10	3.19	31	2.17	157	2.39
February	75	2.53	31	2.27	9	3.13	R 24	2.28	139	2.47
March	76	2.52	30	R 2.28	9	3.07	23	2.30	138	R 2.47
April	80	2.41	25	2.16	8	3.08	25	2.21	138	2.36

See footnotes at end of table.

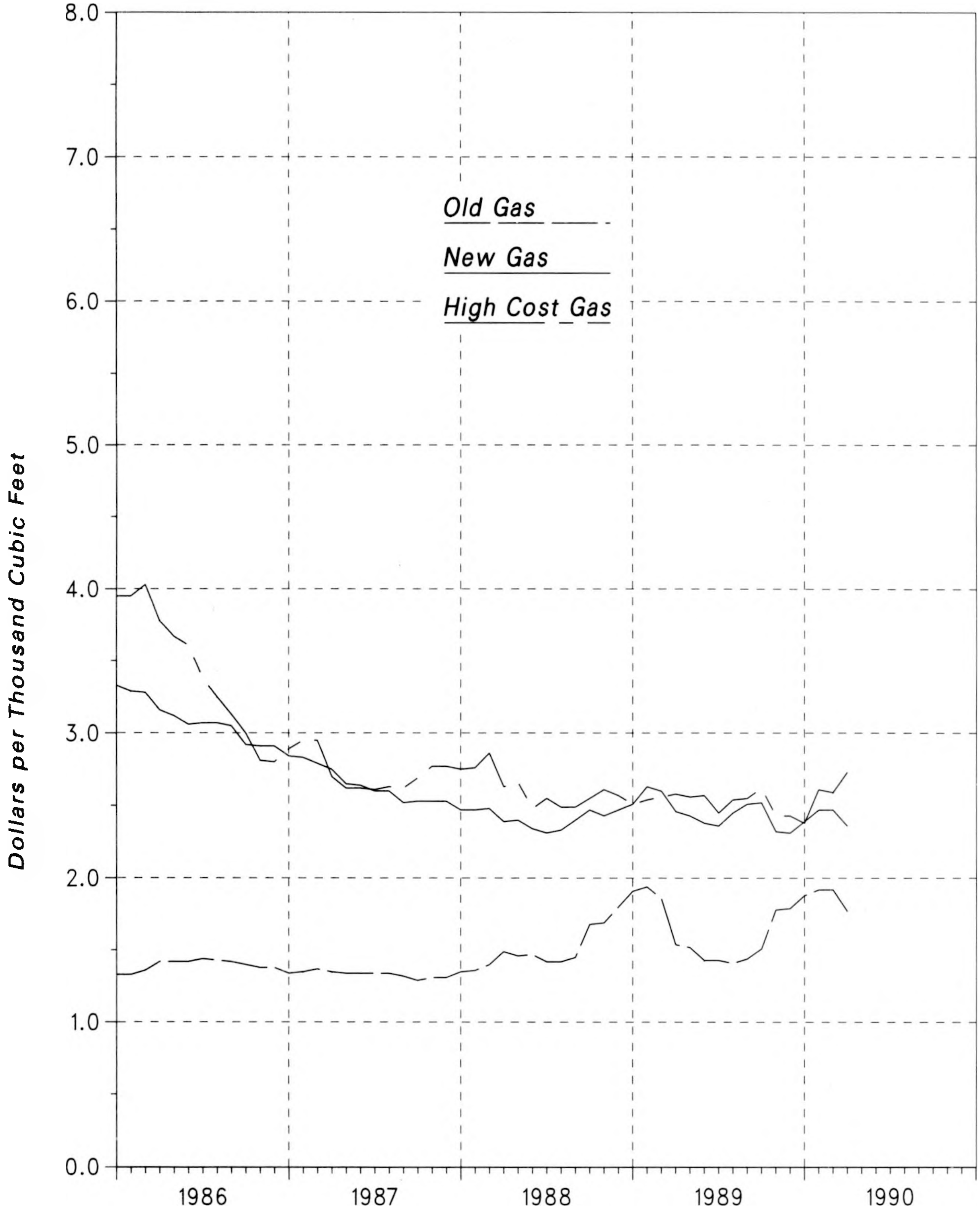
Table 5. Projected Volumes and Prices of Wellhead Purchases by NGPA Category (Continued)

(Volumes in Billion Cubic Feet, Prices in Dollars per Thousand Cubic Feet)

Year and Month	Section 107[j]		Miscellaneous[k]		Total Gas[l]		Number of Companies[n]
	Volume	Price[m]	Volume	Price[m]	Volume	Price[m]	
1984 Total	856	5.35	10	2.77	9,061	2.78	46
1985 Total	738	4.71	*	—	8,890	2.75	48
1986 Total	426	3.48	*	—	6,487	2.32	46
1987 Total	417	2.72	*	—	5,104	2.05	46
1988							
January	38	2.75	*	—	405	1.99	40
February	37	2.76	*	—	401	1.99	40
March	37	2.86	*	—	395	2.03	40
April	37	2.63	*	—	356	2.05	40
May	39	2.66	*	—	360	2.04	41
June	40	2.48	*	—	345	2.00	43
July	38	2.55	*	—	315	1.99	46
August	35	2.49	*	—	292	1.98	45
September	36	2.49	*	—	297	2.02	43
October	38	2.55	*	—	342	2.14	42
November	30	2.61	*	—	356	2.14	41
December	31	2.57	*	—	362	2.19	41
Total	438	2.61	*	—	4,226	2.04	42
1989							
January	31	2.51	*	—	358	2.26	39
February	34	2.54	*	—	358	2.33	41
March	33	2.56	*	—	343	2.29	40
April	31	2.58	*	—	278	2.16	41
May	29	2.56	*	—	233	2.11	44
June	28	2.57	*	—	220	2.06	45
July	26	2.45	*	—	203	2.03	45
August	24	2.54	*	—	199	2.07	44
September	24	2.55	*	—	195	2.11	44
October	28	2.62	*	—	231	2.15	44
November	29	2.43	*	—	280	2.16	44
December	28	2.43	*	—	284	2.16	44
Total	347	2.53	—	—	3,182	2.18	38
1990							
January	25	2.38	*	—	261	2.23	41
February	R 22	R 2.61	*	—	R 230	2.32	42
March	R 23	R 2.59	*	—	R 227	2.32	R 42
April	23	2.73	*	—	223	2.24	41

[a] Dedicated to interstate commerce.
[b] Existing intrastate contracts.
[c] Rollover contracts.
[d] Total of Sections 104, 105, and 106.
[e] New natural gas and certain natural gas produced from the Outer Continental Shelf.
[f] New onshore production wells.
[g] Stripper well natural gas.
[h] Other categories of natural gas.
[i] Total of Sections 102, 103, 108, and 109.
[j] High cost natural gas.
[k] Natural gas not identified by category in Purchased Gas Adjustments (PGA) filing.
[l] Total of old gas, new gas, high cost gas, and miscellaneous.
[m] All prices are weighted averages.
[n] Additional interstate pipeline companies have been included with the 20 major interstate pipelines starting with PGA filings effective July 1, 1984. See Appendix A, Explanatory Note 12 for expanded pipeline company list.
R = Revised Data.
— = Not Applicable.
* = Volume is less than 500 million cubic feet.
Notes and Sources: See the last page of this section.

Figure 5. Purchased Gas Wellhead Prices



Source: Purchased Gas Adjustment filings for interstate pipeline companies.

Table 6. Summary of Natural Gas Imports and Exports
(Volumes in Million Cubic Feet, Prices in Dollars per Thousand Cubic Feet)

Year and Month	Imports				Exports	
	Longterm Contracts		Spot Markets			
	Volume	Average Price	Volume	Average Price	Volume	Average Price
1985 Total	949,715	3.21	NA	NA	55,268	4.77
1986 Total	750,449	2.43	34,489	1.57	61,271	2.81
1987 Total	804,496	1.95	188,036	1.30	54,020	3.07
1988						
January	109,709	1.93	28,156	1.63	4,765	3.11
February	85,449	1.90	30,774	1.63	4,650	3.14
March	78,548	1.89	33,268	1.49	6,218	2.84
April	66,170	1.83	28,552	1.29	6,354	2.75
May	68,642	1.83	24,728	1.21	3,777	2.30
June	67,847	1.78	25,318	1.20	8,469	2.53
July	76,951	1.74	22,893	1.24	4,892	2.94
August	77,121	1.80	18,313	1.27	6,008	2.70
September	75,942	1.85	19,919	1.35	7,187	2.59
October	77,011	1.79	29,873	1.43	5,497	2.78
November	82,395	1.82	38,290	1.40	6,771	2.61
December	86,735	1.90	41,208	1.57	9,050	2.70
Total	952,520	1.84	341,292	1.41	73,638	2.74
1989						
January	82,813	2.21	39,604	1.69	5,923	2.88
February	71,892	2.11	34,673	1.53	5,529	2.60
March	81,655	2.04	35,016	1.38	6,472	2.43
April	74,433	2.08	38,611	1.32	5,744	2.71
May	68,812	2.02	36,713	1.37	4,899	2.28
June	69,355	2.01	35,343	1.35	5,693	2.29
July	66,849	1.94	34,225	1.31	5,734	2.67
August	73,268	2.29	32,701	1.29	5,922	2.66
September	78,435	2.09	34,566	1.22	5,865	2.57
October	83,324	2.22	37,676	1.24	5,568	2.73
November	80,124	2.08	41,876	1.48	6,642	2.60
December	98,801	2.06	47,199	1.70	5,912	2.71
Total	929,761	2.09	448,203	1.41	69,903	2.59

NA = Not Available

Notes and Sources: See the last page of this section.

Table 7. Marketed Production of Natural Gas by State
(Million Cubic Feet)

Year and Month	Alabama	Alaska	Arkansas	California	Colorado	Florida	Kansas
1984 Total	101,821	289,129	135,161	476,333	173,257	12,585	465,979
1985 Total	107,342	321,346	155,099	491,283	178,233	10,545	512,872
1986 Total	107,184	304,841	131,075	462,218	163,684	8,833	465,695
1987 Total	117,241	359,837	141,151	424,621	164,557	8,281	457,050
1988							
January	11,392	32,910	19,390	31,183	19,577	652	72,587
February	10,929	29,964	15,308	27,825	18,155	597	50,858
March	11,255	36,393	14,968	31,580	18,025	643	55,095
April	10,471	29,666	12,473	29,582	15,972	614	46,812
May	9,236	28,656	12,473	31,084	16,515	607	43,514
June	10,523	29,466	11,793	30,367	12,769	790	45,892
July	10,953	29,263	11,566	29,984	13,028	677	36,847
August	10,753	29,530	13,040	31,763	14,001	644	33,789
September	10,368	30,159	12,246	30,887	14,099	602	28,996
October	11,100	34,017	12,587	29,853	15,057	538	46,615
November	10,663	34,088	13,607	27,587	15,588	528	51,178
December	11,880	34,525	17,122	27,750	18,759	593	64,090
Total	129,524	378,638	166,573	359,444	191,544	7,484	576,274
1989							
January	12,157	35,183	E 20,100	31,130	20,932	677	57,637
February	10,580	32,940	E 15,300	28,702	17,953	583	60,549
March	11,618	34,670	E 15,900	31,421	16,808	611	55,625
April	11,020	33,350	E 12,800	31,150	14,638	633	47,081
May	11,332	24,524	E 12,500	31,838	15,058	699	50,548
June	10,906	31,929	E 11,900	31,132	14,626	605	42,170
July	11,204	32,078	E 11,500	32,806	14,813	676	47,746
August	10,591	29,845	E 13,200	32,504	14,503	683	43,652
September	10,112	29,836	E 12,000	30,545	15,489	706	36,711
October	9,701	34,464	E 12,400	31,438	18,221	750	41,043
November	9,130	34,137	E 13,900	28,831	20,285	648	46,639
December	9,966	35,291	E 16,800	30,357	20,521	713	57,698
Total	128,317	388,247	168,300	371,854	203,847	7,984	587,099
1990							
January	10,650	35,514	E 20,800	28,313	20,957	699	57,345

See footnotes at end of table.

Table 7. Marketed Production of Natural Gas by State (Continued)
(Million Cubic Feet)

Year and Month	Louisiana	Michigan	Mississippi	Montana	New Mexico	North Dakota	Oklahoma
1984 Total	5,825,055	144,537	157,911	51,474	957,366	70,496	1,985,869
1985 Total	5,013,702	131,855	144,170	52,494	905,272	72,633	1,936,341
1986 Total	4,895,394	127,287	140,833	46,592	702,614	55,098	1,917,493
1987 Total	5,122,509	146,996	139,727	46,456	823,773	62,258	2,004,797
1988							
January	469,503	12,922	10,167	5,159	85,471	4,992	185,737
February	445,057	11,869	10,842	4,746	72,987	4,671	172,119
March	454,289	12,317	12,267	4,131	74,098	4,980	176,902
April	417,561	11,160	11,025	3,246	61,034	4,773	166,081
May	437,323	12,993	13,653	3,215	66,043	5,131	179,902
June	404,480	12,943	7,565	3,276	61,239	5,008	167,219
July	416,209	12,550	7,964	2,997	57,384	5,046	172,969
August	423,979	12,225	10,363	3,713	62,752	4,973	173,393
September	375,326	11,944	10,001	3,898	61,629	4,140	174,621
October	425,295	11,490	10,149	5,463	59,083	4,520	176,689
November	443,353	12,170	10,027	5,918	60,000	4,862	177,191
December	467,897	11,561	10,032	5,893	70,097	4,651	183,810
Total	5,180,267	146,145	124,053	51,654	791,819	57,747	2,106,632
1989							
January	462,387	12,169	10,288	5,256	75,890	4,704	168,894
February	417,105	12,757	9,080	4,714	71,524	4,019	167,934
March	452,412	12,679	9,138	4,763	72,086	4,470	176,242
April	430,419	12,705	9,746	4,348	66,985	4,411	179,347
May	436,627	12,854	9,579	3,776	65,131	4,582	187,417
June	413,350	14,772	9,296	2,527	60,134	4,291	180,775
July	408,698	12,938	9,047	3,148	66,794	4,635	182,738
August	408,504	12,849	9,353	3,350	70,288	3,912	178,091
September	385,856	13,741	7,269	4,234	67,010	4,082	172,299
October	407,490	13,370	7,487	4,831	70,350	4,738	183,074
November	[R] 424,800	14,001	7,943	5,008	79,494	4,583	187,338
December	[b] 483,557	11,666	8,602	5,070	83,393	4,663	[E] 189,000
Total	[R] 5,131,205	156,501	106,828	51,025	849,079	53,090	2,153,149
1990							
January	[b] 470,413	14,451	8,360	5,291	86,903	4,681	[E] 186,000

See footnotes at end of table.

Table 7. Marketed Production of Natural Gas by State (Continued)
(Million Cubic Feet)

Year and Month	Texas	Utah	West Virginia	Wyoming	Other[a] States	U.S. **Total**
1984 Total	6,185,021	74,698	143,730	516,683	462,533	18,229,638
1985 Total	6,052,663	83,405	144,883	416,565	467,294	17,197,999
1986 Total	6,151,775	90,013	135,431	403,266	481,584	16,790,910
1987 Total	6,126,315	87,158	160,000	497,980	457,830	17,348,537
1988						
January	575,425	10,268	17,691	48,751	40,008	1,653,785
February	529,339	9,369	17,113	34,516	39,504	1,505,768
March	548,365	9,602	15,841	50,106	39,605	1,570,462
April	507,830	8,280	15,263	48,261	37,589	1,437,693
May	514,825	9,197	14,800	35,440	37,589	1,472,196
June	493,090	7,475	14,685	43,307	36,884	1,398,771
July	513,708	7,287	14,569	37,103	37,388	1,417,492
August	521,584	8,275	14,222	29,618	38,698	1,437,315
September	484,953	8,562	14,107	42,143	37,186	1,355,867
October	526,788	8,032	12,372	43,810	39,705	1,473,163
November	525,427	10,031	15,610	45,919	38,295	1,502,042
December	544,695	4,993	15,726	50,085	39,605	1,583,764
Total	6,286,029	101,372	182,000	509,058	462,056	17,808,313
1989						
January	543,971	11,426	E 20,100	56,885	E 40,200	1,589,986
February	497,322	10,505	E 19,700	49,365	E 39,700	1,470,332
March	540,099	10,224	E 18,200	50,717	E 39,800	1,557,483
April	516,205	9,203	E 16,700	46,565	E 37,800	1,485,106
May	522,344	10,014	E 15,900	50,920	E 38,000	1,503,643
June	502,515	7,732	E 16,600	46,973	E 36,900	1,439,133
July	515,345	9,973	E 15,300	46,482	E 37,400	1,463,321
August	509,665	9,475	E 14,900	45,079	E 38,700	1,449,144
September	489,615	8,362	E 14,500	45,968	E 37,200	1,385,535
October	510,057	9,361	E 12,700	49,850	E 39,700	1,461,025
November	c 513,605	10,010	E 16,400	52,429	E 38,300	R 1,507,481
December	c 545,956	12,386	E 17,200	58,514	E 39,600	1,630,953
Total	6,206,699	118,671	198,200	599,747	463,300	R 17,943,142
1990						
January	c 558,705	14,705	E 23,000	56,550	E 39,700	1,643,037

[a] Includes Arizona, Illinois, Indiana, Kentucky, Maryland, Missouri, Nebraska, New York, Ohio, Oregon, Pennsylvania, South Dakota, Tennessee, and Virginia. The 1989 monthly values for these States are estimated.
[b] Total marketed production for Louisiana in December 1989 and January 1990 were estimated on the basis of production reported in January - December 1988 and 1989, seasonally adjusted.
[c] Total marketed production for Texas in November 1989 thru January 1990 represents reported data for State onshore and estimated data for Outer Continental Shelf (OCS) producing areas.
E = Estimated Data.
R = Revised Data.
Notes and Sources: See the last page of this section.

Table 8. Well Determination Filings
(Volume in Billion Cubic Feet)

Year and Month	Section 102[a]			Section 103[b]			Section 107[c]		
	Number of Filings[e]			Number of Filings[e]			Number of Filings[e]		
	Total	With Volumes	Estimated Annual Volume[f]	Total	With Volumes	Estimated Annual Volume[f]	Total	With Volumes	Estimated Annual Volume[f]
1984 Total	10,167	8,071	2,432	16,048	12,751	1,217	9,656	7,846	757
1985 Total	9,052	7,028	1,905	15,896	12,531	1,455	10,940	8,766	741
1986 Total	4,631	3,620	1,010	11,348	8,956	959	6,709	4,874	367
1987 Total	2,387	1,787	471	5,717	4,548	532	6,655	4,242	248
1988									
January	118	86	18	444	352	32	327	233	13
February	186	132	31	540	415	44	605	386	21
March	204	135	38	670	495	82	582	341	14
April	101	80	18	686	477	59	454	232	14
May	170	127	30	680	571	66	620	426	18
June	425	360	55	794	698	40	444	252	13
July	121	71	22	269	198	21	478	304	19
August	190	135	217	585	458	51	575	377	25
September	111	83	23	435	349	54	535	246	17
October	193	104	27	356	288	25	465	288	10
November	145	90	26	345	271	30	269	144	7
December	183	105	21	555	432	60	389	265	16
Total	2,147	1,508	526	6,359	5,004	563	5,743	3,494	185
1989									
January	124	97	25	389	300	31	385	286	14
February	134	103	28	400	303	54	268	219	14
March	104	78	22	392	317	23	351	234	10
April	131	93	24	384	279	40	286	217	15
May	135	107	29	405	285	30	295	192	21
June	66	44	13	294	199	18	214	136	6
July	137	110	24	462	339	38	266	218	14
August	124	91	26	313	236	24	341	259	28
September	74	61	102	269	195	32	314	268	17
October	87	73	24	448	338	57	385	293	20
November	91	69	21	233	143	20	364	302	22
December	55	41	7	205	126	13	362	229	14
Total	1,262	967	344	4,194	3,060	379	3,831	2,853	195
1990									
January	85	67	17	289	173	24	388	298	21
February	67	54	20	248	155	18	389	262	16
March	122	86	17	291	181	17	714	468	29
1990 YTD	274	207	53	828	509	59	1,491	1,028	67
1989 YTD	362	278	74	1,181	920	108	1,004	739	38
1988 YTD	508	353	86	1,654	1,262	158	1,514	960	47

See footnotes at end of table.

Table 8. Well Determination Filings (Continued)
(Volume in Billion Cubic Feet)

Year and Month	Section 108[d]			Total		
	Number of Filings[e]		Estimated Annual Volume[f]	Number of Filings[e]		Estimated Annual Volume[f]
	Total	With Volumes		Total	With Volumes	
1984 Total	12,653	7,633	124	48,524	36,301	4,531
1985 Total	9,740	5,304	74	45,628	33,629	4,174
1986 Total	7,215	4,115	50	29,903	21,566	2,383
1987 Total	5,061	3,179	58	19,820	13,756	1,309
1988						
January	686	542	5	1,575	1,213	68
February	420	242	3	1,751	1,175	99
March	554	475	4	2,010	1,446	137
April	372	233	3	1,613	1,022	94
May	572	448	8	2,042	1,572	123
June	179	102	3	1,842	1,412	111
July	139	80	1	1,007	653	63
August	259	154	2	1,609	1,124	294
September	346	50	1	1,427	728	95
October	162	89	2	1,176	769	64
November	160	106	1	919	611	64
December	171	81	1	1,298	883	98
Total	4,020	2,602	34	18,269	12,608	1,309
1989						
January	120	71	1	1,018	754	71
February	136	78	1	938	703	96
March	142	61	1	989	690	56
April	170	103	1	971	692	80
May	408	326	1	1,243	910	81
June	163	101	1	737	480	38
July	389	344	2	1,254	1,011	78
August	92	75	1	870	661	78
September	144	80	3	801	604	153
October	380	338	3	1,300	1,042	104
November	145	65	1	833	579	63
December	92	39	1	714	435	35
Total	2,381	1,681	16	11,668	8,561	934
1990						
January	344	311	7	1,106	849	69
February	89	54	1	793	525	55
March	50	30	0	1,177	765	63
1990 YTD	483	395	8	3,076	2,139	187
1989 YTD	398	210	3	2,945	2,147	222
1988 YTD	1,660	1,259	13	5,336	3,834	304

[a] New natural gas and certain natural gas produced from the Outer Continental Shelf.
[b] New onshore production wells.
[c] High cost natural gas.
[d] Stripper well natural gas.
[e] Not all filings report estimated volumes. The "With Volumes" columns show number reporting volumes.
[f] Annual volumes are often estimated by producers prior to actual operations or based on short periods of operation. For this reason the accuracy of estimates may vary.

Notes and Sources: See the last page of this section.

Table 9. Well Determination Filings by State, March 1990
(Volume in Million Cubic Feet)

State	Section 102[a]			Section 103[b]			Section 107[c]		
	Number of Filings[e]			Number of Filings[e]			Number of Filings[e]		
	Total	With Volumes	Estimated Annual Volume[f]	Total	With Volumes	Estimated Annual Volume	Total	With Volumes	Estimated Annual Volume
Alabama	4	1	180	0	0	0	53	27	1,326
Colorado	0	0	0	8	8	2,435	41	8	565
Kentucky	0	0	0	20	11	547	34	31	1,194
Louisiana	4	2	790	0	0	0	0	0	0
Michigan	3	3	166	1	1	50	260	171	4,361
Montana	21	21	711	24	0	0	0	0	0
New Mexico	1	0	0	31	18	1,803	37	1	75
New York	0	0	0	9	1	75	3	1	18
Ohio	2	2	50	4	4	89	80	75	1,432
Oklahoma	25	8	835	25	20	3,375	2	2	1,514
Pennsylvania	18	17	745	31	31	1,325	76	59	1,584
Texas	44	32	13,296	78	43	5,807	48	34	13,450
West Virginia	0	0	0	43	38	585	78	59	3,641
Wyoming	0	0	0	17	6	596	2	0	0
Total	122	86	16,773	291	181	16,687	714	468	29,160

See footnotes at end of table.

Table 9. Well Determination Filings by State, March 1990 (Continued)
(Volume in Million Cubic Feet)

State	Section 108[d]			Total		
	Number of Filings[e]			Number of Filings[e]		
	Total	With Volumes	Estimated Annual Volume[f]	Total	With Volumes	Estimated Annual Volume[f]
Alabama	0	0	0	57	28	1,506
Colorado	0	0	0	49	16	3,000
Kentucky	2	2	39	56	44	1,780
Louisiana	0	0	0	4	2	790
Michigan	0	0	0	264	175	4,577
Montana	3	3	43	48	24	754
New Mexico	13	4	67	82	23	1,945
New York	0	0	0	12	2	93
Ohio	0	0	0	86	81	1,571
Oklahoma	5	2	31	57	32	5,755
Pennsylvania	0	0	0	125	107	3,654
Texas	14	7	88	184	116	32,641
West Virginia	11	10	86	132	107	4,312
Wyoming	2	2	29	21	8	625
Total	50	30	383	1,177	765	63,003

[a] New natural gas and certain natural gas produced from the Outer Continental Shelf.
[b] New onshore production wells.
[c] High cost natural gas.
[d] Stripper well natural gas.
[e] Not all filings report estimated volumes. The "With Volumes" columns show number reporting volumes.
[f] Annual volumes are often estimated by producers prior to actual operations or based on short periods of operation. For this reason the accuracy of estimates may vary.
Notes and Sources: See the last page of this section.

Table 10. Well Determination Filings by Category, March 1990
(Volumes in Million Cubic Feet)

NGPA Category	Total Filings	Filings Reporting Volume	Estimated Annual Volume[a] [b]
Section 102[c]			
New OCS Lease	0	0	0
New Onshore Well (2.5 miles)	43	41	2,406
New Onshore Well (1,000 ft. deeper)	1	1	1,300
New Onshore Reservoir	70	39	11,678
New Reservoir on Old OCS Lease	7	5	1,389
Unspecified	1	0	0
Total	122	86	16,773
Section 103[d]			
Less than 5,000 Feet Deep	125	89	5,055
5,000 Feet and Deeper	126	91	11,449
Depth Not Reported	40	1	183
Total	291	181	16,687
Section 107[e]			
Deep	4	4	1,550
Geopressurized Brine	0	0	0
Coal Seam Gas	112	32	1,823
Devonian Shale	423	314	9,910
Production Enhancement	0	0	0
New Tight Formation	175	118	15,877
Recompletion Tight Formation	0	0	0
Unspecified	0	0	0
Total	714	468	29,160
Section 108[f]			
Stripper Well	37	30	383
Seasonally Affected	0	0	0
Enhanced Recovery	6	0	0
Temporary Pressure Buildup	7	0	0
Unspecified	0	0	0
Total	50	30	383
Total All Sections	1,177	765	63,003

[a] Includes all filings reporting volume.
[b] Annual volumes are often estimated by producers prior to actual operations or based on short periods of operation. For this reason the accuracy of estimates may vary.
[c] New natural gas and certain natural gas produced from the Outer Continental Shelf.
[d] New onshore production wells.
[e] High cost natural gas.
[f] Stripper well natural gas.
Notes and Sources: See the last page of this section.

Table 11. Natural Gas Ceiling Prices by Category of Gas, Type of Sale, or Contract[a]
(Dollars per Million Btu)

NGPA Category	May 1990	May 1989	May 1988	May 1987	May 1986	May 1985	May 1984
Section 102							
New Natural Gas, Certain OCS Gas[b]	5.702	5.273	4.872	4.544	4.264	3.962	3.680
Section 103 (b)(1)							
New Onshore Production Wells[b]	3.565	3.423	3.283	3.180	3.099	2.991	2.889
Section 103 (b)(2)							
New Onshore Production Wells[b]	—	3.423	.000	3.862	3.682	3.477	—
Section 105[c]							
Intrastate Existing Contracts	5.425	5.063	4.722	4.447	4.212	3.950	—
Section 106 (b)(1)(B)							
Alternate Maximum Lawful Price for Certain Intrastate Rollover Gas[d]	2.039	1.958	1.877	1.819	1.773	1.711	1.649
Section 107							
Gas Produced from Tight Formations	7.130	6.846	6.566	6.360	6.198	5.982	5.778
Section 108							
Stripper Gas	6.106	5.646	5.217	4.866	4.565	4.242	3.942
Section 109							
Not Otherwise Covered	2.950	2.833	2.719	2.634	2.566	2.478	2.391
Section 104 and 106 (a)							
Post-1974 Gas: All Producers	2.950	2.833	2.719	2.634	2.566	2.478	2.391
1973-1974 Biennium Gas:							
Small Producer	2.489	2.392	2.296	2.226	2.170	2.096	2.025
Large Producer	1.909	1.831	1.757	1.701	1.658	1.598	1.545
Interstate Rollover Gas:[e]							
Small Producer	1.095	1.052	1.008	.979	.954	.920	.888
Large Producer	1.095	1.052	1.008	.979	.954	.920	.888
Replacement Contract Gas or Recompletion Gas							
Small Producer	1.402	1.344	1.289	1.248	1.217	1.177	1.136
Large Producer	1.071	1.030	.989	.960	.935	.901	.870
Flowing Gas:							
Small Producer	.707	.679	.654	.634	.681	.596	.574
Large Producer	.595	.573	.551	.534	.518	.504	.486
Certain Permian Basin Gas:							
Small Producer	.834	.802	.768	.744	.726	.700	.678
Large Producer	.737	.708	.680	.660	.644	.619	.597
Certain Rocky Mountain Gas:							
Small Producer	.834	.802	.768	.744	.726	.700	.678
Large Producer	.707	.679	.654	.634	.618	.596	.574
Certain Appalachian Basin Gas:							
North Subarea Contracts dated after Oct. 7, 1969	.673	.645	.620	.603	.587	.565	.543
Other Contracts	.624	.597	.575	.558	.542	.522	.504
Minimum Rate Gas: All Producers							
(dollars per Mcf)	.366	.353	.341	.329	.320	.308	.296

[a] See Appendix A, Explanatory Note 10 for discussion of Title I of the Natural Gas Policy Act.
[b] Commencing January 1, 1985 and July 1, 1987, the price of some natural gas finally determined to be natural gas produced from a new, onshore production well under Section 103 is deregulated. Thus, for all months succeeding June 1987 publication of a maximum lawful price per MMBtu under NGPA Section 103(b)(2) is discontinued.
[c] New category as of January 1, 1985.
[d] Section 106(b) of the NGPA provides that for certain gas sold under an intrastate rollover contract, the maximum lawful price is the higher of the price paid under the expired contract, adjusted for inflation or an alternative Maximum Lawful Price specified in this table. This alternative Maximum Lawful Price for each month appears in this row.
[e] The price for interstate rollover gas is the higher of the price listed in this table or the just and reasonable price under the expired contract as adjusted for inflation.
— = Not Applicable.
Notes and Sources: See the last page of this section.

Table 12. Revenues, Expenses, and Income of Major Interstate Natural Gas Pipeline Companies
(Million Dollars)

Year and Month	Total Sales Volume[a] (Bcf)	Gas Operating Revenues	Gas Operating Expenses				Total Operating Income	Total Income Before Interest Charges and Extraordinary Expenses	Net Income[c]
			Operation and Maintenance	Depreciation, Depletion, and Amortization	Taxes[b]	Total Gas Operating Expenses			
1984 Total	12,596	53,629	42,250	1,693	630	50,467	3,168	5,279	3,227
1985 Total	11,286	48,470	42,071	1,655	666	45,835	2,582	4,303	1,791
1986 Total	8,130	34,541	28,538	1,672	602	32,250	2,335	3,761	1,490
1987 Total	6,758	27,469	21,871	1,520	552	25,151	2,333	3,493	1,414
1988									
January	1,152	3,860	3,147	137	56	3,500	360	485	306
February	939	3,337	2,711	155	54	3,033	304	423	255
March	606	2,414	1,855	133	50	2,151	263	441	240
April	378	1,720	1,312	126	48	1,648	185	339	160
May	317	1,550	1,193	118	46	1,376	174	325	163
June	308	1,515	1,468	123	46	1,568	-53	93	20
July	315	1,483	1,124	126	43	1,215	268	-62	-159
August	347	1,681	1,324	131	45	1,680	4	226	73
September	321	1,595	1,628	129	47	1,531	64	-67	-253
October	435	1,949	1,591	141	51	1,775	172	158	-43
November	504	2,395	2,387	133	48	2,467	-83	50	-148
December	792	3,138	2,900	127	48	2,996	145	939	752
Total	6,414	26,637	22,640	1,579	582	24,940	1,803	3,350	1,366
1989									
January	711	2,902	2,278	132	56	2,589	313	454	280
February	721	2,922	2,306	137	56	2,619	303	447	267
March	520	2,436	2,077	130	53	2,293	144	329	130
April	357	1,885	1,461	120	54	1,678	207	304	122
May	305	1,945	1,547	130	44	1,769	276	351	191
June	252	1,471	1,141	129	51	1,331	138	331	162
July	271	1,520	1,192	129	51	1,382	138	222	43
August	300	1,565	1,214	131	51	1,406	158	293	110
September	303	1,695	1,279	154	40	1,513	172	368	190
October	388	1,827	1,754	103	50	1,781	46	212	57
November	518	2,443	1,965	119	48	2,230	213	396	228
December	1,006	4,092	3,550	79	42	3,675	418	713	397
Total	5,652	26,703	21,764	1,493	596	24,266	2,526	4,420	2,177
1990									
January	710	3,106	2,495	130	59	2,783	323	492	326
February	584	2,501	1,977	121	57	2,240	262	401	243

[a] Includes sales for resale and sales to ultimate consumers.
[b] Excludes income taxes.
[c] Total Income before Interest Charges and Extraordinary Expenses and Investment Tax Credits minus Income Taxes, Interest Charges, and Extraordinary Items.
Notes and Sources: See the last page of this section.

Table 13. Volumes and Prices of Natural Gas Sold by Major Interstate Natural Gas Pipeline Companies
(Volumes in Million Cubic Feet, Prices in Dollars per Thousand Cubic Feet)

Year and Month	To Industrial Users		To Other Ultimate Consumers		Total Sales to Ultimate Consumers		Sales For Resale		Total Sales of Natural Gas		Number of Companies
	Volume	Price[a]	Volume	Price[a]	Volume	Price[a]	Volume	Price[a]	Volume	Price[a]	
1984 Total	702,540	4.13	388,780	5.34	1,091,320	4.56	9,020,704	3.99	10,112,024	4.05	44
1985 Total	885,254	3.91	557,602	5.30	1,442,856	4.45	8,074,803	3.90	9,517,659	3.98	45
1986 Total	549,956	3.23	433,058	5.08	983,014	4.04	6,023,893	3.69	7,006,907	3.74	48
1987 Total	442,041	3.07	301,567	5.06	743,608	3.91	5,213,629	3.37	5,957,237	3.44	47
1988											
January	31,555	2.94	81,597	4.61	113,152	4.14	899,736	2.99	1,012,888	3.11	46
February	20,698	2.96	68,547	4.76	89,245	4.34	729,882	3.11	819,127	3.25	46
March	23,154	2.83	50,926	4.88	74,080	4.24	469,116	3.27	543,196	3.40	46
April	24,440	2.67	17,334	5.41	41,774	3.81	304,224	3.57	345,998	3.60	46
May	25,651	2.36	19,724	4.95	45,375	3.49	238,526	3.85	283,901	3.79	46
June	28,916	2.52	17,336	5.94	46,252	3.80	224,768	3.85	271,020	3.85	46
July	28,489	2.45	18,472	5.82	46,961	3.78	222,087	3.73	269,048	3.74	46
August	30,159	2.51	19,904	5.66	50,063	3.76	252,794	3.95	302,857	3.92	46
September	26,001	2.40	15,716	6.19	43,965	3.80	230,466	4.01	274,431	3.98	46
October	17,982	2.63	28,309	5.42	46,467	4.30	329,151	3.75	375,442	3.84	46
November	18,263	2.85	38,695	5.10	54,539	4.44	364,104	4.22	421,062	4.25	46
December	19,513	2.82	64,123	4.42	83,636	4.05	601,339	3.34	684,975	3.42	46
Total	294,821	2.65	440,683	4.99	735,509	4.05	4,866,193	3.47	5,603,945	3.55	46
1989											
January	23,906	2.80	64,345	4.83	88,251	4.28	540,346	3.32	628,597	3.45	46
February	R 57,581	R 2.45	69,901	4.73	R 127,474	R 3.74	556,103	3.37	R 683,577	R 3.44	46
March	34,247	2.29	56,503	4.96	90,750	3.95	379,148	3.47	469,898	3.57	47
April	31,606	2.69	34,276	5.40	65,882	4.10	248,725	3.13	314,607	3.33	48
May	32,223	2.66	21,016	5.59	53,239	3.82	210,678	3.22	263,917	3.34	49
June	27,766	2.68	14,648	6.19	42,414	3.89	177,429	3.29	219,843	3.41	49
July	41,014	2.44	17,461	5.57	58,475	3.37	182,379	3.49	240,854	3.46	48
August	32,280	2.51	18,844	4.92	51,124	3.40	221,426	3.40	272,550	3.40	49
September	33,768	2.50	16,516	5.76	50,284	3.57	225,373	3.33	275,657	3.38	50
October	29,222	2.62	25,710	5.61	54,932	4.02	289,586	3.26	344,518	3.38	50
November	25,864	2.70	41,965	5.06	67,829	4.16	408,232	3.40	476,061	3.51	50
December	23,366	3.03	84,407	4.49	107,773	4.18	795,655	3.30	903,428	3.41	50
Total	R 392,843	R 2.58	465,592	5.02	R 858,427	R 3.91	4,235,080	3.33	R 5,093,507	R 3.43	50
1990											
January	23,281	3.52	61,566	4.90	84,847	4.52	488,521	3.43	573,368	3.59	51
February	53,729	2.58	54,123	5.00	107,852	3.80	428,176	2.59	536,028	2.83	51

[a] All prices are weighted averages.
R = Revised Data.
Notes and Sources: See the last page of this section.

Table 14. Volumes and Prices of Natural Gas Sold by Major Interstate Natural Gas Pipeline Companies, by Company, February 1990
(Volumes in Million Cubic Feet, Prices in Dollars per Thousand Cubic Feet)

Pipeline Company	To Industrial Users		To Other Ultimate Consumers		Total Sales to Ultimate Consumers		Sales For Resale		Total Sales of Natural Gas	
	Volume	Price[a]	Volume	Price[a]	Volume	Price[a]	Volume	Price[a]	Volume	Price[a]
Algonquin Gas	0	0.00	0	0.00	0	0.00	17,591	3.70	17,591	3.70
ANR	0	.00	0	.00	0	.00	23,300	4.16	23,300	4.16
Arkla, Inc	2,879	3.37	20,993	5.27	23,872	5.04	432	1.22	24,304	4.97
Bear Creek Storage	0	.00	0	.00	0	.00	0	.00	0	.00
Canyon Creek Transm Co	0	.00	0	.00	0	.00	0	.00	0	.00
Colorado Interstate	97	2.53	1	3.00	98	2.53	12,317	2.61	12,415	2.61
Columbia Gas Transm	0	.00	0	.00	0	.00	3,251	3.96	3,251	3.96
Columbia Gulf	0	.00	0	.00	0	.00	0	.00	0	.00
Consolidated Gas	74	2.78	0	.00	74	2.78	27,645	.79	27,719	.80
East Tennessee	1,644	3.28	4	3.50	1,648	3.28	6,238	2.73	7,886	2.84
El Paso	634	2.62	0	.00	634	2.62	14,820	3.86	15,454	3.81
Equitrans	1,531	3.32	0	.00	1,531	3.32	5,937	4.14	7,468	3.97
Florida Gas	13,462	2.69	0	.00	13,462	2.69	7,488	2.96	20,950	2.79
Great Lakes Gas	0	.00	0	.00	0	.00	1	1.00	1	1.00
High Island Offshore	0	.00	0	.00	0	.00	0	.00	0	.00
K N Energy Inc	89	2.93	4,985	4.42	5,074	4.39	3,949	2.96	9,023	3.77
Michigan Consolidated	431	4.54	28,021	4.91	28,452	4.91	0	.00	28,452	4.91
Michigan Gas Storage	0	.00	0	.00	0	.00	234	1.17	234	1.17
Midwestern	0	.00	0	.00	0	.00	3,038	2.60	3,038	2.60
Mississippi River	497	3.06	0	.00	497	3.06	9,231	3.33	9,728	3.32
Mountain Fuel Res	0	.00	0	.00	0	.00	7,034	3.44	7,034	3.44
National Fuel	0	.00	0	.00	0	.00	18,696	3.22	18,696	3.22
Natural Gas Pipeline	2	4.00	0	.00	2	4.00	29,265	1.88	29,267	1.88
Northern Border	0	.00	0	.00	0	.00	0	.00	0	.00
Northern Natural	116	5.81	3	1.67	119	5.71	31,390	3.01	31,509	3.02
Northwest Alaskan	0	.00	0	.00	0	.00	26,909	1.92	26,909	1.92
Northwest Pipeline	1	1.00	0	.00	1	1.00	5,137	2.76	5,138	2.76
Overthrust Pipeline	0	.00	0	.00	0	.00	0	.00	0	.00
Pacific Gas Transm	31,503	2.33	0	.00	31,503	2.33	0	.00	31,503	2.33
Pacific Interstate	0	.00	0	.00	0	.00	6,097	3.82	6,097	3.82
Panhandle Eastern	64	3.59	51	2.12	115	2.94	8,123	2.75	8,238	2.76
Sabine Pipeline Co	0	.00	0	.00	0	.00	0	.00	0	.00
Sea Robin Pipeline	0	.00	0	.00	0	.00	0	.00	0	.00
Southern Natural	25	8.68	0	.00	25	8.68	11,915	2.89	11,940	2.91
Stingray Pipeline	0	.00	0	.00	0	.00	0	.00	0	.00
Tenneco, Inc	78	3.13	0	.00	78	3.13	22,662	3.50	22,740	3.50
Texas Eastern	0	.00	0	.00	0	.00	106,086	1.85	106,086	1.85
Texas Gas Transm	0	.00	0	.00	0	.00	17,290	3.64	17,290	3.64
Trailblazer Pipeline	0	.00	0	.00	0	.00	0	.00	0	.00
Transco Gas	0	.00	0	.00	0	.00	0	.00	0	.00
Transcontinental	68	2.28	0	.00	68	2.28	18,653	2.12	18,721	2.12
Transwestern Pipeline	11	2.55	0	.00	11	2.55	3,195	3.22	3,206	3.22
Trunkline Gas Co	0	.00	1	2.00	1	3.00	9,217	3.61	9,218	3.61
Trunkline LNG	0	.00	0	.00	0	.00	0	.00	0	.00
U-T Offshore	0	.00	0	.00	0	.00	0	.00	0	.00
United Gas Pipeline	61	3.15	46	2.89	107	3.04	398	5.22	505	4.76
Valero Interstate Transm	0	.00	0	.00	0	.00	0	.00	0	.00
Viking Gas Company	0	.00	0	.00	0	.00	842	1.88	842	1.88
Williams Natural	462	2.84	18	1.44	480	2.79	14,362	3.71	14,842	3.68
Williston Basin	0	.00	0	.00	0	.00	3,203	3.71	3,203	3.71
Wyoming Interstate	0	.00	0	.00	0	.00	0	.00	0	.00
Total/Average Price[a]	53,729	2.58	54,123	5.00	107,852	3.80	475,946	2.68	583,798	2.89
Sales to Other Major Companies	—	—	—	—	—	—	47,770	3.50	47,770	3.50
Sales Excluding Sales to Major Companies	—	—	—	—	—	—	428,176	2.59	536,028	2.83

[a] All prices are computed weighted averages based on dollar and volume amounts reported, which may include or reflect out-of-period dollar or volume adjustments, restatements or revisions, or account reclassifications or provisions for ending regulatory adjustments. See Appendix A, Explanatory Note 9 for discussion of apparent anomalies.

— Not Applicable.

Notes and Sources: See the last page of this section.

Table 15. Natural and Other Gases Produced and Purchased by Major Interstate Natural Gas Pipeline Companies
(Million Cubic Feet)

Year and Month	Transported Gas[a]	Natural Gas[b] Production	Manufactured Gas, Liquefied Natural Gas, Gasified Coal, and Synthetic Gas Production	Purchased Natural Gas				
				From Producers	Intracompany Transfers	Imports	From Others	Total
1984 Total	7,652,245	365,796	2,121	9,190,510	NA	771,075	785,279	10,746,864
1985 Total	8,922,483	206,967	18,166	8,211,227	363,055	887,187	596,926	9,695,340
1986 Total	10,588,148	136,921	22,634	6,466,257	166,964	697,249	345,309	7,675,780
1987 Total	13,479,989	152,039	22,905	4,848,577	124,572	759,345	400,134	6,132,628
1988								
January	1,278,992	16,620	2,091	604,262	10,699	100,465	73,973	789,399
February	1,253,637	19,682	2,352	484,546	6,740	83,145	65,111	639,542
March	1,400,959	16,140	1,720	449,314	8,293	74,762	30,351	562,720
April	1,400,187	5,560	2,783	323,745	-283	75,279	8,917	407,658
May	1,291,115	7,126	2,288	324,784	4,750	67,846	13,869	411,249
June	1,230,313	9,760	2,071	308,585	7,046	68,915	8,376	392,922
July	1,222,281	11,270	993	314,460	4,886	79,748	13,860	412,954
August	1,245,290	10,678	1,635	307,875	5,057	86,241	21,116	420,289
September	1,178,750	9,996	1,854	285,403	4,054	80,533	17,737	389,579
October	1,378,349	10,478	1,814	325,497	4,363	71,791	11,894	411,011
November	1,406,500	11,449	1,789	341,016	6,544	89,842	34,112	471,514
December	1,664,134	10,862	2,570	446,633	4,730	83,816	75,667	610,846
Total	15,950,507	139,621	23,960	4,516,120	66,879	962,383	374,983	5,919,683
1989								
January	1,604,355	12,145	2,018	400,130	7,077	76,463	72,507	556,177
February	1,495,146	12,008	1,763	372,710	8,143	66,282	45,791	492,926
March	1,638,521	11,077	2,134	314,545	6,881	79,191	27,718	428,335
April	1,629,112	8,935	2,010	224,007	4,975	74,285	24,877	328,144
May	1,621,453	6,610	2,083	237,163	4,994	73,118	15,864	331,139
June	1,512,971	6,410	1,956	247,553	5,623	68,512	25,409	347,097
July	1,421,878	7,932	2,150	239,428	6,091	74,761	25,283	345,563
August	1,414,240	6,857	2,031	249,948	5,540	67,871	28,038	351,397
September	1,418,307	5,851	2,052	240,590	4,275	73,787	24,128	342,780
October	1,540,630	7,307	2,171	259,112	5,788	72,313	27,491	364,704
November	1,682,778	8,321	2,060	339,534	6,777	77,522	44,754	468,586
December	1,717,007	9,317	2,181	407,868	7,894	99,383	65,283	580,428
Total	18,696,398	102,770	24,609	3,532,588	74,058	903,488	427,143	4,937,276
1990								
January	1,843,090	9,249	2,064	487,025	7,656	102,640	73,255	670,576
February	1,653,276	7,301	1,948	356,499	5,752	77,018	27,028	466,297

[a] Gas transported for other companies through the production, transmission, or distribution lines or compressor stations of the reporting pipelines.
[b] Mixture of hydrocarbons existing in gaseous phase or in solution with crude oil in natural underground reservoirs.
[c] Includes out-of-period adjustments to correct data in prior month.
NA = Not Available.
Notes and Sources: See the last page of this section.

Table 16. Natural and Other Gases Produced and Purchased by Major Interstate Natural Gas Pipeline Companies, February 1990
(Million Cubic Feet)

Pipeline Company	Transported Gas	Natural Gas Production	Manufactured Gas, Liquefied Natural Gas, Gasified Coal and Synthetic Gas Production	Purchased Natural Gas				
				From Producers	Intracompany Transfers	Imports	From Others	Total
Algonquin Gas	3,673	0	0	0	0	0	17,334	17,334
ANR	95,256	0	1,078	18,329	0	[a] -53	555	18,831
Arkla, Inc	37,043	0	0	7,781	0	0	15,852	23,633
Bear Creek Storage	0	0	0	0	0	0	0	0
Canyon Creek Transm Co	3,144	0	0	0	0	0	0	0
Colorado Interstate	31,721	3,977	0	7,245	3,977	0	0	11,222
Columbia Gas Transm	76,293	0	0	23,202	378	0	1,404	24,984
Columbia Gulf	89,036	0	0	0	0	0	3,016	3,016
Consolidated Gas	27,810	1,388	0	12,421	0	0	23,100	35,521
East Tennessee	21	0	0	6,986	0	0	489	7,475
El Paso	105,199	294	0	19,200	0	0	[a] -3,976	15,224
Equitrans	1,924	0	0	2,045	0	0	2,986	5,031
Florida Gas	1,551	0	0	15,548	0	0	6,126	21,674
Great Lakes Gas	41,134	0	0	0	0	1,275	0	1,275
High Island Offshore	36,448	0	0	0	0	0	0	0
K N Energy Inc	4,709	0	0	6,060	0	0	2,621	8,681
Michigan Consolidated	11,090	264	0	7,412	0	481	5,062	12,955
Michigan Gas Storage	16,649	0	0	0	0	0	284	284
Midwestern	2,923	0	0	2,766	0	0	850	3,616
Mississippi River	5,264	0	0	7,615	0	0	0	7,615
Mountain Fuel Res	14,223	0	0	4,856	0	0	642	5,498
National Fuel	7,002	401	0	11,064	401	0	1,453	12,918
Natural Gas Pipeline	103,422	1,034	870	23,269	1,034	1,693	907	26,903
Northern Border	28,865	0	0	0	0	0	0	0
Northern Natural	132,621	0	0	20,839	0	5,490	0	26,329
Northwest Alaskan	0	0	0	0	0	26,909	0	26,909
Northwest Pipeline	60,574	[a] -160	0	1,486	[a] -160	3,289	0	4,615
Overthrust Pipeline	4,594	0	0	0	0	0	0	0
Pacific Gas Transm	10,350	0	0	171	0	32,484	0	32,655
Pacific Interstate	0	0	0	0	0	0	6,729	6,729
Panhandle Eastern	41,189	0	0	5,537	0	0	31	5,568
Sabine Pipeline Co	7,234	0	0	0	0	0	0	0
Sea Robin Pipeline	20,283	0	0	10	0	0	0	10
Southern Natural	36,188	0	0	13,292	0	0	0	13,292
Stingray Pipeline	29,709	0	0	0	0	0	0	0
Tenneco, Inc	120,811	36	0	35,695	0	2,851	[a] -2,995	35,551
Texas Eastern	49,047	64	0	43,638	0	1,848	11,063	56,549
Texas Gas Transm	38,939	3	0	18,218	3	0	5,732	23,953
Trailblazer Pipeline	4,617	0	0	0	0	0	0	0
Transco Gas	0	0	0	0	0	0	0	0
Transcontinental	164,046	0	0	11,597	0	0	1,355	12,952
Transwestern Pipeline	27,845	0	0	4,224	0	0	0	4,224
Trunkline Gas Co	38,891	0	0	10,039	0	0	0	10,039
Trunkline LNG	0	0	0	0	0	0	0	0
U-T Offshore	28,465	0	0	0	0	0	0	0
United Gas Pipeline	52,148	0	0	2,012	0	0	1,739	3,751
Valero Interstate Transm	4,285	0	0	0	0	0	0	0
Viking Gas Company	5,721	0	0	0	0	751	0	751
Williams Natural	19,317	0	0	12,030	0	0	2,350	14,380
Williston Basin	6,088	0	0	1,912	119	0	0	2,031
Wyoming Interstate	5,914	0	0	0	0	0	0	0
Total	1,653,276	7,301	1,948	356,499	5,752	77,018	104,709	543,978
Purchases from Other Major Companies	—	—	—	0	0	0	77,681	77,681
Purchases Excluding Purchases from Other Major Companies	—	—	—	356,499	5,752	77,018	27,028	466,297

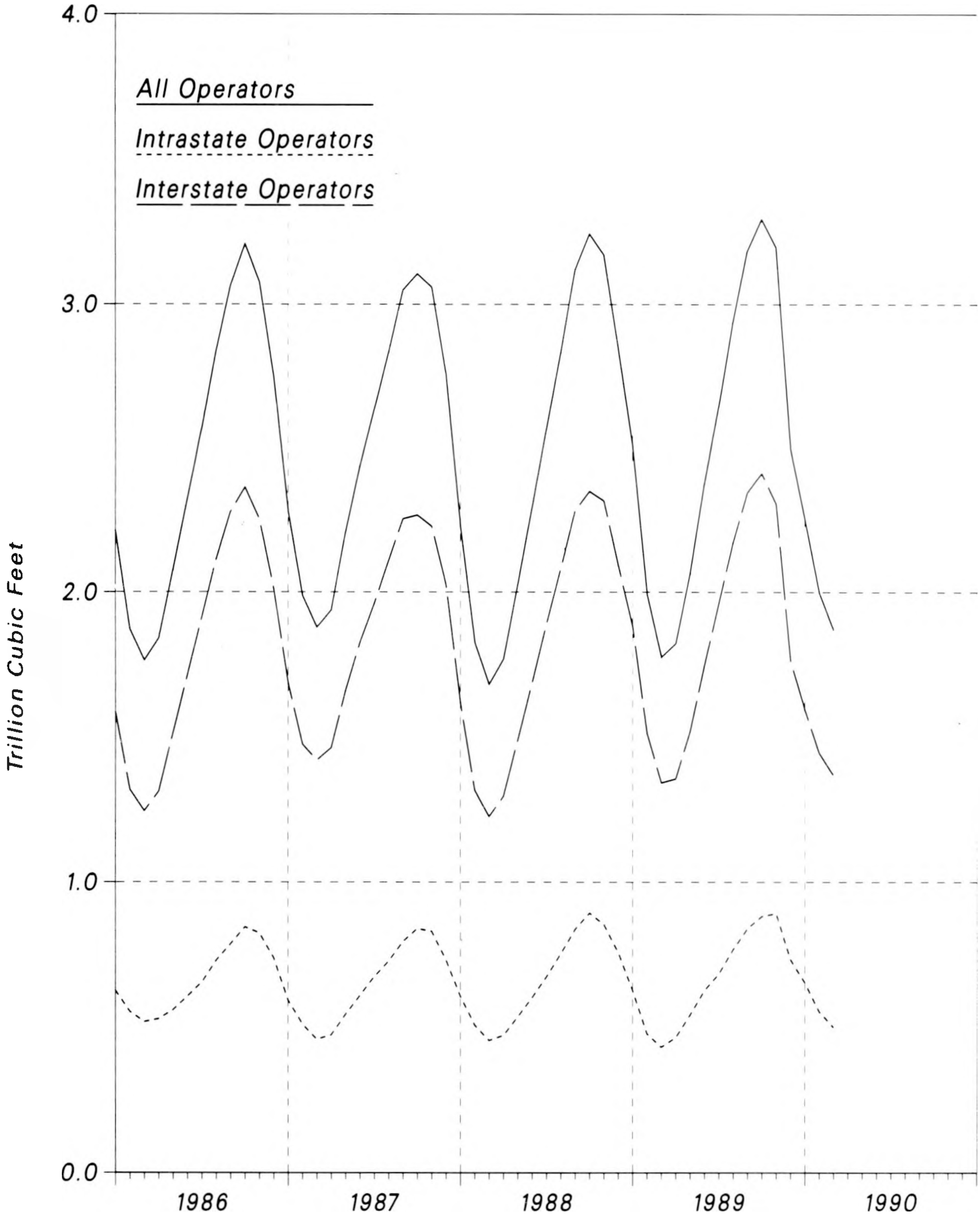
[a] Includes out-of-period adjustments to correct data in prior month.
— Not Applicable.
Notes and Sources: See the last page of this section.

Table 17. Underground Natural Gas Storage (All Operators)
(Volumes in Billion Cubic Feet)

Year and Month	Natural Gas in Underground Storage at End of Period			Change In Working Gas from Same Period Previous Year		Storage Activity		
	Base Gas	Working Gas	Total[b]	Volume	Percent	Injections	Withdrawals	Net[c]
1984 Total[a]	3,830	2,876	6,706	281	10.8	2,252	2,064	188
1985 Total[a]	3,842	2,607	6,448	-270	-9.4	2,128	2,359	-231
1986 Total[a]	3,819	2,749	6,567	142	5.5	1,952	1,812	140
1987 Total[a]	3,792	2,756	6,548	7	.3	1,887	1,881	6
1988								
January	3,792	2,228	6,020	-52	-2.3	47	578	-531
February	3,791	1,827	5,618	-161	-8.1	50	456	-406
March	3,790	1,682	5,473	-197	-10.5	99	255	-156
April	3,790	1,769	5,559	-169	-8.7	162	92	71
May	3,790	2,027	5,818	-179	-8.1	282	46	236
June	3,792	2,293	6,085	-144	-5.9	274	36	238
July	3,793	2,567	6,359	-69	-2.6	294	42	252
August	3,791	2,835	6,626	-1	—	282	52	230
September	3,791	3,120	6,911	71	2.3	308	46	262
October	3,792	3,243	7,035	137	4.4	198	92	105
November	3,803	3,171	6,974	112	3.7	117	157	-40
December	3,800	2,850	6,650	94	3.4	62	391	-329
Total	--	--	--	--	--	2,174	2,243	-69
1989								
January	3,798	2,509	6,307	281	12.6	49	404	-354
February	3,801	1,994	5,796	168	9.2	28	546	-518
March	3,801	1,776	5,578	94	5.6	96	314	-218
April	3,801	1,823	5,624	54	3.0	170	124	47
May	3,802	2,062	5,863	34	1.7	279	62	216
June	3,802	2,374	6,176	82	3.6	332	19	313
July	3,802	2,644	6,446	77	3.0	321	24	297
August	3,802	2,938	6,740	103	3.6	321	27	294
September	3,802	3,183	6,986	63	2.0	283	34	249
October	3,800	3,293	7,094	50	1.5	192	85	107
November	3,812	3,197	7,010	26	.8	91	198	-107
December	3,812	2,499	6,311	-351	-12.3	50	729	-679
Total	--	--	--	--	--	2,212	2,566	-353
1990								
January	3,818	2,251	6,069	-258	-10.3	92	329	-236
February	3,814	2,000	5,814	6	.3	85	340	-255
March	3,814	1,871	5,684	95	5.3	119	250	-132

[a] Total as of December 31.
[b] Total underground storage capacity at the end of each calendar Year (in billion cubic feet): 1984 - 8,043; 1985 - 8,087; 1986 - 8,145; 1987 and 1988 - 8,124; and 1989 - 8,124. Current total capacity is 8,125.
[c] Positive numbers indicate the volume of injections in excess of withdrawals. Negative numbers indicate the volume of withdrawals in excess of injections.
-- = Not Applicable.
Notes and Sources: See the last page of this section.

Figure 6. Underground Natural Gas Storage in the United States



Source: Form EIA-191, Form FERC-8, and Form EIA-176.

Table 18. Underground Natural Gas Storage (Interstate Operators of Storage Fields)
(Volumes in Billion Cubic Feet)

Year and Month	Natural Gas in Underground Storage at End of Period			Change in Working Gas from Same Period Previous Year		Storage Activity		
	Base Gas	Working Gas	Total[b]	Volume	Percent	Injections	Withdrawals	Net[c]
1984 Total[a]	2,511	2,094	4,605	257	14.0	1,696	1,522	174
1985 Total[a]	2,517	1,905	4,422	-189	-9.0	1,590	1,758	-167
1986 Total[a]	2,483	2,010	4,492	104	5.5	1,448	1,353	95
1987 Total[a]	2,461	2,024	4,485	14	.7	1,364	1,347	17
1988								
January	2,461	1,620	4,081	-66	-3.9	27	430	-403
February	2,461	1,317	3,778	-158	-10.7	36	338	-303
March	2,460	1,226	3,686	-193	-13.6	78	173	-95
April	2,460	1,296	3,755	-167	-11.4	124	55	69
May	2,460	1,490	3,950	-171	-10.3	214	22	192
June	2,462	1,688	4,150	-138	-7.6	206	13	193
July	2,462	1,892	4,353	-69	-3.5	216	13	203
August	2,462	2,081	4,543	-26	-1.2	203	20	183
September	2,462	2,282	4,744	29	1.3	218	21	197
October	2,462	2,349	4,810	82	3.6	132	67	65
November	2,469	2,316	4,785	89	4.0	87	111	-24
December	2,469	2,092	4,561	68	3.3	47	269	-222
Total	—	—	—	—	—	1,587	1,532	55
1989								
January	2,469	1,881	4,350	261	16.1	37	251	-214
February	2,469	1,515	3,983	197	15.0	16	383	-367
March	2,469	1,343	3,812	117	9.5	63	234	-171
April	2,469	1,357	3,825	61	4.7	109	95	13
May	2,469	1,519	3,988	29	1.9	196	30	166
June	2,469	1,748	4,217	59	3.5	239	11	229
July	2,469	1,960	4,429	68	3.6	245	33	212
August	2,469	2,170	4,639	89	4.3	226	17	209
September	2,469	2,344	4,813	62	2.7	195	21	174
October	2,469	2,411	4,880	62	2.6	131	68	63
November	2,478	2,305	4,783	-11	-.5	62	160	-98
December	2,478	1,765	4,243	-327	-15.6	25	562	-537
Total	—	—	—	—	—	1,544	1,865	-321
1990								
January	2,479	1,597	4,076	-284	-15.1	71	235	-164
February	2,479	1,446	3,925	-69	-4.6	65	216	-151
March	2,479	1,369	3,848	26	1.9	96	174	-78

[a] Total as of December 31.
[b] Total underground storage capacity at the end of each calendar year (in billion cubic feet): 1984 - 5,557; 1985 - 5,602; 1986 - 5,642; 1987 and 1988 - 5,622; and 1989 - 5,622. Current total capacity is 5,622.
[c] Positive numbers indicate the volume of injections in excess of withdrawals. Negative numbers indicate the volume of withdrawals in excess of injections.
— = Not Applicable.
Notes and Sources: See the last page of this section.

Table 19. Underground Natural Gas Storage (Intrastate Operators and Independent Producers)
(Volumes in Billion Cubic Feet)

Year and Month	Natural Gas in Underground Storage at End of Period			Change in Working Gas from Same Period Previous Year		Storage Activity		
	Base Gas	Working Gas	Total[b]	Volume	Percent	Injections	Withdrawals	Net[c]
1984 Total[a]	1,319	782	2,101	23	3.1	556	543	14
1985 Total[a]	1,325	701	2,026	-81	-10.3	538	602	-64
1986 Total[a]	1,336	739	2,075	38	5.4	504	459	45
1987 Total[a]	1,331	732	2,063	-7	.1	522	533	-11
1988								
January	1,331	608	1,939	14	2.4	20	148	-128
February	1,331	509	1,840	-3	-.6	14	118	-104
March	1,331	456	1,787	-4	-.8	20	82	-62
April	1,330	474	1,804	-2	-.3	39	37	2
May	1,331	537	1,868	-8	-1.4	68	24	44
June	1,331	604	1,935	-6	-1.0	68	23	46
July	1,331	675	2,006	*	*	78	29	49
August	1,329	754	2,083	25	3.5	80	32	47
September	1,329	838	2,167	42	5.3	90	25	66
October	1,330	894	2,225	55	6.5	66	26	40
November	1,334	854	2,189	23	2.7	30	46	-16
December	1,331	758	2,089	26	3.6	14	122	-107
Total	—	—	—	—	—	587	711	-124
1989								
January	1,329	628	1,957	20	3.3	12	152	-140
February	1,332	480	1,812	-30	-5.8	12	163	-151
March	1,332	433	1,765	-23	-5.1	33	80	-47
April	1,332	466	1,799	-7	-1.5	62	28	33
May	1,332	543	1,875	6	1.0	82	32	50
June	1,332	627	1,959	23	3.7	92	8	84
July	1,333	684	2,017	9	1.3	76	-9	84
August	1,333	768	2,101	14	1.9	95	10	84
September	1,333	840	2,173	2	.2	88	13	75
October	1,331	882	2,214	-12	-1.3	60	17	43
November	1,335	892	2,226	38	4.4	29	39	-9
December	1,335	734	2,068	-24	-3.2	25	168	-142
Total	—	—	—	—	—	666	701	-36
1990								
January	1,338	655	1,993	27	4.3	21	93	-72
February	1,335	555	1,889	75	15.6	20	124	-104
March	1,335	502	1,836	69	15.9	23	76	-53

[a] Total as of December 31.
[b] Total underground storage capacity at the end of each calendar year (in billion cubic feet): 1984 - 2,467; 1985 - 2,485; 1986 - 2,503; 1987 and 1988 - 2,502; and 1989 - 2,502. Current total capacity is 2,503.
[c] Positive numbers indicate the volume of injections in excess of withdrawals. Negative numbers indicate the volume of withdrawals in excess of injections.
— = Not Applicable.
* = Volume is less than 500 million cubic feet.
Notes and Sources: See the last page of this section.

Table 20. Activities of Multi-State Underground Natural Gas Storage Operators, March 1990
(Volume in Million Cubic Feet)

Pipeline Company	Storage Capacity		Natural Gas in Underground Storage at End of Period			Change in Working Gas from Same Period Previous Year		Net Injections or Withdrawals[a]	
	By Individual State	Total	Base Gas	Working Gas	Total	Volume	Percent	Current Period	Same Period Previous Year
Arkla, Inc	KS 2,393 LA 15,000 OK 50,152	67,545	30,674	16,207	46,881	7,765	92.0	2,086	-2,385
Colorado Interstate	CO 56,289 KS 24,800	81,089	46,302	11,163	57,465	3,689	49.4	-3,669	-3,244
Columbia Gas Transm	NY 18,285 OH 434,695 PA 36,494 WV 283,685	773,159	429,041	128,345	557,386	-22,359	-14.8	2,730	2,007
Consolidated Gas	NY 35,904 PA 497,077 WV 180,356	713,337	364,384	110,314	474,698	30,039	37.4	-19,321	-40,183
Equitrans Inc	PA 23,286 WV 38,240	61,526	29,802	4,404	34,206	-3,506	-44.3	-3,270	-3,953
K N Energy Inc	CO 5,692 KS 5,845 NE 88,438	99,975	33,159	58,385	91,545	-1,685	-2.8	-415	-533
Mississippi River	IL 4,100 LA 82,300	86,400	53,986	8,779	62,765	3,078	54.0	-5,402	-4,930
National Fuel	NY 56,400 PA 191,783	248,183	96,683	28,538	125,221	4,337	17.9	-3,980	-13,534
Natural Gas Pipeline	IL 220,400 IA 191,000 OK 86,000 TX 144,000	641,400	178,998	288,136	467,135	-9,852	-3.3	-10,682	-15,470
Northern Natural	IA 120,000 KS 107,000	227,000	130,500	19,852	150,352	7,164	56.5	-7,895	-6,443
Panhandle Eastern	IL 70,000 MI 32,000 OK 21,600	123,600	77,026	19,298	96,325	-2,318	-10.7	-1,362	-3,853
Phillips Petroleum	OK 2,150 TX 2,065 UT 3,000	7,215	1,623	3,231	4,854	-77	-2.3	-476	-1,008
Questar Pipeline Co	UT 111,980 WY 10,000	121,980	52,730	8,174	60,905	190	2.4	-1,855	-915
Texas Gas Transm	IN 11,272 KY 161,279	172,550	90,169	56,560	146,729	-1,706	-2.9	1,702	-4,997
Transcontinental	LA 143,500 MS 8,361	151,861	57,567	26,853	84,420	11,892	79.5	-9,887	-8,495
United Gas Pipeline	LA 141,000 MS 5,550	146,550	75,024	29,374	104,398	-3,601	-10.9	2,366	-14,730
Williams Natural	KS 112,983 OK 55,298	168,281	111,978	15,822	127,800	2,687	20.5	1,434	5,035
Williston Basin	MT 287,200 WY 66,610	353,810	75,202	203,333	278,535	-13,525	-6.2	-1,356	-3,093
Total	–	4,245,461	1,934,847	1,036,769	2,971,616	12,215	1.2	-59,252	-120,722

[a] Positive numbers indicate the volume of injections in excess of withdrawals. Negative numbers indicate the volume of withdrawals in excess of injections.
— = Not Applicable
Notes and Sources: See the last page of this section.

Table 21. Activities of Single-State Underground Natural Gas Storage Operators, by State, March 1990
(Volumes in Million Cubic Feet)

State	Total Storage Capacity	Natural Gas in Underground Storage at End of Period			Change in Working Gas from Same Period Previous Year		Net Injections or Withdrawals[a]	
		Base Gas	Working Gas	Total	Volume	Percent	Current Period	Same Period Previous Year
Arkansas	31,447	19,202	8,235	27,437	-486	-5.6	-130	-158
California	466,819	243,944	108,752	352,695	8,849	8.9	4,881	14,152
Colorado	20,682	6,248	8,156	14,404	446	5.8	-1,546	-998
Illinois	657,780	418,060	99,747	517,807	13,193	15.2	-24,574	-19,725
Indiana	100,774	68,927	14,111	82,852	303	2.2	-1,850	-4,002
Kansas	81,905	37,390	18,478	55,868	-8,480	-31.5	-1,364	-1,872
Kentucky	45,325	21,351	7,448	28,799	336	4.7	-2,994	-2,606
Louisiana	177,219	79,751	41,114	120,864	4,933	13.6	1,694	-6,530
Maryland	61,978	46,677	3,585	50,263	724	25.3	1,020	211
Michigan	950,362	379,965	196,459	576,423	16,386	9.1	-24,085	-52,203
Minnesota	7,000	4,655	1,225	5,880	28	2.3	64	6
Mississippi	94,297	41,138	29,610	70,749	2,221	8.1	1,179	-3,527
Missouri	29,791	21,600	6,030	27,630	-336	-5.3	243	-363
Montana	86,760	45,800	23,470	69,270	1,643	7.5	-283	242
New Mexico	94,600	20,204	10,924	31,127	-5,300	-32.7	-316	-866
New York	45,670	19,995	8,345	28,340	300	3.7	-1,759	-2,072
Ohio	177,852	115,818	2,657	118,476	381	16.7	-7,751	-7,626
Oklahoma	149,688	89,163	26,150	115,312	7,289	38.6	-2,854	-4,667
Oregon	9,791	3,291	1,717	5,008	6,384	-136.8	-689	-4,667
Pennsylvania	56,754	25,638	1,180	26,818	-2,297	-66.1	-3,999	-2,530
Texas	443,716	125,001	203,686	328,687	43,111	26.8	-4,390	-7,023
Washington	36,400	21,300	3,229	24,529	283	9.6	-1,976	-1,807
West Virginia	20,851	9,793	5,191	14,984	-375	-6.7	-730	-1,046
Wyoming	27,221	13,990	4,560	18,550	-653	-12.5	-121	-25
Total	3,874,681	1,878,900	834,058	2,712,772	84,216	11.2	-72,331	-105,036

[a] Positive numbers indicate the volume of injections in excess of withdrawals. Negative numbers indicate the volume of withdrawals in excess of injections.

Notes and Sources: See the last page of this section.

Table 22. Natural Gas Deliveries to Residential Consumers by State
(Million Cubic Feet)

State	YTD 1990	YTD 1989	YTD 1988	February 1990	January 1990	Total 1989
Alabama	17,904	16,376	17,608	6,687	11,217	50,422
Alaska	3,835	3,941	3,302	2,090	1,745	13,589
Arizona	10,856	11,063	10,848	5,235	5,621	27,199
Arkansas	14,339	13,772	16,190	5,259	9,080	42,020
California	152,422	163,594	155,374	73,809	78,613	514,221
Colorado	29,192	30,191	32,058	13,529	15,663	91,405
Connecticut	12,414	12,320	12,902	5,696	6,718	40,744
Delaware	2,682	2,418	2,597	1,069	1,613	7,621
District of Columbia	5,609	5,269	6,054	2,257	3,352	16,827
Florida	4,283	3,165	4,811	1,465	2,818	13,124
Georgia	27,803	31,627	35,924	11,698	16,105	104,063
Hawaii	102	103	106	53	49	565
Idaho	2,862	3,295	2,747	1,418	1,444	8,794
Illinois	128,620	149,768	167,754	61,088	67,532	492,460
Indiana	46,462	47,948	55,314	20,470	25,992	156,647
Iowa	24,984	25,412	28,574	10,750	14,234	77,334
Kansas	26,070	26,744	29,439	NA	15,085	76,886
Kentucky	18,207	20,196	23,466	8,423	9,784	64,777
Louisiana	19,000	19,616	22,500	6,455	12,545	67,380
Maine	195	176	162	86	109	638
Maryland	23,069	22,755	25,546	9,121	13,948	73,916
Massachusetts	35,963	34,112	34,455	15,842	20,121	109,747
Michigan	110,199	108,102	117,345	48,380	61,819	354,997
Minnesota	34,945	37,966	40,270	16,046	18,899	116,834
Mississippi	9,303	11,023	10,189	3,284	6,019	36,143
Missouri	41,663	43,778	49,807	16,794	24,869	129,058
Montana	5,083	5,616	5,202	2,439	2,644	18,311
Nebraska	14,104	14,902	16,337	6,487	7,617	44,759
Nevada	5,999	6,122	5,366	3,011	2,988	16,829
New Hampshire	2,008	1,948	1,927	890	1,118	6,290
New Jersey	57,553	58,225	62,604	24,764	32,789	189,214
New Mexico	10,345	10,389	10,432	4,861	5,484	26,772
New York	108,322	107,901	113,468	NA	56,488	361,669
North Carolina	13,485	12,611	14,398	4,924	8,561	38,686
North Dakota	3,101	3,250	3,247	1,440	1,661	9,825
Ohio	96,296	107,120	119,375	46,780	49,516	356,504
Oklahoma	24,558	24,688	28,043	10,319	14,239	71,712
Oregon	7,610	7,658	7,175	3,795	3,815	22,495
Pennsylvania	81,800	82,583	90,196	34,659	47,141	267,994
Rhode Island	5,791	5,545	5,611	2,533	3,258	18,268
South Carolina	7,402	6,728	8,528	2,565	4,837	20,263
South Dakota	3,298	3,628	3,889	1,529	1,769	11,354
Tennessee	17,901	16,496	18,562	6,449	11,452	49,265
Texas	65,290	96,805	81,550	25,176	40,114	302,216
Utah	14,118	16,612	14,628	6,949	7,169	45,185
Vermont	729	667	612	327	402	2,126
Virginia	18,323	20,376	20,751	7,378	10,945	64,581
Washington	12,323	12,733	11,336	6,378	5,945	38,390
West Virginia	11,593	11,327	13,153	4,683	6,910	36,704
Wisconsin	37,139	38,269	42,191	17,664	19,475	124,697
Wyoming	4,513	3,926	3,945	2,152	2,361	11,898
Total	1,431,668	1,520,852	1,607,866	637,974	793,694	4,843,416

See footnote at end of table.

Table 22. Natural Gas Deliveries to Residential Consumers by State (Continued)
(Million Cubic Feet)

State	December 1989	November 1989	October 1989	September 1989	August 1989	July 1989
Alabama	7,321	3,687	1,883	1,420	1,398	1,474
Alaska	1,656	1,474	895	536	370	432
Arizona	3,962	1,775	963	836	780	883
Arkansas	5,946	2,743	1,468	1,230	1,128	1,246
California	63,126	40,085	28,093	24,193	22,985	22,738
Colorado	11,047	6,963	3,743	2,596	2,275	2,773
Connecticut	7,001	3,225	1,989	1,139	998	1,116
Delaware	1,088	486	276	207	190	192
District of Columbia	2,545	1,061	632	477	467	490
Florida	1,830	977	639	643	619	676
Georgia	22,198	11,154	5,189	3,479	2,803	2,999
Hawaii	46	46	43	45	42	46
Idaho	1,243	769	330	221	146	160
Illinois	91,910	50,152	25,331	13,273	9,699	10,495
Indiana	29,930	15,437	8,335	4,024	2,917	2,942
Iowa	12,388	5,906	3,200	1,783	1,524	1,647
Kansas	11,827	5,461	2,933	1,978	1,706	1,865
Kentucky	12,510	5,754	2,999	1,430	1,325	1,334
Louisiana	11,382	4,890	2,943	2,377	2,359	2,549
Maine	95	46	35	21	19	12
Maryland	11,766	5,010	3,054	2,137	2,036	2,206
Massachusetts	14,302	7,496	4,840	2,996	2,739	3,006
Michigan	55,089	27,788	17,106	8,566	7,329	8,003
Minnesota	20,107	11,060	5,426	2,681	2,268	2,387
Mississippi	5,825	2,655	1,432	1,228	1,138	1,186
Missouri	21,574	9,435	4,949	3,109	2,730	3,006
Montana	2,533	1,739	1,091	574	438	429
Nebraska	7,290	3,784	1,970	1,211	1,006	1,077
Nevada	2,368	1,405	706	557	480	533
New Hampshire	926	448	274	169	127	155
New Jersey	32,267	15,206	8,644	5,112	4,623	5,130
New Mexico	3,772	1,988	905	770	739	835
New York	56,813	28,338	15,926	9,434	9,112	10,014
North Carolina	6,871	2,825	1,339	746	696	744
North Dakota	1,411	816	398	240	166	213
Ohio	65,014	34,295	19,402	9,411	7,112	7,352
Oklahoma	11,023	4,792	2,568	1,884	1,652	1,857
Oregon	2,886	1,826	804	581	549	696
Pennsylvania	43,659	20,846	12,761	6,575	5,929	6,353
Rhode Island	2,730	1,325	855	497	463	500
South Carolina	3,871	1,511	614	342	323	391
South Dakota	1,765	1,076	535	298	221	245
Tennessee	8,575	3,560	1,618	1,045	962	1,043
Texas	56,675	22,132	12,915	10,440	9,514	10,239
Utah	5,925	3,641	1,719	1,323	1,235	1,375
Vermont	353	165	97	43	37	40
Virginia	11,564	4,761	2,921	1,468	1,420	1,573
Washington	5,092	3,459	1,625	971	802	1,004
West Virginia	6,309	3,203	1,718	814	687	733
Wisconsin	20,285	10,389	5,942	3,115	2,180	2,687
Wyoming	1,426	983	523	353	262	347
Total	789,119	400,047	226,595	140,599	122,723	131,431

See footnote at end of table.

Table 22. Natural Gas Deliveries to Residential Consumers by State (Continued)
(Million Cubic Feet)

State	June 1989	May 1989	April 1989	March 1989	February 1989	January 1989
Alabama	1,728	2,888	4,775	7,475	8,887	7,489
Alaska	638	858	1,223	1,566	2,148	1,793
Arizona	1,099	1,210	1,677	2,949	4,934	6,129
Arkansas	1,456	2,014	4,023	6,994	6,931	6,841
California	26,591	31,172	37,846	53,799	75,727	87,867
Colorado	3,940	5,684	8,565	13,628	15,251	14,940
Connecticut	1,298	2,234	3,699	5,725	5,899	6,421
Delaware	273	468	795	1,227	1,157	1,261
District of Columbia	626	989	1,605	2,666	2,467	2,802
Florida	710	819	1,206	1,840	1,450	1,715
Georgia	3,064	4,647	7,239	9,644	16,453	15,174
Hawaii	49	47	50	50	52	51
Idaho	307	369	748	1,207	1,674	1,621
Illinois	12,275	23,940	40,975	64,621	76,015	73,753
Indiana	3,826	7,648	12,765	20,875	23,958	23,990
Iowa	2,053	3,956	7,264	12,238	12,609	12,803
Kansas	2,228	3,474	6,589	12,080	13,916	12,828
Kentucky	1,880	3,239	5,482	8,628	10,330	9,866
Louisiana	2,704	3,282	5,507	9,770	9,962	9,654
Maine	27	49	66	92	84	92
Maryland	2,648	4,284	6,947	11,073	10,703	12,052
Massachusetts	4,054	7,553	11,859	16,941	16,518	17,594
Michigan	11,395	22,970	36,654	51,996	51,464	56,638
Minnesota	3,119	5,519	9,800	16,501	19,052	18,914
Mississippi	1,277	1,762	3,015	5,601	5,535	5,488
Missouri	3,613	5,789	11,185	19,796	22,285	21,493
Montana	684	970	1,676	2,560	2,795	2,821
Nebraska	1,136	1,966	3,683	6,735	7,903	6,999
Nevada	751	832	1,110	1,964	2,982	3,140
New Hampshire	210	422	686	926	904	1,044
New Jersey	5,903	10,206	17,108	26,855	28,153	30,072
New Mexico	916	1,118	1,974	3,367	4,728	5,661
New York	13,252	23,669	35,663	51,547	52,064	55,837
North Carolina	1,021	1,900	3,725	6,207	5,660	6,951
North Dakota	309	506	1,040	1,476	1,590	1,660
Ohio	8,991	19,432	32,902	45,472	55,778	51,342
Oklahoma	2,166	3,040	5,778	12,265	13,123	11,565
Oregon	950	1,141	2,054	3,351	4,026	3,632
Pennsylvania	8,190	16,194	26,434	38,476	39,873	42,710
Rhode Island	590	1,223	1,828	2,711	2,681	2,864
South Carolina	463	870	1,856	3,293	2,998	3,730
South Dakota	340	563	1,039	1,644	1,866	1,762
Tennessee	1,349	2,222	4,358	7,971	8,162	8,334
Texas	10,803	12,489	20,754	39,449	52,876	43,929
Utah	1,764	2,216	3,586	5,789	8,293	8,319
Vermont	61	122	227	314	314	353
Virginia	1,825	3,165	5,846	9,662	9,870	10,506
Washington	1,505	1,826	3,632	5,740	6,672	6,061
West Virginia	989	2,237	3,567	5,120	5,556	5,771
Wisconsin	3,709	7,732	11,785	18,605	19,250	19,019
Wyoming	522	750	1,192	1,613	1,984	1,942
Total	161,276	263,677	425,060	662,093	755,560	765,292

See footnote at end of table.

Table 22. Natural Gas Deliveries to Residential Consumers by State (Continued)
(Million Cubic Feet)

State	Total 1988	December 1988	November 1988	October 1988	September 1988	August 1988
Alabama	48,913	5,747	3,187	1,786	1,397	1,389
Alaska	12,529	1,705	1,360	877	550	393
Arizona	28,206	3,975	1,373	974	904	821
Arkansas	42,867	5,464	2,834	1,490	1,223	1,163
California	497,138	64,013	38,555	23,925	20,371	20,548
Colorado	92,888	11,945	5,999	3,643	2,483	2,245
Connecticut	39,485	5,404	3,620	2,223	1,050	953
Delaware	7,586	925	617	294	187	168
District of Columbia	17,471	2,262	1,417	714	460	449
Florida	14,891	1,569	846	668	665	617
Georgia	108,125	16,166	9,329	6,928	2,946	2,690
Hawaii	563	46	45	42	44	42
Idaho	7,683	1,240	577	272	199	144
Illinois	462,339	66,927	44,223	27,975	9,917	9,020
Indiana	153,609	23,035	15,517	9,953	3,434	2,766
Iowa	76,111	10,581	6,819	2,854	1,605	1,472
Kansas	76,420	10,125	5,573	2,708	1,774	1,685
Kentucky	64,027	9,458	6,146	3,378	1,321	1,253
Louisiana	59,707	7,386	3,436	2,437	2,188	2,037
Maine	568	71	48	30	21	17
Maryland	74,918	9,797	6,176	3,269	2,126	2,000
Massachusetts	108,631	13,260	8,943	4,669	2,855	2,654
Michigan	348,512	46,575	32,503	16,226	7,961	6,958
Minnesota	109,669	15,989	9,931	4,415	2,298	2,170
Mississippi	26,889	3,463	1,754	1,074	831	801
Missouri	128,317	17,861	10,737	4,804	2,914	2,838
Montana	16,900	2,648	1,582	930	521	372
Nebraska	43,502	5,717	3,625	1,708	1,030	1,011
Nevada	15,275	2,183	885	579	496	460
New Hampshire	5,927	764	492	281	156	117
New Jersey	181,506	20,892	16,643	9,697	5,108	4,401
New Mexico	27,846	4,063	1,450	930	751	702
New York	357,260	47,246	30,903	18,752	9,854	8,895
North Carolina	38,384	5,553	3,425	1,625	720	666
North Dakota	9,147	1,264	815	388	224	165
Ohio	350,612	51,280	32,608	25,044	7,933	7,020
Oklahoma	71,970	9,433	4,554	2,493	1,735	1,649
Oregon	20,819	2,939	1,412	692	545	517
Pennsylvania	268,038	35,769	23,856	13,708	6,367	5,629
Rhode Island	17,678	2,186	1,515	843	500	463
South Carolina	20,790	3,155	1,703	738	341	319
South Dakota	10,687	1,408	910	441	248	217
Tennessee	47,668	6,758	3,713	1,611	957	939
Texas	209,957	27,633	12,680	8,325	7,067	6,987
Utah	42,241	6,398	2,677	1,653	1,291	1,116
Vermont	1,868	261	162	98	43	31
Virginia	58,539	8,500	5,014	2,834	1,489	1,442
Washington	34,981	5,089	3,102	1,536	954	777
West Virginia	37,690	5,525	3,325	1,700	847	637
Wisconsin	121,335	16,676	10,750	7,200	3,512	2,341
Wyoming	11,650	1,539	856	501	327	259
Total	4,630,330	629,866	390,223	231,935	124,739	114,427

NA = Not Available.
Notes and Sources: See the last page of this section.

Table 23. Natural Gas Deliveries to Commercial Consumers by State
(Million Cubic Feet)

State	YTD 1990	YTD 1989	YTD 1988	February 1990	January 1990	Total 1989
Alabama	7,894	7,897	8,380	3,174	4,720	27,961
Alaska	5,031	5,189	4,588	2,584	2,447	21,731
Arizona	7,097	7,433	7,427	3,475	3,622	28,043
Arkansas	8,356	8,254	9,959	3,154	5,202	27,226
California	59,010	55,854	56,096	28,920	30,090	244,505
Colorado	20,134	21,251	22,731	9,485	10,649	67,114
Connecticut	8,143	7,647	7,549	3,848	4,295	30,665
Delaware	1,325	1,248	1,307	534	791	4,223
District of Columbia	3,953	4,109	4,284	1,911	2,042	15,570
Florida	7,366	6,967	8,322	3,287	4,079	35,289
Georgia	13,993	14,667	17,707	5,905	8,088	53,473
Hawaii	378	365	369	188	190	2,129
Idaho	2,594	3,134	2,781	1,282	1,312	9,003
Illinois	54,200	59,431	80,142	24,549	29,651	202,322
Indiana	24,883	22,451	25,851	11,307	13,576	75,601
Iowa	14,359	14,754	16,463	6,329	8,030	46,632
Kansas	15,212	14,925	17,740	NA	8,529	59,048
Kentucky	9,525	10,671	12,685	4,283	5,242	35,985
Louisiana	7,221	7,496	8,524	2,717	4,504	30,169
Maine	495	455	415	227	268	1,660
Maryland	7,443	7,743	7,894	3,195	4,248	27,104
Massachusetts	14,799	14,347	14,133	6,550	8,249	49,541
Michigan	47,108	44,703	57,427	23,028	24,080	141,879
Minnesota	23,658	26,303	27,889	11,152	12,506	82,741
Mississippi	5,247	7,074	6,288	2,003	3,244	25,495
Missouri	19,559	20,492	23,932	7,947	11,612	63,310
Montana	3,641	3,966	3,697	1,717	1,924	13,200
Nebraska	11,417	8,992	10,046	5,251	6,166	34,880
Nevada	3,781	4,187	4,021	1,898	1,883	14,792
New Hampshire	1,702	1,595	1,560	803	899	5,371
New Jersey	32,264	31,293	31,271	14,463	17,801	113,062
New Mexico	7,104	10,451	10,606	3,382	3,722	31,048
New York	47,080	47,321	55,364	NA	24,809	184,699
North Carolina	8,705	8,546	9,799	3,531	5,174	31,655
North Dakota	3,014	3,298	3,354	1,406	1,608	10,246
Ohio	43,450	48,446	55,441	19,394	24,056	160,191
Oklahoma	12,946	13,661	18,011	5,524	7,422	40,647
Oregon	5,983	6,062	5,772	3,015	2,968	19,894
Pennsylvania	37,123	37,807	42,521	16,399	20,724	130,057
Rhode Island	2,097	2,006	2,164	903	1,194	8,738
South Carolina	4,038	4,040	4,935	1,623	2,415	16,250
South Dakota	2,581	2,793	2,970	1,210	1,371	8,834
Tennessee	14,175	13,686	15,391	5,569	8,606	47,136
Texas	39,138	58,658	52,964	16,618	22,520	246,877
Utah	5,643	8,727	6,648	2,779	2,864	18,599
Vermont	626	615	587	288	338	2,081
Virginia	11,406	13,517	13,104	5,196	6,210	49,006
Washington	10,767	11,065	10,458	5,650	5,117	41,200
West Virginia	6,060	6,128	7,361	2,545	3,515	22,363
Wisconsin	19,904	18,668	23,530	8,825	11,079	60,531
Wyoming	3,201	2,755	2,951	1,520	1,681	8,501
Total	726,832	763,143	845,412	329,496	397,336	2,728,277

See footnote at end of table.

Table 23. Natural Gas Deliveries to Commercial Consumers by State (Continued)
(Million Cubic Feet)

State	December 1989	November 1989	October 1989	September 1989	August 1989	July 1989
Alabama	3,586	2,026	1,417	1,231	1,146	1,807
Alaska	2,428	2,143	1,576	1,202	1,091	1,042
Arizona	3,057	2,035	1,460	1,601	1,584	1,813
Arkansas	3,725	1,826	1,205	1,102	1,009	1,038
California	24,984	19,617	18,236	18,319	17,286	14,294
Colorado	8,058	5,412	3,215	2,291	2,109	2,316
Connecticut	3,886	2,321	1,668	1,519	1,578	1,494
Delaware	636	297	183	146	134	129
District of Columbia	2,029	1,078	767	705	755	684
Florida	3,640	2,884	2,459	2,498	2,382	2,539
Georgia	8,385	4,874	3,507	2,625	2,401	2,451
Hawaii	177	172	179	175	173	182
Idaho	1,173	784	434	320	249	300
Illinois	34,508	20,688	11,390	6,348	5,062	5,650
Indiana	15,374	7,979	3,883	2,237	1,681	1,594
Iowa	7,082	3,725	2,078	1,232	1,226	1,182
Kansas	6,811	4,427	2,812	3,098	4,819	3,388
Kentucky	6,403	3,162	1,895	1,152	994	1,103
Louisiana	3,946	2,279	1,743	1,593	1,487	1,551
Maine	269	128	96	60	50	51
Maryland	3,605	1,768	1,209	992	949	976
Massachusetts	5,499	3,144	2,703	1,831	1,697	1,723
Michigan	20,753	10,850	5,821	3,355	2,888	3,149
Minnesota	13,469	8,512	4,489	2,387	1,812	1,916
Mississippi	3,957	1,960	1,360	1,094	1,017	1,042
Missouri	9,953	4,742	2,770	2,034	1,790	1,841
Montana	1,789	1,241	810	447	384	332
Nebraska	5,289	2,598	2,101	1,629	2,044	2,081
Nevada	1,630	1,206	929	800	793	778
New Hampshire	817	393	248	176	140	154
New Jersey	15,862	8,833	6,036	4,375	4,246	4,628
New Mexico	4,211	2,705	1,323	1,170	1,283	1,034
New York	25,982	15,548	10,917	8,251	7,686	7,903
North Carolina	4,372	2,495	1,744	1,417	1,313	1,319
North Dakota	1,474	912	429	340	237	269
Ohio	28,257	14,635	8,291	4,289	3,744	3,589
Oklahoma	5,870	2,694	1,812	1,419	1,400	1,392
Oregon	2,323	1,584	956	867	791	809
Pennsylvania	20,021	10,845	6,796	4,271	4,001	4,121
Rhode Island	1,001	653	656	559	518	470
South Carolina	1,935	1,302	955	852	796	893
South Dakota	1,374	851	434	255	197	203
Tennessee	7,341	3,686	2,279	1,835	1,656	1,795
Texas	33,603	17,206	14,220	12,380	15,135	17,283
Utah	2,306	1,314	521	390	346	357
Vermont	307	189	130	73	57	57
Virginia	6,969	3,884	2,434	2,253	1,670	2,115
Washington	4,500	3,348	2,114	1,540	1,571	1,694
West Virginia	3,510	1,971	1,341	850	845	778
Wisconsin	9,721	5,491	3,072	1,512	1,316	1,350
Wyoming	1,017	720	394	267	231	284
Total	388,873	225,136	149,498	113,359	109,769	110,943

See footnote at end of table.

Table 23. Natural Gas Deliveries to Commercial Consumers by State (Continued)
(Million Cubic Feet)

State	June 1989	May 1989	April 1989	March 1989	February 1989	January 1989
Alabama	1,241	1,764	2,400	3,447	4,069	3,828
Alaska	1,287	1,569	1,948	2,257	2,690	2,499
Arizona	1,960	1,992	2,280	2,827	3,546	3,887
Arkansas	1,399	1,154	2,338	4,176	4,257	3,997
California	20,124	18,410	17,834	20,908	27,933	27,921
Colorado	3,065	4,137	6,102	9,158	10,786	10,465
Connecticut	1,624	2,104	2,894	3,931	3,744	3,903
Delaware	168	251	402	630	611	637
District of Columbia	795	988	1,618	2,043	1,999	2,110
Florida	2,584	2,685	3,088	3,565	3,454	3,513
Georgia	2,377	3,018	3,958	5,205	7,531	7,136
Hawaii	175	181	175	174	178	187
Idaho	354	408	690	1,157	1,571	1,563
Illinois	6,172	9,557	16,534	26,968	30,536	28,895
Indiana	1,893	3,268	5,709	9,532	11,330	11,121
Iowa	1,366	2,190	4,077	6,899	7,414	7,340
Kansas	2,552	3,686	5,466	7,063	7,739	7,186
Kentucky	1,206	1,798	2,910	4,693	5,468	5,203
Louisiana	1,639	1,983	2,617	3,832	3,729	3,767
Maine	63	106	160	221	226	229
Maryland	1,179	1,737	2,626	4,320	3,727	4,016
Massachusetts	2,145	3,695	5,381	7,219	6,969	7,378
Michigan	4,567	9,114	14,801	21,925	21,569	23,134
Minnesota	2,252	3,760	6,683	11,157	13,403	12,900
Mississippi	1,073	1,374	2,042	3,500	3,632	3,442
Missouri	2,374	2,814	5,271	9,233	10,328	10,164
Montana	481	691	1,212	1,847	1,929	2,037
Nebraska	1,761	1,645	2,499	4,242	4,806	4,186
Nevada	878	991	1,086	1,515	2,084	2,103
New Hampshire	188	339	551	771	753	842
New Jersey	4,808	7,262	10,606	15,133	15,044	16,249
New Mexico	1,344	1,662	2,253	3,614	4,859	5,592
New York	8,303	11,485	17,424	23,878	23,216	24,105
North Carolina	1,431	1,869	2,920	4,230	3,913	4,633
North Dakota	335	508	997	1,448	1,598	1,700
Ohio	4,323	8,547	13,826	22,243	23,998	24,448
Oklahoma	1,428	1,736	2,998	6,328	7,282	6,379
Oregon	973	1,121	1,695	2,714	3,227	2,835
Pennsylvania	4,563	8,288	12,159	17,188	18,467	19,340
Rhode Island	457	564	854	1,001	977	1,029
South Carolina	876	1,076	1,464	2,061	1,902	2,138
South Dakota	276	414	778	1,256	1,454	1,339
Tennessee	1,911	2,518	4,033	6,331	6,785	6,901
Texas	14,587	15,346	21,361	27,098	31,308	27,350
Utah	472	653	1,228	2,282	3,379	5,348
Vermont	66	105	199	283	300	315
Virginia	2,365	2,786	4,572	6,439	6,661	6,856
Washington	1,877	2,713	4,852	5,927	5,643	5,422
West Virginia	866	1,430	1,958	2,686	3,105	3,023
Wisconsin	1,726	3,223	5,698	8,755	9,532	9,136
Wyoming	366	518	847	1,105	1,406	1,349
Total	122,295	161,236	238,074	346,413	382,065	381,078

See footnote at end of table.

Table 23. Natural Gas Deliveries to Commercial Consumers by State (Continued)
(Million Cubic Feet)

State	Total 1988	December 1988	November 1988	October 1988	September 1988	August 1988
Alabama	25,562	2,565	1,781	1,307	1,197	1,058
Alaska	20,842	2,471	1,971	1,575	1,217	1,065
Arizona	28,299	3,281	1,819	1,534	1,577	1,595
Arkansas	27,457	3,218	1,738	1,105	1,074	982
California	248,397	12,389	17,705	19,515	24,025	20,729
Colorado	68,515	8,612	4,837	3,022	2,153	1,974
Connecticut	27,411	3,456	2,668	1,646	1,035	1,141
Delaware	4,041	548	260	190	137	129
District of Columbia	15,012	1,805	1,197	685	634	629
Florida	37,834	3,513	2,876	2,561	2,575	2,493
Georgia	55,963	7,341	4,435	3,691	2,281	2,056
Hawaii	2,049	158	163	168	168	165
Idaho	8,252	1,245	618	348	305	254
Illinois	215,257	29,166	19,930	14,975	5,433	4,319
Indiana	71,708	10,249	7,441	4,821	1,799	1,392
Iowa	44,955	6,073	3,955	1,888	1,257	1,167
Kansas	61,120	6,209	4,011	2,666	3,188	5,017
Kentucky	35,718	5,050	3,260	2,084	943	905
Louisiana	27,475	2,854	1,770	1,474	1,481	1,336
Maine	1,461	191	132	85	58	48
Maryland	25,879	3,178	2,105	1,235	936	1,034
Massachusetts	48,915	5,586	4,459	2,406	1,814	1,737
Michigan	167,900	22,268	15,510	7,605	3,676	3,304
Minnesota	79,989	11,476	7,449	3,844	2,133	1,821
Mississippi	18,108	2,152	1,293	943	819	702
Missouri	63,839	8,185	4,850	2,770	1,922	1,833
Montana	12,041	1,945	1,074	581	488	260
Nebraska	39,368	3,736	2,552	2,047	1,578	4,270
Nevada	14,879	1,670	1,082	874	711	793
New Hampshire	5,034	654	445	256	168	138
New Jersey	101,325	11,010	9,752	5,198	3,312	3,466
New Mexico	31,032	4,103	1,926	1,384	1,146	1,079
New York	188,037	23,953	16,406	10,813	6,831	7,419
North Carolina	32,464	4,074	2,892	1,997	1,396	1,258
North Dakota	9,827	1,299	882	476	287	228
Ohio	158,790	22,916	15,503	9,521	3,773	3,153
Oklahoma	47,870	5,709	2,815	1,786	1,759	1,716
Oregon	18,406	2,363	1,283	839	773	713
Pennsylvania	127,382	16,548	11,394	7,003	3,567	3,571
Rhode Island	8,352	919	759	553	381	414
South Carolina	17,472	1,934	1,390	1,127	1,010	947
South Dakota	8,396	1,099	751	388	224	193
Tennessee	45,852	5,782	3,705	2,313	1,763	1,534
Texas	175,368	19,969	12,870	9,583	8,839	10,470
Utah	17,911	2,407	1,078	617	481	424
Vermont	1,941	264	169	131	76	58
Virginia	42,013	5,369	3,622	2,255	1,708	1,587
Washington	36,674	4,391	2,893	2,102	1,514	1,349
West Virginia	22,416	3,211	1,957	1,282	673	600
Wisconsin	66,939	9,215	5,932	3,399	1,661	1,435
Wyoming	8,700	1,088	627	371	255	213
Total	2,670,465	318,867	221,992	151,039	108,213	106,172

NA Not Available.
Notes and Sources: See the last page of this section.

Table 24. Natural Gas Deliveries to Industrial Consumers by State
(Million Cubic Feet)

State	YTD 1990	YTD 1989	YTD 1988	February 1990	January 1990	Total 1989
Alabama	24,674	25,833	28,478	10,116	14,558	151,694
Alaska	7,193	9,516	10,950	3,564	3,629	58,995
Arizona	2,986	3,589	3,313	1,514	1,472	20,682
Arkansas	26,999	25,209	19,879	12,822	14,177	152,907
California	82,066	79,708	69,585	38,465	43,601	545,286
Colorado	14,184	6,927	7,299	7,186	6,998	39,250
Connecticut	3,565	3,310	3,061	2,043	1,522	19,873
Delaware	3,045	2,410	2,914	1,315	1,730	15,137
District of Columbia	0	0	0	0	0	0
Florida	14,138	14,409	14,373	6,402	7,736	78,633
Georgia	28,545	24,595	28,225	13,694	14,851	153,423
Hawaii	0	0	0	0	0	0
Idaho	4,415	4,243	4,097	2,079	2,336	23,368
Illinois	55,388	58,311	70,195	25,960	29,428	282,149
Indiana	38,192	40,334	49,740	17,524	20,668	219,646
Iowa	16,402	17,766	19,817	8,247	8,155	93,934
Kansas	17,446	18,595	22,164	NA	8,656	99,541
Kentucky	12,694	12,609	12,975	6,040	6,654	64,397
Louisiana	154,616	139,924	136,755	76,329	78,287	844,421
Maine	236	199	223	143	93	1,374
Maryland	12,645	12,723	15,573	6,542	6,103	65,577
Massachusetts	6,097	5,283	4,942	2,855	3,242	38,806
Michigan	31,506	26,558	46,075	18,427	13,079	111,138
Minnesota	17,837	15,467	15,950	9,945	7,892	83,555
Mississippi	16,088	16,897	16,583	7,736	8,352	100,958
Missouri	11,117	10,800	14,267	5,081	6,036	54,016
Montana	1,790	1,716	1,582	764	1,026	9,952
Nebraska	5,113	6,067	7,760	2,888	2,225	31,177
Nevada	1,171	1,226	1,342	559	612	6,956
New Hampshire	440	306	274	203	237	2,293
New Jersey	13,874	13,034	16,293	7,155	6,719	85,933
New Mexico	3,172	3,416	2,107	1,526	1,646	18,690
New York	18,835	17,686	24,138	NA	9,637	91,776
North Carolina	15,190	13,957	12,377	7,764	7,426	89,126
North Dakota	953	1,190	1,062	463	490	5,120
Ohio	51,706	55,984	61,403	24,760	26,946	283,022
Oklahoma	29,925	29,934	27,134	15,621	14,304	157,984
Oregon	10,850	7,062	9,565	5,967	4,883	56,872
Pennsylvania	43,704	43,220	48,882	21,630	22,074	241,524
Rhode Island	683	662	843	306	377	4,581
South Carolina	11,889	8,936	10,069	5,776	6,113	73,913
South Dakota	900	1,034	1,018	480	420	4,973
Tennessee	18,866	19,349	20,573	9,171	9,695	104,660
Texas	287,900	305,993	284,025	136,202	151,698	1,883,415
Utah	6,928	4,492	6,556	3,436	3,492	31,983
Vermont	391	427	361	177	214	1,901
Virginia	9,228	10,338	10,679	4,482	4,746	70,887
Washington	14,314	13,000	15,706	6,743	7,571	71,839
West Virginia	7,481	7,365	7,645	3,778	3,703	44,171
Wisconsin	26,912	30,196	30,805	12,771	14,141	132,947
Wyoming	2,341	2,969	3,224	1,047	1,294	15,352
Total	1,186,628	1,174,776	1,222,855	575,686	610,942	6,839,810

See footnotes at end of table

Table 24. Natural Gas Deliveries to Industrial Consumers by State (Continued)
(Million Cubic Feet)

State	December 1989	November 1989	October 1989	September 1989	August 1989	July 1989
Alabama	13,537	13,985	12,759	11,638	11,678	10,948
Alaska	4,477	3,970	4,419	4,714	4,929	5,272
Arizona	1,576	1,915	1,872	1,563	1,652	1,587
Arkansas	12,916	14,150	14,075	9,549	10,867	12,267
California	51,033	46,968	49,971	47,711	45,749	49,323
Colorado	3,793	3,231	2,967	2,929	3,902	2,513
Connecticut	1,650	2,124	2,095	2,117	1,420	1,260
Delaware	1,216	1,358	1,221	1,154	957	1,044
District of Columbia	0	0	0	0	0	0
Florida	6,882	6,302	6,151	5,745	5,770	5,958
Georgia	10,006	13,832	14,683	12,133	13,295	11,918
Hawaii	0	0	0	0	0	0
Idaho	2,281	2,156	2,013	1,754	1,408	1,464
Illinois	32,444	26,444	22,702	19,215	17,790	16,955
Indiana	19,982	19,269	17,953	15,619	15,676	16,050
Iowa	11,916	7,604	7,197	6,826	6,185	5,936
Kansas	8,780	8,394	7,134	6,207	7,249	8,156
Kentucky	6,670	6,032	5,360	4,327	4,245	3,910
Louisiana	83,134	81,524	66,674	64,785	66,635	67,988
Maine	125	131	114	120	111	102
Maryland	5,736	5,209	4,743	4,630	4,662	4,659
Massachusetts	2,047	3,078	3,620	3,310	3,289	3,027
Michigan	11,597	9,215	7,085	6,497	5,609	6,242
Minnesota	7,776	8,022	7,055	6,090	6,122	6,234
Mississippi	8,957	9,318	9,175	7,902	8,759	7,782
Missouri	5,750	4,622	4,437	3,628	3,552	3,477
Montana	1,074	1,065	1,088	846	689	598
Nebraska	2,141	2,293	1,574	2,680	2,218	2,695
Nevada	542	648	584	537	590	571
New Hampshire	183	161	262	204	156	161
New Jersey	6,816	6,746	7,884	7,667	7,052	6,561
New Mexico	1,942	1,694	1,490	1,390	1,572	1,288
New York	10,384	7,961	6,855	6,633	6,125	5,915
North Carolina	5,523	8,231	8,394	7,239	7,588	6,868
North Dakota	540	527	472	283	218	235
Ohio	29,103	24,963	22,140	18,818	19,142	17,892
Oklahoma	14,523	12,570	10,969	9,854	10,662	10,252
Oregon	6,260	5,737	5,776	5,654	3,843	4,256
Pennsylvania	21,111	20,591	19,077	18,054	18,965	17,438
Rhode Island	303	276	397	409	458	323
South Carolina	4,051	6,945	7,313	6,254	7,243	6,665
South Dakota	496	469	450	312	304	298
Tennessee	9,133	8,977	8,779	8,031	8,183	7,898
Texas	191,582	160,242	109,130	162,438	168,040	165,613
Utah	3,790	3,020	2,749	2,513	2,513	1,953
Vermont	119	203	179	115	101	96
Virginia	3,989	5,646	6,000	5,824	5,903	6,621
Washington	7,302	6,106	6,064	5,674	5,068	5,604
West Virginia	3,898	3,757	3,976	3,806	3,594	3,576
Wisconsin	15,166	12,420	9,919	7,720	7,681	6,999
Wyoming	1,621	1,504	1,414	1,186	986	956
Total	655,877	601,603	518,409	534,306	540,406	535,403

See footnotes at end of table

Table 24. Natural Gas Deliveries to Industrial Consumers by State (Continued)
(Million Cubic Feet)

State	June 1989	May 1989	April 1989	March 1989	February 1989	January 1989
Alabama	12,051	12,539	12,787	13,695	12,588	13,245
Alaska	5,540	5,090	5,487	5,581	4,642	4,874
Arizona	1,751	1,885	1,612	1,681	1,613	1,976
Arkansas	11,171	11,325	13,328	15,683	13,224	11,985
California	43,625	46,127	39,125	44,380	32,628	47,080
Colorado	2,740	3,056	3,382	3,571	3,537	3,390
Connecticut	1,430	1,496	1,828	1,852	1,647	1,663
Delaware	1,332	1,580	1,647	1,217	1,229	1,181
District of Columbia	0	0	0	0	0	0
Florida	6,468	6,986	6,642	7,275	7,008	7,401
Georgia	12,727	13,047	13,147	14,012	11,774	12,821
Hawaii	0	0	0	0	0	0
Idaho	1,804	2,050	2,023	2,170	2,025	2,218
Illinois	16,746	21,113	22,834	28,094	30,161	28,150
Indiana	16,301	18,524	18,840	21,098	20,555	19,779
Iowa	6,733	6,924	7,861	8,885	8,907	8,859
Kansas	7,806	8,345	8,750	9,791	8,784	9,811
Kentucky	4,678	4,958	5,344	6,267	6,404	6,205
Louisiana	67,863	69,083	66,847	71,670	70,110	69,814
Maine	110	130	130	101	104	95
Maryland	5,049	5,281	6,031	6,855	6,453	6,270
Massachusetts	3,271	4,464	3,964	3,338	2,622	2,661
Michigan	6,884	8,595	9,969	13,349	12,856	13,702
Minnesota	5,705	6,052	6,820	8,350	7,516	7,951
Mississippi	8,376	8,174	8,551	7,209	7,681	9,216
Missouri	3,649	4,056	4,637	5,388	5,550	5,250
Montana	662	683	761	771	762	954
Nebraska	2,614	2,766	2,722	3,186	2,996	3,071
Nevada	544	548	582	609	567	659
New Hampshire	203	244	265	148	144	162
New Jersey	7,272	7,331	7,537	8,067	6,110	6,924
New Mexico	1,307	1,746	1,528	1,319	1,493	1,923
New York	6,572	6,516	7,978	9,150	8,703	8,983
North Carolina	7,599	7,870	8,172	7,688	6,602	7,355
North Dakota	298	360	451	546	536	654
Ohio	19,328	22,089	25,363	28,199	27,969	28,015
Oklahoma	14,937	13,653	14,484	16,101	14,678	15,256
Oregon	5,032	3,885	5,315	4,053	3,268	3,794
Pennsylvania	18,393	20,681	21,023	22,971	21,678	21,542
Rhode Island	437	511	458	347	321	341
South Carolina	7,138	6,726	6,512	6,128	4,623	4,313
South Dakota	358	371	425	457	504	530
Tennessee	8,310	7,714	9,127	9,115	9,481	9,868
Texas	158,232	149,639	155,197	157,285	150,999	154,994
Utah	2,604	2,525	2,726	3,097	3,166	1,326
Vermont	122	140	187	211	193	234
Virginia	7,329	6,959	6,500	5,700	5,023	5,315
Washington	5,034	5,518	5,743	6,305	6,284	6,716
West Virginia	3,308	3,728	3,555	3,608	3,527	3,838
Wisconsin	7,845	9,099	11,563	14,338	15,534	14,662
Wyoming	1,049	1,191	1,171	1,304	1,374	1,595
Total	540,339	553,375	570,934	612,216	576,155	598,621

See footnotes at end of table

Table 24. Natural Gas Deliveries to Industrial Consumers by State (Continued)
(Million Cubic Feet)

State	Total 1988	December 1988	November 1988	October 1988	September 1988	August 1988
Alabama	140,536	10,624	11,554	11,243	10,561	10,922
Alaska	67,805	5,864	5,244	6,448	5,960	5,895
Arizona	24,185	2,256	2,494	2,471	2,161	2,017
Arkansas	104,808	9,039	8,731	10,407	9,117	7,357
California	464,008	50,230	39,269	50,106	45,072	34,963
Colorado	38,197	3,171	3,033	3,085	3,244	2,872
Connecticut	19,436	1,671	1,862	1,620	1,418	1,343
Delaware	14,803	1,258	1,151	1,055	1,142	1,018
District of Columbia	0	0	0	0	0	0
Florida	75,518	6,589	5,713	5,919	5,789	5,755
Georgia	150,448	14,104	12,497	12,585	11,382	11,984
Hawaii	0	0	0	0	0	0
Idaho	20,710	2,004	1,789	1,670	1,462	1,301
Illinois	269,226	25,424	25,139	19,699	15,589	15,629
Indiana	218,769	20,900	17,051	17,899	14,513	14,676
Iowa	102,013	8,369	8,142	8,943	8,718	8,269
Kansas	108,108	8,433	6,897	7,150	7,446	10,585
Kentucky	60,136	6,285	5,512	4,992	4,283	4,001
Louisiana	779,171	65,998	62,727	60,563	61,109	67,184
Maine	1,162	79	118	103	96	92
Maryland	64,194	6,666	5,125	4,216	4,012	3,872
Massachusetts	31,577	2,349	3,443	3,100	2,656	2,517
Michigan	191,159	19,355	16,226	13,346	11,241	10,858
Minnesota	77,710	7,870	7,467	5,948	5,022	5,622
Mississippi	92,910	8,066	7,967	8,249	7,559	7,739
Missouri	54,243	4,835	4,235	3,520	3,091	3,019
Montana	8,360	903	705	729	610	652
Nebraska	32,299	2,878	2,556	2,174	2,544	2,064
Nevada	7,218	518	601	608	545	550
New Hampshire	1,971	145	136	233	185	191
New Jersey	77,518	6,273	6,198	5,275	4,900	4,773
New Mexico	14,709	1,292	1,351	1,075	1,238	1,354
New York	90,883	9,113	7,309	5,978	5,208	4,699
North Carolina	74,874	6,761	7,294	6,807	5,560	5,637
North Dakota	3,901	414	369	299	222	187
Ohio	280,059	28,309	25,979	23,622	18,094	18,093
Oklahoma	163,069	18,576	17,133	14,330	14,627	12,146
Oregon	39,771	3,204	3,028	2,938	2,806	2,783
Pennsylvania	228,619	21,825	20,573	17,872	16,279	15,911
Rhode Island	4,453	334	312	345	331	331
South Carolina	69,177	5,170	5,402	6,082	4,959	5,939
South Dakota	4,668	425	425	407	318	279
Tennessee	103,349	8,874	8,726	8,275	7,620	7,653
Texas	1,675,324	153,249	143,407	137,692	138,684	149,604
Utah	30,354	2,879	2,584	2,253	2,202	2,108
Vermont	1,741	183	140	141	123	104
Virginia	53,107	4,203	4,558	4,451	4,524	4,206
Washington	69,418	5,346	4,965	5,213	5,235	5,238
West Virginia	40,415	3,725	3,341	3,621	3,349	3,107
Wisconsin	121,819	14,015	11,438	8,530	6,943	6,502
Wyoming	15,472	1,459	1,391	1,147	1,128	931
Total	6,383,382	591,511	543,309	524,431	490,875	494,531

NA Not Available.
Notes and Sources: See the last page of this section.

Table 25. Natural Gas Deliveries to Electrical Utility[a] Consumers by State
(Million Cubic Feet)

State	YTD 1990	YTD 1989	YTD 1988	February 1990	January 1990	Total 1989
Alabama	239	261	89	130	109	1,707
Alaska	5,824	5,825	4,193	2,920	2,904	32,746
Arizona	3,896	2,802	2,787	1,974	1,922	50,807
Arkansas	1,613	1,764	624	973	640	29,655
California	53,998	67,538	70,428	24,795	29,203	520,506
Colorado	612	3,067	2,798	258	354	8,375
Connecticut	2	1	1	1	1	3,291
Delaware	1,170	506	76	819	351	8,412
District of Columbia	0	0	0	0	0	0
Florida	24,256	22,523	19,489	12,531	11,725	186,894
Georgia	23	47	58	12	11	685
Hawaii	0	0	0	0	0	0
Idaho	0	0	0	0	0	0
Illinois	824	1,007	530	407	417	6,942
Indiana	865	846	330	433	432	4,075
Iowa	192	314	204	101	91	2,402
Kansas	1,714	1,557	1,963	NA	895	18,752
Kentucky	46	54	49	32	14	328
Louisiana	22,969	22,403	36,770	11,415	11,554	227,082
Maine	0	0	0	0	0	0
Maryland	364	200	286	163	201	19,184
Massachusetts	575	152	336	557	18	48,448
Michigan	3,878	3,789	1,823	1,650	2,228	18,782
Minnesota	449	528	445	206	243	4,322
Mississippi	4,162	2,052	2,540	2,016	2,146	45,129
Missouri	93	112	151	43	50	1,242
Montana	45	62	36	19	26	336
Nebraska	105	303	151	46	59	2,593
Nevada	2,014	1,495	915	828	1,186	23,210
New Hampshire	0	3	0	0	0	23
New Jersey	901	2,427	5,936	686	215	54,778
New Mexico	2,540	3,370	2,330	997	1,543	27,365
New York	12,225	6,619	11,842	NA	5,252	182,000
North Carolina	146	88	39	76	70	1,673
North Dakota	0	0	0	0	0	1
Ohio	70	52	67	30	40	978
Oklahoma	22,284	25,351	26,003	10,589	11,695	178,021
Oregon	1,731	0	0	1,496	235	12,942
Pennsylvania	329	678	381	156	173	4,022
Rhode Island	25	0	19	0	25	2,147
South Carolina	19	31	37	11	8	2,705
South Dakota	1	2	2	0	1	132
Tennessee	0	0	0	0	0	18
Texas	104,411	136,227	142,368	46,978	57,433	1,019,993
Utah	1	84	78	0	1	622
Vermont	23	0	0	2	21	37
Virginia	1	47	48	0	1	3,796
Washington	12	1,643	17	9	3	8,320
West Virginia	49	23	23	18	31	124
Wisconsin	199	370	246	101	98	2,076
Wyoming	10	15	23	5	5	85
Total	274,907	316,235	336,528	131,273	143,634	2,767,766

See footnotes at end of table.

Table 25. Natural Gas Deliveries to Electrical Utility[a] Consumers by State (Continued)
(Million Cubic Feet)

State	December 1989	November 1989	October 1989	September 1989	August 1989	July 1989
Alabama	152	83	113	119	130	202
Alaska	2,711	2,981	2,849	2,835	2,777	2,616
Arizona	3,252	4,774	3,436	5,313	5,758	7,551
Arkansas	1,861	2,719	2,358	1,768	4,877	3,467
California	26,365	44,914	57,546	65,463	52,063	61,693
Colorado	659	473	659	526	432	462
Connecticut	1	19	858	700	141	5
Delaware	359	369	940	1,034	1,355	1,185
District of Columbia	0	0	0	0	0	0
Florida	9,698	13,249	16,371	19,164	19,183	19,071
Georgia	37	18	52	24	33	156
Hawaii	0	0	0	0	0	0
Idaho	0	0	0	0	0	0
Illinois	648	450	308	452	644	788
Indiana	550	431	270	228	129	260
Iowa	117	116	363	239	201	244
Kansas	923	713	641	1,302	4,252	4,247
Kentucky	21	3	16	11	18	86
Louisiana	13,132	14,228	21,027	22,293	26,898	26,452
Maine	0	0	0	0	0	0
Maryland	250	377	3,079	1,480	2,406	1,876
Massachusetts	6	1,522	8,538	6,832	5,808	7,075
Michigan	1,187	1,063	881	1,503	1,316	1,921
Minnesota	221	396	366	357	640	694
Mississippi	2,485	2,099	4,270	4,529	6,883	6,241
Missouri	104	56	73	78	176	229
Montana	31	28	35	14	29	25
Nebraska	71	357	295	167	189	392
Nevada	1,291	1,610	2,048	2,545	3,484	3,328
New Hampshire	0	0	1	5	6	4
New Jersey	724	1,521	2,901	4,558	7,203	9,002
New Mexico	1,814	2,223	2,702	2,775	2,592	2,905
New York	3,242	10,283	18,102	19,425	21,814	22,458
North Carolina	105	118	88	246	237	286
North Dakota	0	0	0	0	0	0
Ohio	163	41	63	64	189	154
Oklahoma	14,601	12,468	13,771	15,095	18,485	17,523
Oregon	2,185	1,747	1,877	1,546	274	946
Pennsylvania	456	256	164	240	288	399
Rhode Island	0	68	407	242	436	398
South Carolina	107	179	198	377	371	550
South Dakota	3	14	1	1	6	39
Tennessee	0	11	0	2	5	0
Texas	79,807	64,389	80,046	89,939	113,340	109,233
Utah	93	63	2	0	0	1
Vermont	1	36	0	0	0	0
Virginia	19	35	32	51	252	779
Washington	241	39	6	221	289	1,669
West Virginia	20	6	16	7	5	9
Wisconsin	246	127	173	105	166	324
Wyoming	9	6	17	5	6	6
Total	169,967	186,677	247,958	273,876	305,786	316,954

See footnotes at end of table.

Table 25. Natural Gas Deliveries to Electrical Utility[a] Consumers by State (Continued)
(Million Cubic Feet)

State	June 1989	May 1989	April 1989	March 1989	February 1989	January 1989
Alabama	249	205	93	100	157	104
Alaska	2,366	2,488	2,527	2,773	2,746	3,079
Arizona	4,713	4,387	6,188	2,632	1,129	1,673
Arkansas	2,153	1,334	3,483	3,871	1,450	314
California	42,285	28,043	36,693	37,905	36,214	31,324
Colorado	264	474	787	574	1,202	1,865
Connecticut	232	761	463	112	0	1
Delaware	973	145	809	737	389	117
District of Columbia	0	0	0	0	0	0
Florida	18,536	18,055	16,129	14,914	10,794	11,729
Georgia	160	42	70	46	15	32
Hawaii	0	0	0	0	0	0
Idaho	0	0	0	0	0	0
Illinois	1,084	671	404	486	533	474
Indiana	60	464	412	424	401	445
Iowa	183	199	181	246	132	182
Kansas	2,338	989	1,000	791	764	793
Kentucky	50	26	28	15	25	29
Louisiana	24,374	24,177	15,948	16,150	11,604	10,799
Maine	0	0	0	0	0	0
Maryland	2,454	2,518	3,410	1,134	69	131
Massachusetts	6,054	5,133	5,279	2,050	54	98
Michigan	1,727	1,844	2,015	1,535	1,911	1,878
Minnesota	326	195	314	286	263	265
Mississippi	5,083	5,984	3,022	2,482	1,076	976
Missouri	172	110	74	59	68	44
Montana	20	30	24	37	34	28
Nebraska	113	89	428	189	249	54
Nevada	2,012	1,890	2,147	1,359	692	803
New Hampshire	3	1	0	1	2	1
New Jersey	9,075	5,522	5,913	5,930	1,360	1,067
New Mexico	2,276	2,280	2,349	2,078	1,679	1,691
New York	21,761	22,442	20,996	14,860	4,189	2,430
North Carolina	344	82	36	42	35	53
North Dakota	0	0	0	0	0	0
Ohio	159	39	33	22	29	23
Oklahoma	14,333	18,549	15,212	12,633	12,840	12,511
Oregon	2,086	385	1,896	0	0	0
Pennsylvania	367	335	324	516	411	267
Rhode Island	276	235	85	0	0	0
South Carolina	653	87	86	66	27	4
South Dakota	0	11	8	49	1	1
Tennessee	0	0	0	0	0	0
Texas	87,945	97,663	82,643	78,761	76,100	60,127
Utah	2	107	136	134	80	4
Vermont	0	0	0	0	0	0
Virginia	1,189	770	601	20	16	31
Washington	134	0	916	3,162	1,640	3
West Virginia	11	13	5	9	19	4
Wisconsin	158	122	94	191	201	169
Wyoming	7	6	6	3	4	11
Total	258,759	248,901	233,268	209,384	170,603	145,632

See footnotes at end of table.

Table 25. Natural Gas Deliveries to Electrical Utility[a] Consumers by State (Continued)
(Million Cubic Feet)

State	Total 1988	December 1988	November 1988	October 1988	September 1988	August 1988
Alabama	2,574	106	75	86	200	836
Alaska	30,841	2,819	2,809	3,064	2,524	2,424
Arizona	25,328	935	530	1,893	2,064	6,005
Arkansas	22,075	353	492	2,125	2,341	3,478
California	552,938	26,939	25,625	42,692	41,805	57,651
Colorado	8,488	1,952	481	342	289	600
Connecticut	1,260	1	1	1	1	387
Delaware	2,824	77	62	87	129	600
District of Columbia	0	0	0	0	0	0
Florida	154,550	6,778	4,958	7,892	15,869	19,464
Georgia	1,573	32	27	44	109	539
Hawaii	0	0	0	0	0	0
Idaho	0	0	0	0	0	0
Illinois	5,706	484	306	191	273	1,073
Indiana	3,455	580	430	336	144	567
Iowa	5,229	146	119	175	330	1,525
Kansas	18,890	719	869	934	1,232	3,714
Kentucky	452	21	20	21	19	211
Louisiana	250,323	12,401	15,372	15,726	24,217	33,204
Maine	0	0	0	0	0	0
Maryland	5,336	50	187	150	816	1,410
Massachusetts	19,874	284	742	990	1,063	4,916
Michigan	14,991	1,687	517	1,309	969	1,868
Minnesota	5,217	315	405	275	327	910
Mississippi	33,279	1,098	1,352	1,408	3,965	7,051
Missouri	1,623	53	69	45	66	459
Montana	286	30	17	20	36	34
Nebraska	2,046	64	236	142	154	176
Nevada	10,658	967	330	479	1,116	1,774
New Hampshire	55	2	3	10	0	22
New Jersey	51,066	938	966	915	1,437	10,664
New Mexico	21,267	1,674	1,554	1,948	1,171	2,398
New York	148,493	1,177	5,508	8,938	14,196	24,199
North Carolina	1,068	116	23	11	91	336
North Dakota	2	0	1	0	0	0
Ohio	974	47	31	113	161	238
Oklahoma	177,222	13,520	12,115	12,327	14,262	21,633
Oregon	0	0	0	0	0	0
Pennsylvania	2,649	273	189	108	102	535
Rhode Island	185	0	0	0	0	0
South Carolina	2,378	63	8	15	16	306
South Dakota	223	1	1	0	1	54
Tennessee	225	0	0	0	5	103
Texas	1,043,143	60,402	73,791	76,581	100,966	132,037
Utah	196	2	7	5	1	12
Vermont	0	0	0	0	0	0
Virginia	1,096	17	1	19	30	162
Washington	1,753	5	5	4	5	2
West Virginia	73	4	6	1	3	11
Wisconsin	2,739	296	248	228	138	632
Wyoming	183	20	15	19	21	13
Total	2,634,807	137,449	150,506	181,673	232,665	344,232

[a] Includes all steam electric utility generating plants with a combined capacity of 50 megawatts or greater.
NA = Not Available.
Notes and Sources: See the last page of this section.

Table 26. Natural Gas Deliveries to All Consumers by State
(Million Cubic Feet)

State	YTD 1990	YTD 1989	YTD 1988	February 1990	January 1990	Total 1989
Alabama	50,711	50,366	54,555	20,107	30,604	231,784
Alaska	21,882	24,472	23,032	11,157	10,725	127,060
Arizona	24,834	24,888	24,375	12,197	12,637	126,732
Arkansas	51,307	48,999	46,653	22,209	29,098	251,808
California	347,495	366,694	351,483	165,989	181,506	1,824,519
Colorado	64,122	61,436	64,886	30,458	33,664	206,145
Connecticut	24,124	23,278	23,514	11,588	12,536	94,573
Delaware	8,223	6,582	6,894	3,737	4,486	35,392
District of Columbia	9,562	9,378	10,338	4,167	5,395	32,397
Florida	50,042	47,063	46,996	23,684	26,358	313,940
Georgia	70,364	70,937	81,914	31,309	39,055	311,644
Hawaii	480	467	475	241	239	2,694
Idaho	9,871	10,672	9,625	4,779	5,092	41,164
Illinois	239,031	268,516	318,621	112,003	127,028	983,873
Indiana	110,402	111,578	131,235	49,733	60,669	455,969
Iowa	55,938	58,246	65,057	25,427	30,511	220,302
Kansas	60,443	61,820	71,306	NA	33,165	254,227
Kentucky	40,471	43,528	49,174	18,778	21,693	165,487
Louisiana	203,806	189,440	204,549	96,917	106,889	1,169,052
Maine	925	831	800	455	470	3,672
Maryland	43,521	43,421	49,300	19,021	24,500	185,780
Massachusetts	57,435	53,895	53,866	25,804	31,631	246,542
Michigan	192,690	183,151	222,669	91,484	101,206	626,797
Minnesota	76,889	80,265	84,555	37,349	39,540	287,452
Mississippi	34,800	37,045	35,600	15,039	19,761	207,725
Missouri	72,430	75,182	88,156	29,863	42,567	247,626
Montana	10,559	11,361	10,517	4,938	5,621	41,799
Nebraska	30,740	30,262	34,292	14,673	16,067	113,410
Nevada	12,966	13,029	11,644	6,296	6,670	61,787
New Hampshire	4,151	3,851	3,761	1,897	2,254	13,978
New Jersey	104,594	104,981	116,105	47,069	57,525	442,986
New Mexico	23,160	27,627	25,475	10,766	12,394	103,876
New York	186,461	179,528	204,812	NA	96,185	820,144
North Carolina	37,527	35,202	36,613	16,295	21,232	161,141
North Dakota	7,068	7,737	7,663	3,309	3,759	25,191
Ohio	191,524	211,601	236,286	90,965	100,559	800,695
Oklahoma	89,714	93,635	99,191	42,053	47,661	448,364
Oregon	26,173	20,781	22,512	14,272	11,901	112,204
Pennsylvania	162,957	164,287	181,980	72,844	90,113	643,597
Rhode Island	8,597	8,214	8,637	3,743	4,854	33,735
South Carolina	23,347	19,735	23,568	9,974	13,373	113,132
South Dakota	6,783	7,456	7,879	3,221	3,562	25,293
Tennessee	50,942	49,531	54,527	21,189	29,753	201,080
Texas	496,739	597,684	560,908	224,974	271,765	3,452,501
Utah	26,690	29,916	27,909	13,164	13,526	96,389
Vermont	1,769	1,709	1,559	793	976	6,145
Virginia	38,960	44,280	44,581	17,057	21,903	188,269
Washington	37,415	38,441	37,516	18,779	18,636	159,749
West Virginia	25,182	24,843	28,181	11,024	14,158	103,363
Wisconsin	84,154	87,503	96,772	39,361	44,793	320,252
Wyoming	10,064	9,664	10,142	4,724	5,340	35,837
Total	3,620,035	3,775,007	4,012,659	1,674,429	1,945,606	17,179,270

See footnotes at end of tables.

Table 26. Natural Gas Deliveries to All Consumers by State (Continued)
(Million Cubic Feet)

State	December 1989	November 1989	October 1989	September 1989	August 1989	July 1989
Alabama	24,596	19,782	16,171	14,408	14,352	14,431
Alaska	11,271	10,567	9,739	9,286	9,167	9,362
Arizona	11,848	10,499	7,730	9,314	9,775	11,835
Arkansas	24,448	21,438	19,106	13,649	17,880	18,019
California	165,509	151,584	153,846	155,685	138,083	148,047
Colorado	23,557	16,079	10,584	8,342	8,718	8,064
Connecticut	12,537	7,689	6,610	5,475	4,136	3,875
Delaware	3,299	2,510	2,620	2,541	2,635	2,551
District of Columbia	4,575	2,139	1,399	1,182	1,221	1,174
Florida	22,051	23,413	25,621	28,050	27,953	28,244
Georgia	40,625	29,877	23,431	18,261	18,532	17,525
Hawaii	224	217	222	220	215	228
Idaho	4,696	3,709	2,777	2,295	1,803	1,924
Illinois	159,510	97,734	59,730	39,288	33,196	33,888
Indiana	65,836	43,115	30,441	22,107	20,403	20,847
Iowa	31,503	17,351	12,837	10,080	9,136	9,010
Kansas	28,340	18,995	13,520	12,584	18,027	17,656
Kentucky	25,604	14,950	10,269	6,920	6,582	6,432
Louisiana	111,593	102,920	92,387	91,048	97,379	98,540
Maine	490	305	244	202	181	165
Maryland	21,357	12,363	12,086	9,238	10,053	9,716
Massachusetts	21,853	15,239	19,701	14,968	13,533	14,831
Michigan	88,627	48,916	30,893	19,921	17,142	19,316
Minnesota	41,574	27,990	17,336	11,514	10,841	11,231
Mississippi	21,224	16,032	16,237	14,753	17,798	16,252
Missouri	37,380	18,855	12,228	8,850	8,247	8,553
Montana	5,427	4,073	3,024	1,881	1,539	1,384
Nebraska	14,791	9,032	5,941	5,687	5,457	6,245
Nevada	5,831	4,869	4,267	4,438	5,348	5,209
New Hampshire	1,926	1,002	785	554	429	475
New Jersey	55,670	32,307	25,465	21,712	23,125	25,322
New Mexico	11,738	8,610	6,420	6,104	6,186	6,062
New York	96,421	62,130	51,800	43,743	44,737	46,289
North Carolina	16,871	13,668	11,565	9,649	9,834	9,218
North Dakota	3,426	2,254	1,299	863	622	717
Ohio	122,538	73,935	49,896	32,582	30,186	28,988
Oklahoma	46,016	32,524	29,121	28,251	32,199	31,023
Oregon	13,654	10,894	9,413	8,648	5,457	6,707
Pennsylvania	85,246	52,538	38,797	29,139	29,183	28,311
Rhode Island	4,034	2,323	2,315	1,708	1,875	1,691
South Carolina	9,965	9,937	9,080	7,826	8,733	8,499
South Dakota	3,638	2,411	1,420	866	727	785
Tennessee	25,050	16,234	12,675	10,914	10,805	10,735
Texas	361,667	263,969	216,311	275,197	306,029	302,368
Utah	12,114	8,039	4,991	4,227	4,095	3,686
Vermont	781	593	406	230	196	193
Virginia	22,541	14,326	11,388	9,596	9,245	11,087
Washington	17,135	12,952	9,809	8,406	7,730	9,972
West Virginia	13,737	8,936	7,051	5,477	5,131	5,097
Wisconsin	45,419	28,428	19,107	12,451	11,343	11,360
Wyoming	4,074	3,213	2,348	1,811	1,486	1,594
Total	2,003,835	1,413,463	1,142,460	1,062,140	1,078,684	1,094,730

See footnotes at end of tables.

Table 26. Natural Gas Deliveries to All Consumers by State (Continued)
(Million Cubic Feet)

State	June 1989	May 1989	April 1989	March 1989	February 1989	January 1989
Alabama	15,269	17,396	20,055	24,717	25,700	24,666
Alaska	9,831	10,004	11,184	12,177	12,227	12,245
Arizona	9,522	9,475	11,757	10,089	11,222	13,666
Arkansas	16,180	15,827	23,172	30,724	25,862	23,137
California	132,625	123,752	131,498	156,991	172,502	194,192
Colorado	10,009	13,351	18,836	26,931	30,776	30,660
Connecticut	4,583	6,596	8,884	11,620	11,290	11,988
Delaware	2,745	2,444	3,653	3,811	3,386	3,196
District of Columbia	1,421	1,978	3,223	4,709	4,466	4,912
Florida	28,298	28,546	27,065	27,594	22,706	24,357
Georgia	18,328	20,754	24,414	28,906	35,773	35,164
Hawaii	223	228	225	224	230	237
Idaho	2,465	2,827	3,461	4,535	5,270	5,402
Illinois	36,277	55,281	80,748	120,169	137,244	131,272
Indiana	22,081	29,905	37,727	51,928	56,243	55,335
Iowa	10,335	13,269	19,383	28,269	29,062	29,184
Kansas	14,924	16,494	21,806	29,726	31,203	30,617
Kentucky	7,814	10,020	13,763	19,603	22,226	21,302
Louisiana	96,581	98,525	90,919	101,422	95,406	94,034
Maine	199	285	357	414	415	416
Maryland	11,330	13,820	19,014	23,382	20,952	22,469
Massachusetts	15,524	20,845	26,482	29,548	26,163	27,732
Michigan	24,574	42,523	63,440	88,805	87,799	95,352
Minnesota	11,403	15,526	23,617	36,293	40,234	40,031
Mississippi	15,808	17,294	16,630	18,791	17,924	19,121
Missouri	9,808	12,769	21,167	34,476	38,231	36,951
Montana	1,848	2,375	3,673	5,215	5,520	5,841
Nebraska	5,624	6,466	9,332	14,351	15,953	14,309
Nevada	4,186	4,261	4,926	5,447	6,325	6,704
New Hampshire	604	1,006	1,501	1,845	1,803	2,048
New Jersey	27,059	30,320	41,164	55,986	50,668	54,313
New Mexico	5,843	6,806	8,104	10,378	12,760	14,867
New York	49,888	64,112	82,060	99,435	88,172	91,356
North Carolina	10,395	11,722	14,853	18,167	16,210	18,992
North Dakota	942	1,373	2,488	3,470	3,723	4,014
Ohio	32,801	50,107	72,125	95,936	107,774	103,827
Oklahoma	32,864	36,978	38,473	47,327	47,923	45,712
Oregon	9,040	6,532	10,960	10,118	10,521	10,260
Pennsylvania	31,512	45,498	59,940	79,152	80,429	83,858
Rhode Island	1,759	2,533	3,224	4,059	3,980	4,234
South Carolina	9,131	8,760	9,918	11,548	9,550	10,185
South Dakota	975	1,359	2,250	3,406	3,824	3,632
Tennessee	11,569	12,455	17,517	23,416	24,428	25,103
Texas	271,568	275,136	279,954	302,594	311,283	286,401
Utah	4,842	5,501	7,676	11,302	14,919	14,997
Vermont	248	367	613	809	807	902
Virginia	12,709	13,680	17,519	21,822	21,571	22,709
Washington	8,550	10,058	15,143	21,134	20,238	18,203
West Virginia	5,174	7,409	9,086	11,423	12,207	12,636
Wisconsin	13,437	20,176	29,139	41,888	44,517	42,986
Wyoming	1,943	2,465	3,216	4,025	4,767	4,897
Total	1,082,668	1,227,189	1,467,336	1,830,106	1,884,383	1,890,624

See footnotes at end of tables.

Table 26. Natural Gas Deliveries to All Consumers by State (Continued)
(Million Cubic Feet)

State	Total 1988	December 1988	November 1988	October 1988	September 1988	August 1988
Alabama	217,586	19,041	16,598	14,421	13,354	14,205
Alaska	132,017	12,859	11,384	11,964	10,252	9,777
Arizona	106,017	10,446	6,216	6,872	6,707	10,437
Arkansas	197,208	18,074	13,796	15,127	13,755	12,980
California	1,762,480	153,571	121,155	136,238	131,273	133,891
Colorado	208,087	25,680	14,349	10,093	8,169	7,691
Connecticut	87,592	10,532	8,151	5,489	3,503	3,823
Delaware	29,253	2,808	2,090	1,626	1,595	1,915
District of Columbia	32,483	4,067	2,614	1,399	1,094	1,078
Florida	282,792	18,450	14,393	17,040	24,898	28,329
Georgia	316,108	37,642	26,289	23,247	16,718	17,270
Hawaii	2,614	205	208	211	214	207
Idaho	36,646	4,490	2,984	2,291	1,967	1,699
Illinois	952,529	122,001	89,598	62,840	31,211	30,041
Indiana	447,542	54,764	40,439	33,008	19,889	19,402
Iowa	228,308	25,168	19,036	13,860	11,911	12,433
Kansas	264,539	25,486	17,349	13,458	13,640	21,002
Kentucky	160,332	20,814	14,938	10,475	6,566	6,370
Louisiana	1,116,676	88,639	83,306	80,201	88,994	103,761
Maine	3,191	341	298	218	175	157
Maryland	170,326	19,691	13,592	8,870	7,889	8,317
Massachusetts	208,998	21,480	17,586	11,165	8,388	11,824
Michigan	722,562	89,885	64,756	38,486	23,848	22,988
Minnesota	272,585	35,651	25,253	14,482	9,780	10,522
Mississippi	171,186	14,779	12,366	11,675	13,175	16,293
Missouri	248,022	30,934	19,891	11,139	7,993	8,148
Montana	37,587	5,526	3,378	2,261	1,655	1,318
Nebraska	117,234	12,395	8,968	6,070	5,306	7,521
Nevada	48,031	5,337	2,899	2,539	2,868	3,577
New Hampshire	12,987	1,565	1,075	780	509	468
New Jersey	411,415	39,113	33,561	21,084	14,757	23,305
New Mexico	94,853	11,132	6,281	5,337	4,306	5,533
New York	784,673	81,489	60,126	44,481	36,090	45,212
North Carolina	146,790	16,504	13,634	10,440	7,767	7,896
North Dakota	22,876	2,977	2,068	1,163	733	580
Ohio	790,436	102,552	74,121	58,300	29,961	28,504
Oklahoma	460,130	47,238	36,618	30,935	32,383	37,145
Oregon	78,996	8,506	5,724	4,470	4,124	4,012
Pennsylvania	626,688	74,415	56,012	38,691	26,316	25,645
Rhode Island	30,668	3,439	2,586	1,741	1,212	1,208
South Carolina	109,817	10,321	8,503	7,962	6,326	7,510
South Dakota	23,974	2,933	2,088	1,237	791	742
Tennessee	197,095	21,414	16,144	12,199	10,345	10,230
Texas	3,103,792	261,254	242,748	232,180	255,555	299,100
Utah	90,702	11,687	6,346	4,528	3,974	3,660
Vermont	5,551	708	471	371	242	192
Virginia	154,756	18,088	13,196	9,558	7,750	7,396
Washington	142,825	14,831	10,965	8,855	7,709	7,366
West Virginia	100,595	12,465	8,629	6,605	4,871	4,354
Wisconsin	312,832	40,202	28,368	19,357	12,253	10,910
Wyoming	36,005	4,105	2,888	2,038	1,731	1,417
Total	16,318,984	1,677,693	1,306,030	1,089,077	956,494	1,059,362

NA = Not Available.
Notes and Sources: See the last page of this section.

Table 27. Average City Gate Price by State
(Dollars per Thousand Cubic Feet)

State	YTD 1990	YTD 1989	YTD 1988	February 1990	January 1990	Total 1989	December 1989	November 1989
Alabama	3.18	3.17	3.31	3.22	3.15	3.03	3.09	3.14
Alaska	.33	.33	.34	.33	.33	.33	.33	.33
Arizona	2.88	2.70	2.53	2.60	3.13	2.67	2.72	2.74
Arkansas	2.53	2.48	2.41	2.50	2.55	2.47	2.50	2.45
California	2.95	2.91	2.66	2.87	3.02	2.75	2.85	2.83
Colorado	2.91	2.84	2.96	2.99	2.85	2.96	2.79	2.73
Connecticut	3.83	3.31	3.01	3.79	3.86	3.46	3.34	3.53
Délaware	2.98	3.56	2.94	3.16	2.84	2.82	3.29	2.98
District of Columbia	—	—	—	—	—	—	—	—
Florida	3.02	2.69	2.64	2.98	3.05	2.63	2.90	2.64
Georgia	3.77	3.86	3.90	3.84	3.73	3.54	3.57	3.36
Hawaii	7.24	5.67	6.34	7.27	7.18	6.49	6.65	6.55
Idaho	2.05	2.00	2.34	1.98	2.10	2.17	2.06	2.10
Illinois	3.82	3.69	2.92	3.72	3.91	2.99	3.24	2.92
Indiana	3.24	3.32	2.95	2.93	3.57	3.13	3.24	2.67
Iowa	3.18	2.98	3.02	2.77	3.55	2.80	3.00	2.49
Kansas	2.97	2.26	2.22	NA	3.08	2.28	3.12	2.70
Kentucky	3.42	3.15	2.99	3.35	3.46	3.01	3.00	3.10
Louisiana	3.25	3.03	2.95	3.20	3.29	2.99	3.03	3.00
Maine	3.40	3.27	2.89	3.59	3.13	3.23	2.71	3.70
Maryland	2.96	3.24	2.89	3.04	2.90	3.20	3.18	3.00
Massachusetts	3.62	3.42	2.87	3.73	3.53	3.20	3.54	3.61
Michigan	3.39	3.51	3.35	3.43	3.36	3.24	2.98	3.11
Minnesota	3.07	2.82	2.88	2.72	3.40	2.72	2.85	2.39
Mississippi	3.22	3.01	3.26	3.11	3.30	3.08	2.96	2.98
Missouri	3.23	2.90	2.81	3.23	3.23	3.00	3.21	3.05
Montana	3.43	3.59	3.42	3.54	3.33	3.43	3.24	3.24
Nebraska	3.14	2.95	3.00	2.76	3.50	2.91	2.90	2.64
Nevada	3.14	3.22	2.80	3.05	3.23	3.33	3.22	3.29
New Hampshire	4.07	3.51	3.90	4.12	4.02	3.28	3.36	3.60
New Jersey	3.53	3.28	3.01	3.47	3.57	3.17	3.41	3.09
New Mexico	2.63	2.52	2.67	2.54	2.72	2.66	2.72	2.60
New York	3.32	3.17	2.87	NA	3.37	3.07	3.41	3.23
North Carolina	3.03	3.19	2.93	2.94	3.09	3.01	2.98	2.71
North Dakota	3.10	3.34	3.24	3.19	3.01	3.12	3.03	2.83
Ohio	3.13	3.45	3.10	3.16	3.10	3.31	3.32	3.34
Oklahoma	2.17	2.20	2.35	2.14	2.19	2.07	2.29	2.01
Oregon	2.48	2.42	2.82	2.39	2.56	2.67	2.49	3.12
Pennsylvania	3.32	3.10	2.90	3.28	3.36	3.26	3.01	3.14
Rhode Island	3.69	3.47	3.27	3.71	3.68	3.68	3.47	3.51
South Carolina	3.49	4.13	3.79	3.45	3.53	3.46	3.53	3.35
South Dakota	3.24	3.15	3.05	3.02	3.44	3.04	3.00	2.62
Tennessee	3.10	2.81	2.63	2.72	3.36	2.81	3.00	2.81
Texas	3.30	3.35	3.16	3.26	3.33	3.33	3.49	3.35
Utah	3.35	3.19	2.79	3.33	3.37	3.58	3.38	3.53
Vermont	2.74	2.61	2.69	2.77	2.70	2.59	2.47	2.67
Virginia	3.32	3.43	2.82	3.16	3.47	3.10	3.20	2.67
Washington	2.16	2.30	2.39	2.03	2.29	2.21	2.15	1.97
West Virginia	3.53	3.29	2.86	3.95	3.32	3.75	3.27	3.53
Wisconsin	3.39	3.71	3.39	3.38	3.40	3.40	2.28	3.05
Wyoming	2.74	2.96	2.87	3.00	2.49	2.99	2.86	2.86
Total	3.19	3.13	2.93	3.12	3.25	3.01	3.09	2.97

See footnotes at end of table.

Table 27. Average City Gate Price by State (Continued)
(Dollars per Thousand Cubic Feet)

State	October 1989	September 1989	August 1989	July 1989	June 1989	May 1989	April 1989	March 1989
Alabama	2.95	2.95	3.00	3.10	2.99	2.83	2.82	2.93
Alaska	.33	.33	.33	.33	.33	.33	.33	.33
Arizona	2.64	2.82	2.73	3.56	2.69	2.52	2.47	2.52
Arkansas	2.42	2.40	2.41	2.35	2.50	2.40	2.40	2.45
California	2.59	2.82	2.84	2.77	2.68	2.87	2.49	2.53
Colorado	2.94	3.09	3.31	4.16	3.60	3.36	3.19	2.92
Connecticut	3.38	3.89	3.81	4.29	4.21	3.54	3.18	3.24
Delaware	2.09	2.29	2.66	3.53	2.14	2.90	2.38	3.14
District of Columbia	—	—	—	—	—	—	—	—
Florida	2.49	2.41	2.59	2.59	2.63	2.62	2.62	2.49
Georgia	3.08	3.20	3.32	3.91	3.67	3.35	3.10	3.52
Hawaii	6.32	6.34	6.56	6.66	7.15	7.00	6.52	6.83
Idaho	2.35	2.49	2.93	2.62	2.55	2.57	2.41	2.06
Illinois	2.64	2.67	2.71	2.80	2.79	2.60	2.60	2.96
Indiana	3.04	2.94	2.96	3.20	3.37	3.32	3.08	3.04
Iowa	2.33	2.97	3.04	3.07	3.17	2.29	2.74	2.66
Kansas	2.45	1.88	2.37	1.78	1.61	1.69	1.82	2.34
Kentucky	2.74	2.66	2.76	2.92	3.09	3.15	3.12	3.10
Louisiana	2.91	3.17	3.13	3.03	2.95	3.04	2.83	2.82
Maine	2.94	3.41	3.52	3.53	3.35	2.98	3.28	3.20
Maryland	2.78	3.55	3.59	4.53	3.77	3.56	2.85	3.02
Massachusetts	2.89	3.26	3.32	3.15	3.10	3.62	2.43	2.99
Michigan	3.31	3.09	3.01	3.20	3.21	3.19	3.44	3.47
Minnesota	2.41	2.98	3.21	3.35	3.14	2.66	2.40	2.57
Mississippi	3.13	3.20	3.23	3.37	3.22	3.13	3.43	2.90
Missouri	3.04	3.03	2.95	3.25	2.87	3.06	2.93	2.89
Montana	3.03	3.09	2.96	3.35	3.35	3.86	3.64	3.57
Nebraska	2.67	3.15	3.22	3.39	3.34	2.98	2.68	2.86
Nevada	2.71	3.03	3.26	3.51	3.50	4.02	3.12	4.18
New Hampshire	2.90	3.05	3.26	3.21	3.11	2.91	2.91	3.31
New Jersey	3.19	3.12	3.10	3.41	3.16	3.18	2.73	3.01
New Mexico	2.72	3.25	3.07	3.00	3.03	2.54	2.53	2.59
New York	2.80	2.94	3.03	3.07	2.96	2.84	2.87	2.87
North Carolina	2.77	2.91	3.06	3.50	3.04	2.94	2.88	3.07
North Dakota	2.61	2.75	2.92	3.13	3.10	3.11	3.28	3.20
Ohio	3.16	4.34	3.60	3.61	2.49	2.70	3.41	3.06
Oklahoma	1.86	1.79	1.84	1.72	1.89	1.94	2.10	1.99
Oregon	2.60	2.59	3.80	2.57	3.01	2.82	3.00	2.49
Pennsylvania	3.41	3.79	3.91	3.84	4.01	3.37	3.56	3.05
Rhode Island	3.55	4.63	3.19	5.49	4.25	4.01	3.22	3.36
South Carolina	3.22	3.02	3.15	3.29	3.17	3.23	3.23	3.31
South Dakota	2.61	3.11	3.53	3.91	3.47	3.05	2.92	3.09
Tennessee	2.78	2.88	2.92	2.97	3.05	2.86	2.64	2.40
Texas	2.96	3.17	3.43	3.35	3.19	3.22	3.07	3.37
Utah	3.86	4.56	5.01	5.27	4.07	3.69	3.31	3.28
Vermont	2.57	2.67	2.72	2.75	2.70	2.78	2.60	2.47
Virginia	3.04	3.05	3.24	2.93	3.01	2.76	2.57	3.12
Washington	2.20	2.19	2.19	2.32	2.33	2.49	2.13	2.10
West Virginia	4.04	6.96	7.14	7.05	4.88	4.93	3.67	3.30
Wisconsin	3.49	4.31	5.12	4.77	4.52	4.00	3.66	3.21
Wyoming	3.13	3.11	3.04	3.42	3.17	2.98	3.08	2.89
Total	2.84	2.99	3.04	3.08	2.98	2.94	2.83	2.89

See footnotes at end of table.

Table 27. Average City Gate Price by State (Continued)
(Dollars per Thousand Cubic Feet)

State	February 1989	January 1989	Total 1988	December 1988	November 1988	October 1988	September 1988	August 1988
Alabama	3.26	3.05	3.16	3.18	2.92	2.81	3.46	3.12
Alaska	.33	.33	.33	.33	.33	.33	.33	.33
Arizona	2.77	2.65	2.51	2.60	2.42	2.59	2.65	2.56
Arkansas	2.48	2.48	2.43	2.49	2.40	2.35	2.55	2.58
California	2.95	2.88	2.60	2.74	2.80	2.75	2.74	2.59
Colorado	2.85	2.83	3.07	2.86	2.94	3.36	3.69	2.82
Connecticut	3.34	3.27	3.27	3.20	3.16	3.25	3.98	3.79
Delaware	3.17	3.95	2.88	4.14	3.54	1.73	3.05	2.16
District of Columbia	—	—	—	—	—	—	—	—
Florida	2.61	2.77	2.46	2.57	2.43	2.44	2.39	2.32
Georgia	3.76	3.95	3.60	3.37	3.28	3.17	3.61	3.82
Hawaii	5.92	5.42	6.21	5.59	5.76	6.07	6.09	6.38
Idaho	2.04	1.95	2.14	1.89	1.85	1.85	1.95	1.95
Illinois	3.34	4.13	2.74	3.05	2.81	2.75	2.68	2.47
Indiana	3.21	3.44	3.13	3.34	3.08	3.04	3.32	3.22
Iowa	2.80	3.20	2.92	3.01	2.68	2.74	2.56	3.10
Kansas	2.41	2.09	2.05	2.18	2.11	2.05	2.22	1.84
Kentucky	3.11	3.19	2.94	3.04	2.92	2.78	2.75	2.78
Louisiana	2.89	3.19	3.09	3.14	2.75	3.53	3.52	3.36
Maine	3.60	2.93	3.00	2.93	2.98	2.74	4.17	3.32
Maryland	3.21	3.26	3.15	3.22	3.25	3.04	4.14	4.26
Massachusetts	3.68	3.20	3.00	3.30	3.10	2.87	3.68	2.94
Michigan	3.59	3.45	3.41	3.38	3.44	3.34	3.62	3.64
Minnesota	2.66	3.00	2.79	2.86	2.47	2.52	3.08	3.15
Mississippi	2.92	3.11	3.29	3.13	3.05	3.23	3.49	3.58
Missouri	2.81	3.00	2.87	3.02	2.65	2.80	3.29	2.85
Montana	3.58	3.59	3.69	3.33	3.40	3.67	4.29	5.02
Nebraska	2.76	3.18	3.03	3.04	2.73	2.90	3.50	3.38
Nevada	2.94	3.45	2.87	2.79	2.85	3.42	3.24	3.41
New Hampshire	3.65	3.38	3.04	3.29	3.15	2.73	2.54	2.24
New Jersey	3.56	3.06	3.03	3.09	3.10	3.06	3.51	3.12
New Mexico	2.56	2.49	2.58	2.45	2.62	2.94	2.89	2.77
New York	3.09	3.24	2.91	3.30	3.16	3.05	3.12	2.90
North Carolina	3.17	3.19	2.87	3.21	2.98	2.78	2.78	2.81
North Dakota	3.33	3.36	3.42	3.12	3.08	3.38	3.96	4.58
Ohio	3.47	3.44	3.26	3.53	3.55	3.14	3.54	3.44
Oklahoma	2.17	2.23	2.24	2.50	2.15	2.12	1.93	1.97
Oregon	2.31	2.55	3.01	3.04	3.11	3.29	3.10	3.08
Pennsylvania	3.06	3.13	3.15	3.18	3.25	3.23	3.61	3.63
Rhode Island	3.47	3.47	3.43	3.45	3.35	3.49	4.24	4.09
South Carolina	3.91	4.32	3.46	3.88	3.65	3.37	3.23	3.28
South Dakota	2.99	3.34	3.18	3.11	2.81	3.15	3.80	3.94
Tennessee	2.70	2.94	2.77	2.96	2.94	2.71	3.05	2.98
Texas	3.41	3.26	3.05	3.18	3.03	2.98	2.99	3.14
Utah	3.19	3.18	3.14	3.24	3.30	3.29	3.37	4.26
Vermont	2.58	2.63	2.59	2.55	2.55	2.46	2.61	2.64
Virginia	3.41	3.45	2.87	3.27	3.08	2.67	2.89	2.87
Washington	2.33	2.27	2.32	2.26	2.28	2.35	2.11	2.04
West Virginia	3.19	3.39	3.43	3.31	3.57	3.68	6.28	6.69
Wisconsin	3.64	3.80	3.62	3.41	3.42	3.65	4.96	4.96
Wyoming	2.96	2.96	3.15	2.96	3.10	3.13	3.38	3.77
Total	3.11	3.16	2.93	3.08	2.98	2.92	3.05	2.93

NA = Not Available.
— = Not Applicable.
Notes and Sources: See the last page of this section.

Table 28. Average Price of Natural Gas Delivered to Residential Consumers by State
(Dollars per Thousand Cubic Feet)

State	YTD 1990	YTD 1989	YTD 1988	February 1990	January 1990	Total 1989	December 1989	November 1989
Alabama	5.69	5.77	5.98	5.95	5.53	6.23	5.82	6.65
Alaska	3.69	3.52	3.26	3.68	3.70	3.63	3.55	3.57
Arizona	6.18	6.21	6.30	6.20	6.17	6.90	6.05	7.21
Arkansas	4.50	4.34	4.39	4.68	4.40	4.87	4.51	5.22
California	5.74	5.74	5.49	5.77	5.72	5.58	5.38	5.12
Colorado	4.37	4.27	4.14	4.46	4.30	4.59	4.46	4.71
Connecticut	8.20	7.76	7.44	8.24	8.17	8.26	7.92	8.24
Delaware	6.03	6.06	5.55	6.15	5.95	6.40	6.14	6.74
District of Columbia	7.56	7.44	6.52	7.84	7.37	7.42	7.29	7.59
Florida	7.31	7.51	6.58	8.01	6.95	8.19	7.30	8.48
Georgia	6.64	5.81	6.07	6.89	6.45	6.27	5.64	6.43
Hawaii	15.80	14.49	15.63	15.79	15.81	15.66	15.89	15.99
Idaho	4.66	4.70	5.24	4.68	4.64	5.04	4.81	5.29
Illinois	4.99	4.77	4.24	5.25	4.75	4.86	4.49	4.51
Indiana	5.66	5.61	4.64	5.54	5.75	5.51	4.87	4.90
Iowa	5.01	4.68	4.55	4.95	5.05	4.80	4.69	4.84
Kansas	4.26	3.74	3.78	NA	4.21	4.16	4.23	4.41
Kentucky	4.71	4.48	4.22	4.75	4.68	4.67	4.36	4.63
Louisiana	5.35	5.29	4.97	5.90	5.07	5.93	5.95	6.76
Maine	7.42	6.74	7.11	7.95	7.00	7.16	7.08	7.59
Maryland	6.00	6.03	5.29	6.29	5.81	6.34	5.78	6.51
Massachusetts	7.59	6.96	6.26	7.96	7.24	7.11	7.32	7.70
Michigan	4.69	4.99	4.97	4.72	4.67	5.15	4.64	4.96
Minnesota	4.79	4.60	4.53	4.57	4.97	4.59	4.57	4.46
Mississippi	5.07	5.46	5.74	5.25	4.97	5.50	5.10	5.69
Missouri	4.83	4.46	4.44	4.99	4.73	4.83	4.65	5.03
Montana	4.23	4.29	4.39	4.24	4.23	4.34	4.23	4.27
Nebraska	4.56	4.41	4.29	4.44	4.66	4.51	4.40	4.50
Nevada	5.06	5.06	5.25	5.05	5.07	5.51	5.14	5.49
New Hampshire	7.13	6.70	5.95	7.60	6.76	6.85	6.83	7.28
New Jersey	5.97	6.08	5.87	6.43	5.63	6.55	6.23	6.66
New Mexico	5.15	5.12	4.40	5.20	5.10	5.79	5.34	5.94
New York	6.82	6.79	5.95	NA	6.72	7.39	6.93	7.76
North Carolina	5.71	6.10	5.89	5.77	5.67	6.42	5.87	6.48
North Dakota	4.38	4.47	5.10	4.39	4.38	4.68	4.34	4.65
Ohio	5.11	5.33	4.87	5.06	5.15	5.33	4.88	5.17
Oklahoma	4.26	3.88	4.10	4.38	4.18	4.52	4.38	5.11
Oregon	6.06	6.06	6.41	6.07	6.06	6.19	6.16	6.25
Pennsylvania	6.13	5.74	5.36	6.22	6.07	6.15	6.04	6.53
Rhode Island	6.87	6.77	6.32	6.93	6.83	7.13	6.85	7.10
South Carolina	6.86	6.73	6.79	6.86	6.86	6.89	6.84	6.95
South Dakota	4.91	4.76	4.70	4.82	4.98	4.85	4.83	4.67
Tennessee	4.80	4.57	4.33	4.99	4.70	4.83	4.78	5.08
Texas	5.13	5.11	4.64	5.39	4.96	5.59	5.03	5.69
Utah	5.07	4.86	4.85	5.05	5.08	5.14	5.17	5.39
Vermont	5.42	5.42	5.43	5.45	5.40	5.62	5.43	5.69
Virginia	6.37	6.43	5.33	6.53	6.25	6.77	6.36	6.73
Washington	4.89	5.15	5.10	4.86	4.92	5.49	5.08	5.49
West Virginia	6.05	5.29	5.27	6.17	5.98	5.72	6.16	5.95
Wisconsin	5.67	5.77	5.89	5.81	5.54	5.74	5.48	5.74
Wyoming	4.70	4.53	4.20	4.72	4.68	4.75	4.65	4.81
Total	5.50	5.40	5.08	5.61	5.41	5.63	5.30	5.56

See footnotes at end of table.

Table 28. Average Price of Natural Gas Delivered to Residential Consumers by State (Continued)
(Dollars per Thousand Cubic Feet)

State	October 1989	September 1989	August 1989	July 1989	June 1989	May 1989	April 1989	March 1989
Alabama	7.79	8.43	8.38	8.23	7.75	6.66	5.95	5.49
Alaska	3.71	3.94	4.19	4.07	3.84	3.72	3.61	3.56
Arizona	8.64	9.25	9.50	8.99	8.32	8.08	7.42	6.62
Arkansas	6.33	6.69	6.83	6.61	6.11	5.69	4.92	4.33
California	6.11	6.10	5.90	6.07	6.09	5.69	4.62	5.21
Colorado	5.23	5.77	6.03	5.66	5.16	4.78	4.51	4.30
Connecticut	9.08	10.11	10.50	10.03	9.96	8.78	8.29	7.80
Delaware	7.36	7.46	7.47	7.93	7.50	6.79	6.31	6.04
District of Columbia	8.02	8.58	6.68	7.09	5.89	7.11	7.48	7.70
Florida	9.68	9.54	9.83	9.56	9.46	9.06	8.06	7.24
Georgia	7.32	7.50	8.00	7.94	7.77	7.06	6.25	6.16
Hawaii	15.99	15.98	16.47	16.37	16.23	15.75	15.49	15.12
Idaho	5.66	5.94	6.49	6.37	5.65	5.55	5.29	4.91
Illinois	4.94	5.74	6.35	5.78	5.52	5.05	4.91	5.02
Indiana	5.13	6.15	6.86	6.87	6.75	6.19	5.87	5.63
Iowa	5.22	6.29	6.76	6.51	5.91	4.86	4.41	4.34
Kansas	4.91	5.33	5.64	5.50	5.24	4.82	4.04	3.79
Kentucky	5.12	5.97	6.12	5.96	5.47	5.02	4.72	4.48
Louisiana	7.28	7.56	7.59	7.21	7.08	6.40	5.75	4.86
Maine	7.79	8.59	8.47	8.06	7.96	7.21	7.01	6.72
Maryland	7.36	8.16	7.94	7.74	7.30	6.61	6.24	6.05
Massachusetts	6.25	7.84	8.06	7.81	7.37	6.63	7.06	6.96
Michigan	5.60	6.82	7.20	6.69	6.07	5.28	5.06	4.96
Minnesota	4.70	5.20	5.41	5.35	5.09	4.65	4.33	4.32
Mississippi	5.77	5.90	5.97	5.92	5.85	6.00	5.54	5.31
Missouri	5.51	6.34	6.72	6.55	6.22	5.34	4.75	4.48
Montana	4.33	4.56	4.65	4.70	4.55	4.50	4.39	4.33
Nebraska	4.83	5.26	5.50	5.38	5.69	4.73	4.33	4.18
Nevada	6.34	6.84	7.17	6.85	6.23	6.08	5.78	5.30
New Hampshire	6.86	7.43	7.94	7.50	7.00	6.32	6.91	6.75
New Jersey	7.33	8.34	8.60	8.22	7.91	7.01	6.48	6.19
New Mexico	7.57	8.02	8.08	7.91	7.50	7.16	5.92	5.27
New York	8.17	9.40	9.58	9.23	8.51	7.28	7.03	7.64
North Carolina	7.29	8.50	8.79	8.53	7.86	6.85	6.66	6.16
North Dakota	5.22	5.98	6.64	6.08	5.51	5.09	4.59	4.44
Ohio	5.33	6.27	6.51	6.49	6.09	5.37	5.41	5.27
Oklahoma	5.99	6.36	6.56	6.37	6.08	5.46	4.62	3.99
Oregon	6.76	7.13	7.21	6.80	6.56	6.36	6.03	5.85
Pennsylvania	6.98	7.86	8.05	7.89	6.72	6.23	5.93	5.77
Rhode Island	7.49	8.55	8.65	8.44	8.25	7.26	7.13	6.98
South Carolina	7.19	8.07	8.38	7.93	7.62	6.80	6.70	6.82
South Dakota	5.00	5.73	6.26	6.00	5.52	5.02	4.64	4.53
Tennessee	5.48	6.02	6.10	5.98	5.49	5.07	4.78	4.52
Texas	6.55	6.83	7.33	7.09	6.91	6.61	5.88	5.22
Utah	5.85	5.80	5.80	5.51	5.17	5.27	5.26	5.01
Vermont	5.99	6.88	7.08	6.96	6.43	5.83	5.54	5.44
Virginia	7.33	9.39	8.99	8.87	8.42	6.68	6.70	6.53
Washington	6.24	7.07	7.51	7.01	6.39	6.11	5.46	5.18
West Virginia	5.90	6.85	7.23	7.06	6.63	5.79	5.47	5.34
Wisconsin	5.68	6.33	6.89	6.55	6.15	5.69	5.67	5.65
Wyoming	5.16	5.54	5.89	5.58	5.09	4.89	4.66	4.56
Total	6.09	6.81	7.06	6.90	6.53	5.90	5.52	5.44

See footnotes at end of table.

Table 28. Average Price of Natural Gas Delivered to Residential Consumers by State (Continued)
(Dollars per Thousand Cubic Feet)

State	February 1989	January 1989	Total 1988	December 1988	November 1988	October 1988	September 1988	August 1988
Alabama	5.93	5.59	6.51	5.90	6.63	7.85	8.62	8.53
Alaska	3.51	3.53	3.46	3.49	3.54	3.66	3.86	4.08
Arizona	6.22	6.20	6.99	6.48	7.91	8.66	9.00	9.25
Arkansas	4.35	4.32	4.81	4.44	4.97	5.99	6.54	6.44
California	5.63	5.84	5.64	5.90	5.37	6.21	6.42	6.38
Colorado	4.27	4.27	4.42	4.14	4.54	5.07	5.65	5.82
Connecticut	7.82	7.71	7.87	7.74	7.84	8.16	9.85	9.95
Delaware	6.08	6.04	6.00	6.20	6.17	6.81	7.47	7.62
District of Columbia	7.41	7.47	6.96	7.49	7.55	7.55	7.79	6.28
Florida	7.67	7.38	7.49	7.19	8.52	9.13	9.00	9.24
Georgia	5.83	5.79	6.22	5.56	5.77	6.87	7.60	7.75
Hawaii	14.31	14.67	15.69	14.94	15.53	15.81	15.83	16.23
Idaho	4.71	4.69	5.49	4.81	5.30	5.90	6.43	6.83
Illinois	4.90	4.64	4.60	4.48	4.55	4.70	5.55	5.54
Indiana	5.49	5.72	5.16	5.30	5.39	4.07	5.90	6.48
Iowa	4.59	4.77	4.79	4.51	4.56	5.38	6.63	6.73
Kansas	3.76	3.72	4.02	3.81	4.07	4.65	5.27	5.36
Kentucky	4.48	4.49	4.48	4.36	4.41	4.98	5.96	6.02
Louisiana	5.21	5.37	5.74	5.55	7.08	7.67	7.17	7.49
Maine	6.77	6.71	7.26	6.94	7.00	7.28	7.97	8.25
Maryland	6.10	5.96	5.90	5.79	6.10	6.69	7.43	7.47
Massachusetts	7.00	6.93	6.47	7.07	6.92	6.33	6.92	7.11
Michigan	4.98	4.99	5.34	5.30	5.47	5.98	7.09	7.18
Minnesota	4.51	4.69	4.64	4.60	4.61	5.07	5.50	5.49
Mississippi	5.50	5.41	5.85	5.47	5.90	5.84	6.14	6.19
Missouri	4.47	4.45	4.76	4.51	4.76	5.52	6.24	6.32
Montana	4.31	4.27	4.30	4.11	4.20	4.17	4.40	4.57
Nebraska	4.34	4.48	4.46	4.37	4.48	4.91	5.31	5.29
Nevada	5.05	5.06	5.87	5.57	6.44	7.09	7.45	7.61
New Hampshire	6.75	6.66	6.28	6.86	7.13	6.09	6.79	7.28
New Jersey	6.18	5.99	6.32	6.07	6.28	6.86	8.03	8.49
New Mexico	5.07	5.16	5.23	5.24	6.43	7.31	7.77	7.61
New York	6.82	6.76	6.50	6.64	6.93	7.58	8.13	8.61
North Carolina	6.17	6.05	6.25	6.22	6.39	6.67	8.17	8.36
North Dakota	4.46	4.47	5.15	4.58	5.00	5.62	6.37	7.06
Ohio	5.31	5.35	5.21	5.23	5.28	5.39	6.28	6.58
Oklahoma	3.87	3.89	4.52	3.99	4.64	5.47	6.20	6.29
Oregon	5.85	6.30	6.79	6.78	7.06	7.62	7.94	8.03
Pennsylvania	5.76	5.73	5.79	5.80	6.01	6.50	7.56	7.81
Rhode Island	7.00	6.56	6.60	6.66	6.80	7.17	7.37	7.38
South Carolina	6.79	6.68	6.73	6.55	6.49	6.85	8.92	8.15
South Dakota	4.67	4.86	4.91	4.80	4.95	5.45	6.08	6.27
Tennessee	4.59	4.56	4.65	4.62	4.90	5.47	5.98	5.98
Texas	5.10	5.12	5.37	5.13	6.07	6.65	6.96	7.09
Utah	4.88	4.85	5.11	4.96	5.43	5.60	5.56	5.83
Vermont	5.44	5.41	5.65	5.49	5.66	5.94	6.75	7.29
Virginia	6.57	6.30	5.81	6.06	6.10	7.01	7.81	6.74
Washington	5.14	5.17	5.50	5.23	5.51	6.21	6.94	7.31
West Virginia	5.30	5.28	5.50	5.17	5.48	5.91	6.75	7.43
Wisconsin	5.81	5.72	5.89	5.79	5.94	5.44	6.66	7.21
Wyoming	4.53	4.53	4.48	4.31	4.54	4.87	5.36	5.60
Total	5.38	5.41	5.47	5.39	5.56	5.95	6.79	6.93

NA = Not Available.
Notes and Sources: See the last page of this section.

Table 29. Average Price of Natural Gas Sold to Commercial Consumers by State
(Dollars per Thousand Cubic Feet)

State	YTD 1990	YTD 1989	YTD 1988	February 1990	January 1990	Total 1989	December 1989	November 1989
Alabama	5.16	5.14	5.35	5.26	5.10	5.06	5.06	5.28
Alaska	2.71	2.71	2.58	2.74	2.67	2.58	2.54	2.49
Arizona	4.84	4.77	4.93	4.82	4.86	4.93	4.97	5.05
Arkansas	4.28	4.15	4.24	4.35	4.24	4.38	4.25	4.50
California	5.60	5.28	5.40	5.65	5.56	4.87	5.48	5.12
Colorado	3.94	3.90	3.80	3.95	3.93	4.00	3.99	4.05
Connecticut	6.90	6.33	6.27	6.85	6.95	6.10	6.82	6.33
Delaware	5.34	5.27	4.77	5.36	5.32	5.36	5.32	5.42
District of Columbia	5.89	5.40	5.15	5.73	6.04	5.19	5.50	5.08
Florida	5.15	4.79	4.67	5.23	5.08	4.78	4.93	4.80
Georgia	5.97	5.34	5.58	6.26	5.78	5.43	5.27	5.69
Hawaii	11.83	10.51	11.65	11.94	11.73	11.44	11.52	11.84
Idaho	3.89	4.01	4.44	3.91	3.87	4.20	4.02	4.45
Illinois	4.77	4.57	3.98	5.00	4.58	4.57	4.40	4.22
Indiana	5.04	5.04	4.34	4.94	5.12	4.81	4.39	4.34
Iowa	4.49	4.13	4.18	4.32	4.63	3.90	4.19	3.88
Kansas	3.87	3.38	3.26	NA	3.86	3.21	3.87	3.31
Kentucky	4.52	4.28	4.08	4.50	4.54	4.33	4.19	4.34
Louisiana	5.24	5.08	4.77	5.43	5.12	5.26	5.66	5.79
Maine	6.90	6.10	6.42	7.42	6.46	6.29	6.42	6.56
Maryland	5.63	5.21	4.96	5.43	5.78	5.25	5.17	5.32
Massachusetts	6.62	6.08	6.59	7.12	6.23	5.82	6.64	5.93
Michigan	4.60	4.86	4.82	4.61	4.59	4.85	4.52	4.64
Minnesota	4.38	4.18	4.10	4.06	4.66	4.03	4.21	3.85
Mississippi	4.65	4.81	5.24	4.62	4.67	4.62	4.44	4.56
Missouri	4.62	4.24	4.20	4.70	4.56	4.35	4.42	4.37
Montana	4.20	4.37	4.41	4.22	4.19	4.34	4.24	4.29
Nebraska	4.05	4.01	3.91	3.79	4.27	3.75	3.97	3.76
Nevada	4.35	4.23	4.57	4.35	4.34	4.42	4.55	4.41
New Hampshire	6.76	6.24	5.57	7.18	6.38	6.23	6.39	6.58
New Jersey	5.69	5.36	5.32	5.62	5.74	5.30	5.66	5.31
New Mexico	4.41	4.37	3.10	4.44	4.39	4.38	4.33	4.15
New York	5.78	5.90	5.21	NA	5.66	5.84	5.70	5.53
North Carolina	4.80	5.16	5.08	4.67	4.89	5.12	5.05	4.88
North Dakota	4.18	4.20	4.72	4.17	4.18	4.19	4.05	4.12
Ohio	4.94	5.04	4.58	4.95	4.93	4.90	4.69	4.75
Oklahoma	3.99	3.83	4.07	4.00	3.99	4.05	4.07	4.32
Oregon	4.89	5.01	5.21	4.89	4.89	4.89	4.89	4.85
Pennsylvania	5.93	5.33	4.91	5.92	5.93	5.53	5.73	5.80
Rhode Island	6.68	6.58	6.27	6.74	6.63	6.43	6.43	5.84
South Carolina	5.88	5.73	5.97	5.78	5.94	5.55	6.01	5.43
South Dakota	4.29	4.07	4.17	4.15	4.41	4.00	4.15	3.82
Tennessee	4.94	4.46	4.34	5.09	4.84	4.47	4.70	4.50
Texas	4.63	4.57	4.22	4.64	4.63	4.38	4.62	4.53
Utah	4.22	4.03	4.12	4.21	4.23	4.17	4.30	4.43
Vermont	4.98	4.60	4.70	4.99	4.97	4.74	4.96	4.65
Virginia	5.09	5.14	4.34	5.10	5.08	4.89	5.15	4.62
Washington	4.19	4.69	4.67	4.06	4.34	4.66	4.43	4.71
West Virginia	5.70	5.02	4.98	5.89	5.58	5.47	5.84	5.83
Wisconsin	4.66	4.83	4.79	4.80	4.55	4.67	4.52	4.60
Wyoming	4.48	4.31	4.00	4.47	4.48	4.33	4.33	4.36
Total	5.01	4.84	4.63	5.04	4.99	4.79	4.86	4.75

See footnotes at end of table

Table 29. Average Price of Natural Gas Sold to Commercial Consumers by State (Continued)

(Dollars per Thousand Cubic Feet)

State	October 1989	September 1989	August 1989	July 1989	June 1989	May 1989	April 1989	March 1989
Alabama	5.09	5.20	5.17	5.23	5.11	4.96	4.85	4.78
Alaska	2.39	2.31	2.28	2.60	2.64	2.62	2.70	2.69
Arizona	5.60	4.85	5.14	4.87	4.83	5.09	4.89	4.82
Arkansas	4.83	4.93	4.99	4.98	4.45	4.70	4.55	4.19
California	4.33	4.39	4.44	4.62	4.06	4.27	5.15	5.26
Colorado	4.14	4.26	4.31	4.27	4.14	4.04	3.97	3.91
Connecticut	5.90	5.36	5.00	5.28	5.63	5.56	6.18	6.07
Delaware	5.53	5.45	5.43	5.62	5.58	5.47	5.40	5.30
District of Columbia	4.95	4.98	4.49	4.85	4.55	4.85	5.01	5.62
Florida	4.70	4.63	4.78	4.73	4.79	4.82	4.78	4.76
Georgia	5.76	5.46	5.52	5.59	5.52	5.46	5.35	5.50
Hawaii	11.54	11.65	11.72	11.91	12.05	11.46	11.55	11.09
Idaho	4.46	4.46	4.57	4.50	4.49	4.49	4.45	4.11
Illinois	4.41	4.91	5.22	5.17	4.87	4.64	4.63	4.79
Indiana	4.38	4.72	4.75	4.85	5.00	5.33	5.17	5.07
Iowa	3.70	3.90	3.95	3.89	3.76	3.67	3.66	3.80
Kansas	3.20	2.70	2.67	2.89	2.76	2.90	3.02	3.37
Kentucky	4.47	4.66	4.76	4.61	4.48	4.47	4.30	4.32
Louisiana	5.56	5.65	5.62	5.27	5.49	4.88	5.02	4.74
Maine	6.46	6.67	6.42	6.55	6.45	6.27	6.24	6.11
Maryland	5.59	5.64	5.52	5.65	5.34	5.25	5.29	4.98
Massachusetts	4.95	5.17	5.17	5.16	5.14	5.25	5.90	6.02
Michigan	4.67	5.77	6.03	5.65	5.23	4.87	4.81	4.82
Minnesota	3.76	3.85	3.97	4.01	4.00	3.85	3.83	3.91
Mississippi	4.40	4.44	4.46	4.55	4.52	4.81	4.61	4.69
Missouri	4.45	4.53	4.75	4.80	4.65	4.48	4.23	4.23
Montana	4.26	4.35	4.34	4.44	4.43	4.41	4.39	4.35
Nebraska	3.63	3.59	3.20	3.11	3.79	3.74	3.68	3.75
Nevada	4.52	4.33	4.42	4.51	4.56	4.52	4.58	4.52
New Hampshire	6.00	6.07	6.18	6.16	5.92	5.70	6.31	6.25
New Jersey	5.02	4.95	4.98	4.96	5.09	5.06	5.24	5.41
New Mexico	5.05	4.73	4.48	4.94	4.45	4.11	4.50	4.14
New York	5.36	5.68	5.77	5.73	5.76	5.93	6.09	6.18
North Carolina	4.97	5.13	5.17	5.18	5.02	4.99	5.28	5.23
North Dakota	4.61	3.93	4.54	4.46	4.32	4.31	4.18	4.15
Ohio	4.81	4.99	5.17	5.09	4.95	4.80	5.02	4.89
Oklahoma	5.57	4.22	4.77	4.37	4.28	4.19	4.22	3.96
Oregon	4.82	4.89	4.93	4.87	4.84	4.78	4.80	4.79
Pennsylvania	5.85	5.98	5.92	5.93	5.58	5.43	5.37	5.35
Rhode Island	5.16	7.02	7.13	6.93	7.33	6.65	6.33	6.53
South Carolina	5.23	5.34	5.14	5.29	4.77	5.71	5.42	5.72
South Dakota	3.81	4.00	4.16	4.09	4.05	3.97	3.89	3.87
Tennessee	4.49	4.48	4.52	4.49	4.45	4.18	4.39	4.33
Texas	4.36	4.41	4.04	3.96	4.21	4.20	4.18	4.38
Utah	4.55	4.30	4.23	4.13	4.00	4.17	4.30	4.13
Vermont	4.49	4.71	4.92	5.01	5.13	4.99	4.73	4.70
Virginia	4.65	4.16	4.58	4.49	4.34	4.88	4.80	5.04
Washington	4.43	5.65	4.64	4.75	4.90	4.81	4.67	4.49
West Virginia	5.69	6.47	6.48	6.68	6.37	5.54	5.25	5.08
Wisconsin	4.42	4.78	4.91	4.76	4.62	4.46	4.61	4.69
Wyoming	4.36	4.45	4.45	4.40	4.31	4.35	4.31	4.30
Total	4.65	4.71	4.65	4.70	4.61	4.69	4.81	4.83

See footnotes at end of table

Table 29. Average Price of Natural Gas Sold to Commercial Consumers by State (Continued)
(Dollars per Thousand Cubic Feet)

State	February 1989	January 1989	Total 1988	December 1988	November 1988	October 1988	September 1988	August 1988
Alabama	5.26	4.98	5.28	5.11	5.09	5.20	5.11	5.33
Alaska	2.75	2.66	2.60	2.69	2.73	2.73	2.77	2.80
Arizona	4.89	4.66	4.97	4.95	5.13	5.13	5.04	4.88
Arkansas	4.16	4.13	4.34	4.17	4.34	4.60	4.80	4.72
California	5.25	5.32	4.68	5.95	4.56	3.86	3.49	3.81
Colorado	3.90	3.90	3.86	3.72	3.78	4.08	4.19	4.24
Connecticut	6.32	6.34	5.62	5.96	5.40	5.08	5.05	4.64
Delaware	5.24	5.30	4.93	5.31	5.30	5.01	4.97	4.84
District of Columbia	5.36	5.44	5.03	5.23	5.17	4.75	4.50	4.35
Florida	4.76	4.81	4.54	4.60	4.58	4.62	4.45	4.39
Georgia	5.43	5.24	5.45	5.10	5.20	5.60	5.58	5.50
Hawaii	10.59	10.43	11.52	11.01	11.18	11.42	11.50	11.66
Idaho	4.02	3.99	4.52	4.04	4.42	4.58	4.93	4.95
Illinois	4.68	4.45	4.19	4.18	4.05	4.04	4.50	5.06
Indiana	4.93	5.15	4.60	4.77	4.75	3.70	4.46	5.00
Iowa	4.04	4.22	4.03	4.06	3.85	3.80	3.86	3.76
Kansas	3.42	3.34	3.03	3.18	3.07	3.03	2.67	2.60
Kentucky	4.26	4.30	4.21	4.20	4.23	4.20	4.63	4.56
Louisiana	4.97	5.19	5.14	5.53	6.09	6.26	5.30	5.44
Maine	6.10	6.10	6.25	6.17	6.06	5.82	NA	6.03
Maryland	5.26	5.16	5.09	5.00	5.13	5.19	5.24	4.98
Massachusetts	6.09	6.07	6.11	6.80	6.07	5.14	5.04	4.95
Michigan	4.84	4.87	5.00	5.09	5.14	5.34	6.02	5.93
Minnesota	4.08	4.28	4.03	4.13	3.97	3.97	3.97	3.89
Mississippi	4.82	4.79	5.02	4.72	4.63	4.48	4.49	4.61
Missouri	4.26	4.22	4.20	4.17	4.24	4.33	4.25	4.23
Montana	4.38	4.37	4.30	4.14	4.40	4.00	4.48	4.30
Nebraska	3.96	4.06	3.75	3.87	3.78	3.68	3.64	3.55
Nevada	4.24	4.22	4.62	4.50	4.52	4.66	4.77	4.73
New Hampshire	6.28	6.20	5.66	6.24	6.36	5.14	5.56	5.36
New Jersey	5.44	5.29	5.24	5.07	5.07	5.24	5.82	5.21
New Mexico	4.28	4.44	3.31	3.64	3.58	3.49	3.42	3.40
New York	5.93	5.88	5.39	5.70	5.61	5.55	5.39	5.39
North Carolina	5.19	5.14	4.94	5.18	4.96	4.64	4.81	4.83
North Dakota	4.18	4.21	4.48	4.15	4.32	4.40	4.87	4.52
Ohio	5.03	5.04	4.75	4.91	4.91	4.82	4.92	4.97
Oklahoma	3.81	3.85	4.07	3.76	3.80	4.03	4.09	4.05
Oregon	4.81	5.23	5.36	5.50	5.46	5.42	5.60	5.70
Pennsylvania	5.35	5.31	5.09	5.30	5.26	5.28	5.38	5.42
Rhode Island	6.79	6.39	5.80	6.14	5.73	5.31	5.30	4.90
South Carolina	5.83	5.64	5.59	5.80	5.26	5.09	5.71	5.42
South Dakota	3.95	4.20	4.10	4.08	4.04	4.08	4.15	4.18
Tennessee	4.49	4.44	4.38	4.45	4.41	4.46	4.42	4.52
Texas	4.60	4.54	4.19	4.45	4.23	4.13	4.18	3.83
Utah	4.03	4.03	4.08	4.10	4.36	4.43	4.06	4.16
Vermont	4.88	4.34	4.67	4.62	4.52	4.46	4.58	4.71
Virginia	5.19	5.10	4.45	4.88	4.54	4.56	4.44	4.31
Washington	4.72	4.65	4.59	4.72	4.78	4.50	4.65	4.75
West Virginia	5.02	5.03	5.18	4.86	5.10	5.46	6.36	6.42
Wisconsin	4.85	4.80	4.68	4.71	4.76	4.84	4.80	4.94
Wyoming	4.31	4.31	4.11	4.16	4.26	4.38	4.54	4.49
Total	4.84	4.85	4.63	4.77	4.69	4.52	4.41	4.39

NA = Not Available.
Notes and Sources: See the last page of this section.

Table 30. Average Price of Natural Gas Sold to Industrial Consumers by State
(Dollars per Thousand Cubic Feet)

State	YTD 1990	YTD 1989	YTD 1988	February 1990	January 1990	Total 1989	December 1989	November 1989
Alabama	3.34	3.09	3.31	3.22	3.45	2.94	3.40	2.89
Alaska	1.08	1.27	.83	1.08	1.08	1.08	1.05	1 03
Arizona	3.63	3.87	3.71	3.59	3.66	3.18	3.59	2.67
Arkansas	3.29	3.19	3.19	3.27	3.30	3.09	3.13	3.12
California	3.82	4.25	3.88	3.99	3.71	3.62	3.84	4.10
Colorado	2.41	3.61	3.37	2.41	2.41	3.46	3.65	3.53
Connecticut	5.77	5.14	5.26	5.59	6.00	4.50	5.54	4.40
Delaware	3.93	3.80	3.34	3.82	4.00	3.47	3.72	3.25
District of Columbia	—	—	—	—	—	—	—	—
Florida	3.57	3.07	2.98	3.48	3.65	3.09	3.35	3.18
Georgia	3.85	3.78	4.04	4.21	3.70	3.64	3.68	3.70
Hawaii	—	—	—	—	—	—	—	—
Idaho	2.45	4.08	3.88	2.83	2.43	4.35	4.41	3.50
Illinois	4.26	4.02	3.36	4.17	4.34	3.77	3.73	3.52
Indiana	4.30	4.40	3.78	4.08	4.48	3.92	4.06	3.71
Iowa	3.30	3.24	3.55	3.09	3.49	2.76	3.53	2.80
Kansas	3.11	2.83	2.43	NA	3.22	3.25	3.47	3.26
Kentucky	3.98	4.11	3.44	3.93	4.01	3.96	3.75	3.79
Louisiana	2.50	2.32	2.12	2.56	2.45	1.97	2.10	1.89
Maine	6.37	5.03	5.24	6.89	5.58	4.57	5.68	4.78
Maryland	4.72	4.90	4.14	4.59	4.86	4.83	5.17	4.80
Massachusetts	5.68	5.57	5.23	5.98	5.42	3.98	6.01	3.75
Michigan	4.25	4.64	4.20	4.22	4.27	4.51	4.10	4.20
Minnesota	3.44	3.15	3.12	3.21	3.65	2.87	3.27	2.86
Mississippi	2.89	2.83	2.91	2.78	2.99	2.49	2.80	2.54
Missouri	4.54	4.21	3.83	4.42	4.62	4.15	4.31	4.10
Montana	3.54	3.40	3.59	3.45	3.63	2.95	3.73	3.81
Nebraska	3.40	3.32	2.86	3.20	3.60	2.97	3.25	2.89
Nevada	4.17	4.00	3.61	4.37	4.04	4.81	4.32	4.81
New Hampshire	5.79	4.89	4.79	6.09	5.54	4.11	5.91	5.03
New Jersey	4.96	4.45	4.23	4.89	5.03	4.02	4.45	3.93
New Mexico	4.31	4.07	3.69	4.27	4.34	3.85	3.95	4.11
New York	5.00	5.09	4.37	NA	4.94	4.79	5.06	4.58
North Carolina	3.63	3.69	3.95	3.53	3.72	3.54	4.08	3.54
North Dakota	3.90	3.58	3.18	4.13	3.67	3.54	5.12	3.30
Ohio	4.24	4.45	3.91	4.28	4.22	4.12	4.22	4.02
Oklahoma	1.66	1.76	2.37	1.48	1.81	1.78	1.88	1.68
Oregon	3.68	3.88	3.58	3.71	3.66	3.53	3.67	3.49
Pennsylvania	4.38	3.89	3.88	4.37	4.38	3.83	4.10	3.75
Rhode Island	6.30	6.26	5.88	6.23	6.36	5.21	6.15	5.76
South Carolina	3.77	3.90	4.20	3.62	3.93	3.31	3.99	3.39
South Dakota	3.69	3.36	3.35	3.56	3.82	3.08	3.33	3.02
Tennessee	3.83	3.54	3.34	3.70	3.94	3.30	3.63	3.32
Texas	2.83	2.38	2.38	2.57	3.05	2.23	2.67	2.19
Utah	4.17	3.49	3.15	4.93	3.46	3.36	3.45	3.47
Vermont	3.81	3.01	3.12	4.02	3.63	3.01	3.35	3.09
Virginia	4.05	4.90	3.16	4.25	3.81	4.28	4.82	4.27
Washington	3.04	3.28	3.19	2.93	3.13	2.96	3.02	3.25
West Virginia	3.68	3.04	3.00	3.69	3.67	3.10	3.85	3.20
Wisconsin	4.01	4.37	4.22	4.04	3.99	4.13	3.82	4.11
Wyoming	3.16	3.37	3.31	3.21	3.13	3.28	3.13	3.23
Total	3.41	3.29	3.20	3.34	3.47	2.92	3.27	2.90

See footnotes at end of table.

Table 30. Average Price of Natural Gas Sold to Industrial Consumers by State (Continued)
(Dollars per Thousand Cubic Feet)

State	October 1989	September 1989	August 1989	July 1989	June 1989	May 1989	April 1989	March 1989
Alabama	2.87	2.84	2.94	2.95	2.81	2.79	2.74	2.71
Alaska	.96	.98	.93	1.01	1.06	1.05	1.05	1.11
Arizona	2.66	2.91	3.14	3.03	2.96	3.16	3.24	3.90
Arkansas	3.16	3.15	3.21	3.21	3.10	3.16	3.21	3.19
California	3.08	3.27	3.45	3.33	3.28	3.38	3.75	3.98
Colorado	3.32	3.49	2.91	3.40	3.80	3.62	3.52	3.42
Connecticut	3.89	3.90	3.66	4.01	3.81	4.11	4.45	5.07
Delaware	3.39	3.41	3.68	3.28	3.36	3.29	3.28	3.58
District of Columbia	—	—	—	—	—	—	—	—
Florida	3.01	3.06	3.06	2.99	3.13	3.13	3.12	2.87
Georgia	3.70	3.51	3.56	3.67	3.55	3.56	3.44	3.64
Hawaii	—	—	—	—	—	—	—	—
Idaho	3.86	4.12	6.14	5.12	4.98	4.83	4.74	4.31
Illinois	3.32	3.44	3.34	3.53	3.83	3.74	3.84	4.26
Indiana	3.61	3.66	3.34	3.18	2.95	4.08	4.40	4.60
Iowa	2.44	2.38	2.47	2.41	2.44	2.52	2.57	2.66
Kansas	3.38	2.97	3.35	3.37	3.11	3.48	3.25	3.41
Kentucky	3.57	3.79	3.84	4.03	3.93	3.97	4.04	4.15
Louisiana	1.82	1.87	1.89	1.91	1.90	1.82	1.78	1.99
Maine	4.11	4.23	4.09	4.03	4.11	4.21	4.61	4.99
Maryland	4.73	4.67	4.59	4.63	4.61	4.62	4.75	4.88
Massachusetts	3.21	3.20	3.22	3.30	3.30	3.29	4.25	4.85
Michigan	4.49	4.78	4.87	5.06	4.66	4.45	4.48	4.52
Minnesota	2.62	2.70	2.63	2.60	2.59	2.56	2.76	2.82
Mississippi	2.39	2.28	2.33	2.29	2.42	2.35	2.36	2.32
Missouri	4.14	4.04	4.02	4.13	4.12	4.12	4.09	4.18
Montana	2.66	2.53	2.47	1.78	3.00	2.53	2.75	2.83
Nebraska	2.79	2.77	2.81	2.79	2.79	2.74	2.78	2.96
Nevada	4.18	5.94	6.55	5.94	6.47	5.72	4.54	4.49
New Hampshire	3.56	3.20	3.66	3.54	3.41	3.55	3.83	5.03
New Jersey	3.49	3.41	3.48	3.58	3.44	4.28	4.07	4.45
New Mexico	3.89	3.72	3.65	4.39	3.83	3.58	3.59	3.80
New York	4.28	3.96	4.50	3.94	4.52	4.56	4.97	5.33
North Carolina	3.49	3.41	3.43	3.34	3.38	3.40	3.30	3.50
North Dakota	3.09	3.18	3.19	3.16	3.12	3.17	3.19	3.46
Ohio	3.89	3.81	3.82	3.90	3.79	4.16	4.07	4.13
Oklahoma	1.65	1.82	2.11	1.87	1.71	1.50	1.57	1.65
Oregon	3.16	3.22	3.39	3.42	3.35	3.45	3.37	3.66
Pennsylvania	3.76	3.72	3.69	3.69	3.58	3.76	3.89	3.82
Rhode Island	4.44	4.40	4.34	4.30	4.52	4.67	5.14	6.00
South Carolina	3.15	3.08	3.10	3.00	3.16	3.25	3.08	3.24
South Dakota	2.87	2.96	2.97	2.96	2.89	2.84	2.89	3.09
Tennessee	3.13	2.74	3.13	3.18	3.19	3.17	3.12	3.23
Texas	2.19	1.99	2.08	2.11	2.17	2.22	2.09	2.17
Utah	3.47	3.23	4.05	3.04	3.01	3.04	3.22	3.20
Vermont	2.87	3.00	3.07	3.10	3.14	3.08	2.94	2.77
Virginia	5.31	3.80	5.28	4.42	3.19	4.39	3.36	4.52
Washington	2.77	2.71	2.66	2.71	2.75	2.86	2.94	3.16
West Virginia	2.89	3.00	3.02	2.98	3.00	2.96	2.82	3.06
Wisconsin	3.86	3.91	4.16	4.19	3.71	4.05	4.27	4.28
Wyoming	3.17	2.96	3.47	3.44	3.34	3.30	3.26	3.33
Total	2.72	2.60	2.67	2.62	2.66	2.76	2.84	3.04

See footnotes at end of table.

Table 30. Average Price of Natural Gas Sold to Industrial Consumers by State (Continued)
(Dollars per Thousand Cubic Feet)

State	February 1989	January 1989	Total 1988	December 1988	November 1988	October 1988	September 1988	August 1988
Alabama	3.11	3.06	3.00	3.14	3.01	3.01	2.76	2.83
Alaska	1.25	1.28	1.07	1.16	1.20	1.13	1.11	1.12
Arizona	3.83	3.91	3.78	3.84	3.92	3.75	3.70	3.86
Arkansas	3.23	3.14	3.06	3.15	3.04	2.91	2.94	2.82
California	4.19	4.29	3.76	4.77	3.82	3.30	3.42	3.74
Colorado	3.72	3.50	3.45	3.39	3.29	3.32	3.35	3.58
Connecticut	5.18	5.11	4.05	4.78	3.96	3.59	3.59	3.25
Delaware	3.76	3.85	3.22	3.60	3.45	2.99	3.12	2.97
District of Columbia	—	—	—	—	—	—	—	—
Florida	2.93	3.21	2.84	2.99	2.88	2.85	2.76	2.76
Georgia	3.88	3.70	3.61	3.68	3.45	3.40	3.42	3.29
Hawaii	—	—	—	—	—	—	—	—
Idaho	4.12	4.05	4.26	4.20	4.77	5.31	5.19	4.52
Illinois	4.26	3.77	3.42	3.70	3.35	3.42	3.02	3.15
Indiana	4.10	4.76	3.75	4.13	4.56	2.88	3.38	3.16
Iowa	3.06	3.42	3.11	3.47	3.27	2.33	2.82	2.70
Kansas	3.05	2.64	2.36	2.20	2.27	2.15	2.53	2.34
Kentucky	4.17	4.07	3.44	3.54	3.52	3.25	3.46	3.42
Louisiana	2.29	2.34	1.99	2.23	2.03	1.94	1.87	1.80
Maine	5.00	5.07	4.51	6.11	4.00	3.51	3.73	3.61
Maryland	4.95	4.85	4.30	4.56	4.52	4.27	4.22	4.05
Massachusetts	5.57	5.57	4.03	5.16	3.80	2.93	3.05	3.41
Michigan	4.60	4.67	4.36	4.59	4.57	4.61	4.62	4.55
Minnesota	3.06	3.23	2.81	3.15	2.88	2.85	2.60	2.44
Mississippi	2.77	2.88	2.54	2.84	2.62	2.45	2.40	2.28
Missouri	4.21	4.20	3.81	3.94	3.79	3.83	3.84	3.72
Montana	2.99	3.80	3.08	3.49	3.65	3.09	2.55	2.49
Nebraska	3.35	3.30	2.85	3.10	3.03	2.99	2.60	2.76
Nevada	4.16	3.82	3.83	3.75	3.79	3.56	3.59	3.91
New Hampshire	4.86	4.91	3.72	4.91	4.49	3.08	3.11	3.01
New Jersey	4.59	4.34	3.87	4.05	4.07	3.61	3.57	3.51
New Mexico	4.12	4.03	3.39	4.32	3.60	3.69	3.26	3.30
New York	5.19	5.01	4.69	5.28	5.01	6.10	4.61	4.53
North Carolina	3.68	3.69	3.57	3.83	3.54	3.36	3.38	3.38
North Dakota	3.62	3.55	3.41	4.15	3.29	3.69	3.34	3.40
Ohio	4.44	4.46	4.10	4.30	4.34	4.18	3.86	3.97
Oklahoma	1.87	1.65	1.76	1.65	1.63	1.65	1.60	1.60
Oregon	4.19	3.56	3.72	3.93	3.82	3.65	3.47	3.69
Pennsylvania	3.94	3.83	3.63	3.71	3.55	3.40	3.34	3.34
Rhode Island	6.36	6.17	4.83	5.82	5.53	4.66	4.08	4.15
South Carolina	3.86	3.94	3.43	3.90	3.51	3.16	3.28	3.27
South Dakota	3.32	3.40	3.18	3.27	3.20	3.13	3.01	3.02
Tennessee	3.50	3.57	3.26	3.58	3.36	3.27	3.18	3.11
Texas	2.28	2.49	2.19	2.43	2.22	2.18	2.12	2.10
Utah	3.16	3.80	3.10	3.32	3.27	3.25	3.04	2.91
Vermont	2.65	3.31	2.97	2.72	2.72	2.81	2.86	3.02
Virginia	4.84	4.96	3.35	3.72	3.50	4.81	3.14	3.00
Washington	3.38	3.18	2.97	3.19	3.05	2.82	2.71	2.69
West Virginia	3.02	3.06	2.86	3.01	2.93	2.79	2.76	2.77
Wisconsin	4.38	4.36	4.08	4.02	4.09	4.20	3.89	3.81
Wyoming	3.34	3.41	3.36	3.20	3.23	3.37	3.96	3.64
Total	3.25	3.32	2.95	3.31	3.00	2.80	2.70	2.67

NA = Not Available.
— = Not Applicable.
Notes and Sources: See the last page of this section.

Table 31. Average Price of Natural Gas Delivered to Electric Utility[a] Consumers by State
(Dollars per Thousand Cubic Feet)

State	January 1990	Total 1989	December 1989	November 1989	October 1989	September 1989	August 1989	July 1989
Alabama	3.11	2.27	2.68	2.29	2.31	2.05	2.14	2.25
Alaska	NA	NA	NA	NA	NA	NA	NA	NA
Arizona	3.30	2.33	2.95	2.49	2.26	2.26	2.27	2.31
Arkansas	1.93	1.69	2.21	1.82	1.75	1.62	1.88	1.64
California	3.82	3.04	4.00	3.28	2.87	3.05	3.00	2.86
Colorado	2.37	2.28	2.26	2.78	2.81	2.27	2.37	2.40
Connecticut	6.27	2.59	6.23	2.67	2.56	2.37	2.46	3.11
Delaware	3.48	2.80	3.50	3.01	2.48	2.43	2.72	2.88
District of Columbia	—	—	—	—	—	—	—	—
Florida	3.29	2.49	2.99	2.42	2.52	2.21	2.30	2.59
Georgia	3.75	3.25	3.78	3.67	3.50	3.51	3.49	3.33
Hawaii	—	—	—	—	—	—	—	—
Idaho	—	—	—	—	—	—	—	—
Illinois	3.48	3.30	3.32	2.85	2.92	3.33	3.26	2.88
Indiana	3.25	2.71	3.37	2.61	2.23	2.52	2.32	2.38
Iowa	4.36	2.69	3.64	3.30	2.02	2.21	2.85	2.72
Kansas	2.33	1.93	2.35	2.33	2.31	2.05	1.70	1.70
Kentucky	3.37	2.72	3.14	2.84	2.76	2.50	2.61	2.49
Louisiana	2.01	1.77	2.03	1.66	1.69	1.71	1.79	1.86
Maine	—	—	—	—	—	—	—	—
Maryland	2.84	2.72	3.56	3.20	2.61	2.59	2.63	3.02
Massachusetts	5.13	2.50	6.08	2.77	2.45	2.32	2.42	2.46
Michigan	.31	.19	.22	.25	.19	.17	.20	.18
Minnesota	3.12	2.15	2.73	2.22	2.11	2.10	2.01	1.94
Mississippi	2.52	1.89	2.45	2.04	1.80	1.77	1.89	1.91
Missouri	3.19	2.42	3.25	2.39	2.42	1.94	2.24	2.40
Montana	1.40	1.39	1.53	1.49	1.25	2.26	1.42	1.62
Nebraska	3.35	2.27	3.14	2.06	1.79	2.23	2.32	2.19
Nevada	3.18	2.18	2.73	2.43	2.24	2.20	2.16	2.10
New Hampshire	—	NA	—	NA	NA	NA	NA	NA
New Jersey	3.78	2.56	2.88	2.93	2.49	2.40	2.43	2.47
New Mexico	2.71	2.20	2.70	2.28	2.12	2.05	2.16	2.27
New York	3.47	2.43	3.17	2.67	2.37	2.20	2.31	2.39
North Carolina	NA	NA	NA	NA	NA	NA	NA	NA
North Dakota	—	4.40	—	4.08	—	—	—	—
Ohio	4.14	3.43	4.07	3.84	3.85	3.04	3.29	2.73
Oklahoma	3.34	3.05	3.20	3.15	3.32	2.86	2.81	3.08
Oregon	NA	NA	NA	NA	NA	NA	NA	NA
Pennsylvania	3.34	3.57	3.59	3.63	3.57	3.21	2.93	3.25
Rhode Island	NA	2.49	—	2.61	2.48	2.34	2.39	2.41
South Carolina	4.37	2.34	2.97	2.44	2.23	2.19	2.19	2.23
South Dakota	NA	NA	NA	NA	NA	NA	NA	NA
Tennessee	—	NA	—	NA	—	NA	NA	NA
Texas	2.76	2.23	2.56	2.24	2.10	2.07	2.28	2.25
Utah	NA	NA	NA	NA	NA	NA	NA	NA
Vermont	NA	NA	NA	NA	—	—	—	—
Virginia	NA	2.64	6.34	6.53	6.79	1.78	2.69	2.45
Washington	NA	NA	NA	NA	NA	NA	NA	NA
West Virginia	4.76	4.59	4.81	5.09	4.48	4.72	4.60	4.60
Wisconsin	3.64	3.26	3.27	3.03	2.77	2.69	3.38	3.20
Wyoming	3.88	3.61	3.61	3.63	3.63	3.42	3.42	3.42
Total	3.01	2.43	2.85	2.56	2.39	2.35	2.38	2.41

See footnotes at end of table.

Table 31. Average Price of Natural Gas Delivered to Electric Utility[a] Consumers by State (Continued)
(Dollars per Thousand Cubic Feet)

State	June 1989	May 1989	April 1989	March 1989	February 1989	January 1989	Total 1988	December 1988
Alabama	2.23	2.07	2.08	2.21	2.56	2.34	2.13	2.14
Alaska	NA	—	NA	NA	NA	NA	1.34	NA
Arizona	2.31	2.22	2.15	2.09	2.19	2.84	2.31	2.50
Arkansas	1.54	1.40	1.50	1.59	1.47	1.21	1.39	1.10
California	2.95	3.17	2.75	2.89	2.92	3.33	2.94	3.65
Colorado	2.48	2.47	2.18	2.14	2.10	2.07	2.35	2.08
Connecticut	2.56	2.66	2.81	2.87	3.13	3.19	2.24	3.43
Delaware	3.91	3.01	2.61	2.56	2.72	3.28	2.57	3.09
District of Columbia	—	—	—	—	—	—	—	—
Florida	2.54	2.79	2.63	2.27	2.34	2.37	2.12	2.26
Georgia	2.84	3.39	2.76	3.60	3.62	3.35	2.76	3.50
Hawaii	—	—	—	—	—	—	—	—
Idaho	—	—	—	—	—	—	—	—
Illinois	3.61	3.47	3.00	3.26	3.96	3.30	3.32	3.36
Indiana	3.30	2.89	2.58	2.41	2.54	2.97	2.57	2.82
Iowa	2.59	2.24	2.61	2.84	3.19	3.49	2.01	3.26
Kansas	1.75	2.25	2.27	2.07	2.27	2.34	2.04	2.09
Kentucky	2.43	3.10	2.98	2.76	2.81	3.07	2.52	3.25
Louisiana	1.85	1.82	1.66	1.59	1.81	1.80	1.70	1.63
Maine	—	—	—	—	—	—	—	—
Maryland	2.68	2.83	2.60	2.64	3.67	3.41	2.67	3.86
Massachusetts	2.61	2.76	2.39	2.55	3.17	5.22	2.41	4.31
Michigan	.15	.18	.18	.20	.19	.20	.41	.28
Minnesota	2.09	2.05	1.78	2.08	2.53	2.87	2.03	2.59
Mississippi	1.93	1.84	1.68	1.67	1.96	2.23	1.90	2.28
Missouri	2.32	2.35	2.36	2.43	2.60	2.56	2.76	2.71
Montana	1.91	1.25	1.38	1.12	1.01	1.18	1.57	1.29
Nebraska	2.50	2.79	2.28	2.36	2.50	2.89	2.58	2.99
Nevada	2.28	2.19	1.72	2.09	2.00	2.15	2.79	2.07
New Hampshire	NA	—	—	NA	NA	NA	2.48	NA
New Jersey	2.51	2.64	2.58	2.62	3.24	3.08	2.34	3.02
New Mexico	2.23	2.20	1.93	2.02	2.23	2.47	2.19	2.39
New York	2.45	2.44	2.37	2.51	2.78	2.98	2.31	2.99
North Carolina	NA	—	NA	NA	NA	NA	3.48	NA
North Dakota	4.84	—	4.20	—	—	—	4.40	—
Ohio	3.22	2.67	3.70	4.33	4.23	4.21	3.53	4.18
Oklahoma	3.11	3.06	2.96	2.98	3.13	3.03	2.92	2.54
Oregon	NA	—	—	—	—	—	—	—
Pennsylvania	3.44	3.80	3.78	3.66	3.97	3.81	3.42	4.03
Rhode Island	2.58	2.76	2.73	—	—	—	2.15	—
South Carolina	2.22	3.96	2.31	2.26	4.30	3.94	2.09	3.90
South Dakota	NA	—	NA	NA	NA	NA	2.33	NA
Tennessee	—	—	—	—	—	—	2.46	—
Texas	2.19	2.12	2.13	2.14	2.24	2.48	2.16	2.39
Utah	NA	—	NA	NA	NA	NA	3.05	NA
Vermont	—	—	—	—	—	—	—	—
Virginia	2.37	2.81	2.74	1.33	2.34	2.04	2.08	5.06
Washington	NA	—	NA	NA	NA	NA	3.15	NA
West Virginia	4.55	4.52	4.76	4.45	4.31	4.76	3.86	4.76
Wisconsin	3.35	3.30	3.30	3.52	3.57	3.48	3.25	3.62
Wyoming	3.41	3.43	3.45	5.17	4.10	3.57	3.78	3.60
Total	2.40	2.39	2.31	2.32	2.44	2.64	2.34	2.57

See footnotes at end of table.

Table 31. Average Price of Natural Gas Delivered to Electric Utility[a] Consumers by State (Continued)

(Dollars per Thousand Cubic Feet)

State	November 1988	October 1988	September 1988	August 1988	July 1988	June 1988	May 1988	April 1988
Alabama	2.02	2.07	2.13	2.15	2.07	2.04	1.91	2.18
Alaska	NA	NA	NA	NA	NA	NA	NA	NA
Arizona	2.44	2.42	2.65	2.28	2.22	1.93	1.91	2.36
Arkansas	1.30	1.47	1.47	1.49	1.40	1.38	1.38	1.06
California	3.66	3.18	3.30	3.14	2.74	2.68	2.43	2.64
Colorado	2.77	2.38	3.09	2.59	2.49	2.23	2.33	2.52
Connecticut	2.72	2.72	2.60	2.21	2.34	2.22	2.15	2.24
Delaware	2.76	2.69	2.94	2.68	2.42	2.35	2.43	2.56
District of Columbia	—	—	—	—	—	—	—	—
Florida	2.18	1.70	2.08	2.08	2.30	2.14	1.99	2.04
Georgia	3.16	2.78	2.91	2.49	2.49	3.69	3.73	3.71
Hawaii	—	—	—	—	—	—	—	—
Idaho	—	—	—	—	—	—	—	—
Illinois	3.26	3.10	2.62	3.07	3.37	3.23	3.39	3.71
Indiana	2.53	2.59	2.38	2.10	2.02	2.55	3.01	3.22
Iowa	3.03	2.72	2.61	1.85	1.83	1.60	1.63	2.04
Kansas	2.10	1.90	2.15	1.98	1.99	1.93	1.99	2.09
Kentucky	2.83	2.53	2.49	2.17	2.51	2.86	3.10	3.00
Louisiana	1.82	1.73	1.83	1.75	1.69	1.62	1.54	1.52
Maine	—	—	—	—	—	—	—	—
Maryland	3.29	2.52	2.37	2.39	2.36	2.47	2.51	2.39
Massachusetts	2.67	2.84	2.55	2.36	2.13	2.16	2.29	2.41
Michigan	1.13	.44	.36	.37	.27	.31	.66	.44
Minnesota	2.07	2.25	2.24	1.92	1.74	1.73	1.47	2.58
Mississippi	1.97	1.93	2.02	1.91	1.80	1.76	1.80	1.92
Missouri	2.38	1.82	2.49	2.55	2.97	3.02	2.84	3.09
Montana	1.72	1.64	1.24	1.51	1.70	11.71	.94	1.67
Nebraska	2.43	2.27	2.66	2.69	2.30	2.52	2.57	2.79
Nevada	2.61	2.88	2.75	2.78	2.85	3.05	2.90	2.75
New Hampshire	NA	NA	—	NA	NA	NA	NA	NA
New Jersey	2.74	2.51	2.46	2.35	2.24	2.18	2.19	2.18
New Mexico	2.40	2.21	2.41	2.22	2.05	1.84	1.97	2.05
New York	2.56	2.35	2.37	2.23	2.14	2.17	2.15	2.31
North Carolina	NA	NA	NA	NA	NA	NA	NA	NA
North Dakota	4.42	4.37	4.26	NA	4.34	—	—	NA
Ohio	4.17	3.83	3.03	3.30	3.56	2.54	4.20	4.19
Oklahoma	3.15	3.01	2.90	3.03	2.94	2.92	2.95	2.99
Oregon	—	—	—	—	—	—	—	—
Pennsylvania	3.78	3.62	3.42	3.43	3.11	2.95	2.72	3.14
Rhode Island	—	—	—	—	2.11	2.16	2.16	—
South Carolina	3.33	3.49	3.56	3.07	1.85	1.74	1.72	3.68
South Dakota	NA	NA	NA	NA	NA	NA	NA	NA
Tennessee	—	—	NA	NA	NA	—	—	—
Texas	2.32	2.13	2.10	2.22	2.04	1.96	1.95	1.95
Utah	NA	NA	NA	NA	NA	NA	NA	NA
Vermont	—	—	—	—	—	—	—	—
Virginia	1.38	4.00	2.52	1.59	2.06	2.10	2.07	1.79
Washington	NA	NA	NA	NA	NA	NA	NA	NA
West Virginia	4.52	4.34	4.32	4.12	4.08	4.55	2.59	2.08
Wisconsin	3.78	3.31	3.45	3.05	2.91	2.87	3.20	2.85
Wyoming	4.03	4.75	4.10	2.96	3.41	3.68	3.82	3.50
Total	2.58	2.40	2.36	2.36	2.23	2.16	2.10	2.20

[a] Includes all steam electric utility generating plants with a combined capacity of 50 megawatts or greater.
[b] Average prices calculated from data reported on Form EIA-176.
NA = Not Available.
— = Not Applicable.
Notes and Sources: See the last page of this section.

Table 32. Average Price of Natural Gas Delivered to All Consumers by State

(Dollars per Thousand Cubic Feet)

State	January 1990	Total 1989	December 1989	November 1989	October 1989	September 1989	August 1989	July 1989
Alabama	4.92	4.53	4.77	4.66	4.46	4.43	1.71	4.40
Alaska	2.42	2.06	2.26	2.17	1.99	1.77	1.64	1.79
Arizona	5.12	4.07	4.63	3.88	3.89	3.44	3.06	3.27
Arkansas	4.10	3.63	3.88	3.60	3.57	3.75	1.44	3.26
California	5.00	4.27	4.82	4.29	3.74	3.84	3.07	3.75
Colorado	3.93	4.19	4.17	4.32	4.44	4.63	2.93	4.64
Connecticut	7.49	6.63	7.27	6.62	5.94	5.73	5.25	6.52
Delaware	4.98	4.27	4.92	4.33	3.67	3.47	3.10	3.59
District of Columbia	6.86	6.35	6.50	6.32	6.33	6.43	5.33	5.78
Florida	4.02	3.07	3.74	3.09	2.97	2.69	2.53	2.98
Georgia	5.55	5.43	5.32	5.66	5.76	5.55	2.17	5.74
Hawaii	12.57	12.32	12.43	12.71	12.40	12.53	12.65	12.81
Idaho	4.16	4.63	4.45	4.83	4.97	5.05	5.42	5.21
Illinois	4.67	4.66	4.40	4.34	4.57	5.08	2.61	5.10
Indiana	5.37	5.02	4.61	4.53	4.60	5.03	1.65	4.86
Iowa	4.70	4.02	4.37	4.00	3.66	3.81	2.34	3.90
Kansas	3.96	3.49	3.96	3.75	3.86	3.32	2.83	2.92
Kentucky	4.54	4.48	4.25	4.47	4.70	5.16	5.20	4.95
Louisiana	3.01	2.30	2.82	2.30	2.07	2.07	2.09	2.11
Maine	6.41	5.80	6.36	5.95	5.56	5.42	5.20	5.09
Maryland	5.62	5.42	5.54	5.82	5.02	5.63	3.10	5.46
Massachusetts	6.80	5.43	7.03	6.07	3.84	3.92	3.87	3.99
Michigan	4.49	4.86	4.52	4.72	5.23	5.71	3.89	5.41
Minnesota	4.69	4.08	4.29	3.96	3.83	3.94	2.29	3.85
Mississippi	3.99	3.07	3.69	3.27	2.61	2.48	1.61	2.45
Missouri	4.67	4.60	4.55	4.70	4.90	5.20	3.98	5.34
Montana	4.13	4.05	4.15	4.17	3.86	3.80	3.66	3.42
Nebraska	4.42	3.97	4.15	3.91	3.80	3.90	2.63	3.54
Nevada	4.46	3.82	4.37	4.02	3.60	3.31	3.06	3.07
New Hampshire	6.48	6.16	6.56	6.65	5.49	5.42	5.78	5.71
New Jersey	5.60	5.35	5.83	5.65	5.31	4.94	3.84	4.53
New Mexico	4.48	3.99	4.37	3.97	3.67	3.46	2.48	3.65
New York	6.12	5.58	6.33	5.98	4.92	4.50	3.68	4.47
North Carolina	4.83	4.82	5.12	4.51	4.63	4.60	4.56	4.50
North Dakota	4.26	4.40	4.25	4.34	4.79	4.77	5.34	5.09
Ohio	5.02	5.13	4.80	4.99	5.07	5.63	5.70	5.73
Oklahoma	3.34	3.10	3.27	3.10	3.22	2.89	2.90	3.03
Oregon	5.24	5.18	5.31	5.18	4.90	4.99	5.07	5.15
Pennsylvania	5.87	5.65	5.75	5.89	6.13	6.31	6.30	6.33
Rhode Island	6.75	6.42	6.69	6.46	5.46	6.15	5.55	5.72
South Carolina	5.54	4.42	5.55	4.31	3.78	3.60	2.09	3.47
South Dakota	4.65	4.30	4.43	4.15	4.14	4.47	4.64	4.56
Tennessee	4.55	4.11	4.44	4.15	3.91	3.91	3.84	3.90
Texas	3.60	2.76	3.32	2.80	2.55	2.38	1.42	2.52
Utah	4.73	4.67	4.78	4.92	5.09	4.88	5.08	4.69
Vermont	4.85	4.51	4.92	4.39	4.13	4.26	4.37	4.46
Virginia	5.67	5.75	5.90	5.74	6.14	6.04	6.25	5.50
Washington	4.18	4.28	4.25	4.49	3.93	4.06	3.86	3.94
West Virginia	5.74	5.47	5.96	5.74	5.53	6.00	1.43	6.18
Wisconsin	4.94	5.14	4.88	5.09	4.97	5.34	1.92	5.39
Wyoming	4.49	4.44	4.39	4.50	4.54	4.68	1.63	4.78
Total	4.76	4.18	4.58	4.24	3.83	3.60	3.53	3.52

See footnotes at end of table.

Table 32. Average Price of Natural Gas Delivered to All Consumers by State (Continued)
(Dollars per Thousand Cubic Feet)

State	June 1989	May 1989	April 1989	March 1989	February 1989	January 1989	Total 1988	December 1988
Alabama	4.22	4.33	4.39	4.34	4.83	4.60	4.53	4.73
Alaska	1.83	1.91	2.11	2.13	2.42	2.24	1.77	2.17
Arizona	3.67	3.78	3.57	4.53	5.17	5.14	4.75	5.31
Arkansas	3.52	3.88	3.54	3.53	3.83	3.99	3.67	3.99
California	3.97	4.23	3.92	4.36	4.78	5.06	4.20	5.19
Colorado	4.57	4.32	4.14	4.07	4.02	3.95	4.04	3.78
Connecticut	6.27	6.06	6.57	6.75	6.94	6.90	6.25	6.70
Delaware	4.20	4.28	4.08	4.51	4.78	5.09	4.22	4.90
District of Columbia	5.14	5.98	6.24	6.79	6.50	6.60	6.07	6.49
Florida	2.99	3.20	3.18	3.01	3.17	3.25	2.92	3.42
Georgia	5.47	5.53	5.27	5.38	5.42	5.20	5.24	4.99
Hawaii	12.96	12.34	12.42	11.98	11.42	11.33	12.41	11.90
Idaho	5.07	5.03	4.91	4.53	4.39	4.36	4.99	4.45
Illinois	4.99	4.76	4.73	4.90	4.79	4.51	4.35	4.34
Indiana	4.70	5.48	5.42	5.32	5.12	5.43	4.73	4.96
Iowa	3.84	3.77	3.78	3.88	4.15	4.37	4.09	4.18
Kansas	3.18	3.63	3.45	3.56	3.55	3.45	3.18	3.35
Kentucky	4.79	4.67	4.51	4.40	4.38	4.38	4.20	4.19
Louisiana	2.12	2.07	2.16	2.37	2.74	2.78	2.29	2.68
Maine	5.37	5.49	5.79	5.97	5.96	6.00	5.80	6.31
Maryland	5.04	5.13	5.04	5.45	5.73	5.61	5.31	5.42
Massachusetts	4.32	4.71	5.45	6.18	6.63	6.58	5.63	6.76
Michigan	5.21	4.86	4.78	4.80	4.80	4.83	5.05	5.08
Minnesota	3.93	3.88	3.85	3.96	4.18	4.36	4.05	4.22
Mississippi	2.58	2.62	3.06	3.53	4.04	4.06	3.40	3.98
Missouri	5.22	4.86	4.51	4.38	4.39	4.36	4.44	4.35
Montana	3.96	3.92	4.07	4.11	4.15	4.23	4.04	4.01
Nebraska	4.12	3.93	3.78	3.88	4.09	4.20	3.88	4.03
Nevada	3.68	3.70	3.48	4.16	4.38	4.37	4.57	4.48
New Hampshire	5.45	5.44	6.15	6.40	6.40	6.33	5.64	6.42
New Jersey	4.53	5.20	5.25	5.40	5.73	5.55	5.18	5.46
New Mexico	3.77	3.77	3.82	4.00	4.26	4.46	3.68	4.11
New York	4.70	4.92	5.31	6.26	6.26	6.31	5.26	6.23
North Carolina	4.51	4.61	4.84	5.00	4.96	4.95	4.67	5.05
North Dakota	4.81	4.62	4.33	4.27	4.29	4.30	4.70	4.36
Ohio	5.49	5.13	5.23	5.10	5.20	5.21	4.98	5.07
Oklahoma	3.01	3.02	3.06	3.17	3.22	3.11	3.15	2.84
Oregon	5.08	5.09	5.11	5.14	5.24	5.52	5.50	5.91
Pennsylvania	5.69	5.61	5.54	5.43	5.42	5.39	5.18	5.33
Rhode Island	6.17	6.27	6.57	6.78	6.90	6.49	6.14	6.46
South Carolina	3.50	4.17	4.32	4.95	5.37	5.36	4.50	5.18
South Dakota	4.39	4.27	4.14	4.14	4.27	4.47	4.34	4.36
Tennessee	3.89	3.86	4.01	4.08	4.24	4.22	3.97	4.23
Texas	2.53	2.51	2.64	2.86	3.10	3.24	2.69	3.12
Utah	4.47	4.61	4.74	4.60	4.49	4.54	4.47	4.55
Vermont	4.47	4.54	4.48	4.49	4.56	4.49	4.47	4.45
Virginia	4.88	5.36	5.40	5.85	5.96	5.79	4.82	5.35
Washington	4.15	4.22	4.34	4.40	4.56	4.45	4.19	4.51
West Virginia	6.03	5.50	5.23	5.18	5.10	5.09	5.11	4.92
Wisconsin	5.15	5.07	5.14	5.17	5.29	5.24	5.19	5.15
Wyoming	4.52	4.42	4.42	4.36	4.35	4.36	4.18	4.15
Total	3.67	3.91	4.13	4.42	4.58	4.65	4.09	4.55

See footnotes at end of table.

Table 32. Average Price of Natural Gas Delivered to All Consumers by State (Continued)
(Dollars per Thousand Cubic Feet)

State	November 1988	October 1988	September 1988	August 1988	July 1988	June 1988	May 1988	April 1988
Alabama	4.41	4.35	4.15	4.00	3.92	4.22	4.35	4.52
Alaska	2.17	1.89	1.81	1.74	1.67	1.72	1.88	2.08
Arizona	5.53	4.63	4.63	3.46	3.73	4.15	4.50	5.30
Arkansas	3.97	3.39	3.38	3.00	3.21	2.83	2.86	4.08
California	4.47	3.94	3.92	3.91	3.55	3.99	4.13	3.75
Colorado	4.06	4.34	4.55	4.55	4.65	4.28	4.13	4.07
Connecticut	6.17	5.91	5.92	5.25	5.59	5.59	5.87	6.20
Delaware	4.60	4.05	3.89	3.47	3.58	3.44	4.08	4.06
District of Columbia	6.46	6.18	5.88	5.15	5.24	5.80	6.19	6.33
Florida	3.36	2.83	2.66	2.57	2.73	2.66	2.62	2.83
Georgia	4.95	5.41	5.13	4.89	4.86	5.15	5.20	5.19
Hawaii	12.13	12.30	12.40	12.60	12.73	12.50	12.27	12.59
Idaho	4.88	5.22	5.56	5.56	5.53	5.35	5.60	5.41
Illinois	4.28	4.35	4.72	4.73	4.86	4.80	4.72	4.79
Indiana	5.06	3.70	4.69	4.72	4.93	5.04	5.80	5.37
Iowa	4.06	3.66	3.88	3.51	3.72	3.80	3.87	4.06
Kansas	3.34	3.23	3.09	2.69	2.79	2.87	3.15	3.22
Kentucky	4.20	4.34	4.61	4.48	4.65	4.55	4.32	4.19
Louisiana	2.41	2.25	2.12	2.00	1.96	1.97	2.03	2.30
Maine	5.39	4.94	4.98	4.86	5.21	5.23	5.57	6.26
Maryland	5.57	5.76	5.50	5.06	5.38	5.45	5.72	5.52
Massachusetts	5.92	4.82	4.74	4.03	4.20	4.02	4.97	6.05
Michigan	5.28	5.44	6.10	5.64	5.51	5.47	5.16	4.94
Minnesota	4.02	4.03	3.86	3.54	3.57	3.60	3.80	3.98
Mississippi	3.45	3.05	2.73	2.45	2.36	2.64	3.10	3.74
Missouri	4.47	4.79	4.96	4.83	4.96	4.85	4.65	4.46
Montana	4.15	3.79	3.73	3.47	3.62	3.84	4.00	3.96
Nebraska	3.95	3.92	3.69	3.67	3.59	3.57	3.85	3.93
Nevada	4.91	4.83	4.31	4.01	4.06	4.49	4.61	4.74
New Hampshire	6.48	4.86	5.05	4.86	4.87	5.01	5.00	5.74
New Jersey	5.52	5.67	5.80	4.23	4.16	4.42	5.00	5.17
New Mexico	4.04	3.74	4.04	3.42	3.39	3.37	3.48	3.47
New York	6.01	5.82	4.85	4.20	4.14	4.46	4.72	5.28
North Carolina	4.66	4.23	4.20	4.18	4.34	4.34	4.38	4.36
North Dakota	4.55	4.84	5.29	5.30	5.17	4.95	4.74	4.58
Ohio	5.09	5.13	5.46	5.63	5.59	5.55	5.21	4.99
Oklahoma	2.98	2.89	2.82	2.99	2.95	2.99	3.26	3.42
Oregon	5.75	5.57	5.46	5.60	5.63	5.64	5.68	5.55
Pennsylvania	5.33	5.41	5.43	5.41	5.52	5.45	5.20	5.10
Rhode Island	6.37	6.17	5.94	5.75	5.94	5.74	5.92	5.89
South Carolina	4.52	3.89	4.11	3.83	3.69	3.39	3.26	4.43
South Dakota	4.34	4.39	4.49	4.58	4.51	4.43	4.22	4.23
Tennessee	4.08	3.93	3.80	3.75	3.79	3.78	3.76	3.87
Texas	2.78	2.54	2.43	2.45	2.35	2.33	2.38	2.55
Utah	4.69	4.66	4.37	4.43	4.50	4.18	4.30	4.58
Vermont	4.38	4.22	4.09	4.21	4.24	4.28	4.51	4.53
Virginia	5.03	5.59	4.81	4.35	4.44	4.42	4.54	4.78
Washington	4.42	4.04	3.85	3.80	3.92	4.12	3.85	4.26
West Virginia	5.11	5.15	5.48	5.53	5.62	5.65	5.22	5.11
Wisconsin	5.22	5.01	5.43	5.29	5.36	5.25	5.25	4.89
Wyoming	4.27	4.37	4.71	4.66	4.57	4.45	4.13	4.02
Total	4.31	3.94	3.60	3.39	3.36	3.54	3.84	4.10

Notes and Sources: See the last page of this section.

Table 33. Percentage of Total Deliveries Represented by Onsystem Sales

State	February 1990		January 1990		Total 1989		December 1989	
	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial
Alabama	80.4	40.0	85.5	31.6	81.2	35.3	83.4	40.3
Alaska	100.0	60.3	100.0	57.8	100.0	54.9	100.0	51.4
Arizona	96.1	58.0	96.2	62.3	93.3	44.3	95.1	57.3
Arkansas	94.4	13.9	96.0	18.3	93.0	16.9	92.9	20.5
California	97.2	47.8	97.8	70.3	95.4	57.5	94.8	67.4
Colorado	98.0	45.5	98.1	50.6	97.3	29.4	97.2	22.3
Connecticut	100.0	98.5	100.0	99.7	91.5	91.1	99.5	100.0
Delaware	100.0	72.2	100.0	78.2	100.0	75.6	100.0	74.1
District of Columbia	100.0	—	100.0	—	100.0	—	100.0	—
Florida	100.0	72.5	100.0	72.4	100.0	74.4	100.0	74.7
Georgia	89.8	25.3	96.3	58.2	89.4	33.4	96.5	56.8
Hawaii	100.0	—	100.0	—	100.0	—	100.0	—
Idaho	90.4	.6	91.5	8.8	87.5	2.5	87.4	2.9
Illinois	67.6	31.4	66.6	28.5	67.4	29.3	72.7	36.5
Indiana	83.2	30.8	89.2	31.1	93.0	21.0	88.8	33.4
Iowa	98.2	41.2	98.5	44.5	97.9	41.7	98.3	26.9
Kansas	90.0	19.0	91.9	21.4	92.4	21.1	92.4	24.9
Kentucky	96.2	21.8	96.3	40.1	94.6	21.6	96.8	30.6
Louisiana	100.0	42.1	99.5	46.2	100.0	50.9	100.0	45.0
Maine	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Maryland	97.2	59.9	98.3	58.7	96.3	31.8	97.0	44.8
Massachusetts	100.0	91.8	100.0	94.2	100.0	98.8	100.0	99.6
Michigan	72.4	20.7	88.4	35.2	84.6	28.0	89.4	34.3
Minnesota	98.3	39.6	98.6	52.9	97.8	45.7	98.7	53.5
Mississippi	100.0	51.4	100.0	52.0	100.0	54.0	100.0	59.5
Missouri	91.4	46.3	94.1	55.1	92.1	55.6	92.2	57.1
Montana	97.8	73.3	97.9	56.5	97.8	73.9	97.8	59.5
Nebraska	72.7	45.7	73.7	59.6	94.5	40.4	74.8	57.0
Nevada	99.4	21.8	99.1	32.4	96.0	13.1	98.8	15.8
New Hampshire	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
New Jersey	98.8	74.2	99.4	81.9	98.5	59.8	99.7	83.3
New Mexico	83.4	9.1	85.5	8.6	82.2	16.0	81.2	15.5
New York	93.3	60.0	92.4	58.2	86.2	45.3	90.5	58.1
North Carolina	98.9	91.1	99.1	97.4	93.9	64.1	98.7	85.9
North Dakota	85.1	27.5	86.5	24.9	83.1	33.3	83.3	35.2
Ohio	88.9	12.8	89.2	20.1	86.2	14.4	89.5	18.6
Oklahoma	92.0	57.1	94.2	71.3	82.3	58.8	88.5	74.9
Oregon	98.5	18.2	98.2	26.6	98.2	16.8	98.0	14.5
Pennsylvania	83.2	28.9	85.6	31.7	84.4	26.5	85.2	35.4
Rhode Island	100.0	100.0	100.0	100.0	83.8	82.2	100.0	100.0
South Carolina	98.0	85.6	98.3	79.5	97.7	79.4	96.7	91.6
South Dakota	92.1	63.1	92.5	76.0	92.1	66.7	92.0	69.7
Tennessee	98.2	63.3	98.7	65.5	97.9	58.7	99.0	62.9
Texas	94.6	30.9	95.3	32.4	92.1	31.6	93.6	29.2
Utah	100.0	23.9	100.0	24.9	88.9	30.6	100.0	23.8
Vermont	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Virginia	95.6	20.9	96.8	18.2	96.7	13.8	97.6	11.4
Washington	95.9	63.9	96.2	63.9	89.0	62.2	96.5	55.8
West Virginia	63.6	14.8	70.2	17.6	57.8	9.3	68.3	12.2
Wisconsin	91.2	49.1	91.0	57.4	92.3	34.2	95.0	54.3
Wyoming	99.8	18.3	99.8	23.8	99.9	17.4	99.6	16.8
Total	89.8	38.4	91.8	43.5	89.9	38.9	91.2	41.0

See footnotes at end of table.

Table 33. Percentage of Total Deliveries Represented by Onsystem Sales (Continued)

State	November 1989		October 1989		September 1989		August 1989	
	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial
Alabama	75.2	29.9	82.0	30.6	75.9	30.2	81.0	31.7
Alaska	100.0	61.1	100.0	47.8	100.0	48.3	100.0	47.5
Arizona	93.9	55.4	90.2	44.0	91.3	51.3	88.7	49.4
Arkansas	90.1	15.7	87.0	12.8	88.2	17.0	86.1	13.7
California	97.6	40.5	94.7	91.2	94.9	54.0	94.4	45.9
Colorado	96.9	23.3	95.6	30.2	95.7	29.5	91.8	37.5
Connecticut	90.8	95.9	86.2	76.2	76.2	56.5	80.4	88.5
Delaware	100.0	68.9	100.0	68.0	100.0	63.9	100.0	66.0
District of Columbia	100.0	—	100.0	—	100.0	—	100.0	—
Florida	100.0	68.7	100.0	71.8	100.0	71.3	100.0	74.4
Georgia	88.5	33.4	85.2	27.2	81.7	27.4	78.7	26.9
Hawaii	100.0	—	100.0	—	100.0	—	100.0	—
Idaho	84.6	3.6	79.3	2.3	84.1	2.1	83.0	2.0
Illinois	66.8	30.2	62.4	27.3	60.3	22.8	45.3	21.5
Indiana	94.0	21.8	92.3	16.6	89.6	14.7	97.0	16.4
Iowa	97.6	48.3	96.6	49.3	95.2	41.6	95.1	41.8
Kansas	87.5	18.8	88.2	17.5	91.2	21.5	94.4	25.9
Kentucky	93.8	14.6	89.9	13.6	89.5	10.4	87.4	13.1
Louisiana	100.0	45.6	100.0	52.4	100.0	51.0	100.0	49.6
Maine	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Maryland	95.7	30.7	93.9	23.6	93.5	20.0	94.5	18.2
Massachusetts	100.0	97.7	100.0	100.0	100.0	100.0	100.0	100.0
Michigan	85.6	25.4	84.7	23.0	76.1	18.1	71.5	15.6
Minnesota	98.0	43.2	96.9	43.4	96.5	33.0	95.6	31.5
Mississippi	100.0	52.9	100.0	53.1	100.0	56.1	100.0	51.2
Missouri	90.1	55.4	88.3	49.2	86.7	51.1	90.3	50.3
Montana	97.6	61.5	97.2	57.1	95.8	60.7	95.8	75.5
Nebraska	97.8	51.9	98.7	66.7	99.5	28.4	99.6	35.6
Nevada	97.1	9.0	96.0	13.3	91.0	8.2	91.5	12.9
New Hampshire	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
New Jersey	99.5	70.7	95.9	52.9	96.2	49.7	96.5	45.0
New Mexico	78.7	12.6	79.7	15.4	72.2	20.4	74.5	26.7
New York	83.6	45.3	76.2	41.3	74.6	33.9	80.1	39.8
North Carolina	97.9	85.0	86.2	44.1	84.1	42.7	83.5	43.8
North Dakota	77.9	27.9	76.7	20.7	71.4	27.3	64.9	28.9
Ohio	86.6	13.5	83.8	13.4	78.1	12.5	74.8	12.2
Oklahoma	81.5	70.7	75.8	68.0	73.7	69.2	64.6	71.3
Oregon	97.3	14.9	96.6	14.0	97.4	11.5	97.2	16.4
Pennsylvania	80.9	28.6	78.7	20.9	73.6	19.0	74.8	17.7
Rhode Island	100.0	88.8	82.7	87.4	44.6	67.6	40.3	71.0
South Carolina	97.6	83.7	97.3	71.6	97.2	76.6	97.1	75.4
South Dakota	91.1	64.1	89.6	62.7	90.0	61.6	89.4	59.8
Tennessee	98.5	59.2	96.4	56.6	96.3	60.6	95.0	54.0
Texas	91.0	30.4	86.7	40.2	85.4	31.3	91.5	28.1
Utah	100.0	23.7	100.0	23.2	100.0	23.9	100.0	23.1
Vermont	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Virginia	95.9	11.2	92.4	7.2	94.9	7.4	93.4	5.5
Washington	93.5	54.4	93.1	66.9	78.2	62.9	92.7	67.3
West Virginia	54.7	8.6	45.8	7.2	37.0	7.8	36.0	7.6
Wisconsin	91.0	33.8	81.5	22.7	83.1	19.5	82.7	17.1
Wyoming	99.6	12.3	99.5	13.4	99.8	13.1	100.0	13.3
Total	89.2	36.9	86.8	43.1	86.0	36.4	86.8	34.6

See footnotes at end of table.

Table 33. Percentage of Total Deliveries Represented by Onsystem Sales (Continued)

State	July 1989		June 1989		May 1989		April 1989	
	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial
Alabama	51.1	34.3	84.0	35.0	81.3	33.6	89.0	35.5
Alaska	100.0	44.1	100.0	54.9	100.0	60.2	100.0	50.7
Arizona	88.8	49.1	91.4	45.6	92.5	44.9	93.3	43.3
Arkansas	87.4	11.6	91.7	14.7	90.4	15.0	94.7	13.9
California	94.1	49.0	97.3	58.0	97.3	48.1	90.6	52.6
Colorado	94.9	33.9	97.2	27.2	97.2	28.1	97.8	30.3
Connecticut	76.0	78.6	76.4	88.7	81.6	89.3	90.0	92.3
Delaware	100.0	78.1	100.0	76.4	100.0	82.9	100.0	83.8
District of Columbia	100.0	—	100.0	—	100.0	—	100.0	—
Florida	100.0	71.1	100.0	70.0	100.0	75.9	100.0	74.0
Georgia	79.2	24.7	80.3	28.2	84.1	27.7	87.2	30.8
Hawaii	100.0	—	100.0	—	100.0	—	100.0	—
Idaho	86.7	2.1	85.8	1.8	82.8	1.8	89.0	1.9
Illinois	47.7	20.7	57.5	24.1	65.4	25.2	68.0	27.5
Indiana	97.2	18.6	97.6	28.2	93.3	13.8	93.3	16.4
Iowa	95.5	43.9	96.3	40.5	97.0	43.0	98.0	40.3
Kansas	93.3	19.5	88.5	18.6	92.5	17.7	94.3	20.5
Kentucky	88.7	22.9	88.8	20.1	90.4	21.8	94.7	21.4
Louisiana	100.0	56.1	100.0	55.6	100.0	55.7	100.0	54.2
Maine	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Maryland	94.1	16.1	94.7	21.4	95.7	27.5	96.6	35.5
Massachusetts	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Michigan	73.6	15.1	72.7	17.9	82.0	25.3	84.6	31.6
Minnesota	95.6	31.9	95.5	41.1	97.6	47.7	97.9	51.0
Mississippi	100.0	55.3	100.0	49.9	100.0	53.9	100.0	50.7
Missouri	85.8	50.7	85.5	50.2	90.5	53.0	93.0	55.7
Montana	95.9	84.9	96.4	89.7	97.1	85.5	98.4	83.8
Nebraska	99.7	26.2	99.0	29.4	99.4	35.6	99.5	40.3
Nevada	92.5	10.3	94.2	10.6	94.1	10.7	94.9	12.7
New Hampshire	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
New Jersey	96.9	45.1	97.2	52.5	97.5	51.7	98.3	57.6
New Mexico	72.1	19.8	76.5	19.9	80.5	26.7	80.4	14.7
New York	79.1	31.8	81.2	33.9	85.2	40.0	85.5	41.1
North Carolina	78.6	48.2	87.4	48.5	89.7	53.3	92.7	65.4
North Dakota	69.2	29.7	74.8	27.3	80.6	31.8	86.4	42.5
Ohio	75.4	11.9	76.8	11.2	81.7	12.3	86.4	13.2
Oklahoma	71.2	70.5	75.2	48.8	79.6	46.9	81.5	46.6
Oregon	97.0	12.5	97.5	13.6	97.5	17.5	98.3	14.5
Pennsylvania	77.8	17.0	75.9	19.7	81.4	22.4	85.4	23.2
Rhode Island	48.9	69.6	47.6	67.5	83.9	71.1	87.1	82.0
South Carolina	97.7	84.4	97.7	85.7	97.7	68.9	98.0	76.8
South Dakota	90.2	61.7	91.6	60.2	92.5	62.8	92.2	71.3
Tennessee	96.1	54.1	95.2	52.9	96.3	63.9	97.0	58.1
Texas	91.8	29.7	88.6	33.0	89.5	30.5	92.5	31.5
Utah	100.0	28.9	100.0	26.4	100.0	29.2	100.0	31.7
Vermont	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Virginia	93.2	6.2	95.9	14.4	96.0	8.0	96.8	26.8
Washington	87.1	62.2	89.9	65.5	76.4	62.7	71.6	65.2
West Virginia	36.3	7.2	41.7	7.4	51.3	7.4	60.3	10.5
Wisconsin	85.1	19.4	86.6	24.0	92.1	31.1	93.8	33.7
Wyoming	100.0	14.2	100.0	19.2	100.0	25.3	100.0	16.1
Total	86.2	36.1	87.9	38.5	88.9	37.1	89.6	38.0

See footnotes at end of table.

Table 33. Percentage of Total Deliveries Represented by Onsystem Sales (Continued)

State	March 1989		February 1989		January 1989		Total 1988	
	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial
Alabama	87.7	39.7	91.9	46.5	75.0	36.9	91.0	50.0
Alaska	100.0	61.5	100.0	58.9	100.0	72.1	100.0	54.5
Arizona	93.9	31.3	96.1	32.5	95.9	29.5	95.3	29.0
Arkansas	96.1	14.8	95.4	18.5	95.4	19.7	93.7	24.2
California	95.5	53.6	98.9	60.9	93.2	64.7	95.6	63.0
Colorado	98.3	26.8	98.1	32.5	98.0	33.4	97.7	38.9
Connecticut	98.4	95.8	100.0	100.0	100.0	100.0	98.1	97.6
Delaware	100.0	83.5	100.0	79.2	100.0	75.9	100.0	79.1
District of Columbia	100.0	—	100.0	—	100.0	—	100.0	—
Florida	100.0	78.0	100.0	80.0	100.0	79.6	100.0	76.0
Georgia	88.8	34.3	93.0	39.3	96.3	49.8	93.8	46.2
Hawaii	100.0	—	100.0	—	100.0	—	100.0	—
Idaho	90.6	2.6	90.2	3.3	88.8	3.2	85.9	3.6
Illinois	68.2	30.4	71.9	36.0	69.4	36.8	76.7	34.7
Indiana	94.7	19.2	94.1	26.9	94.2	23.4	95.1	23.2
Iowa	98.5	44.2	98.4	45.8	98.4	43.8	98.2	40.2
Kansas	93.2	21.6	93.4	21.5	93.7	21.8	96.4	37.0
Kentucky	96.3	23.1	96.3	25.2	96.9	34.8	95.7	37.7
Louisiana	100.0	51.1	100.0	48.1	100.0	53.7	99.9	57.4
Maine	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Maryland	97.2	39.7	96.7	41.7	97.4	47.1	96.9	37.8
Massachusetts	100.0	100.0	100.0	93.1	100.0	92.8	99.9	99.1
Michigan	85.1	33.8	84.9	34.0	86.3	35.0	71.6	19.9
Minnesota	98.1	52.8	98.1	55.7	98.0	55.2	96.8	55.8
Mississippi	100.0	58.6	100.0	57.8	100.0	49.5	100.0	56.0
Missouri	94.3	61.6	93.8	61.5	94.2	63.5	96.2	70.3
Montana	98.6	89.0	98.7	90.0	98.1	74.5	99.8	86.8
Nebraska	96.8	40.2	96.4	44.0	96.7	46.9	97.7	51.1
Nevada	96.8	16.1	98.1	22.3	97.9	17.8	95.1	31.2
New Hampshire	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
New Jersey	98.9	61.6	99.0	74.7	99.5	77.6	98.4	65.1
New Mexico	87.0	2.0	84.1	10.0	88.7	8.3	92.6	21.0
New York	89.9	52.8	90.6	51.4	90.9	56.8	89.3	48.0
North Carolina	95.0	72.2	99.3	94.4	99.1	94.3	95.6	82.2
North Dakota	87.7	37.5	88.5	39.4	85.9	39.2	92.7	43.4
Ohio	87.6	15.6	87.8	16.5	87.7	17.5	87.1	18.6
Oklahoma	87.1	48.0	84.5	54.6	82.7	51.6	74.4	40.0
Oregon	98.7	24.6	99.1	31.9	99.1	26.6	98.8	34.5
Pennsylvania	88.3	31.1	88.0	38.4	88.7	38.5	90.2	41.1
Rhode Island	100.0	100.0	100.0	100.0	100.0	100.0	87.0	85.1
South Carolina	98.3	75.5	98.1	77.4	98.1	95.5	99.1	80.2
South Dakota	92.8	73.6	93.1	74.0	92.8	69.9	96.1	69.4
Tennessee	98.7	62.5	98.7	62.3	99.0	62.8	97.4	67.8
Texas	95.1	34.7	95.1	32.5	94.3	31.4	87.5	29.7
Utah	100.0	30.7	100.0	39.2	61.4	100.0	100.0	46.9
Vermont	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Virginia	97.9	23.5	98.1	25.6	98.0	20.7	97.6	51.3
Washington	90.1	63.7	94.9	63.8	95.6	62.8	97.2	68.8
West Virginia	61.7	9.0	65.6	13.3	65.2	13.1	60.2	17.2
Wisconsin	94.4	38.8	94.0	40.8	94.0	42.0	93.3	35.4
Wyoming	100.0	22.2	100.0	22.4	100.0	19.1	100.0	22.1
Total	91.4	40.1	92.2	41.3	91.2	42.9	90.7	42.6

See footnotes at end of table.

Table 33. Percentage of Total Deliveries Represented by Onsystem Sales (Continued)

State	December 1988		November 1988		October 1988		September 1988	
	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial
Alabama	90.2	43.5	91.0	49.3	90.8	46.7	91.1	46.8
Alaska	100.0	59.7	100.0	58.3	100.0	58.3	100.0	55.3
Arizona	95.3	25.7	95.3	23.6	95.3	21.5	95.3	24.3
Arkansas	93.7	26.5	93.5	26.0	93.4	20.5	93.4	20.5
California	95.0	64.6	95.1	61.9	95.4	65.6	95.7	66.3
Colorado	97.7	36.6	97.6	37.8	97.6	38.8	97.6	40.3
Connecticut	98.1	97.7	98.1	97.6	98.1	97.6	98.1	97.5
Delaware	100.0	78.7	100.0	78.5	100.0	78.0	100.0	79.3
District of Columbia	100.0	—	100.0	—	100.0	—	100.0	—
Florida	100.0	76.6	100.0	75.2	100.0	74.9	100.0	75.0
Georgia	93.9	53.4	93.6	45.9	93.6	42.2	93.3	41.3
Hawaii	100.0	—	100.0	—	100.0	—	100.0	—
Idaho	86.0	3.7	85.3	2.5	84.9	1.9	84.9	2.0
Illinois	76.3	32.2	76.0	36.0	77.1	33.3	73.1	25.4
Indiana	95.1	27.3	95.3	22.2	95.0	23.1	94.9	17.9
Iowa	98.2	42.6	98.2	39.3	98.2	41.9	98.2	42.8
Kansas	96.2	27.1	96.2	26.4	96.1	26.5	96.3	33.3
Kentucky	95.8	40.4	95.7	36.9	95.7	33.9	95.6	35.7
Louisiana	99.9	54.4	99.9	55.8	99.9	57.9	99.9	58.4
Maine	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Maryland	96.9	39.6	96.8	36.7	96.8	29.9	96.8	25.9
Massachusetts	99.9	99.1	99.9	99.1	99.9	99.1	99.9	99.2
Michigan	72.4	22.4	71.9	19.6	67.9	15.5	64.3	12.7
Minnesota	96.8	55.5	96.8	56.0	96.7	54.8	96.8	54.8
Mississippi	100.0	53.4	100.0	58.2	100.0	55.3	100.0	57.7
Missouri	96.0	68.4	96.0	68.1	96.0	64.2	95.9	64.8
Montana	99.8	86.6	99.8	85.3	99.8	86.4	99.8	86.1
Nebraska	97.7	49.2	97.7	47.1	97.6	49.2	97.6	52.3
Nevada	94.9	16.2	94.9	26.8	95.0	30.6	94.9	30.9
New Hampshire	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
New Jersey	98.4	69.0	98.4	62.5	98.4	59.1	98.4	60.4
New Mexico	92.6	15.9	92.7	16.9	92.2	19.4	92.2	22.9
New York	89.4	50.9	89.2	47.5	89.1	39.8	88.7	42.9
North Carolina	95.7	84.4	95.6	82.7	95.4	80.9	95.3	80.0
North Dakota	92.7	41.1	92.4	39.6	92.8	31.9	92.1	29.7
Ohio	87.2	21.6	87.0	20.5	86.9	16.5	85.6	14.9
Oklahoma	75.9	49.0	74.2	49.2	62.9	50.9	62.4	47.1
Oregon	98.7	24.9	98.7	25.2	98.7	23.1	98.7	26.1
Pennsylvania	90.2	45.1	90.0	41.9	89.8	38.7	89.3	38.6
Rhode Island	88.5	87.0	88.3	86.5	87.1	83.2	84.5	83.6
South Carolina	99.1	81.5	99.1	80.2	99.1	79.4	99.1	78.5
South Dakota	96.1	70.1	96.0	69.5	96.0	69.1	96.1	68.7
Tennessee	97.4	67.0	97.4	67.3	97.3	67.9	97.2	66.1
Texas	87.1	32.3	87.3	29.7	87.6	32.3	86.0	29.3
Utah	100.0	42.1	100.0	44.0	100.0	44.8	100.0	47.2
Vermont	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Virginia	97.6	52.4	97.6	51.3	97.5	49.7	97.6	49.6
Washington	97.1	64.3	97.0	65.0	97.2	67.2	97.1	68.7
West Virginia	62.7	17.8	61.7	16.4	55.4	17.7	50.5	15.0
Wisconsin	93.3	41.0	93.3	36.8	93.2	31.7	93.0	28.8
Wyoming	100.0	17.5	100.0	15.5	100.0	22.6	100.0	18.0
Total	90.1	43.4	90.3	42.2	90.3	43.0	91.3	42.0

See footnotes at end of table.

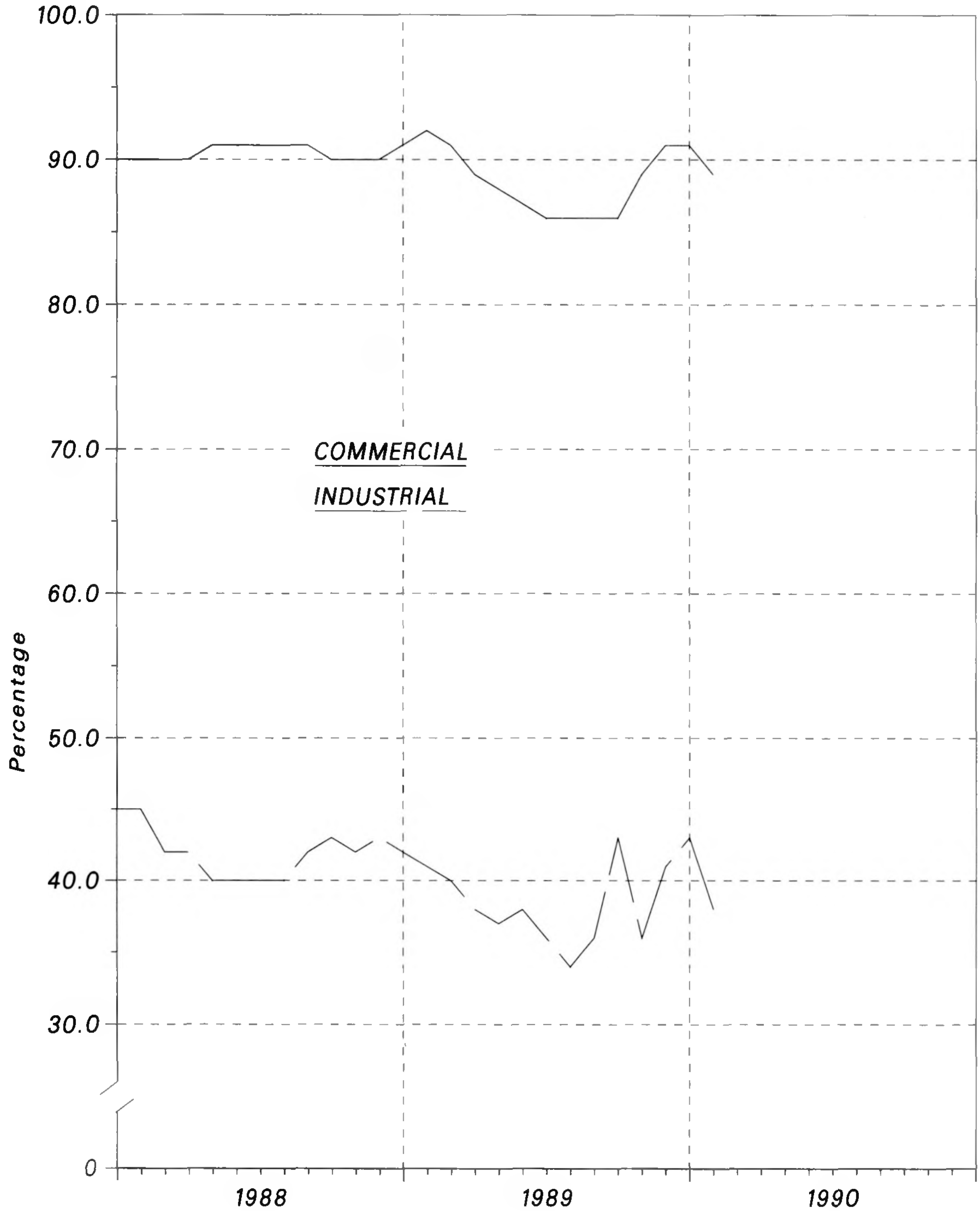
Table 33. Percentage of Total Deliveries Represented by Onsystem Sales (Continued)

State	August 1988		July 1988		June 1988		May 1988	
	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial
Alabama	91.0	47.1	90.4	47.7	90.8	45.8	91.3	48.7
Alaska	100.0	55.1	100.0	55.1	100.0	52.7	100.0	55.5
Arizona	95.2	26.1	95.2	32.2	95.2	24.6	95.3	30.3
Arkansas	93.3	23.5	93.4	21.4	93.4	23.9	93.5	22.6
California	95.7	65.4	95.3	60.5	95.7	52.8	95.7	54.5
Colorado	97.6	38.1	97.6	40.4	97.7	39.7	97.6	39.2
Connecticut	97.9	97.6	98.0	97.6	97.9	97.5	98.0	97.6
Delaware	100.0	78.8	100.0	78.8	100.0	79.5	100.0	79.2
District of Columbia	100.0	—	100.0	—	100.0	—	100.0	—
Florida	100.0	75.9	100.0	73.9	100.0	75.6	100.0	76.7
Georgia	92.9	39.3	93.2	41.0	93.6	39.1	93.7	38.8
Hawaii	100.0	—	100.0	—	100.0	—	100.0	—
Idaho	85.3	3.6	85.1	3.4	85.2	3.7	85.6	3.8
Illinois	70.3	26.3	73.6	27.1	73.7	24.3	75.4	30.3
Indiana	94.8	16.2	94.8	16.3	94.9	18.2	95.0	16.0
Iowa	98.2	37.2	98.2	37.1	98.2	37.8	98.2	36.3
Kansas	96.3	38.5	96.4	37.6	96.4	32.9	96.4	34.0
Kentucky	95.5	35.1	95.4	35.6	95.6	34.3	95.6	35.0
Louisiana	99.9	58.1	99.9	58.4	99.9	57.9	99.9	58.2
Maine	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Maryland	96.8	25.4	96.8	25.7	96.8	25.7	96.8	34.2
Massachusetts	99.9	99.1	99.9	99.1	99.9	99.1	99.9	99.2
Michigan	61.8	11.9	64.2	11.0	64.5	15.0	70.7	18.1
Minnesota	96.8	54.8	96.6	52.5	96.6	53.9	96.7	54.9
Mississippi	100.0	55.5	100.0	55.8	100.0	54.2	100.0	53.9
Missouri	95.9	63.8	95.9	65.0	96.0	66.4	96.1	69.6
Montana	99.8	88.0	99.8	88.0	99.8	88.0	99.8	88.0
Nebraska	97.7	49.7	97.7	45.0	97.7	46.5	97.6	44.6
Nevada	95.0	30.7	95.1	31.0	95.1	32.1	95.1	32.9
New Hampshire	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
New Jersey	98.4	57.3	98.4	58.4	98.4	60.1	98.4	62.7
New Mexico	92.1	27.2	92.5	24.3	92.3	26.8	92.5	27.4
New York	88.7	41.9	89.0	36.2	88.8	38.6	89.2	45.6
North Carolina	95.3	79.2	95.2	78.7	94.8	79.7	95.1	80.5
North Dakota	92.2	35.1	92.2	31.5	92.4	27.4	92.8	36.7
Ohio	85.2	14.3	85.6	14.0	85.5	14.1	86.5	15.4
Oklahoma	60.2	43.4	63.1	40.0	62.1	41.2	65.5	26.8
Oregon	98.7	24.8	98.7	25.1	98.7	26.4	98.7	30.1
Pennsylvania	89.3	37.8	89.6	34.0	89.7	33.8	89.9	35.8
Rhode Island	88.4	83.5	84.1	82.4	78.8	83.4	83.6	83.7
South Carolina	99.1	78.7	99.1	79.5	99.1	79.8	99.1	79.6
South Dakota	96.1	66.7	96.1	70.0	96.1	67.4	96.2	68.6
Tennessee	97.3	66.3	97.2	66.3	97.2	65.9	97.3	67.3
Texas	86.9	26.7	87.1	29.2	87.2	29.2	87.2	29.3
Utah	100.0	45.3	100.0	44.8	100.0	45.3	100.0	46.2
Vermont	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Virginia	97.6	51.7	97.6	43.3	97.6	44.6	97.6	49.9
Washington	97.2	68.2	97.2	68.1	97.1	66.1	97.2	67.7
West Virginia	47.0	16.9	46.6	16.8	45.0	14.2	60.5	18.8
Wisconsin	92.9	27.1	92.9	26.6	93.0	27.0	93.3	29.9
Wyoming	100.0	19.2	100.0	15.2	100.0	22.3	100.0	26.1
Total	91.4	40.4	91.2	40.6	91.4	40.0	91.0	40.8

NA = Not Available

Notes and Sources: The percentages depict the portion of total commercial and industrial deliveries represented by onsystem sales. Total deliveries include volume transported to commercial and industrial comsumers for the account of others.

Figure 7. Percentage of Total Deliveries Represented by Onsystem Sales



Source: Form EIA-857.

Table 34. Gas Home Customer-Weighted Heating Degree-Days

Census Divisions	March 1 through March 31					Cumulative July 1 through March 31				
	Normal[a]	1989	1990	Percent Change		Normal[a]	1989	1990	Percent Change	
				Normal to 1990	1989 to 1990				Normal to 1990	1989 to 1990
New England CT, ME, MA, NH, RI, VT	894	903	833	-6.8	-7.8	5,433	5,390	5,389	-0.8	0.0
Middle Atlantic NJ, NY, PA	831	824	721	-13.2	-12.5	5,125	5,003	4,850	-5.4	-3.1
East North Central IL, IN, MI, OH, WI	891	868	728	-18.3	-16.1	5,613	5,512	5,382	-4.1	-2.4
West North Central IA, KS, MN, MO, ND, NE, SD	889	880	728	-18.1	-17.3	5,824	5,750	5,502	-5.5	-4.3
South Atlantic DE, FL, GA, MD and DC, NC, SC, VA, WV	484	439	369	-23.8	-15.9	3,249	3,057	2,936	-9.6	-4.0
East South Central AL, KY, MS, TN	464	379	341	-26.5	-10.0	3,275	2,981	2,921	-10.8	-2.0
West South Central AR, LA, OK, TX	289	286	233	-19.4	-18.5	2,229	2,031	2,051	-8.0	1.0
Mountain AZ, CO, ID, MT, NV, NM, UT, WY	751	608	662	-11.9	8.9	4,873	4,736	4,641	-4.8	-2.0
Pacific[b] CA, OR, WA	411	336	360	-12.4	7.1	2,348	2,348	2,255	-4.0	-4.0
U.S. Average[b]	657	620	548	-16.6	-11.6	4,198	4,083	3,974	-5.3	-2.7

[a] Normal is based on calculations of data from 1951 through 1980.
[b] Excludes Alaska and Hawaii.
Notes and Sources: See the last page of this section.

Table Notes and Sources

Table 1

Notes: Data for 1983 through 1988 are final. All other data are preliminary unless otherwise indicated. Geographic coverage is the 50 States and the District of Columbia. Totals may not equal sum of components because of independent rounding.

Sources:

- EIA, *Natural Gas Annual 1988.* Table 7 and EIA estimates, January 1989 through current month. See Explanatory Notes 1, 3, and 6 for discussion of computation, estimating procedures, and revision policy.

Table 2

Notes: Data for 1983 through 1988 are final. All other data are preliminary unless otherwise indicated. Geographic coverage is the 50 States and the District of Columbia. Totals may not equal sum of components because of independent rounding.

Sources:

- Total Dry Gas Production: EIA *Natural Gas Annual 1988,* 1983 through 1988; IOCC, MMS reporting, and EIA estimates, January 1989 through current month. See Explanatory Note 3 for estimation procedures and revision policy.

- Withdrawals from and Additions to Storage: EIA *Natural Gas Annual 1988,* 1983 through 1988; Form FERC-8 and Form EIA-191, January 1989 through current month.

- Supplemental Gaseous Fuels: EIA *Natural Gas Annual 1988,* 1983 through 1988; and EIA computations, January 1989 through current month. See Explanatory Note 2 for discussion of computation procedures and revision policy.

- Imports and Exports: Form FPC-14, 1983 through 1988; and EIA estimates, January 1989 through the current month. See Explanatory Note 4 for discussion of procedures and revision policy.

- Consumption and Unaccounted For: EIA *Natural Gas Annual 1988*, 1983 through 1988; and EIA computations, January 1989 through current month. See Explanatory Notes 5 and 11 for discussion of computation procedures and revision policy.

Table 3

Notes: Data for 1983 through 1988 are final. All other data are preliminary unless otherwise indicated. Geographic coverage is the 50 States and the District of Columbia. Totals may not equal sum of components because of independent rounding.

Sources:

- All data except electric utility: EIA *Natural Gas Annual 1988,* 1983 through 1988; and Form EIA-857 and computations January 1989 through the current month. See Explanatory Note 5 for computation procedures and revision policy. Electric utility data: Form EIA-759, "Monthly Power Plant Report" (formerly Form FPC-4).

Table 4

Notes: Data for 1983 through 1988 are final. All other data are preliminary unless otherwise indicated. Geographic coverage is the 50 States and the District of Columbia. Average prices for gas delivered to industrial consumers for 1983 through 1987 include imputed averages for volumes of gas delivered for the account of others. In 1988 and 1989 average prices reflect on-system sales prices only. The change in series in 1987 affects the commercial, industrial, and all consumers averages.

Sources:

- Average wellhead price: EIA *Natural Gas Annual 1988,* 1983 through 1988; and EIA estimates, January 1989 through current month. See Explanatory Note 8 for estimation procedures and revision policy.
- Imports and Interstate Pipeline Company Purchases: Form FERC-11.
- Average City Gate, Residential, Commercial and Industrial average prices for 1983 through current month from Form EIA-857. See Explanatory Note 5 for discussion of revision policy.
- Earlier prices from EIA *Natural Gas Annual 1988.* Electric Utilities averages from Form FERC-423, "Monthly Report of Cost and Quality of Fuels for Electric Plants."

Table 5

Notes: See Explanatory Note 12 for discussion of purchased gas adjustment filings. Totals may not equal sum of components because of independent rounding.

Source:

- Purchased Gas Adjustment filings for interstate pipeline companies.

Table 6

Notes: Data for 1985 through 1988 are final. All other data are preliminary.

Sources:

- Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas."
- "Quarterly Sales and Price Report" prepared by the Office of Fuels Programs, Office of Fossil Energy.

Table 7

Notes: Data for 1983 through 1988 are final. All other data are preliminary unless otherwise indicated. Totals may not equal sum of components because of independent rounding. See Explanatory Notes 1 and 3 for discussion of computation procedures and revision policy.

Sources:

- EIA *Natural Gas Annual 1988,* 1983 through 1988.
- IOCC, MMSreports, and EIA computations, January 1989 through current month.

Table 8

Notes: Data for the current month and the previous 2 months are preliminary. All other data are final. Dates shown indicate date received at the FERC. Data include affirmative determinations only. See Explanatory Note 10 for discussion of Title I of the Natural Gas Policy Act. Geographic coverage is the 50 States and the District of Columbia. Totals may not equal sum of components because of independent rounding.

Source:

- Form FERC-121.

Table 9

Notes: Dates shown indicate date received at FERC. Values include affirmative determinations only. See Explanatory Note 10 for discussion of Title I of the Natural Gas Policy Act. Geographic coverage is the 50 States and the District of Columbia. Totals may not equal sum of components because of independent rounding.

Source:

- Form FERC-121.

Table 10

Note: Data shown are based on filings received at FERC during the month indicated by the table heading. Data include affirmative determinations only. See Explanatory Note 10 for discussion of Title I of the Natural Gas Policy Act. Geographic coverage is the 50 States and the District of Columbia. Totals may not equal sum of components because of independent rounding.

Source:

- Form FERC-121.

Table 11

Notes: Geographic coverage is the 50 States and the District of Columbia. A "small producer" is one with annual sales subject to FERC jurisdiction not in excess of 10 billion cubic feet. On November 16, 1984, the Federal Energy Regulatory Commission issued Order No. 406 in Docket No. RM 84-14-000 providing for inclusion of maximum lawful prices under Sections 103(b)(2) and 105(b)(3) of the Natural Gas Policy Act. Order No. 406 became effective on January 1, 1985.

Source:

- *Federal Register,* "Rules and Regulations."

Table 12

Notes: Data up to 3 years prior to current month are final. All other data are preliminary unless otherwise indicated. See Explanatory Note 9 for discussion of major interstate pipeline companies. Totals may not equal sum of components because of independent rounding. This table shows selected items only and therefore does not balance mathematically.

Source:

- Form FERC-11

Table 13

Notes: The summaries presented in this table are exclusive of transactions between major pipeline companies in the computation of total pipeline activities to eliminate double-counting. Data up to 3 years prior to current month are final. All other data are preliminary unless otherwise indicated. See Explanatory Note 9 for discussion of major interstate pipeline companies. Totals may not equal sum of components because of independent rounding.

Source:

- Form FERC-11.

Table 14

Notes: Two lines have been added to this table to explicitly differentiate transactions between major and nonmajor pipeline companies. Totals may not equal sum of components due to independent rounding and provisions for pending regulatory adjustments.

Source:

- Form FERC-11.

Table 15

Notes: Previously published manufactured gas is now summarized with liquefied natural gas, gasified coal, and synthetic gas production. Also, the summaries presented in this table are exclusive of transactions between major pipeline companies in the computation of total pipeline activities to eliminate double counting. See Explanatory Note 9 for discussion of major interstate pipeline companies. Totals may not equal sum of components because of independent rounding.

Source:

- Form FERC-11.

Table 16

Notes: Previously published manufactured gas is now summarized with liquefied natural gas, gasified coal, and synthetic gas production. Two lines have been added to this table that explicitly differentiate transactions between major and nonmajor pipeline companies. See Explanatory Note 9 for discussion of major interstate pipeline companies. Totals may not equal sum of components because of independent rounding.

Source:

- Form FERC-11.

Table 17

Notes: Data for 1983 through 1988 are final. All other data are preliminary unless otherwise noted. See Explanatory Note 7 for discussion of revision policy. Gas in storage at the end of a reporting period may not equal the quantity derived by adding or subtracting net injections or withdrawals during the period to the quantity of gas in storage at the beginning of the period. This is due to changes in the quantities of native gas included in base gas and/or losses in base gas due to migration from storage reservoirs. Totals may not equal sum of components because of independent rounding. Geographic coverage is the 50 States and the District of Columbia.

Sources:

- Form EIA-191, Form FERC-8, and Form EIA-176.

Table 18

Notes: Data for 1983 through 1988 are final. All other data are preliminary unless otherwise noted. See Explanatory Note 7 for discussion of revision policy. Gas in storage at the end of a reporting period may not equal the quantity derived by adding or subtracting net injections or withdrawals during the period to the quantity of gas in storage at the beginning of the period. This is due to changes in the quantities of native gas included in base gas and/or losses in base gas due to migration from storage reservoirs. Totals may not equal sum of components because of independent rounding. Geographic coverage is the 50 States and the District of Columbia.

Sources:

- Form EIA-191, Form FERC-8, and Form EIA-176.

Table 19

Notes: Data for 1984 through 1988 are final. All other data are preliminary unless otherwise noted. See Explanatory Note 7 for discussion of revision policy. Gas in storage at the end of a reporting period may not equal the quantity derived by adding or subtracting net injections or withdrawals during the period to the quantity of gas in storage at the beginning of the period. This is due to changes in the quantities of native gas included in base gas and/or losses in base gas due to migration from storage reservoirs. Totals may not equal sum of components because of independent rounding. Geographic coverage is the 50 States and the District of Columbia.

Sources:

- Form EIA-191, Form FERC-8, and Form EIA-176.

Table 20

Notes: Gas in storage at the end of a reporting period may not equal the quantity derived by adding or subtracting net injections or withdrawals during the period to the quantity of gas in storage at the beginning of the period. This is due to changes in the quantities of native gas included in base gas and/or losses in base gas due to migration from storage reservoirs. Totals may not equal sum of components because of independent rounding. Geographic coverage is the 50 States and the District of Columbia.

Source:

- Form FERC-8.

Table 21

Notes: Gas in storage at the end of a reporting period may not equal the quantity derived by adding or subtracting net injections or withdrawals during the period to the quantity of gas in storage at the beginning of the period. This is due to changes in the quantities of native gas included in base gas and/or losses in base gas due to migration from storage reservoirs. Totals may not equal sum of components because of independent rounding. Geographic coverage is the 50 States and the District of Columbia.

Sources:

- Form FERC-8 and Form EIA-191.

Tables 22-25

Notes: Geographic coverage is the 50 States and the District of Columbia. Volumes in these tables represent the amount of natural gas delivered to four groups of natural gas consumers. See Explanatory Note 5 for discussion of computations and revision policy.

Sources:

- Residential, Commercial, and Industrial Volumes: Form EIA-857.
- Electric Utility Volumes: Form EIA-759.

Table 26

Notes: Geographic coverage is the 50 States and the District of Columbia. Volumes in this table represent the amount of natural gas delivered to all consumers. See Explanatory Note 5 for discussion of computations and revision policy.

Source:

- Form EIA-857 and Form EIA-759.

Table 27

Notes: Geographic coverage is the 50 States and the District of Columbia. Prices in this table represent the average price of natural gas by State at the point where the gas is transferred from a pipeline to a local distribution company within the State. See Explanatory Note 5 for discussion of computations and revision policy.

Source:

- Form EIA-857.

Tables 28-31

Notes: Data for 1987 and 1988 are final. All other data are preliminary unless otherwise indicated. Geographic coverage is the 50 States and the District of Columbia. Average prices for gas delivered to commercial and industrial consumers for 1987 forward reflect onsystem sales prices only. See Explanatory Note 5 for discussion of computations and revision policy. See Table 33 for data on onsystem sales expressed as a percentage of both total commercial and total industrial deliveries.

Sources:

- Residential, Commercial, and Industrial Prices: Form EIA-857.
- Electric Utility Prices: Form FERC-423.

Table 32

Notes: Geographic coverage is the 50 States and the District of Columbia. Prices in this table represent the on-system average price of natural gas delivered to all consumers. See preceding note regarding break in average price series. See Explanatory Note 5 for discussion of computations and revision policy.

Sources:

- Form EIA-857 and Form FERC-423.

Table 33

Notes: Volumes of natural gas reported for the commercial and industrial sectors in this publication include data for both sales and deliveries for the account of others. This table shows the percent of the total State volume that represents natural gas sales to the commercial and industrial sectors. This information may be helpful in evaluating commercial and industrial price data which are based on sales data only. See Appendix C, Statistical Considerations, for a discussion of the computation of natural gas prices.

Source:

- Form EIA-857.

Table 34

Notes: Degree-days are relative measurements of outdoor air temperature. Heating degree-days are deviations of the mean daily temperature below 65 degrees Fahrenheit. A weather station recording a mean daily temperature of 40 degrees Fahrenheit would report 25 heating degree-days.

There are several degree-day data bases maintained by the National Oceanic and Atmospheric Administration. The information published in the EIA *Natural Gas Monthly* is developed by the National Weather Service Climate Analysis Center, Camp Springs, Maryland. The data are available weekly with monthly summaries and are based on mean daily temperatures recorded at about 200 major weather stations around the country. The temperature information recorded at these weather stations is used to calculate Statewide degree-day averages weighted by gas home customers. The State figures are then aggregated into Census Divisions and into the national average.

Sources:

- National Oceanic and Atmospheric Administration.

Appendix A

Explanatory Notes

Appendix A

Explanatory Notes

Note 1. Nonhydrocarbon Gases Removed

Annual Data

Data on nonhydrocarbon gases removed from marketed production--carbon dioxide, helium, hydrogen sulfide, and nitrogen--are reported by State agencies on the voluntary Form EIA-627. For 1988, of the 32 producing States, 22 reported data on nonhydrocarbon gases removed. The 22 States accounted for 58 percent of total 1988 gross withdrawals. Of the 22 States reporting nonhydrocarbon gases removed, 11 reported zero values: Alaska, Arizona, Arkansas, Illinois, Indiana, Maryland, Missouri, New York, Oregon, South Dakota, and Virginia. The nine States reporting volumes greater than zero are Alabama, California, Colorado, Florida, Mississippi, New Mexico, North Dakota, Texas, and Wyoming. Two States (Kentucky and Nebraska) reported quantities unknown but considered insignificant. In addition, Kansas, Louisiana, Montana, and Oklahoma, which together accounted for 38 percent of gross withdrawals, did not report nonhydrocarbon gases removed separately. However, their gross withdrawal data excluded all or most of the nonhydrocarbon gases removed on leases. No estimates are made for States not reporting nonhydrocarbon gases removed.

Preliminary Monthly Data

All monthly data are considered preliminary until after publication of the *Natural Gas Annual* for the year in which the report month falls. Three States report monthly data on nonhydrocarbon gases removed: Alabama, Texas, and Mississippi. Monthly data for California, Colorado, Florida, New Mexico, North Dakota, and Wyoming are estimated based on annual data reported on Form EIA-627. Nonhydrocarbon gases as an annual percentage of gross withdrawals reported by each of the six States is applied to each State's monthly gross withdrawal data to produce an estimate of nonhydrocarbon gases removed. From January 1983 through December 1987, monthly data on nonhydrocarbons (hydrogen sulfide only) in Wyoming were estimated on the basis of sulfur output reported by natural gas processing plants. Calculations are based on a factor of 48,000 cubic feet of hydrogen sulfide per short ton of produced sulfur at a sulfur recovery efficiency rate of approximately 67 percent.

Final Monthly Data

Monthly data are revised after publication of the *Natural Gas Annual* by proportionally allocating the differences between annual data reported on the Form EIA-627 and the sum of monthly data (January-December).

Note 2. Supplemental Gaseous Fuels

Annual Data

Annual data are published from Form EIA-176.

Preliminary Monthly Data

All monthly data are considered preliminary until after the publication of the *Natural Gas Annual* for the year in which the report month falls. Monthly estimates are based on the annual ratio of supplemental gaseous fuels to the sum of dry gas production, net imports, and net withdrawals from storage. This ratio is applied to the monthly sum of these three elements to compute a monthly supplemental gaseous fuels figure.

Final Monthly Data

Monthly data are revised after publication of the *Natural Gas Annual*. Final monthly data are estimated based on the revised annual ratio of supplemental gaseous fuels to the sum of dry gas production, net imports, and net withdrawals from storage. This ratio is applied to the revised monthly sum of these three elements to compute final monthly data.

Note 3. Production

Annual Data

Natural gas production data are collected from 32 gas-producing States on Form EIA-627. The U.S. Minerals Management Service (MMS) also supplies data on the quantity and value of natural gas production on the Gulf of Mexico and Outer Continental Shelf. No adjustments are made to the data.

Estimated Monthly Data

State marketed production data for a particular month are estimated if data are unavailable at the time of publication. The data are estimated based on an average rate of change between the report month and the prior month over the previous 3 years. The rate-of-change percentage is applied to the data for the month prior to the report month to compute the estimate for the report month in the current year.

Estimates for total U.S. marketed production are based on the application of historical (latest 3 calendar years) month-to-month ratios of daily production rates to the latest preliminary reported monthly production data. State estimates for nonhydrocarbon gas removed, gas used for repressuring, and gas vented and flared are based on the ratio of the latest preliminary reported 3-month average of these categories to marketed production. These ratios are applied to the estimates of marketed production to calculate figures for nonhydrocarbon gases removed, gas used for repressuring, and gas vented and flared. Estimates for gross withdrawal data are the sum of the estimates calculated for nonhydrocarbon gases removed, gas used for repressuring, gas vented and flared, and marketed production.

Preliminary Monthly Data

All monthly data are considered preliminary until after publication of the *Natural Gas Annual* for the year in which the report month falls. Preliminary monthly data are published from reports from the Interstate Oil Compact Commission (IOCC) and the MMS. Volumetric data are converted, as necessary, to a standard 14.73 psia pressure base. Data are revised as Table 7 monthly data are updated.

Final Monthly Data

The differences between each State's annual production data reported on the annual Form EIA-627 and the sum of its monthly IOCC reports (January-December) are allocated proportionally to the monthly IOCC data.

Note 4. Imports and Exports

Annual Data and Final Monthly Data

Annual and final monthly data are published from the annual Form FPC-14, which requires data to be reported by month for the calendar year.

Preliminary Monthly Data - Imports

Preliminary monthly import data are based on data from the National Energy Board of Canada and responses to informal industry contacts and EIA estimates. Preliminary data are revised after the publication of the article "U.S. Imports and Exports of Natural Gas" for the calendar year.

Preliminary Monthly Data - Exports

Preliminary monthly export data are based on historical data from the Form FPC-14, informal industry contacts, and information gathered from natural gas industry trade publications. Preliminary monthly data are revised after publication of "U.S. Imports and Exports of Natural Gas" for the calendar year in which the report month falls.

Note 5. Consumption

All Annual Data

All consumption data except electric utility data are from the Form EIA-857 and Form EIA-176. No adjustments are made to the data. Electric utility data are reported on Form EIA-759.

Monthly Data

All monthly data are considered preliminary until after publication of the *Natural Gas Annual*.

Total Consumption

Preliminary Monthly Data

The most current month estimate is calculated based on the arithmetic average change from the previous month for the previous 3 years. The following month this estimate is revised by summing the components (pipeline fuel, lease and plant fuel, and deliveries to consumers).

Final Monthly Data

Monthly data are revised after publication of the *Natural Gas Annual.* Final monthly total consumption is obtained by summing its components.

Residential, Commercial, and Industrial Sector Consumption

Preliminary Monthly Data

Preliminary monthly residential, commercial, and industrial data are from Form EIA-857. Monthly data for 1988 differ from those of previous years in terms of sample selection, estimates from sample data, and adjustments to industrial data. See Appendix C, "Statistical Considerations," for a detailed explanation of these changes.

Price data for 1988 are representative of prices for gas sold and delivered to residential, commercial, and industrial consumers. These prices do not reflect average prices of natural gas transported to consumers for the account of third parties or "spot-market" prices.

Final Monthly Data

Monthly data are revised after the publication of the *Natural Gas Annual.* Final monthly data are estimated by allocating annual consumption data from the Form EIA-176 to each month in proportion to monthly sales volumes reported in Form EIA-857.

Electric Utility Sector Consumption

All Monthly Data

Monthly data published are from Form EIA-759.

Pipeline Fuel Consumption

Preliminary Monthly Data

Preliminary data are estimated based on the pipeline fuel consumption as an annual percentage of total consumption from the previous year's Form EIA-176. This percentage is applied to each month's total consumption figure to compute the monthly estimate.

Final Monthly Data

Monthly data are revised after the publication of the *Natural Gas Annual.* Final monthly data are based on the revised annual ratio of pipeline fuel consumption to total consumption from the Form EIA-176. This ratio is applied to each month's revised total consumption figure to compute final monthly pipeline fuel consumption estimates.

Lease and Plant Fuel Consumption

Preliminary Monthly Data

Preliminary monthly data are estimated based on lease and plant fuel consumption as an annual percentage of marketed production (excluding nonhydrocarbon gases). This percentage is applied to each month's marketed production figure to compute estimated lease and plant fuel consumption.

Final Monthly Data

Monthly data are revised after publication of the *Natural Gas Annual.* Final monthly data are based on a revised annual ratio of lease and plant fuel consumption to marketed production (excluding nonhydrocarbon gases) from Form EIA-176. This ratio is applied to each month's revised marketed production figure to compute final monthly lease and plant fuel consumption estimates.

Note 6. Extraction Loss

Annual Data

Extraction loss data are calculated from filings of Form EIA-64A, "Annual Report of the Origin of Natural Gas Liquids Production." For a fuller discussion, see the *Natural Gas Annual 1988, Volume I* .

Preliminary Monthly Data

Preliminary data are estimated based on extraction loss as an annual percentage of marketed production. This percentage is applied to each month's marketed production to estimate monthly extraction loss.

Final Monthly Data

Monthly data are revised after the publication of the *Natural Gas Annual.* Final monthly data are estimated by allocating annual extraction loss data to each month based on its total natural gas disposition.

Note 7. Natural Gas Storage

Underground Natural Gas Storage

All monthly data concerning underground storage are published from the essentially identical forms, FERC-8 and EIA-191. Monthly data are revised after publication of "Underground Natural Gas Storage in the United States" for the heating year (April through March) in which the report month falls. In addition, injection and withdrawal data from the FERC-8/ EIA-191 survey are adjusted to correspond to data from Form EIA-176 following publication of the *Natural Gas Annual.*

Underground and Liquefied Natural Gas Storage

The final monthly and annual storage and withdrawal data for 1983 through 1988 shown in Table 2 include both underground and liquefied natural gas (LNG) storage. Underground storage data are obtained from the FERC-8/EIA-191 and EIA-176 surveys in the manner described earlier. Annual data on LNG additions and withdrawals are taken from Form EIA-176. Monthly data are estimated by computing the ratio of each month's underground storage additions and withdrawals to annual underground storage additions and withdrawals and applying it to annual LNG data.

Note 8. Average Wellhead Value

Annual Data

Form EIA-627 requests State agencies to report the quantity and value of marketed production. When complete data are unavailable, the form instructs the State agency to report the available value and the quantity of marketed production associated with this value. A number of States reported volumes of production and associated values for other than marketed production. In addition, information for several States which were unable to provide data was obtained from Form EIA-176. It should be noted that Form EIA-176 reports a fraction of State production. The imputed value of marketed production in each State is calculated by dividing the State's reported value by its associated wellhead value. This unit price is then applied to the quantity of the State's marketed production to derive the imputed value of marketed production.

Preliminary Monthly Data

An estimate of the U.S. gas price is made each month based on monthly gas prices from four States: Mississippi, New Mexico, Oklahoma, and Texas.

Final Monthly Data

Preliminary monthly data are revised after the publication of the *Natural Gas Annual.* The weighted average 12-month prices for Texas, New Mexico, Oklahoma, and Mississippi are compared to the wellhead prices published for each of the four States in the *Natural Gas Annual.* The ratio derived from this comparison is then applied to each month's estimates for those States, and the monthly data are revised.

Note 9. Financial Data of Major Interstate Pipeline Companies

The prices in Table 4 for imports and purchases from producers, and industrial sales by major interstate pipeline companies, and all data in Tables 12 through 16 are derived from Form FERC-11. Form FERC-11 is filed monthly by the approximately 47 major interstate natural gas pipeline companies. A major pipeline company is defined as one "whose combined sales for resale, and gas transported interstate or stored for a fee exceeded 50 billion cubic feet in the previous calendar year."

Data reported by the major interstate pipeline companies on Form FERC-11 generally reflect the timing of data entry, revision, and/or reclassification of accounts in the companies' accounting records in accordance with the FERC regulations and regulatory filings. Certain data may also be estimated. Consequently, the data reported and shown in Tables 12 through 16 for any given month may include or reflect out-of-period dollar or volume adjustments, restatements or revisions, or account reclassifications. The dollar amounts reported as paid or received and volumes reported as delivered or received may also include amounts paid, delivered, or received under contractual provisions such as prepayment, take-or-pay, minimum take, or minimum bill provisions. Unless otherwise footnoted, the individual data items, computed averages, and aggregated totals shown include the effect of any and all such adjustments, revisions, estimates, reclassifications, and/or contractual provisions. Average prices are not reported on the Form 11. The averages shown are computed by dividing the total dollars reported for the particular item by the total volume reported for the same item.

Final Monthly Data

Final revisions for the prior year's data are made upon receipt of the December data for the current survey year.

Note 10. Natural Gas Policy Act of 1978

Tables 5 and 8 through 11, in this publication contain data reported by the natural gas industry under Title I of the Natural Gas Policy Act of 1978 (NGPA).

Title I of the NGPA - Wellhead Prices

The NGPA signed into law on November 9, 1978, mandated a new framework for the regulation of most facets of the natural gas industry. Ceiling prices were established for all production of natural gas. For gas produced from both new and old (pre-NGPA) reserves, ceiling prices depend on contract provisions and the characteristics of the well. If a well qualifies under more than one provision in Title I of the NGPA, the highest maximum ceiling price is applicable. Further, all price ceilings are adjusted by a monthly inflation adjustment.

Natural gas dedicated to interstate commerce on or before the November 9, 1978 enactment of the NGPA has as a maximum lawful price the "just and reasonable" rate as established by the Federal Energy Regulatory Commission under Section 104.

The maximum lawful price of natural gas under old intrastate contracts (Section 105) is based on its contract price on November 9, 1978, and is, in general, much higher than for comparable old interstate gas. Gas production under Sections 104, 105, and 106 (old contracts that have "rolled over") constitute what is referred to as "old gas."

Almost all development and extension wells begun after February 19, 1977, qualify as new onshore production (Section 103). In order to qualify for new gas status under Section 102, an onshore well started after February 19, 1977, must produce from a new reservoir or be at least 2.5 miles from, or 1,000 feet deeper than, a "marker well" (a well producing in commercial quantities any time between January 1, 1970, and April 20, 1977). Offshore gas qualifies for Section 102 if production is from new leases (entered into on or after April 20, 1977) or reservoirs "discovered" on or after July 27, 1976.

Production from wells qualifying under Section 107 is given special treatment as "high-cost gas" and is defined as gas produced:

- from wells started after February 19, 1977, and completed to produce from a depth greater than 15,000 feet
- from geopressured brine
- from coal seams
- from Devonian shale
- under conditions determined by the Federal Energy Regulatory Commission to present extraordinary risks or costs.

On November 1, 1979, gas from the first four categories was deregulated. On August 15, 1980, natural gas produced from tight formations (geologic formation where tight packing of the reservoir rock causes low production rates) was defined as high-cost gas with a ceiling price set at 200 percent of the Section 103 price.

Under the NGPA, producers applying for price classification under Sections 102, 103, 107, or 108 must file Form FERC-121, with the applicable State jurisdictional agency. The forms are then sent to FERC for review. The filings are grouped according to the month received by FERC. Not all submissions contain estimated annual volumes or contract prices. Annual volumes are often estimated by producers prior to actual operations or based on short periods of operation. Price data from Form FERC-121 are not included in this publication, since submission dates vary and prices may have changed subsequent to submission.

On January 1, 1985, the following categories of gas were deregulated pursuant to NGPA Section 121:

- Section 102(c) "new natural gas"
- Section 103(c) "new onshore production wells" which were not committed or dedicated to interstate commerce on April 20, 1977, and which produce gas from a completion location deeper than 5,000 feet.
- Sections 105 and 106(b) "intrastate gas under contracts" where the price paid on December 31, 1984, is higher than $1.00 per million Btu, provided that such price over $1.00 was not established by operation of an indefinite escalator clause.

On July 1, 1987, the following category of gas was deregulated pursuant to NGPA Section 121:

- Section 103(b)(2) "new onshore production wells" which were not committed or dedicated to interstate commerce on April 20, 1977, and which produce gas from a completion location less than 5,000 feet deep.

On July 26, 1989, the President signed legislation to remove all remaining natural gas wellhead price controls by 1993.

Note 11. Unaccounted For

The "unaccounted for" category represents the difference between the sum of the components of natural gas supply and the sum of the components of natural gas disposition. These differences may be due to quantities lost or to the effects of data reporting problems. Reporting problems include differences due to the net result of conversions of flow data metered at varying temperatures and pressure bases and converted to a standard temperature and pressure base; the effect of variations in company accounting and billing practices; differences between billing cycles and calendar periods; and imbalances resulting from the merger of data reporting systems, which vary in scope, format, definitions, and type of respondents.

Annual Data

Annual data are from the *Natural Gas Annual.* For an explanation of the methodology involved in calculating annual "unaccounted for" data, see the *Natural Gas Annual 1988.*

Preliminary Monthly Data

Preliminary monthly data in the "unaccounted for" category are calculated by subtracting additions to storage, exports, and consumption from total supply/disposition.

Final Monthly Data

Final monthly data in the "unaccounted for" category are calculated by subtracting storage additions, exports, and total consumption from total supply.

Note 12. Purchased Gas Adjustments

The Purchased Gas Adjustment filings for selected interstate pipeline companies have been aggregated to present volume and price data by NGPA category as shown in Table 5. These filings represent over 85 percent of the wellhead purchases subject to the NGPA and dedicated to the interstate market.

These filings were submitted every 6 months by most of the pipeline companies and once a year by the others. Beginning June 1, 1988, all pipelines will file projections quarterly in an abbreviated format, and one detailed filing per year. The projected volume and price data are used for each month for which the filing is effective. The filing dates, which are different for the different companies, are shown in Table A1.

Table A1. PGA Filing Schedule

Pipeline Company	Annual Filing Effective Date
Alabama-Tenn (b)	January
Algonguin Gas Trans (a)	March
ANR Pipeline	May
Arkla Gas (a,b)	April
Bayou Inter	August
Carnegie Nat Gas	September
Colorado Inter	October
Columbia (a,c)	May
Commercial	April
Consolidated (a)	September
E. Tenn Natural Gas (b)	January
Eastern Shore (c)	November
El Paso (b)	July
Equitrans Inc (a)	September
Florida (a,c)	May
Granite St Gas Trans(a,b)	January
Great Lakes Gas (a,c)	November
KN Energy (a)	December
Kentucky W. Va (a,c)	May
Lawrenceburg Gas	February
Mid-Louisiana Gas	September
Midwestern No. Div (b,c)	October
Midwestern So. Div	April
MIGC, Inc. (c)	May
MS. River Trans	June
National Fuel Supply(a,b)	January
Natural (a)	March
North Penn Gas (d)	March
Northern Natural (a,b)	January
Northwest Pipeline (a)	April
Panhandle Eastern (a)	March
Questar Pipeline Co	June
Ringwood Gathering	October
Sea Robin Pipeline (a)	January
South Georgia	July
Southern Natural	April
Tennessee Gas Pipeline(b)	January
Texas Eastern (a)	February
Texas Gas Pipeline	November
Texas Gas Trans (a,c)	February
Transcontinental (a)	August
Transwestern	July
Trunkline (a)	September
United (a)	October
Valero Interstate	June
Valley Gas	November
Western Gas Inter	August
Williams Nat Gas (a,c)	May
Williston Basin (a)	August

(a) Filed quarterly effective June 1, 1988.

(b) Filed quarterly effective July 1, 1988.

(c) Filed quarterly effective August 1, 1988.

Appendix B

Data Sources

Appendix B

Data Sources

The data in this publication are taken from survey reports authorized by the U.S. Department of Energy (DOE), Energy Information Administration (EIA) and by the Federal Energy Regulatory Commission (FERC). The EIA is the independent statistical and analytical agency within the DOE. The FERC is an independent regulatory commission within the DOE which has jurisdiction primarily in the regulation of electric utilities and the interstate natural gas industry. The EIA conducts and processes some of the surveys authorized by the FERC.

Data are collected from two annual surveys and five monthly surveys. Filings with the FERC also provide sources of data for this publication.

The annual reports are the Form EIA-176, a mandatory survey of all companies that deliver natural gas to consumers or that transport gas across State lines, and the Form EIA-627, a voluntary survey completed by energy or conservation agencies in the gas-producing States.

The monthly reports include three surveys of the natural gas industry and two surveys of the electric utility industry. The natural gas industry surveys are the Forms FERC-8 and EIA-191 filed by companies that operate underground storage facilities, the Form FERC-11 filed by major interstate natural gas pipeline companies, and the Form EIA-857 filed by a sample of companies that deliver natural gas to consumers. The electric utility industry surveys are the Form EIA-759 filed by all generating electric utilities and the Form FERC-423 filed by fossil fueled plants. Responses to these five monthly surveys are mandatory.

Data in this publication are also taken from two types of reports that are filed with the FERC under its regulatory functions. One filing is the Form FERC-121, filed by natural gas producers who are the first seller of gas that qualified for an incentive price. The other filing is the "Purchased Gas Adjustment," which is filed by interstate pipeline companies to allow them to recover changes in their purchase prices for natural gas above the cost of service reflected in their current filings.

A description of the survey respondents, reporting requirements, and processing and editing of the data is given on the following pages for each of the surveys. Also shown are copies of the EIA and FERC survey forms that are sources of data for this publication.

Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition"

Survey Design

The original version of Form EIA-176 was approved in 1980 with a mandatory response requirement. Prior to 1980, published data were based on voluntary responses to Bureau of Mines, U.S. Department of the Interior predecessor Forms BOM-6-1340-A and BOM-6-1341-A of the same title.

In 1982, the scope of the revised EIA-176 survey was expanded to collect the number of electric utility consumers in each State, volumes of gas transported to industrial and electric utility consumers, detailed information on volumes transported across State borders by the respondent for others and for the responding company, and detailed information on other disposition. These changes were incorporated to provide more complete survey information with a minimal change in respondent burden. The 1982 revision of the Form EIA-176 continues to be the basis of the current version of this form. On March 4, 1985, the Form EIA-176 was again approved by the Office of Management and Budget for use through report year 1986.

In 1988, the Form EIA-176 was revised to include data collection for deliveries of natural gas to commercial consumers for the account of others. The revised form was approved for use during report years 1987 through 1989. Response to the form continues to be mandatory.

A short version of Form EIA-176 was also approved in 1988. Companies engaged in purchase and delivery activities, but not in transportation and storage acitivies, may file the short form. Usually, these companies are municipals handling small volumes of gas.

Survey Universe and Response Statistics

The Form EIA-176 is mailed to all identified interstate and intrastate natural gas pipeline companies, investor and municipally owned natural gas distributors, underground natural gas storage operators, synthetic natural gas plant operators, and field, well, or processing plant operators that deliver natural gas directly to consumers (including their own industrial facilities) and/or that transport gas to, across, or from a State border through field or gathering facilities.

Each company and its parent company or subsidiaries were required to file if they met the survey specifications. The original mailing totaled 2,174 questionnaire packages. To this original mailing, 2 names were added and 14 were deleted as a result of the survey processing. Additions were the result of comparisons of the mailing list to other survey mailing lists. Deletions resulted from post office returns and determinations that companies were out of business, sold, or not within the scope of the survey. After all updates, the survey universe was 2,162 responses from approximately 1,800 companies.

Following the original mailing, second request mailing, and nonrespondents followup, 2,162 responses were entered into the data base, and there were no nonrespondents.

Summary of Form EIA-176 Data Reporting Requirements

The EIA-176 is a multiline schedule for reporting all supplies of natural gas and supplemental gaseous fuels and their disposition within the State indicated. Respondents file completed forms with EIA in Washington, DC. Data for the report year are due by April 1 of the following year. Extensions of the filing deadline for up to 45 days are granted to any respondent on request.

All natural gas and supplemental gaseous fuels volumes are reported on a physical custody basis in thousand cubic feet (Mcf), and dollar values are reported to the nearest whole dollar. All volumes are reported at 14.73 pounds per square inch absolute pressure (psia) and 60 degrees Fahrenheit.

Routine Form EIA-176 Edit Checks

A series of manual and computerized edit checks are used to screen the Form EIA-176. The edits performed include validity, arithmetic, and analytical checks.

The incoming forms are reviewed prior to keying. This prescan determines if the respondent identification (ID) number and the company name and address are correct, if the data on the form appear complete and reasonable, and if the certifying information is complete.

Manual checks on the data are also made. Each form is prescanned to determine that data were reported on the correct lines. The flow of gas through interstate pipelines is checked at the company level to ensure that each delivery from a State is matched with a corresponding receipt in an adjoining State.

After the data are keyed, computer edit procedures are performed. Edit programs verify the report year, State code, and arithmetic totals. Further tests are made to ensure that all necessary data elements are present and that the data are reasonable and internally consistent. The computerized edit system produces error listings with messages for each failed edit test. When problems occur, respondents are contacted by telephone and required to file amended forms with corrected data.

Other EIA Publications Referencing Form EIA-176

Data from Form EIA-176 are also published in the *Natural Gas Annual.*

Form EIA-176

U.S. DEPARTMENT OF ENERGY
ENERGY INFORMATION ADMINISTRATION

Form Approved
OMB No. 19050175
Expires: 12/31/90

ANNUAL REPORT OF NATURAL AND SUPPLEMENTAL GAS SUPPLY AND DISPOSITION, 19 ☐☐

This report is mandatory under the Federal Energy Administration Act of 1974 (Public Law 93-275). Failure to report may result in criminal fines, civil penalties, and other sanctions as provided by law. See Section VI of the instructions for confidentiality statement. Public reporting burden for this collection of information is estimated to average 19.8 hours per response, including the time of reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Energy Information Administration, Office of Statistical Standards EI-73, Mail Station 1H-023 Forrestal, 1000 Independence Ave SW, Washington DC 20585; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington DC 20503.

EIA COPY. Tear out, complete, and return to:

Energy Information Administration
Mail Station: BG-094 FORSTL
U.S. Department of Energy
Washington, D.C. 20585
Attn: Form EIA-176

EIA USE

Affix mailing label or enter mail address

Control (ID) No. ______

Name: .... ______
Operations in (State): .... ______
Street or Post Office Box: ...... ______
City, State, Zip Code: .... ______
Attention: .... ______

PART I: IDENTIFICATION

1.0 Control No.	2.0 Company Name:	3.0 Report State	EIA ☐☐	4.0 Resubmittal ☐ Date:

5.0 Company status, name, and/or address change or correction. (Check appropriate box.)

a. ☐ Name and address on mailing label are correct.
b. ☐ Change name, attention line, and/or mail address as indicated below.
c. ☐ Company was sold to, or merged with, company entered below.
d. ☐ Company went out of business. Customer accounts taken over by company entered below.
e. ☐ Other changes, corrections, or comments: ______

5.1 Change mail address to:
a. Company Name: .... ______
b. Operations in (State): .... ______
c. Street or Post Office Box: .... ______
d. City, State, Zip Code: .... ______
e. Attention: .... ______

6.0 Contact person:
Name: ______ Telephone Number: Area Code ______ No. ______ Ext. ______

PART II: CERTIFICATION AND DISCLOSURE STATEMENT

1.0 I certify that (Check appropriate box):

a. ☐ The information provided herein and appended hereto is true and accurate or, where indicated on the form, reasonable estimates to the best of my knowledge.
b. ☐ My company does not meet any of the criteria set forth in Section II, "Who must submit," of the instructions and is therefore not required to complete and submit a Form EIA-176 for the report State.
c. Does the information supplied on this form contain trade secrets and/or confidential commercial information? ☐ Yes ☐ No

2.0 Name	3.0 Title
4.0 Signature	5.0 Date

Title 18, USC 1001, makes it a crime for any person knowingly and willingly to make to any agency or department of the United States any false, fictitious or fraudulent statements as to any matter within its jurisdiction.

Page 1

EIA-176
(Revised 1988)

ANNUAL REPORT OF NATURAL AND SUPPLEMENTAL GAS SUPPLY AND DISPOSITION, 19 ☐☐

1.0 Control No.	2.0 Company Name	3.0 Report State EIA	4.0 Resubmittal ☐ Date:

PART III: TYPE OF COMPANY AND GAS ACTIVITIES OPERATED IN THE REPORT STATE

1.0 Type of Company (check one)

- a ☐ Investor owned distributor
- b ☐ Municipally owned distributor
- c ☐ Interstate pipeline
- d ☐ Intrastate pipeline
- e ☐ Storage operator
- f ☐ SNG plant operator
- g ☐ Integrated oil and gas
- h ☐ Producer
- i ☐ Gatherer
- j ☐ Processor
- k ☐ Other (specify)

2.0 Gas Activities Operated On-system Within the Report State (check all that apply)

- a ☐ Produced Natural Gas
- b ☐ Gathered
- c ☐ Processed
- d ☐ Purchased
- e ☐ Transported Interstate
- f ☐ Transported Intrastate
- g ☐ Stored Underground
- h ☐ Stored LNG
- i ☐ Injected Propane-air
- j ☐ Produced SNG
- k ☐ Imported
- i ☐ Exported
- m ☐ Delivered for Resale
- n ☐ Delivered directly to consumers
- ☐ Other (specify) ____________

PART IV: SUPPLY OF NATURAL AND SUPPLEMENTAL GAS RECEIVED WITHIN OR TRANSPORTED INTO REPORT STATE

	Volume (Mcf at 14.73 psia)	e or f	Cost (Dollars)	e or f
1.0 Company owned natural gas produced on-system				
2.0 On-system purchases received:				
2.1 From producers, gatherers, and/or gas processors				
2.2 From pipeline, distribution, and/or storage operators				
2.3 From synthetic natural gas plants or SNG pipeline				
2.4 At State line or U.S. border from:				
(Company) ____________				
(State or Country) ____________				
(Continue on Part VI, if more space is needed)				
3.0 Transportation, exchange, and/or storage receipts:				
3.1 Received within the report State				
3.2 Received at the State line or U.S. border from:				
(Company) ____________				
(State or Country) ____________				
(Continue on Part VI, if more space is needed)				
4.0 Transported into the report State from:				
(State or Country) ____________				
(Continue on Part VI, if more space is needed)				
5.0 Withdrawn from company operated storage facilities:				
5.1 From underground storage				
5.2 From liquefied natural gas storage				
6.0 Synthetic natural gas produced				
7.0 Other sources of supply (specify):				
(Source and/or kind of fuel)				
____________				
(Continue on Part VI, if more space is needed)				
8.0 Total supply within report State				

EIA-176

EIA COPY Page 2

ANNUAL REPORT OF NATURAL AND SUPPLEMENTAL GAS SUPPLY AND DISPOSITION, 19 ☐☐

1.0 Control No.	2.0 Company Name	3.0 Report State	EIA	4.0 Resubmittal
			☐☐	☐ Date:

PART V: DISPOSITION OF NATURAL AND SUPPLEMENTAL GAS WITHIN OR TRANSPORTED OUT OF REPORT STATE

	Volume (Mcf at 14.73 psia)	e or f	Cost or Revenue (Dollars)	e or f
1.0 Used in well, lease, and field operations				
2.0 Returned to oil and/or gas reservoirs				
3.0 Used, removed, or lost in gas processing or treating plants				
3.1 Company operated plants:				
3.1.1 Volume delivered to company operated plants for redelivery ______ Mcf				
3.1.2 Volume used for plant fuel				
3.1.3 Extraction loss (Estimated gas phase volume of liquids extracted)				
3.1.4 Volume of nonhydrocarbons removed (e.g., H_2S & CO_2)				
3.1.5 Vented, flared, and/or lost				
3.2 Plants operated by others:				
3.2.1 Volume delivered to plants operated by others for redelivery ______ Mcf				
3.2.2 Total volume used, removed, vented, and/or flared				
4.0 Used in pipeline, storage, and/or distribution operations				
5.0 Added to company operated storage facilities:				
5.1 Injected into underground storage				
5.2 Added to liquefied natural gas storage				
6.0 Transportation, exchange, and/or storage deliveries:				
6.1 Delivered at point(s) within the report State				
6.2 Delivered at the State line or U.S. border to:				
(Company) ______				
(State or Country) ______				
(Continue on Part VI, if more space is needed)				
7.0 Transported out of the report State to:				
(State or Country) ______				
(Continue on Part VI, if more space is needed)				
8.0 Delivered for sales for resale:				
8.1 Delivered within the report State				
8.2 Delivered at the State line or U.S. border to:				
(Company) ______				
(State or Country) ______				
(Continue on Part VI, if more space is needed)				
9.0 Delivered directly to consumers: (Type of transaction and consumer) — (Number of consumers)				
9.1 Residential sales				
9.2 Commercial sales				
9.3 Industrial sales				
9.4 Electric utility sales				
9.5 Transported to industrials				
9.6 Transported to electric utilities				
9.7 Transported to commercial consumers				
10.0 Average heat content of gas delivered directly to consumers (Btu per cubic foot) ______ Btu				
11.0 Other disposition (specify)				
______				
(Continue on Part VI, if more space is needed)				
12.0 Total disposition accounted for				
13.0 Unaccounted for gas supply (+) or disposition (–)				

EIA-176

EIA COPY

Page 3

ANNUAL REPORT OF NATURAL AND SUPPLEMENTAL GAS SUPPLY AND DISPOSITION, 19

1.0 Control No.	2.0 Company Name	3.0 Report State	EIA	4.0 Resubmittal Date:

PART VI: CONTINUATION SHEET Sheet ____ of ____

(To be used only if insufficient space was provided on Part IV and/or Part V)

Supply (Continued)	Volume (Mcf at 14.73 psia)	e or f	Cost or Revenue (Dollars)	e or f
PART IV, 2.4 On-system purchases received at State line or U.S. border from: (Continued)				
Company				
State or Country				
Company				
State or Country				
PART IV, 3.2 Transportation, exchange, and/or storage receipts at State line or U.S. border from: (Continued)				
Company				
State or Country				
Company				
State or Country				
PART IV, 4.0 Transported into report State from: (Continued)				
State or Country				
State or Country				
State or Country				
State or Country				
PART IV, 7.0 Other sources of supply (specify): (Continued) (Source and/or kind of fuel)				
Disposition (Continued)				
PART V, 6.2 Transportation, exchange, and/or storage deliveries at State line or U.S. border to: (Continued)				
Company				
State or Country				
Company				
State or Country				
PART V, 7.0 Transported out of report State to: (Continued)				
State or Country				
State or Country				
State or Country				
State or Country				
PART V, 8.2 Delivered for sale for resale at State line or U.S. border to: (Continued)				
Company				
State or Country				
Company				
State or Country				
PART V, 11.0 Other Disposition (specify): (Continued)				

EIA-176 EIA COPY Page 4

ANNUAL REPORT OF NATURAL AND SUPPLEMENTAL GAS SUPPLY AND DISPOSITION, 19

1.0 Control No.	2.0 Company Name	3.0 Report State	EIA	4.0 Resubmittal Date:

PART VII: FOOTNOTES

Part No.	Item No.	EIA Use	Sub-item (State, Company, or Line)	Line No.	Footnote

EIA-176

EIA COPY **Page 5**

Form Approved
OMB No. 19050175
Expires: 12/31/90

U.S. DEPARTMENT OF ENERGY
ENERGY INFORMATION ADMINISTRATION

ANNUAL REPORT OF NATURAL AND SUPPLEMENTAL GAS SUPPLY AND DISPOSITION, 19 ☐☐ SHORT FORM

This report is mandatory under the Federal Energy Administration Act of 1974 (Public Law 93-275). Failure to report may result in criminal fines, civil penalties, and other sanctions as provided by law. See Section VI of the instructions for confidentiality statement. Public reporting burden for this collection of information is estimated to average 2 hours per response, including the time of reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Energy Information Administration, Office of Statistical Standards EI-73, Mail Station 1H-023 Forrestal, 1000 Independence Ave SW, Washington DC 20585; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington DC 20503.

EIA USE

EIA COPY. Tear out, complete, and return to:

Energy Information Administration
Mail Station: BG-094 FORSTL
U.S. Department of Energy
Washington, D.C. 20585
Attn: Form EIA-176

Affix mailing label or enter mail address

Control (ID) No. ____________

Name: .... ____________
Operations in (State): .... ____________
Street or Post Office Box: ...... ____________
City, State, Zip Code: .... ____________
Attention: .... ____________

PART I: IDENTIFICATION

1.0 Control No.	2.0 Company Name:	3.0 Report State	EIA	4.0 Resubmittal
			☐☐	☐ Date:

5.0 Company status, name, and/or address change or correction. (Check appropriate box.)

a. ☐ Name and address on mailing label are correct.
b. ☐ Change name, attention line, and/or mail address as indicated below.
c. ☐ Company was sold to, or merged with, company entered below.
d. ☐ Company went out of business. Customer accounts taken over by company entered below.
e. ☐ Other changes, corrections, or comments: ____________

5.1 Change mail address to:
a. Company Name: .... ____________
b. Operations in (State): .... ____________
c. Street or Post Office Box: .... ____________
d. City, State, Zip Code: .... ____________
e. Attention: .... ____________

6.0 Contact person:

Name: ____________ Telephone Number: Area Code ____ No. ________ Ext. ____

PART II: CERTIFICATION AND DISCLOSURE STATEMENT

1.0 I certify that (Check appropriate box):

a. ☐ The information provided herein and appended hereto is true and accurate or, where indicated on the form, reasonable estimates to the best of my knowledge.

b. ☐ My company does not meet any of the criteria set forth in Section II, "Who must submit," of the instructions and is therefore not required to complete and submit a Form EIA-176 for the report State.

c. Does the information supplied on this form contain trade secrets and/or confidential commercial information? ☐ Yes ☐ No

2.0 Name	3.0 Title
4.0 Signature	5.0 Date

Title 18, USC 1001, makes it a crime for any person knowingly and willingly to make to any agency or department of the United States any false, fictitious or fraudulent statements as to any matter within its jurisdiction.

EIA-176 (Revised 1988) SHORT FORM

Page 1

ANNUAL REPORT OF NATURAL AND SUPPLEMENTAL GAS SUPPLY AND DISPOSITION, 19 ☐☐

1.0 Control No.	2.0 Company Name:	3.0 Report State EIA ☐☐	4.0 Resubmittal ☐ Date:

PART III: TYPE OF COMPANY AND GAS ACTIVITIES OPERATED IN THE REPORT STATE

1.0 Type of Company (check one)

a. ☐ Investor owned distributor
b. ☐ Municipally owned distributor
c. ☐ Interstate pipeline
d. ☐ Intrastate pipeline
e. ☐ Storage operator
f. ☐ SNG plant operator
g. ☐ Integrated oil and gas
h. ☐ Producer
i. ☐ Gatherer
j. ☐ Processor
k. ☐ Other (specify) ________

2.0 Gas Activities Operated On-system Within the Report State (check all that apply)

a. ☐ Produced Natural Gas
b. ☐ Gathered
c. ☐ Processed
d. ☐ Purchased
e. ☐ Transported Interstate
f. ☐ Transported Intrastate
g. ☐ Stored Underground
h. ☐ Stored LNG
i. ☐ Injected Propane-air
j. ☐ Produced SNG
k. ☐ Imported
l. ☐ Exported
m. ☐ Delivered for Resale
n. ☐ Delivered directly to consumers
o. ☐ Other (specify) ________

PART IV: SUPPLY OF NATURAL AND SUPPLEMENTAL GAS RECEIVED WITHIN OR TRANSPORTED INTO REPORT STATE

	Volume (Mcf at 14.73 psia)	e or f	Cost (Dollars)	e or f
2.0 On-system purchases received:				
2.1 From producers, gatherers, and/or gas processors				
2.2 From pipeline, distribution, and/or storage operators				
2.3 From synthetic natural gas plants or SNG pipeline				
7.0 Other sources of supply (specify): (Source and/or kind of fuel)				
(Continue on Part VI, if more space is needed)				
8.0 Total Supply within report State				

PART V: DISPOSITION OF NATURAL AND SUPPLEMENTAL GAS WITHIN OR TRANSPORTED OUT OF REPORT STATE

	(Number of consumers)	Volume (Mcf at 14.73 psia)	e or f	Cost or Revenue (Dollars)	e or f
4.0 Used in pipeline, storage and/or distribution operations					
9.0 Delivered directly to consumers: (Type of transaction and consumer)					
9.1 Residential sales					
9.2 Commercial sales					
9.3 Industrial sales					
9.4 Electric utility sales					
10.0 Average heat content of gas delivered directly to consumers (Btu per cubic foot) ________ Btu					
11.0 Other disposition (specify)					
(Continue on Part VI, if more space is needed)					
12.0 Total disposition accounted for					
13.0 Unaccounted for gas supply (+) or disposition (-)					

EIA-176 SHORT FORM — EIA COPY — Page 2

ANNUAL REPORT OF NATURAL AND SUPPLEMENTAL GAS SUPPLY AND DISPOSITION, 19 ☐☐

1.0 Control No.	2.0 Company Name:	3.0 Report State	EIA ☐☐	4.0 Resubmittal ☐ Date:

PART VI: CONTINUATION SHEET Sheet _____ of _____
(To be used only if insufficient space was provided on Part IV and/or Part V)

Supply (Continued)	Volume (Mcf at 14.73 psia)	e or f	Cost or Revenue (Dollars)	e or f
PART IV. 7.0 Other sources of supply (specify): (Continued) (Source and/or kind of fuel)				
Disposition (Continued)				
PART V. 11.0 Other Disposition (specify): (Continued)				

PART VII: FOOTNOTES

Part No.	Item No.	EIA Use	Sub-item (State, Company, or Line)	Line No.	Footnote

EIA-176 SHORT FORM EIA COPY Page 3

Form EIA-627, "Annual Quantity and Value of Natural Gas Report"

Survey Design

Beginning with 1980, natural gas production data previously obtained on an informal basis from State conservation agencies were collected on Form EIA-627 (Figure D2). This form was designed by EIA to collect annual natural gas production data from the appropriate State agencies under a standard data reporting system within the limits imposed by the diversity of data collection systems of the various producing States. It was also designed to avoid duplication of effort in collecting production and value data by producing States and to avoid an unnecessary respondent burden on gas and oil well operators.

Survey Universe and Response Statistics

Form EIA-627 is mailed to energy or conservation agencies in all 32 natural gas producing States. All producing States participate voluntarily in the EIA-627 survey by filing the completed form or by responding to telephone contacts. For 1988, data on the quantities of nonhydrocarbon gases removed were reported by the appropriate agencies of 22 of the 32 States. These 22 States accounted for 58 percent of total 1988 gross withdrawals. In addition, gross withdrawal data from Kansas, Oklahoma, Louisiana, and Montana, which together accounted for 38 percent of total production, excluded all or most of the nonhydrocarbon gases removed on leases.

Summary of Form EIA-627 Data Reporting Requirements

Form EIA-627 is a multipart form that collects data on the production volume of natural gas (including gross withdrawals from both gas and oil wells); volumes returned to formation for repressuring, pressure maintenance, and cycling; quantities vented and flared; quantities of nonhydrocarbon gases removed; marketed production; the value of marketed production; and the number of producing gas wells.

Respondents are asked to report all volumes in million cubic feet at the State's standard pressure base and at 60 degrees Fahrenheit. All dollar values are reported in thousands.

Routine Form EIA-627 Edit Checks

Each filing of Form EIA-627 is manually checked for reasonableness and mathematical accuracy. Information on the forms is compared to totals of monthly data reported to the Interstate Oil Compact Commission (see Appendix B, "Data Sources"). Volumes are converted, as necessary, to a standard 14.73 psia pressure base. Reasonableness of data is assessed by comparing reported data to the previous year's data. State agencies are contacted by telephone to correct errors. Amended filings or resubmissions are not a requirement, since participation in the survey is voluntary.

Other EIA Publications Referencing Form EIA-627

Data from Form EIA-627 are also published in the EIA publication, *Natural Gas Annual.*

Interstate Oil Compact Commission Form "Monthly Report of Natural Gas Production"

Survey Design

The Interstate Oil Compact Commission (IOCC) is an organization comprised of 32 gas and oil producing States; the Governor of each State sits on the board of the IOCC. The IOCC form, "Monthly Report of Natural Gas Production," (Figure D3) is a voluntary report filed to the IOCC by most of the producing States. The IOCC forwards copies of these forms to the EIA. The purpose of the form is to standardize, to the extent possible, the reporting of natural gas data by the States.

Survey Universe and Response Statistics

Most of the 32 States report data to the IOCC. Two exceptions are Florida, which submits its own form, and California, whose data are taken from the Conservation Committee of California Oil Producers publication. Reports on State production are forwarded to the EIA by the IOCC approximately 80 days after the end of the report month.

Form EIA-627

U.S. DEPARTMENT OF ENERGY
Energy Information Administration

Form Approved
OMB No. 19050175
Expires: 12/31/90

ANNUAL QUANTITY AND VALUE OF NATURAL GAS REPORT

This report is collected under P.L. 93-275, Federal Energy Administration Act of 1974. Your voluntary cooperation and response are urgently needed to provide comprehensive, accurate and timely energy information. Because the data collected on EIA-627 are already aggregated by state, no confidentiality pledges are required.

PART I: IDENTIFICATION DATA

1. Name of State Reporting	2. Calendar Year Being Reported ☐☐☐☐
3. Name of Office/Agency	
4. Office Address (Street, City, State, Zip Code)	
5. Name of Contact Person	6. Phone Number of Contact Person (☐☐☐) ☐☐☐-☐☐☐☐

PART II: NATURAL GAS VOLUMES

7. Enter the pressure base at which all volumes are reported (psia at 60°F)

8. Gross Withdrawals

REPORT ALL VOLUMES IN MILLIONS OF CUBIC FEET

Gross withdrawals should represent full well stream volumes including all natural gas plant liquids and nonhydrocarbon gases, but excluding lease condensate. Also, include amounts delivered as royalty payments or consumed in field operations.

PROVIDE BEST ESTIMATE WHEN GAS IS NOT METERED

Item *(a)*	Volume *(b)*
(1) Are the gross withdrawal quantities available from your records consistent with the definition stated above? (i) ☐ Yes (ii) ☐ No . . . *Explain the difference(s) in PART IV*	
(2) Enter the volume of natural gas from gas and condensate wells	
(3) Enter the volume of natural gas from oil wells (casinghead)	
(4) Enter the total of 8(2) and 8(3)	
9. Enter quantity of natural gas returned to formation for repressuring, pressure maintenance and cycling	
10. Enter quantity of natural gas vented to air or burned in flares on the lease or at gas processing plants	
11. Enter quantity of nonhydrocarbon gases removed in treating or processing operations	
12. Enter marketed production *(Enter the result of line 8(4) less lines 9, 10, and 11)*	

EIA-627 (4-83)

Page 1

ANNUAL QUANTITY AND VALUE OF NATURAL GAS REPORT

PART III: NATURAL GAS VALUES

13. Value of Marketed Production (Wellhead Sales Prices)

NOTE

The value reported on line 14 below should represent wellhead sales prices including charges for natural gas plant liquids subsequently removed from the gas and for gathering and compression, in addition to state production, severance, and/or similar taxes.

Complete the table below only if your method of reporting is inconsistent with the above note. For each item in column (a) of the table, enter an "X" in column (b) or (c) to indicate whether the item is included or excluded from the amount reported on line 14.

Line No.	Item *(a)*	Included *(b)*	Excluded *(c)*
(1)	Natural gas plant liquids		
(2)	Lease condensate		
(3)	Gathering and compression charges		
(4)	State production, severance, and/or similar taxes		

14. Enter the available value of marketed production **REPORT IN THOUSANDS OF DOLLARS**	$
15. Enter the quantity of marketed production associated with the value entered in 14. **REPORT IN MILLIONS OF CUBIC FEET**	
16. Enter the total number of producing gas wells in operation as of December 31 for the reporting year.	

PART IV: COMMENTS

17. Enter any additional comments you may have, including identification and explanation of any data elements submitted based on definitions differing from those applications to data which you provided for the previous year. If more space is needed, please attach separate sheet(s) and put "sheet ____ of ____" in the upper right corner of those sheets.

EIA-627 (4-83) Page 2

INTERSTATE OIL COMPACT COMMISSION

HEADQUARTERS OFFICE: 900 N. E. 23RD STREET • P. O. BOX 53127 • OKLAHOMA CITY, OKLAHOMA 73152
TELEPHONE: (405) 525-3556

Address Reply to Headquarters Office

Monthly Report of Natural Gas Production for the State of ________________

Month of ____________________

Please return two copies of this report as soon as the figures are available after the close of the month for which data are reported. Reports should be addressed to the Interstate Oil Compact Commission, Box 53127, Oklahoma City, OK 73152.

Name of Reporting Agency ____
Address ____
Correspondent & Title ____

Please adjust all volumes to the same pressure base:
Report pressure base used (____________ lbs. absolute at 60° F.)

(Millions of Cubic Feet)

1. Gross gas production* ____________________
   (a) Natural gas from gas and condensate wells ____________________
   (b) Natural gas from oil wells (casinghead) ____________________

* Include amounts delivered as royalty payments or consumed in field operations. Please provide best estimates when gas is not metered.

2. Quantity of natural gas returned to formation for repressuring, pressure maintenance and cycling. ____________________

3. Quantity of natural gas vented to air or burned in flares on the lease or at gas processing plants. ____________________

MEMBER STATES: ALABAMA · ALASKA · ARIZONA · ARKANSAS · CALIFORNIA · COLORADO · FLORIDA · ILLINOIS · INDIANA · KANSAS · KENTUCKY
LOUISIANA · MARYLAND · MICHIGAN · MISSISSIPPI · MONTANA · NEBRASKA · NEVADA · NEW MEXICO · NEW YORK · NORTH DAKOTA · OHIO
OKLAHOMA · PENNSYLVANIA · SOUTH DAKOTA · TENNESSEE · TEXAS · UTAH · WEST VIRGINIA · WYOMING
ASSOCIATES: GEORGIA · IDAHO · NORTH CAROLINA · OREGON · SOUTH CAROLINA · WASHINGTON

Summary of Data Requirements

The IOCC form consists of three questions on one page, and requires volumetric information on gross production, quantities of gas vented or flared, and gas used for repressuring.

Routine Edit Checks

State data are checked for reasonableness and, in the event of problems, the appropriate State agency is called.

FERC-8/EIA-191 Surveys, "Underground Natural Gas Storage Report"

Survey Design

This survey was jointly implemented in 1975 by the Federal Power Commission (FPC), the Federal Energy Administration (FEA), and the Bureau of Mines (BOM) as the FPC-8/ FEA-G-318 system. The data received on both the FPC-8 and FEA-G-318 were computerized and aggregated by FPC.

At the beginning of 1979, the EIA assumed responsibility for the collection, processing, and publication of the data gathered in the survey. Form FEA-G-318 was renewed on July 1, 1979, as Form EIA-191 and the survey was retitled the FPC-8/EIA-191 Survey (Figure D4 shows the EIA-191). Form FPC-8 was renewed in December 1985 and the survey retitled FERC-8/ EIA-191 Survey. The forms have not been merged because of FERC's stated desire to maintain the separate identity of the FERC-8 for administrative reasons.

Survey Universe and Response Statistics

Currently, 91 companies operate underground storage facilities. Of these companies, 40 are subject to the jurisdiction of FERC and are required to report data on Form FERC-8. The other 51 companies are required to file the essentially identical Form EIA-191. Both forms are filed with EIA and the data are merged in a unified data processing system.

The response rate as of the filing deadline is approximately 20 percent. Data from the remaining 80 percent of respondents are received in writing and/or by telephone within 3 to 4 days after the filing deadline. All data supplied by telephone are subsequently filed in writing, generally within 15 days of the filing deadline. The final response rate is 100 percent.

Summary of FERC-8/EIA-191 Data Reporting Requirements

The virtually identical Forms FERC-8 and EIA-191 are multipart forms that report the quantities of gas in storage, injections and withdrawals, and the location (including State and county), and capacity of underground storage reservoirs. Information on co-owners of storage reservoirs is also required.

Collection of the survey is on a custody basis, although some respondent ownership data are required. Information requested must be provided within 10 days after the first day of each month. Twelve reports are required per calendar year. Respondents are required to indicate whether the data reported are actual or estimated. In the case of most estimated filings, the necessary revisions are reflected in subsequent scheduled filings or in a revised submission that provides actual data filed, although there is no specific requirement that the respondent do either. Actual data on natural gas injections and withdrawals from underground storage are based on metered quantities. Data on quantities of gas in storage and on storage capacity represent, in part, reservoir engineering evaluations. All volumes are reported at 14.73 psia and 60 degrees Fahrenheit.

Routine Forms FERC-8/EIA-191 Edit Checks

Data received on Form FERC-8 are merged with data received on Form EIA-191 in a unified data processing system. The survey's five principal data elements (total, base, and working gas in storage, injections, and withdrawals) are hand tabulated to provide preliminary totals.

Individual company reports are manually checked for reasonableness by comparing current reports with prior responses. Mathematical calculations are manually checked for accuracy and all data are checked for internal consistency. Respondents are required to refile reports containing any inconsistencies or errors.

Other EIA Publications Referencing Forms FERC-8/EIA-191

The EIA publication *Monthly Energy Review* contains data from the FERC-8/EIA-191 survey.

Form EIA-191

U.S. DEPARTMENT OF ENERGY
ENERGY INFORMATION ADMINISTRATION
Washington, D.C. 20585

Form Approved
OMB No. 19050175
Expires: 12/31/90

UNDERGROUND GAS STORAGE REPORT

This report is mandatory under Public Law 93-275. Failure to report may result in criminal fines, civil penalties, or other sanctions as provided by law. See Part F of the General Instructions for information concerning confidentiality

I. RESPONDENT IDENTIFICATION DATA

(1	a. IRS EIN Number	b. DOE Code	c. Report Period Ending Date (Mo / Da / Yr)	d. ☐ Check if this is a revision to report previously submitted for the report period indicated.	e. ☐ Check box if respondent identification has changed. If name has changed, enter previous name:
(2	Respondent's Name		Street Address		City, State and Zip Code
(3	Person to contact if questions arise concerning this report:		Title	City and State	Tel. No. *(Include Area Code and Extension)*

II. GAS STORAGE DATA

Line No.		BALANCES (All volumes in Mcf - 14.73 psia - 60°F)				INJECTIONS & WITHDRAWALS		
		Base Gas *(a)*	Working Gas *(b)*	Total Gas in Storage *(c)*	Native Gas Included in Column (a) *(d)*	Time Period	Injections *(e)*	Withdrawals *(f)*
	A. Respondent's Gas In Reservoirs Operated By Respondent					☐ Estimated	☐ Actual	
4	Balance Nov. 1					Nov. 1 To Date		
5	Report Period					Report Period		
	B. Gas Belonging To Others In Reservoirs Operated By Respondent							
6	Balance Nov. 1					Nov. 1 To Date		
7	Report Period					Report Period		
	C. Total Gas (Sum Of A And B)							
8	Balance Nov. 1					Nov. 1 To Date		
9	Report Period					Report Period		
	D. Respondent's Gas In Reservoirs Operated By Others							
10	Balance Nov. 1					Nov. 1 To Date		
11	Report Period					Report Period		
	E. Reservoirs In Development Stage Included In A And B Above							
12	Balance Nov. 1					Nov. 1 To Date		
13	Report Period					Report Period		

III. CERTIFICATION

I certify that the information submitted on this form is the most accurate available at this time to the best of my knowledge.

Name *(Type or Print)*	Title	Signature	Date

Title 18 USC 1001 makes it a crime for any person knowingly and willingly to make to any Agency or Department of the United States any false, fictitious or fraudulent statements as to any matter within its jurisdiction.

EIA-191 (10-83) Page 1

Form FERC-11, "Natural Gas Pipeline Company Monthly Statement"

Survey Design

The collection of monthly data from major pipeline companies was begun in December 1964 by the Federal Power Commission (FPC). On October 1, 1977, FPC ceased to exist, and its functions and regulatory responsibilities were transferred to the Secretary of Energy and to the Federal Energy Regulatory Commission (FERC), an independent commission within the Department of Energy.

Information collected on Form FERC-11 (Figure D5) is used by FERC in carrying out its regulatory authority. Form FERC-11 is a monthly regulatory reporting form rather than one filed for statistical purposes.

Survey Universe and Response Statistics

Form FERC-11 is filed by major interstate natural gas pipeline companies whose combined sales for resale and gas transported interstate or stored for a fee exceeded 50 billion cubic feet in the previous calendar year. Approximately 40 pipeline companies report data on Form FERC-11. Natural gas pipeline companies are monitored annually to determine whether each has met the requirements for classification as a major pipeline.

Information is collected monthly by mail. Historically, the response rate has been 100 percent.

Summary of Form FERC-11 Data Requirements

Form FERC-11 requires information on revenues, expenses, and sales data, as well as volumetric data on purchases and production.

Submission of Form FERC-11 is required no later than 40 days after the close of the report month. The form requires reporting of both preliminary data for the report month and final data for the same month in the previous year. All data are reported on an equity basis.

Routine Form FERC-11 Edit Checks

Data are collected on standard forms that initially are manually reviewed and coded. Reviews are made to ensure consistency in reporting within and among utilities in the presentation of current and 12-month financial and sales data. Also, receipts and disposition of gas are analyzed between domestic and foreign producers. Data are later sent for keying, which begins the automated processing. Data are keyed to tape or disk for data editing. Edit reports are produced and are reviewed manually.

Other EIA Publications Referencing Form FERC-11

The Energy Information Administration publication *Monthly Energy Review* contains data from Form FERC-11.

FERC-121, "Application for Determination of the Maximum Lawful Price Under the Natural Gas Policy Act"

Survey Design

Form FERC-121 (Figure D6) was designed by the Federal Energy Regulatory Commission (FERC) to carry out its authority to regulate natural gas prices under the Natural Gas Policy Act. Form FERC-121 is initially filed with the agency having jurisdiction over the lease on the land where the well is drilled, for example, State agencies or the Department of Interior. The agencies determine whether or not to grant the application. The application, support documentation, and decision are forwarded to FERC, which has 45 days to review the decision.

Survey Universe and Response Statistics

Form FERC-121 must be filed by any natural gas producer who is the first seller of gas that qualifies for an incentive price. At the end of February 1988, FERC had 408,363 applications from 12,000 producers on file. Of the total applications, approximately 20 percent are reapplications requesting new price determinations on wells that have been producing under a previous application.

Form Approved, OMB No. 1902-0032
(Expires 6-30-90)

U.S. DEPARTMENT OF ENERGY
Federal Energy Regulatory Commission
Washington, D.C. 20426

Company Code Number
Month Being Reported 19 ___

FERC FORM NO. 11: NATURAL GAS PIPELINE COMPANY MONTHLY STATEMENT

This report is mandatory under the authority granted by Sections 10 and 16 and sanctions provided by Section 21(b) of the Natural Gas Act. Failure to report may result in criminal fines, civil penalties and other sanctions as provided by law.

PART I: IDENTIFICATION

1. Name of Company

2. Address of Company
(1) Number and Street (2) City (3) State (4) Zip Code

3. Person Authorized To Sign This Report
(1) Signature (2) Phone Number (Including area code)

PART II: REVENUE DATA

Line No. (a)	Item (b)	Revenues (In thousands of dollars) Current Year (c)	Revenues (In thousands of dollars) Previous Year (d)	Sales (In millions of cubic feet) Current Year (e)	Sales (In millions of cubic feet) Previous Year (f)	Footnote (g)
4	Sales of Natural Gas					
5	Firm Industrial					
6	Off-peak Industrial					
7	Interruptible Industrial					
8	TOTAL INDUSTRIAL (Enter total of lines 5, 6 and 7)					
9	Other Ultimate Consumers					
10	TOTAL SALES TO ULTIMATE CONSUMERS (Enter total of lines 8 and 9)					
	Sales For Resale (483)					
11	Total Major Gas Pipelines					
12	Total to All Other Pipelines and Gas Utilities					
13	TOTAL SALES FOR RESALE (Enter total of lines 11 and 12)					
14	TOTAL SALES OF NATURAL GAS (Enter total of lines 10 and 13)					
15	Intracompany Transfers (485)					
16	Revenues From Transportation of Gas of Others (489)			(Enter volume of gas transported:)		
17	Provision for Rate Refunds (496)					

FERC FORM NO. 11 (REVISED 12-84) Page 1 of 4

Company Code Number	Month and Year Being Reported

PART III: INCOME DATA

Line No. (a)	Item (b)	Current Year *(In thousands of dollars)* (c)	Previous Year *(In thousands of dollars)* (d)	Foot-note (e)
18	Gas Operating Revenues (400)			
19	Operation and Maintenance Expense (401, 402)			
20	Depreciation, Depletion and Amortization Expense (403-407)			
21	Taxes Other Than Income Taxes, Utility Operating Income (408.1)			
22	Total Gas Operating Expenses (401, 402, 403-407, 408.1, 409.1, 410.1, 411.1, 411.4)			
23	Net Gas Operating Revenues (Enter the result of lines 18 minus 22) (including Plant Leased to Others)			
24	Total Gas Utility Operating Income (Refer to specific instruction for line 24.)			
25	Allowance For All Funds Used During Construction - Credit (419.1, 432)			
26	Total Income Before Interest Charges (427-432) and Extraordinary Items (409.3, 434,435)			
27	Net Income (433) Before Extraordinary Items (434, 435), Income Taxes (409.1, 409.2, 409.3, 410.1, 410.2, 411.1, 411.2), and Investment Tax Credits (411.4, 411.5, 420)			
28	Net Income (Monthly Amount Related to 433.)			

PART IV: OTHER SELECTED DATA

Line No. (a)	Item (b)	Current Year *(In thousands of dollars)* (c)	Previous Year *(In thousands of dollars)* (d)	Foot-note (e)
29	Gas Utility Plant in Service (101)			
30	Accumulated Provision For Depreciation, Depletion, and Amortization of Gas Utility Plant (108, 111)			
31	Gas Plant Construction Work In Progress (107)			
32	Gross Additions To Construction Work In Progress (107) For This Month Being Reported			
33	Amount Collected Which Is Subject To Refund During This Month Being Reported			
34	Cumulative Amount Collected Since January 1 This Year Subject To Refund, At End Of This Month Being Reported			
35	Monthly Amount Subject To Refund Actually Refunded During This Month Being Reported			
36	Cumulative Amount Subject To Refund Refunded Since January 1 This Year, To The End Of This Month Being Reported			

FERC FORM NO. 11 (REVISED 12-84) Page 2 of 4

Company Code Number	Month and Year Being Reported

PART V: OPERATION AND MAINTENANCE EXPENSE DATA

Line No. (a)	Item (b)	Amount (In thousands of dollars) Current Year (c)	Amount (In thousands of dollars) Previous Year (d)	Gas Volume (In millions of cubic feet) Current Year (e)	Gas Volume (In millions of cubic feet) Previous Year (f)	Foot-note (g)
37	Manufactured Gas Production					
38	Liquefied Petroleum Gas					
39	Other Manufactured Gas					
40	TOTAL (Enter total of lines 38 and 39)					
41	Natural Gas Production					
42	Production and Gathering (750–769)					
43	Products Extraction (770–791)			(Enter thousands of gallons)		
44	Exploration and Development (795–798)					
	Purchased Natural Gas From					
45	Producers (800, 801-803)					
46	Intracompany Transfers (800.1)					
47	Imports					
48	Major Gas Pipelines (800, 801-803)					
49	Other Piplines (800, 801-803)					
50	Other Gas Purchases (804, 805, 805.1 minus line 68 -71)					
51	TOTAL (Enter total of lines 45 to 50)					
52	Natural Gas Produced					
53	Exchange Gas – In (806)					
54	Exchange Gas – Out (806)					
55	Purchased Gas Expenses (807.1–807.5)					
56	Gas Withdrawn From Underground Storage – Debit (808.1, 809.1)					
57	Gas Delivered To Underground Storage – Credit (808.2, 809.2)					
58	Gas Used For Compressor Station Fuel – Credit (810)					
59	Gas Used For Products Extraction – Credit (811)					
60	Gas Used For Other Utility Operations – Credit (812)					
61	Other Gas Supply Expenses (813)					
62	TOTAL GAS PRODUCTION (Enter total of lines 40, 42, 43, 44, 51, 53 to 61)					
63	Storage Expenses (814–843.9)					
64	LNG Terminating and Processing Expenses (844.1–847.8)					
65	Transmission Expenses (850–867)					
66	Distribution Expenses (870–894)					
67	Other Gas Purchased and Produced (<u>Entries here should not be</u> included under any <u>other item in this part</u>.)					
68	Liquefied Natural Gas (804.1)					
69	Gasified Coal					
70	Synthetic Gas [Reformed (gasified) liquid hydrocarbons.]					
71	TOTAL (Enter total of lines 68 to 70)					
72	All Other Operating and Maintenance Expenses (901-905, 907-916, 920-931, 935)					
73	TOTAL OPERATING AND MAINTENANCE EXPENSES (Enter total of lines 62, 63, 64, 65, 66, 71, 72)					

FERC FORM NO. 11 (REVISED 12-84)

Page 3 of 4

Summary of Form FERC-121 Data Reporting Requirements

Form FERC-121 requires information on the location and API number of the well, the name and address of the applicant, the type of determination being sought, the estimated annual production, and the contract price.

In addition to Form FERC-121, each application must be submitted with support documentation; for example, a well completion report for Section 103 filings, and geological information on surrounding wells for Section 102 applications.

Routine Form FERC-121 Edit Checks

Upon receipt at FERC, forms are checked manually for completeness. In addition, a computerized edit program flags incomplete or incorrect data.

Purchased Gas Adjustment Filings

The purpose of the PGA is to allow interstate natural gas pipeline companies to recover changes in their purchase prices for natural gas above the cost of service reflected in their current tariff filings. To allow recovery in a timely manner, the key data reported in the PGA are projections of purchases in the immediate future. In most cases, companies report both the NGPA Section number covering each contracted purchase and the date of the contract. These data make the PGA filings a unique source of information about the current state of the natural gas market.

Description of Data

Fifty-eight interstate pipeline companies submit PGA filings. Pipeline companies that transport only intrastate supplies of natural gas do not submit filings, nor do companies that have no purchased gas adjustment clauses in their tariffs.

Prior to July 1, 1984, filings for 20 of the largest interstate pipeline companies were included in Table 5. Together, they accounted for between 86 and 88 percent of all interstate wellhead purchases reported on Form FERC-2 for each year between 1976 and 1982. These companies were also the subject of an informal 1979 FERC study of NGPA prices.

The portion of the PGA filing used was generally referred to as the supporting cost-study. This study was not filed in a specific format or for specified time periods. As a result, the level of detail included varied from company to company, as did the exact time period covered. In most cases, however, companies filed price and volume data for their purchase contracts, along with the following:

- Contract date
- NGPA category
- Geographic source
- FERC account category.

For the 20 pipeline companies, the timing of PGA submissions varied in two ways:

- Seventeen companies reported data semiannually, while three reported annually.
- The dates on which the filings became effective and the periods covered by the filings varied.

Because of the lack of a specified form for PGA filings, each submission was processed separately. Major adjustments required to transform the various submissions into a single data base are described in the section on data transformations.

Effective July 1, 1984, Form 542-PGA required that certain purchased gas cost information that is common to all PGA filings be set forth in a standardized format. Filings received after July 1, 1984, are now being included in Table 5 as they are computerized and become available. Eventually all pipeline companies that file the Form 542-PGA will be included in the table. It is expected that there will be approximately 54 companies included.

All PGA filings included projected purchases for a defined future period. Projected volumes and prices represent the company's best estimate of natural gas purchase volumes and costs during the subsequent effective tariff period. The figures are usually derived from those of similar past periods. Some PGA filings also include "actual" volumes and prices for some past period. The two sets of figures cannot, in general, be used to check each other because the actual figures can cover periods other than past projections. To the extent that the two sets of figures can be compared, they appear to approximate but not to match each other.

Form FERC-121

U.S. DEPARTMENT OF ENERGY
Federal Energy Regulatory Commission
Washington, D.C. 20426

Form Approved
OMB No. 19050175
Expires: 12/31/90

APPLICATION FOR DETERMINATION OF THE MAXIMUM LAWFUL PRICE UNDER THE NATURAL GAS POLICY ACT (NGPA)
(Sections 102, 103, 107 and 108)

GENERAL INSTRUCTIONS

Complete this form if you are applying for price classification under sections 102, 103, 107 or 108 of the NGPA.

Complete each appropriate item on the reverse side of this page. The code numbers used in items 4 and 6 can be obtained from the Buyer/Seller Code Book. If there is more than one purchaser or contract, identify the additional information in the space below. Also enter any additional remarks in the space below. The data reported on this form are not considered to be confidential and will not be treated as such.

Submit the completed application to the appropriate Jurisdictional Agency as listed in title 18 of the CFR, part 274.501. If there are any questions, call (202) 357-8585.

SPECIFIC INSTRUCTIONS

Use the codes in the table below for type of determination in item 2.

Section of NGPA (a)	Category Code (b)	Description (c)
102	1	New OCS lease
102	2	New onshore well (2.5 mile test)
102	3	New onshore well (1000 feet deeper test)
102	4	New onshore reservoir
102	5	New reservoir on old OCS lease
103	-	New onshore production well
107	0	Deep (more than 15,000 feet) high-cost gas
107	1	Gas produced from geopressured brine
107	2	Gas produced from coal seams
107	3	Gas produced from Devonian shale
107	5	Production enhancement gas
107	6	New tight formation gas
107	7	Recompletion tight formation gas
108	0	Stripper well
108	1	Stripper well — seasonally affected
108	2	Stripper well — enhanced recovery
108	3	Stripper well — temporary pressure buildup
108	4	Stripper well — protest procedure

Enter the appropriate information regarding other Purchasers/Contracts.

Line No.	Contract Date (Mo, Da, Yr) (a)	Purchaser (b)	Buyer Code (c)
1			
2			
3			
4			
5			
6			

Remarks:

FERC-121 (8-82)

APPLICATION FOR DETERMINATION OF THE MAXIMUM LAWFUL PRICE UNDER THE NATURAL GAS POLICY ACT (NGPA)

1.0 API well number: (If not assigned, leave blank. 14 digits.)	____ - ____ - ____ - ____
2.0 Type of determination being sought: (Use the codes found on the front of this form.)	Section of NGPA; Category Code
3.0 Depth of the deepest completion location: (Only needed if sections 103 or 107 in 2.0 above.)	____ feet
4.0 Name, address and code number of applicant: (35 letters per line maximum. If code number not available, leave blank.)	Name; Seller Code Street City; State; Zip Code
5.0 Location of this well: [Complete (a) or (b).] (a) For onshore wells (35 letters maximum for field name.)	Field Name County; State
(b) For OCS wells:	Area Name; Block Number Date of Lease: Mo. Day Yr.; OCS Lease Number
(c) Name and identification number of this well: (35 letters and digits maximum.)	
(d) If code 4 or 5 in 2.0 above, name of the reservoir: (35 letters maximum.)	
6.0 (a) Name and code number of the purchaser: (35 letters and digits maximum. If code number not available, leave blank.)	Name; Buyer Code
(b) Date of the contract:	Mo. Day Yr.
(c) Estimated total annual production from the well:	____ Million Cubic Feet

		(a) Base Price	(b) Tax	(c) All Other Prices [Indicate (+) or (–).]	(d) Total of (a), (b) and (c)
7.0 Contract price: (As of filing date. Complete to 3 decimal places.)	S/MMBTU	__.___	__.___	__.___	__.___
8.0 Maximum lawful rate: (As of filing date. Complete to 3 decimal places.)	S/MMBTU	__.___	__.___	__.___	__.___

9.0 Person responsible for this application:	Name; Title
Agency Use Only	Signature
Date Received by Juris. Agency	
Date Received by FERC	Date Application is Completed; Phone Number

FERC-121 (8-82)

Only projected figures for volumes and costs have been used. They are considered more generally useful and accurate than the reports of actual production for the following reasons:

- Companies file actual reports largely as a convenience to themselves. The data are not generally subjected to the same scrutiny as projections. Moreover, pipeline companies have considerable latitude as to which time they use in reporting actual figures.
- The costs reported as actual costs are costs derived from previous projections.
- Not all companies filed actual totals.
- As a general rule, neither projected nor actual volumes are audited. In the absence of such an audit, it is thought that actual volumes may be as subject to error as the projections.

It appears that PGA data have become increasingly accurate and complete with each submission. The number of cases requiring imputation for missing data (for example, NGPA Section number) has been reduced, as has the incidence of obviously incorrect data. Moreover, company submissions have become increasingly consistent with each other.

Purchased volumes and prices were checked against control totals taken from the hard copy of the submission on file with the FERC. The data comprising inconsistent totals were compared directly with the filing. Discrepancies were forwarded to the FERC for consideration. Errors discovered in this way were corrected, and the process was repeated until agreement was reached.

PGA data (through mid-1982) were also compared with data from Form FERC-2 to ensure that the totals derived from the two sources were compatible. The two filings cannot be compared directly because the PGA is not usually filed for calendar years.

The results of this comparison suggest that PGA filings approximate the best currently available source for aggregate information, but do not match it very closely. Volumes can differ by as much as 20 percent (though many are very close). There is no consistent pattern of volume differences. In the case of prices, there appears to be two patterns: either the two reports agree quite closely, or else the PGA projects prices 10 to 20 percent lower than those reported on Form FERC-2. The reason for such consistent discrepancy is at present unknown. In general, differences between PGA filings and Form 2 information may be due to a variety of causes, including:

- PGA filings are projections that may not always reflect future behavior accurately.
- Companies may use different methods to obtain PGA projections.
- There may be systematic differences in reporting practices between the two reports for some or all companies.

The PGA filings contain a rough indication of the error due to using projections in the form of the surcharge adjustment. The surcharge adjustment is used to recover purchase costs beyond those expected or to repay costs below those expected. The surcharge adjustment cannot be applied directly to PGA filings because:

- It contains only a summary figure for all differences from projected levels. This includes costs of pipeline purchases and imports.
- No volumes are directly reported. A cost per thousand cubic feet figure is reported but is based on projected future purchases only.
- It covers time periods different from previous projections. Normally, the surcharge adjustment covers a period from 9 to 3 months prior to the beginning of a new projection period.

The PGA filings remain the only source of information for analyzing gas categories, however, and the data problems do not appear to be crippling for purposes of drawing general conclusions.

No further validation of the PGA data has been performed because of the difficulties involved in such a process. There are some procedural issues that may affect the accuracy of filings, however. PGA filings are not intended to serve as data collection instruments per se but as a regulatory system for natural gas. Questions concerning the data are usually aired during FERC rate hearings, where the primary concern is resolution of legal issues. No attempt is made to revise PGA submissions to reflect the results of such questioning. In addition, most PGA filings are protested and the resulting tariffs are suspended for a time. In cases of successful protests, a new PGA must be filed. The precise status of data on a given current submission becomes difficult to judge.

Interpretation of Data. The projected purchase cost for each contract volume represents the pipeline company's estimates of the purchase costs it will incur during the coverage period of the filing. These costs include:

- The average price to be paid to the producer
- Gathering charges
- Transportation charges
- Taxes.

Royalty payments and payments for gas not received under take-or-pay clauses are among the costs not included.

Projected volumes reported in the PGA filings are generally based on actual volumes for a similar preceding period (though they are typically adjusted to fit current market conditions). A number of projected gas purchases reported in the PGA filings have not been considered because they would have resulted in significant double counting. They are:

- Purchases from other pipelines
- Imports
- Exchange gas.

In addition, cost-of-service gas (a company's own production from specific leaseholds of pre-NGPA gas) is not considered because it is not covered by the NGPA and because most companies do not include it in their PGA filings.

The table included in this publication is therefore designed to cover a specific part of the overall national gas market: wellhead purchases that are both subject to the NGPA and dedicated to the interstate market.

Imputation of NPGA Category Data. NGPA categories were not included in part or all of some early PGA filings. To make filings comparable, each contract that did not have a reported NGPA section was assigned one based on cost. The same procedure was used for reported NGPA sections when the prices were obviously inappropriate. Less than 10 percent of the volume was subjected to this procedure in any given month. Since the inception of the Form 542-PGA, NGPA categories are included in all PGA filings.

Miscellaneous Adjustments. Slight reporting discrepancies among the companies required further minor adjustments to the data base. The adjustments are as follows:

- All volumetric projections have been converted to monthly rates.
- In their PGA filing, many companies, in whole or in part, reported their gas volumes at a pressure base other than 14.73 psia. Volumes provided at the other pressure bases (14.65 and 15.025) were adjusted to the 14.73 psia level. The factors used in the adjustment were:

  - Volume (at 14.65) x 0.9946 = Volume (at 14.73)

  - Volume (at 15.025) x 1.02 = Volume (at 14.73).
- Volumetric data are presented in cubic feet, although several companies reported in therms for their hardcopy filings. Volumes in cubic feet are available on tape.
- All prices are reported in cents (or dollars and cents) per thousand cubic feet.

In fiiings received since July 1, 1984, all companies are reporting volumes in million Btu making pressure base adjustments to volumes unnecessary.

Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas"

Survey Design

The collection of data covering natural gas imports and exports was begun in 1973 by the Federal Power Commission (FPC). On October 1977, FPC ceased to exist and its data collection functions were transferred to the Federal Energy Regulatory Commission (FERC) within the Department of Energy (DOE). Since 1979, the Energy Information Administration (EIA) has had the responsibility for collecting Form FPC-14.

Survey Universe and Response Statistics

The Form FPC-14 is filed annually by each organization or individual having authorization to import and export natural gas regardless of whether any imports or exports took place during the reporting year. The authorization to import and export was originally granted by the FPC. In 1977, it was tranferred to the Economic Regulatory Commission (ERA) and it now resides with the Office of Fuels Programs in the Office of Fossil Energy. In 1988, 165 companies met the reporting criteria, only 61 reported import or export of natural gas.

The respondent list for the Form FPC-14 is updated at the beginning of each year. All new respondents with authorization to import or export natural gas are added to the list and respondents whose licenses have expirted are deleted. Five copies of Form FPC-14 are mailed in February to all companies authorized to import or export natural gas. The completed original and three copies are to be filed with the EIA on or before March 31 of each year, for the preceding calendar year. Companies that have not filed by March 31 are contacted.

Routine Form FPC-14 Edit Checks

Respondents are required to certify the accuracy of all data reported. The survey forms are checked at the EIA for responableness and accuracy. If errors are found the companies are required to file corrected data. The data are processed at the EIA and published as reported. All natural gas volumes in this report are expressed at a pressure base of 14.73 pounds per square inch absolute and temperature of 60 degrees Fahrenheit, except as noted. All prices are in U.S. dollars and import/export prices are those paid at the U.S. border (except exports of LNG are those prices paid at the point of sale and delivery in Yokohama, Japan).

"Quarterly Natural Gas Import and Export Sales and Price Report"

This report is prepared quarterly by the Office of Fuels Programs in the Office of Fossil Energy based on information submitted by all firms having authorization to import or export natural gas. All data on this report is considered preliminary until the annual data on the Form FPC-14 is final, usually in September of the following year.

Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers"

Survey Design

The original Form EIA-857 was approved for use in December 1984. Response to the Form EIA-857 is mandatory on a monthly basis. Data collected on the Form EIA-857 cover the 50 States and the District of Columbia and include both price and volume data.

Survey Universe and Response Statistics

A sample of 408 natural gas companies including interstate pipelines, intrastate pipelines, and local distribution companies report to the survey. The sample was selected independently for each of the 50 States and the District of Columbia. Each selected company is required to complete and file the Form EIA-857 on a monthly basis. Initial response statistics on a monthly basis are as follows: responses received by due date, approximately 90 percent, and responses received after follow-up, 100 percent.

The Form EIA-857 is a monthly sample survey of natural gas marketers, including interstate pipelines, intrastate pipelines, and local distribution companies. It provides data that are used to estimate monthly sales of natural gas (volume and price) by State and monthly deliveries of natural gas on behalf of others (volume) by State to three consumer sectors - residential, commercial, and industrial. (Monthly deliveries and prices of natural gas to electric utilities are reported on the Form FERC-423, "Monthly Report of Cost and Quality of Fuels for Electric Plants," and the Form EIA-759, "Monthly Power Plant Report.")

See Appendix C for a discussion of the sample design and estimation procedures.

Summary of Form EIA-857 Data Reporting Requirements

Data collected monthly on the Form EIA-857 on a State level include the volume and cost of purchased gas, the volume and cost of natural gas consumed by sector (residential, commercial, and industrial), and the average heat content of all gas consumed. Respondents file completed forms with EIA in Washington, DC on or before the 30th day after the end of the report month.

All natural gas volumes are reported in thousand cubic feet at 14.73 psia at 60 degrees Fahrenheit and dollar values are reported to the nearest whole dollar.

Routine Form EIA-857 Edit Checks

A series of manual and computerized edit checks are used to screen the Form EIA-857. The edits performed include validity and analytical checks.

Form EIA-857

U.S. Department of Energy
Energy Information Administration

Form Approved
OMB No. 19050175
Expires: 12/31/90

MONTHLY REPORT OF NATURAL GAS PURCHASES AND DELIVERIES TO CONSUMERS

This report is mandatory under the Federal Energy Administration Act of 1974 (Public Law 93-275). Failure to report may result in criminal fines, civil penalties, and other sanctions as provided by law. See section VI of the instructions for the confidentiality statement. Public reporting burden for this collection of information is estimated to average 4 hours per response, including time of reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden or any other aspect of this collection of information, including suggestions for reducing this burden, to the Energy Information Administration, Office of Statistical Standards EI-73, Mail Station: 1H-023 Forrestal, 1000 Independence Ave. SW, Washington, DC 20585; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

Affix Indentification Label or Enter:

01 Control No.: ______________

02 Company Name: ______________

State of Operation: ______________

Return completed forms to:

Energy Information Administration
Mail Station: BG-094
U.S. Department of Energy
Washington, D.C. 20585
Attn: Form EIA-857

Report Period	Mo.	Yr.	Revised Report Indicator	
03			04	

SECTION I — Natural Gas Purchases and Deliveries to Consumers

		Volume (Mcf at 14.73 psia)	Cost or Revenue (Dollars)
Purchased Gas Received in Distribution Service Area	05		
Delivered to Residential Consumers (Onsystem Sales)	06		
Delivered to Commercial Consumers (Onsystem Sales)	07		
Delivered to Industrial Consumers (Onsystem Sales)	08		
Transported to Commercial Consumers	09		
Transported to Industrial Consumers	10		

		(Btu/cu. ft.)
Average Btu Content of Gas Delivered to Consumers	11	

SECTION II — FOOTNOTES

SECTION III — CONTACT PERSON AND CERTIFICATION

Contact Person: 12 Name:	(Area Code—Number—Extension) 13 Telephone:
Certification: I certify that the information provided hereon is true and accurate or, where indicated on the form, reasonable estimates to the best of my knowledge.	
Name: 14	Title: 15
Signature:	Date:

EIA-857
(Revised 1988)

FEDERAL ENERGY REGULATORY COMMISSION
Washington, D.C. 20426

ANNUAL REPORT FOR IMPORTERS AND EXPORTERS OF NATURAL GAS

Form Approved
OMB Number 1902-0027
Expiration Date 03/31/89

GENERAL INSTRUCTIONS

1. The completed original and 3 conformed copies of this report shall be filed with the Federal Energy Regulatory Commission, Washington, D.C. 20426 on or before March 31, of each year, for the preceding calendar year.
2. The report will be filed by each person having authorization to import or export natural gas.
3. Use a separate schedule for each authorization. If one authorization involves more than one import or export point, a separate schedule must be filed for each point.
4. All volumes reported in Mcf will be at 14.73 Psia and 60°F.
5. Where transactions are based primarily on volumetric measurement, weighted average Btu data should be used to estimate total monthly Btu's.
6. Amounts paid or received and cost or receipts shall be reported in U.S. Dollars.
7. DEFINITIONS: — Transporter—the party or parties, other than buyer or seller, owning the facilities by which gas or LNG is physically transferred between buyer and seller; Costs—all expenses incurred by importer up to the U.S. point of delivery for the reported quantity imported; Receipts—all revenues received by exporter for the reported quantity exported.

Name of Respondent	Address of Respondent	Year Ending December 31, _____

SCHEDULE I — GASEOUS PHASE NATURAL GAS

NOTE: If authorization granted is increased, decreased, or extended under a succession of docket numbers and all related gas moved through the same border facilities and authorized expansions thereof, moved to or from the same purchaser or supplier, and was subject to the same rate, such transaction shall be combined for reporting purposes and appropriate Docket Numbers shown.

Report for *(Check one)* ☐ Import ☐ Export	Foreign Seller or Foreign Buyer

U.S. Entry or Exit Point	Transporter	Docket Number(s)

Line No.	Month *(a)*	QUANTITY RECEIVED OR SHIPPED AT THE ENTRY OR EXIT POINT — Peak Day: Date *(b)*	Peak Day: Mcf *(c)*	Mcf *(d)*	MMBtu *(e)*	Amount Paid or Received at Entry or Exit Point *(f)*
1	January					
2	February					
3	March					
4	April					
5	May					
6	June					
7	July					
8	August					
9	September					
10	October					
11	November					
12	December					
13	TOTAL					

ANNUAL WEIGHTED AVERAGE IN Btu's PER CUBIC FOOT *(Line 13; [Column (e) ÷ (Column (d) X 1000)])* _____	ANNUAL WEIGHTED AVERAGE PRICE IN CENTS PER MMBtu *(Line 13; Column (f) ÷ Column (e) X 100)* _____

FPC-14 (8-82)

Appendix C

Statistical Considerations

Appendix C

Statistical Considerations

The monthly sales (volume and price) and monthly deliveries (volume) of natural gas by State presented in this report are estimated from data reported on the Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers." (See Appendix B for a description of this Form.) These estimations must be made from the reported data since the Form EIA-857 is a sample survey. A description of the sample design and the estimation procedures is given below.

Sample Design

The Form EIA-857 is a monthly sample survey of natural gas marketers including interstate pipeline companies, intrastate pipeline companies, producers, and local distribution companies. It provides data that are used to estimate monthly onsystem sales of natural gas (volume and price) by State and monthly deliveries of natural gas (volume) by State to three consumer sectors--residential, commercial, and industrial. Monthly deliveries and prices of natural gas to electric utilities are reported on the Form EIA-759, "Monthly Power Plant Report," and the Form FERC-423, "Monthly Report of Costs and Quality of Fuels for Electric Plants."

Sample Universe. The sample currently in use was selected from a universe of 1,746 companies. These companies were respondents to the Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition," for reporting year 1988. (See Appendix B for a description of the Form EIA-176.)

Sampling Plan. The goal was a sample that would provide estimates of monthly natural gas consumption by the three consuming sectors within each State and the District of Columbia. A stratified sample using a single stage and systematic selection with probability proportional to size was designed. The measure of size was the volume of gas sales and deliveries by the company during 1988. There were two strata--companies selected with certainty and companies selected under the systematic probability proportional to size design. Initial calculations showed that a 25 percent sample of companies would yield reasonably accurate estimates. The sample was selected independently in each State, resulting in a national total of 408 companies.

Certainty Stratum. Since estimates were needed for each of the 50 States and the District of Columbia, the strata were established independently within each State. In 16 States and the District of Columbia where sampling was not feasible due to small numbers of companies and/or small volumes of gas sales, all companies were selected. The 16 States were: Alaska, Connecticut, Delaware, Hawaii, Idaho, Maine, North Dakota, New Hampshire, New Jersey, Nevada, Oregon, Rhode Island, South Dakota, Utah, Vermont, and Washington.

For each of the remaining States, the total volumes of industrial sales and deliveries and of the combined residential/commercial sales were determined. Companies with gas sales/deliveries to the industrial sector or to the combined residential/commercial sector above a certain level were selected with certainty. This procedure ensured that large companies would be included since a few large companies often account for most of the volume of gas sales within a State. The formula for determining certainty was applied independently in the two consumer sectors--the industrial and the combined residential/commercial. These selected companies, together with the companies in the jurisdictions discussed where sampling was not feasible, formed the certainty stratum.

All companies with gas sales/deliveries in sector j greater than the cut-off value ($C_{.j}$) were included in the certainty stratum. The formula for $C_{.j}$ was:

$$C_{.j} = \frac{X_{.j}}{2n} \qquad (1)$$

where:

$C_{.j}$ = cutoff value for consumer sector j,

n = target sample size to be selected for the State, 25 percent of the companies in the State,

X_{ij} = the annual volume of gas sales/deliveries by company i to customers in consumer sector j,

$X_{i.}$ = the sum within State of annual gas volumes for company i,

$X_{.j}$ = the sum within State of annual gas volumes in consumer sector j,

$X_{..}$ = the sum within State of annual gas volumes in all consumer sectors.

Noncertainty Stratum. All other companies formed the noncertainty stratum. They were systematically sampled with probability proportional to size. The measure of size for each company was the total volume of gas sales to all consumer sectors ($X_{i.}$). The number of companies to be selected from the noncertainty stratum was calculated for each State, with a minimum of 2.

The formula for selecting the number of noncertainty stratum companies was:

$$m = n\frac{X2}{X_{..}} \qquad (2)$$

where:

m = the sample size for the noncertainty stratum within a State,

$X2$ = the sum within State of the $X_{i.}$ for all companies in the noncertainty stratum.

Companies were listed in ascending order according to their measure of size and then a cumulative measure of size in the stratum was calculated for each company. The cumulative measure of size was the sum of the measures of size for that company and all preceding companies on the list. An interval (I) for selecting the companies systematically was calculated ($I = \frac{X2}{m}$). A uniform random number R was selected between zero and I. The first sampled company was the first company on the list to have a cumulative measure of size greater than R. The second company selected was the first company on the list to have a cumulative measure of size greater than R + I. R + I was increased again by I to determine the third company to be selected. This procedure was repeated until the entire sample was drawn.

Subgroups. In 12 States, the noncertainty stratum was divided into subgroups to ensure that gas in each consumer sector could be estimated. The systematic sample with probability proportional to size design described above was applied independently in each subgroup. The methods for determining the subgroup sample size and calculating the subgroup interval for sample selection were the same as the methods described above for the noncertainty stratum, except that X2 was the sum within State of the $X_{i.}$ for only those companies in the subgroup.

These subgroups were defined only for the purpose of sample selection. They are:

West Virginia: companies handling only residential/commercial gas and all other companies.

California, Louisiana, and Mississippi: companies handling only industrial gas and all other companies.

Alabama, Illinois, Kentucky, and Ohio: companies handling any industrial gas and all other companies.

Texas: companies handling only residential/commercial gas, companies handling only industrial gas, and all other companies (three subgroups).

Arkansas: companies handling 0.5 million cubic feet or more of gas and companies handling less than 0.5 million cubic feet of gas.

Colorado: companies handling 1 million cubic feet or more of gas and companies handling less than 1 million cubic feet of gas.

New York: companies handling 8 million cubic feet or more of gas and companies handling less than 8 million cubic feet of gas.

Estimation Procedures

Estimates of Volumes. A ratio estimator is applied to the volumes reported in each State by the sampled companies to estimate the total gas sales and deliveries for the State. Ratio estimators are calculated for each consumer sector--residential, commercial, and industrial--in each State where companies are sampled. The following annual data are taken from the most recent 1988 submissions of Form EIA-176:

The formula for calculating the ratio estimator (E_{vj}) for the volume of gas in consumer sector j is:

$$E_{vj} = \frac{Y_{.j}}{Y'_{.j}} \qquad (3)$$

where:

$Y_{.j}$ = the sum within State of annual gas volumes in consumer sector j for all companies,

$Y'_{.j}$ = the sum within State of annual gas volumes in consumer sector j for those companies in the sample.

The ratio estimator is applied as follows:

$$V_j = y_{.j} \times E_{vj} \qquad (4)$$

where:

V_j = the State estimate of monthly gas volumes in consumer sector j,

$y_{.j}$ = the sum within State of reported monthly gas volumes in consumer sector j.

Estimates of Revenues. State revenues are estimated from monthly data reported by the sample companies in the same way as the volumes are estimated. Ratio estimators are calculated for each consumer sector based on annual *sales* revenue in each State where companies are sampled. The estimated revenues are subsequently used to calculate average prices.

The formula for calculating the ratio estimator for residential gas sales revenues in consumer sector j is:

$$E_{rj} = \frac{Z_{.j}}{Z'_{.j}},$$

where:

$Z_{.j}$ = the sum within State of annual gas sales revenues in consumer sector j,

$Z'_{.j}$ = the sum within State of annual gas sales revenues for those companies in the sample in consumer sector j.

The ratio estimator is applied as follows:

$$R_j = z_{.j} \times E_j,$$

where:

R_j = the monthly estimated revenue for gas sales in consumer sector j,

$z_{.j}$ = the sum within State of reported monthly gas sales revenues in consumer sector j.

Computation of Natural Gas Prices. The natural gas volumes that are included in the computation of prices represent only those volumes associated with natural gas sales.

The average price of natural gas is calculated as follows:

$$P_j = \frac{R_j}{V_j},$$

where:

P_j = the average price of gas sales within a State in consumer sector j,

V_r = the estimate of gas sales within a State in consumer sector j.

All average prices are weighted by their corresponding sales volume estimates when national average prices are computed.

The monthly average prices of natural gas in the commercial and industrial sectors are based on sales data only. Volumes of gas delivered for the account of others to these consumer sectors are not included in the State or national average prices. Virtually all natural gas deliveries to the residential sector represent sales volumes only.

Table 33 shows the percent of the total State volume that represents volumes from natural gas sales to the commercial and industrial sectors. This table may be helpful in evaluating commercial and industrial price data.

Estimation for Nonrespondents. A volume for each consumer category is imputed for companies that fail to respond. The imputation is based on the previous month's value reported by the non-responding company and the change from the previous month to the current month in volumes reported by other companies in the State. The imputed volumes are included in the State totals. To estimate prices for non-respondents, the unit price (dollars per thousand cubic feet) reported by the company in the previous month is used.

The formula for imputing volumes of gas sales for nonrespondents was:

$$F_t = F_{t-1} \times \frac{y_{.jt}}{y_{.j}t-1} \qquad (5)$$

where:

F_t = imputed gas volume for current month t,

F_{t-1} = gas volume for the company for the previous month,

$y_{.jt}$ = gas volume reported by companies in the State stratum for report month t,

$y_{.j}t-1$ = gas volume in the previous month for companies in the State stratum that reported in month t.

Final Revisions

Adjusting Monthly Data to Annual Data. After the annual data reported on the Form EIA-176 have been submitted, edited, and prepared for publication in the *Natural Gas Annual,* revisions are made to monthly data. The revisions are made to the volumes and prices of natural gas delivered to consumers that have appeared in the *Natural Gas Monthly* to match them to the annual values appearing in the *Natural Gas Annual.* The revised monthly estimates allocate the difference between the sum of monthly estimates and the annual reports according to the distribution of the estimated values across the months.

Before the final revisions are made, changes or additions to submitted data received after publication of the monthly estimate and not sufficiently large to require a revision to be published in the *Natural Gas Monthly,* are used to derive an updated estimate of monthly consumption and revenues for each State's residential, commercial, or industrial natural gas consumption.

For each State, two numbers were revised, the estimated consumption and the estimated price per Mcf.

The formula for revising the estimated consumption is:

$$V^*_{jm} = V_{jm} + \left[(V_{ja} - V'_{jm})(\frac{V_{jm}}{V'_{jm}}) \right] \qquad (6)$$

where:

V^*_{jm} = the final volume estimate for month m in consumer sector j,

V_{jm} = the estimated volume for month m in consumer sector j,

V_{ja} = the volume for the year reported on Form EIA-176,

V'_{jm} = The annual sum of estimated monthly volumes.

The price is calculated as described above in the Estimation Procedures section, using the final revised consumption estimate and a revised revenue estimate.

The formula for revising the estimated revenue is:

$$R^*_{jm} = R_{jm} + \left[(R_{ja} - R'_{jm})(\frac{R_{jm}}{R'_{jm}}) \right] \qquad (7)$$

where:

R^*_{jm} = the final revenue estimate for month m in consumer sector j,

R_{jm} = the estimated revenue for month m in consumer sector j,

R_{ja} = the revenue for the year reported on Form EIA-176,

R'_{jm} = The annual sum of estimated monthly revenues.

Reliability of Monthly Data

The monthly data published in this report are subject to two sources of error - nonsampling error and sampling error. Nonsampling errors occur in the collection and processing of the data. See the discussion of the Form EIA-857 in Appendix B for a description of nonsampling errors for monthly data.

Sampling error may be defined as the difference between the results obtained from a sample and the results that a complete enumeration would provide. The standard error statistic is a measurement of sampling error.

Standard Errors

A standard error of an estimate is a statistical measure that indicates how the estimate from the sample compares to the result from a complete enumeration. Standard errors are calculated based on statistical theory that refers to all possible samples of the same size and design.

The standard errors for monthly natural gas volume estimates by State are given in Table C2. Ninety-five percent of the time, the volume that would have been obtained from a complete enumeration will lie in the range between the estimated volume minus two standard errors and the estimated volume plus two standard errors.

Table C-1. Standard Error for Natural Gas Deliveries and Price to Consumers by State, February 1990

State	Volume Million Cubic Feet				Price Dollars per Thousand Cubic Feet			
	Residential	Commercial	Industrial	Total	Residential	Commercial	Industrial	Total
Alabama	249	224	432	546	0.08	0.29	0.32	0.44
Alaska	0	0	0	0	.00	.00	.00	.00
Arizona	36	47	0	59	.02	.01	.00	.04
Arkansas	54	32	111	127	.10	.09	.22	.15
California	1,307	275	1,852	2,283	.03	.12	.08	.12
Colorado	138	59	8,085	8,086	.03	.01	.94	1.24
Connecticut	0	0	0	0	.00	.00	.00	.00
Delaware	0	0	0	0	.00	.00	.00	.00
District of Columbia	0	0	0	0	.00	.00	.00	.00
Florida	24	176	409	446	.10	.12	.12	.32
Georgia	330	92	1,174	1,223	.14	.44	1.34	1.08
Hawaii	0	0	0	0	.00	.00	.00	.00
Idaho	0	0	0	0	.00	.00	.00	.00
Illinois	308	262	192	447	.05	.09	.01	.07
Indiana	489	425	2,740	2,816	.42	.32	.35	.23
Iowa	12	29	23	39	.01	.01	.00	.01
Kansas	NA	NA	NA	NA	NA	NA	NA	NA
Kentucky	99	76	134	184	.07	.08	.23	.13
Louisiana	208	56	51,265	51,266	.05	.04	.19	4.26
Maine	0	0	0	0	.00	.00	.00	.00
Maryland	2	35	96	102	.04	.10	.12	.08
Massachusetts	608	123	688	926	.36	.14	.49	.33
Michigan	611	325	985	1,204	.11	.18	.34	.13
Minnesota	206	219	828	881	.11	.10	.05	.14
Mississippi	721	438	974	1,289	.16	.36	.34	1.34
Missouri	618	253	54	670	.28	.35	.12	.15
Montana	22	16	0	27	.02	.01	.00	.03
Nebraska	353	190	249	472	.04	.01	.02	.19
Nevada	0	0	0	0	.00	.00	.00	.00
New Hampshire	0	0	0	0	.00	.00	.00	.00
New Jersey	0	0	0	0	.00	.00	.00	.00
New Mexico	173	327	0	369	.27	1.01	.00	.36
New York	NA	NA	NA	NA	NA	NA	NA	NA
North Carolina	17	19	500	501	.05	.01	.02	.24
North Dakota	0	0	0	0	.00	.00	.00	.00
Ohio	80	627	11,221	11,239	.06	.06	.00	.07
Oklahoma	501	504	53	713	.50	.55	.02	.25
Oregon	0	0	0	0	.00	.00	.00	.00
Pennsylvania	79	245	352	436	.01	.04	.08	.43
Rhode Island	0	0	0	0	.00	.00	.00	.00
South Carolina	182	206	655	710	.21	.20	.11	.61
South Dakota	0	0	0	0	.00	.00	.00	.00
Tennessee	170	129	2,493	2,503	.05	.12	.15	.23
Texas	245	7,035	10,301	12,476	.05	1.01	.07	.55
Utah	0	0	0	0	.00	.00	.00	.00
Vermont	0	0	0	0	.00	.00	.00	.00
Virginia	196	44	195	280	.21	.17	.94	.47
Washington	0	0	0	0	.00	.00	.00	.00
West Virginia	121	57	6	134	.26	.26	.01	.20
Wisconsin	176	481	852	994	.21	.18	.10	.23
Wyoming	148	139	72	216	.21	.15	.33	.36
U.S. Totals	2,312	14,396	55,446	57,331	.03	.15	.51	.11

NA = Not Available

The standard error of the natural gas volume estimate is the square root of the variance of the estimate. The formula for calculating the variance of the volume estimate is:

$$\hat{V}(Y) = \sum_{h=1} [N_h^2 \frac{(1 - \frac{n_h}{N_h})}{n_h(n_h - 1)} (\sum_{i=1} (y_i - Tx_i)^2)] \quad (8)$$

where:

N_h = the total number of companies in stratum h

n_h = the sample size in stratum h

y_i = the reported monthly volume for company i

x_i = the reported annual volume for company i

T = the ratio of the sum of the reported monthly volumes for sample companies to the sum of the reported annual volumes for the sample companies.

Appendix D

Natural Gas Reports and Feature Articles

Appendix D

Natural Gas Reports and Feature Articles

Reports Dealing Principally with Natural Gas and/or Natural Gas Liquids

- *Natural Gas Annual,* DOE/EIA-0131(88). October 1989.
- *Statistics of Interstate Natural Gas Pipeline Companies 1988,* DOE/EIA-0145(88), November 1989. Published annually.
- *Gas Supplies of Interstate Natural Gas Pipeline Companies 1988,* DOE/EIA-0167(88), December 1989. Published annually.

Other Reports Covering Natural Gas, Natural Gas Liquids, and Other Energy Sources

- *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves - 1988 Annual Report,* DOE/EIA-0216(88), September 1989.
- *Monthly Energy Review,* DOE/EIA-0035. Published monthly. Provides national aggregate data for natural gas, natural gas liquids, and other energy sources.
- *Annual Report to Congress 1989,* DOE/EIA-0173(89), March 1990. Published annually.
- *Annual Energy Outlook 1990,* DOE/EIA-0383(90), January 1990. Published annually.
- *Annual Energy Review 1988,* DOE/EIA-0384(88), May 1989. Published annually.
- *Short-Term Energy Outlook,* DOE/EIA-0202. Published quarterly. Provides forecasts for next six quarters for natural gas and other energy sources.
- *International Energy Annual 1988,* DOE/EIA-0219(88), October 1989. Published annually.
- *Annual Outlook for Oil and Gas: 1990* DOE/EIA-0517(90), May 1990.
- *International Oil and Gas Exploration and Development Activities,* DOE/EIA-0523. Published Quarterly. Provides a compilation of reported oil and gas reserve additions in foreign countries.

Selected One-Time Natural Gas and Related Reports

- *Drilling and Production Under Title I of the Natural Gas Policy Act, 1978-1986,* DOE/EIA-0448(86), January 1989.
- *Wellhead Purchases by Interstate Natural Gas Pipeline Companies Since the NGPA,* DOE/EIA-0510, March 1988.
- *An Examination of Domestic Natural Gas Resource Estimates,* SR/RNGD/89-01, February 1989.
- *Growth in Unbundled Natural Gas Transportation Services: 1982-1987,* DOE/EIA-0525, May 1989.
- *Assessment of Pipeline Capacity to Transport Domestic Natural Gas Supplies to the Northeast,* SR/RNGD/89-02, August 1989.

Selected and Recurring Natural Gas and Related Data Reference Reports

- *Directory of Energy Data Collection Forms,* DOE/EIA-0249(88), February 1989.
- *EIA Publications Directory 1987, A User's Guide,* DOE/EIA-0149(87), March 1988. Published annually.
- *Oil and Gas Field Code Master List, 1989,* EIA-0370(89), January 1990.
- *Energy Information Directory,* DOE/EIA-0205(88/2), August 1988.

NGM Feature Articles

March 1987

Estimated Distribution of Proved Natural Gas Reserves Among the Geologic Provinces of the Lower 48 States

(Presents an overview of the methodology and procedures employed in the formulation of certain positions of EIA's annual reserves study.)

April 1987

Contract Provisions Covering Production of New Gas

(Discusses various types of contract provisions included in recent natural gas contracts.)

May 1987

U.S. Imports and Exports of Natural Gas 1986

(Provides final 1986 data on all U.S. imports and exports of natural gas.)

July 1987

Underground Storage of Natural Gas

(Presents an analysis of the natural gas storage facilities and statistics.)

Domestic Natural Gas Reserves and Production Dedicated to Interstate Pipeline Companies, 1986

(Provides preliminary data on natural gas reserves and production dedicated to the interstate market.)

October 1987

Main Line Natural Gas Sales to Industrial Users, 1986

(Describes and analyzes direct sales to end users by interstate pipeline companies and SIC codes.)

December 1987

Overview of Wellhead Purchases by Interstate Natural Gas Pipeline Companies Since the NGPA

(Presents an overview of gas purchasing trends and practices since 1979.)

January 1988

Gas Deliverability in Louisiana

(Provides information on the levels of natural gas deliverability in the State of Louisiana.)

April 1988

Overview of Pipeline Take-or-Pay Exposure: 1983-1987

(Presents information on the recent history of the take-or-pay issue.)

June 1988

Domestic Natural Gas Reserves and Production Dedicated to Interstate Pipeline Companies, 1987

(Provides preliminary data on natural gas reserves and production dedicated to the interstate market.)

July 1988

U.S. Imports and Exports of Natural Gas - 1987

(Contains final 1987 data on all U.S. imports and exports of natural gas.)

September 1988

Status of Coalbed Methane Recovery in the United States

(Presents an overview of coalbed methane gas in the U.S.)

January 1989

Main Line Natural Gas Sales by Interstate Pipeline Companies, 1987

(Describes and analyzes direct sales to end users by interstate pipeline companies and SIC codes.)

Summary of An Examination of Domestic Gas Resource Estimates

(Provides an overview of the various natural gas resource estimates currently in use.)

May 1989

The Outlook for Natural Gas Supply in the 1990's

(Discusses recent conditions in the oil and gas producing industry.)

June 1989

Domestic Natural Gas Reserves and Production Dedicated to Interstate Pipeline Companies, 1988

(Provides preliminary data on natural gas reserves and production dedicated to the interstate market.)

August 1989

U.S. Natural Gas Imports and Exports - 1988

(Contains final 1988 data on all U.S. imports and exports of natural gas.)

September 1989

Natural Gas Production in the Post-NGPA Decade

(Presents data on the production of natural gas by categories defined under the Natural Gas Policy Act of 1978 (NGPA).)

November 1989

Natural Gas Wellhead Decontrol Act of 1989

(Describes the categories of natural gas most affected by the decontrol provisions and provides market data for these categories and the overall markets during the 1980's.)

Appendix E

Technical Contacts

161/162

Appendix E

Technical Contacts

Section	Tables		Principal Data Sources	Technical Contact
Summary Statistics:				
Natural Gas Production and Consumption	1, 2, 3	Monthly:	Interstate Oil Compact Commission (IOCC)	Sheila Darnell (202) 586-6165
		Annual:	Form EIA-627, "Annual Quantity and Value of Natural Gas Report"	
		Monthly:	Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers"	
Extraction Loss	1	Monthly:	EIA computations	James McCarrick (202) 586-6198
		Annual:	Form EIA-816, "Monthly Natural Gas Liquids Report" and Form EIA-64A, "Annual Report of the Origin of Natural Gas Liquids Production"	
Supplemental Gaseous Fuels	2	Monthly:	EIA computations	Margo Natof (202) 586-6303
		Annual:	Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition"	
Imports and Exports	2	Monthly	EIA computations	Margo Natof (202) 586-6303
		Annual:	Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas"	Fay Dillard (202) 586-6181
Price:				
City Gate, Residential, Commercial, and Industrial	4	Monthly:	Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers"	Roy Kass (202) 586-4790
Imports and Purchases from Producers	4	Monthly:	Form FERC-11, "Natural Gas Pipeline Company Monthly Statement"	James Keeling (202) 586-6107
Wellhead	4	Monthly:	EIA computations	Sheila Darnell (202) 586-6165
		Annual:	Form EIA-627, "Annual Quantity and Value of Natural Gas Report"	
Electric Utility	4	Monthly:	Form FPC-423, "Cost and Quality of Fuels for Electric Power Plants"	Margo Natof (202) 586-6303
NGPA Category - Prices And Volumes	5	Periodic:	Purchased Gas Adjustment Filings	Norman Crabtree (202) 586-6180
Summary of Natural Gas Imports and Exports	6	Quarterly:	Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas" and "Quarterly Sales and Price Report"	James Todaro (202) 586-6305
Producer Related Activities:				
Natural Gas Production	7	Monthly:	Interstate Oil Compact Commission (IOCC)	Sheila Darnell (202) 586-6165
Well Determination Filings	8, 9, 10,	Monthly:	Form FERC-121, "Application for Determination of Maximum Lawful Price Under the Natural Gas Policy Act"	Norman Crabtree (202) 586-6180
NGPA Ceiling Prices	11	Monthly:	*Federal Register*	Eva Fleming (202) 586-6113
Interstate Pipeline Activities:	12, 13, 14, 15, 16	Monthly:	Form FERC-11, "Natural Gas Pipeline Company Monthly Statement"	James Keeling (202) 586-6107

Underground Storage:	17, 18, 19, 20, 21	Monthly:	Forms FERC-8 and EIA-191, "Underground Gas Storage Report"	Ellis Maupin (202) 586-6178
Distribution and Consumption:				
Deliveries to:				
Residential,	22	Monthly:	Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers"	Roy Kass (202) 586-4790
Commercial,	23			
Industrial,	24			
Electric Utility,	25		Form FERC-423, "Cost and Quality of Fuels for Electric Power Plants"	Margo Natof (202) 586-6303
All Consumers	26			
Average Price to:				
City Gate	27	Monthly:	Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers"	Roy Kass (202) 586-4780
Residential,	28			
Commercial,	29			
Industrial,	30		Form FERC-423, "Cost and Quality of Fuels for Electric Power Plants"	Margo Natof (202) 586-6303
Electric Utility,	31			
and All Consumers	32			
Onsystem Sales	33	Monthly:	Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers"	Roy Kass (202) 586-4790
Heating Degree Days	34	Seasonal:	National Oceanic and Atmospheric Administration	Rosemary Jameson (202) 586-6229
Highlights and Industry Overview				James Todaro (202) 586-6305
Recent Developments				James Todaro (202) 586-6305

Glossary

Base (Cushion) Gas: The volume of gas needed as a permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates throughout the withdrawal season. All native gas is included in the base gas volume.

British Thermal Unit (Btu): The heat required to raise the termperature of one pound of water by one degree Fahrenheit at or near 39.2 degrees Fahrenheit.

City-gate: A point or measuring station at which a gas distribution company receives gas from a pipeline company or transmission system.

Commercial Consumption: Gas used by nonmanufacturing organizations such as hotels, restaurants, retail stores, laundries, and other service enterprises, and gas used by local, State, and Federal agencies engaged in nonmanufacturing activities.

Depletion: The loss in service value incurred in connection with the exhaustion of the natural gas reserves in the course of service.

Depreciation: The loss in service value not restored by current maintenance, incurred in connection with the consumption or respective retirement of a gas plant in the course of service from causes that are known to be in current operation and against which the utility is not protected by insurance; for example, wear and tear, decay, obsolescence, changes in demand and requirements of public authorities, and the exhaustion of natural resources.

Dry Natural Gas Production: Marketed production less extraction loss.

Electric Utility Consumption: Gas used as fuel in electric utility plants.

Exports: Natural gas deliveries out of the Continental United States (including Alaska) to foreign countries. {3}

Extraction Loss: The reduction in volume of natural gas resulting from the removal of natural gas liquid constituents at natural gas processing plants.

Flared: The volume of gas burned in flares on the base site or at gas processing plants.

Gross Withdrawals: Full well stream volume, including all natural gas plant liquid and nonhydrocarbon gases, but excluding lease condensate. Also includes amounts delivered as royalty payments or consumed in field operations.

Hinshaw Pipeline: A pipeline or local distribution company that has received exemption, (by Section 1 (c) of the Natural Gas Act), from regulations pursuant to the Natural Gas Act. These companies transport interstate natural gas not subject to regulations under NGA.

Imports: Natural gas received in the Continental United States (including Alaska) from a foreign country.

Independent Producers: Independent natural gas producers subject to the jurisdiction of the FERC.

Industrial Consumption: Natural gas used by manufacturing and mining establishments for heat, power, and chemical feedstock.

Interstate Companies: Natural gas pipeline companies subject to FERC jurisdiction.

Intransit Deliveries: Redeliveries to a foreign country of foreign gas received for transportation across U.S. territory and deliveries of U.S. gas to a foreign country for transportation across its territory and redelivery to the United States.

Intransit Receipts: Receipts of foreign gas for transportation across U.S. territory and redelivery to a foreign country and redeliveries to the United States of U.S. gas transported across foreign territory.

Intrastate Companies: Companies not subject to FERC jurisdiction.

Lease and Plant Fuel: Natural gas used in lease operations, as gas processing plant fuel, and net used for gas lift.

Liquefied Natural Gas (LNG): Natural gas that has been liquefied by reducing its temperature to minus 260 degrees Fahrenheit at atmospheric pressure.

Marketed Production: Gross withdrawals less gas used for repressuring, quantities vented and flared, and nonhydrocarbon gases removed in treating or processing operations. Includes all quantities of gas used in field and processing operations. See Explanatory Note 1 for discussion of coverage of data concerning nonhydrocarbon gases removed.

Major Interstate Pipeline Company: A company whose combined sales for resale, and gas transported interstate or stored for a fee, exceeded 50 million thousand cubic feet in the previous year.

Native Gas: Gas in place at the time that a reservoir was converted to use as an underground storage reservoir. Excludes quantities of gas added or injected.

Natural Gas: A mixture of hydrocarbon compounds and small quantities of various nonhydrocarbons existing in the gaseous phase or solution with oil in natural underground reservoirs at reservoir conditions.

Natural Gas Policy Act of 1978 (NGPA): Signed into law on November 9, 1978, the NGPA is a framework for the regulation of most facets of the natural gas industry. See Explanatory Note 10 for a full discussion.

Nonhydrocarbon Gases: Typical nonhydrocarbon gases that may be present in reservoir natural gas are carbon dioxide, helium, hydrogen sulfide, and nitrogen.

Onsystem Sales: Sales to customers where the delivery point is a point on, or directly interconnected with, a transportation, storage, and/or distribution system operated by the reporting company.

Pipeline Fuel: Gas consumed in the operation of pipelines, primarily in compressors.

Repressuring: The injection of gas into oil or gas formations for pressure maintenance and cycling purposes.

Residential Consumption: Gas used in private dwellings, including apartments, for heating, cooking, water heating, and other household uses.

Storage Additions: The volume of gas injected or otherwise added to underground natural gas or liquefied natural gas storage during the applicable reporting period.

Storage Withdrawals: Total volume of gas withdrawn from underground storage or liquefied natural gas storage during the applicable reporting period.

Supplemental Gaseous Fuels Supplies: Synthetic natural gas, propane-air, refinery gas, biomass gas, air injected for stabilization of heating content, and manufactured gas commingled and distributed with natural gas.

Synthetic Natural Gas (SNG): A manufactured product chemically similar in most respects to natural gas, that results from the conversion or reforming of petroleum hydorcarbons and may easily be substituted for or interchanged with pipeline quality natural gas.

Therm: One-hundred thousand British thermal units.

Unaccounted For: Represents the difference between the sum of the components of natural gas supply and the sum of the components of natural gas disposition. These differences may be due to quantities lost or to the effects of data reporting problems. Reporting problems include differences due to the net result of conversions of flow data metered at varying temperature and pressure bases and converted to a standard temperature and pressure base; the effect of variations in company accounting and billing practices; differences between billing cycle and calendar period time frames; and imbalances resulting from the merger of data reporting systems which vary in scope, format, definitions, and type of respondents.

Underground Gas Storage Reservoir Capacity: Interstate company reservoir capacities are those certificated by FERC. Independent producer and intrastate company reservoir capacities are reported as developed capacity.

Vented Gas: Gas released into the air on the base site or at processing plants.

Wellhead Price: Represents the wellhead sales price, including charges for natural gas plant liquids subsequently removed from the gas, gathering and compression charges, and State production, severance, and/or similar charges.

Working (Top Storage) Gas: The volume of gas in an underground storage reservoir above the designed level of the base. It may or may not be completely withdrawn during any particular withdrawal season. Conditions permitting, the total working capacity could be used more than once during any season.

Government Books FOR YOU

Take advantage of the wealth of knowledge available from your Government. The Superintendent of Documents produces a catalog that tells you about new and popular books sold by the Government. Hundreds of books on agriculture, business, children, energy, health, history, space, and much, much more. For a free copy of this catalog, write—

Free Catalog
P.O. Box 37000
Washington, DC 20013-7000

DO NOT MICROFILM THIS PAGE