6. The Conversion of New York City

The New York City metropolitan area was the largest manufactured-gas market in the United States. Located approximately 100 miles from Philadelphia, it was the next major gas market northeast of Philadelphia. Although pipeline entrepreneurs had expressed interest since the early 1940s in selling natural gas to the New York area utility companies, they found local utility companies wary. During the war, both the FPC and WPB believed that Appalachian-area customers should receive necessary gas supplies before certifying expansion projects farther into the northeast. But after the war, Texas Eastern’s success in attaining FPC certification to sell gas to two Philadelphia distribution companies indicated that regulatory authorities would not prohibit gas sales even deeper into the Northeast. As the cost of manufactured gas increased, the regional utilities considered more seriously the possibility of contracting for natural gas.

New York City and Gas Consumption

The New York City area had an extensive and well-entrenched manufactured-gas industry. The local manufactured-gas industry developed very early in the New York metropolitan area, and New York City alone consumed about 40 percent of all manufactured gas used in the nation. Residential gas consumers burned most of this gas. For natural gas to break into this huge and lucrative market, a pipeline company had to convince federal, state, and local regulatory agencies, as well as the utility companies themselves, that it could arrange twenty-year contracts.
for large quantities of natural gas at prices competitive with manufactured gas.

All the utility companies operating in the New York City area distributed manufactured gas. They included some of the nation’s largest utility companies, such as Consolidated Edison, Brooklyn Union, Public Service of New Jersey, and Long Island Lighting Company. At least one of these utilities, Consolidated Edison, had considered purchasing natural gas for its distribution system as early as the 1920s. Late in that decade, Consolidated Edison hired Ralph E. Davis, a consulting geologist, “to study the feasibility of a pipeline that might be built from that area [eastern Kentucky and West Virginia] to take gas into New York.” Davis’s study concluded that a fifteen-year supply of natural gas existed in the Chattanooga shale in eastern Kentucky and West Virginia suitable for use in Consolidated Edison’s system. But the Great Depression halted all Con Edison’s plans to build such a line. In the early 1930s, after the discovery of the Oriskany Trend in northwestern Pennsylvania and southwestern New York, Consolidated Edison hired Davis again to study the feasibility of building a pipeline from these fields to New York City. The Oriskany discoveries flooded the Appalachian gas market, and the price of gas subsequently fell from a maximum field price of $0.35 per mcf to a low of $0.06 per mcf. But Con Edison’s managers feared that the Oriskany reserve life was limited and therefore not dependable for a long-term supply of gas. According to Davis, “This gas supply did not promise the longevity needed to justify Consolidated Gas Company changing over to natural gas.”

During the late 1930s and early 1940s, Hope Natural Gas and others recognized the potential for profit in selling natural gas to the New York City area. They formed the Reserve Gas Pipeline Corporation to sell excess Texas Gulf Coast gas to northeastern customers, particularly those in New York. Ray Fish, a designer of the proposed line, recalled that the New York market “was all manufactured [gas] and we could see that it was a kind of ailing industry. . . . We tried to sell that deal [Reserve Gas Pipeline] to the New York market . . . but we didn’t make any progress.” The Reserve Gas group contacted Consolidated Edison, Brooklyn Union, as well as utilities in Philadelphia offering them delivered natural gas for $0.23–0.25 per mcf, a price competitive with manufactured gas (see table 6.1). The utilities countered with a maximum purchase price of $0.18 per mcf; this would not support the promotion of the pipeline venture. After the United States entered World War II, the Reserve Gas plan was suspended and then dropped.
The Conversion of New York City

Table 6.1. Manufactured-Gas Production Costs of One Northeastern Company (cost per mcf of 550-Btu gas produced)

<table>
<thead>
<tr>
<th>Production Component</th>
<th>1939</th>
<th>1943</th>
<th>1946</th>
<th>1948</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas generator solid fuel</td>
<td>$0.014</td>
<td>$0.039</td>
<td>$0.068</td>
<td>$0.063</td>
</tr>
<tr>
<td>Oil for generator gas</td>
<td>0.026</td>
<td>0.076</td>
<td>0.120</td>
<td>0.203</td>
</tr>
<tr>
<td>Coke oven and other gas</td>
<td>0.087</td>
<td>0.089</td>
<td>0.064</td>
<td>0.144</td>
</tr>
<tr>
<td>Other production items (ie., labor, maint., etc.)</td>
<td>0.038</td>
<td>0.051</td>
<td>0.065</td>
<td>0.078</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$0.165</strong></td>
<td><strong>$0.255</strong></td>
<td><strong>$0.317</strong></td>
<td><strong>$0.488</strong></td>
</tr>
</tbody>
</table>


Interest in the New York City gas market revived again after World War II, especially during the debate over the postwar use of the Inch Lines. At the hearings before the Special Committee Investigating Petroleum Resources in November 1945, several witnesses discussed the potential for using the Inch Lines to transport gas into northeastern areas, including New York City. One of these speakers, future Texas Eastern organizer E. Holley Poe, stated that the New York, northern New Jersey, and Philadelphia areas needed approximately 65 bcf per year of natural gas to replace petroleum, but not coal, in the manufactured-gas production process. After winning the bid for the Inch Lines, Texas Eastern's original interest in the New York market continued. But the company determined after taking customers in Appalachia and Philadelphia that it was not immediately prepared to contract for large gas sales into the New York market.

THE FORMATION OF TRANSCONTINENTAL GAS

Other entrepreneurs also had focused their interest on the New York market. Claude Williams, bespectacled and nearly bald at his still young forty-two years, hoped to sell gas into the Northeast through either the Inch Lines or a new system. A former assistant secretary of state of Texas, attorney, and self-described independent oil and gas operator, Williams perceived the Inch Lines as a vehicle to finally make it big.3 On February 16, 1946, Williams and his uncle, Rogers Lacy, jointly formed Transcontinental Gas Pipe Line Company, Incorporated, of which Williams was the president, to acquire the Inch Lines. Soon after the company was formed, two other associates, Alfred C. Glassell and Alfred C. Glassell,
Jr., joined Williams and Lacy in order to market their own gas reserves to northeastern customers. Later, Tennessee Gas founders Ray Fish and Clyde Alexander left Tennessee Gas and joined Williams's new venture. Fish, the debonair designer of Tennessee Gas and the unsuccessful Reserve Gas, brought his ideas for a similar line to Williams to be used for the construction of a new one if their effort to acquire the Inch Lines proved unsuccessful.  

Williams, however, planned first an attempt to purchase the Inch Lines. He formally declared his interest in the Inch Lines, or an alternative new line, on March 1, 1946, when he applied for a certificate to construct and operate a pipeline from the Southwest to New York. Williams also offered to purchase the Inch Lines, and the Southwest Emergency Pipe Lines, a much smaller war surplus pipeline system, from the War Assets Corporation, predecessor agency of the WAA, and convert them to gas transmission. Neither the WAC nor the WAA acted on Williams's informal offer.

In the same application, Transcontinental stated that if unsuccessful in purchasing the government pipelines, it would construct a 26-inch line from Corpus Christi, Texas, to Pennsylvania, New Jersey, and New York. This new line would have an initial capacity of 300 mmcf/d, with the possibility of looping the line with an additional 26-inch system as the market developed. Williams's interest in the Inch Lines continued throughout 1946, and he formally bid on them during the first round of bidding in July. After these bids were thrown out by General Littlejohn, Williams continued his efforts to purchase the Inch Lines, and he also planned contingently to build a new pipeline system in case his second bid for the Inch Lines proved unsatisfactory. Williams's group recognized quickly that the New York area comprised a high demand for natural gas, and either the Inch Lines, or a new system, could serve that market. His strategic decision to simultaneously bid for the Inch Lines and promote a new system marked his determination to enter the industry with a major pipeline system. Within the company, he was perceived primarily as a lobbyist, but he also had an entrepreneurial vision.

On December 11, 1946, Transcontinental filed its first amended certificate application based upon its original application of March 1, 1946. In the amended application, the company provided a more detailed description of a new line and estimated that it could construct its own 1,380-mile, 26-inch system for $130 million based on a proposed gas sales price of $2.25 per therm. It would have a capacity of 325 mmcf/d, about 25
percent of which would consist of flare, or residue, gas. The line would extend from Texas through Arkansas, Missouri, Illinois, Indiana, Ohio, and Pennsylvania to a point near the Hudson River, and the company reported that it had already negotiated for gas contracts with eight utilities in New York, Pennsylvania, Maryland, Delaware, and New Jersey.

The certificate application also addressed the continually troublesome issue of manufactured-gas displacement:

The natural gas supplied to these companies will be used mainly for enrichment and reforming in connection with their manufactured gas product. The area is presently being served with various combinations of carbonated water gas, coke oven gas and refinery gas. Applicant has agreed with the utilities serving the territory to expand the market for domestic and superior use of natural gas. In negotiations with utility companies Applicant and the utility companies have tentatively agreed upon a contract whereby the only gas not used for enriching or reforming purposes in connection with their manufacturing and distributing business will be used by them during off heating season in their electric generating stations.

Thus, Transcontinental carefully indicated that its gas supply would not be used by utilities to displace their manufactured-gas sales, particularly during the winter heating season.

Less than two weeks after the company submitted its amended application to the FPC, the New York *Journal of Commerce* published an article confidently predicting that New York would soon receive gas supplies. The writer noted that as much as 1 bcf/d of natural gas was still being wasted in Texas due mostly to careless oil production techniques. Abundant southwestern gas supplies and increasingly interested northeastern utilities assured investors that natural gas pipelines were attractive investments. Rapidly increasing costs associated with maintaining and expanding manufactured-gas facilities in the New York region clearly supported this view. During the 1946–47 winter, Brooklyn Union halted home heating equipment sales to residential customers because of inadequate supplies of manufactured gas. According to a New York business writer, abundant southwestern natural gas would alleviate “the need for plant expansion at present inflated costs of construction” and reduce “dependence on bituminous coal and the United Mine Workers.”

The rising costs of manufactured-gas production, combined with excess natural gas availability in the Southwest and an existing pipeline system connecting the two regions, promised a future of natural gas for New York City.
OPPOSITION TO NATURAL GAS IN NEW YORK

Not unexpectedly, Transcontinental's amended certificate application evoked intense opposition from the solid-fuels industry, railroads, and other natural gas pipeline interests. Eastern Gas and Fuel Associates filed a petition to intervene on December 27, 1946. The firm's attorney, John Gage, cited his client's interest in the market areas of its wholly owned subsidiaries, the Philadelphia Coke Company, the Connecticut Coke Company, the Boston Consolidated Gas Company, and the Old Colony Gas Company, all of which either produced or sold manufactured gas in Pennsylvania and much of New England. The Eastern States Retail Solid Fuel Conference petitioned to intervene. The conference represented the Pennsylvania Retail Coal Merchants Association, Baltimore-Maryland Coal Exchange, New England Fuel Dealers Association, Fuel Merchants Association of New Jersey, Retail Fuel Institute (of Boston, Mass.), New York State Retail Solid Fuel Merchants Association, Delaware State Coal Club, the Coal Dealers Association of Philadelphia, Office of the Coordinator of the Retail Solid Fuel Industry of the City of New York, and a total of 4,900 retail solid-fuel dealer members of these associations. Through its attorney, the conference stated that natural gas importation would result in "serious injury to the anthracite industry and to many thousands of individuals dependent upon it." The Anthracite Institute filed a similar petition with a straightforward message: natural gas should not be introduced into areas which could be adequately served by the solid-fuel industries.

Along with the coal companies, railroads joined the anti-natural gas fracas. Alfred S. Knowlton, representing twenty-three railroads including the Baltimore and Ohio Railroad Company and the Pennsylvania Railroad Company, objected to a Transcontinental certificate on the grounds that natural gas would displace "substantial quantities of anthracite and bituminous coal and coke and other solid fuels upon which petitioners largely depend for traffic and revenue." He also stated that the substitution of natural gas for anthracite and bituminous coal would be "unnecessary and uneconomical. . . . [Natural gas] . . . will substantially reduce petitioners' revenues and to that extent impair their abilities to continue to function efficiently and economically as common carriers in the public interest as required by law." Other opposition to Transcontinental's application included bidders for the Inch Lines, the Organization Committee, Mutual Cooperative Plan of the American Public Util-
ities Bureau and Big Inch Natural Gas Transmission Company, as well as an existing firm, Southern Natural Gas Company.\textsuperscript{15}

Many other petitions to intervene came into the commission as well. The Pennsylvania Public Utilities Commission gave notice of its intention to intervene. Frank Harper, executive secretary of the Public Service Commission of Maryland, requested that the FPC keep his office informed of any developments regarding Transcontinental’s proposed service to Maryland. All these intervenors were focusing their attention on the pipeline’s application even before the WAA had sold the Inch Lines to the highest bidder. But the Inch Lines, an existing system extending into New York, posed a much more immediate threat to the northeastern coal, oil, and railroad interests. And as soon as Texas Eastern won the bid, the various intervenors in Transcontinental’s application refocused their opposition on the new Texas Eastern system.

**CREATING A REGULATED FIRM**

Having lost the bid for the Inch Lines, Claude Williams redoubled his efforts to construct his own pipeline system. Some of his original partners, however, decided to sell back their stock in the venture. Interest among other investors remained after Ray Fish, who had formed the Fish Engineering Corporation in 1946, became a substantial stockholder and proposed to construct the new line. Although not the powerhouse represented by Texas Eastern founders George and Herman Brown, Fish brought much experience in gas pipeline engineering and design to the proposed construction of Transcontinental’s line.

More than anything else, Transcontinental needed an FPC certificate as fast as possible in order to remain competitive with Tennessee Gas and Texas Eastern. On February 17, 1947, Williams requested from the FPC “an immediate hearing on its application to construct a gas transmission line from Texas to the eastern seaboard. . . . Please advise date of hearing as soon as possible.”\textsuperscript{16} Leon Fuquay, secretary of the FPC, pointed out to Williams that before hearings could take place, Williams’s company needed to file “all applicable exhibits listed in part 57.6 (order No. 99) of the commission’s regulations under the Natural Gas Act.”\textsuperscript{17} After receiving and reviewing those documents, the FPC would advise Williams of any dates set for a hearing. Williams, anxious to move ahead, believed that he could sell gas to New York customers for $0.06 per mcf less than Texas Eastern, but first he had to comply with FPC certificate requirements and build a pipeline system.\textsuperscript{18}
At the same time, New York regulatory officials were becoming increasingly concerned about gas shortages within their state. Some of the less populated and industrialized regions of the state did consume locally produced natural gas from small local distributors. One of these companies, the New York State Natural Gas Corporation, planned to sell 15 mmcf/d, and 30 mmcf/d later, to a Canadian company. The New York Public Service Commission (NYPSC), the state’s utility regulatory agency, opposed the plan because of New York’s developing gas shortage problems, in which at least one utility curtailed customers due to a shortage of supply. These and related developments encouraged the NYPSC to support the sale of southwestern-produced natural gas into New York to augment the state’s existing albeit limited production and supply.19

Transcontinental’s intense efforts to build a new pipeline were mired in uncertainty. Although on the surface it seemed that a new gas pipeline was needed and feasible, Claude Williams confronted difficult obstacles. He described his company’s position: “Owners of gas were slow to commit reserves to a new company. Distributors of gas wondered about signing up with a company whose line was still on paper. Investors had to be persuaded that the whole gas industry was as good as it looked and that this particular project would pay out. Large diameter steel pipe and plate from which to make it were really scarce.”20 Transcontinental eventually signed numerous gas supply contracts for takes from fifty-four separate gas fields, many of which were located on the Louisiana coast. The company contracted for steel from the Kaiser Company, Incorporated, and Consolidated Western Steel Corporation, and the pipeline essentially paid for the steel with notes and stock.21

In addition, Transcontinental began preparing for the FPC certificate hearings. The company amassed a multitude of data to prove to the FPC that it could successfully finance and build its line and supply its large metropolitan distribution customers with an adequate supply of gas. However, there was no guarantee that the FPC would grant a certificate, and potential competitors were also preparing to block Transcontinental’s certificate application.

Texas Eastern, for one, was adamantly opposed to Transcontinental’s certificate application, and it asked the FPC to delay the application for as long as possible, if not simply to dismiss it. Having successfully bid on the Inch Lines, Texas Eastern feared that another pipeline might capture New York City, the most prized northeastern gas market. During May,
Texas Eastern petitioned the FPC to intervene in Transcontinental’s certificate application. In a brief filed by Texas Eastern attorney J. Ross Gamble, the company stated that Transcontinental’s service “will largely duplicate the service which can be rendered from the existing facilities of the Intervenor... and would constitute a hazard to the successful operation of the Intervenor’s system to the detriment of the Government of the United States.”

Thus, Texas Eastern’s posture reflected the idea that if Transcontinental’s future operation adversely affected Texas Eastern’s profitability and the company suffered financial difficulties, the government might in some way have to bear Texas Eastern’s resulting burden.

Time was important in the race for the New York market. And both Tennessee Gas and Texas Eastern were eager to beat Transcontinental to New York. Tennessee Gas, though, intended to serve Buffalo, New York, instead of the New York City area. Tennessee Gas’s inability to obtain the necessary twenty-year gas supply contracts for the New York City market prevented negotiations with those utilities. But Tennessee did receive FPC approval to extend its pipeline to Buffalo, New York, and eventually supplied several upstate New York utility customers. Texas Eastern, with its system’s proximity to New York City, discussed gas sales with utilities in New York as well as in other northeastern areas. Soon after winning the bid, E. Holley Poe and Reginald Hargrove, who in 1947 became president of the American Gas Association, began meeting with potential customers in Philadelphia and New York.

Thus, while opposing Transcontinental in the regulatory arena, Texas Eastern attempted to contract with New York area utilities, in part to limit its competitor’s potential range of customers. In late May, nearly one month after Texas Eastern began operating its pipeline, W. E. Bolte, assistant vice-president of Brooklyn Union Gas Company, wrote a letter to Poe that was subsequently referred to Hargrove. The letter expressed Brooklyn Union’s interest in purchasing natural gas from Texas Eastern. Later, in New York, the two Texas Easterners met with Bolte. Hargrove expressed his interest in selling gas to Brooklyn Union. He emphasized, however, that Brooklyn Union, not Texas Eastern, needed to investigate all legal, technical, and engineering problems regarding how Texas Eastern would extend its line to Brooklyn Union. In particular, Hargrove requested information on the feasibility of extending Texas Eastern’s pipeline across the Narrows—the preferable and more economical route—or crossing the Hudson River north of New York City and then bringing
the pipeline through the city. "In either event . . . ," Hargrove wrote, "the question of the availability of pipe will be of paramount importance." In fact, Hargrove's insistence that Brooklyn Union conduct the investigations regarding river crossings for the pipeline and the availability of steel may well have proved to be a tactical mistake. The provider, Texas Eastern in this case, was asking the customer to do all the necessary research for a profitable service Texas Eastern would perform; for its part, Brooklyn Union kept its gas supply options open.

During Texas Eastern's FPC certificate hearings in the summer of 1947, Malcolm F. Orton of the Public Service Commission of New York, testified on his state's interest in natural gas. Orton stated that certain cities in New York experienced shortages of natural gas similar to those experienced by Philadelphia. However, Orton requested that the FPC not certify Texas Eastern to sell gas into Philadelphia until the Appalachian fuel shortage ended. Only then, Orton said, should the FPC permit new gas service in the other northeastern areas. And at that point, he noted, an "opportunity should be afforded to present the claims of other territories than those proposed to be contracted for by the applicant [Texas Eastern], particularly New York City and vicinity." Texas Eastern opposed Orton's contention that it should serve only Appalachian customers until the shortage was over. The FPC, believing that some portion of Texas Eastern's capacity should be dedicated to new markets, did certify Texas Eastern to sell gas to customers in Philadelphia. Once again, however, Texas Eastern's interests were opposed to those of the potential New York area customers. These situations may not have helped the company's long-term strategy of selling gas to New York City. At the same time, Transcontinental engaged in contract negotiations with the New York City utilities.

TRANSCONTINENTAL'S CERTIFICATE HEARINGS

After Transcontinental filed the necessary documents with the FPC, the regulatory agency scheduled public certificate hearings to begin on October 27, 1947. For the hearings, a total of fourteen intervenors supported Transcontinental's certificate application. All of them were either northeastern utilities or public service commissions anxious to have natural gas supply in their areas. Opposing intervenors included the expected panoply of coal, railroad, and labor organizations which feared that the introduction of natural gas into the New York metropolitan area
would have serious economic effects on their business. Several gas pipeline companies including Texas Eastern opposed the application as well.

At the hearings, Transcontinental proposed to construct a transmission line consisting of 1,760 miles of 26-inch pipe, including 80 miles of additional line, and fifteen compressor stations with a total of 160,000 hp to transport 340 mmcf/d. It now estimated the total cost of constructing this system to be $151,380,426, or $20 million more than the company bid for the Inch Lines. A Transcontinental representative maintained that the majority of its gas sales would displace petroleum, not coal, in the manufactured-gas reforming and enriching process. The company also intended to sell large volumes of natural gas to be used for underfiring boilers in electrical generating plants on an interruptible basis.

Although there was some question as to the availability of sufficient quantities of steel necessary to build the system, a Special Subcommittee on Petroleum of the Committee of Armed Service of the House of Representatives noted that "the provision of steel to those who plan to construct such pipe lines [natural gas] is of No. 1 priority in importance." The subcommittee encouraged any means through which petroleum consumption could be reduced, including increased natural gas use. Although the war had been over for more than two years, the immediate availability of petroleum in case of future conflict stimulated Congress to support all ways to reduce petroleum consumption in order to conserve the fuel for future emergency situations.

The first round of hearings ended on February 21, 1948. The FPC was clearly dissatisfied with certain aspects of Transcontinental's application, particularly in regard to its lack of planning for northeastern gas storage facilities and inadequate gas supply contracts. The next step in the hearings process, which included filing briefs for the concluding oral arguments, allowed at least one of its challengers to take advantage of the company's poor showing during the hearings.

The newly organized Texas Eastern provided some of the most aggressive opposition to Transcontinental's application. Earlier in the year, Texas Eastern's president, Reginald Hargrove, announced his company's intention to build a separate 26-inch pipeline to add 400–450 mmcf/d to the company's capacity. This line, Hargrove stated, would supply gas to New York and lower New England, the same general market area targeted by Transcontinental. During Transcontinental's hearings, Texas Eastern attempted to block the competing project with a motion filed with the FPC.
to dismiss its application to build the line. A Texas Eastern attorney argued that the line was not necessary because ultimately his company intended to serve the New York area and the newly proposed project would adversely affect the orderly economic development of Texas Eastern’s system “and would have a detrimental effect on the potential natural gas consumers in the area to be served.”

The FPC denied Texas Eastern’s motion and took the opportunity to make an important point regarding competition in the interstate gas pipeline business. The FPC replied: “It is manifest that Texas Eastern seeks to obtain a monopoly of the natural gas markets in the Middle Atlantic seaboard area. We cannot subscribe to the thought that Texas Eastern is entitled to preempt such markets or that recognition of such prospective monopoly is in the public interest. It is therefore concluded that the position taken by Texas Eastern in this regard is without merit.”

The commission told Texas Eastern that it “should go out and fight for business.” The FPC proved in this instance that it would allow and encourage competition for gas markets. The FPC acknowledged here that it was treating the natural gas pipeline industry as one with oligopolistic powers where several of the highly capital-intensive systems could serve the same customer in a competitive business environment. Although the FPC rebuffed Texas Eastern’s challenge, the agency remained displeased with Transcontinental’s lack of interest in pursuing storage facilities and its inadequate gas purchase plan.

On March 31, 1948, the FPC announced that Transcontinental “had not demonstrated that it possessed an adequate supply of natural gas with which to support its proposed project.” The company testified previously during the hearings that it had investigated gas storage facilities in New York and Pennsylvania, and that the inclusion of a storage project in its plans would increase the overall cost of its gas by $0.045 per mcf. However, the FPC reopened the hearings and allowed Transcontinental to present additional evidence to prove that it had commitments for its maximum daily gas requirements for twenty years, and this time the FPC agreed.

As with both Tennessee Gas and Texas Eastern before it, anxious potential customers and interested state public utility commissions greatly aided Transcontinental’s application. In 1948, the New York Public Service Commission, which regulated the sale of natural gas by utilities within the state, recommended that gas utilities in New York not already negotiating with Transcontinental intervene in the hearings and request natural gas
for their own systems.\textsuperscript{31} The NYPSC stated that manufactured-gas companies throughout New York, as well as throughout the nation, were undergoing a rapid inflationary period: Utilities "are faced with operating costs which have increased in some instances to a point where not only is there no return on investment but substantial deficits are experienced."\textsuperscript{32} Unexpectedly, Consolidated of Baltimore also made a request for natural gas. Although it had not previously negotiated for gas purchases from Transcontinental, the Baltimore gas distribution utility indicated during the hearings that it was also seeking sufficient quantities of natural gas with which to convert its system from manufactured gas to natural gas. Natural gas, which cost less and had twice the heating value of manufactured gas, promised to be a more economical and efficient fuel.\textsuperscript{33}

In considering Transcontinental's application, the FPC acknowledged that the existing northeastern petroleum shortage could be alleviated if natural gas supplies were sufficient to replace the fuel oil used to produce manufactured gas. The FPC encouraged any measures to conserve petroleum products, and the agency estimated that natural gas would displace 629 million gallons of fuel oil per year. The FPC considered this to be a positive step in the alleviation of the ongoing oil shortage rather than an economic hardship to be imposed on the oil industry.\textsuperscript{34}

However, the displacement of solid fuels, particularly coke and coal, presented a more controversial problem. Despite Transcontinental's earlier statements that its customers would use natural gas only to enrich manufactured gas and displace the fuel oil used in the manufactured-gas production process, it became clear during the hearings that the new natural gas supplies would also displace significant amounts of coal and coke. The utilities planning to purchase natural gas showed that they would reduce their coke consumption for the production of manufactured gas by 600,000 tons annually. Moreover, Transcontinental proposed to sell 22.5 bcf of natural gas to utilities for underfiring boilers in their gas plants and electrical generating stations. These sales would displace approximately 860,000 tons of coal during the pipeline's first year of operation.\textsuperscript{35}

The FPC, on the other hand, noted that "the economic impact of the relatively small and decreasing displacement of coal resulting from the project upon the interests of the coal and associated intervenors should not be serious."\textsuperscript{36} According to the figures presented, the distribution companies, by using natural gas instead of oil in the manufactured-gas enriching process, would save as much as $35 million, which would be
reflected in lower fuel bills to a total of 4 million customers, a cost and price reduction the FPC could not ignore.

On May 29, after a somewhat tumultuous series of hearings, the FPC finally issued a certificate to Transcontinental. The entire process lasted nine months, required 200 witnesses, filled 9,000 pages, and cost approximately $500,000. The FPC imposed a litany of conditions on Transcontinental's certificate. The FPC required the company to begin actual pipe laying within one year, and it ordered the pipeline company to have its system operational and delivering gas to its customers within twenty-eight months of the May 29 certification date. The FPC also requested quarterly progress reports on construction activities, a tariff consisting of rates, charges, and classifications, among other features, satisfactory to the FPC. Finally, the FPC ordered the pipeline to continue investigating storage facilities for its own system and requested that it consider gas sales to the Columbia system, and others in Appalachia, for their storage systems and to report back within two years. Although Transcontinental's presentation to the FPC in its hearings was barely satisfactory, northeastern demand for gas encouraged the FPC to grant the certificate and guide the company through its construction and initial organization phase.

SELLING NATURAL GAS TO NEW YORK CITY

After the hearings concluded, Transcontinental quickly filed a petition to enlarge its system, even before it had begun construction. The company proposed to use 1,210 miles of 30-inch pipe in place of its original 26-inch pipe. In addition, the company wanted to modify its compressor station system in order to increase the capacity of the pipeline from the original 325 to 505 mmcf/d. The FPC approved the application and modified the line construction schedule so that construction would begin by May 29, 1949, and end no later than April 1, 1951.

Transcontinental Gas broke ground for its line, hailed as the "world's longest natural gas pipeline," on May 23, 1949, in Laurel, Mississippi. Construction began less than one week before the FPC's deadline, but significant pipe-laying activity did not begin until July. The southern segment of the 1,840-mile pipeline path was divided into six 100-mile segments, and this portion was completed by the end of the year. In December, the company began laying pipe on the New Jersey side of the Hudson River and worked southward to meet the system's main line. During 1950, fourteen pipe-laying crews completed the remainder of the
system. Before the line reached New York, the company began its first gas deliveries to Danville, Virginia, along the pipeline route. Transcontinental, now a $233 million pipeline, expected to be delivering gas to its New York customers by early 1951 (see map).\textsuperscript{39}

Before Transcontinental completed its pipeline, Texas Eastern captured one of its prospective customers. The relatively small New York and Richmond Gas Company was dissatisfied with its treatment by Transcontinental. The company originally had to intervene, or appeal, to the FPC for inclusion among the retail distributors to receive Transcontinental gas and, although successful, had been granted only 2.5 mmcf/d out of an initial capacity of 340 mmcf/d. Companies such as Consolidated Edison of New York, Public Service of New Jersey, and Brooklyn Union Gas, although having many more customers, still received disproportionately higher allocations. Further, those utilities planned to use the natural gas as a substitute for oil in the gas-enriching process; Richmond Gas wanted to convert entirely to natural gas use. Its management felt that complete conversion to natural gas would bring substantial profits to the company and lower costs to the customer. Moreover, since Texas Eastern had transmission lines to the south in nearby New Jersey, distribution lines to that area, including Staten Island, supplied by Texas Eastern gas, could be constructed with modest capital outlays.\textsuperscript{40}
Consequently, New York and Richmond applied to the FPC to be served by Texas Eastern instead of Transcontinental Gas. The FPC agreed, allowing New York and Richmond to cancel its allocation from Transcontinental. In late August, Texas Eastern became the first pipeline company to deliver natural gas to New York City when it commenced gas deliveries to the New York and Richmond Gas Company, which served Staten Island, the Richmond borough of New York City. In a ceremony marking the historic event, New York's mayor, William O'Dwyer, lit the first natural gas flame on Staten Island produced from gas supplied by Texas Eastern. In the first full year of operation with natural gas, New York and Richmond earned a net profit of $200,000 after a loss of $45,000 in 1948. Moreover, during 1949 the company passed on a 11 percent rate reduction to customers. Although Texas Eastern captured a New York City area utility before Transcontinental began delivering gas into the area, its prize was more symbolic than anything else. Nonetheless, Texas Eastern served notice that its initial exclusion from the larger area utilities did not necessarily mean a cease-fire in the ongoing competition for new northeastern customers.

Once certified, constructed, and operational, Transcontinental quickly became a competitive factor and one of the top three pipelines vying for a share of the northeastern market (see table 6.2). It was not only preparing to deliver gas into the New York City area, it had begun selling gas to the Philadelphia Electric Company, one of Texas Eastern's prized customers, and exemplifying in the process the FPC's policy of treating the natural gas industry as a natural oligopoly. Although Transcontinental's gas sales of 57 mmcf/d to Philadelphia Electric "was nearly three times the amount received in 1950 [from Texas Eastern], it was not nearly enough to warrant a complete changeover to natural gas."41 In fact, most of Transcontinental's gas was reserved for its New York customers.

Despite the heated competition between Texas Eastern and Transcontinental for New York, cooperation among the growing network of gas pipelines was essential for the successful operation of the gas industry as a whole. Late in December 1950, as Transcontinental was preparing its line for operation, a work stoppage at Public Service of New Jersey's manufactured-gas plants created a system-wide gas shortage. Transcontinental then contracted for emergency deliveries from Texas Eastern to purge and pressurize the trunk line so that it could begin delivering natural gas early to Public Service of New Jersey. Later, Texas Eastern agreed to sell part of
The Conversion of New York City

Table 6.2. Transcontinental Gas Pipe Line Corporation Operations, 1951–1954

<table>
<thead>
<tr>
<th>Year</th>
<th>Gas Sold and Transported (bcf)</th>
<th>Operating Revenues ($ million)</th>
<th>Miles of Pipeline</th>
<th>Personnel</th>
<th>Reserves (tcf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951</td>
<td>136</td>
<td>39</td>
<td>1,200</td>
<td>1,419</td>
<td>4</td>
</tr>
<tr>
<td>1952</td>
<td>183</td>
<td>52</td>
<td>1,284</td>
<td>1,284</td>
<td>4</td>
</tr>
<tr>
<td>1953</td>
<td>192</td>
<td>59</td>
<td>1,832</td>
<td>1,241</td>
<td>4</td>
</tr>
<tr>
<td>1954</td>
<td>198</td>
<td>63</td>
<td>2,482¹</td>
<td>1,287</td>
<td>6</td>
</tr>
</tbody>
</table>

¹Includes some proposed mileage.  
Sources: Transcontinental Gas Pipe Line Corporation, Annual Report (various years), and Moody’s Public Utility Manual.

its Oakford natural gas storage facility to Transcontinental so that it could comply with the FPC’s insistence that it acquire such facilities.

CONVERTING NEW YORK CITY TO NATURAL GAS

Transcontinental’s sole grip on Consolidated Edison, Brooklyn Union Gas Company, and other area utilities remained firm at least for the short term (see table 6.3). Gas demand was concentrated in five major New York gas companies, Con Edison, Brooklyn Borough Gas, Brooklyn Union Gas, Kings County Lighting Company, and Long Island Lighting Company, which all contracted for purchases of natural gas from Transcontinental under contracts dated July 25, 1950, superseding contracts signed by all the same parties during 1948.

Under the terms of the New York facilities’ agreement, these utilities jointly agreed to take responsibility for natural gas deliveries from Transcontinental’s terminus at the east bank of the Hudson River at 134th Street. The five utilities agreed to cooperate in financing and constructing several underwater pipelines from Transcontinental’s terminus to points in New York City where the utilities would receive their gas. They also agreed to construct separate lines from the receiving point to connect with their own distribution systems. Consolidated Edison was the largest purchaser in this group of five utilities, and it accounted for approximately 20 percent of Transcontinental’s total gas sales volume.⁴²

The five utilities agreed to construct those sections of the line that ran through their own franchise territory. Some portions of the line were used by two or more of the five companies; in those cases all costs were apportioned appropriately. The utilities estimated the total cost of the
Table 6.3: Transcontinental Gas Pipe Line Corporation’s Gas Sales

<table>
<thead>
<tr>
<th>Customer</th>
<th>Contract Volume (mcf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consolidated Edison Company</td>
<td>128,000</td>
</tr>
<tr>
<td>Public Service Electric Gas Company</td>
<td>70,000</td>
</tr>
<tr>
<td>Brooklyn Union Gas Company</td>
<td>70,000</td>
</tr>
<tr>
<td>Northeastern Gas Transmission Company</td>
<td>64,000</td>
</tr>
<tr>
<td>Philadelphia Electric Company</td>
<td>37,000</td>
</tr>
<tr>
<td>Long Island Lighting System</td>
<td>35,000</td>
</tr>
<tr>
<td>Philadelphia Gas Works</td>
<td>25,000</td>
</tr>
<tr>
<td>Piedmont Natural Gas Company</td>
<td>20,000</td>
</tr>
<tr>
<td>South Jersey Gas Company</td>
<td>20,000</td>
</tr>
<tr>
<td>Elizabethtown Consolidated Gas Company</td>
<td>15,000</td>
</tr>
<tr>
<td>Others</td>
<td>69,657</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>553,657</strong></td>
</tr>
</tbody>
</table>

Notes: These are Transcontinental’s original proposed contract sales amounts. Actual amounts changed after the line began operations.


262,830-foot line to reach $14 million. It contained sections of pipe measuring from 12 to 30 inches in diameter with a working pressure capacity of 350 psi. Because the high-pressure line would travel under heavily traveled metropolitan streets in densely populated areas, the pipeline had high safety standards. Owing to the line’s high cost and expensive safety precautions, gas industry observers dubbed it the “Safest Inch” as well as the “Costliest Inch.”

Transcontinental’s two major New York City customers, Consolidated Edison and Brooklyn Union, began receiving natural gas on January 16, 1951. The two utilities accounted for gas deliveries to nearly all the residential gas consumers in the New York City area, and their eventual conversion from manufactured gas to natural gas represented a substantial loss to the manufactured-gas industry as a whole (see table 6.4).

Consolidated Edison, a gas and electric utility, served more than a million gas customers, mostly residential. Brooklyn Union served approximately 350,000 gas customers in the boroughs of Brooklyn and Queens. Despite Texas Eastern’s apparent coup in selling the first natural gas to New York City when it began supplying gas to the New York and Richmond, the New York media recognized Transcontinental as the first substantial supplier of gas to the City. The *New York Times* noted that “while this is not the first natural gas to get here — Staten Island has had it since 1949 — it is the first to arrive in any volume.”

137
### Table 6.4. Conversion from Manufactured Gas to Natural Gas: Two New York Utilities

<table>
<thead>
<tr>
<th>Year</th>
<th>Brooklyn Union Gas Company</th>
<th></th>
<th>Consolidated Edison Company of New York</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Natural Gas Produced</td>
<td>Manufactured Purchased</td>
<td>Natural Gas Produced</td>
</tr>
<tr>
<td>1948</td>
<td>35³</td>
<td>—</td>
<td>58</td>
</tr>
<tr>
<td>1949</td>
<td>33³</td>
<td>—</td>
<td>57</td>
</tr>
<tr>
<td>1950</td>
<td>36³</td>
<td>—</td>
<td>62</td>
</tr>
<tr>
<td>1951</td>
<td>38³</td>
<td>14</td>
<td>58</td>
</tr>
<tr>
<td>1952</td>
<td>43³</td>
<td>22</td>
<td>50</td>
</tr>
<tr>
<td>1953</td>
<td>—</td>
<td>25</td>
<td>29</td>
</tr>
<tr>
<td>1954</td>
<td>—</td>
<td>31</td>
<td>39</td>
</tr>
<tr>
<td>1955</td>
<td>—</td>
<td>31</td>
<td>15</td>
</tr>
<tr>
<td>1956</td>
<td>—</td>
<td>38</td>
<td>4</td>
</tr>
<tr>
<td>1957</td>
<td>—</td>
<td>47</td>
<td>—</td>
</tr>
<tr>
<td>1958</td>
<td>—</td>
<td>55</td>
<td>—</td>
</tr>
</tbody>
</table>

**Notes:**

1. Brooklyn Union began its conversion during early 1952 and completed the conversion on August 27, 1952.
2. Consolidated Edison began its conversion during April 1950 and completed the conversion during the summer of 1956.
3. These volumes are sales volumes.

**Source:** Moody’s Public Utility Manual, various years.

Consolidated Edison’s long-range plan called for converting its gas distribution system entirely from manufactured gas to natural gas. But this plan was not based on years of exhaustive research. Instead, “changing economic conditions,” particularly the rapidly increasing cost of manufactured gas and the availability of ample supplies of natural gas, led the company to the obvious choice. The decision to convert to natural gas was not without short-term costs. Con Edison had a $250 million investment in gas-manufacturing plants, plants which were becoming obsolete and expensive to operate. Natural gas offered a cost-competitive fuel that was much more efficient and clean-burning than manufactured gas. After World War II, according to a management study of Consolidated Edison’s decision-making process, “natural gas [had] a clear and unmistakable cost advantage over the traditional manufactured product.”

Consolidated Edison’s growing interest in natural gas was a harbinger of the nation’s largest metropolitan fuel conversion. The entire regional
manufactured-gas industry was teetering on the edge of industrial extinction, and a decision by New York's large utilities to convert to natural gas would effectively end manufactured gas's 130-year existence in American energy history. It was ironic that an old synthetic fuel was on the verge of being replaced by a natural one during the age of industrial innovation (see table 6.5).

Many technical problems, however, would have to be addressed before a full-scale conversion could take place. Transcontinental initiated the conversion process by using natural gas to enrich its production of manufactured water gas, which normally had a lower heating content than manufactured coal gas but was less expensive to produce. By mixing it with natural gas, the heating value matched that of manufactured coal gas. This method saved Consolidated Edison money while beginning the overall process of converting the total system to natural gas. It also allowed the utility to keep its manufactured-gas plants in operation while it evaluated the opportunity to switch its system entirely over to natural gas.

Consolidated Edison was assured of a long-term and increasing supply of natural gas. The utility directed its System Engineering Department to prepare studies to guide the proposed conversion of the system to natural gas; the Gas Planning Division was responsible for the actual conversion process. The first priority in planning for the conversion was determining the order in which different parts of Con Edison’s service area would be converted to natural gas. After evaluating the layout of gas distribution mains, patterns of demand for gas, and the availability of manufactured
gas, the company's Commercial Operations Center and System Engineering Department stipulated that each of the utility's local service areas be converted in the following order: Westchester County, the Riverdale section of the Bronx, the Third Ward of Queens, the First Ward of Queens, the east Bronx, the west Bronx, and Manhattan. These areas comprised approximately 1.4 million gas customers, each of whom operated an average of two gas appliances. Every gas-burning appliance had to be adjusted to burn natural gas since it had a significantly higher heating content than manufactured gas.46

Consolidated Edison began the conversion of the first area, Westchester County, in April 1950 and finished it by the summer of 1951. To convert the appliances of the county's approximately 207,000 gas customers, the huge utility hired North American Conversion Company, a firm specializing in natural gas conversions, to undertake the project. North American brought in 600 experienced workers to visit each customer and adjust each gas-burning appliance. Having learned the process of converting appliances from North American, Con Edison itself converted the remaining service areas. By taking over the conversion process, Con Edison was able to employ many of those workers at the manufactured-gas plants that were being mothballed, and the conversion team grew to 1,100 employees during the final stage of its work, the conversion of Manhattan. By the summer of 1956, the utility had converted most of its Manhattan customers to natural gas. Con Edison accomplished the entire conversion of its service area for approximately $36 million. Although several of Con Edison's gas plants were kept in working order for backup, they were rarely used.47

Brooklyn Union also underwent a massive conversion program, but only after fully investigating costs of expanding its own manufactured-gas system. During the late 1940s, Brooklyn Union Gas Company instituted a three-year, $25 million construction program to expand its peak capacity for manufactured gas by approximately 10 percent. Yet during these years, the company could not even keep pace with growing demands for gas in its service territory. The northeastern utilities had historically invested hundreds of millions of dollars to build manufactured-gas plants staffed by thousands of factory workers. If this industry was to expand dramatically to meet the postwar demand for gas, its owners would be required to make even greater commitments of funds to build plants and hire new workers. This prospect was not particularly attractive to any gas distributor.
Brooklyn Union first began to consider seriously contracting for natural gas service during the bidding for the Inch Lines in 1946. Brooklyn Union had unsuccessful discussions with Texas Eastern in 1947 about gas purchases, but it was able to contract with Transcontinental for gas. Brooklyn Union officials decided that Transcontinental's line offered it distinct advantages anyway. Whereas Texas Eastern's system traveled through the highly industrialized Appalachian region, Transcontinental's followed a more southerly course, offering Brooklyn Union a gas supply far less likely to be curtailed due to an unexpected, or continuing, Appalachian fuel shortage.48

Brooklyn Union knew from studies conducted by Peoples Gas Light & Coke Company of Chicago and the Michigan Consolidated Gas Company of Detroit that utilities which purchased large quantities of natural gas found themselves in a greatly improved operating position. Brooklyn Union first considered using natural gas to produce mixed gas rather than converting directly to natural gas. By utilizing mixed gas, the company could increase its current gas output without jeopardizing its gas supply.49

Brooklyn Union's final decision to produce and distribute mixed gas was based on a simple calculation. By producing mixed gas from its proposed 70 mmcf/d allotment combined with its existing 213 mmcf/d production capacity, Brooklyn Union could raise its gas output, after accounting for fuel loss, to 265 mmcf/d with a total investment of about $4 million. A similar increase provided solely by the addition of manufactured-gas production facilities would cost the utility $10 million. The decision to contract for natural gas was an obvious one to make for both short- and long-term economic reasons.50

Brooklyn Union undertook a further series of studies of its own system. After a thorough analysis of the economics of using natural gas to produce mixed gas, the company determined that it should not undergo a complete conversion to mixed gas. If the company converted its system to mixed gas and then, as expected, to straight natural gas several years in the future, it would have to adjust its customers' appliances twice and make several costly modifications to its own system. Instead, Brooklyn Union decided to move toward converting its entire system to straight natural gas within the near future.51

Brooklyn Union fueled more than 2 million appliances including oven ranges, gas refrigerators, water heaters, various indoor heaters, and other gas appliances, all of which had to be converted from the low-Btu manufactured gas to high-Btu natural gas. The conversion process began
on March 6, 1952. The company's residential customers were converted to natural gas within six months. The company's 5,000 industrial customers underwent a similar conversion process to their furnaces. By the end of the year, Brooklyn Union's entire service area was using natural gas.52

The conversion of the New York City area from manufactured gas to natural gas was an important event in domestic fuel conversion. Indeed, it marked the end of manufactured gas as a significant industry in the United States. Utilities mounted a tremendous labor-intensive effort to convert their customers' appliances to accept natural gas, and new customers were quickly added to the system. Not only had natural gas displaced an existing fuel, it had, by breaking into the largest gas market in the country, expanded into one of the foremost energy-consuming regions in the United States.

The New York area was the Northeast's prize gas market. Despite losing the bid for the Inch Lines, Transcontinental was the first entrant into this most profitable of all northeastern markets. Transcontinental's promoters were extremely determined to achieve this goal. They were the only low bidders for the Inch Lines not already operating a pipeline system to successfully build a system to serve the large northeastern gas market. Transcontinental's promoters succeeded in acquiring an FPC certificate and persuading the New York Public Service Commission to actively support the introduction of natural gas into the state. Claude Williams's style of political entrepreneurship rested on an impressive promotion of natural gas to New York's manufactured-gas utilities and regulatory commissions.

A combination of federal, state, and local regulatory systems shaped Transcontinental's success. The regulatory process pushed and pulled the entrepreneurial impulse to build the line. Texas Eastern and Tennessee Gas desired to enter the New York market, but the FPC mandated those lines to continue serving their original customers, who more urgently needed natural gas. The New York market represented not only a vast demand for natural gas, it was the last remaining highly concentrated manufactured-gas market. Accounting for nearly 50 percent of all manufactured-gas sales in the nation, the New York City metropolitan area was the prize behind the Pennsylvania coal industry's opposition to northeastern natural gas sales. While Texas Eastern gained access to Pennsylvania markets, Transcontinental, unencumbered with FPC-mandated customers, built a line designed specifically to serve New York City. With access to abundant supplies of the fuel, New York City area utilities were
amazingly quick to begin converting their distribution systems to natural gas, effectively ending the century-old domination of the Northeast by manufactured gas.

The success of natural gas in New York did not end competition among the three Southwest to Northeast pipeline companies. The entire New England area remained without access to natural gas, and well before the New York utilities converted to natural gas, an intense competition for New England customers was in progress.