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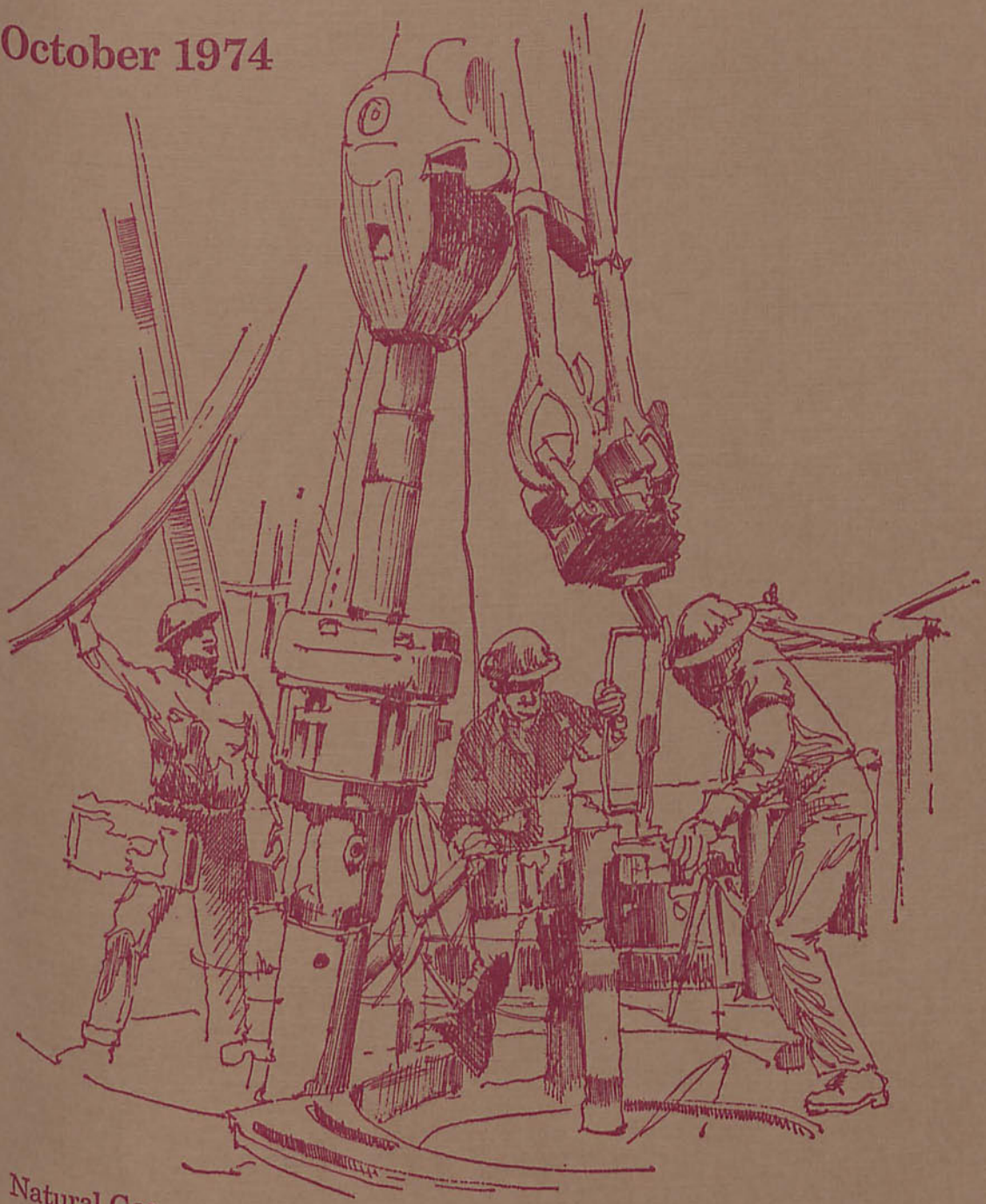

Natural Gas–
Pipeline Industry Responds to Challenge of Declining Reserves

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Pipeline Industry Responds To Challenge of Declining Reserves

The growing shortage of natural gas will require far-reaching adjustments on the part of consumers and industry alike. Not only will it lead to further changes in prices and demand, but it will also call for the development of new sources of supply, forcing difficult adjustments on the gas transmission industry. Bridging the production and consumption of natural gas, this industry is tied to existing facilities for production and marketing–and both are bound to change in the years to come.

With proved reserves dwindling, pipeline companies are already experiencing declining utilization of existing pipelines. As a result, they are working with gas producers, trying to encourage discovery of the additional reserves needed for them to supply established markets. And they are also looking at the possibilities for boosting supplies by tapping vast undeveloped reserves in Alaska, bringing gas from overseas, and building synthetic gas plants. All this marks a basic change in the transmission industry itself.

Without pipelines to connect fields with mass markets, gas was considered a hindrance to oil production and was flared in the field.

As new sources of gas are found, the nation's network of pipelines will have to be extended. The cost in additional lines and facilities–and possibly even new technology still to be developed–will run into billions of dollars. And by participating in the development of supplies to fill their lines, pipeline companies are facing the prospects of making additional enormous investments at risks they have not had before.

The present network of pipelines was developed under conditions of an excess supply of natural gas. While the pipelines were expensive to lay, the pipeline companies themselves were not usually involved in developing sources of supply. By taking on the risks of trying to develop sources of gas, they are taking on a new role. The change in their role–and level of risk–is a direct result of the emerging scarcity of natural gas.

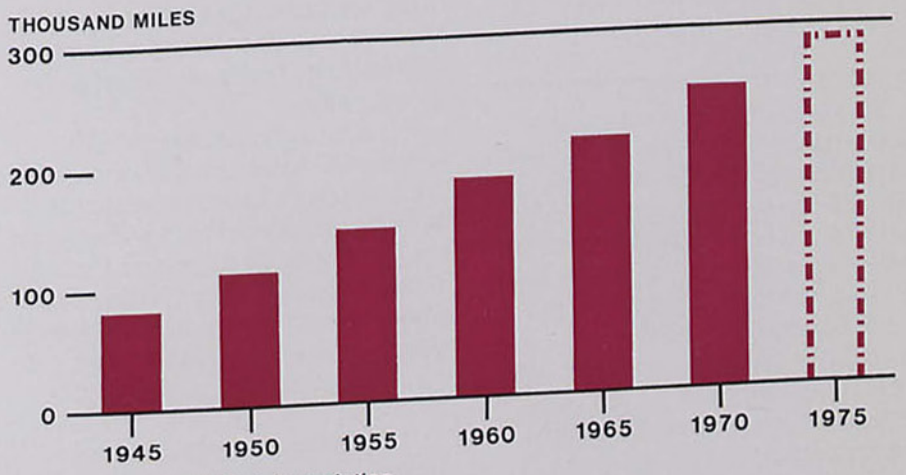
Long-distance lines

The nation's pipelines developed into a major industry in response to an abundance of natural gas in fields far from urban areas. Discovery of giant oil and gas fields throughout the decade leading up to World War II produced an enormous backlog of gas that was certain to be available for many years to come. As a result of the search for oil, gas reserves that had been about 20 times the demands on them in the 1920's ballooned to about 40 times actual usage by the outbreak of World War II.

With these vast reserves overhanging the market, gas prices plummeted. Gas became almost worthless as reserves continued to expand and markets still went underdeveloped. Without pipelines to connect fields (mostly in the Southwest) with mass markets (mostly in the North and East), gas, in fact, was considered a hindrance to oil production and was flared in the field.

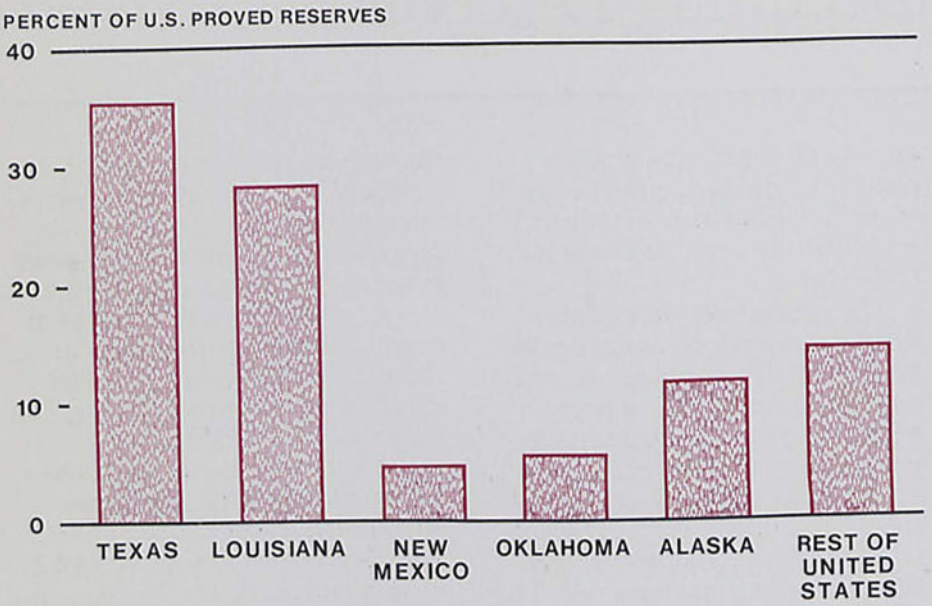
Long-term contracts made during these years of abundant gas still make the average sale of Texas

Nation's gas transmission lines increase nearly threefold since World War II



SOURCE: American Gas Association

Three-fourths of nation's proved gas reserves located in states of the Eleventh District



SOURCE: American Gas Association

gas look inexpensive. Last year, Texas gas sold at an average of about 20 cents per 1,000 cubic feet. At the same time, some sales of new gas exceeded $1 per thousand.

Not until the development of large pipe and high-volume pumping stations could enough gas be moved to serve mass markets.

The potential market for gas predated development of this once vast reserve base. Even before the turn of the century, gas manufactured from coal was sold in urban areas, creating the "Gaslight Era." First developed in England, processes for making gas from coal were later improved with the discovery of water gas, which contained hydrogen that burned to water vapor.

Despite these advances, however, manufactured gas was of a low quality–low, certainly, compared with natural gas. And the cost of manufacturing gas rose throughout the early part of the century, making coal and oil more attractive fuels.

The way to link an overabundance of cheap gas in the Southwest with a need for more competitively priced gas in large urban areas was, of course, to pump it through pipelines. But first, significant new technology had to be developed.

Pipelines seldom exceeded 150 miles until after the midtwenties. And although lines were later laid to carry gas from the Southwest to such cities as Chicago and Detroit, it was not until after the development of large pipe and high-volume pumping stations that enough gas could be moved to serve mass markets.

The first major pipelines were built to reduce tanker traffic in World War II. The Big Inch (a 24-inch pipe) was run 1,250 miles to carry oil from East Texas northeastward through the nation's industrial heartland. The Little Inch (a 20-inch line) moved oil 1,475 miles in a slightly more easterly direction, terminating in the New York area.

After the war, sale of these first long-distance lines to transmission companies that converted them to interstate carriers of natural gas opened the whole Eastern Seaboard to large supplies of natural gas, laying the basis for the formation of a separate pipeline industry. Eventually, gas lines were extended to link fields throughout Texas, Oklahoma, and Louisiana with all major metropolitan areas.

The net of long-distance transmission lines was extended from about 80,000 miles at the end of World War II to about 260,000 miles in 1972, boosting residential consumption of natural gas nearly eightfold. Today, pipelines fan out from these southwestern states to reach urban areas throughout the country.

High-capacity lines

More than long-distance lines were needed, however, to open up vast new markets for what had once been a low-value byproduct of oil production. To hold down the cost of moving gas thousands of miles, the flow of gas had to be increased–a need calling for large high-pressure lines. By increasing the size of lines and spreading the high fixed cost over larger volumes of gas, pipeline companies could keep the unit cost of delivered gas fairly low.

Early pipelines were very small by standards of today. Usually no larger than 8 inches in diameter, they could carry gas only under low pressures. Today, gas turbine compressors operating at 30,000 horsepower (compared with less than 5,000 only a few years ago) push gas through welded-joint and seamless pipes of up to 30 inches in diameter (some are even 40

inches or more) and at pressures of more than 1,000 pounds per square inch.

By increasing the size of lines and spreading the high fixed cost over large volumes of gas, pipeline companies could keep the unit cost of delivered gas fairly low.

But even in these large-capacity operations, fixed costs remain a major item in the marketing of natural gas. With a big pipeline operating at 85 percent or more of capacity, it costs from 1.5 to 2 cents to move 1,000 cubic feet of gas 100 miles. And four-fifths of this cost must be assigned to recover the fixed cost of the pipeline itself. Fixed costs per unit of gas moved can roughly double when use of a line drops to about 50 percent.

With seasonal fluctuations in demand for natural gas, keeping utilization of pipelines high year round has been a problem for transmission companies. To keep use of their lines close to capacity, they have sold some gas to industrial users at lower prices but with the understanding that deliveries could be interrupted during periods of peak demand when more of the gas had to go to other users.

Further facilitation of the flow of natural gas to rapidly expanding but fluctuating markets came with the development of underground storage close to points of consumption. Use of these storage facilities–usually depleted oil and gas fields or abandoned coal mines–allows near-capacity deliveries to continue even during off-peak seasons. Pumped back underground, the gas can later be reclaimed for use when demand rises again. Altogether, there is underground storage for more than 6 trillion cubic feet of natural gas in the United States.

Recent years have seen still further development of gas-storage technology with the introduction of cryogenic plants operated in connection with pipelines. Supercooled to a liquid at these plants, gas is shrunk to a tiny fraction of its gaseous volume. There is storage for about 36 billion cubic feet of liquefied natural gas.

With seasonal fluctuations in demand for gas, keeping utilization of pipelines high year round has been a problem.

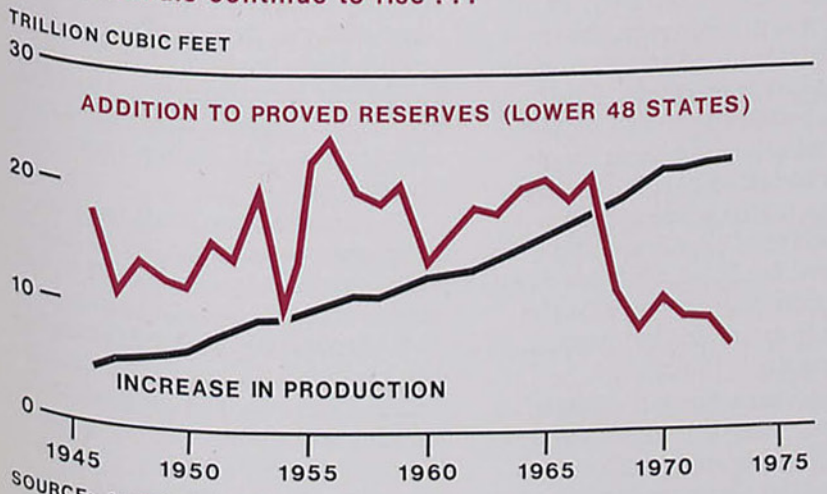
Having adjusted the flow in their lines to the seasonal demand for fuel, pipeline companies completed their adaptation to the special conditions of their industry. They had successfully linked widely separated sources of supply and commercial outlets halfway across the continent. And by making the most of long-lived facilities and a highly dependable demand for gas, they were able to hold down costs to consumers–at least as long as reserves lasted.

Declining reserves

The nation's gas reserves are now being drawn down far faster than new discoveries add to them. From a peak of 289 trillion cubic feet in 1967, proved reserves (excluding those in Alaska) dropped to 218 trillion in 1973–falling for the first time below the ten-year life expectancy considered necessary for deliveries to continue nationwide without some interruption of service.

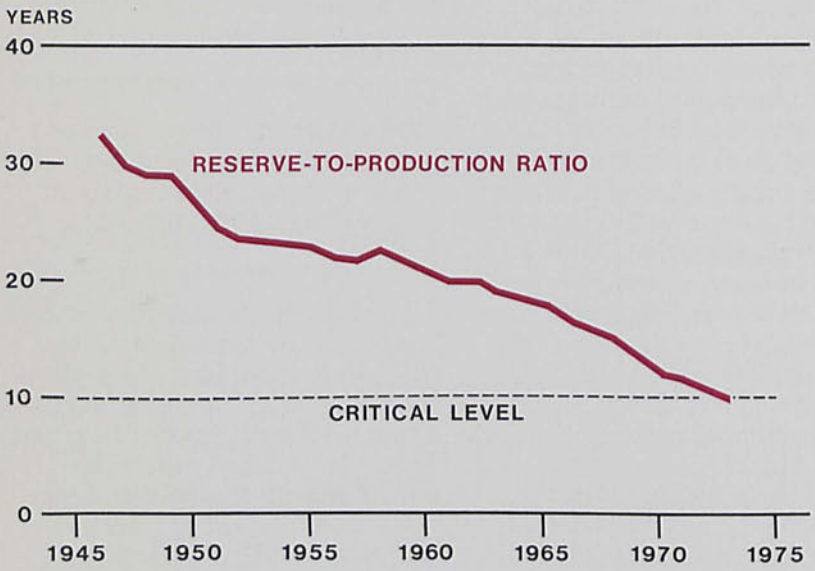
The concept of effective life of reserves is more meaningful than any measure of the reserves themselves–especially with reserves continuing to decline in the face of the rapidly growing demands on them. Where reserves at the end of World War II were adequate to meet the demand for over 30 years, reserves in the lower 48 states in 1973 were adequate for only 9.7 years of production. For the past several years, in fact, reserves have not been large enough to prevent scattered disruption of service.

Growth in natural gas reserves slows as withdrawals continue to rise . . .



SOURCE: American Gas Association

. . . forcing effective life of reserves below the required ten-year minimum



SOURCE: American Gas Association

When the nation's total reserves were large, the declining reserve life was generally believed to be merely an adjustment to conditions of excess reserves. But it is now well understood that a backlog of reserves equal to about ten years of production is necessary to avoid interruptions. There are both technical and economic reasons for keeping a backlog of that size.

Where reserves at the end of World War II were adequate to meet the demand for over 30 years, reserves in 1973 were adequate for only 9.7 years of production. And a backlog of reserves equal to about ten years of production is necessary to avoid interruptions in deliveries.

On the technical side, there is the problem of pacing production so that the full potential of a field can be developed without damaging the reservoir. About a fifth of the nation's proved gas reserves are associated with oil reserves. And as gas provides the driving force that pushes the oil into the well, much of the gas has to be kept in the ground as a conservation measure. Without the gas, pressure in the oil-bearing formations would be lost, causing a loss of much of the oil. But even wells that produce no oil would become clogged with sand if the gas were withdrawn too fast.

On the economic side, there are the problems of balancing production against investment. The high cost of developing a field requires that production continue long enough to earn a return. To withdraw gas faster, more must be spent on wells, pipelines, and other long-lived facilities. But the faster production may not provide the returns to cover the increase in investment.

This seems especially true of pipelines. They are expensive to lay, impossible to move, and so durable that their service life is almost indefinite. For these facilities to earn a return, there must be reserves to keep them in operation for many years.

With the declining availability of gas, interstate pipelines have been having to curtail deliveries since 1970, cutting back service to all categories of customers. Not only do industrial users now find supplies scarce, but in some areas, gas is no longer available for gas utilities to extend new service to large numbers of residential and commercial users.

Nationwide, sales increased only half a percentage point last year, compared with an average annual increase of 5 percent in the 1960's. And preliminary estimates show electric utilities may have used over 9 percent less gas last year than in 1972, even though they generated close to 6 percent more electricity.

To meet emergency shortages last year, the Federal Power Commission set priorities for the interstate delivery of natural gas. Residential users and small commercial customers were given top priorities. The lowest priority was assigned to large industrial users having capabilities for burning other fuels.

The impact of the gas shortage, moreover, has fallen unevenly on pipeline companies, depending on the size of the reserves they have backing their deliveries. One company with reserves having a delivery life that dropped from 11 years in 1966 to only three years in 1972 was told to freeze deliveries at current levels and take on no new customers.

As reserves have continued to drop–reserves committed to interstate pipelines fell, in fact, 8.5 percent from 1972 to 1973 alone–prospects for ending such curtailments appear bleak. In recent testimony before Congress, the chairman of the Federal Power Commission predicted major shortages of gas throughout the northern and eastern parts of the country in the next five years. As measures to help al-

leviate threatened shortages, he recommended the deregulation of wellhead prices and increased sale of offshore leases.

Such changes would increase the incentives and opportunities for finding new gas. But with the rapid decline in reserves overall, they probably would not greatly improve the outlook for supplies in the near future. A study by the Federal Power Commission shows the outlook bleak through 1990. Without a marked improvement in sources of gas, according to the study, annual production could drop to about 11 trillion cubic feet by then, compared with 22 trillion in 1970. But even with improvements, production is still not likely to exceed 22 trillion.

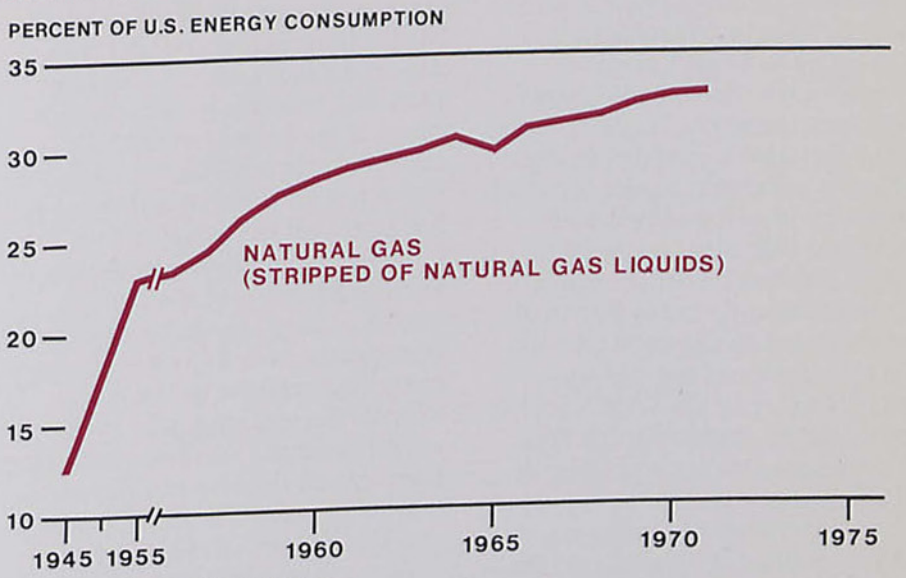
While the field price of gas going into interstate pipelines has not been deregulated, prices of new gas have been allowed to rise significantly. And the Government has sharply increased its offerings of offshore leases. In addition, a closer look has been taken at some of the environmental objections to pipelines and other proposals for fueling industry.

All these changes indicate a determination to expand the availability of gas and other forms of fuel. Altogether, nearly 32 trillion cubic feet of new gas might be available in 1990, and with extremely liberal incentives, a supply of 49 trillion is conceivable though not probable. A more reasonable projection is probably the FPC's fairly well assured forecast of an availability of about 25 trillion cubic feet.

The industry's response . . .

The pipeline industry's response to the decline in reserves and drop in the utilization of its lines has been, surprisingly, to continue expansion of the lines, even though prospects of improving the availability of gas appear dim. But in fact, if use of gas is to increase at all, pipeline companies will have to undertake very large construction projects–and they are.

Proportion of energy consumption accounted for by natural gas tapers off



SOURCE: U.S. Bureau of Mines

These companies are investing to encourage exploration of new reserves, pursuing economic and technological possibilities for importing natural gas, extending their lines to fields previously considered inaccessible, and looking ahead to the eventual production of synthetic gas. Taken as a whole, these changes will not only cost billions, adding thousands of miles to the nation's pipeline system, but will even change the pattern of the system itself.

. . . in the North . . .

Pipelines from the Far North provide a case in point. Although discussion of the Alaskan pipeline so far has centered on the movement of oil, there is believed to be as much as 26 trillion cubic feet of natural gas under the North Slope and possibly as much as 300 trillion. In addition, there are large reserves in Canada's Mackenzie River Delta that could exceed 100 trillion. And reserves in the Arctic islands could exceed 240 trillion.

If large amounts of gas are found in the Far North, they will far exceed the proved reserves in the continental United States, easily justifying construction of the facilities needed to connect them with markets in Canada and the lower United States.

If such large amounts of gas are actually found, they will far exceed the proved reserves in the continental United States, easily justifying construction of the facilities needed to connect them with urban markets in Canada and the lower United States. But the full extent of these reserves cannot be known until they have been developed further. And further development waits on pipelines with access to markets.

In Alaska, there are only enough proved reserves now to support

one pipeline. The gas could be moved to market either through a pipeline to the coast, with facilities there to liquefy it for shipment by tanker to the West Coast, or through a pipeline across Canada to the northeastern United States. Either approach would spur exploration to enlarge the reserves. And discovery of new reserves could make another pipeline possible.

Gas produced near the coast of Alaska is already being liquefied for shipment to Japan. And with the rising price of gas, shipment of gas by tanker to the West Coast is becoming economically feasible.

A gas pipeline from the North Slope could be laid parallel to the oil line, bringing gas to the coast, where additional liquefaction facilities would have to be built. According to some studies, gas shipped that way would cost no more than gas piped through Canada.

A gas line across Canada would be built–initially, at least–as an alternative to a line across Alaska to the sea. Running 4,200 miles, such a line would probably cost about $7.5 billion. The main line would reenter the United States in Montana. Reaching eastward from there 1,600 miles to Pennsylvania, it would make gas from the Arctic available in 26 midwestern and eastern states. A spur could cross the border in Idaho, making northern gas available west of the Rockies.

Whether running to the coast or across Canada, an Alaskan gas line will pose problems different from those of an oil line. To speed the flow in such a cold climate, oil in the line will be kept warm. And to avoid damage to the tundra, the oil line will have to be laid above ground. But to increase the flow in the gas line, the gas would be refrigerated and, therefore, the line buried.

Agreements, of course, would have to be worked out first with Canada, detailing the amount of gas to go to Canadian markets, the extent of Canadian responsibility for management of the line, and the preference to be given Canadian companies during construction. But this line would offer the advantage of also providing the means of tapping Mackenzie River Delta reserves and bringing gas to hard-pressed eastern markets.

In addition to these lines connecting Alaska and the United States, a third major gas pipeline is under study to tap possibly even more vast reserves in the Arctic islands. Several proposed routes would bring gas down one side or the other of the Hudson Bay to markets in southeastern Canada and the eastern United States.

Any of these lines would blaze new trails in terms of economics and technology. They would stretch further than lines have ever stretched before, cross country that has been considered almost inaccessible, and have to be built under extremely cold climatic conditions. All this would be technically feasible, but it would be economically possible only with still higher gas prices.

. . . offshore . . .

Natural gas found offshore presents problems similar in magnitude to those of tapping reserves in the Far North. To make offshore gas accessible to hard-pressed markets ashore, it, too, must be brought into the nation's network of distribution lines. And like northern gas, it can be brought to distribution points only at great expense.

Extension of gas lines to connect offshore wells has involved major technological achievements. And as exploration is extended into deeper water further from shore, the technology must be continually refined–at ever greater expense.

The most impressive offshore pipe project so far in the United States is a 36-inch system being built off Louisiana. The project will link wells drilled in water depths of 365 feet. That will be a record for offshore pipe in the Gulf. And the wells are 125 miles from shore, which will make another Gulf Coast record.

Construction will require the use of barges the size of football fields and costing $10 million each. Where the water is too deep for divers, miniature submarines will be needed to inspect the line as it is laid.

When completed in about three years, the system will bring ashore up to 1 billion cubic feet of gas a day. But it will have cost some $155 million to build.

Even more ambitious pipe systems are being developed to gather gas in the North Sea. There, fields are considerably further from shore than the new wells being drilled in the Gulf of Mexico, and the wells are in deeper water.

By participating in exploration, pipeline companies are departing from their old role as merely the link between points of production and points of consumption.

Although such projects allow the search for gas to extend further out into the oceans, they are much more expensive than pipelines laid ashore and take much longer to complete. It often takes three or four years to develop a field offshore, compared with half that time ashore. Constant efforts are being made to speed completion of such projects and expand the nation's reserve base.

Part of these efforts offshore have involved actual participation in the search for new reserves. Until shortages became evident a few years ago, pipeline companies were concerned only with moving gas to market. Now, to find enough

gas to fill their lines, they are actively promoting exploration.

Most of this effort has gone into offering exploration companies advance payments in return for agreements to commit new discoveries to their lines. Some transmission companies, however, have been associating themselves directly with exploration companies.

Pipeline companies have been particularly active in spurring exploration in gas-rich areas off the Gulf Coast. And with the Government increasing its offerings of offshore leases, there has been a boom in drilling in the Gulf.

Government lease sales have coaxed bids of billions from the producing industry and its partners in the pipeline industry. It is this availability of leases, together with the higher prices being paid for interstate gas, that has brought on the upturn in offshore drilling and, in turn, a marked increase in the proportion of interstate gas originating along the Gulf Coast.

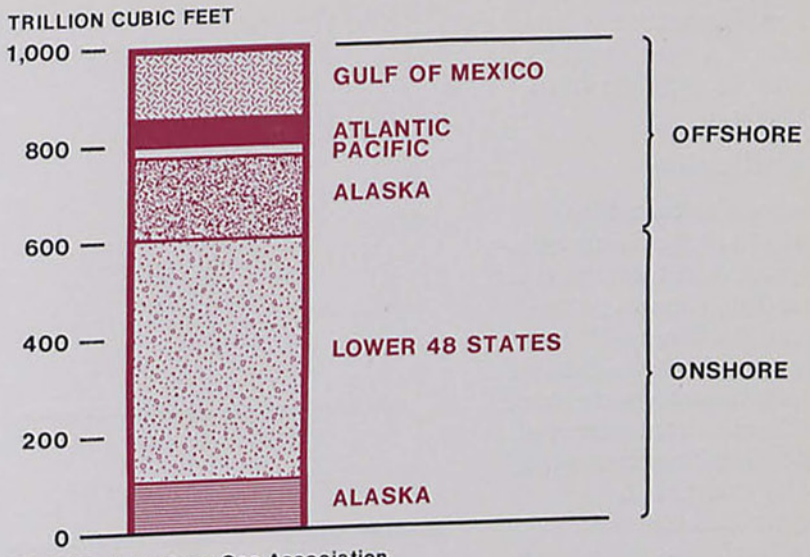
Prices of gas sold intrastate are still significantly higher than the prices interstate companies can pay. But many of the new producing areas offshore are outside the jurisdiction of any one state. The gas, therefore, has to be sold in interstate lines.

By participating in exploration, pipeline companies are, of course, departing from their old role as merely the link between points of production and points of consumption. They are now taking on some of the heady risks of exploration.

The only way to know if there is oil or gas in an area is to sink a well. And in some areas, that can cost in the neighborhood of $1 million and involve a greater risk than a bank or most other outside investors would tolerate.

Continued emphasis on offshore drilling is, nevertheless, central to the development of adequate gas reserves. Overall, production from offshore wells from 1971 to 1990

Nation will probably find over a third of its new gas reserves offshore



SOURCE: American Gas Association

has been estimated by the FPC as running from 80 trillion to 150 trillion cubic feet, depending on the incentives for exploration. In the most probable range, estimated at between 99 trillion and 117 trillion cubic feet, offshore production will have grown from about 15 percent of all gas produced in the lower 48 states in 1970 to between 33 and 36 percent in 1990.

. . . overseas . . .

There are enormous foreign reserves of natural gas, most of them overseas. In several countries, the situation is much as it was in the United States in the early years after World War II, when for lack of a means to market gas, large amounts of gas produced in connection with crude oil were flared in the field.

As a result of the abundant reserves that are going largely unused overseas, costly efforts are being made to expand facilities for supercooling natural gas to a liquid for shipment in cryogenic tankers. Some 3.4 billion cubic feet of liquefied natural gas was imported into the United States from Algeria by refrigerated tankers in 1973. And far more could be bought there and in other African and Middle Eastern countries–and possibly the Soviet Union–if there were facilities for handling it.

Altogether, ten terminals are being planned to receive liquefied gas in the United States. Construction has already started on some of them. The terminals will cost about $300 million each and require about $700 million in supporting ships, pipelines, and facilities for handling and storing gas.

Prospects for increased use of imports from overseas have been dampened, however, by the recent energy crisis. Once the investment was made in ships and terminals, overseas suppliers could raise prices for their gas, just as they have done for their oil, leaving foreign gas supplies no more secure than foreign oil supplies.

Thus, while the outlook is for increased imports, most of the increase is expected to be within North America. According to the Federal Power Commission's pro-

jection of the most likely case, imports from 1971 to 1990 could range from 67 trillion to 110 trillion cubic feet. Roughly a third of these imports, however, would probably come by pipeline from fields in Canada.

. . . and in gasification

Pipeline companies have also joined efforts to supplement natural gas supplies with manufactured gas. Exploration, though promising–especially offshore–is just that. And even if the possibilities of finding new reserves were more certain, without other sources of gas, the additional reserves would eventually be exhausted.

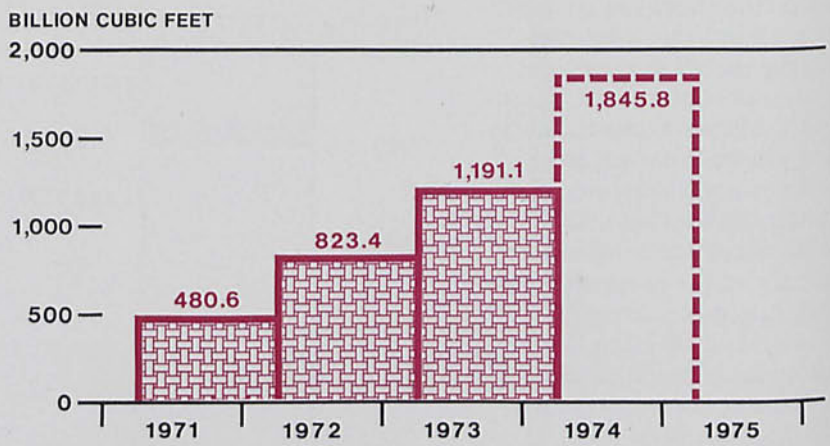
Of the hydrocarbons used in making synthetic gas, petroleum products are the easiest to work with. In fact, propane mixed with air can simply be added to gas lines without any further processing to boost the heating quality of natural gas and extend the supply.

Petroleum feedstocks are being used in 12 gasification plants. With a combined capacity of 295 million cubic feet a day, these plants were built at a total cost of $588 million.

Gasification would solve the two big problems with coal in the past–the pollution it causes when burned directly and the expense of its cumbersome delivery to distant markets.

Recent boosts in prices of petroleum products have discouraged further construction of gasification plants based on petroleum, however, especially as continued expansion of synthetic gas capacity based on petroleum would leave these plants to compete with producers of petrochemicals for the raw materials. Petrochemical producers are already concerned about the availability of feedstocks–certainly at the prices on which their industry was built.

Amount of gas pipelines committed to deliver, but cannot supply, continues to rise



SOURCE: American Gas Association

But there has also been discouragement with the dependability of petroleum supplies, regardless of price. The growing dependence on foreign sources of crude oil has raised a national security issue. Many feel that the country should be moving toward self-sufficiency in its energy needs.

Gasification of coal provides an appealing alternative to synthetic gas plants using petroleum products. There is a wealth of domestic coal that could be drawn on for gasification.

Coal, in fact, is the nation's most abundant fuel resource. There are reserves of 300 billion tons that could be used with existing technology. And gasification would solve the two big problems with coal in the past–the pollution it causes when burned directly and the expense of its cumbersome delivery to distant markets.

All the essential know-how of converting coal to gas has long since been developed. Although early use of manufactured gas was suspended in the United States as pipelines were built to carry natural gas to market, commercial gasification of coal has continued in Europe–where there was little natural gas until recent years and manufactured gas has remained an important fuel. Further improvements have been made in manufacturing processes there, and some of this technology is now being imported into the United States.

There are some problems with the location of the domestic reserves available for gasification. Mines near the nation's large industrial and urban centers are producing coal under long-term contracts that leave their output committed for years to come. And new mines will take years to open.

Reserves further away from these large markets could, nevertheless, be developed. In many cases, strip-mining could be undertaken in these remote locations to provide fairly low-cost fuel.

But the gasification plants would have to be located nearby. Otherwise, costs would rise with the handling and shipping of the large amounts of coal needed to meet demand for gas. And if the gas were manufactured so far from market, the price of the gas would

have to include the cost of long-distance transmission.

In some areas that could be important sources of coal, the lack of water presents a major barrier to gasification. This barrier will have to be overcome before coal can make a really significant contribution to the nation's fuel supplies.

Not only is steam essential to the manufacturing of synthetic gas, but water is needed to prepare the coal for processing, to treat the byproducts of gasification, to cool equipment, and to control dust.

But if enough water were available near the mines to support a coal gas operation, it might not be necessary to locate the plant there anyway. With enough water, the coal could be crushed and washed through pipelines as slurry to plants in better locations.

New Mexico has allocated 72,000 acre-feet of water to support seven gasification plants planned to make use of its large coal reserves. But still more water is needed to make full use of these reserves.

Because of these problems, there may not be more than six coal gasification plants in operation nationwide by the end of the 1970's. That will not be enough to meet more than a small fraction of the demand for gas.

In this fiscal year alone, Government expenditures on coal gasification research are expected to exceed the total of public and private spending on this type of research for the past ten years.

The study by the Federal Power Commission indicates coal could be used in producing 8 trillion to 26 trillion cubic feet of gas from 1971 to 1990. The most likely range is 12 trillion to 16 trillion. That would be about 3 percent of the gas from domestic sources.

Falling gas reserves and higher world oil prices, nevertheless, keep interest in coal gasification running strong. In this fiscal year alone, Government expenditures on coal gasification research are expected to exceed the total of public and private spending on this type of research for the past ten years. And some recommendations call for even more spending by the end of the decade.

The Federal Power Commission has ruled favorably on several of the coal gasification projects proposed for New Mexico, all of which would send synthetic gas through interstate pipelines. This gas would be considerably more expensive than most natural gas.

Gas produced at one New Mexico complex would cost about $1.51 per 1,000 cubic feet the first year. Thereafter, the cost would drop somewhat but still average $1.25 per thousand over the 25-year life of the plant.

By contrast, natural gas bought by interstate lines seldom commands more than 43 cents. The price of new gas sold in intrastate markets has also been rising, however, and, in some cases, has already reached the level expected for New Mexico's synthetic gas.

Further in the future

Hydrogen would make an even better gaseous fuel. It has all the advantages of cleanness and convenience that natural or synthetic gas can offer, without the serious disadvantage of a limited reserve base. If nuclear fusion were perfected, plants on the coast could provide enough cheap power to break seawater down into an almost inexhaustible supply of hydrogen. Perfection of this new technology would bring on a hydrogen-powered economy, and replacement of the old economy based on hydrocarbons would present the pipeline industry with even greater challenges.

Use of hydrogen as a fuel is not altogether new. A century ago, manufactured gas was close to half hydrogen. And today, it is used in liquid form in space programs, as a propellant and for generating electricity through fuel cells.

Commercial hydrogen could be piped into distribution systems now used for natural gas. Initially, it would be burned. But eventually, with the further development of fuel cells, it could be used to generate electricity in the home.

Although some modification of existing pipelines would be needed for them to carry hydrogen, current technology makes gas transmission more economical than electric power transmission.

One of the impediments to quicker use of nuclear power in the generation of electricity has been concern for the environment–especially concern over heat pollution. With advances being made in offshore pipelines, however, nuclear facilities could be built on floating platforms similar to those used in offshore drilling operations. If these plants were otherwise feasible from an environmental and safety standpoint, their location at sea, with underwater pipelines to shore, would remove the problems of heat pollution near urban areas.

Although some modification of existing pipelines would be needed for them to carry hydrogen, current technology makes gas transmission more economical than electric power transmission. There is always some loss on a power line, but little in a pipeline. And although these modifications would boost gas transmission costs somewhat, the lines would be more efficient than they are now because they could pump a much greater

volume of hydrogen than they can natural gas.

Such a changeover is, of course, still well in the future, and, yet, with the rapid decline in gas reserves and demand still rising unabated by the increase in prices, there will have to be marked changes in the future. And pipeline companies are watching the considerable progress being made in the development of both nuclear fusion and fuel cells.

When the changeover comes, it will end the Southwest's domination of gas production. With nuclear fusion, hydrogen can be produced as easily on the East Coast as on the Gulf Coast. And with the shift will come further changes in the nation's network of pipelines.

–Stephen L. Gardner

New member banks

The Brownsville National Bank, Brownsville, Texas, a newly organized institution located in the territory served by the San Antonio Branch of the Federal Reserve Bank of Dallas, opened for business August 23, 1974, as a member of the Federal Reserve System. The new member bank opened with capital of $440,000, surplus of $440,000, and undivided profits of $220,000. The officers are: Joe Zavaletta, Chairman of the Board; Raymond E. Barr, President; Jean M. Webb, Executive Vice President; and Anita Salinas, Cashier.

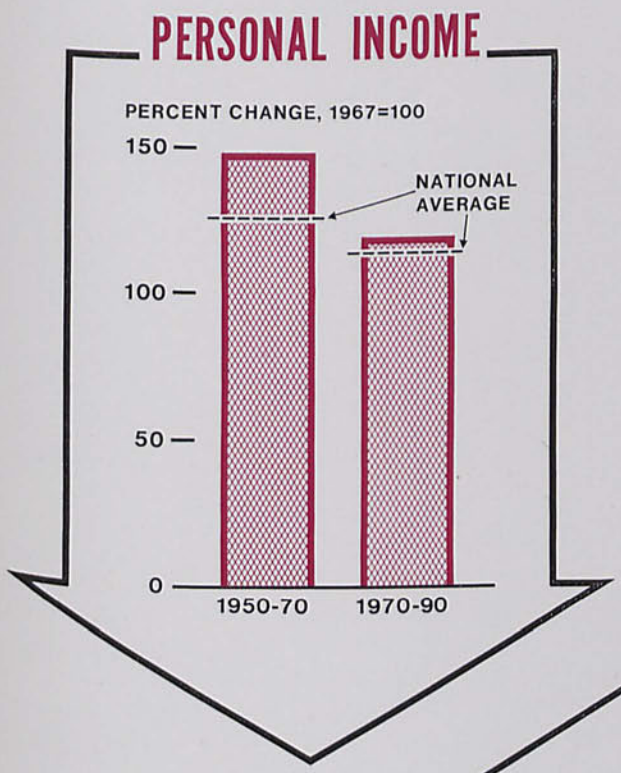
The Continental National Bank, El Paso, Texas, a newly organized institution located in the territory served by the El Paso Branch of the Federal Reserve Bank of Dallas, opened for business September 16, 1974, as a member of the Federal Reserve System. The new member bank opened with capital of $600,000, surplus of $200,000, and undivided profits of $200,000. The officers are: W. R. Squires, Jr., President; Mark Valentine, Vice President and Cashier; Stewart M. Pinkerton, Jr., Vice President; and Marlene Banks, Assistant Vice President.

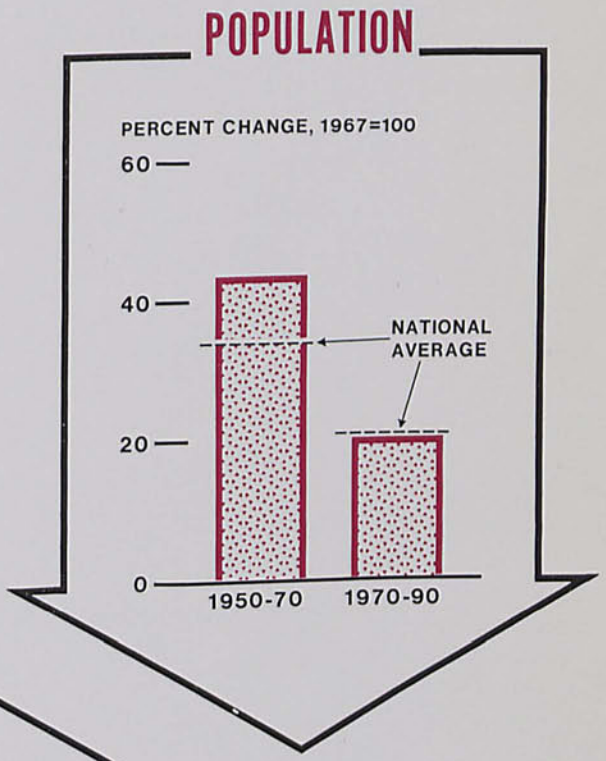
New par banks

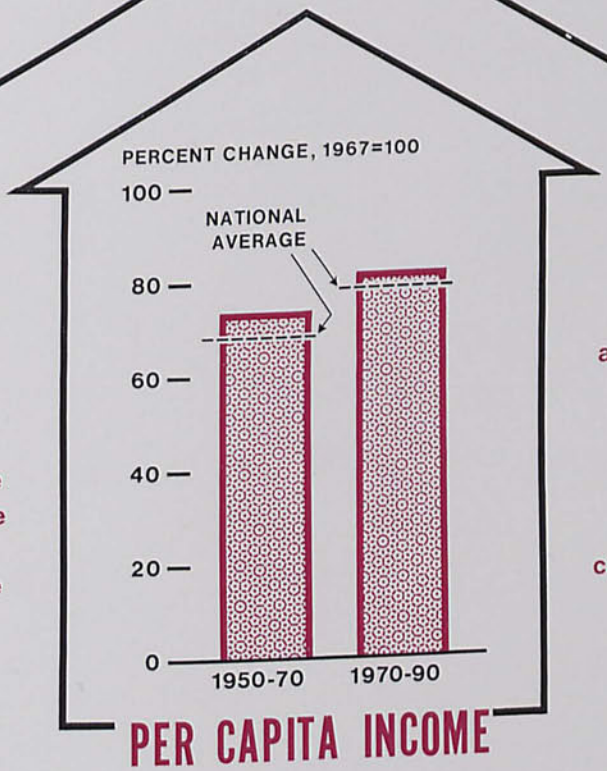
The Jersey Village Bank, Houston, Texas, an insured nonmember bank located in the territory served by the Houston Branch of the Federal Reserve Bank of Dallas, was added to the Par List on its opening date, August 12, 1974. The officers are: George Gentry, President, and George Martinez, Vice President and Cashier.

The Exchange Bank, Houston, Texas, an insured nonmember bank located in the territory served by the Houston Branch of the Federal Reserve Bank of Dallas, was added to the Par List on its opening date, August 30, 1974. The officers are: George W. Cone, President; Jeff C. Suttles, Vice President; Dave Schmidt, Vice President; and Ron Smulcer, Cashier.

Faster Gains in Per Capita Income Expected for the Southwest







Per capita income for states of the Eleventh Federal Reserve District is expected to grow a little faster in the years ahead. Projections by the Department of Commerce show the increase in personal income in these five southwestern states slowing over the 1970's and 1980's, dropping back closer to the national average. But with the expansion in population expected to slow even more, the outlook for per capita income is improved.

SOURCE: Survey of Current Business

Research Department
Federal Reserve Bank of Dallas
Station K, Dallas, Texas 75222

Federal Reserve Bank of Dallas
October 1974

Statistical Supplement to the Business Review

Total bank credit at weekly reporting banks in the Eleventh District declined contraseasonally in the five weeks ended September 18. Total loans were down sharply, and holdings of municipal securities were reduced moderately. Total deposits rose about in line with normal expectations, however, and banks used these funds primarily to reduce their net purchases of Federal funds.

The decline in total loans resulted mainly from a reduction in business loans–the first such decline in six months. Area bankers have reportedly become more restrictive in their lending policies, primarily to maintain liquidity levels. Consumer loans rose appreciably, about in line with the increase in consumer prices. Recently announced price increases for 1975-model automobiles have caused many consumers to purchase available 1974 models.

Total investments at reporting banks declined in the five-week period, as these banks reduced their portfolios of municipal issues. Recent reductions in the amount of new offerings probably made maturing issues somewhat more difficult to replace. Holdings of short-term Treasury securities increased slightly.

The rise in total deposits at District banks mainly reflected an increase in demand deposits of the Government. Inflows of large CD's and other time and savings deposits were considerably less than usual.

The seasonally adjusted Texas industrial production index dropped slightly in August, following five consecutive monthly gains. Petroleum refining, which had increased steadily since March, accounted for much of the decline. With large stocks of finished products, refiners were forced to trim production, bringing crude runs to stills down nearly 4 percent from July.

The continued weakness in construction resulted in lower output in building-related industries. Production of lumber products and stone, clay, and glass goods was off from a month before. And the output of furniture and fixtures fell for the fourth consecutive month.

Mining was up slightly, but the recovery of crude oil and natural gas stayed below year-earlier levels. Output by utilities, on the other hand, was down 3 percent from July. Although utilities may be feeling the impact of consumer reaction to recent rate hikes, the lower distribution of electricity and gas was due, in part, to unseasonably mild weather in August.

The decline in crude oil production in Texas has continued since 1972, the peak year for output. According to recent Government statistics, production in 1973 was down more than half a percent from a year earlier. Total value of crude production, however, has increased. The average value per barrel at the wellhead rose from $3.48 in 1972 to $3.98 last year, resulting in an increase of 14 percent in the value of production.

For the nation as a whole, crude petroleum prices in the first eight months of 1974 averaged slightly higher then $7 a barrel. With the sharply higher prices, demand for crude oil eased some 4 percent.

Employment in the five southwestern states was strong throughout the summer—much better than in the nation as a whole. In August, the number of jobholders increased rapidly for the second consecutive month, reaching a level 3 percent higher than a year earlier. Only in durable goods manufacturing was there any sizable loss of workers. Jobless statistics also improved. The number of unemployed workers dropped, following a substantial increase last month. The unemployment rate, therefore, fell from 4.8 per cent in July to 4.7 percent.

New car sales, seasonally adjusted, in the four largest metropolitan counties of Texas rose 2 percent in August, after increasing 13 percent in July. The slowdown resulted largely from a sharp depletion in inventories of lower-priced 1974 models.

Seasonally adjusted department store sales in the Eleventh District rebounded from mid-August to mid-September, rising nearly 2 percent. The gain came on the heels of a downturn in the previous four weeks. But even with the rise, the trend in purchases has been flat since last spring. Given price increases, moreover, it is evident that unit sales fell during the summer.

Range and livestock conditions in the Eleventh District were generally improved in September. But even with a favorable outlook for grazing, the cattle market was still sluggish. Limited feed supplies and dismal prospects for harvests combined to drive grain prices even higher, discouraging placements in feedlots. As a result, the number of cattle on feed in Texas and Arizona on September 1 was down a fourth from a year earlier. Instead of being fed, many calves were slaughtered.

(Continued on back page)

CONDITION STATISTICS OF WEEKLY REPORTING COMMERCIAL BANKS

Eleventh Federal Reserve District

(Thousand dollars)

ASSETS	Sept. 18, 1974	Aug. 14, 1974	Sept. 19, 1973
Federal funds sold and securities purchased under agreements to resell	1,202,129	1,400,740	1,001,502
Other loans and discounts, gross	10,517,817	10,563,631	9,729,332
Commercial and industrial loans	4,734,735	4,764,616	4,405,737
Agricultural loans, excluding CCC certificates of interest	252,659	258,712	283,442
Loans to brokers and dealers for purchasing or carrying:			
U.S. Government securities	1,253	1,259	851
Other securities	35,309	41,039	46,163
Other loans for purchasing or carrying:			
U.S. Government securities	5,292	3,452	7,076
Other securities	432,765	440,634	479,036
Loans to nonbank financial institutions:			
Sales finance, personal finance, factors, and other business credit companies	169,578	161,748	145,158
Other	719,125	734,941	651,955
Real estate loans	1,564,974	1,553,513	1,367,185
Loans to domestic commercial banks	47,054	57,078	32,412
Loans to foreign banks	93,745	84,477	74,151
Consumer instalment loans	1,121,050	1,088,673	1,062,766
Loans to foreign governments, official institutions, central banks, and international institutions	73	76	270
Other loans	1,340,205	1,373,413	1,173,130
Total investments	4,175,540	4,207,384	3,951,594
Total U.S. Government securities	910,294	907,427	975,473
Treasury bills	96,375	71,519	169,812
Treasury certificates of indebtedness	0	0	0
Treasury notes and U.S. Government bonds maturing:			
Within 1 year	135,506	129,883	151,180
1 year to 5 years	521,900	528,181	494,950
After 5 years	156,513	177,844	159,531
Obligations of states and political subdivisions:			
Tax warrants and short-term notes and bills	183,454	172,057	128,478
All other	2,766,108	2,828,849	2,595,067
Other bonds, corporate stocks, and securities:			
Certificates representing participations in federal agency loans	14,336	9,484	8,561
All other (including corporate stocks)	301,348	289,567	244,015
Cash items in process of collection	1,541,540	1,469,271	1,433,964
Reserves with Federal Reserve Bank	1,059,898	943,369	755,292
Currency and coin	130,248	130,765	124,102
Balances with banks in the United States	420,699	425,571	446,822
Balances with banks in foreign countries	26,067	30,105	15,321
Other assets (including investments in subsidiaries not consolidated)	924,037	882,200	815,253
TOTAL ASSETS	19,997,975	20,053,036	18,273,182

LIABILITIES	Sept. 18, 1974	Aug. 14, 1974	Sept. 19, 1973
Total deposits	14,965,583	14,758,541	13,524,412
Total demand deposits	7,178,912	7,000,489	6,700,027
Individuals, partnerships, and corporations	5,099,677	5,106,551	4,877,827
States and political subdivisions	533,837	506,311	277,867
U.S. Government	166,417	52,583	150,032
Banks in the United States	1,209,144	1,159,046	1,231,179
Foreign:			
Governments, official institutions, central banks, and international institutions	2,385	2,464	2,972
Commercial banks	64,945	70,711	49,820
Certified and officers' checks, etc.	102,507	102,823	110,330
Total time and savings deposits	7,786,671	7,758,052	6,824,385
Individuals, partnerships, and corporations:			
Savings deposits	1,129,426	1,140,778	1,137,139
Other time deposits	4,445,869	4,369,978	3,749,203
States and political subdivisions	2,064,971	2,106,261	1,787,378
U.S. Government (including postal savings)	10,272	8,279	21,954
Banks in the United States	114,366	110,770	103,691
Foreign:			
Governments, official institutions, central banks, and international institutions	11,780	8,099	25,000
Commercial banks	9,987	13,887	20
Federal funds purchased and securities sold under agreements to repurchase	2,640,137	2,949,032	2,473,564
Other liabilities for borrowed money	229,304	223,999	311,161
Other liabilities	591,366	559,637	561,304
Reserves on loans	187,963	183,131	165,814
Reserves on securities	20,436	20,413	14,359
Total capital accounts	1,363,186	1,358,283	1,222,568
TOTAL LIABILITIES, RESERVES, AND CAPITAL ACCOUNTS	19,997,975	20,053,036	18,273,182

CONDITION STATISTICS OF ALL MEMBER BANKS

Eleventh Federal Reserve District

(Million dollars)

Item	Aug. 28, 1974	July 31, 1974	Aug. 29, 1973
ASSETS			
Loans and discounts, gross	20,981	21,058	18,719
U.S. Government obligations	2,100	2,109	2,279
Other securities	6,775	6,785	6,036
Reserves with Federal Reserve Bank	1,473	1,477	1,435
Cash in vault	383	363	352
Balances with banks in the United States	1,286	1,342	1,194
Balances with banks in foreign countries[e]	33	40	21
Cash items in process of collection	1,682	1,888	1,588
Other assets[e]	1,691	1,656	1,514
TOTAL ASSETS[e]	36,404	36,718	33,138
LIABILITIES AND CAPITAL ACCOUNTS			
Demand deposits of banks	1,662	1,702	1,568
Other demand deposits	11,834	12,234	11,199
Time deposits	15,579	15,485	13,574
Total deposits	29,075	29,421	26,341
Borrowings	3,174	3,244	3,143
Other liabilities[e]	1,572	1,475	1,327
Total capital accounts[e]	2,583	2,578	2,327
TOTAL LIABILITIES AND CAPITAL ACCOUNTS[e]	36,404	36,718	33,138

e—Estimated

DEMAND AND TIME DEPOSITS OF MEMBER BANKS

Eleventh Federal Reserve District

(Averages of daily figures. Million dollars)

	DEMAND DEPOSITS			TIME DEPOSITS	
Date	Total	Adjusted[1]	U.S. Government	Total	Savings
1972: August	12,420	8,824	226	11,441	2,717
1973: August	12,941	9,492	172	13,507	2,857
September	13,039	9,442	208	13,618	2,854
October	13,289	9,461	239	13,795	2,863
November	13,455	9,816	167	13,953	2,871
December	14,008	10,086	244	14,154	2,883
1974: January	14,384	10,276	302	14,533	2,900
February	13,949	10,082	264	14,919	2,909
March	13,933	10,150	260	15,126	2,958
April	13,984	10,289	236	15,143	2,975
May	13,553	9,880	278	15,148	2,962
June	13,742	10,030	240	15,333	2,979
July	13,809	10,056	212	15,442	2,983
August	13,634	9,988	175	15,509	2,956

1. Other than those of U.S. Government and domestic commercial banks, less cash items in process of collection

RESERVE POSITIONS OF MEMBER BANKS

Eleventh Federal Reserve District

(Averages of daily figures. Thousand dollars)

Item	4 weeks ended Sept. 4, 1974	5 weeks ended Aug. 7, 1974	5 weeks ended Sept. 5, 1973
Total reserves held	2,021,581	2,008,762	1,795,557
With Federal Reserve Bank	1,684,363	1,677,397	1,491,421
Currency and coin	337,218	331,365	304,136
Required reserves	2,005,361	2,001,836	1,786,515
Excess reserves	16,220	6,926	9,042
Borrowings	177,019	125,297	102,966
Free reserves	-160,799	-118,371	-93,924

BANK DEBITS, END-OF-MONTH DEPOSITS, AND DEPOSIT TURNOVER

SMSA's in Eleventh Federal Reserve District

(Dollar amounts in thousands, seasonally adjusted)

Standard metropolitan statistical area	DEBITS TO DEMAND DEPOSIT ACCOUNTS[1]				DEMAND DEPOSITS[1]			
	Aug. 1974 (Annual-rate basis)	Percent change: Aug. 1974 from July 1974	Percent change: Aug. 1974 from Aug. 1973	Percent change: 8 months, 1974 from 1973	Aug. 31, 1974	Annual rate of turnover: Aug. 1974	Annual rate of turnover: July 1974	Annual rate of turnover: Aug. 1973
ARIZONA: Tucson	$17,652,314	12%	14%	25%	$379,547	47.0	42.5	44.5
LOUISIANA: Monroe	5,834,236	8	16	14	128,164	46.0	43.7	42.5
Shreveport	23,211,631	8	18	25	346,806	65.4	57.2	60.8
NEW MEXICO: Roswell[2]	1,447,098	2	4	20	52,346	27.5	26.8	27.4
TEXAS: Abilene	4,456,669	0	26	33	146,255	30.1	28.7	24.4
Amarillo	11,569,003	10	−1	15	231,589	49.7	43.3	54.0
Austin	20,067,660	−10	21	35	461,489	43.8	47.3	36.8
Beaumont-Port Arthur-Orange	11,190,973	6	27	31	311,511	35.7	33.1	31.0
Brownsville-Harlingen-San Benito	4,736,675	9	69	33	123,848	38.1	34.3	24.4
Bryan-College Station	1,643,057	−9	−6	16	60,165	27.0	29.3	30.1
Corpus Christi	10,440,730	−11	15	37	295,199	35.1	39.1	31.0
Corsicana[2]	822,205	4	24	18	38,587	20.3	18.7	15.8
Dallas	263,509,730	2	16	35	3,185,469	83.3	82.1	77.7
El Paso	13,715,308	−5	16	26	316,407	40.8	42.5	36.8
Fort Worth	38,274,083	0	14	22	880,729	42.9	42.7	39.8
Galveston-Texas City	4,745,645	−1	22	19	140,309	33.6	34.3	29.0
Houston	229,091,059	3	37	33	3,706,882	61.0	58.7	50.6
Killeen-Temple	2,596,231	−9	2	9	118,726	21.6	23.3	21.6
Laredo	2,020,370	4	30	33	66,487	30.8	29.5	25.8
Lubbock	10,034,256	5	13	37	243,373	41.3	39.3	38.5
McAllen-Pharr-Edinburg	4,033,121	0	10	19	158,980	25.6	25.5	21.8
Midland	4,127,129	7	42	39	197,215	20.6	18.9	18.5
Odessa	3,117,694	3	27	23	120,088	25.8	25.2	23.8
San Angelo	2,898,772	−1	30	32	94,851	30.2	28.7	26.5
San Antonio	31,917,708	4	10	14	891,600	35.6	34.4	31.7
Sherman-Denison	1,652,502	−8	−1	11	86,039	19.4	20.9	19.3
Texarkana (Texas-Arkansas)	2,153,899	1	1	7	91,871	23.1	22.4	23.5
Tyler	3,789,136	5	23	15	137,508	26.3	24.6	24.0
Waco	5,297,929	7	9	13	156,277	32.9	30.1	30.6
Wichita Falls	4,945,102	0	33	39	166,426	29.5	29.0	24.4
Total—30 centers	$740,991,925	2%	22%	30%	$13,334,743	55.2	53.6	49.0

1. Deposits of individuals, partnerships, and corporations and of states and political subdivisions
2. County basis

CONDITION OF THE FEDERAL RESERVE BANK OF DALLAS

(Thousand dollars)

Item	Sept. 25, 1974	Aug. 21, 1974	Sept. 26, 1973
Total gold certificate reserves	554,472	626,103	458,903
Loans to member banks	133,417	110,434	180,117
Other loans	0	0	0
Federal agency obligations	176,368	154,205	65,755
U.S. Government securities	3,525,418	3,507,199	3,138,328
Total earning assets	3,835,203	3,771,838	3,384,200
Member bank reserve deposits	1,683,109	1,799,455	1,561,785
Federal reserve notes in actual circulation	2,576,235	2,559,090	2,347,569

VALUE OF CONSTRUCTION CONTRACTS

(Million dollars)

Area and type	Aug. 1974	July 1974	June 1974	January—August 1974	January—August 1973r
FIVE SOUTHWESTERN STATES[1]					
Residential building	930	1,538	1,061	8,299	8,022
Nonresidential building	398	369	440	3,156	3,844
Nonbuilding construction	321	665	349	3,208	2,774
UNITED STATES	211	504	272	1,935	1,405
Residential building	8,416	9,295	8,480	64,653	68,802
Nonresidential building	3,060	3,350	3,546	25,912	33,093
Nonbuilding construction	3,246	3,698	2,989	23,003	21,463
	2,110	2,247	1,945	15,738	14,247

1. Arizona, Louisiana, New Mexico, Oklahoma, and Texas
r—Revised
NOTE: Details may not add to totals because of rounding.
SOURCE: F. W. Dodge, McGraw-Hill, Inc.

BUILDING PERMITS

Area	NUMBER: Aug. 1974	NUMBER: 8 mos. 1974	VALUATION (Dollar amounts in thousands): Aug. 1974	VALUATION: 8 mos. 1974	Percent change: Aug. 1974 from July 1974	Percent change: Aug. 1974 from Aug. 1973	Percent change: 8 months, 1974 from 1973
ARIZONA							
Tucson	463	4,190	$4,045	$61,451	−61%	−68%	−50%
LOUISIANA							
Monroe-West Monroe	62	519	4,286	15,031	99	166	−27
Shreveport	934	5,902	3,668	74,690	−79	−31	29
TEXAS							
Abilene	81	628	1,088	11,507	−68	58	−40
Amarillo	615	3,343	6,904	43,723	11	131	18
Austin	511	3,844	9,963	167,292	−28	−64	−15
Beaumont	126	1,499	1,075	33,312	−83	−68	45
Brownsville	111	877	3,088	20,472	199	−43	−9
Corpus Christi	199	1,970	2,617	43,734	−64	43	18
Dallas	1,341	11,423	16,368	240,560	−37	−41	6
Denison	23	180	77	1,263	18	24	−34
El Paso	372	4,124	8,158	126,033	−51	−65	0
Fort Worth	351	2,980	7,072	106,456	14	−39	26
Galveston	59	439	911	29,325	78	142	334
Houston	1,952	16,514	67,132	466,692	43	15	−5
Laredo	26	290	704	7,857	−84	−10	−45
Lubbock	157	1,282	10,204	104,563	−55	165	110
Midland	73	594	944	25,102	−73	240	146
Odessa	113	856	1,339	14,601	−24	88	38
Port Arthur	73	544	176	1,654	−31	−57	−64
San Angelo	62	557	629	10,322	33	−58	39
San Antonio	3,412	14,341	7,439	142,072	−56	−70	−16
Sherman	27	239	165	3,968	−45	−53	−4
Texarkana	46	528	429	6,095	−53	−74	30
Waco	188	1,741	7,193	31,026	242	106	15
Wichita Falls	72	613	815	10,182	−44	−93	−59
Total—26 cities	11,449	80,017	$166,489	$1,798,983	−24%	−28%	1%

DAILY AVERAGE PRODUCTION OF CRUDE OIL

(Thousand barrels)

Area	Aug. 1974	July 1974	Aug. 1973r	Percent change from July 1974	Percent change from Aug. 1973
FOUR SOUTHWESTERN STATES	6,313.1	6,288.6	6,579.2	.4%	−4.1%
Louisiana	1,964.9	1,943.1	2,263.4	1.1	−13.2
New Mexico	271.7	272.1	267.7	.2	1.5
Oklahoma	479.6	483.2	502.5	−.8	−4.6
Texas	3,596.9	3,590.0	3,545.6	.2	1.5
Gulf Coast	712.8	705.0	693.4	1.1	2.8
West Texas	1,887.7	1,885.3	1,842.5	.1	2.5
East Texas (proper)	234.0	236.1	204.5	−.9	14.4
Panhandle	61.0	61.8	59.2	−1.3	3.0
Rest of state	701.4	701.8	746.0	−.1	−6.0
UNITED STATES	8,913.9	8,880.9	9,160.9	.4%	−2.7%

r—Revised
SOURCES: American Petroleum Institute
U.S. Bureau of Mines
Federal Reserve Bank of Dallas

LABOR FORCE, EMPLOYMENT, AND UNEMPLOYMENT

Five Southwestern States[1]

(Seasonally adjusted)

Item	Thousands of persons: Aug. 1974p	July 1974	Aug. 1973r	Percent change Aug. 1974 from: July 1974	Aug. 1973
Civilian labor force	8,970.0	8,936.0	8,701.1	0.4%	3.1%
Total employment	8,547.4	8,511.5	8,304.2	.4	2.9
Total unemployment	422.6	424.5	396.9	−.4	6.5
Unemployment rate	4.7%	4.8%	4.6%	[2]−.1	[2].1
Total nonagricultural wage and salary employment	7,441.9	7,431.8	7,209.6	.1	3.2
Manufacturing	1,278.6	1,284.0	1,262.6	−.4	1.3
Durable	714.6	720.3	706.8	−.8	1.1
Nondurable	564.0	563.6	555.9	.1	1.5
Nonmanufacturing	6,163.3	6,147.8	5,946.9	.3	3.6
Mining	245.8	245.1	238.9	.3	2.9
Construction	494.2	494.6	493.2	−.1	.2
Transportation and public utilities	505.3	502.1	497.2	.6	1.6
Trade	1,793.1	1,789.5	1,723.6	.2	4.0
Finance	414.2	412.0	393.7	.5	5.2
Service	1,239.3	1,236.6	1,172.6	.2	5.7
Government	1,471.4	1,468.0	1,427.7	.2%	3.1%

1. Arizona, Louisiana, New Mexico, Oklahoma, and Texas
2. Actual change
p—Preliminary
r—Revised
NOTE: Details may not add to totals because of rounding.
SOURCES: State employment agencies
Federal Reserve Bank of Dallas (seasonal adjustment)

CROP PRODUCTION

(Thousand bushels)

Crop	TEXAS: 1974, estimated Sept. 1	TEXAS: 1973	TEXAS: 1972	FIVE SOUTHWESTERN STATES[1]: 1974, estimated Sept. 1	FIVE SOUTHWESTERN STATES[1]: 1973	FIVE SOUTHWESTERN STATES[1]: 1972
Cotton[2]	3,206	4,699	4,277	5,229	6,446	6,140
Corn	69,750	60,800	39,560	81,634	73,118	52,795
Winter wheat	52,800	98,600	44,000	209,013	280,442	150,115
Oats	8,100	26,650	9,720	11,892	34,948	16,149
Barley	1,350	3,510	1,980	12,710	21,645	19,334
Rye	200	648	630	965	1,981	1,890
Rice[3]	24,772	20,530	22,122	47,776	41,924	42,089
Sorghum grain	295,000	417,000	319,780	343,817	478,164	378,218
Flaxseed	374	80	165	374	80	165
Hay[4]	3,912	5,808	3,899r	9,522	12,964	9,734r
Peanuts[5]	454,500	471,225	480,455	722,640	743,867	743,566
Irish potatoes[3]	2,863	3,778	3,182	6,251	6,880	6,665
Sweet potatoes[3]	788	855	813	3,938	3,825	4,113
Pecans[5]	35,000	20,000	75,000	52,500	96,500	99,300
Soybeans	6,500	8,500	5,460	51,145	51,800	47,371

r—Revised
1. Arizona, Louisiana, New Mexico, Oklahoma, and Texas
2. Thousand bales
3. Thousand hundredweight
4. Thousand tons
5. Thousand pounds
SOURCE: U.S. Department of Agriculture

INDUSTRIAL PRODUCTION

(Seasonally adjusted indexes, 1967 = 100)

Area and type of index	Aug. 1974p	July 1974	June 1974	Aug. 1973
TEXAS				
Total industrial production	140.9	141.3	140.8r	138.3
Manufacturing	147.5	147.9	147.5r	144.0
Durable	162.8	161.8	162.2	159.0
Nondurable	136.5	137.9	136.9r	133.2
Mining	119.3	118.4	118.6r	120.6
Utilities	162.5	167.8	162.4r	153.2
UNITED STATES				
Total industrial production	125.2	125.7	125.8r	126.5
Manufacturing	125.0	125.8	125.9r	126.1r
Durable	120.8	122.4	122.4r	122.6r
Nondurable	131.2	130.7	130.9r	130.9r
Mining	108.1	110.3	110.6r	111.5r
Utilities	152.5	151.5	150.5r	154.8

p—Preliminary
r—Revised
SOURCES: Board of Governors of the Federal Reserve System
Federal Reserve Bank of Dallas

Harvests were delayed by moderate to heavy rains over much of the District. Most directly affected was the cotton crop. Rain reduced the fiber quality of cotton ready for harvest, and low temperatures curtailed growth in West Texas.

Lack of moisture in the spring and early summer has held average crop yields far below 1973 levels. But the rain in September provided excellent conditions for seeding small grain crops.

The index of prices received by Texas farmers and ranchers rose 3 percent in the month ended August 15. The index was, nevertheless, off 13 percent from a year earlier. Prices for livestock and livestock products advanced 7 percent but lagged the record level of the corresponding period last year by 35 percent. With feed grain prices continuing to rise, the crop index was up 21 percent from a year before.

In the first seven months of this year, cash receipts from farm and ranch marketings in states of the District totaled $5.9 billion—6 percent higher than a year earlier. Crop receipts jumped 29 percent to $2.3 billion, while livestock receipts totaled $3.6 billion, down 5 percent.