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REPORT TO THE HOUSE
COMMITTEE ON
GOVERNMENT OPERATIONS

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BY THE COMPTROLLER GENERAL
OF THE UNITED STATES



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The Economic And Environmental
Impact Of Natural Gas
Curtailments During The
Winter Of 1975-76

Federal Power Commission 25

Federal Energy Administration 75

Curtailments of natural gas are expected to be greatly increased in the coming winter over those experienced in 1974-75.

If the winter is normal and if alternative fuels are available, widespread unemployment and extensive plant closures are not expected.

Localized areas in a number of States are expected to be severely impacted economically if projected curtailments come about—particularly in those areas with industries that are dependent on gaseous fuels for processing or as feedstock.

Alternative fuels can cost three to four times more than natural gas. This increased cost of industry operations will be passed on to the consumer wherever possible.

RED-76-39

OCT. 31, 1975

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-181503

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C1
The Honorable Jack Brooks
Chairman, Committee on Government
Operations
House of Representatives

HSE C1500

Dear Mr. Chairman:

This is our report on the economic and environmental impact of natural gas curtailments during the winter of 1975-76. This report represents the first of a two-part study that you requested in your letter of July 26, 1975.

We did not obtain formal comments on our report from Federal Power Commission or Federal Energy Administration officials. However, we did informally discuss our overall observations with them and incorporated their comments where applicable.

The second part of the study--an assessment of the various impacts that would result from a decision to deregulate the price of interstate natural gas--will be covered in a separate report.

Sincerely yours,

Comptroller General
of the United States

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ABBREVIATIONS

Bcf	billion cubic feet
FEA	Federal Energy Administration
FPC	Federal Power Commission
GAO	General Accounting Office
Mcf	thousand cubic feet
Tcf	trillion cubic feet

COMPTROLLER GENERAL'S REPORT
TO THE COMMITTEE ON
GOVERNMENT OPERATIONS
HOUSE OF REPRESENTATIVES

ECONOMIC AND ENVIRONMENTAL
IMPACT OF NATURAL GAS
CURTAILMENTS DURING THE
WINTER OF 1975-76
Federal Power Commission
Federal Energy Administration

D I G E S T

Because of shortages of natural gas, the Federal Power Commission is projecting major curtailments by interstate pipeline companies during the 1975-76 winter season. The total amount curtailed for the period April 1975 through March 1976 is expected to be 3.2 trillion cubic feet. (See pp. 1 and 3.)

This is about 45 percent more than the 2.2 trillion cubic feet curtailed during the same months in 1974-75. (See p. 3.) GAO was asked to assess the social, economic, and environmental consequences of this curtailment, particularly as it applies to industry. (See p. 1.)

GAO concentrated its work in eight States--Ohio, Pennsylvania, New York, New Jersey, Maryland, Virginia, North Carolina, and South Carolina. These, according to Commission and Federal Energy Administration data, would be among the most severely affected by this winter's gas shortages. They receive 68 percent of their total interstate supply from four interstate pipelines that were projecting major curtailment increases in 1975-76 over amounts curtailed in prior years. (See p. 8.)

Natural gas consumption in this eight-State area in 1974 totaled about 3.3 trillion cubic feet--nearly 15 percent of all gas consumed. Gas curtailments amounted to 550 billion cubic feet, or 25 percent of all gas curtailed, with an additional 384 billion cubic feet projected for curtailment in 1975-76. These States have many industrialized areas which consume large amounts of gas and which employ a large percentage of the States' total labor force. (See pp. 8 and 9.)

GAO did not identify any broad areas of projected unemployment or widespread shutdowns of industrial operations due to the curtailment. However, unseasonably cold weather early in the winter and/or a shortage of alternative fuels could result in these conditions' occurring. GAO did identify some localized areas, including southern New Jersey and parts of North Carolina, that would be severely impacted economically if curtailment levels

come about and if alternative fuel supplies are not available. (See p. 13.)

The Federal Energy Administration told GAO that, generally, alternative fuels, such as oil or propane, would be available but at three to four times the cost of natural gas. It appears, therefore, that, under normal weather conditions, the most important economic impact of the gas curtailments will be in terms of higher industry-operating costs caused by the increased fuel costs. The industries plan to pass on these increased costs to the consumer wherever possible. (See pp. 13 and 14.)

Industrial firms in the eight-State area that expect to be severely affected by gas curtailments generally fall into one of five standard industrial classifications: food and kindred products; textile mill products; chemicals and allied products; stone, clay, glass, and concrete products; and primary metal industries. (See p. 30.) Certain industries will be more severely affected than others because they are unable to use non-gaseous alternative fuels. For example, the glass, chemical and textile industries require a minimum percentage of natural gas or propane as a process fuel or as feedstock. (See p. 13.)

Government agencies responsible for energy programs currently are taking steps to identify, and alleviate where possible, the impact resulting from natural gas curtailments. Federal Energy Administration regulations are being relaxed so that alternative fuels, such as propane and butane, can be imported and used. (See p. 42.) The Federal Power Commission has authorized certain industrial users to contract directly with gas producers and, therefore, tap intrastate gas supplies for interstate use. (See p. 36.)

The use of fuel other than natural gas will have some impact on air quality, but the specific effect has not been determined. The Environmental Protection Agency and Federal Power Commission have done little to assess this problem on a short-range basis. However, it appears that the Federal Power Commission's priority-of-service system will help promote maximum air quality. This system allocates clean-burning-gas supplies for small industries and commercial and residential facilities which, if fuel oil were used, would contribute a proportionately larger share of air pollutants than do utilities and large industrial plants. (See pp. 39 and 42.)

CHAPTER 1INTRODUCTION

CG
 Congressman Jack Brooks, Chairman, House Committee on Government Operations, asked us to make a two-part study for the Subcommittee on Conservation, Energy, and Natural Resources. The study was to encompass the following two parts. HSE 01502

1. An assessment of the social, economic, and environmental consequences that would result this winter (1975-76) from natural gas curtailments of the magnitude being forecast by the Federal Power Commission (FPC) with special emphasis on what industries will be most severely impacted and what alternatives are available to them.
2. An assessment of the social, economic, natural resource, and environmental impacts that would result if a decision were made to deregulate the price of interstate natural gas.

This report covers part 1 of the requested study. Part 2 will be covered in a separate report.

Natural gas currently represents about one-third of all energy consumed in the United States and almost one-half of all nontransportation uses. Natural gas is consumed by over 40 million residences, 3.4 million commercial establishments, and over 200,000 industrial users. The annual consumption of natural gas peaked at 23.6 trillion cubic feet (Tcf) in 1973 and declined to 22.5 Tcf in 1974.

The industrial community accounts for over 46 percent of all natural gas consumed, nearly twice that of the next largest user. Consumption percentages, by category, follow.

Residential use	24.5%
Commerical use	11.6
Industrial use	46.2
Electric power	16.5
Other	1.2

Although natural gas is an important source of energy to all industry, it is used more intensively in some industries and geographic locations than in others. In 1971 industries constituting 3 of the 21 standard industrial classification categories used 65 percent of all natural gas industry purchased. These primary industrial consumers are food and kindred products; textile mill products; chemical and allied

products; stone, clay, glass, and concrete products; and the primary metal industries.

NATURAL GAS DEMAND AND CURTAILMENT TRENDS

Until 1970 the increasing demand for natural gas was met from domestic production and from a small quantity of imported gas. In 1971 the demand for natural gas began to exceed available supplies. As shown in the following schedule, this unsatisfied demand has continued to increase.

U.S. Natural Gas Supply-Demand Balance

<u>Year</u>	<u>Domestic production</u>	<u>Net imports</u>	<u>Total available</u>	<u>Demand (note a)</u>	<u>Unsatisfied demand</u>
----- (Tcf) -----					
1968	19.3	0.6	19.9	19.9	0
1969	20.7	0.7	21.4	21.3	0
1970	21.9	0.8	22.7	22.6	0
1971	22.5	0.9	23.4	24.6	1.2
1972	22.5	0.9	23.4	26.1	2.6
1973	22.6	1.0	23.6	27.7	4.1
1974	21.6	0.9	22.5	28.8	6.3

*Projected for 1971-74

Source: Mineral Industry Surveys, U.S. Bureau of Mines, Annual Natural Gas Reports; and FPC staff study.

As the demand for natural gas gradually exceeded the amount available, the interstate pipeline companies were forced to curtail deliveries to their distributor (utilities) and industrial customers. This trend is illustrated in the following table.

Natural Gas Curtailment Trends

<u>Year</u> <u>(April to March)</u>	<u>Annual</u> <u>curtailments</u> (Tcf)
1970-71	0.1
1971-72	0.5
1972-73	0.8
1973-74	1.4
1974-75	2.2
1975-76 (expected)	3.2
1976-77 (forecast)	4.0

FPC NATURAL GAS CURTAILMENT POLICY

When the supply of natural gas cannot meet general needs, some difficult decisions must be made with respect to consumers whose service must be curtailed. Interstate pipeline companies make these decisions, but only with FPC approval and subject to a priority-of-service system established by FPC.

The nine-point system currently in effect is based on FPC Order 467-B issued on March 2, 1973. The priority-of-service categories follow.

1. Residential and small commercial (less than 50 thousand cubic feet (Mcf) on a peak day).
2. Large commercial (50 Mcf or more on a peak day) and firm industrial requirements for plant production, feedstock and process needs, and pipeline customer storage injection requirements.
3. Industrial customers not specified in category 2, 4, 5, 6, 7, 8, or 9.
- 4 and 5. Firm industrial requirements for boiler fuel use where alternative fuel capabilities can meet such requirements.
- 6 to 9. Interruptible requirements where alternative fuel capabilities can meet such requirements.

The FPC priority-of-service system applies only to the allocation of gas sold by interstate pipeline companies. Although the system is based on the end use of natural gas supplies, once the gas enters a State for distribution, FPC's jurisdiction over how the gas is finally allocated ends. At that point the ultimate consumer is decided by the distributor, subject to whatever State priority system is in effect. Although the final use of the natural gas may not necessarily conform to FPC's priority system, the flexibility at the State level may result in a more equitable response to economic demand than if FPC's system were rigidly adhered to throughout the system.

CONSUMPTION AND CURTAILMENT BY GEOGRAPHIC AREA

Natural gas consumption varies by region across the United States (see graph on p. 5) as do the curtailment levels. In 1974 the nine States in the east north-central and west south-central regions accounted for over one-half of the total natural gas consumed (about 12.3 Tcf) but were not considered to be greatly affected by natural gas curtailments. Conversely, the 11 States and Washington, D.C., forming the middle and south Atlantic regions, account for less than 14 percent of natural gas consumption (about 3.1 Tcf), but 9 of these States are included in the Federal Energy Administration's (FEA's) list of the 14 States most affected by the projected natural gas curtailments.

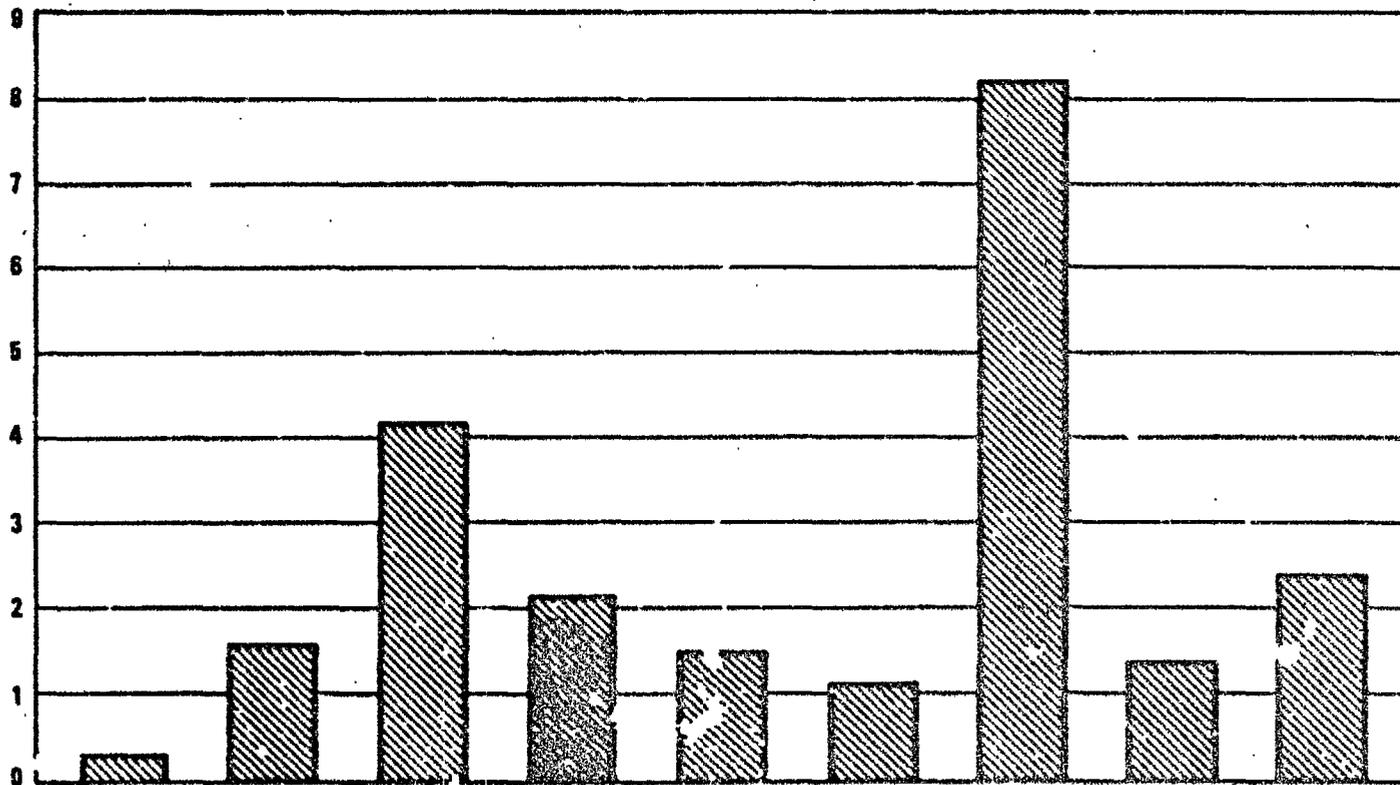
NATURAL GAS DISTRIBUTION SYSTEM

The U.S. natural gas system comprises producers, interstate and intrastate pipelines, distributors, and end users. The natural gas produced domestically reaches distributors and end users through both interstate and intrastate pipelines. Domestic production is concentrated in six States (Texas, Louisiana, Oklahoma, California, New Mexico, and Kansas) with most of the production's being in Texas and Louisiana. Consequently, most of the intrastate pipelines are found in these States and they supply about one-third of the total natural gas market.

The remaining two-thirds of U.S. natural gas requirements are supplied through 119 interstate pipeline systems, with 34 of the largest companies selling about 90 percent of all interstate natural gas. With some minor exceptions, all the natural gas curtailments through 1974 have been imposed by the interstate pipeline companies.

REGIONAL DISTRIBUTION OF NATURAL GAS CONSUMPTION, 1974

Trillion Cubic Feet



NEW ENGLAND	MIDDLE ATLANTIC	EAST NORTH CENTRAL	WEST NORTH CENTRAL	SOUTH ATLANTIC	EAST SOUTH CENTRAL	WEST SOUTH CENTRAL	MOUNTAIN	PACIFIC
Maine	New York	Ohio	Minnesota	Danaware	Kentucky	Louisiana	Montana	Washington
Vermont	New Jersey	Indiana	Iowa	Maryland	Tennessee	Oklahoma	Idaho	Oregon
New Hampshire	Pennsylvania	Illinois	Missouri	District of Columbia	Alabama	Texas	Wyoming	California
Massachusetts		Michigan	N. Dakota	Virginia	Mississippi	Arkansas	Colorado	Alaska
Rhode Island		Wisconsin	S. Dakota	W. Virginia			New Mexico	Hawaii
Connecticut			Nebreska	N. Carolina			Arizona	
			Kansas	S. Carolina			Utah	
				Georgia			Nevada	
				Florida				

EAST NORTH CENTRAL

Interstate pipelines provide natural gas to their customers based on firm- or interruptible-service contracts. FPC has defined the terms of service as follows.

"Firm Service: Service from schedules or contracts under which seller is expressly obligated to deliver specific volumes within a given time period and which anticipates no interruptions, but which may permit unexpected interruption in case the supply to higher priority customers is threatened "

"Interruptible Service: Service from schedules or contracts under which seller is not expressly obligated to deliver specific volumes within a given time period, and which anticipates and permits interruption on short notice, or service under schedules or contracts which expressly or impliedly require installation or alternate fuel capability."

Pipeline companies usually provide interruptible service as a way to maintain a favorable load factor. Load factor measures the degree to which physical facilities, and more basically invested capital, are being used. Pipeline companies make large capital expenditures to provide maximum gas deliveries to its distribution utilities for heating customers during cold weather. Since the typical residential gas customer uses almost five times as much gas during a winter month as during a summer month, the pipeline companies have unused capacities during the summer. With about 90 percent of transmission costs fixed, the companies are particularly sensitive to the load factor. To maintain the required load factor, pipelines offer the interruptible sale of fuel at a very low rate with the provision that service can be interrupted to supply firm customers. These interruptible customers normally are required to have an alternative fuel source that they can use when service is interrupted. During the 1974-75 season, requirements for interruptible service amounted to over 535 billion cubic feet (Bcf) of natural gas, or 3.5 percent of total interstate gas requirements. The requirement for the 1975-76 season is expected to drop to 503 Bcf, or 3.2 percent of total interstate requirements.

NATURAL GAS CURTAILMENT LEVELS

Since the terms of interruptible-service agreements allow for gas curtailments on short notice and have the element of expectation that the user has an alternative energy source, these customers obviously receive the greatest gas curtailment. However, customers holding firm-service contracts were also curtailed, particularly as the shortage increased. The schedule below shows the curtailments by

interstate pipelines for both firm- and interruptible-service customers as reported by FPC.

Curtailment of Firm and Interruptible
Service by Interstate Pipelines as Reported by FPC

Year (April to March)	Firm	Curtailment		Interruptible	Curtailment	
	requirements	Amount	Percent	requirements	Amount	Percent
	(Tcf)			(Tcf)		
1972-73	14.9	0.8	5	(a)	(a)	--
1973-74	14.9	1.2	8	0.6	0.2	33
1974-75	14.8	2.0	14	0.5	0.2	40
1975-76 (note b)	15.0	2.9	19	0.5	0.3	60

a Data not available.

b Expected

The curtailment figures shown above have been emphasized in natural gas studies and reports prepared by FPC and FEA. However, we believe these figures may be misleading if used as an indicator of the impact of natural gas curtailments for end users or as a measure of gas consumption that will be curtailed.

Data on natural gas requirements, deliveries, and curtailments are provided to FPC by interstate pipeline companies. In general, the reports submitted do not show the economic impact of the curtailments on the areas involved. This deficiency was discussed in a recently published GAO report on "Need for the Federal Power Commission to Evaluate the Effectiveness of the Natural Gas Curtailment Policy" (RED-76-18, dated September 19, 1975). We found that the FPC reports (1) contained no information on the intrastate deliveries and curtailments of natural gas to end users, (2) did not consider to what extent alternative fuels or stored gas were available to offset the curtailments, and (3) contained no information on what gas supplies the curtailed pipeline customers might themselves own or purchase directly from producers.

The curtailments reported by pipeline companies generally showed reductions in natural gas supplies based on requirements or deliveries and not reductions in actual consumption by end users. In our September 19, 1975 report, we found that industrial customers curtailed by one interstate

pipeline were generally taking less gas than their entitlement and that customers in general were taking less than their contract amounts. Although we did not determine why this was so, it is possible that lowered operational levels resulting from the economic recession and the relatively mild winter weather the past year reduced the quantities of gas that customers needed below the amount originally contracted for. If this same situation were true for customers of other pipeline companies, requirements data submitted (which can be based on entitlements or contract demands) could be overstated. Since curtailments generally are requirements less deliveries, the quantities reported as curtailed would also be overstated.

IDENTIFICATION OF IMPACT AREA
AND SCOPE OF SURVEY

We did not have enough time to verify the accuracy of the data the pipeline companies submitted to FPC. For our survey, we worked with the data available, accepting the curtailment levels as given. On the basis of our analysis of data obtained from FPC and FEA, we identified four pipeline companies that were projecting major increases in curtailments in natural gas deliveries for 1975-76 over amounts curtailed in prior years. We then selected eight States served by these pipeline companies which, according to FPC and FEA data, would be among those most severely affected by the projected curtailments. These States receive 68 percent of their interstate gas supply from the four pipeline companies. The eight States, with a 1974 gas consumption of about 3.3 trillion cubic feet (about 15 percent of total consumption), have (1) concentrations of industries that are heavy gas users and/or (2) large percentage increases in projected curtailments for 1975-76 over actual curtailments in 1974-75. From April 1974 through March 1975, these eight States had actual curtailments of over 550 Bcf of natural gas, or 25 percent of the total curtailment of 2,209 Bcf. This eight-State curtailment is projected to increase to nearly 934 Bcf during the 1975-76 season, or 38 percent of the total projected increase in curtailments.

For these eight-States, the following table shows the increase in curtailment rates projected for 1975-76 over the actual curtailment rates for 1974-75, the 1974 gas consumption, and the relationships of gas consumption to industry and State employment.

Natural Gas Curtailment, Consumption, and Usage Data
For Eight Affected States

<u>State</u>	<u>Projected curtailment increase, 1975-76 over 1974-75</u>	<u>Natural gas consumption, 1974</u> (Bcf)	<u>Percent used by industry</u>	<u>Percent of total employment in gas-using industry</u>
New Jersey	84	274	24	32
Maryland/D.C.	19	197	29	20
Virginia	16	139	37	9
North Carolina	21	136	64	33
South Carolina	12	130	56	29
Pennsylvania	9	693	45	25
Ohio	11	1,074	40	24
New York	5	624	17	21
		<u>3,267</u>		

Source: The Natural Gas Shortage: A Preliminary Report, FEA, August 1975

The tabulation on page 11 shows the requirements and curtailments of the four pipelines for the eight-State area for 1974-75 (actual) and 1975-76 (projected). The map on page 12 shows the major gas-producing regions, the pipelines with large curtailments, and the eight-State area selected for our survey.

Beyond the identification of major pipeline curtailments and the States most severely affected, we found very little work had been done until recently (see p. 37) at the Federal level to assess the extent and impact of pipeline company curtailments at the distributor and end-user levels. To determine how the distributors within each State were reacting to curtailed deliveries and the impact their actions were having on industrial end users, we contacted representatives of these groups in each of the eight States. Overall, we contacted 26 distributors and 62 industrial end users and obtained their assessment of the expected consequences of the curtailments.

From our analysis of types of industries operating in the eight-State area, we found that industries in the five standard industrial classification categories previously identified as heavy gas users were well represented. (Nearly all 62 end users contacted were firms included in these 5 industrial categories.) For these 5 industry groups, we contacted representatives of 50 trade associations and obtained, when possible, their assessment of the economic impact of the projected gas curtailment.

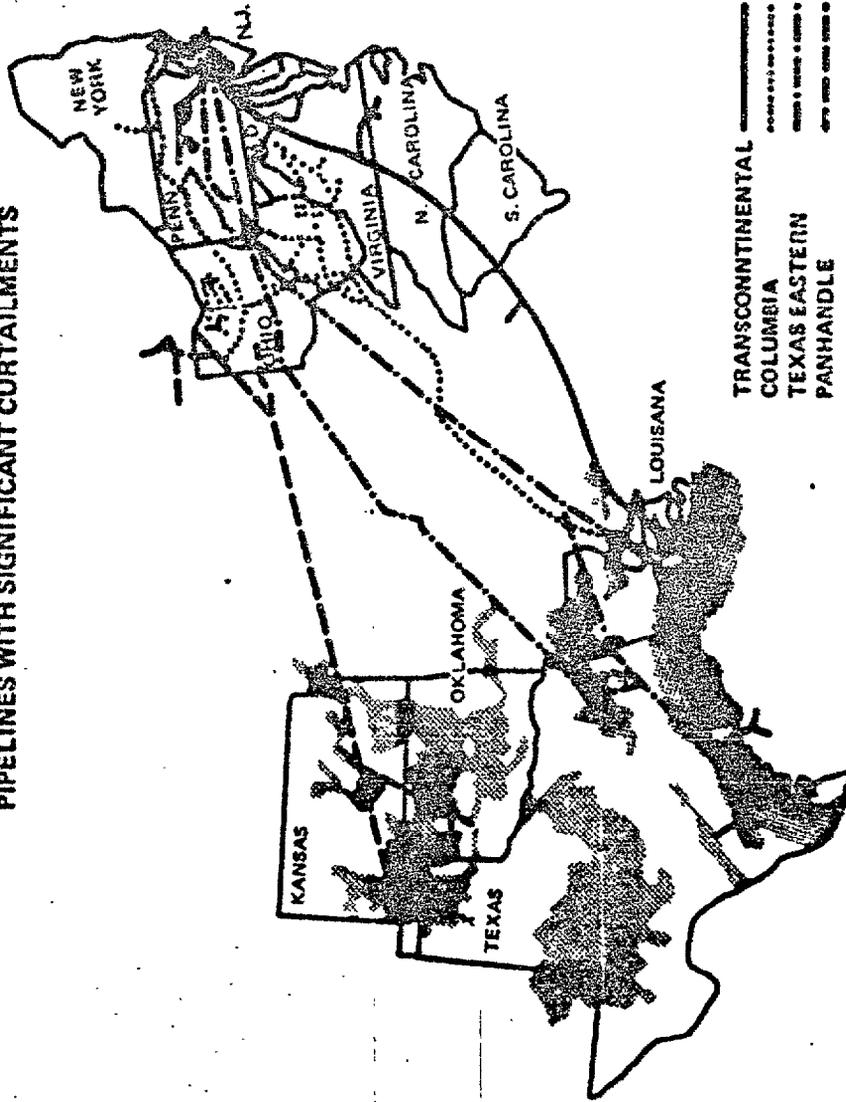
We contacted representatives of the Environmental Protection Agency and FEA to obtain data on the expected environmental impact from using alternative fuels and the expected availability of fuel oil and propane.

SCHEDULE OF REQUIREMENTS AND CURTAILMENTS BY PIPELINE COMPANIES

<u>Pipeline company</u>	<u>States served</u>	<u>1974-75 (actual)</u>			<u>1975-76 (projected)</u>		
		<u>Require- ments</u>	<u>Curtail- ments</u>	<u>Percent curtailed</u>	<u>Require- ments</u>	<u>Curtail- ments</u>	<u>Percent curtailed</u>
		-----	(Bcf)	-----	-----	(Bcf)	-----
Columbia Gas Transmission Corporation	Maryland	126.72	12.08	9.5	126.72	36.30	28.6
	New York	42.16	5.23	12.4	42.16	12.10	28.7
	New Jersey	2.54	0.36	14.2	2.54	0.74	29.0
	Ohio	680.80	104.20	15.3	680.80	193.79	28.5
	Pennsylvania	245.57	31.61	12.9	245.57	70.31	28.6
	Virginia	75.30	7.27	9.6	75.30	21.54	28.6
II Panhandle Eastern Pipe Line Company	Ohio	177.33	18.97	10.7	177.25	33.41	18.8
Texas Eastern Transmission Corporation	New York	53.57	16.09	30.0	54.02	17.38	32.2
	New Jersey	265.51	51.27	19.3	255.14	61.48	24.1
	Ohio	154.73	33.66	21.8	152.40	39.59	26.0
	Pennsylvania	429.19	95.16	22.2	426.40	119.26	28.0
Transcontinental Gas Pipe Line Corporation	Maryland	6.54	1.59	24.3	6.62	2.05	30.9
	New York	259.13	66.88	25.8	256.01	97.81	38.2
	New Jersey	220.22	59.91	27.2	230.75	84.72	36.7
	Pennsylvania	209.21	54.91	26.2	206.09	73.44	35.6
	Virginia	67.05	19.50	29.1	70.33	27.43	39.0
	North Carolina	195.46	62.43	31.9	199.41	104.95	52.6
South Carolina	35.99	11.36	31.6	36.47	19.7	53.9	

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**MAJOR NATURAL GAS PRODUCING REGIONS AND
PIPELINES WITH SIGNIFICANT CURTAILMENTS**



CHAPTER 2

THE SOCIAL-ECONOMIC CONSEQUENCES OF THE PROJECTED CURTAILMENT

FPC has projected large increases in natural gas curtailments during 1975-76 over curtailments in prior years. These projected curtailments have given rise to concern that the U.S. industrial community will be severely impacted during this current heating season, resulting in large-scale unemployment and widespread plant closures.

OVERALL ASSESSMENT OF IMPACT

Our survey of the eight States determined to be among the most severely curtailed by interstate pipeline companies did not support that concern in its totality. On the basis of assessments by distributors and end users and assuming normal winter weather conditions, we did not identify any broad areas of projected large-scale unemployment or widespread shutdowns of industrial operations due to the natural gas curtailments. However, unseasonably cold weather early in the winter and/or a shortage of alternative fuels could considerably increase unemployment levels and the number of plant closures with adverse social and economic consequences.

We did find indications that some smaller industrial companies and some localized areas, such as southern New Jersey and North Carolina's Piedmont area, would be severely impacted economically if actual curtailments were to reach projected levels and if alternative fuel supplies were not available. We found that certain industries expect to be affected more than others, because they are unable to use nongaseous alternative fuels, such as fuel oil or coal. For example, the glass, brick, chemical, and textile industries require a minimum percentage of gaseous fuel for processing or as feedstock. Large gas curtailments or restricted availability of other gaseous fuels to these companies were expected to result in limited production capabilities and declining employment levels. Other small companies that could use other fuels expect to be affected by curtailments, because they cannot absorb the additional cost required to convert their facilities and pay the higher prices for alternative fuels.

FEA officials told us that generally alternative fuels, such as fuel oil or propane, would be available. However, these fuels currently cost three or four times the price industrial users pay for interstate natural gas. It appears, therefore, that, unless the winter is unusually cold,

the most important economic impact of the curtailment will be in terms of higher industry-operating costs caused by the increased fuel costs. Industry representatives told us that these added costs would be passed on with the product wherever possible and that consumers could expect to pay higher prices for the finished products.

ASSESSMENT OF IMPACT BY STATE AND INDUSTRY

We have summarized below the data obtained during our survey for each State. We have included the results of our contacts with trade association representatives, showing, where obtainable, their assessment of curtailment consequences as these consequences apply to their particular industry groups.

Ohio

Projected firm curtailment for 1975-76 stated as a percent of requirements	21.8
Percent of total State requirements furnished by pipelines surveyed	69.1
Percent of curtailments attributable to pipelines surveyed	86.7
Percent of curtailments attributable to distributors contacted	93.8

We contacted 4 of the 24 distributors that obtain gas from the pipelines included in our survey. We also contacted 11 customers of these 4 distributors.

The one distributor in the Cleveland area reported that the curtailments for 1975-76 would be no worse than they were during the 1974-75 season and that the highest service priority curtailment actually would drop from 30 to 20 percent this year. The other three distributors serving Columbus and many of its surrounding counties, Dayton, and Cincinnati are planning for a minimum 28-percent overall curtailment during the coming heating season. All four distributors will attempt to limit curtailments to their industrial and/or commercial customers which generally have alternative fuel capabilities and which were also curtailed during the 1974-75 season. Most of the industrial end users have firm-service contracts and with the exception of the East Ohio Gas Company, have less than 1 percent of the industrial-commercial customers on interruptible-service contracts.

As a result of these curtailment policies, the distributors are projecting that there will be no appreciable economic impact resulting in unemployment or plant closures from the curtailment. Officials of two distributing companies said that some small companies that lacked the capability or financial resources to switch to other fuels might be forced to restrict operations or lay off employees if curtailments reach the projected levels. This situation is most likely to happen in the Dayton area. The Dayton Power and Light Co., is prorating its overall 28-percent curtailment among 2,200 of its 1,447 industrial and 20,314 commercial customers, resulting in an actual curtailment of about 35 percent for these 2,200 customers. This policy contrasts with the plan of Cincinnati Gas and Electric Co., to pass all of its curtailment to the 80 largest of its 1,287 industrial customers.

Columbia Gas of Ohio, Inc., which serves 65 of Ohio's 88 counties, has about 2,300 industrial customers, of which about one-half will be affected to some degree. Columbia Gas will curtail all use of gas for boiler fuel and will curtail 65 percent of all gas consumption in excess of 1,000 Mcf a month. This policy will result in 317 large users' experiencing most of the curtailment.

Those expected to be most severely affected in Ohio are greenhouses; grain dryers; and food-processing, glass, brick, ceramics, fertilizer-manufacturing, steel, and nonferrous metals industries. Our contacts with 11 end users in some of these industries confirmed statements by the distributors that most large users would be able to offset the impact of gas curtailments by using alternative fuels and that the impact would be greater for the smaller industries.

Five companies manufacturing glass, chemical, and steel products and having from 900 to 27,000 employees will be curtailed from 30 to 100 percent, yet none of them are projecting layoffs or plant shutdowns due solely to the curtailments. All have been alerted to the projected curtailments, and most have firm contracts for alternative fuels. Two of the firms have considered buying gas direct from producers, if possible, as authorized by FPC Order 533. (See p. 36.) The two biggest problems they see are potential limitations on their alternative fuel supplies (which could cause layoffs or shutdowns) and the increased cost of these alternative fuels. The added costs, which range from 200 to 400 percent more than current gas prices, will be passed on to the consumer whenever possible.

The difference in industrial firms' abilities to pass on the higher costs of alternative fuels to consumers is

demonstrated by the two chemical companies in the Cincinnati area. Both firms have alternative fuel supplies. One estimates its fuel costs will increase by 220 percent, or \$8,000 a day. This company plans to pass on these increased costs to consumers by increasing its prices. The second company estimated its fuel costs would be four times higher than equivalent quantities of natural gas. This company, however, was not sure it could pass on the increased costs to consumers because of the competitiveness of the chemical industry in the area in which the company operated.

Dayton Flexible Products, with about 500 employees; the Dayton Forging and Heat Treating Co., with about 250 employees; and Commercial Heat Treating of Dayton, Inc., with 35 employees did project problems with curtailments. These companies require some gas to stay in business, although they can use oil for certain operations. The additional cost of oil is more difficult for them to absorb or pass on than the big companies and may affect their operations. Dayton Flexible Products, plans to transfer 10 percent of its operations out of State with the loss of about 130 jobs in Ohio. It is now anticipating a 2-week shutdown with additional shutdowns if propane is not available. The Dayton Forging and Heat Treating Co., has a firm fuel-oil contract through March 1976 but needs some gas for processing. If either fuel is not available, operations could be reduced by 15 percent or more.

If curtailment levels do not exceed current projections and if alternative fuels remain available for those companies that can use them, Ohio should not be too severely impacted, this coming winter. Although some small companies may be seriously affected, the economic impact is not expected to be great for the State as a whole. Additional gas supplies may be made available if industrial users are able to negotiate directly with producers for gas. The extent to which this is being done and the effect it will have is not known at this time.

Pennsylvania

Projected firm curtailment for 1975-76 stated as a percent of requirements	22.1
Percent of total State requirements furnished by pipelines surveyed	64.3
Percent of curtailments attributable to pipelines surveyed	90.3

Percent of curtailments attributable to
distributors contacted

68.0

We contacted 5 of the 24 distributors receiving natural gas from the pipeline companies surveyed and 5 industrial end users.

Two of the distributors, Philadelphia Electric Co., and Philadelphia Gas Works, serve the Philadelphia area in eastern Pennsylvania. The Philadelphia Electric Co., is projecting a shortfall this winter season of about 10 percent, or 4.3 Bcf, which is four times the shortfall experienced during the 1974-75 season. Philadelphia Electric stopped all deliveries to interruptible-service customers in September 1974 and began curtailments to four major industrial customers on firm-service contracts in January 1975. Philadelphia Electric identified a total of 20 firm industrial customers that may be affected by curtailments during the 1975-76 season. Companies projected for possible curtailment were selected on the basis of FPC's nine-point priority system. To help offset the projected curtailments, Philadelphia Electric Co., officials told us they are planning to buy 24 million gallons of propane at \$4 a Mcf and any available surplus natural gas from the Algonquin Gas Transmission Co., for \$5.34 a Mcf, to supplement their regular pipeline deliveries. These higher costs will be passed on to Philadelphia Electric's customers.

The Philadelphia Gas Works is expecting a 21-percent curtailment by its suppliers for this winter season but is not expecting to curtail any firm customers. The company's extensive investments in oil gas, propane, and liquefied natural gas facilities will preclude curtailments, except to interruptible customers. The economic impact of the curtailment is expected to be minimal, but the use of the more expensive alternative fuels will increase costs to its customers.

The United Gas Improvement Corporation, serving the Harrisburg, Lancaster, Reading, and Lehigh areas, initially planned to impose a proportionate curtailment of about 43 percent on 450 of its 1,244 industrial customers that use more than 30 Mcf of gas a day. Subsequently, the corporation's analysis of its allocation plan resulted in lower curtailment levels during the winter heating season, at least for two companies we contacted. Its 97 interruptible customers have been terminated and its noncritical customers (those with alternative fuel capabilities) will be curtailed until requirements match available supply. Under this plan, every firm customer will get some gas. The corporation has no storage facilities for natural gas but is buying and storing liquefied natural gas and propane as supplemental

supplies. Corporation officials are also working on transfer arrangements with small intrastate gas suppliers for additional natural gas. A corporation official told us that, if all the variables that affect fuel supplies turned out right, it could be caught with excess fuel supplies this winter.

Carnegie Natural Gas Co., and Columbia Gas of Pennsylvania, Inc., serve as distributors in the Pittsburgh area. United States Steel Corporation takes 90 to 95 percent of Carnegie's supply and is, in effect, a direct user from the pipeline company. U.S. Steel's curtailment levels range from 37 to 87 percent and could reach 100 percent this winter. Although U.S. Steel officials chose not to discuss the matter with us, a Carnegie official said U.S. Steel might be forced to close down some of its works if gas were completely curtailed, but he could give us no specific data. The remaining 5 percent of Carnegie's supply goes to 4 small industrial and 4,900 residential and commercial customers, none of which will be curtailed. Columbia Gas of Pennsylvania, Inc., is projecting the same 28-percent curtailment that Columbia Gas of Ohio is projecting. However, this is being applied against the larger industrial users, as evidenced by the large curtailments to Lukens Steel Company and the Jones-Laughlin Steel Co.

The reactions to the projected curtailments by end users we contacted varied according to their particular situation. One user--an alcoholic beverage company--was on an interruptible-service contract, and it is being curtailed 100 percent. However, the beverage company has the capability for using oil, gas, and even coal if need be. Use of alternative fuels will increase production costs as much as 20 percent, which may affect sales levels. The company is planning no layoffs; it may reduce operations, but only because of the economic situation.

An aluminum plant served by United Gas is totally dependent on gaseous fuels and cannot substitute fuel oil or coal. The 43-percent curtailment initially projected by the corporation would require reducing plant temperatures to 38°F to 40°F and laying off about 125 employees. However, the corporation's current projected curtailment is down to about 26 percent, which should improve the situation. Substituting propane for natural gas is not necessarily a viable alternative. Even if the plant could buy propane and have it converted to gas, the high cost (about \$5.02 a Mcf) would result in the plant's losing money during the time the gas was being used, since the increased costs could not be passed on because of the plant's competitive situation.

The curtailment effect on steel manufacturers appears to be dependent on the type of product produced. Speciality steel products producers, like the Carpenter Technology Corporation, need gas to meet quality assurance standards, although they are converting operations to oil wherever possible. If gas supplies are not curtailed more than 25 percent, normal operations can continue. Higher curtailment levels, such as the projected 38-percent curtailment, could cause certain products to be eliminated from production.

Lukens Steel Company specializes in manufacturing steel-plate and quality control in the heat-treating process requires gas. Lukens is a firm customer of Columbia Gas of Pennsylvania, Inc., but expects about a 60-percent curtailment this winter. Lukens can substitute oil for some operations but cannot pass the increased cost on to its customers. Plant operations can continue if curtailments do not exceed 40 percent, as was evidenced by last year's experience when no layoffs or shutdowns occurred at that curtailment level. Lukens has applied to FPC for approval to purchase additional gas supplies direct from producers.

The Jones and Laughlin Steel Corp., is representative of large integrated steel manufacturers. Natural gas is considered a "swing-fuel;"--used whenever it is available--and accounts for only about 16 percent of Jones and Laughlin's energy needs. Other fuels used are coke-oven and blast-furnace gas, tar, and coal. Even with a projected gas curtailment of 70 percent, Jones and Laughlin do not foresee any plant shutdowns or any layoffs among its approximately 30,000 employees.

It appears that Pennsylvania's industries, as a whole, will not be too severely impacted this winter if alternative fuel supplies are available. The increased costs of using alternative fuels will be the big factor in the economic picture, both for companies that must absorb these costs and for consumers in the marketplace.

New York

Projected firm curtailment for 1975-76 stated as a percent of requirements	18.4
Percent of total State requirements furnished by pipelines surveyed	44.4
Percent of curtailments attributable to pipelines surveyed	87.2

Percent of curtailments attributable
to distributors contacted

19.2

New York is unique among the eight States surveyed in that overall, the State is expected to get more gas this year than last year. However, the New York City metropolitan area and southeastern New York will be getting less gas this year. These areas are served by three of the four pipelines included in our survey. From the eight distributors supplied natural gas by these three pipelines, we contacted four of the larger companies. We also contacted 13 end-user customers of the 4 distributor companies.

Comments by distributor representatives varied as to the possible consequences of natural gas curtailment this season. Brooklyn Union Gas Co., officials said actual curtailment figures would not be available until November 15, 1975, but felt it would be twice the amount curtailed last year. They foresee a possible 100-percent curtailment of interruptible customers, as was the case last year, and they may also curtail 90 to 100 firm industrial customers for the first time. They are currently negotiating for additional supplies to prevent the latter curtailment.

Consolidated Edison Company of New York, Inc., is projecting curtailment only to its interruptible customers who have alternative fuel capability and does not expect the impact to be too severe. Columbia Gas of New York, Inc., cut off all gas to industrial users last year but has submitted a revised curtailment plan for this season. Under this plan all deliveries would be cut to large industrial users and the small industrial and commercial users would be grouped together and curtailed 30 percent.

The Orange and Rockland Utilities, Inc., offered little information on current curtailment plans. It did say they were able to meet all firm customer requirements and that interruptibles had been reduced by only 30 percent last year. Brooklyn Union Gas Co., was the only distributor that indicated steps had been taken to develop supplemental storage capacity and a synthetic natural gas plant.

Of 13 end users contacted, 9 had interruptible-service contracts and all had been curtailed in the past. No layoffs or shutdowns could be attributed to curtailments because alternative fuels were available, although at a higher price than gas. Several of the end users expect heavy curtailments, but if alternative fuels are available, the situation will generally be the same. Although no layoffs are anticipated, some could result because of the high cost of fuel oil. One hospital with an expected 39-percent curtailment, expressed

concern over having enough alternative fuel to continue providing full services.

One customer of Consolidated Edison has both firm and interruptible service and has had no problem thus far. The company could use oil as an alternative fuel, if necessary, but officials felt that the cost of oil was too high and that they would probably lay off their 1,250 employees if gas was not available.

We contacted three firm contract customers who are expecting a 100-percent curtailment this winter of gas used in manufacturing operations. Alternative fuels were used last year to avoid layoffs, and the companies are attempting to do so again this year. Their success will depend on the availability of fuel and the price they have to pay. One company said that it had passed on the increased cost of fuel oil to its customers.

About 23 percent of New York gas consumption is by utilities and industries. The three largest gas-consuming industries: primary metals; stone, clay, and glass; and food, account for about 50-percent of all industrial use. However, the employment impact of curtailments is not likely to be large because only about 3.4 percent of total employment is in these three industry groups.

New Jersey

Projected firm curtailment for 1975-76 stated as a percent of requirements	32.7
Percent of total State requirements furnished by pipelines surveyed	95.9
Percent of curtailments attributable to pipelines surveyed	99.6
Percent of curtailments attributable to distributors contacted	91.5

During our survey we contacted three of the eight distributors serving New Jersey. We also contacted nine industrial end users served by these distributors and discussed curtailment consequences with company personnel.

The greatest impact of gas curtailment in New Jersey is projected to occur in the southern part of the State where Transcontinental Gas Pipeline Corporation (Transco) is predicting curtailments up to 52 percent for this winter. Two major industry gas consumers--the glass and chemical industries--

are both located in southern New Jersey and have limited capability for switching to alternative fuels. The glass industry uses 23 percent of its consumption as a process fuel, and the chemical industry uses 21 percent as a process fuel and feedstock.

South Jersey Gas Co., which serves the southern area, has curtailed all interruptible customers 100 percent. The company believes it will be able to meet its firm requirements by purchasing liquefied natural gas and synthetic natural gas for resale. However, the higher prices for these supplemental fuels will have to be passed on to the consumer. A South Jersey Gas Co. official informed us that if these alternative fuels are not available for firm customers, most of the 19 largest customers would be forced to close. Estimated direct and indirect unemployment for such shutdowns is 25,000.

Two of the distributors serving mainly the northern part of the State projected much less impact from the curtailment. Public Service Electric and Gas Co., stated that, of about 4,000 industrial customers only 85 on interruptible-service contracts would be curtailed. For some of these companies, the interruptible curtailments and resultant higher alternative fuel costs, may result in layoffs and shutdowns. Elizabethtown Gas Company is expecting a less severe curtailment than projected, with the impact limited to interruptible customers. They did not know how much the actual curtailment would be. Elizabethtown Gas Company has requested FPC approval to contract directly with producers for additional gas supplies.

We contacted four customers of South Jersey Gas Co., for further assessment of curtailment effects. Three of these customers produce glass and one produces materials for can manufacturers. All four are on firm contracts. One of the customers, the Owens-Corning glass plant, also has an interruptible-service contract which has been curtailed for over a year, but it has been able to use oil as an alternative fuel. Only one of the customers has been curtailed on his firm contract and that was only for several short periods.

All three glass companies have alternative fuel supplies if natural gas is curtailed. These alternatives, however, would not be sufficient to keep two of the plants operating at full capacity if large curtailments were imposed, but the Owens-Illinois, Inc., of Glassboro, has a propane system that would enable it to continue full-time operations. The additional cost of using propane would have to be passed

on to its customers. Collectively, the three glass plants have about 3,000 employees.

Del Monte Foods, the other customer contacted, has received no indication of curtailment for this year but has contracted for supplemental supplies of propane as a precautionary measure. Del Monte uses 100 percent of its gas for production and can substitute only a certain percentage of alternative fuels. Del Monte officials said that, because of contract commitments for its products, curtailments resulting in decreased production could affect industries in New Jersey, Puerto Rico, and Hawaii, resulting in layoffs and possible plant closures.

End-use customers on firm contracts with the other two distributors generally reported they saw no problems due to the curtailments. Customers with additional interruptible-service contracts have had deliveries curtailed, but alternative fuels have been available.

The New Jersey Shale Brick Corp., is one company with only an interruptible-service contract. A 180-day curtailment last year nearly forced the company out of business; if the curtailment projected for this year materializes, the company may have to close down and lay off its 100 employees.

Maryland-D.C.

Projected firm curtailment for 1975-76 stated as a percent of requirements	28.2
Percent of total State requirements furnished to pipelines surveyed	98.9
Percent of curtailments attributable to pipelines surveyed	99.7
Percent of curtailments attributable to distributors contacted	88.2

In the State of Maryland we contacted one distributor with projected curtailment this winter of 88.2 percent of the State total. We also contacted six industrial end users of the one distributor and discussed curtailment consequences with five of them.

Officials of the Baltimore Gas and Electric Co., said that they did not anticipate any major problems this heating season due to gas curtailments. Interruptible customers may be curtailed 100 percent, but this is contingent on the severity of the winter. Baltimore Gas and Electric does not

anticipate curtailing any firm customers, but, if natural gas supplies are insufficient for these customers, it plans to supplement such supplies with liquefied natural gas.

Although Baltimore Gas and Electric has a policy of providing interruptible service to only those customers with demonstrated alternative fuel capabilities, it gave us a list of six large interruptible customers who may experience difficulty this winter.

We were able to obtain assessments of the possible curtailment effects from five of the six companies. One glass company representative said he preferred not to discuss the matter with us. Two of the remaining five companies were not expecting any shutdowns or layoffs due to curtailments. The other three companies, Diamond Shamrock Chemical Co., Glidden Durkee Division of SCM Corp., and Crown Cork and Seal Co. Inc., were uncertain at this point, with the critical factor being the availability of alternative fuels needed for production processing. The Diamond Shamrock Chemical Co., reported laying off 12 to 15 employees last year and expects a similar or worse situation this year. It does not expect a total shutdown, however, for its 200 employees.

All five companies expressed concern over the additional cost of using alternative fuels. One company currently pays \$0.51 a thousand cubic feet and using another fuel will raise this to \$1.97 a thousand cubic feet.

Four of the five companies are attempting to purchase gas directly from producers to provide a source of gas other than Baltimore Gas and Electric. Final action had not been taken at the time of our contacts.

Virginia

Projected firm curtailment for 1975-76 stated as a percent of requirements	33.3
Percent of total State requirements furnished by pipelines surveyed	93.9
Percent of curtailments attributable to pipelines surveyed	94.0
Percent of curtailments attributable to distributors contacted	57.4

Two of the eight distributors supplied by Virginia's two interstate pipeline companies and four industrial end users were contacted.

The Commonwealth Natural Gas Corporation of Virginia, is the State's biggest distributor. However, it differs from most distributors in that it has only six customers-- five utility companies that are themselves distributors and one industrial end user. A Commonwealth official said that all customers were affected by the 1974-75 curtailment and that all would be curtailed to some extent this year. All six customers have firm-service contracts and two have interruptible-service contracts. The Virginia Electric Power Co., will require about 13 Bcf and will get about 8 Bcf. The Allied Chemical Corporation needs about 5 Bcf and will get about 3.5 Bcf. It does not project any serious impact on its operations other than higher production costs as it has arranged for supplemental supplies of oil and synthetic natural gas. Commonwealth operates a plant to make synthetic natural gas which will help some, but its output is limited to 4.5 Bcf at a cost of \$4 to \$4.50 a thousand cubic feet.

The city of Danville requires about 2.1 Bcf this winter, and it is projected that it will get only about 1.6 Bcf-- enough for its residential, commercial, and most small industrial users. The 0.5 Bcf shortage will result in 100-percent curtailment of Danville's four major industrial plants which collectively employ nearly 10,000 of Danville's 40,000 population.

Two of the four plants, United States Gypsum Co., and Goodyear Tire and Rubber Co., Inc., can largely convert to oil. In addition, Goodyear has its own propane plant. A U.S. Gypsum official said that gas must supply a minimum of 5 percent of its energy needs to operate even though 95 percent of its needs are met with oil. Dan River Mills, Inc., needs 2 million cubic feet of gas a day for 6 days a week. They have contracted directly with producers for 1.2 million cubic feet of this and have also arranged for supplemental supplies of 1.5 million gallons of propane if FEA will authorize its use. Even with these supplies, Dan River Mills will have to operate on a shorter workweek and may have to eventually close down if additional supplies are not available. The company employs about 9,100 people.

The Corning Glass Co., may have to close if gas that is critical for certain operational processes is not available. The company has purchased 600,000 gallons of propane which will supply one-third to one-half of its needs, but this is not sufficient to continue operations without natural gas. Corning Glass Co., is trying to buy gas from producers in

Texas and Louisiana. If this is not successful, the company will have to close down. The company has about 500 employees.

Although the stone, clay, and glass industry and the paper and textile industries account for 50 percent of total industrial gas consumption in Virginia, they employ only about 6 percent of total State employment. Therefore, except for the specific areas mentioned, the employment impact of gas curtailments is not expected to be too severe. If curtailments exceed expectations, some small and medium commercial industries with no alternative fuel capabilities may shut down rather than pay conversion costs.

North Carolina

Projected firm curtailment for 1975-76 stated as a percent of requirements	52.6
Percent of total State requirements furnished by pipelines surveyed	100.0
Percent of curtailments attributable to pipelines surveyed	100.0
Percent of curtailments attributable to distributors contacted	91.9

Transco is the only interstate pipeline serving North Carolina, and we contacted three of its nine distributors for the State. Eight customers of these distributors were also contacted.

North Carolina is expected to be the area hardest hit by this year's curtailment. Transco is projecting the largest curtailment of the four pipelines included in our survey. In addition, 64 percent of North Carolina's gas consumption is by industry--generally a low-priority classification--with about 20 percent of its total work force in textile industry; chemicals industry; and stone, clay, and glass industries; all natural gas consumers.

Although gas curtailment is expected to be considerable, the severity of the impact on the economy will generally depend on the availability of required alternative fuels and winter weather conditions. The three distributors we contacted have a number of commercial and industrial customers with interruptible-service contracts which will be curtailed 100 percent. Many of them have the capability to use other fuel, if it is available. For example, the Piedmont Natural Gas Co., has 519 industrial and commercial customers who have interruptible-service contracts and projected curtailments

of 100 percent. Equipment for burning other fuel is available at 513 of these companies, but 385 need number 2 fuel oil, and deliveries may not keep up with demand. The Public Service Co. of North Carolina, Inc., has 269 interruptible customers, and all have alternative fuel facilities and standby supplies.

The greatest impact will undoubtedly fall on the commercial and industrial customers with firm contracts which will be curtailed but which do not have facilities to use other fuels. Piedmont Natural Gas Co., reported 200 firm industrial and commercial customers that it expects to curtail, although it does not know the exact level of such curtailment. Five or six of these customers can use propane, but the remainder have no alternative fuel capability. The Public Service Co., on the other hand, expects to curtail some of its 13,217 commercial customers with firm contracts by a maximum 25 percent, and only 28 of these are without alternative fuel or facilities for burning other fuels. Public Service Co.'s 409 firm industrial customers are projected for a 74-percent curtailment, but 320 have alternative fuel and facilities. Of the remaining 89 customers, 35 are partially equipped to switch to other fuel but 54 have no alternative fuel capability.

North Carolina Natural Gas Corporation was not certain as to what curtailment levels would be imposed and provided little other information. It reported firm contract customers were curtailed nearly 36 percent last year and estimate such curtailment would be about 67 percent this year. The company has 180 interruptible customers which will be curtailed 100-percent and 250 large firm industrial customers which will experience some curtailment. No impact assessment was provided by company officials.

Seven of the eight end users contacted are located in North Carolina. The eighth company, a textile firm, is in South Carolina but gets its gas from Piedmont Natural Gas. This textile company is on an interruptible contract but has no alternative fuel supplies. The only alternative fuel that the company can use is propane. If the curtailment is too severe, the plant will close leaving its 3,200 workers unemployed.

Three of the seven North Carolina companies contacted have interruptible-service contracts, three have firm contracts, and one company has both types of contracts. Only one company has made firm arrangements for alternative fuel to avoid a shutdown, although three other companies have tried to obtain propane or supplemental supplies of natural gas directly from producers. Two brick companies on inter-

ruptible-service contracts can use oil for fuel but only by sacrificing product quality. One of these brick companies, employing 100 people, is expected to close down and lay off 75 people rather than use an alternative fuel. The Laurens Glass Works is expecting at least a 25-percent curtailment of its firm contract, and company officials predict that layoffs among their approximately 600 employees will generally equal their curtailment levels. The Cannon Mills Company, with about 18,000 employees, is on a firm contract with no alternative fuel capability. The company was reluctant to provide any specific information but did indicate a possible plant closure if natural gas is not available.

The general tenor of comments by company officials with firm contracts is that they are uncertain as to curtailment levels and that planning is difficult. Their companies are generally not equipped to switch to alternative fuels, and some layoffs or plant closures are anticipated if curtailments become too severe. Only one of the three companies on firm contracts was curtailed last year, and it finally received some supplemental supplies to avoid a shutdown. All four interruptible companies were required to shut down or reduce operations because of last year's curtailments.

The greatest economic consequences are projected to fall in the central (Piedmont) area, coincident with industrial and population concentration. Even though extensive unemployment may not result from the curtailment, North Carolina's recovery from the economic recession may be slowed if curtailments reach the projected levels.

South Carolina

Projected firm curtailment in 1975-76 stated as a percent of requirements	17.3
Percent of total State requirements furnished by pipelines surveyed	32.1
Percent of curtailments attributable to pipelines surveyed	100.0
Percent of curtailments attributable to distributors contacted	74.7

In South Carolina we contacted four of the nine distributors for Transco and one industrial firm purchasing natural gas direct from Transco for its own use. We also contacted five end-use customers of the four distributors.

South Carolina receives about three-fourths of its gas supply from Southern Natural Gas Co. However, we did not include this company in our survey as it was projecting no curtailments to firm customers for 1975-76 and only about a 24-percent curtailment for its interruptible customers. As a result, our overall assessment is that South Carolina will not suffer a severe economic impact from the curtailment. Any impact is expected to be in the northwest part of the State. This area, served by Transco, has a concentration of textile companies as well as chemical industries and stone, clay, and glass industries. The northwest area accounts for about 40 percent of the total State employment.

The four distributors told us that interruptible customers will be curtailed 100 percent, although one distributor indicated it might have some gas for interruptible customers. All distributors reported that their interruptible customers had alternative fuels available. Two distributors expect some curtailment of firm customers, and one of the two projected curtailments for commercial users. Some layoffs and plant closures are predicted.

Three of the five industrial end users contacted told us that they had been notified of the projected 100-percent curtailments of their interruptible gas supply and that they had arranged for alternative fuel supplies. They do not anticipate any layoffs and/or reduced production. The other two companies, a glass company and a brick company, said they could use fuel oil for some purposes but that natural gas was required in the production process. The glass company employs about 600 workers, and layoffs will be proportionate to amount of gas curtailed. Last year about 325 employees were laid off. The brick company representative said that about 100 of its approximately 150 employees would be laid off on a short-term basis if a 100-percent curtailment occurred.

The Owens-Corning Fiberglass Corporation plant at Anderson buys direct from Transco and employs about 1,200 hourly employees. Last year it was curtailed about 35 percent during the winter and layoffs averaged about 40 percent. Its projected 100-percent curtailment for this winter could mean the plant will close and lay off its 1,364 employees until gas is available. Owens-Corning has no alternative fuel, and natural gas is used in every phase of its processing cycle. It has applied for approval to buy 600 Mcf of gas a day directly from gas producers.

Last year's natural gas curtailment did not have a major effect on South Carolina industries, primarily because economic activity was reduced. Industries were operating at

only 40 to 60 percent of capacity. With an improved economy this year, recovery could be slowed somewhat, particularly in the area served by Transco.

Views of trade associations

Historical information about last year's natural gas consumption shows that, within the eight States covered in our survey, industries which are included in the following standard industrial classifications were heavy users: food and kindred products; textile mill products; chemicals and allied products; stone, clay, glass, and concrete products; and primary metal industries.

To obtain assessments of the impact of natural gas curtailments on the industries within these classifications, we contacted national trade associations that represent these industries.

Food and kindred products

Within this classification we contacted 13 trade associations. Industries in this classification are engaged in producing the following products: meat and dairy products; canned and preserved fruits and vegetables; grain mill products; bakery products, sugar, and confectionary products; fats and oils; beverages; and miscellaneous food preparations and kindred products.

Representatives of these 13 trade associations told us that they had not made any independent industrywide assessments of the impact of natural gas curtailments on their member industries. A representative of the National Grain and Feed Association told us that the impact could be severe if member companies did not get natural gas for their primary need--drying corn. However, a representative of the National Corn Growers Association told us that this would not be a problem this year because the corn crops matured faster as a result of unusually hot weather and the drying process will be completed before November. Therefore, corn dryers will not have to compete for natural gas during the heating season.

With one exception, none of the individuals contacted at the associations identified specific member companies that had experienced business interruptions or expected problems with shutdowns and lay offs this winter because of the unavailability of natural gas. A member of a meat product association identified a meatpacking company in Ohio facing possible lay offs because of natural gas curtailments. This company has 1,100 employees, and the company president

indicated a potential plant closure during the coldest part of the winter if the gas supply is curtailed 100 percent. At least 5 percent of the company's energy needs must come from natural gas, and without this amount, the plant cannot continue operations. Representatives of two meat product associations told us that if member companies had to use alternative fuels, it would have a major impact on their production costs and the resultant cost to consumers.

Textile mill products

The industrial classification of textile mill products includes the following types of companies: fabric mills; knitting mills; floor covering mills; dyers and finishers of textiles, except wool fabrics and knit goods; yarn and thread mills; and manufacturers of many miscellaneous types of textile goods.

We contacted four major trade associations in this industrial classification. Overall, the associations had not done a great deal of work in assessing the impact of natural gas curtailments on their member industries. A representative of the American Apparel Manufacturers Association, Inc., told us that it was making a study of the natural gas shortage in the textile industry, but were unable to supply us with any information at that time.

The American Textile Manufacturers Institute, Inc., has surveyed members on the problems associated with natural gas curtailments. The Institute has not identified any specific layoffs or shutdowns associated with curtailments this winter. A representative of the association told us, however, that several member companies would be curtailed this winter, and the resulting use of more costly alternative fuels would have an adverse impact on cost of goods sold. In addition, the representative noted that the industry was recovering from the recent recession, and that the natural gas shortage would hamper the industry's ability to put people back to work and expand their operations.

Chemicals and allied products

The industry classification of chemicals and allied products includes the following types of products: industrial inorganic chemicals; plastics materials and synthetic resins, synthetic rubber and synthetic and other manmade fiber, except glass; drugs; soap, detergents and cleaning preparations, perfumes, cosmetics, and other toilet preparations; paints, varnishes, lacquers, enamels, and allied products; industrial organic chemicals; agricultural chemicals; and miscellaneous chemical products.

Of the seven trade associations we contacted in this industrial classification, only one, the Fertilizer Institute, indicated that it had been studying the natural gas curtailments on a continuing basis. The institute is predicting that over 530,000 tons of ammonia production will be lost during fiscal year 1976 because of natural gas curtailments. An official of the Department of Commerce told us that the Department is predicting 670,000 tons of lost ammonia production due to curtailments. Commerce's estimate, however, translates into only a 4-percent loss in total production and no specific shutdowns or layoffs can be identified in association with the production cutback.

Stone, clay, glass, and concrete products

Industries in the classification of stone, clay, glass, and concrete products include the following: flat glass; pressed or blown glass and glassware; glass products made of purchased glass; cement, hydraulic; structural clay products, pottery and related products; concrete, gypsum and plaster products; cut stone and stone products; and abrasives, asbestos, and miscellaneous nonmetallic mineral products.

We contacted 12 trade associations representing companies in this industrial classification. Only the Brick Institute of America was able to give us an industrywide assessment on the effects of natural gas curtailments this winter. The Institute is predicting plant closings, unemployment, loss of competitive position, loss of product output and in many areas, total loss of plants. In North Carolina the Institute is predicting at least a 50-percent reduction in product output with an associated 3,500 people unemployed. The Institute also pointed out that brick manufacturers are taking all possible steps to convert to alternative fuels and to use fuel conservation measures. Substitute fuel, particularly oil, will increase substantially costs which cannot be totally passed on to the consumers.

The Expanded Slate, Clay, and Slate Institute also indicated continuing problems due to curtailments, but supplied no hard evidence. In addition, a representative of the Glass Container Manufacturers Institute, Inc., told us that glass manufacturers are having problems obtaining natural gas since they are usually on interruptible-service contracts. He also indicated that glass industries in New Jersey might have problems getting alternative fuels that meet the State's air quality standards.

The associations we contacted that represent companies in the cut stone and stone products industry and the concrete, gypsum, and plaster products industry indicated they

were not large users of natural gas in proportion to other fuels and did not expect serious problems.

Primary metal industries

Primary metal industries include: blast furnaces, steelworks, and rolling and finishing mills; iron and steel foundries; primary smelting and refining of nonferrous metals; secondary smelting and refining of nonferrous metals; rolling, drawing, and extruding of nonferrous metals; nonferrous foundries (castings); and miscellaneous primary metal products.

We contacted 14 trade associations representing industries in this group. None of the associations could give any specific information about shutdowns or layoffs among their members this winter because of natural gas curtailments, although several identified members that were affected last year. Contacts at several associations representing the steel industry told us that members would be seriously affected by curtailments, but they had not surveyed members to identify specific problem companies nor attempted to assess the overall impact. In addition, a representative of the American Foundryman's Society characterized natural gas curtailments as a serious problem to member companies, but predicted no companies would be shut down or have layoffs because of it. He also said that additional cost incurred through the use of alternative fuels would be passed on to consumers.

FACTORS INFLUENCING THE IMPACT OF PROJECTED GAS CURTAILMENTS

We discussed with FPC and FEA officials two factors which must be considered when assessing the economic impact resulting from the projected natural gas curtailments. These two factors are (1) the availability of alternative fuels for consumers that can switch to alternative energy sources and (2) the effects of possible adverse winter weather conditions. The results of these discussions follow.

Availability of alternative fuels

During our discussions with natural gas distributors and end users, we found that most of the industrial companies on interruptible-service contracts, and even a number of companies with firm contracts, had the capability for burning some type of fuel other than natural gas. Some companies are limited to using propane or other gaseous fuels, but many companies can also burn fuel oil. A common concern expressed by industry representatives, in addition to the

increased cost, was the availability of these alternative fuels to meet their heating requirements.

FPC officials said they did not gather data in this area but relied on FEA to do this. FEA officials told us that they were preparing a report on the availability of these alternative fuels and that by October 31, 1975, they should know the aggregate need for alternative fuels and the projected shortfall, if any, in meeting consumer requirements. Their preliminary findings on fuel oil and propane are as follows.

It appears that sufficient supplies of fuel oil will generally be available nationwide, although some localized shortages are possible due to transportation and distribution problems.

Propane supplies at this time appear to be dependent on continuing FEA's allocation authority. FEA officials said that as long as they retain this allocation authority for domestic supplies of propane, they believe there will be sufficient propane to meet the needs of users who require a gaseous-type fuel to continue operations. However, if FEA's allocation authority expires and propane becomes a free market commodity available to anyone with no quantity restrictions, they are not certain what will happen to the propane supply.

Effects of adverse weather conditions

Requirements for natural gas supplies are based on projected customer usage under weather conditions normally anticipated during the winter heating season. When curtailments are required because of insufficient supply, deviations from the normal pattern can have serious consequences on projected curtailment levels. A current concern of FPC and FEA officials is the possibility that the 1975-76 heating season may experience colder than normal temperatures. This would result in increased demand for residential and commercial heating and further reductions in natural gas for lower priority industrial users. FPC officials cautioned, however, that the timing of the cold weather, as well as the lower temperatures, could influence gas curtailment levels and the resulting economic impact. Unseasonably cold weather occurring early in the winter would have a much greater impact than if it occurred late in the winter months. Pipeline companies and distributors would be more inclined to draw down on storage facilities late in the season to meet the increased demand than they might be at the beginning of the winter. Unseasonably cold weather early in the year, then, could result in a much higher level of unemployment and plant closures than was indicated from our survey results.

CHAPTER 3

MEASURES TAKEN TO EASE THE EFFECTS OF
NATURAL GAS CURTAILMENTS

Several actions have been taken by the Government which should help to ease the effects of the natural gas shortage caused by curtailments.

FPC PIPELINE HEARINGS

On June 11, 1975, FPC instituted public hearings on the 14 pipeline companies with projected curtailments in excess of 20 percent of firm-service contract requirements during the forthcoming winter. These pipeline companies account for 85 percent of projected deficiency for this winter as reported to the FPC by 48 interstate pipeline companies. The hearings, which were still continuing as of September 15, were to determine, among other things (1) the impact of curtailments on direct industrial customers of the pipeline, including the general alternative fuel situations of these customers, and (2) the impact on distribution companies, with particular reference to the amount of curtailment passed on to ultimate consumers and the general ability of industrial ultimate consumers to absorb such curtailments.

As a result of these hearings, FPC plans to determine the adequacy of existing curtailment plans to deal with the projected shortage this winter and, if necessary, to develop contingency plans within the framework of the pipeline curtailment program to allocate natural gas supplies to essential priority uses.

As a result of the hearings that have been held, as of September 15, FPC had identified alternative fuel deficiencies for industrial customers of five of the 14 natural gas pipeline companies which are significantly curtailing their customers. An FPC official told us that efforts were currently underway to develop coordination with FEA to assist these industrial customers in obtaining the necessary alternative fuels. The FPC official also told us that as a result of the hearings, FPC has found that most process and feedstock users should have adequate supplies of gas during the upcoming winter except in isolated instances which will probably have to be handled through FPC's emergency relief procedures. As of September 15, some of the pipelines were also currently formulating interim plans to attempt to solve potential problem situations.

LIMITED WAIVER OF FPC'S CONTROL
OVER INTERSTATE GAS

On August 28, 1975, FPC issued Order 533, which, in effect, waived part of its control over certain industries whose gas supplies were curtailed by pipeline companies by allowing them to go directly to field producers to negotiate gas purchases. The decision would allow the following natural gas consumer to bypass distributors and interstate pipeline companies that normally supply their gas: large commercial customers (those using 50 Mcf or more on a peak day) and firm-industrial-requirements customers classified as priority 2 or priority 3 (if the proposed uses would have been in priority 2 and if the gas had been purchased on a firm basis). Neither of these consumers can have a technically feasible alternative fuel capability.

FPC pointed out in the decision that implementing this policy would not avert the shortfall of deliverable natural gas supplies, but would serve only to mitigate, to a limited extent, imminent and deepening curtailments of natural gas service. FPC has projected that this action could release 450,604,000 Mcf of gas to the interstate market for four major pipelines (Texas Eastern Transmission Company, Panhandle Eastern Pipeline Company, Columbia Gas Transmission Corporation, and Transcontinental Gas Pipeline Corporation) if all priority 2 and priority 3 end users affected take advantage of the order.

To provide legislative support for this administrative action and preclude possible court action protesting the order, H.R. 9409 was introduced in the 94th Congress on September 5, 1975. As of September 15, 1975, no action had been taken on the bill. Other bills, similar in nature to H.R. 9409, have been introduced for legislative action, but none of these have been enacted.

Although FPC officials did not rule out the possibility of a court case, they felt that FPC acted within its jurisdiction under the Natural Gas Act and that a court challenge would be unsuccessful.

It is unlikely, however, that all eligible companies will attempt to negotiate contracts because (1) many eligible consumers are small-volume users and probably would have difficulty in arranging purchases from producers for these limited quantities, (2) some eligible consumers may have already converted to alternative fuels, (3) the availability of intrastate supply to the interstate market will become more limited as industrial economic recovery accelerates, (4) time constraints between the adoption of FPC's policy and the

coming winter will further limit application, and (5) court proceedings could possibly invalidate the order.

In addition, FPC officials said that intrastate pipelines are impeding implementation of Order 533, because they are reluctant to sell gas that involves interstate transmission facilities. They are afraid they may eventually become subject to FPC jurisdiction by selling gas or transmission services to out-of-State customers.

As of September 15, FPC records show that eight end users had negotiated contracts with field producers for the purchase of natural gas under the new policy. These contracts ranged from a daily volume of 600 Mcf to 40,000 Mcf. Natural gas prices under these contracts ranged from \$0.80 to \$1.90 a thousand cubic feet.

PROVISIONS FOR EMERGENCY RELIEF

As an adjunct to its priorities-of-service system for curtailments, FPC also issued Order 467-A on January 15, 1973, which has the effect of granting to interstate pipeline companies the authority to respond by unilateral action to emergency situations, including environmental emergencies, during periods of curtailment in which supplemental deliveries are required to forestall irreparable injury to life or property.

In addition, in several instances FPC has granted extraordinary relief from curtailment upon proof of irreparable injury to the applicant pending formal hearing on the merits of the request. In the past, when extraordinary relief has been granted, the applicant was given higher priority so that he might obtain needed gas. However, other companies in the same or lower priority suffered increased curtailment as a result, because only a finite amount of gas is available to meet the needs of pipeline customers.

The FPC actions are applicable only to natural gas deliveries to customers by natural gas companies subject to FPC jurisdiction. FPC has not sought to impose its curtailment policies upon consumers when the supplier is an intrastate pipeline company or a local distribution company. Curtailment of natural gas deliveries in those circumstances is subject to the authority of respective State public utility commissions.

ESTABLISHMENT OF NATURAL GAS DATA SYSTEM

The Energy Resources Council established the Natural Gas Policy Contingency Task Force under the leadership of

FEA, which will focus on the winter season of 1975-76 and which will provide a preliminary forecast of the natural gas and associated economic impacts based on a sample survey of major producers, distributors, and users.

The preliminary forecast concluded that:

- The shortage would increase by about 0.3 Tcf, and this increment was probably the most accurate measure of economic impact.
- The shortage was likely to be focused in about 10 to 15 States including those on the mid-Atlantic coast (from New York to North Carolina), and others, such as Ohio, West Virginia, Pennsylvania, and Kentucky.
- The potential economic impact was concentrated in these States because the pipelines in those States were least able to meet the demand and because industrial use in some of those States was highly concentrated. Local communities within those States were likely to feel an even greater impact when a factory, which is a major employer, might be forced to shut down or reduce output.

Despite the last conclusion, however, FEA officials were unable to identify any specific factories or employers which would be laying off employees or reducing output this winter. By the end of September 1975, the FEA task force also expects to have a report which will include a forecast of the shortage and economic impact at regional State levels and a finalized operational contingency plan for dealing with the shortage.

CHAPTER 4ENVIRONMENTAL IMPACT OF NATURAL GAS CURTAILMENT

Natural gas is the cleanest and most efficient primary fuel from the point of production to the point of consumption. It has been preferred over other fossil fuels for a number of reasons including its clean-burning qualities and the absence of waste disposal problems. These factors have resulted in many air quality advantages not associated with other fuels.

Curtailments of natural gas this winter could result in a broad range of environmental consequences. End users forced to convert to other, dirtier fossil fuels (i.e., coal and fuel oil) are potential contributors to pollution that will lessen air quality. Due to the time constraints of this study and the lack of data available pertaining to this area, it is difficult for us to assess the degree of the adverse environmental effects caused by natural gas curtailment. The Environmental Protection Agency and FPC have done little to assess this problem on a short-range basis. This problem can be discussed in general terms with emphasis placed on steps being taken to alleviate it during the 1975-76 winter.

IMPACT OF ALTERNATIVE FUELS

Most of the companies we contacted indicated that propane, synthetic natural gas, fuel oil, or coal could be used as an alternative fuel. Propane and synthetic natural gas are similar in quality to natural gas and would not present a pollution problem, but their relatively high cost may limit their use.

Conversion from natural gas to coal is possible only in a limited number of industries. In converting from gas to coal, complete new plant equipment would be required, as well as storage facilities for coal that might exceed the physical space available in many plants. An FPC official said that large increases in coal extraction could not be accomplished in less than 4 years. He also said that most large plants and electric utilities located in urban areas could not use coal because of the problems of storage, pollution, and waste disposal. Additionally, he said that due to a shortage of coal equipment manufacturers, there was a scarcity of the necessary equipment that large firms use to convert coal to energy. This has resulted in a 5-year delay before most plants can convert to coal. Consequently, most plants that have started converting to coal over the last 2

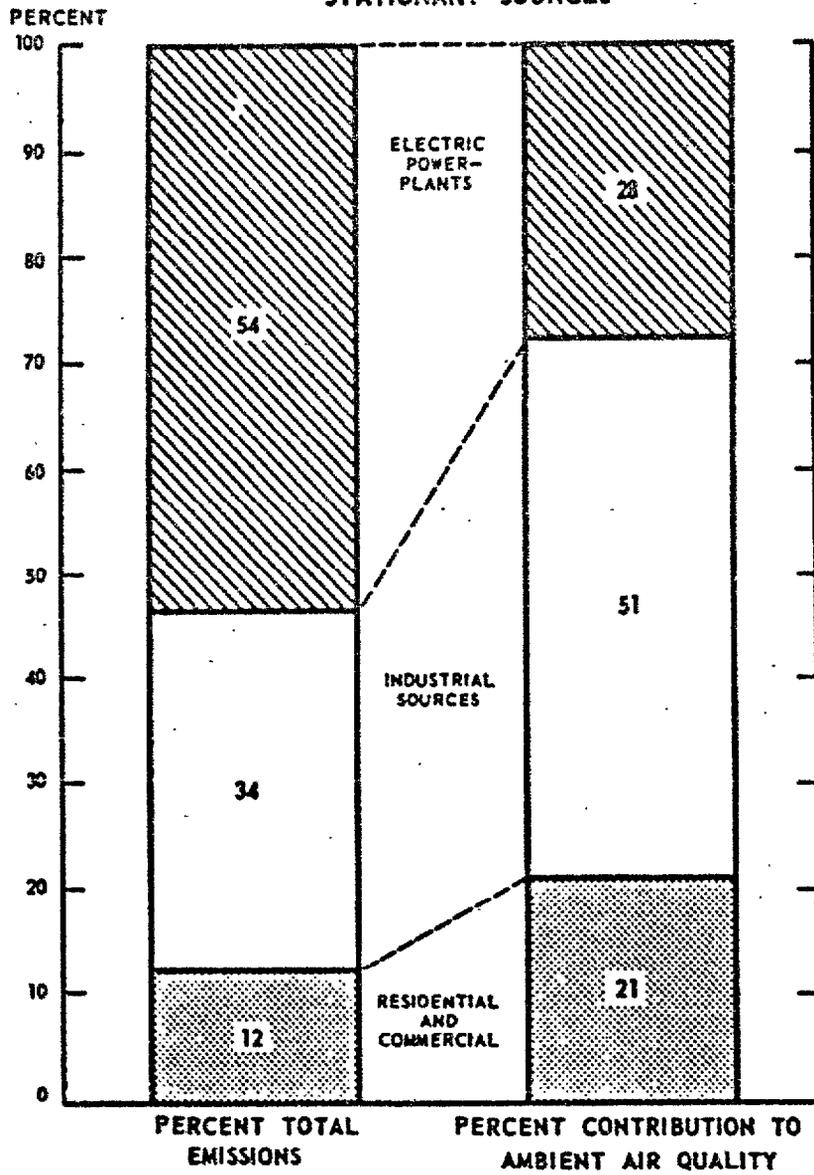
or 3 years will probably not be able to use coal as an alternative fuel for the winter of 1975-76.

Oil, therefore, not only becomes the most viable alternative fuel available to most industries for the current heating season, but also has the most potential for increasing air pollution. However, the exact amount of pollutants that would be added to the environment because of the increased use of oil is unknown. Variable factors, such as the use of pollution control devices, the type of oil used, the type of industrial use, and the user location, would all impact on any such computation. Historical data does indicate that not all curtailed volumes of natural gas will be replaced with other fuels, and for part of the quantity that is replaced, other nonpolluting gaseous fuels will be used in place of oil products. On the basis of projected usage levels and a range of oil quality, we have estimated that for every 1 billion cubic feet of natural gas replaced with oil, 15 to 128 tons of sulphur oxide and 0.2 to 5.3 tons of particulates could be emitted by users.

IMPACT OF EMISSIONS ON AMBIENT AIR QUALITY

Although it is not possible to pinpoint the actual quantity of estimated pollutant emission, the Environmental Protection Agency has attempted to demonstrate the effects of emissions. The agency has developed diffusion-model computer programs and has calculated the effects of emissions on a typical eastern urban air quality control region. The chart on page 41 shows the result of the analysis.

RELATIONSHIP BETWEEN SULFUR OXIDE
SOURCE CONTRIBUTION AND IMPACT ON
AMBIENT AIR QUALITY FOR
STATIONARY SOURCES



Source: Federal Power Commission, NATIONAL GAS SURVEY, 1975

Although electric powerplants, which typically are large emission sources with tall stacks, contribute 54 percent of all sulfur-oxide emissions, they contribute only 28-percent to the ground-level ambient sulfur-oxide concentrations. Industrial sources, which are greater in number and typically have smaller emission sources with shorter stacks, contribute only 34-percent of all sulfur-oxide emissions but contribute 51-percent to the ground-level ambient sulfur-oxide concentrations. Commercial and residential sources, which are greatest in number and typically consist of many small sources with short stacks near ground level, contribute 12-percent of the emissions and 21-percent to the ground-level ambient concentration.

The FPC end-use natural gas priorities, although developed primarily from a human needs viewpoint, also promote maximum air quality. Smaller industries and commercial and residential facilities which are proportionately larger contributors to ambient ground-level concentrations of air pollution, are given a higher priority for natural gas than industries where oil can be burned in large combustion units with tall stacks, such as steam electric generation plants and large industrial boilers.

MEASURES TO ALLEVIATE ADVERSE ENVIRONMENTAL IMPACTS

FEA has already taken a major step that will lessen the environmental impact of natural gas curtailments. On September 4, 1975, FEA published regulations in the Federal Register for the relaxation of restrictions on non-Canadian imports of propane and butane. The easing of restrictions will allow industrial consumers to import enough propane and butane to meet their current needs. Both propane and butane are similar to natural gas and present minimal pollution problems.

FPC has set forth procedures for emergency and extraordinary relief from curtailment plans. Under emergency procedures, pipeline companies may grant relief to prevent irreparable injury to life or property or to alleviate an environmental emergency.

On the other hand it is possible that Federal and State pollution regulations may be relaxed this winter, as they have been relaxed in past winters. This allows end users to burn coal and high-sulfur oils which will add to the pollution problems.

STUDIES ON ENVIRONMENTAL IMPACT ARE LACKING

Neither the Environmental Protection Agency nor FPC has studied the effects of natural gas curtailments on the environment for the upcoming winter, although FPC touched upon the subject in its environmental impact statements on the individual pipelines. Officials of both agencies felt that too many variables were involved (i.e., weather, sulfur content of alternative fuels, curtailment plans utilized, and pollution control facilities of the plants) to make accurate projections of environmental impact.

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NINETY-FOURTH CONGRESS
 Congress of the United States

House of Representatives
 COMMITTEE ON GOVERNMENT OPERATIONS
 2157 Rayburn House Office Building
 Washington, D.C. 20515

July 26, 1975

The Honorable Elmer B. Staats
 Comptroller General of the United States
 Washington, D. C. 20548

Dear Elmer:

The Conservation, Energy and Natural Resources Subcommittee has been investigating the severe natural gas shortage which the nation is almost certain to experience this winter. On June 12, the subcommittee held a hearing at which witnesses from the Federal Power Commission and the Federal Energy Administration testified as to the predicted extent of natural gas curtailments for industrial users this winter and the Federal government's proposed strategy for dealing with this problem.

We are requesting you to undertake a two-part study for the subcommittee. First, we would like you to give us your best judgment of the social, economic, environmental and other consequences that would result this winter from natural gas curtailments of the magnitude being forecast by the Federal Power Commission. If possible, tell us specifically what industries will be most severely impacted and what alternatives are available to them. This information would be extremely helpful to us during the course of our current investigation. It would be particularly valuable if you could supply this information for us as soon as possible, even if this means that you would have to appropriately limit the scope of your study.

Secondly, both the FPC and the FEA testified before the subcommittee that the long-term answer to this country's natural gas shortages is to deregulate the price of gas in the interstate market. We request that, as a second phase of a report to our subcommittee, you assess the social, economic, natural resource and environmental impacts that would result if a decision were made to deregulate the price of interstate natural gas. Among the questions we would ask you to address is how much additional natural gas would be produced in the two years following a decision to deregulate that would be attributable to the resulting price increases

APPENDIX I

APPENDIX I

2 - The Honorable Elmer B. Staats

July 26, 1975

for interstate natural gas. We recognize that such a study would take a significantly longer period of time to accomplish than phase 1.

Our staff will be happy to assist you in structuring this study.

With best wishes, I am

Jack Brooks
Sincerely,
Jack Brooks

Jack Brooks
Chairman

cc: The Honorable William S. Moorhead
Chairman, Conservation, Energy, and
Natural Resources Subcommittee
Committee on Government Operations

The Honorable Gilbert Gude
Ranking Minority Member
Conservation, Energy, and
Natural Resources Subcommittee

E R R A T A

To the recipients of the Comptroller General's report
to the Congress--The Economic and Environmental Impact of
Natural Gas Curtailments During the Winter of 1975-76.
(B-181503) October 31, 1975:

Page number 44 should show the Minority Members of the
House Committee on Government Operations as listed below:

Frank Horton, N.Y.
John N. Erlenborn, Ill.
John W. Wydler, N.Y.
Clarence J. Brown, Ohio
Gilbert Gude, Mo.
Paul N. McCloskey, Jr., Calif.
Sam Steiger, Ariz.
Garry Brown, Mich.
Charles Thone, Nebr.
Alan Steelman, Tex.
Joel Pritchard, Wash.
Edwin B. Forsythe, N.J.
Robert W. Kasten, Jr., Wis.
Willis D. Gradison, Jr., Ohio

Majority----225-5051
Minority----225-5074