3. Entrepreneurship and the Appalachian War Industry

WORLD WAR II stimulated renewed expansion of the natural gas industry. This phase of growth occurred under a variety of war emergency agencies which essentially controlled the industry. Through these agencies, the federal government financed war production plants and fuel transportation systems and strictly managed the nation’s energy supply. Normal peacetime market mechanisms alone did not guide expansion. Rather, the vital needs of a wartime economy, interpreted by various federal agencies, spurred industry growth.

During the war, factories required record quantities of gas and its by-products for the manufacture of vital steel, aluminum, high-octane gasoline, synthetic rubber, chemicals, and explosives, and for industrial and domestic heat as well as power generation. Residential gas demand increased as well for heating the many newly constructed homes built to house the growing military and domestic war-related labor force.¹ The surge in wartime energy demand, combined with government interest in financing energy systems, stimulated entrepreneurial activity aimed at taking advantage of government support for pipelines to transport fuel to the vital war production and refining centers.

APPALACHIAN GAS SUPPLY AND FEDERAL WAR PLANNING

The Appalachian region quickly became the center of American war production. Cities such as Pittsburgh, Youngstown, and Wheeling contained hundreds of steel mills and metallurgical factories, as well as rubber and chemical plants which required large volumes of natural gas.²
Entrepreneurship and the Appalachian War Industry

Table 3.1. Estimated Gross Production of Natural Gas in Appalachia (bcf)

<table>
<thead>
<tr>
<th>Year</th>
<th>NY</th>
<th>PA</th>
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<td>10</td>
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<tr>
<td>1946</td>
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<td>93</td>
<td>61</td>
<td>201</td>
<td>362</td>
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Natural gas was a particularly important fuel because it burned at a constant specific temperature, allowing for high-quality product manufacture. Approximately 660 factories in the Appalachian area required more than 24 bcf per year of natural gas. As a region, Appalachia required 400 bcf per year of gas, about half of which was accounted for by industrial consumption.³ War hastened the decline of Appalachia's gas reserves; as supplies dwindled, new sources, especially those in the Southwest, became vital to the war effort.

The Appalachian region was the first in the United States to produce large quantities of natural gas, and its production peaked in 1917 at 552 bcf, or approximately 63 percent of the nation's total natural gas production. By the late 1930s, Appalachian production accounted for only about 16 percent of total U.S. gas production. This decline resulted from an overall decline in Appalachian gas reserves as well as a dramatic increase in southwestern-produced gas. Local gas companies continued to produce a significant quantity of natural gas for Appalachia, but by 1943 production could not keep up with the increasing industrial, commercial, and residential demand (see table 3.1).⁴

During the war, the Appalachian region consumed about 18 percent of the nation's natural gas production even though it contained only 3 percent of the nation's natural gas reserves. Additional supplies were needed to meet demand, but many Appalachian gas fields were rapidly depleting. In 1940, for example, gas companies drilled approximately 1,627 new wells in
Appalachia, but 25 percent of them were dry. The major prewar source of supply was the Oriskany Trend, a deep geologic formation which reached peak production in 1942 and began to decline rapidly after 1943. Federal authorities initially attempted to increase local production, but later diverted the steel necessary to build pipelines to the war effort.

The intense drain on regional production soon stimulated private plans for both increased production and access to new supplies. As the industry expanded during the war, executives kept one eye on their industry's postwar future. This was particularly evident in speeches made at the American Gas Association's annual meetings. Gas company executives tended to be optimistic about the postwar demand for their fuel. At one meeting, J. French Robinson, a prominent gas utility executive, said, "In the post-war sunshine of abundant materials for our use, we will be able to realize the potential values of natural gas to all this nation as never before." Natural gas consumption surged during the war years, especially because of high demand from war industries. But the gas industry as a whole did not seem worried that demand would fall off dramatically in the postwar period. The more industry, commercial establishments, and residential consumers used gas the more they would want to continue using it. The AGA also worked hard at encouraging and coordinating advertising efforts to further promote the use of natural gas.

As the European war intensified and American involvement became inevitable, direct government intervention in the nation's energy industry became unavoidable. During the early years of the European war, the American Gas Association and various other industry groups worked privately to promote growth, efficiency, and stability in the gas industry. Maintaining a high level of Appalachian natural gas production without incurring strict governmental control of the industry was an immensely difficult task.

On the government side, Secretary of the Interior Harold I. Ickes lobbied President Franklin D. Roosevelt to create an agency to oversee the nation's wartime energy industries. Confronting an unplanned domestic energy situation, Roosevelt chose Ickes to be the petroleum coordinator for national defense on May 28, 1941. This position gave Ickes special powers over virtually every aspect of the oil and gas industries. It also earned him the unofficial title of oil "czar" for his alleged socialistic ideas and preference for a nationalized oil industry. Ultimately, Ickes carefully crafted a cooperative governmental business approach in his administration of the wartime industry.
Ickes's new organization, the Office of Petroleum Coordinator (OPC), developed later into the Petroleum Administration for War (PAW). The agency sought to elicit cooperation among oil and gas companies. To achieve this end while mollifying industry opposition to the agency, Ickes appointed Ralph K. Davies of Standard Oil of California as his deputy administrator. The PAW divided the United States into five districts, each overseen by a district chairman. Within this geographical framework, Ickes administered the ten separate divisions within PAW, as well as the activities of each district chairman.

The PAW put oil, and for good reason, higher than natural gas on its list of priority fuels. During the war, recalled J. R. Parten, director of transportation for the PAW, "Natural gas didn't stand very high, didn't take much of Ickes' time... natural gas was not a hot spot. Production of crude oil was." Everette DeGolyer, PAW chief of petroleum conservation, was equally concerned about oil supplies. Bill Murray, conservation engineer for PAW District 3 (Texas, New Mexico, Louisiana, Arkansas, and Mississippi), recalled that DeGolyer's orders were simple: "Murray, you find out where it can be produced without waste. What's the maximum rate at which we can produce these fields?"

Natural gas, though not as ultimately important as oil, was certainly a vital fuel. In one early meeting of Ickes's new agency, on December 4, 1941, only three days before Pearl Harbor, the participants met to discuss natural gas supply and demand in the Appalachian area. Representatives from a variety of agencies including the War Department, Navy Department, and FPC attended. Less than a few months earlier, the Office of Production Management (OPM, which later became the WPB) had begun receiving a slew of letters from Pittsburgh area industrial firms requesting natural gas. In one letter from the Aluminum Company of America (ALCOA), the firm asserted that it desperately needed natural gas in order to continue operations. "You understand," the company official wrote, "we are engaged in the production of defense work 100% and it is very essential that we are furnished gas to carry on our production." Thus, conferees heard a supporting presentation: local Appalachian gas supply could meet regional war industry demand through the winter of 1941-42, but a new source of supply, such as would be afforded by a proposed pipeline connecting southwestern supply with Appalachia, would be necessary.

After the OPC officially became the PAW, the PAW created a Natural Gas and Natural Gasoline Division to be responsible for overseeing
developments in the gas industry. E. Holley Poe, a former executive of the American Gas Association and future gas industry entrepreneur, headed the division. His most important goal was maintaining production and deliverability of natural gas, particularly in the Appalachian region. Poe also attempted to marshal support for joint-industry cooperation while administering the wartime industry. At one American Gas Association meeting in 1942, Poe told the audience, "We are not approaching our job as a dubious experiment. . . . We do not like red tape any more than you do." Poe agreed with Ickes that the most satisfactory results for the wartime industry could be attained "by a mutual, unselfish understanding of the problems at hand and a cooperative spirit in their solution." 12 These statements reflected the government's efforts to control the energy industry through cooperative rather than confiscatory policies. 13

The PAW's war emergency powers over natural gas were relatively modest compared to those of the Supply Priorities and Allocation Board (SPAB). The SPAB, which later merged into the War Production Board, had authority to control all areas of industrial production and supply. The agency dictated specific gas sales allocation orders to natural gas pipelines depending upon the fuel requirements of their war industry customers. During the latter part of 1941, representatives of the natural gas industry, military, PAW, WPB, and the American Gas Association met several times in different cities to discuss recommendations for limiting unnecessary natural gas consumption and maintaining natural gas production levels during war. 14 There was little argument about the possibility of serious gas shortages. J. A. Krug, chief of the power branch of the WPB, sent a memorandum to his superior, J. S. Knowlson, outlining a proposed "Limitation Order" to curtail the consumption of natural gas and thereby conserve it. Krug noted that serious shortages were likely, especially in Appalachia as well as in southern California and the mid-continent areas. The proposed limitation order, therefore, would have two major goals: increase gas production and curtail nonessential uses of gas. 15 A high-powered letter of support came from Major General H. K. Rutherford regarding the critical situation faced by war industries dependent upon natural gas. 16

As a result of what appeared to be an impending fuel crisis, the WPB issued on February 16, 1942, its first order imposed on the natural gas industry, Order L-31. On February 25, the WPB mailed copies of the order to all utilities it affected. L-31 requested utilities to comply voluntarily with a provision calling for pooling arrangements "to achieve
practicable maximum output in the area or areas in which a shortage exists or is imminent." The order also provided the WPB with authority to integrate natural gas systems, curtail gas sales when necessary, and reallocate existing gas sales. Furthermore, the WPB actively encouraged pipelines to transport gas at 100 percent load factor, to use gas storage fields whenever possible in order to free up pipeline capacity for gas transmission, and to develop curtailment schedules that would affect the customers least dependent upon natural gas. In the summer of 1942, the WPB issued a similar order, L-174, modeled after L-31, which imposed the same restrictions on the manufactured-gas industry. Essentially, both L-31 and L-174 limited new gas sales for nonmilitary or nonmobilization purposes.

The PAW and WPB also attacked the Appalachian gas production problem. Initially, the PAW issued conservation guidelines for new drilling programs in order to develop a nationwide oil and gas development drilling program "consistent with the availability of material and equipment." The PAW's conservation Order M-68 implemented this program by limiting the drilling of gas wells to not more than one for every 640 acres. However, geologists determined that the maintenance of prewar levels of production required new drilling for shallow gas. Industry leaders expressed concern that Order M-68 would restrict new drilling and seriously threaten current production levels. In response, the PAW revised its spacing provisions on February 13, 1942, to permit the drilling of one well to each 160 acres for specified deep horizons and one to each 40 acres for shallow wells.

The importance of Appalachian natural gas supply to the war effort was reflected in the disproportionate number of gas wells drilled there. Between 1942 and 1945, approximately 70 percent of all gas wells drilled in the country were drilled in Appalachia. Increased drilling activity, however, did not significantly raise production levels. In lieu of increased reserves, federal restrictions placed on natural gas consumption sought to ensure the continued availability of natural gas. But such measures could not meet extremely heavy wartime energy demands on the Appalachian natural gas industry. Wartime demand aggravated a situation already characterized by rapidly diminishing reserves. Industries requiring increasing amounts of natural gas purchased more of the fuel than normal. Consequently, the Appalachian fields could not withstand for long the demand placed upon them for both wartime industry and existing residential and commercial utilization. Government drilling and consumption regulations did little to alter a dangerous energy shortage.
GAS PIPELINES AND APPALACHIAN MARKETS

The wartime shortage reinforced the belief held by some gas experts that the time was right to build a pipeline extending from the Southwest to Appalachia. Curtis B. Dall led one group in a significant attempt to build such a line. Dall, a former Wall Street broker with Lehman Brothers, was best known for his failed marriage to President Franklin D. Roosevelt's daughter, Anna. They had married during the late 1920s and were first estranged and then divorced by the mid-1930s. According to FDR biographer Kenneth Davis, Anna's "marriage to Curtis Dall had been a ghastly mistake; she could not bear to live with him." Even after the divorce, Dall believed that business and government officials regarded him distrustfully due to his former relationship with Franklin Roosevelt, but he continued to pursue business opportunities.

Dall saw in the wartime gas industry a ripe entrepreneurial opportunity. After visiting Nashville, Tennessee, in connection with a business deal involving phosphate properties, Dall recalled that he "ran into a project which greatly interested me. Some friends described how nice it would be" to have natural gas in the Nashville area. Subsequently, Dall and several others formed the Tennessee Gas and Transmission Company, Incorporated, on April 1, 1940.

Soon after its initial organization, Tennessee Gas's directors sought to increase the size of their company by acquiring other operating entities. Tennessee Gas investigated the possibility of buying a local gas company to become part of a larger proposed long-distance pipeline. On May 4, 1940, Tennessee Gas purchased the Eastern Tennessee Oil and Gas Company from Victor S. Johnson in exchange for 30,000 shares of its first 45,000 stock issue. Johnson was a wealthy businessman, president of the Mantle Lamp Company of America, and holder of the gas franchise for Knoxville, Tennessee. With that franchise under its control, Tennessee Gas had at least one prospective market for its gas supply. The company also added Johnson to its board as the largest single stockholder; his primary role was to be the major financial backer of Tennessee Gas.

Working out of his Manhattan office and the Willard Hotel in Washington, Curtis Dall actively promoted the pipeline plan. One of his first actions was to employ the New York engineering firm of Brokaw, Dixon & McKee to supervise construction. In addition, Dall began gas sales negotiations with E. I. Dupont de Nemours and Company and Phillips Petroleum Company, which also preliminarily agreed to assist in financ-
ing the pipeline. Negotiations continued with several other oil and gas companies for both gas supply and assistance with financing.

Dall's seemingly slow progress in arranging for financing and gas supply worried Tennessee's financial backers; the estimated price tag of the line quickly increased from $12 to $20 million. Corporate Secretary John Buckingham wrote to Dall in one of many letters reflecting similar sentiments that "stockholders here are manifesting some anxiety about your activities there. I have assured them that from reports, you are still pleased with prospects." The young company and its officials had much to learn about organizing a regulated pipeline company during war.

Besides arranging financing and contracting for gas supply and sales, the new company required regulatory approval in order to begin construction of the proposed line. Apparently unaware that their pipeline clearly qualified as an interstate pipeline under federal jurisdiction, Tennessee Gas first approached the Tennessee Railroad and Public Utilities Commission for a certificate of public convenience and necessity.

In its application, Tennessee Gas proposed to construct a 20-inch pipeline to extend from Acadia Parish, Louisiana, where gathering lines would connect with four proposed southeastern Louisiana suppliers and ten gas fields, to a point near Brace, Tennessee. From there, two 12-inch extensions were planned to other areas—one to Lebanon, Tennessee, and the other to Knoxville, Tennessee—each to serve numerous communities along the way. The new company, however, feared that United Gas Corporation, the dominant gas distributor in the Louisiana area, might feel threatened by its plans. "We do not wish to get in a wrangle with United Gas on the southern portion of our line," reported one company official; Tennessee Gas did not target southern markets. Substantial markets existed to the north, and the company estimated that it would have an annual capacity of 40 bcf and a potential industrial market of 49 bcf. Tennessee Gas stated that in its first year of operation, it would expect to have the ability to sell 22 bcf at $0.1688 per mcf, and 32 bcf by year five. Any remaining demand would be satisfied by local coal gas production.

During initial discussions with the state commission, Tennessee's directors learned that since they were planning to build an interstate pipeline, they needed a certificate from the Federal Power Commission. The FPC required an applicant to prove during public hearings through extensive expert testimony that it had a twenty-year supply of natural gas for its proposed customers, that it had the engineering plans well worked out in detail, and that it had the financing to build the pipeline.
Despite the rapidly increasing demand in Appalachia for new sources of natural gas, Tennessee's initial application did not meet with favor from the FPC. Lacking solid gas supply contracts and financing, Tennessee Gas officials continually postponed scheduled hearing dates while trying to reach agreements with suppliers and financial institutions. Optimism reigned at Tennessee Gas despite lingering doubts among the stockholders. "With all the demand for fuel, especially gas," Buckingham wrote to Dall, "I don't see how we can fail." But this demand could not be met without gas supply and financing.

On July 22, 1941, after extensive hearings, the FPC dismissed the company's application. Although Tennessee Gas's application suffered from several inadequacies, the company was in trouble for an altogether unexpected reason. The FPC claimed that it lacked jurisdiction to grant a certificate to Tennessee Gas. The agency reported that Tennessee had filed its application under section 7(c) of the Natural Gas Act, which covered the commission's regulatory power over the interstate transmission of natural gas, but the FPC claimed that it lacked jurisdiction to approve the application. The commission ruled that its "jurisdiction to issue certificates . . . exists only when [a company proposes] to construct such facilities for the transportation of natural gas to a market in which natural gas is already being served by another natural gas company." Tennessee could not show that its potential market area constituted one already being served by another natural gas company precisely because the fuel had not previously been available there.

Section 7(c), a curiously worded part of the act, was a legislative obstacle to expansion of the natural gas industry. The provision actually protected the coal and manufactured-gas industries by prohibiting the introduction of natural gas into new markets. Section 7(c) explicitly empowered the FPC to regulate only the expansion of natural gas transmission facilities into areas already receiving natural gas. In 1941, Congress slightly modified the provision by allowing temporary war emergency expansions, but railroad and coal interests opposed any attempts by gas companies to use the emergency provision to expand service permanently.

In a precedent case involving Kansas Pipe Line & Gas Company's certificate application in 1939, the FPC acknowledged its authority to certify expansion programs if the applicant met the necessary requirements. However, the FPC's specific interpretation of the provision remained unclear until it claimed a lack of jurisdiction in the Tennessee Gas
Entrepreneurship and the Appalachian War Industry

case. Importantly, the FPC noted in the Kansas Pipe Line case that "Congress did not intend this Commission generally to weigh the broad social and economic effects of the use of various fuels."\(^{31}\) Here, the FPC made clear that it would not necessarily consider the social and economic dislocations which might result if and when natural gas displaced manufactured gas or other fuels and their industries. However, section 7(c) would have to be modified to allow the FPC to certify pipelines to serve areas not already receiving natural gas before such interfuel competition would result in the Northeast.\(^ {32}\)

After the FPC dismissed Tennessee Gas's application on July 22, the company plotted a new but more difficult strategy for certification. Instead of applying for a blanket federal certificate, the company planned to acquire a certificate in each of the several states in which it intended to operate. Tennessee Gas refiled an application with the Tennessee commission, which instituted its own hearings and accepted all the testimony and exhibits presented during the FPC hearings.

During the hearings held before the Tennessee commission, representatives of several major industries testified on their need for natural gas at a reasonable price. These industries included the phosphate, pulp, paper, pencil, hosiery, structural steel, aviation, and aluminum industries. The steel and chemical industries professed a strong need for natural gas, and representatives of local utility companies expressed their desire for residential natural gas as well. Not only would it provide a fuel for home heating and cooking as an alternative to coal and coal gas, it would also assist the smoke-abatement efforts going on in various cities. The Tennessee commission observed that gas offered a new and useful fuel to assist and spur industrial expansion especially at a time when the availability of electric power had diminished greatly. The southeastern states had faced an electricity shortage since June 1941 due to the substantial increase in the production of defense products and aluminum in particular. The diversion of electrical power to the aluminum industry proved to be a major benefit of Tennessee's application to sell gas in the area that included the nation's largest aluminum plants at Alcoa, Tennessee, and another at Badin, North Carolina, with other plants proposed for the Muscle Shoals, Alabama, region.\(^ {33}\)

Aluminum production increased dramatically after the outbreak of war in Europe in 1939. In 1939, United States aluminum production was 325 million pounds. The Office of Production Management forecast that U.S. wartime aluminum requirements would reach 1.4 billion pounds by 1942.
The agency estimated that aluminum producers required 14 billion kilowatt hours of electricity to produce such quantities of aluminum. The OPM also noted that by 1942, peak load kilowatts had tripled during the previous four years in supply area no. 20, covered in Tennessee’s application, and had already exceeded the dependable capacity of the entire area’s requirements; additional fuels for the area were essential.34

The Tennessee commission proposed that if certified, the pipeline company would engage in a kind of interfuel cooperation in which natural gas could replace electricity in industrial processes requiring heating or hardening only while electricity could be reserved for applications requiring electrolysis, such as aluminum production. Under this plan, natural gas could be used to produce steels, bronzes, alloys, and other metals and to complement hydroelectric power. The state commission then approved Tennessee Gas’s proposal to provide natural gas service in twenty-six counties in Tennessee. However, in deference to section 7(c) and the manufactured-gas, coal, and railroad industries, the Tennessee commission stated that Tennessee Gas would not be allowed to compete with any manufactured-gas distribution service operating with a franchise in any of the twenty-six counties “unless the Commission shall first determine that the facilities of the existing plant, lines, or systems are inadequate to meet the reasonable needs of the public, or that the public utility operating the same has refused or neglected or is unable to make the necessary extensions and additions in order to adequately render the proposed service.”35

The Tennessee commission then explicitly decried the opposition of coal and railroad interests to the pipeline application. Noting that coal and railroad companies had objected to the Tennessee Valley Authority and other electricity and natural gas projects nationwide, the commission expressed the belief that these interests had blindly attempted to impede and delay progress in the economically important expansion of the natural gas industry. The commission stated that in the early 1940s, industrial progress had as much to do with winning the war as any other business goal.36

Despite an overall favorable response to Tennessee Gas’s marketing strategy, the commission remained unconvinced that Tennessee had sufficient financial backing for the proposed pipeline, now estimated to cost $23 million. The company supported its certificate application with a financing contract with the investment firm of O’Brien, Mitchell, and Company, but the Tennessee commission ruled on September 11, 1941,
that the pipeline had 120 days to present a new financing plan, which, if approved, would lead to certification by the commission.37

Tennessee Gas ultimately failed to meet this deadline. The newly created War Production Board hindered Tennessee Gas's application by imposing federal war priorities on all steel projects. Thus, before Tennessee could acquire steel, it had to convince the agency that its pipeline system was vital for national defense. Although the Appalachian region's increasing need for natural gas strained regional production, the WPB did not feel that the emerging gas supply problem merited the immense amount of steel necessary for construction of the pipeline. Tennessee's original promoters had little hope for success. Even if Tennessee could surmount its financing and steel acquisition problems to the satisfaction of the Tennessee commission, it would need to repeat the process in each state in which it intended to operate.

Curtis Dall then employed a new tactic to obtain a certificate. Dall began negotiating with the federal government to have the Tennessee Gas pipeline designated a national defense project. Dall reported to the Tennessee board of directors that if he was successful, the WPB would provide the steel priorities necessary for the construction of the line. In addition, he believed that the federal government, specifically the Reconstruction Finance Corporation, would be obligated to finance the construction of the entire line.38 Dall's efforts were apparently unsuccessful. He reported back to Tennessee Gas headquarters in Nashville that "our company has run into a good deal of semi-hidden opposition here in Washington. . . . It is my purpose to stay here and blast hell out of the opposition if it is the last thing I do."39

Perhaps owing in part to Dall's intensive lobbying, Tennessee Gas's fortunes appeared to improve markedly in early February 1942, when Congress amended section 7(c) of the Natural Gas Act. The original section gave the FPC jurisdiction only in cases where a gas pipeline would enter a market already served by natural gas. The amendment deleted the reference to "market" and required a certificate for all completed interstate pipelines regardless of their market. This version of section 7(c) was based upon the certificate section of the Motor Carrier Act of 1935.40

The original version had elicited widespread discontent from both the gas and coal industries as well as natural gas promoters: It "proved unsatisfactory to all concerned." Ironically, coal and railroad representatives led the fight for the amendatory legislation because they were particularly concerned about "their status as intervenors in certificate
proceedings." They were especially concerned about the application of Tennessee Gas not yet the Reserve Gas Pipe Line Company, in which the Hope Natural Gas Company had an interest, to construct a 26-inch, $80 million pipeline from Texas to New York City. The Reserve Gas group discovered that under the old 7(c) provision, the FPC limited coal and railroad intervention in certificate applications by gas pipelines proposing to serve markets already served by natural gas. The FPC determined that in these markets, the coal and railroad industry did not have a legitimate claim that a new pipeline would threaten their business precisely because natural gas would have been available there previously. The new amendment, however, gave coal and railroad companies the right to intervene in all cases in which a gas pipeline might expand its facilities, except in the case of limited expansions permitted within the line's existing market area. Following the amendment, coal and railroad interests comprised the major intervenors in gas pipeline certificate hearings. The amendment allowed the FPC to grant certificates to gas pipelines to serve new markets not already being served by another gas pipeline, and it gave Tennessee Gas a second chance to acquire a federal certificate. On February 9, only two days after the amendment, Tennessee Gas filed a second application with the FPC. But the company would have to wait for many months before the FPC would consider its application.

Immediately after filing the new certificate application, Dall both met with, and wrote, J. A. Krug, chief of the power branch of the WPB, to push for the requisite steel priorities. Krug responded to Dall: "As I told you . . . approval or disapproval of this project will depend upon the facts as to the increase in war production made possible from the increased availability of natural gas compared with the diversion of steel and other scarce materials required for construction of the pipeline." During the interim, Dall took a leave of absence from Tennessee Gas without surrendering his financial interest and joined the Air Force, thereby removing himself from a direct role in the company's immediate plans although remaining in regular contract with company management.

Other companies proposing to expand their natural gas service or build a new interstate pipeline began bombarding the FPC with applications (see table 3.2). Prior to the amendment only 16 applications for certificates were pending under section 7(c), and the FPC approved only 4 of them—the others were dismissed by the FPC or withdrawn by the companies. After the amendment, natural gas companies submitted 140 applications under a grandfather clause of section 7(c); 100 were approved.
Entrepreneurship and the Appalachian War Industry

Table 3.2. FPC Certificate Proceedings after Amendment to the Natural Gas Act in 1942

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NOTE: Other Status includes applications still pending at end of period and other dispositions.


The rush for applications under the grandfather clause related to the provision in the original section 7(c) allowing unauthorized expansion of systems within their market area. The 140 applicants included most of the interstate natural gas companies in existence at that time. In addition, companies filed 319 applications for certificates of public convenience and necessity from February 7, 1942, to October 15, 1946. Of the 319 applications, the FPC granted certificates for 196 companies by October 15 and 8,244 miles of pipeline and 449,695 horsepower (hp).

FPC chairman Leland Olds later described the natural gas situation after the amendment of 7(c) in hearings before the Senate Subcommittee on Appropriations. He stated:

As a result of the lifting of those limitations practically every natural gas company in the country of any proportion is coming into this commission and stating that the house heating load is growing so rapidly, the space heating load is growing so rapidly, and unless we handle certificate applications promptly, it is going to mean that people throughout these regions served with natural gas today are going to be unable to meet the requirements of heating in the coming winter season.

Indeed, the FPC was so inundated with applications for certificates that it allowed minor additions and expansions without requiring companies to follow the certificate process so long as the provision for the determination of service areas was followed.
COMPETITION FOR APPALACHIAN MARKETS

The amendment to section 7(c) coincided with a recognition by both the FPC and WPB of the growing fuel crisis in Appalachia. Early in 1942, the FPC staff conducted a survey of the Appalachian energy situation at the request of the War Production Board, which had authority to ensure that war production facilities had the necessary fuel to operate. The resulting report described the increasing demand for natural gas in the Appalachian area and the ongoing curtailments of natural gas deliveries due to the lack of supply. The FPC report indicated that curtailments would continue. In response, the WPB requested that the FPC compel a pipeline company to connect the existing Panhandle Eastern Pipe Line system to the Ohio Fuel Gas Company, which served part of the Appalachian region suffering from a shortage of natural gas. The WPB committed to provide the necessary allocation of steel for the construction of a connecting pipeline as approved by the FPC. Ultimately, the FPC had to choose either Panhandle Eastern or Ohio Fuel to build and operate the connecting pipeline system. The required facilities consisted of a 16-inch natural gas pipe extending 88,700 feet from some point on Michigan Gas's (a Panhandle Eastern subsidiary) 22-inch line from Detroit to Ohio Fuel's 16-inch line extending toward Toledo west of Maumee, Ohio.

After the WPB issued its requisite preference rating for materials to build the line, the FPC conducted hearings for the project. The pipe was already being rolled before the hearings began; the only question was which company would build and operate the line. The FPC heard proposals from each company. Panhandle Eastern estimated the job's cost at $394,000; Ohio Fuel estimated $410,815. With proposed looping on the system—the addition of parallel sections to increase capacity—the pipe could deliver 51 mmcf/d on peak days to Ohio Fuel. But representatives from Ohio Fuel, expressing their own misgivings about the project, told the FPC that the company could actually supply all its existing customers without the connecting line. The same officials admitted, however, that extra gas could be used, particularly in the Toledo, Ohio, area.

If a certificate for such a line were to be issued, Ohio Fuel proposed that the FPC grant only a temporary certificate lasting for the duration of the war emergency. Conversely, Panhandle Eastern considered the new pipeline to be necessary not only during the war emergency but for augmenting the "rapidly depleting supply of natural gas in the Appala-
chian area." Owing primarily to Panhandle Eastern's lower estimated price, overall cooperativeness, and intent to use the pipeline after the war to serve the Appalachian region, the FPC granted a conditional certificate to Panhandle Eastern. Although the FPC recognized that the Appalachian shortage might persist beyond the war, it granted only a five-year certificate. It also required that the pipeline be constructed so gas could flow either way and not interfere with either Panhandle Eastern's existing customers or state and local authority over other natural gas operations. Intervenors from the coal and railroad industries did not oppose the pipeline connection at the hearings. But the National Coal Association pleaded that the certificate not be extended beyond the war emergency so that it could not be used to transport natural gas into the postwar Northeast. The FPC approved the certificate on October 2, 1942.\(^50\)

The Panhandle Eastern case indicated that both the FPC and WPB recognized the severity of the Appalachian shortage. The FPC's willingness to promote a pipeline expansion project into Appalachia encouraged others interested in the northeastern market. In particular, Tennessee Gas's promoters seemed to have been following the progress of Panhandle Eastern's certificate hearings. Soon after Panhandle received its certificate, Tennessee Gas, on November 25, 1942, filed a third amended application for a certificate. The third certificate application included a significant change in the routing of the pipeline in order to satisfy government war planners.\(^51\)

Tennessee Gas recognized now that success hinged on its ability to abide by the WPB's war fuel plans, and Dall continued to lobby for a national defense project designation. He also apparently continued negotiations with Jesse Jones's RFC for financial assistance. At this juncture, Brown and Root, the Houston-based engineering and construction firm headed by Herman and George Brown, and its partner, W. E. Callahan Construction Company, expressed interest in increasing their financial stake in the line. "The Brown-Root Callahan Group," reported Tennessee Gas president Harry Tower, "seems to be very anxious to put up $1,000,000 of working capital when as [sic] and if the Federal Power Commission issues the Certificate . . . and we have evidence of major financing from the Federal Government."\(^52\)

Buoyed by increasing private and governmental interest, Tennessee Gas amended its certificate application and proposed to deliver gas only to war industries. The company now proposed to construct a pipeline emanating from near Opelousas, Louisiana, to a northern point near
Ashland, Kentucky, or any other point designated by the government, such as a regional aluminum or chemical plant. Although the company stated that its principal service would be to natural gas companies serving the Appalachian area, it also noted its intention to sell gas to companies along the route of the pipeline. In addition, after the war the company planned to construct a “peacetime extension” line from Brace, Tennessee, to Asheville, North Carolina, thereby creating an expanded version of its originally proposed system.

The FPC conducted hearings on the Tennessee Gas application during the summer of 1943. Appalachian area distribution company executives presented data supporting the claim that their region was truly running out of gas reserves. The president of Hope Natural Gas Company, the large natural gas production subsidiary of Standard Oil Company (N.J.), and the vice president and general manager of the Columbia Gas & Electric Corporation, testified that by the conclusion of the war, neither company would be capable of meeting normal gas sales requirements. Thus, according to representatives of the two largest Appalachian gas-distribution companies, gas shortages would prevent them from meeting demand. The witnesses agreed that the shortages had begun before the war but were now being accentuated and accelerated by it.

Together, the Hope Natural Gas Company, the Columbia system, and their affiliates furnished approximately 60 percent of the total natural gas requirements of the region. Since both companies estimated that they would be short of gas supply, the entire region would suffer. The president of the Hope Company stated that in 1943 his company expected to sell 89.8 bcf, about 3 bcf below expected demand. This lower volume would require curtailment of gas sales to existing customers by 114 mmcf on a projected peak sales day in March 1944. Likewise, the vice president and general manager of the Columbia system expected to have a shortage of 14 bcf in 1944 and a need for 40 bcf of non-Appalachian area gas during the first year after the conclusion of the war. Although these statistics supported the need for a new pipeline system such as Tennessee Gas’s to bring in southwestern gas, the immediate shortage had to be dealt with first.53

Hope Natural Gas’s testimony on its pressing need for new gas supplies lent important support for Tennessee Gas’s application. Hope’s management, however, soon decided that the most efficient way to bring gas to its system was to build its own line. Hope applied for a certificate to build its own pipeline from the Southwest to the Northeast to serve its distribution system. As a subsidiary of Standard of New Jersey, Hope could rely on
financial support from its parent company in such a pipeline venture. Immediately, Hope became a formidable competitor, rather than a supporting witness and potential customer, to Tennessee Gas.

The War Production Board was becoming increasingly anxious to raise the level of natural gas deliveries into Appalachia. During Tennessee Gas’s hearings, the WPB issued directive no. 10, which provided for Panhandle Eastern to deliver through its newly constructed connection with the East Ohio Company an additional 50 mmcf/d for the year to the East Ohio Gas Company and a total of 1 bcf to Hope Natural Gas. In addition, the FPC’s response to the testimony at the hearings on the fuel crisis included an important statement confirming Appalachia’s need for gas. The commission stated that the Appalachian region “embraces one of the most highly industrialized areas in the United States . . . [and] the use of natural gas, both for domestic and industrial purposes, has been substantial for many years.” The FPC’s own staff engineer presented a slightly less dire scenario for the Appalachian gas situation. He testified that during 1942, the Appalachian region’s total gas requirements were 490 bcf and that deliveries were short of that amount by only 1 bcf. Moreover, peak-day requirements of 2.5 bcf/d were short by only 100 mmcf/d. The commission itself estimated that during 1943 there would be a 15 bcf shortage in the Appalachian region and peak-day deficiency of 300 mmcf, figures which did reflect a potentially serious shortage.

The FPC concluded this round of hearings on Tennessee Gas’s application on July 5, 1943, and affirmed the need for additional supplies of gas in Appalachia. “It is crystal clear,” the FPC stated, “that additional natural gas is needed in the Appalachian region. It follows, therefore, that a realistic view of this situation definitely shows that the public convenience and necessity will be served by the construction and operation of the applicant’s pipeline into the area if the additional showing hereinafter referred to is made.” Tennessee’s application nonetheless remained in serious trouble. While the FPC actively supported a new pipeline to connect southwestern reserves with Appalachian customers, Tennessee remained unable to arrange for either financing or gas supply for its line. The FPC allowed Tennessee Gas sixty days to remedy these deficiencies.

The WPB also increased pressure on Tennessee Gas to attain financing and gas supply. On August 28, the WPB informed the FPC that it had designated the project to bring southwestern gas into Appalachia “as an essential part of the war program,” and it declared that it would issue the necessary steel priorities for the applicant receiving a certificate from the
FPC so that steel would be available by the fourth quarter of the current year. The War Production Board required that a pipeline be constructed and in operation for the winter of 1944–45. The WPB stipulated that the certified pipeline would have to place all its orders for pipe no later than October 1, 1943. The WPB wanted a pipeline as soon as possible, regardless of whether Tennessee Gas or Hope Natural Gas built it.

The FPC quickly had to choose either Tennessee Gas or its new competitor, Hope Natural Gas, to build the line. The primary difference between the two proposals was that the Hope line would receive its supply from the proven Hugoton field in north Texas and Kansas, generally known as the Panhandle field. As an established natural gas company in the Appalachian region with impressive financial backing of the Standard Oil Company of New Jersey, Hope seemed to have a greater chance of gaining the FPC certificate. The FPC announced that it would begin hearings on the Hope pipeline plan on September 21.

At this point, Curtis Dall approached Nelson Rockefeller, then employed by the U.S. government as coordinator for inter-American affairs, about Hope Natural Gas's competition with Tennessee Gas. Dall believed that Rockefeller, whose family had once controlled Standard Oil, could help arrange a cooperative pipeline venture with Hope. But Rockefeller insisted that he had left the oil business for government service and had no influence on the oil giant. Dall's persistence finally persuaded Rockefeller to suggest that Dall arrange a meeting with the president of Hope at which some compromise might be reached. Whatever influence Rockefeller might have had, though, did not translate into an agreement between Tennessee Gas and Hope, and the competition continued.56

Facing stiff opposition from Hope Natural Gas, Tennessee sought to convince the FPC to approve its application before Hope's hearings began. In their search for a long-term supply of gas, Tennessee's promoters discovered that a Chicago-based investment trust, the Chicago Corporation, owned very large quantities of natural gas on the Texas Gulf Coast near Corpus Christi. Victor Johnson, Tennessee Gas director, traveled to Chicago and negotiated a preliminary gas sales contract with the Chicago Corporation and in turn agreed that Tennessee's line would be extended southward to Corpus Christi. The Chicago Corporation controlled three gas-recycling plants that extracted liquids from its natural gas production in local fields and then reinjected the gas back into the wells. Although the extraction operations were profitable, the Chicago Corporation had long wanted to market its gas supply as well.
The Chicago Corporation was particularly interested in the Tennessee Gas line because it had already investigated the possibility of constructing its own pipeline to the Northeast. In the late 1930s, when the Chicago Corporation began acquiring gas reserves in the Corpus Christi area, another local operator, Clyde Alexander, considered promoting a pipeline from the Texas Gulf Coast into the New York area. He contracted Ray C. Fish, then an engineer with Stearns-Roger Manufacturing Company, to design such a pipeline. At the same time, Alexander convinced the Chicago Corporation to assume a financial stake in the proposed Reserve Gas Pipeline Company. Contracting for gas purchases was not a problem, but arranging gas sales contracts in the Northeast was then difficult. The northeastern utilities “didn’t want to have their playhouse disturbed,” recalled Alexander, “and they had those artificial gas plants and they were making money and they had been making money for a hundred years and they didn’t want anybody coming around there and changing their set-up and they wouldn’t even talk about it for a long time.” Reserve Gas’s frontal assault on the northeastern manufactured-gas industry proved unsuccessful.

After the United States entered World War II, the War Production Board’s strict steel limitation requirements on steel availability dashed the hopes of Reserve Gas’s promoters and the line was not built. Curtis Dall met with Clyde Alexander in early 1943 to discuss mutual problems and possible solutions in their respective pipeline plans, but they arranged no deals at that time. However, this initial contact likely led Tennessee Gas to approach the Chicago Corporation about a gas purchase agreement later that year.

After successfully negotiating a tentative gas supply contract with the Chicago Corporation, Tennessee Gas hurriedly filed its fourth application for a certificate with the FPC. This certificate, filed on August 23, indicated that the Chicago Corporation would supply gas to Tennessee Gas. But other problems remained. Initially estimated to cost $10 million, the pipeline now carried a $48 million price tag. Part of the increased cost reflected the longer route of the line. In order to obtain the Chicago Corporation’s gas on the Texas Gulf Coast, Tennessee had planned to build a 1,156 mile, 24-inch line, instead of a 20-inch line, from a point near the Stratton–Agua Dulce gas field area of Nueces County, Texas, near Corpus Christi.

After Tennessee Gas filed its amended application, the War Production Board sought to ensure the viability of its newly acquired reserves. E. Holley Poe, director of the PAW’s Natural Gas and Natural Gasoline
Division, estimated that the gas fields contained approximately 3 tcf of gas. Poe noted the relatively minimal current demand for that gas and added that about one-third of the field’s gas supply was currently available. “We therefore recommend,” wrote Poe, “that reserves and availability of gas in the Stratton–Agua Dulce field are adequate to meet the requirements of the pipe line proposed to be constructed by Tennessee Gas and Transmission Company.”59 This recommendation was an important step in resolving one of Tennessee Gas’s two remaining problems.

Tennessee Gas’s increasingly improving outlook began to transform it into an attractive investment. According to one well-placed source, Brown & Root, a Texas-based construction company, attempted to expand further its equity in Tennessee Gas. Tennessee Gas promoter Clyde Alexander heard that in early September, Brown & Root representatives met with Jesse Jones in Washington seeking a financial interest in the proposed line.60 Brown & Root’s founders, Herman and George Brown, were among the most powerful of Houston’s business elite and comprised part of the so-called 8-F Group, prominent local businessmen who regularly met in Herman Brown’s suite 8-F of RFC Chairman Jesse Jones’s Lamar Hotel.61 The Browns’ efforts, however, did not lead them to an equity position in Tennessee Gas.

Tennessee Gas’s new certificate hearings were scheduled to begin on September 8, 1943. On September 7, the company contracted to purchase its gas supply for a twenty-five-year period from the Chicago Corporation; of the 3 tcf of gas reserves in the area, only 30 bcf were being produced. In addition to the deal with Tennessee Gas, the Chicago Corporation agreed with Manufacturers Light and Heat Company for deliveries of 50–100 mmcf/d of its gas for the use of the Columbia Gas & Electric System to be delivered through Tennessee.

When the hearings began, Tennessee presented its new gas supply plan along with an amended pipeline proposal that placed the origin of the line at a point near Corpus Christi. The line would travel through Louisiana, Mississippi, Tennessee, and Kentucky to Kenova, West Virginia, where an 18-inch extension would connect to Hope Natural Gas Company at Cornwell, West Virginia. Tennessee’s new pipeline system would have an initial total compressor power of 58,000 hp from five compressor stations with ten 1,000 hp units each and one station with eight 1,000 hp units. The company expected its initial delivery capacity to be 207 mmcf/d, of which it would deliver 40 mmcf/d to the Kenova connection and 167 mmcf/d to Hope Natural Gas at Cornwell.
But not all participants at the hearings were in favor of additional pipelines to carry new supplies of natural gas to the region. Representatives of the coal industry, labor unions, and railroads stated that present and future needs of the region could be met by coal. In tandem, these witnesses expressed the idea that “the use of natural gas for industrial and space-heating purposes constitutes a dissipation of the natural-gas resources, and threatens the coal industry with ruinous competition.” Although the commission recognized the ability of natural gas to compete favorably with coal, it stated that it did not have the authority to “regulate rates for natural gas sold directly to industrial consumers, which class of gas sales furnishes the keenest competition to the coal industry. Nor does our power to suspend rates extend to indirect sales of natural gas for industrial purposes.” In essence, the FPC stated that it had no authority to regulate the interfuel competition that would result from the introduction of natural gas into an industrial region previously supplied principally by coal and its by-products. Overall, the FPC remained unsympathetic with the coal industry. The FPC pointed out to the coal representatives at the hearings that on September 18, 1943, the solid fuels administrator for war announced that “coal production has been unable to keep pace with the expansion of war requirements.” Although the coal industry blistered at every expansion of the natural gas industry, it was not capable of alleviating the energy shortage. The FPC dismissed the objections of the coal industry regarding increased natural gas supply for Appalachia.

Tennessee’s hearings were going well, but the company’s financial health remained uncertain. Its prospects of attaining financing dimmed considerably when V. S. Johnson, Tennessee Gas director and financial backer, unexpectedly died at the Willard Hotel in Washington during the course of the hearings. The company had looked to Johnson to arrange and provide financing for the entire venture, and his death at that critical juncture placed the project in peril.

TENNESSEE GAS CHANGES HANDS

As of mid-September, Tennessee Gas lacked adequate financial backing to pay for the pipeline construction. All previous negotiations with the government and private industry proved unproductive. Tennessee Gas officials now discussed financing plans with the Chicago Corporation, which had a strong interest in seeing its natural gas supplies on the Texas Gulf Coast sold through the Tennessee Gas system. For the Chicago
Corporation, the timing was right to make a strategic decision to enter the interstate pipeline business. It offered to refinance Tennessee Gas under fairly generous terms, but it required complete control of the company in return. The Chicago Corporation offered to pay Tennessee Gas $500,000 to discharge all its liabilities, acquire 90 percent of Tennessee's stock, and finance the construction of the pipeline. It also demanded the resignations of all current directors and officers.

On the morning of September 20, the day before the FPC scheduled the beginning of hearings for Hope Natural Gas Company's alternative application, Tennessee Gas's board met to consider the offer. The board, with some reluctance, agreed to the Chicago Corporation's terms; while their pipeline proposal would now find more favor at the FPC, they would no longer be part of the project. Curtis Dall voted in favor of the offer, but he read a statement at the meeting which reflected his belief that his association with Franklin Roosevelt had ultimately caused the downfall of his original conception of Tennessee Gas. Dall stated:

Efforts have been made by various people in Washington, by innuendo and covert remark, to damage me personally, and our project, implying that I was trying to use the influence of the President in some way or implying to others that it was dangerous to "play ball" with me or my group, on account of my being his son-in-law. . . . For the further benefit of all those of the new group that will presently run this company, may I state that if I had any influence with the President, which I have not, I would, under no circumstances, try to use it.63

After Dall and the original directors resigned their positions, the Chicago Corporation nominated a new set of officers and directors.64 Principal among them was Gardiner Symonds, a forty-year-old vice president in charge of oil and gas operations for the Chicago Corporation. Symonds had a strong educational and business background. With an A.B. from Stanford and M.B.A. from Harvard, he was one of the new breed of academically educated businessmen chosen to head a new company in a growth industry. His business background in banking did not seem on the surface to be adequate preparation for organizing a gas pipeline company. But his aggressive management style and competitive spirit later characterized him as one of the gas industry's foremost entrepreneurs. As the first president of the reorganized pipeline company, he was responsible for assembling a staff to plan the construction of the line. An extremely aggressive manager, Symonds had a keen interest in dominat-
ing the northeastern gas market. He began to plot strategy for the growth of what would later become one of the nation’s largest corporations.

Only hours after naming new directors, the Chicago Corporation went before the FPC and reported the recent transaction. The FPC immediately granted an oral certificate to Tennessee to build its pipeline on September 20, 1943, the day before the FPC had scheduled hearings on the Hope Company’s competing plan; Hope’s application was now defunct. Tennessee Gas’s oral certificate became official on September 24.\(^65\)

After gaining control of Tennessee Gas, the Chicago Corporation elicited the aid of Paul Kayser in both financing the pipeline and acquiring additional gas supply. Kayser, a Houston attorney and oil and gas man, was president of both the El Paso Natural Gas Company and Gulf States Oil Company. Gulf States controlled gas reserves in the San Salvador field near the Chicago Corporation’s gas reserves. Furthermore, Kayser was an attorney for fellow Houstonian and RFC chairman, Jesse Jones. Kayser’s association with Tennessee Gas raised eyebrows after Jones agreed that the RFC would finance a large part of Tennessee Gas’s construction costs. The deal was officially arranged when Richard Wagner and Gardiner Symonds of the Chicago Corporation met with Jones, who orally agreed to lend $44 million to Tennessee Gas if the company needed money.\(^66\) Tennessee Gas planned first to finance the line through insurance company investment but wanted an RFC commitment in case those financing arrangements fell through.\(^67\)

The RFC’s commitment of $44 million to Tennessee Gas, however, was not carte blanche. Typical of RFC loan policy as developed by long-time chairman Jesse Jones, the agency imposed a great many conditions on the company in return for financing, and these conditions were mailed to Richard Wagner of the Chicago Corporation in mid-November 1943. The loan carried a ten-year term at a 4 percent annual interest rate. The RFC required the Chicago Corporation to inject not less than $2.5 million of its own capital before RFC payments would begin and $1.25 million per year up to a total of $12.5 million during the following ten years. The RFC reserved prior approval of all selections of engineers for the line, construction disbursements, and gas contracts. Of course, the RFC loan would not even be made without prior FPC certification and WPB issuance of the necessary steel priorities.\(^68\)

As Tennessee Gas negotiated with insurance companies to finance the line, these firms did not know about the contingent RFC loan commitment. The Chicago Corporation estimated the total cost of the pipeline to
be $47.5 million. After unsuccessfully negotiating alternative financing plans for the additional funds, Tennessee Gas did call for its $44 million RFC loan. RFC records disclose that the agency agreed to make the $44 million loan on February 12, 1944, based on Tennessee Gas's "informal Application No. 1." The background of this particular reference remains unclear.\(^6\) It is not certain exactly what role Paul Kayser might have had in the acquisition of the loan, but his influence was popularly "credited with once saving that imperiled undertaking [Tennessee Gas] by persuading his old friend Jesse Jones to grant it an RFC loan in the New Deal days."\(^7\) Tennessee Gas was then in a position to contract for gas purchases from Kayser's Gulf States Oil Corporation for 10 percent of its natural gas supply requirements.\(^8\)

Now that Tennessee Gas was on the verge of becoming a reality, other existing natural gas companies felt the specter of future competition with the new company. In particular, N. C. McGowen, president of the United Gas Corporation, feared that Tennessee Gas would begin interfering in his company's market area. United Gas, once a part of the huge Electric Bond & Share Company, dominated the Louisiana area gas market and the larger "Gulf South," as McGowen called it. In early October, McGowen and PAW executive E. Holley Poe met with Richard Wagner of the Chicago Corporation "to see him and do something about keeping Chicago and Tennessee out of his back yard." Apparently persuaded that Tennessee Gas was not interested in competing with United Gas, McGowen later disclosed to Tennessee Gas officials efforts by others to prevent the construction of Tennessee Gas.\(^9\)

The entire effort to finance and construct the pipeline was an impressive display of wartime business-government interaction and cooperation. With federal approval to build the line, financing in place, and general industry approval, construction began. On October 1, 1943, the company established its first payroll. A small number of employees later swelled to between 9,000 and 11,000 workers during peak construction periods. Tennessee Gas hired several construction firms to work on the pipeline. The primary contractor, Bechtel-Dempsey-Price, shared the work with Williams Brothers Corporation and Brown and Root. The company broke ground for the pipeline on December 4, 1943, at the Cumberland River in Tennessee. Workers welded the first mainline pipe on January 10, 1944, but severe winter weather conditions prevented rapid progress. By May 1, 1944, only 76 miles of the pipeline had been constructed as rain, rough terrain, and material shortages slowed progress.
Tennessee Gas Transmission Company. Solid black line indicates pipeline route.

As the weather improved with the coming of summer, the pipeline moved forward. After laying 1,200 miles of pipe, securing rights-of-way from thousands of landowners, crossing sixty-seven rivers and hundreds of roads, and building seven compressor stations, Tennessee Gas began delivering fuel through the pipeline on October 31, 1944 (see map).73

Tennessee’s primary gas market area was the Appalachian region. By the end of 1945, its first full year of operation, Tennessee had delivered 73.5 bcf of gas into Appalachia. Tennessee began operations with five Appalachian area distribution companies, which had a combined customer base of 750 Appalachian area communities. Approximately 95 percent of Tennessee’s early gas sales, though, went to the two large Appalachian distribution systems: United Fuel Gas Company, a subsidiary of Columbia Gas & Electric Corporation, and its former competitor, the Hope Natural Gas Company, now a subsidiary of Consolidated Natural Gas Company. Tennessee thus became the first pipeline to connect Gulf Coast natural gas reserves directly with Appalachia.74

After the Tennessee Gas pipeline was constructed and in operation, the RFC released its interest in the pipeline. It sold its $44 million interest in the line to the Chase National Bank of New York for $45,157,863.75 To pay off the bank note held by Chase National, Tennessee offered a $57.5 million
package to the SEC, which quickly approved it. The plan included the sale of $35 million in First Mortgage pipeline bonds, stocks, and a $15 million loan. Chase National, First National of Chicago, Continental Bank & Trust, and Harris Trust & Savings of Chicago all participated in the plan, which allowed Tennessee Gas to pay off the original loan. At about the same time, Howard J. Kessner resigned as a director of the RFC and took the position of vice president and director of the Chicago Corporation. Although the RFC no longer owned an interest in the line, two of its former associates were now directors of the company.76

Tennessee Gas’s success, however, caused other problems for its parent company as well. During December 1944, the FPC instituted an investigation to determine if the Chicago Corporation through its ownership of 81 percent of Tennessee Gas stock qualified as an interstate natural gas company as defined by the Natural Gas Act of 1938. If so, the FPC could investigate whether any rates, charges, or classifications relating to any of the Chicago Corporation’s natural gas operations were also subject to FPC jurisdiction. Not wanting to risk an unfavorable FPC ruling, the Chicago Corporation began divesting itself of Tennessee Gas stock. First, the parent company considered the possibility of acquiring an additional loan for an extension of its line or paying the existing loan off early. Jesse Jones reported to the RFC board that Richard Wagner had phoned him to discuss these options. It is unlikely that Wagner truly desired another RFC loan for Tennessee Gas since the Chicago Corporation had already begun divesting itself of Tennessee Gas stock. Jones reported that he told Wagner Tennessee Gas could “of course, pay it at any time according to the prepayment privileges which, for the present, would be 104 and accrued interest. I told him,” Jones said, “I felt sure the Corporation [RFC] would not be willing to sell the loan on any different basis.”77

The Chicago Corporation divested itself of Tennessee Gas after a syndicate of underwriters purchased the stock. Stone and Webster, the lead underwriter, became Tennessee Gas’s controlling stockholder. By September 4, 1945, the Chicago Corporation had no financial stake in Tennessee Gas. At the same time, the Chicago Corporation’s representatives on the board of directors, including Paul Kayser, resigned. Gardiner Symonds, the firm’s forty-two-year-old president, severed his ties with the Chicago Corporation and retained his executive post. Symonds was not only the chief manager of the company, he quickly stood out as the dominant force on its board of directors as well. An attorney from Tennessee Gas’s outside law firm later remarked that Symonds “was a
table 3.3. tennessee gas transmission company operations, 1945-1954

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<th>Year</th>
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<th>miles of pipeline</th>
<th>personnel</th>
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sources: tennessee gas transmission company, annual report (various years),
and moody's public utility manual.

taskmaster, there's no doubt about that, but he was a very fair man.”78
tennessee gas was now for the first time an independent corporation with
a single strong leader and certain future as a major interstate pipeline
company (see table 3.3).79

tennessee gas continued to function effectively and expanded its
system capacity to meet the increasing appalachian demand. the war
production board requested tennessee gas to “give consideration to the
feasibility of installing additional compressor stations, compressors, and
auxiliary apparatus” on its natural gas pipeline system to alleviate ongoing
shortages.80 after the wpb’s request, tennessee filed an application with
the fpc for a certificate of public convenience and necessity to expand its
system. the expansion program called for the lease of four additional
compressor stations to be constructed and owned by the defense plant
corporation, additions to its current compressor stations, and construc-
tion of ninety-five miles of 16-inch outside-diameter pipe from the san
salvador gas field in hidalgo county, texas, northward to tennessee
gas's pipeline in nueces county, texas. the addition of the compressor
stations would increase tennessee gas's delivery capacity by 60 mmcf/d.81

during the fpc's hearings on tennessee's application, several expert
witnesses again questioned the actual severity of the appalachian short-
age. it became evident that representatives from two of tennessee's largest
customers, consolidated natural gas and the columbia system, had

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greatly overestimated their respective expected deficiencies of natural gas. The Columbia system representative stated that his company would have a shortage of 169 mmcf/d out of total peak-day deliveries of 1 bcf/d in the winter. But the FPC, after considering all Consolidated's testimony and sources of supply, stated that the shortfall actually could be no more than 30–45 mmcf/d. In addition, the FPC concluded that the Consolidated system would have a 30 mmcf/d shortage out of total peak deliveries of 651 mmcf/d only if its peak days occurred in February; otherwise, no shortage was expected. Despite the evidence that Consolidated had intentionally overestimated its shortage of gas supply, the War Production Board sent a letter to the FPC urging an increased flow of natural gas into the Appalachian region to fuel production for the duration of the war.\textsuperscript{82}

The letter swayed the commission to approve a limited version of Tennessee Gas's request. The commission did not approve the construction of the San Salvador project, ruling that this extension's projected capacity of 94 mmcf/d would be used only at 29 percent capacity.\textsuperscript{83} Moreover, the extension would not collect additional gas for Tennessee, it would only replace a portion of Tennessee's supply currently purchased from the Chicago Corporation. And this supply was in no immediate danger of diminishing. The FPC denied that Tennessee Gas could lease the four compressor stations from the Defense Plant Corporation (DPC), which it planned to purchase after the war to increase its capacity by 60 mmcf/d. The commission also determined that Tennessee should not be able to charge its intended rate of $0.2175 per mcf. Based on a 6.5 percent return and the costs of the proposed additions to existing compressor stations and the calculations used to determine rates, the commission calculated that Tennessee could charge no more than $0.1825 per mcf. The commission then issued a certificate for the modified project covering only the period of the war emergency.\textsuperscript{84}

FPC commissioner Leland Olds issued a strongly worded dissenting opinion. A trained utility economist, former head of research for the AFL’s Railroad Employees Department, and outspoken critic of much of the FPC's own policy, Olds rejected his fellow commissioners' eagerness to permit such large-scale expansion in the gas industry. He argued that a serious shortage of natural gas did not exist in Appalachia. Olds stated that "cross examination of company witnesses also determined that the commission was being asked to give its assent to what was in fact only a limited segment of a broader plan for postwar deliveries of Texas gas to
northeastern markets in much larger quantities.” Foreseeing the potential for a dramatic introduction of southwestern natural gas into the northeastern states, Olds commented that as the war emergency production requirements tapered off, the commission was being “crowded” with applications for natural gas facilities which “taken singly, do not appear too significant but cumulatively might seriously dislocate the balanced utilization of the country’s energy resources.”

Olds warned his fellow commissioners that Tennessee’s application should be viewed in the context of the unprecedented growth of the gas industry, a process Olds hoped to slow to a more manageable pace. His interest in strictly regulating the industry made him no friend of natural gas executives. In particular, Olds distrusted Gardiner Symonds’s motives. During the hearings, Symonds indicated that Tennessee Gas was positioning itself to increase its sales capacity for the postwar period. Olds was concerned about the potential for energy shortage during the war, and he did not believe that any wartime energy adjustments should be used as a springboard from which a natural gas company could conquer the northeastern coal and manufactured-gas industry after the war. Olds believed that Tennessee’s application was masked to hide its true intent of preparing to increase deliveries of Texas-produced gas into “the coal producing Appalachian area and the industrial Northeast.” And he feared that if the commission inadvertently established the basis for the modern natural gas industry in the northeastern states, the effects of the conversion from coal to natural gas might not be adequately prepared for or regulated. Olds concluded his dissent: “Thus I do not find in the record any sufficient evidence of war need to warrant action on the present application without full investigation of the impact of all plans for sale of southwestern gas in the Northeast. We cannot deal with the situation piecemeal and at the same time conserve the public interest for which the Congress made us responsible in 1942 when it amended section 7 of the Natural Gas Act.”

Olds’s objections to the continued rapid expansion of the natural gas industry fell on the unsympathetic ears of both his fellow commissioners and the gas industry. Natural gas operators clearly understood that expansions to their systems allowed during the war would put them in an advantageous competitive position after the war to expand faster than other newly formed competing companies. The WPB and FPC generally supported expansions based on current demand without significant concern for postwar interfuel competition. Thus, Tennessee Gas was able to maneuver its wartime expansion strategy to position itself for future
expansion. Panhandle Eastern had been in a similar situation, but it was less well situated to expand into new northeastern markets because it already served large and growing midwestern markets.

Tennessee Gas began as an entrepreneurial effort focused on selling southwestern gas into gas-short Appalachia. With the outbreak of war, the pipeline venture required intensive governmental assistance for its success. The WPB provided the steel necessary for its construction, the RFC financed it, and the FPC certified its operation. However, Tennessee Gas was a private business, albeit one operating in a heavily regulated wartime industry. Its promoters accepted strict government controls during the war in anticipation of a postwar boom in the natural gas industry. Shepherded through the war by the FPC and the special powers of other war emergency agencies, Tennessee Gas prepared to become the only pipeline capable of serving the vast northeastern markets.

The war years witnessed comprehensive federal involvement in the gas industry, ranging from financing pipeline construction to the strict allocation of gas sales. The FPC and the WPB worked together, although not always harmoniously, to alleviate the Appalachian fuel shortage. They provided more stable sources of natural gas for war industries, thus meeting their primary goal. With the assistance of the various federal agencies involved in its creation, Tennessee Gas survived several changes of corporate control. Importantly, its leaders recognized from the beginning that if their company could secure a place in the wartime natural gas industry, it would be in an excellent competitive position to break into the large northeastern markets after the war.

World War II offered the natural gas industry an opportunity to expand in return for allegiance to strict regulatory control. In particular, intense Appalachian demand for natural gas stimulated entrepreneurial interest in the gas pipeline business. Also, the amended section 7(c) of the Natural Gas Act allowed natural gas pipelines to apply for certificates to serve areas not already served by natural gas. This was an immensely significant change in the 1938 act. The regulatory modification encouraged intense competition among natural gas companies for FPC certification to serve new markets. And it opened up the capabilities of pipelines to transport natural gas to the Appalachian area war industry. It also provided the future opportunity of selling natural gas to markets farther to the east after the war, and it gave coal, railroad, and other interests a greater opportunity to present opposing views to the FPC regarding gas industry expansion.
The Appalachian gas shortage compelled the FPC and other agencies to look favorably upon plans by pipeline companies to bring natural gas into the Northeast. The FPC joined the WPB and RFC in imposing a high level of central planning on the industry's expansion. Panhandle Eastern's expansion and Tennessee Gas's construction clearly resulted from wartime demand compounded by declining regional supply. The FPC determined when, how, and at what price these systems would operate. At this time, the FPC acted to some extent as a governmental pipeline promotion agency, and this biased activity appeared to be in response to the war emergency. With FPC certification, pipeline companies could legitimately expect RFC funding and WPB steel priorities. Government assistance, if not intervention, was a necessary component in the wartime expansion of the natural gas industry.

After the end of the war, federal control of the industry gave way to market-driven expansion. Several other proposed and expanding pipeline companies also targeted the huge northeastern metropolitan areas of Philadelphia, New York City, and Boston, among others, which remained without natural gas. An intense competition among these new lines for gas pipelines and sales into the Northeast was about to begin. Appalachia, as it would turn out, was a timely stepping stone, reached with the assistance of a wartime regulatory regime, to the Northeast.