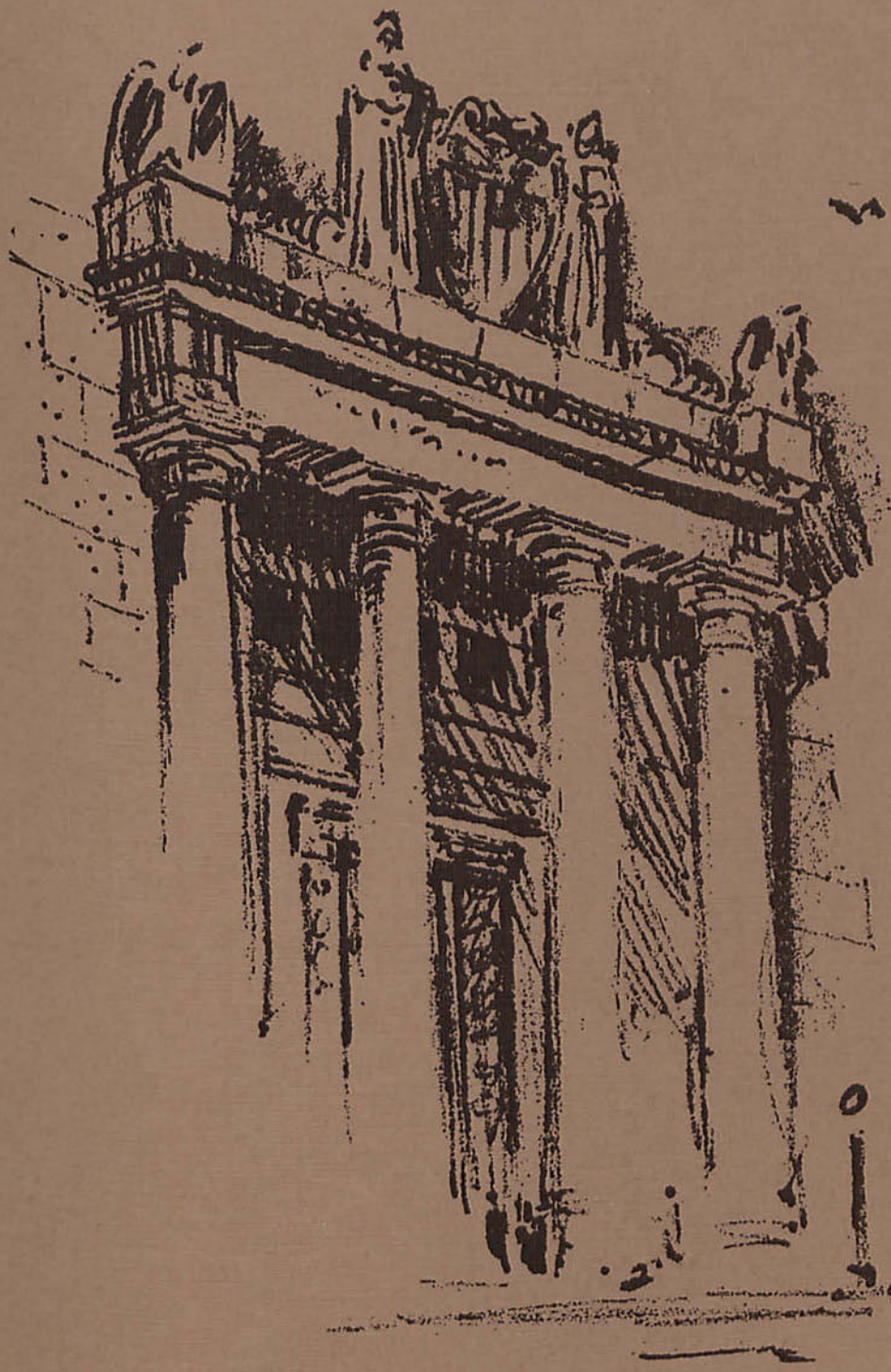
Federal Reserve Bank of Dallas

Business Review



Electric Power–
Economic Uncertainties Hamper Plans for Growth

July 1971

Economic Uncertainties Hamper Plans for Growth

As peak demand for electricity builds up this summer, there is concern that power shortages could again become a problem in some parts of the country. Severe shortages in the North and Northeast last year sharply reduced the lighting and power available in some of the nation's most populated areas, causing considerable inconvenience and threatening to slow industrial output.

The problem is clearly not characteristic of the electric power industry as a whole. Substantial investments in generating capacity have been made all across the country in recent years, allowing most utilities to stay well ahead of growth in peak-load requirements. The industry's outlays for plant and equipment reached record levels last year, for example, expanding the nation's total generating capacity by about 9 percent.

The supply problem centers along the Eastern Seaboard and across the Upper Midwest. There, a sudden hot spell or series of equipment failures could still leave such key cities as Washington, New York, and Chicago short of electricity. Utilities in these areas have had to accommodate not only the fastest growth in population and economic activity in the postwar period but also a belated surge in use of air-conditioners. Where home air conditioning has been established in warmer climates of the country for 20 years, its popularity in northern states is a fairly recent development.

None of the electric utilities in the Eleventh Federal Reserve District face the possibility of a summer shortage in capacity. In fact, plant expansion in the Southwest over the past 20 years has brought the available supply of power in this part of the country to a level exceeding peak-load requirements by more than 15 percent. And with growth in demand more predictable here than in the more populated centers of the North and Northeast, utilities in the Southwest should be able to easily maintain a favorable balance between supply and demand.[1]

Adding further to the problem facing utilities in the North and Northeast last year was a severe shortage of fuel to drive generating plants. Several utilities felt the effects of this shortage, but hardest hit were those least able to stand a setback. As late as October, in fact, some northern utilities were still seeking adequate fuel supplies in competition with industrial users when seasonal demand for heating fuel began to rise.

Since then, much of the problem of fuel supplies has been relieved. Mining companies and railroads have improved their deliveries of coal, and new efforts have been made to tap the nation's enormous coal and lignite reserves. Price agreements with petroleum-exporting countries have largely stabilized the world oil situation, freeing tankers to resume deliveries of residual fuel oil to the East Coast from refineries in the Caribbean. And although supplies of natural gas are still short, high transmission costs make natural gas too expensive for most northern utilities in any case.

But while only a few utilities face a current shortage of generating capacity and none of them face a critical shortage of fuel, all utilities are confronted with the longer-range problems of planning for the types of generating capacity that will best fit public needs. Efforts to anticipate changes in technology, to predict the cost and availability of alternative fuels, and to overcome growing ecological restraints–all these are matters of continuing concern to all electric utilities.

Immediate and long-run needs

A generating plant is a major industrial installation usually taking at least five years and often as long as seven years to plan, build, equip, and put into operation –at a cost, of course, running into the millions. Once in operation, the plant has a long service life.

Because of the long lead time required to bring a plant on line, utilities must be able to project demand for electricity far into the future, pacing their construction programs accordingly. Otherwise, they cannot respond fast enough to changes in load requirements to avoid falling behind in reserve capacity. And once they slip in the race against demand, it is hard for them to catch up.

But because of the long service life of a power plant, utilities must also build the types of plants that cost least to operate, not merely in the near term when construction is first completed but also in the long run of many years to come. And comparative projections of fuel costs and technological changes complicate the choice of plants.

Nuclear plants cost much more than conventional plants to build. But over the long life of a plant, the

1. See Edward L. McClelland, "Electric Utilities in Texas Face Challenge of Rising Demand," *Business Review*, Federal Reserve Bank of Dallas, August 1970, pp. 3-10.

LOAD-SUPPLY SITUATION FOR ELECTRICITY–SUMMER 1971

Region	Estimated peak load	Net dependable capacity	Capacity available for reserves		Additional capacity scheduled for service during June-July-August	
	Megawatts		Megawatts	Percent of peak	Megawatts	Percent of peak
Northeast	57,198	68,119	10,921	19.1%	1,006	1.8%
East Central	47,727	54,355	6,628	13.9	177	.4
Southeast	58,872	65,979	7,107	12.1	2,640	4.5
West Central	36,937	42,621	5,684	15.4	867	2.3
South Central	42,702	49,147	6,445	15.1	2,894	6.8
West	52,788	64,196	11,408	21.6	1,286	2.4
48 states	296,224	344,417	48,193	16.3%	8,870	3.0%

SOURCE: Federal Power Commission

cost of operating a nuclear plant may be less, especially in areas where fossil fuels are scarce. Eventually, nuclear plants are almost certain to account for a growing proportion of the nation's power generation, but siting problems and difficulties with thermal pollution make projections of the rate of changeover difficult.

Roots of the shortage

Shortages in generating capacity built up over several years, essentially as a result of unforeseen changes in urban demand for electricity and unexpected delays in nuclear plant construction. Roots of the shortage extend back to the 1950's. In 1956, for example, consumption of electrical power was expected to almost double over the following decade. During that time, nuclear generation of electricity was expected to increase steadily. Where nuclear plants accounted for less than 0.1 percent of the nation's total generating capacity in 1956, they were envisioned as accounting for 5 percent by 1970 and 17 percent by 1980.

But by 1964, after the many delays in building nuclear plants, the Federal Power Commission and the Atomic Energy Commission agreed that nuclear production of electricity would account for only 0.3 percent of total generating capacity in 1966. They estimated that by 1980, however, nuclear power would provide 19 percent of the nation's generating capacity.

Actually, by 1966 nuclear plants furnished 0.6 percent of total production. But by 1970, with demand for electricity rising faster than expected and construction of nuclear plants running slower, reactors accounted for only 1 percent of the total. Projections continued favorable, however, showing that–barring any further delays–the proportion of total capacity accounted for by nuclear plants would reach 20 percent by 1980.

Projections of electrical demand are based on the most recent actual data available. But because of the long time required to build a plant, generating equipment being installed today was ordered several years ago from projections based on the then-current experience of the early 1960's, when consumption of electricity increased an average of 6.5 percent a year. Recently, however, Paul W. McCracken, chairman of the Council of Economic Advisers–and probably more important in this context, chairman of the President's Commission on Fuels and Energy–told a meeting of the Independent Petroleum Association of America that growth in demand suddenly increased to an annual rate of 9 percent about 1966. It is yet to be determined whether this much faster rate of increase is part of a long-term trend or merely a short-run fluctuation in demand. If it is fairly permanent, utilities will have to expand their reserve capacities even more to avoid falling behind.

Meanwhile in the 1960's, technical problems in the manufacture of nuclear generating equipment slowed deliveries, delaying completion schedules and adding further to construction costs that already tended to skyrocket. Utilities had difficulties finding suitable plant sites. And with the predicted swing to nuclear power failing to gain the momentum expected, demands on fossil-fueled plants increased faster than these more conventional plants could be brought on line. Furthermore, because of dwindling reserves of fossil fuels, costs of operating conventional power plants rose.

One result was a marked shift in the tone of advertising by electric utilities in some parts of the country. Where utilities had once sought to expand their markets through the promotion of home air-conditioners (one of the major sources of the increase in summer consumption of electricity), they turned to advertising heating equipment and other forms of off-peak electric use to better balance their load over the year. One major utility recently urged its customers to use less electricity.

Lag in nuclear power

Equipment manufacturers have since worked out some of the tech-

nical problems that once delayed production of nuclear generating equipment. Site selection remains a problem, however, causing some utilities that once saw nuclear capacity as a practical alternative to plants based on fossil fuels to return to conventional steam generation as the fastest means of increasing the reserve margin between the supply and demand for electricity.

Not only have acceptable sites for nuclear plants become hard to find–because of the opposition of environmental groups fearing radiation–but conservationists concerned about possible thermal pollution of lakes and streams have resisted construction of all nuclear facilities, regardless of the site.

Most electric generating plants use water for condenser-cooling purposes, and when the heated water is discharged back to the source, the ambient temperature of the reservoir rises. But nuclear reactors generate more heat than conventional plants fired by fossil fuels. Plants based on nuclear energy use more water, and the temperatures of their water discharges are much higher.

Cooling towers can be used to reduce heat emission, and they are required at some locations. But these additional facilities can add as much as 10 percent to the cost of a nuclear plant. Depending on the size of the plant, this increase can add $15 to $25 per kilowatt to the cost of a plant.

Controversy over standards of ecological safety continues, partly because effects of increases in the water temperatures vary from region to region. Until the environmental problem is resolved, some nuclear plants ready for operation may have to be run at less than capacity. Starts on others will have to be postponed until suitable sites are found.

With the long delay in construction of nuclear plants, utilities in areas where demand has pressed hardest on generating capacity have been forced to make greater use of existing equipment. By having to keep most of their equipment in operation for longer periods, these companies are not able to perform routine off-peak maintenance, and the equipment wears faster. In some cases, maintenance is not performed until equipment actually breaks down. In fact, most blackouts and brownouts so far have resulted from breakdowns.

The rush to catch up

Utilities, unable to delay construction of additional capacity any longer, began building more conventional steam-powered plants in the late 1960's. Although these new plants lessened the immediate need for nuclear facilities, they were not enough in some areas to meet the still-rising demand for electricity.

Meanwhile, to the uncertainty of future growth in demand were added uncertainties about the cost of new plants and the availability of nonnuclear fuels. Utilities were again forced to reconsider their plans for investment in generating capacity.

Costs of plant construction have climbed rapidly in the years since utilities first began considering the use of nuclear generating plants. From 1963 to 1965, the rise in the index of construction costs compiled by *Engineering News-Record* magazine averaged 3.8 percent a year. The rise from 1965 to 1969, however, was almost twice as fast, averaging 7 percent a year. In 1970, the advance averaged 8.6 percent. So far this year, it has climbed at an annual rate of about 11 percent.

All industrial construction has, of course, been affected by these increases. But some industries have not been able to postpone construction in the face of rising costs–and one of these has been the electric utility industry.

Because of the long lead time required to bring a new power plant on line, the sharp rise in building costs has thrown off cost estimates of new generating plants. And with delays in starting construction, estimates have been thrown off even more.

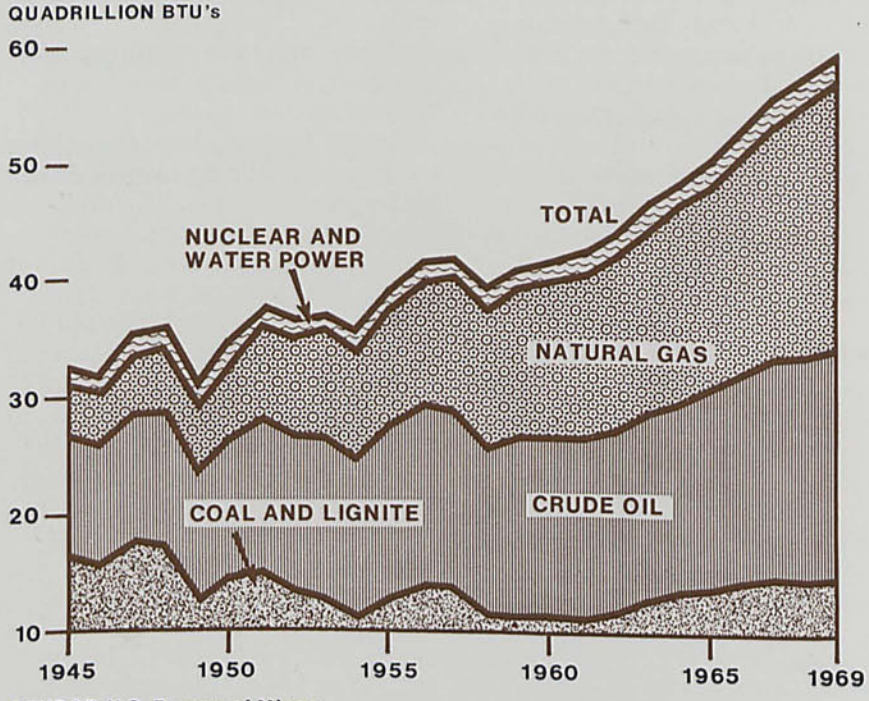
Delays in starts have sometimes postponed financing to periods of higher interest rates. The additional costs of financing power plants were particularly significant during the credit crunch of 1969-70. Where market yields on public utility bonds averaged 5.36 percent a year in 1966, they averaged 8.67 in 1970.

But even in the face of rises in building and financing costs, electric utilities had no choice but to continue increasing their investment in plant and equipment. Where utility outlays for plant and equipment totaled $3.6 billion in 1960, they totaled $4.4 billion in 1965 and $10.7 billion in 1970. Forecasts of capital expenditures by electric utilities this year are running about $13 billion.

The sudden rush to build conventional plants caught fuel industries unprepared for the increase in demand for their products. Available coal supplies were quickly bought up, and prices soared. At the same time, international oil markets were threatened with shortages overseas that limited domestic imports of fuel oil. And the market for natural gas was strained by the rapid increase in demand for this cleaner-burning fuel.

Some utilities burning fossil fuels found they could not buy the coal, fuel oil, and natural gas they needed at the prices they had expected to pay when they built their facilities. Confronted with fuel shortages that faced many large users, some utilities were forced to draw down their own stocks, as well as the stocks of their suppliers–eventually to levels that threatened the continued opera-

Pushed along by gains in oil and gas output, nation's total fuel and energy production increases almost twofold since World War II



SOURCE: U.S. Bureau of Mines

tion of their generators. To keep operating, some were forced to ignore increasingly stringent anti-pollution standards, burning fuels with higher sulfur content than they would perhaps have ordinarily considered. And some were forced to pay higher prices for fuel than they would previously have thought they could afford.

The availability of coal . . .

The shortage in coal was a direct result of earlier miscalculations of the extent to which nuclear plants would replace conventional generating plants–miscalculations that seemed consistent with historical trends. Over the years, coal–once by far the nation's most important energy source–has steadily lost its share of the energy market to fuel oil and natural gas. Where it accounted for more than 70 percent of the energy consumed in the United States in the midtwenties, it now accounts for little more than 20 percent.

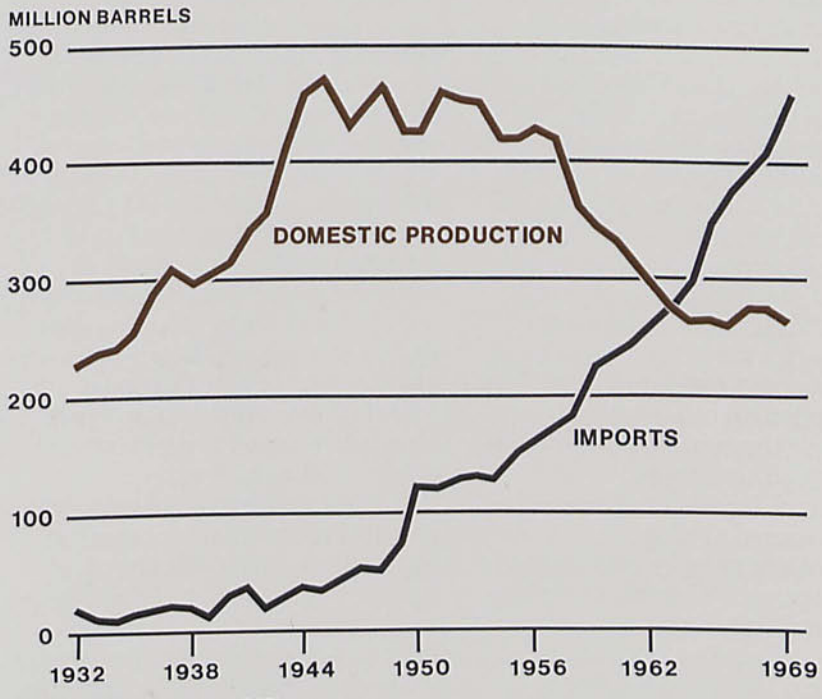
Some of the most notable shifts away from coal have been to natural gas in residential heating and fuel oil in powering ships and trains. Now, electric utilities provide the coal industry with its largest domestic market, buying more than half the coal produced in the United States. In fact, only in the steam grades used by electric utilities has coal consumption shown any rapid growth in recent years.

Projections of shifts in the composition of electric generating capacity led the coal industry to expect further market losses to nuclear-powered generators in the 1960's. Investments in the mining of steam-grade coal were curtailed, and marginal mining operations were closed down. Seeking other markets, the industry concentrated more on increasing the production of metallurgical grades–eventually mining more than could be absorbed in domestic markets and entering long-term commitments for export sales.

When electric utilities began adding conventional steam plants in the late 1960's, they found coal producers, having accepted the common view that the power industry would shift almost entirely to nuclear energy, were no longer in a position to provide steam-grade coal in the quantities needed to maintain the higher levels of generating capacity required. Steam coal came into such short supply that some utilities had to burn higher-priced metallurgical coal.

The problem of coal supplies was further compounded by a shortage of hopper cars that prevented rail-

Nation's production of residual oil slides as refiners improve their processes, allowing imports to make up the difference



SOURCE: U.S. Bureau of Mines

roads from maintaining a smooth flow of coal to generating plants. Most of the transport problem was the result of cars being tied up at the docks waiting for coal to be unloaded into freighters for shipment overseas.

As coal prices rebounded and utilities sought long-term contracts with coal companies, mine operators once again expanded their steam-grade operations. And as railroads added new hopper cars and facilities were built for dumping coal at the docksides, the bottleneck in transportation eased.

With adequate production of steam coal reestablished and the coal industry geared for further increases in demand, coal offers one important advantage over other fossil fuels: there are enough proved coal reserves in this country to supply consumption at the current rate for at least a century. By contrast, available oil and gas reserves can be measured only in decades.

There are several offsetting disadvantages to coal, however. The steam grades now being mined have a high sulfur content and are comparatively expensive to produce. Much of the coal could be mined more economically by stripping away surface rock and soil and mining the exposed beds from the surface. Conservationists, however, are firm in their opposition to this type of mining. The industry also suffers from recurring labor problems that could shut utilities off from this source of energy. Utilities burning coal usually carry large stocks of the fuel, but a prolonged strike would exhaust their supplies.

There are abundant reserves of low-sulfur coal in the Rocky Mountain states that would be comparatively cheap to mine. But these reserves are too far from large utility markets for the coal to be transported economically by rail. It might be pumped more efficiently through pipelines as slurry. As an alternative to the development of cheaper transportation, improved power transmission systems would allow distant reserves to be converted into electrical energy near the mine.

Economically feasible solutions to the problems of distance and the environmental problems of strip-mining and air pollution could make conventional steam plants fueled by coal highly competitive with nuclear-powered plants for some time to come.

. . . residual fuel oil . . .

Like much of the shortage of coal, the shortage of residual fuel oil also resulted from transportation prob-

lems–in this case, the availability of tankers. The residual fuel oil burned in generating plants on the East Coast is ordinarily imported from Caribbean refineries as a substitute for low-sulfur coal. The closing of the Suez Canal and a break in the Trans-Arabian Pipeline interrupted the normally short flow of oil from North Africa and the Middle East across the Mediterranean to markets in Europe, forcing European supplies to be shipped around the tip of South Africa. The longer route created the need for more tankers to meet European demand for oil, and ships were pulled off other trade routes–including those in the Caribbean–to carry oil to Europe.

Demand for low-sulfur residual fuel oil soared as utility companies tried both to comply with increasingly stringent air pollution standards and to overcome the short supplies of coal and growing scarcity of natural gas. For a decade, demand for residual oil had risen at an annual rate of only 2 percent. But consumption last year surged 10 to 15 percent in some localities, and demand for use in generating electricity was boosted 34 percent. Most of this sharp increase was, of course, along the Eastern Seaboard, where import prices make residual oil most competitive with other utility fuels.

A residual product of petroleum refining, this fuel usually sells for less than the crude oil from which it is derived. The more volatile grades of distillate are used primarily in home heating, leaving the less desirable residual oil to be sold as industrial and utility fuel. Domestic refiners have been fairly successful in reducing their production of residuals, leaving most of the domestic utility needs to be met by foreign refiners. Because of their proximity to the East Coast, refineries in the Caribbean furnish 93 percent of the residual fuel oil consumed in this country.

East Coast utilities are not as concerned about domestic crude reserves as they are reserves of natural gas, but they are concerned about the continued availability of foreign oil at favorable prices. Interruption of the established flow of tanker traffic last year caused transportation costs and eventually foreign crude prices to soar, wiping out for the time a $1.25 difference in East Coast prices of foreign and domestic crude.

To cut costs by increasing their economies of scale, shipping companies stepped up their purchases of supertankers. But demand for Middle East crude was so great that deliveries of these giant new ships could not keep up.

Adding further to the supply problem in residual fuel markets on the East Coast was the plant and storage capacity of Caribbean refineries. Capacity of these refineries put a ceiling on the amount of residual fuel available from this source, and although refiners in the United States tried to help by increasing their residual output, prices of even high-sulfur residual rose. To stretch the short supplies, utilities in some areas mixed high-priced distillate and sometimes even low-sulfur crude with the high-sulfur residual in an effort to lower the average sulfur content of the fuels available to them.

But also, apart from the rise in transportation costs, crude prices themselves have risen. The growing dependence of industrial countries on imported crude oil gives producing countries increased leverage in negotiating higher prices. Although some concessions for price stability were gained by major international oil companies insisting on long-term contracts with producing countries in North Africa and the Middle East, the tax and posted price increases negotiated with these countries set a rising trend in crude prices. Other petroleum-exporting countries, of course–such as Venezuela, which supplies most of the crude refined in the Caribbean–quickly achieved parity.

With the upward movement in negotiated crude prices, utilities must expect to pay more for residual oil. With demand for energy also rising in other parts of the world, competition for oil supplies could become intense. Some experts interpret the price negotiations between oil companies and producing countries as meaning a sellers' market in world oil could eventually eliminate the price differences between foreign and domestic petroleum products.

. . . and natural gas

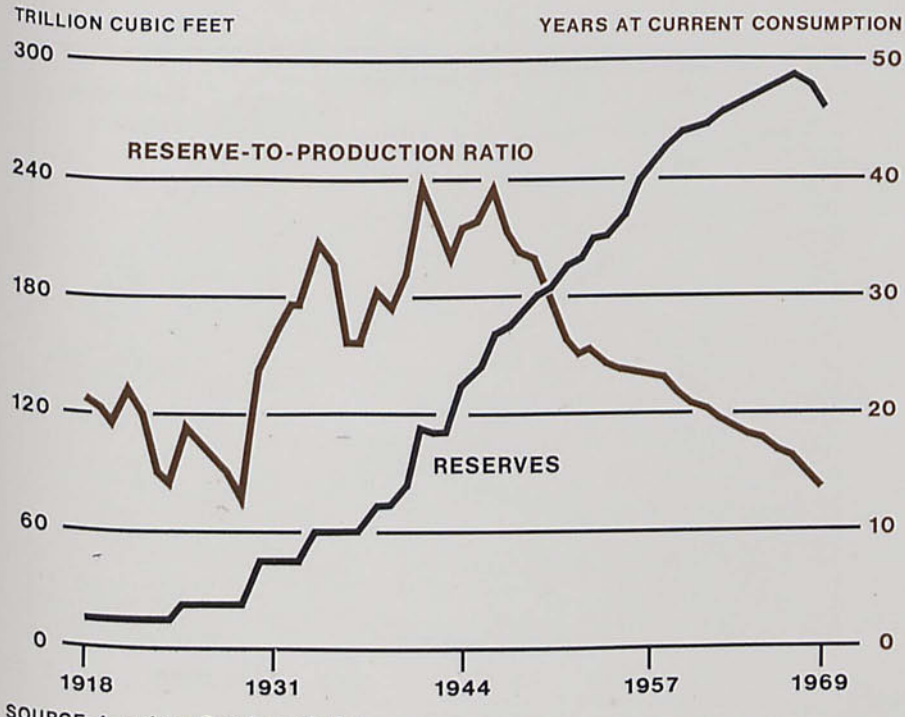
The shortage in natural gas is the result of a sharp decline in reserves relative to demand. Natural gas is the second most important utility fuel, and its importance continues to increase. Gas accounted for about 20 percent of the electricity generated in 1950. In 1969, it accounted for about 28 percent–and this relative gain was in the face of a sixfold increase in the amount generated by gas.

This growth exaggerates the importance of natural gas to areas threatened by fuel shortages, however. Because of the high cost of transmitting gas to distant markets, this fuel is most attractive to utilities near gas-producing areas. Power companies in Texas, Louisiana, and California–all major gas-producing states with few problems in power generation–use more than half the gas consumed in the production of electricity.

The outlook, in fact, is probably for a decline in the proportion of the nation's total capacity fueled by gas. Most observers consider the only possibility for a change in this outlook to be a major breakthrough either in the cost of transporting liquefied natural gas from overseas or in the cost of manufacturing gas from coal or oil products.

Consumption of natural gas has increased dramatically since World War II, but the discovery of new

With increased production of natural gas, relative availability of reserves falls and total reserves finally turn downward



SOURCE: American Gas Association

reserves has not kept pace. In the last few years, in fact, the gas industry has drifted from a position of gradually expanding reserves to one threatened by declining reserves. And unless there is a marked improvement in gas supplies, utilities and other industrial users are at a potential disadvantage in competition with residential users.

For one thing, utilities sometimes buy gas with the understanding that their service can be interrupted when the gas is needed to meet demands of residential users. Under this arrangement, gas transmission companies can allow consumption by utilities to help smooth out the flow of gas through their pipelines and, therefore, can offer utilities a lower price than otherwise.

For another, the Federal Power Commission, which regulates the interstate sale of gas, has maintained that in event of a gas shortage, residential users should be given preference over other users. And already some gas companies are having difficulties meeting their current commitments and have to turn away some customers.

Unlike oil, which can be imported, almost all natural gas must be supplied from within the country. There is very little natural gas imported from Mexico and Canada. The situation with Mexico is not expected to change in the near future, and any increase in imports from Canada will depend on the development of reserves and markets in that country. So far, the only reserves Canada has been willing to commit to U.S. markets have been those surplus to its domestic needs.

Prospects for significant increases in imports from other areas are also bleak, even though some areas abroad have abundant gas reserves. The problem, again, is transportation costs. More cryogenic tankers are being built, and several companies have plans for using them to import liquefied natural gas. To increase overseas imports significantly, however, large fleets of these new ships will have to be operated at a cost low enough to narrow the gap between domestic and import prices.

Gas manufactured from coal or petroleum has been suggested as a possible supplement to natural gas reserves. But while technically feasible, such conversion would be considerably more expensive than the production of natural gas and, for the foreseeable future, would not be competitive. Should gasification processes become economically feasible, plants would probably be located near consumer markets to reduce the cost of pipeline transmission. That assumes, of course, that gasification could be done without creating pollution problems.

Despite the outlook for a decline in the importance of natural gas as a utility fuel, the possibility of a breakthrough in prices that might reverse such a trend cannot be discounted. Given the very marked advantage of natural gas as a clean-burning fuel and the continued possibility of shortages in other utility fuels, natural gas could retain its share of the utility market for some time–and even continue to expand it. Last winter, for example, utilities in New England–which is totally dependent on imports for fuel–were forced to buy liquefied gas from Algeria. The high prices and limited availability of other fossil fuels had made the purchase of what is probably the most exotic of these fuels entirely practical.

Outlook for planners

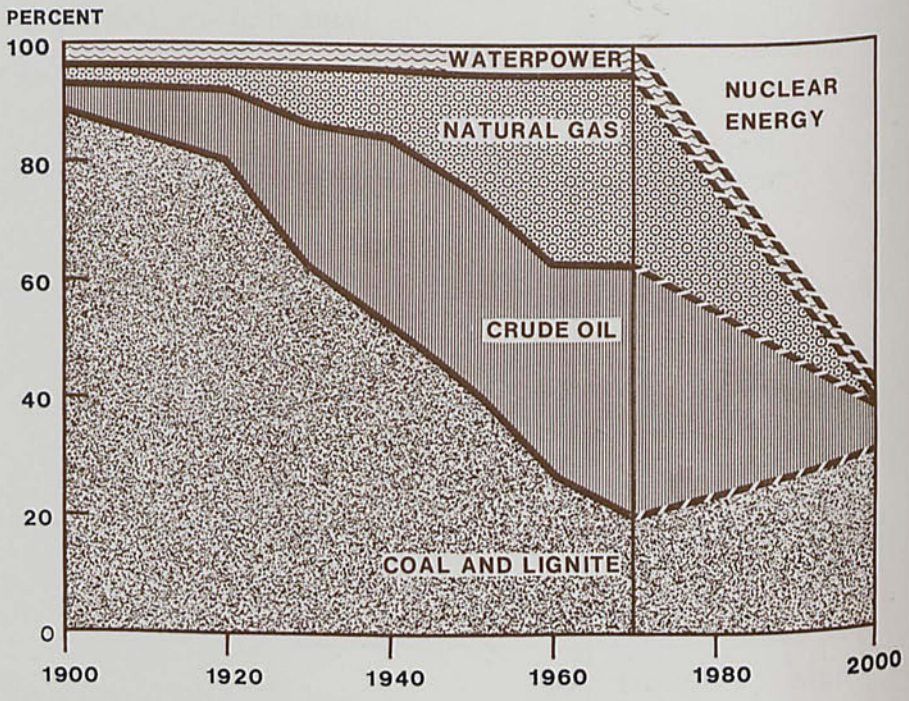
Forecasters–viewing, on the one hand, the rising costs and declining

availability of fossil fuels and, on the other, the almost certain continued sharp rise in demand for electricity–again see nuclear power as the important component in future generating capacity. Their outlook is significantly different from that of the 1950's and early 1960's, however. Where projections then were for nuclear facilities to supplant conventional plants, they are now for nuclear plants merely to supplement conventional plants. In line with these new projections, the increase in investment in nuclear plants is not expected to affect plans for investment in plants based on fossil fuels.

According to current projections, the nation's daily consumption of energy is expected to reach the equivalent of 100 billion barrels of crude oil by the year 2000. Nearly half that will be electricity, and more than half the electricity will come from nuclear plants. Already this year new orders for nuclear equipment have begun to increase.

The future continues to challenge the planners, however. Not only is the future of fossil fuels uncertain, but there are also uncertainties in nuclear power–both in the public's acceptance of nuclear plants and in the availability of reserves of fissionable materials. Recent discoveries of new uranium deposits have been encouraging. But some geologists are still concerned that there may not be enough uranium reserves to support the nuclear generation needed to meet projected demands.

Trends in power generation to shift, with nuclear energy driving most new plants and coal increasing its share of the market



SOURCES: U.S. Bureau of Mines and Federal Reserve Bank of Dallas

Much of the belief that nuclear plants can be a major help in meeting future demand stems from the expectation that breeder reactors will be available to take the pressure off ore supplies in 10 to 20 years. Recently, in announcing a broad Government program of nuclear development, the President emphasized the importance of efforts to develop a breeder reactor. But counting on breakthroughs in technology adds further to the uncertainties in forecasting that already plague planners.

Meanwhile, rising fuel costs, persistent needs to transport fuels over ever-greater distances, and growing ecological restraints also make it hard for utilities to plan expansion of their conventional capacities.

–Stephen L. Gardner
Edward L. McClelland

New par bank

The Northgate State 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, June 9, 1971. The officers are: Leonard Rauch, Chairman of the Board; Sterling Emens, Jr., President; Eric M. Hilton, Vice President (Inactive); and Thomas W. Custer, Cashier.

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

Federal Reserve Bank of Dallas
July 1971

Statistical Supplement to the Business Review

Texas followed the nation in posting a slight gain in industrial production in May. At 181.7 percent of the 1957-59 base, the seasonally adjusted Texas industrial production index was 0.3 percent higher than in April and 2.3 percent higher than in May 1970.

The rise was due entirely to gains in manufacturing and mining, which posted month-to-month increases of 0.3 percent and 0.4 percent, respectively. Most of the increase in manufacturing was in the output of durable goods, which rose 0.6 percent. Aided primarily by a gain in the manufacturing of wearing apparel, production of nondurable goods rose only marginally.

In the durable goods sector, transportation equipment was still the weakest industry group. Production in this group slipped still further in May, dropping to a level 21.7 percent below a year ago. But production of electrical machinery, which had also been weak, showed a determined rise, advancing to a level only 9.1 percent below a year ago.

Continued advances in petroleum production accounted for all the rise in mining output. Crude production reached a point 5.7 percent higher than in the previous May. Output of utilities, while unchanged from a month earlier, was 8.2 percent higher than in May 1970.

Total nonagricultural wage and salary employment in the five southwestern states increased again in May–but only slightly and less than in April. The advance, a gain of only 0.2 percent, was due mostly to hiring by nonmanufacturing industries.

Manufacturing employment, while still far below last year's level, continued its slow rise, gaining 0.1 percent. Although this slight increase helped narrow the year-to-year difference still further, manufacturing employment was left a significant 4.6 percent lower than a year before.

While nonmanufacturing employment failed to make an impressive gain, rising only 0.2 percent over April, no nonmanufacturing industry group showed a decline. The number of jobs in construction and trade both advanced a significant 0.4 percent, and employment in finance increased 0.3 percent. Other industry groups showed increases of 0.2 percent or less, with employment in transportation and public utilities showing essentially no change.

The Texas oil allowable was cut again for the third consecutive month. The reduction for July–a drop of 6.7 points to 68.7 percent of maximum efficient production–was the largest single drop in two years. Even at this reduced level, however, the rate is still considerably above the 55.5 percent allowed in July last year. As in other recent months, the allowable was reduced in response to lower requests for Texas crude.

The flow rate in southeastern New Mexico was also reduced for July. Made to eliminate excessive gas flaring, the cut to 70 barrels a day at each well was in contrast to an 80-barrel rate in effect since January.

The allowable in Louisiana continues at 75 percent of maximum efficient production. The formula defining maximum efficient production was revised, however, to encourage drilling in the state. The change will allow a slight increase in actual production. In Oklahoma, the allowable was held at 150 percent.

Credit at weekly reporting commercial banks in the Eleventh District rose considerably more than usual in the four weeks ended June 23. The expansion was accommodated mainly through an increase in net purchases of Federal funds.

An increase in loans accounted for nearly all the sharp rise in bank credit. Bank holdings of securities rose only slightly. And more than half the increase in loans went to businesses, reflecting perhaps financing needs associated with a buildup in automobile dealers' inventories and possibly some further stockpiling of steel. Increases in other types of loans were no more than in comparable periods of other recent years–and in some cases less.

Although less than the rise in loans, the rise in security holdings was more than normal for this period. The advance resulted from banks making greater than usual additions to their holdings of municipal securities. Their holdings of U.S. Government issues actually declined.

Deposits rose less than usual, due largely to a small rise in demand deposits. Time and savings deposits declined, but less than is typical for this period. Large CD's outstanding fell slightly less than normal, and other time and savings deposits rose contraseasonally. On balance, these banks increased their borrowings from nondeposit sources, particularly in the Eurodollar market.

(Continued on back page)

CONDITION STATISTICS OF WEEKLY REPORTING COMMERCIAL BANKS

Eleventh Federal Reserve District

(Thousand dollars)

ASSETS	June 23, 1971	May 26, 1971	June 24, 1970
Federal funds sold and securities purchased under agreements to resell	631,408	565,545	537,750
Other loans and discounts, gross	6,950,763	6,785,257	6,039,341
Commercial and industrial loans	3,310,580	3,207,089	2,949,883
Agricultural loans, excluding CCC certificates of interest	125,734	121,771	106,133
Loans to brokers and dealers for purchasing or carrying:			
U.S. Government securities	500	540	500
Other securities	57,056	62,515	34,313
Other loans for purchasing or carrying:			
U.S. Government securities	5,195	5,226	1,265
Other securities	427,458	426,885	391,563
Loans to nonbank financial institutions:			
Sales finance, personal finance, factors, and other business credit companies	183,807	177,933	136,251
Other	519,999	496,460	371,247
Real estate loans	714,411	705,912	622,825
Loans to domestic commercial banks	15,475	16,747	6,175
Loans to foreign banks	24,798	19,896	9,695
Consumer instalment loans	764,315	755,866	727,465
Loans to foreign governments, official institutions, central banks, and international institutions	0	0	0
Other loans	801,435	788,417	682,026
Total investments	3,191,450	3,168,116	2,523,865
Total U.S. Government securities	995,507	1,020,987	879,588
Treasury bills	137,601	145,666	32,797
Treasury certificates of indebtedness	0	0	0
Treasury notes and U.S. Government bonds maturing:			
Within 1 year	167,385	157,206	137,249
1 year to 5 years	544,996	539,771	607,571
After 5 years	145,525	178,344	101,971
Obligations of states and political subdivisions:			
Tax warrants and short-term notes and bills	94,507	72,319	12,612
All other	1,871,874	1,823,427	1,479,804
Other bonds, corporate stocks, and securities:			
Certificates representing participations in Federal agency loans	93,883	108,623	82,513
All other (including corporate stocks)	135,679	142,760	69,348
Cash items in process of collection	1,264,067	1,207,695	1,113,923
Reserves with Federal Reserve Bank	926,983	864,754	670,182
Currency and coin	91,689	91,305	89,486
Balances with banks in the United States	510,028	529,633	423,800
Balances with banks in foreign countries	8,756	8,430	8,256
Other assets (including investments in subsidiaries not consolidated)	471,829	463,716	524,051
TOTAL ASSETS	14,046,973	13,684,451	11,930,654

LIABILITIES	June 23, 1971	May 26, 1971	June 24, 1970
Total deposits	10,963,856	10,914,441	9,059,979
Total demand deposits	6,331,266	6,268,588	5,655,875
Individuals, partnerships, and corporations	4,319,119	4,299,058	3,823,457
States and political subdivisions	413,375	384,642	335,653
U.S. Government	142,387	188,057	219,113
Banks in the United States	1,312,356	1,282,324	1,179,025
Foreign:			
Governments, official institutions, central banks, and international institutions	2,321	2,719	3,982
Commercial banks	34,603	24,079	23,308
Certified and officers' checks, etc.	107,105	87,709	71,337
Total time and savings deposits	4,632,590	4,645,853	3,404,104
Individuals, partnerships, and corporations:			
Savings deposits	1,072,127	1,063,802	923,398
Other time deposits	2,459,623	2,455,709	1,703,954
States and political subdivisions	996,813	1,012,835	734,335
U.S. Government (including postal savings)	20,096	24,349	9,478
Banks in the United States	64,346	68,973	17,389
Foreign:			
Governments, official institutions, central banks, and international institutions	18,485	19,085	14,200
Commercial banks	1,100	1,100	1,350
Federal funds purchased and securities sold under agreements to repurchase	1,420,126	1,161,146	1,038,453
Other liabilities for borrowed money	91,116	72,738	219,766
Other liabilities	369,782	335,715	471,309
Reserves on loans	130,137	128,287	133,883
Reserves on securities	20,753	20,753	14,290
Total capital accounts	1,051,203	1,051,371	992,974
TOTAL LIABILITIES, RESERVES, AND CAPITAL ACCOUNTS	14,046,973	13,684,451	11,930,654

RESERVE POSITIONS OF MEMBER BANKS

Eleventh Federal Reserve District

(Averages of daily figures. Thousand dollars)

Item	4 weeks ended June 2, 1971	4 weeks ended May 5, 1971	4 weeks ended June 3, 1970
RESERVE CITY BANKS			
Total reserves held	816,747	831,580	734,308
With Federal Reserve Bank	761,206	775,784	680,488
Currency and coin	55,541	55,796	53,820
Required reserves	825,994	830,437	736,306
Excess reserves	—9,247	1,143	—1,998
Borrowings	1,928	0	33,647
Free reserves	—11,175	1,143	—35,645
COUNTRY BANKS			
Total reserves held	875,439	883,753	782,505
With Federal Reserve Bank	682,960	689,558	601,303
Currency and coin	192,479	194,195	181,202
Required reserves	844,281	855,712	754,778
Excess reserves	31,158	28,041	27,727
Borrowings	48	243	12,986
Free reserves	31,110	27,798	14,741
ALL MEMBER BANKS			
Total reserves held	1,692,186	1,715,333	1,516,813
With Federal Reserve Bank	1,444,166	1,465,342	1,281,791
Currency and coin	248,020	249,991	235,022
Required reserves	1,670,275	1,686,149	1,491,084
Excess reserves	21,911	29,184	25,729
Borrowings	1,976	243	46,633
Free reserves	19,935	28,941	—20,904

CONDITION STATISTICS OF ALL MEMBER BANKS

Eleventh Federal Reserve District

(Million dollars)

Item	May 26, 1971	April 28, 1971	May 27, 1970
ASSETS			
Loans and discounts, gross	13,152	13,086	11,621
U.S. Government obligations	2,330	2,307	1,988
Other securities	4,160	4,152	3,323
Reserves with Federal Reserve Bank	1,458	1,449	1,180
Cash in vault	276	285	262
Balances with banks in the United States	1,333	1,421	1,161
Balances with banks in foreign countries[e]	10	10	9
Cash items in process of collection	1,397	1,433	1,224
Other assets[e]	919	972	936
TOTAL ASSETS[e]	25,035	25,115	21,704
LIABILITIES AND CAPITAL ACCOUNTS			
Demand deposits of banks	1,660	1,721	1,502
Other demand deposits	9,568	9,680	8,671
Time deposits	9,545	9,541	7,395
Total deposits	20,773	20,942	17,568
Borrowings	1,292	1,275	1,151
Other liabilities[e]	1,102	1,027	1,225
Total capital accounts[e]	1,868	1,871	1,760
TOTAL LIABILITIES AND CAPITAL ACCOUNTS[e]	25,035	25,115	21,704

e — Estimated

CONDITION OF THE FEDERAL RESERVE BANK OF DALLAS

(Thousand dollars)

Item	June 23, 1971	May 26, 1971	June 24, 1970
Total gold certificate reserves	454,714	329,974	369,380
Discounts for member banks	14,700	0	78,060
Other discounts and advances	0	0	5,040
U.S. Government securities	2,940,793	3,013,420	2,463,455
Total earning assets	2,955,493	3,013,420	2,546,555
Member bank reserve deposits	1,532,168	1,457,612	1,208,827
Federal Reserve notes in actual circulation	2,029,833	1,986,396	1,774,603

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]			
		Percent change				Annual rate of turnover		
	May 1971 (Annual-rate basis)	May 1971 from April 1971	May 1971 from May 1970	5 months, 1971 from 1970	May 31, 1971	May 1971	April 1971	May 1970
ARIZONA: Tucson	$ 7,722,432	3%	29%	24%	$ 261,411	29.4	28.7	25.5
LOUISIANA: Monroe	3,484,596	9	28	20	91,877	37.6	34.1	32.2
Shreveport	10,707,684	—11	29	14	268,137	41.0	48.0	35.9
NEW MEXICO: Roswell[2]	969,312	—5	6	2	38,785	24.9	25.9	25.6
TEXAS: Abilene	2,344,320	0	12	9	106,792	21.8	21.6	21.2
Amarillo	6,437,400	2	11	8	163,919	38.8	38.0	36.4
Austin	10,810,476	7	22	16	411,726	26.8	26.7	26.1
Beaumont-Port Arthur-Orange	6,673,080	0	12	8	253,778	26.4	26.7	25.7
Brownsville-Harlingen-San Benito	2,109,192	—4	20	16	87,482	24.8	26.1	23.6
Corpus Christi	6,843,252	11	37	27	279,819	24.3	21.7	24.2
Corsicana[2]	473,340	—15	3	13	33,282	14.1	16.2	14.7
Dallas	128,882,652	—4	15	12	2,343,237	54.8	57.4	52.8
El Paso	8,458,392	5	29	15	252,656	33.4	32.6	28.1
Fort Worth	29,527,536	13	12	18	695,149	42.2	37.6	39.0
Galveston-Texas City	2,893,428	4	6	6	109,120	26.3	25.4	24.8
Houston	110,747,076	—2	11	11	2,737,067	41.0	43.1	40.9
Laredo	1,007,988	0	21	14	43,192	23.5	23.3	21.9
Lubbock	5,217,852	0	26	16	170,676	30.6	31.3	26.6
McAllen-Pharr-Edinburg	2,050,248	4	25	15	108,253	18.8	18.4	16.7
Midland	2,016,540	—3	9	5	137,619	14.6	14.9	14.0
Odessa	1,615,596	—2	5	0	97,262	16.9	17.4	18.2
San Angelo	1,454,472	—5	19	20	75,596	19.6	20.7	18.3
San Antonio	20,045,208	—4	19	19	714,782	28.0	29.2	26.5
Sherman-Denison	1,169,544	—1	11	6	68,567	17.0	17.3	16.6
Texarkana (Texas-Arkansas)	1,595,220	0	14	7	78,511	21.2	21.7	20.0
Tyler	2,322,768	—3	6	7	107,969	22.3	23.6	24.6
Waco	3,229,272	—5	11	7	131,747	25.0	26.1	25.3
Wichita Falls	2,622,444	—1	18	14	125,583	21.4	21.7	19.1
Total—28 centers	$383,431,320	—1%	15%	13%	$9,993,994	38.5	39.6	37.1

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

BUILDING PERMITS

Area	NUMBER		VALUATION (Dollar amounts in thousands)				
					Percent change		
					May 1971 from		
	May 1971	5 mos. 1971	May 1971	5 mos. 1971	April 1971	May 1970	5 months, 1971 from 1970
ARIZONA							
Tucson	440	3,710	$ 10,377	$ 41,959	11%	140%	100%
LOUISIANA							
Monroe-West Monroe	109	495	1,233	8,941	—39	14	32
Shreveport	481	2,657	5,841	23,253	11	158	90
TEXAS							
Abilene	56	250	2,262	3,944	247	246	12
Amarillo	158	677	2,325	12,835	24	91	—39
Austin	515	2,565	9,553	62,291	—29	—43	25
Beaumont	157	770	809	4,666	—23	24	7
Brownsville	106	449	379	2,834	—60	80	123
Corpus Christi	807	4,232	9,122	28,766	74	706	126
Dallas	1,959	9,510	26,355	120,586	23	—37	—23
Denison	31	185	175	1,699	—72	88	—3
El Paso	517	2,395	11,362	49,966	33	128	27
Fort Worth	419	2,092	27,743	49,922	362	490	57
Galveston	69	339	947	7,073	53	168	128
Houston	5,035	19,338	55,220	263,668	—8	23	44
Laredo	59	246	1,126	4,010	71	—48	6
Lubbock	153	1,139	3,420	32,412	—72	6	49
Midland	72	344	961	6,248	—74	49	242
Odessa	95	445	966	3,613	—10	—26	—25
Port Arthur	59	356	1,322	2,905	278	975	216
San Angelo	73	329	708	4,503	—37	83	—9
San Antonio	1,435	7,043	6,491	47,195	—58	—16	16
Sherman	43	345	395	3,498	—14	—29	—35
Texarkana	47	198	407	5,051	—83	195	22
Waco	299	1,308	1,893	11,779	—67	—72	—38
Wichita Falls	99	405	2,250	10,378	18	44	91
Total—26 cities	13,293	61,822	$183,642	$813,995	1%	23%	23%

WINTER WHEAT

Area	ACREAGE (Thousand acres)			PRODUCTION (Thousand bushels)		
	For harvest	Harvested				
	Crop of 1971	Crop of 1970	Crop of 1969	Crop of 1971[1]	Crop of 1970	Crop of 1969
Arizona	165	150	73	12,375	10,350	4,526
Louisiana	37	33	38	851	957	874
New Mexico	184	184	159	4,232	5,520	4,293
Oklahoma	3,286	3,777	4,150	60,791	98,202	118,275
Texas	1,542	2,267	2,869	29,298	54,408	68,856
Total	5,214	6,411	7,289	107,547	169,437	196,824

[1] Indicated June 1
SOURCE: U.S. Department of Agriculture

GROSS DEMAND AND TIME DEPOSITS OF MEMBER BANKS

Eleventh Federal Reserve District

(Averages of daily figures. Million dollars)

Date	GROSS DEMAND DEPOSITS			TIME DEPOSITS		
	Total	Reserve city banks	Country banks	Total	Reserve city banks	Country banks
1969: May	10,231	4,777	5,454	7,676	2,962	4,714
1970: May	10,233	4,671	5,562	7,394	2,659	4,735
December	11,271	5,161	6,110	8,825	3,554	5,271
1971: January	11,532	5,236	6,296	9,038	3,635	5,403
February	11,272	5,118	6,154	9,299	3,689	5,610
March	11,219	5,117	6,102	9,548	3,788	5,760
April	11,555	5,274	6,281	9,575	3,736	5,839
May	11,348	5,216	6,132	9,516	3,688	5,828

VALUE OF CONSTRUCTION CONTRACTS

(Million dollars)

Area and type	May 1971	April 1971	March 1971	January—May 1971	January—May 1970r
FIVE SOUTHWESTERN STATES[1]	713	864	720	3,431	3,333
Residential building	387	400	399	1,689	1,151
Nonresidential building	193	312	224	1,152	1,086
Nonbuilding construction	134	153	97	589	1,096
UNITED STATES	7,555	7,743	6,386	31,010	27,873
Residential building	3,310	3,168	2,729	12,685	9,333
Nonresidential building	2,264	2,080	2,199	9,893	10,454
Nonbuilding construction	1,981	2,495	1,458	8,432	8,086

[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.

NONAGRICULTURAL EMPLOYMENT

Five Southwestern States[1]

Type of employment	Number of persons: May 1971p	April 1971	May 1970r	Percent change May 1971 from: Apr. 1971	May 1970
Total nonagricultural wage and salary workers	6,319,600	6,306,800	6,292,800	0.2%	0.4%
Manufacturing	1,115,200	1,113,900	1,168,400	.1	—4.6
Nonmanufacturing	5,204,400	5,192,900	5,124,400	.2	1.6
Mining	228,400	228,200	231,300	.1	—1.3
Construction	381,500	380,000	391,300	.4	—2.5
Transportation and public utilities	448,600	448,500	444,900	.0	.8
Trade	1,483,600	1,477,500	1,450,400	.4	2.3
Finance	328,200	327,300	318,800	.3	2.9
Service	1,020,000	1,018,200	1,002,700	.2	1.7
Government	1,314,100	1,313,200	1,285,000	.1%	2.3%

[1] Arizona, Louisiana, New Mexico, Oklahoma, and Texas
p — Preliminary
r — Revised
SOURCE: State employment agencies

INDUSTRIAL PRODUCTION

(Seasonally adjusted indexes, 1957-59 = 100)

Area and type of index	May 1971p	April 1971	March 1971	May 1970
TEXAS				
Total industrial production	181.7	181.1	179.9r	177.6
Manufacturing	199.6	198.9	198.2r	198.1r
Durable	197.6	196.5	201.0	212.3r
Nondurable	200.9	200.5	196.4r	188.6r
Mining	139.1	138.6	136.2r	133.8r
Utilities	275.9	275.9	275.9r	255.2r
UNITED STATES				
Total industrial production	167.3	166.2	165.5	169.0r
Manufacturing	165.1	163.9	163.5	168.1r
Durable	158.8	157.4	157.7	167.6r
Nondurable	173.0	172.0	170.7	168.7r
Mining	137.1	138.8	138.7	134.8r
Utilities	248.0	246.0	242.2	234.9

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

DAILY AVERAGE PRODUCTION OF CRUDE OIL

(Thousand barrels)

Area	May 1971	April 1971	May 1970r	Percent change from: April 1971	May 1970
FOUR SOUTHWESTERN STATES	7,070.4	7,206.2	6,734.3	—1.9%	5.0%
Louisiana	2,643.2	2,717.1	2,416.2	—2.7	9.4
New Mexico	338.5	337.0	357.4	.4	—5.3
Oklahoma	603.9	616.0	628.4	—2.0	—3.9
Texas	3,484.8	3,536.1	3,332.3	—1.5	4.6
Gulf Coast	714.1	738.1	673.0	—3.3	6.1
West Texas	1,655.2	1,666.0	1,597.2	—.7	3.6
East Texas (proper)	228.8	232.0	183.1	—1.4	25.0
Panhandle	67.9	72.0	78.7	—5.7	—13.7
Rest of state	818.8	828.0	800.3	—1.1	2.3
UNITED STATES	9,797.2	9,913.6	9,523.0	—1.2%	2.9%

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

Agricultural conditions in states of the Eleventh District remain mixed and uncertain. Much of Texas and Oklahoma received rain in late May and early June, but the rain was not enough to break the drouth in Texas and came too late to save small-grain crops in Oklahoma. The wheat crop has suffered setbacks in both states. On June 1, the estimated yield in Oklahoma was off 38 percent from the harvest last year. In Texas, it was off 46 percent. Range and pasture conditions are substantially below ten-year averages in all four western states of the District, and many base herds are endangered.

The outlook depends largely on the adequacy of water supplies. Most irrigated crops are doing well. Because of light snows last winter and almost no spring rain, Arizona and New Mexico face possible water shortages. With Louisiana and now Oklahoma out of the drouth area, prospects for summer crops in these states are good. The most mixed situation is in Texas, where the rains were scattered. Some parts of the state had enough rain to ensure normal crops. Others, however, are still very short on moisture.

Prices for most crops are holding up well, and livestock prices are improving. Shortages due to the drouth give farmers with even near-normal yields the benefit of higher than average prices. Many farmers, however, face not only the prospects of very low yields but the near-certainty of having to pay high prices for feed to supplement their inadequate supplies.

Registrations of new passenger automobiles in Dallas, Fort Worth, Houston, and San Antonio were 8 percent lower in May than in April. Registrations were 7 percent greater than in May 1970, however, and cumulative registrations for the first five months of the year were 9 percent greater than during the same period a year earlier.

Department store sales in the Eleventh District were 9 percent higher in the four weeks ended June 26 than in the corresponding period a year before. Cumulative sales through that date were 8 percent higher than a year before.