Federal Eminent Domain and Interstate Energy Infrastructure: Evidence from History*

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Abstract

We analyze a historical episode to generate evidence on how federal eminent domain authority affected construction of energy transportation infrastructure. The 1947 amendment to the Natural Gas Act gave federally approved interstate natural gas pipelines the power to acquire rights of way by eminent domain when negotiations with landowners failed. We compare construction of interstate gas pipelines with construction of oil pipelines and of within-state gas pipelines, neither of which was directly affected by the reform, using newly digitized historical government records and trade press listings. After 1947, annual additions to interstate gas pipeline mileage rose nearly sixfold while oil pipeline growth held steady, and the gain in interstate mileage was nearly five times the gain for within-state pipelines. Both comparisons suggest that the amendment substantially increased interstate gas pipeline construction. We discuss what this historical evidence implies for current congressional proposals to provide federal eminent domain authority for interstate electricity transmission.

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Building energy infrastructure can require obtaining rights of way from many landowners and approvals from multiple jurisdictions, each of which can delay or veto a project. That set of constraints is at the heart of current debates over electricity transmission, which is central both to the data center buildout and to efforts to expand clean energy generation (Gillett 2026; Jenkins et al. 2022).

A key policy question is whether this structure of permissions and approvals is a binding constraint on private investment. In this paper, we provide historical evidence on this question by analyzing the 1947 amendment to the Natural Gas Act, which provided the power of eminent domain to federally approved interstate gas pipelines. Under the amendment, a developer who could not agree with a landowner could acquire the right of way in federal court.[1] To assess how this amendment affected private investment, we compare construction of interstate gas pipelines with two types of pipeline that the amendment did not directly affect: interstate oil pipelines and within-state gas pipelines. We use newly digitized historical data on U.S. pipeline construction in the 1940s and 1950s from three sources: company-level mileage from the Federal Power Commission and the Interstate Commerce Commission, and listings of construction projects from the trade publication *The Oil Weekly*. We corroborate these with data from a fourth source: national mileage reported by the American Gas Association.

Both comparisons suggest that federal eminent domain authority under the 1947 amendment substantially increased interstate gas pipeline construction. Annual additions to interstate gas pipeline mileage rose nearly sixfold after 1947. Oil pipelines, by contrast, grew at similar annual rates before and after 1947. Put another way, interstate gas pipelines had about 10% less mileage than interstate oil pipelines in 1946 and similar trends up to that point, but about 30% more mileage by 1953.

A comparison against within-state gas pipelines paints a similar picture. Before 1947, construction of both types of pipeline was limited. After 1947, annual construction of interstate pipelines rose by nearly five times the increase for within-state pipelines.

We believe this is the first study to estimate the effect of the 1947 amendment on pipeline construction. Several legal and historical studies describe the amendment's legal context and the politics behind it (Klass and Meinhardt 2015; Ely 2020; Gocke 2023). None measures how the amendment affected pipeline construction.

We also add to a small but growing empirical literature on how permitting requirements

[1]Eminent domain is the power to take private property for public use with just compensation; governments can delegate this power to firms like pipeline companies. Condemnation is the court proceeding in which the holder of eminent domain power uses it to acquire property such as a right of way. A right of way is the property interest a project needs, in our setting typically an easement to build and operate the pipeline or transmission line across a strip of land.

affect private investment. Existing studies mostly examine project costs and completion times rather than the quantity of infrastructure built (Liscow 2025), and suggest meaningfully large effects of permitting on project costs and time-to-build (Bennon and Wilson 2023; Brooks and Liscow 2023). Fewer studies directly estimate the effects of permitting requirements on private investment, mostly for housing, land development, and energy (Liu 2025; Druckenmiller et al. 2026; Gabriel and Kung 2026; Soltas and Gruber 2026; Tabarrok 2026).

Our results also bear on the current congressional debate over the Bipartisan American Affordability and Jobs Act of 2026 (BAAJA). Among the most economically consequential components of BAAJA is federal preemption over siting interstate electricity transmission lines, which resembles the federal eminent domain authority for natural gas pipelines that we study. Many sources note the relevance of the natural gas experience to the proposed transmission reform. Blaug and Nichols (2025) develop this comparison in detail, drawing lessons from the Natural Gas Act's siting framework for federal transmission siting. We build on their work by estimating how much federal authority increased new construction. Several analyses of BAAJA compare its federal siting authority for interstate transmission lines with the Federal Energy Regulatory Commission's authority over interstate gas pipelines (Brenner 2026; Lawson 2026; Levine and Reed 2026; Mackenzie 2026; Zeger et al. 2026), which combines federal approval of a route with federal eminent domain. The 1947 amendment we study isolates the second of these powers—the Federal Power Commission already approved interstate pipelines, and the amendment added the power to condemn land. Current projections of BAAJA's effects (Millican et al. 2026; Rennert and Bergman 2026) have been constructed despite little direct evidence on how new federal authority has changed construction in the past.

Before proceeding, we note three limits of this evidence. First, the samples are small. Most of our regressions use 18 to 24 year-level observations, too few to cluster standard errors, so we put more weight on the figures than on the regressions. The main patterns are large enough to see in the raw data. Second, we discuss other postwar changes and cannot fully rule out a role for them, though we assess that they are unlikely to explain most of our results. Third, precision varies for alternative specifications that relax some assumptions, particularly for proportional growth estimates, since within-state construction began from nearly zero. These limitations call for careful interpretation. Still, the 1947 amendment is an important episode that many current policy analyses cite but that prior work has not analyzed quantitatively, and we believe these comparisons provide the best available evidence on it.

1 Institutional Context: The Natural Gas Act

Congress passed the Natural Gas Act in 1938 to regulate interstate gas companies that fell beyond the reach of state rate regulation. The Act gave the Federal Power Commission authority over interstate transportation and wholesale rates (Merrill 1980; Pierce 1995, 1988).

Until 1947, the Federal Power Commission approved interstate pipelines, but a pipeline's ability to use eminent domain depended on the law of each state it crossed. This division of authority was perceived as creating three problems for developers (U.S. House Committee on Interstate and Foreign Commerce 1947; Ely 2020; Gocke 2023). First, pipeline opponents whose objections the Federal Power Commission rejected could raise them again in each state along the route. Second, many states denied eminent domain to out-of-state corporations and to pipelines that crossed a state without serving its residents. Third, landowners could hold out for high prices. For example, one firm paid over $27,000 for an entire 93-acre farm to obtain a 3,200-foot strip of right of way that would normally have cost no more than $4,000 (U.S. House Committee on Interstate and Foreign Commerce 1947, p. 556).

The 1947 amendment sought to address these issues. The amendment applied to developers that held a certificate of public convenience and necessity (i.e., the Federal Power Commission's approval to build an interstate pipeline). If such a developer could not agree with a landowner on a price, the developer could acquire the right of way by eminent domain in federal court, and the court would set the compensation.

The design of the 1947 amendment lets us compare investment in interstate gas pipelines with two comparison groups. The first is interstate oil pipelines. Gas and oil pipelines used the same steel pipe and faced the same input shocks, but the 1947 amendment did not change how oil pipelines acquired rights of way.[2,3] The second is within-state gas pipelines, which the Act did not directly affect.

Some effects of the amendment could appear in 1947 for projects that already held a certificate when the amendment passed in July 1947. However, we expect the full effect on completed construction to appear a year or more after passage, because developers needed time to obtain a certificate from the Federal Power Commission and then to build the pipeline.[4]

[2]Oil pipelines never received permanent federal eminent domain and needed approval from each state they crossed (Klass and Meinhardt 2015). The Cole Act of 1941 granted federal eminent domain temporarily to pipelines needed for national defense, but the authority expired in 1943 (U.S. Congress 1941; Klass and Meinhardt 2015).

[3]We use "gas" to mean natural gas; we do not separately discuss gasoline.

[4]A few cases from Federal Power Commission dockets suggest that a certificate took five to six months to obtain (Federal Power Commission 1939, p. 546; 1941, p. 1044; 1946a, p. 633). Construction took around a year for the Tennessee Gas and Transmission Company's pipeline from Texas to West Virginia and for the government's Big Inch oil pipeline (Raley 2008; Palmer and Johnson 2023).

2 Data

We measure pipeline construction in the 1940s and 1950s with three sources that we believe no prior study has digitized: company-level pipeline mileage from the Federal Power Commission and the Interstate Commerce Commission, and listings of individual construction projects from the trade publication *The Oil Weekly*.[5] We use a fourth data source, national mileage from the American Gas Association's *Historical Statistics of the Gas Industry*, as corroboration, though these data are not rich enough to use in our main analyses. Appendix Table 1 provides a summary of key details on these data sources.

Interstate Natural Gas and Oil Companies Each year, the Federal Power Commission and the Interstate Commerce Commission published each regulated company's year-end pipeline mileage, compiled from mandatory reports; Appendix Figures 1 and 2 provide examples of what information is available from these sources. Separate agencies reported data on gas versus oil pipelines because Congress regulated the two fuels under separate laws.[6] We measure new construction as the year-over-year change in the national pipeline stock. A robustness check attempts to adjust for company entries and exits, which in principle could change reported mileage even if there were no real additions or removals of pipelines (see Appendix A.1).

The annual *Statistics of Natural Gas Companies* (Federal Power Commission 1942–1954), first published in 1942, reports each company's miles of gas transmission pipelines. We digitize the volumes for 1942–1953.[7] We end the sample in 1953 because the Hinshaw Amendment of 1954 exempted some pipeline companies from the Commission's jurisdiction; almost 30% of companies, with over 10,000 miles of transmission pipelines, dropped out of the 1954 report (Appendix A.1).

The *Statistics of Oil Pipe-Line Companies* (Interstate Commerce Commission, Bureau of Transport Economics and Statistics 1948–1954) reports the pipeline mileage of interstate common carriers of crude oil and refined products, which were required to carry oil for any shipper on equal terms. We digitize the same years, 1942–1953, to measure mileage of trunk pipelines, which are the oil counterpart of gas transmission pipelines—both carry fuel long distances after extraction (Appendices A.1 and A.2). Hereafter, "interstate gas pipelines" and "interstate oil pipelines" refer to these transmission and trunk pipelines. The totals

[5] *The Oil Weekly*, published by the Gulf Publishing Company, was renamed *World Oil* in 1947; for simplicity, we refer to both as *The Oil Weekly*.

[6] The Hepburn Act of 1906 placed interstate oil pipelines under the Interstate Commerce Commission, and the Natural Gas Act of 1938 placed interstate gas pipelines under the Federal Power Commission.

[7] We found no 1943 volume, likely because the Commission suspended the publication during World War II (U.S. House Committee on Appropriations 1946, p. 87).

may include within-state pipelines that interstate companies also operated, which cannot be separately measured in these data (Appendix A.1). The published data on interstate oil pipelines also lack information on pipeline diameter.

Project Construction Listings We digitize listings of individual pipeline construction projects from the annual yearbook issues of *The Oil Weekly*, a petroleum industry trade journal that, despite its name, also covered gas pipelines (Gulf Publishing Company 1943–1951). The yearbooks list proposed, planned, ongoing, and completed projects in a consistent annual format over the years 1942–1950. Before and after this period, the reporting scope varied significantly, and the data appear to be much less comprehensive.[8] These listings let us observe new construction directly rather than infer it from changes in total mileage (Appendix A.3). Appendix A.3.1 describes how we classify interstate versus within-state pipelines. The 1950 *Oil Weekly* yearbook describes the data as compiled from monthly surveys of contractors, pipeline companies, the Federal Power Commission, and other agencies, but does not assess how complete its coverage was or whether coverage varied over time. In Appendix A.4, we construct a comparison of these data against other sources.

Because the *Oil Weekly* listings often report pipeline diameters, our comparison of interstate and within-state gas pipelines analyzes capacity-weighted mileage as an outcome, which more comprehensively captures the economic value of each new mile of pipeline. We compute a capacity scaling factor equal to a pipe's diameter raised to the power of 2.5, which is roughly proportional to the pipe's flow capacity (Appendix A.3.2), and weight the mileage by this factor. We express the total in miles of 24-inch-equivalent pipe. Because we lack data on oil pipeline diameters, the comparison of interstate gas and oil pipelines uses unweighted mileage. To focus on transmission pipelines, we restrict the *Oil Weekly* sample to pipes at least 22 inches in diameter (Appendix A.3.1).

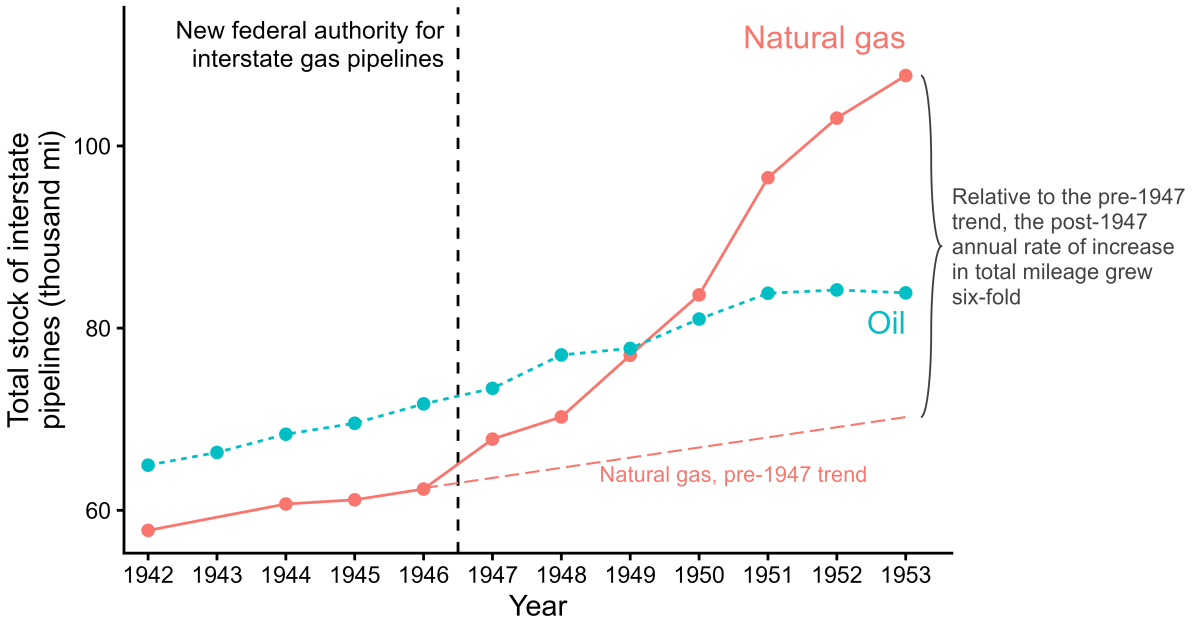
American Gas Association Statistics We use a fourth source only to corroborate the *Oil Weekly* listings. The *Historical Statistics of the Gas Industry* (American Gas Association 1961) reports the national year-end stock of gas mains. We take its data for 1942–1950 and measure new construction as the annual change in this stock. Before 1946, the data combine field, gathering, transmission, and distribution mains, so we cannot separate interstate from within-state pipelines in these data, and we do not use these data for our main estimates (Appendix A.4).

[8]Earlier yearbooks summarize only notable projects. From 1951, construction news moved out of the annual yearbook into monthly sections, and potential changes in reporting methodology are not clearly documented; by late 1952 the scope of sample inclusion had definitively changed to focus primarily on proposed, approved, and ongoing construction rather than completed projects.

3 Results

3.1 Interstate Natural Gas Versus Interstate Oil Pipelines

Figure 1: The Stock of Interstate Pipeline Miles for Natural Gas Grew Relative to Oil After the 1947 Amendment Provided Federal Eminent Domain for Gas



Note: Data are transmission pipeline miles from the Federal Power Commission's *Statistics of Natural Gas Companies* and trunk pipeline miles from the Interstate Commerce Commission's *Statistics of Oil Pipe-Line Companies*, summed across companies. Mileage is not adjusted for companies entering or leaving the reports (Appendix A.1). Federal Power Commission data are not available for 1943.

Figure 1 compares the annual national stock of interstate natural gas pipelines with the stock of interstate oil pipelines. Appendix Figure 4 shows the annual change in mileage, which is the slope of Figure 1.

Interstate gas pipelines grew much faster than oil pipelines after the 1947 amendment (Figure 1). Before 1947, interstate gas and oil pipelines grew at similar rates, with gas growing slightly more slowly. Beginning in 1947 and accelerating thereafter, interstate gas pipeline mileage expanded more rapidly. The gas pipeline stock was about 10% smaller than the oil pipeline stock in 1946 but about 30% larger by 1953. Appendix Figure 4 shows more directly that after 1947, annual additions to interstate gas pipeline mileage increased nearly sixfold, while annual additions to interstate oil pipeline mileage stayed nearly constant.

One way of quantifying the patterns in Figure 1 is with difference-in-differences regressions that compare interstate gas and oil pipeline mileage before versus after 1947, estimated by ordinary least squares with fixed effects for fuel and year. Because each regression has

only 20 to 24 year-fuel observations, we report HC2 heteroskedasticity-robust standard errors and compute p-values with the Bell–McCaffrey degrees-of-freedom adjustment, as Imbens and Kolesár (2016) recommend for small samples. With only two series, we cannot cluster to account for serial correlation within each series.

Consistent with the patterns that are visually apparent in Figure 1, these regression estimates suggest that the 1947 amendment substantially increased interstate gas pipeline mileage (Appendix Table 2, columns 1 and 2). In 1947 and subsequent years, natural gas added over 5,000 more miles of pipeline per year than oil, relative to the gap before 1947. Measured by year-end stocks, the gas pipeline stock grew by about 14,400 more miles than the oil stock after 1947, relative to the gap before 1947. This increase equals about a quarter of the 1942 gas pipeline stock of just under 60,000 miles. Both estimates are statistically significant at conventional levels.

These ordinary least squares estimates provide a transparent quantification of the changes in pipeline miles by fuel type over time plotted in Figure 1. An alternative quantification would be based on proportional models, and for completeness and comparability we also report Poisson pseudo-maximum likelihood estimates. These Poisson estimates imply a similar magnitude to the ordinary least squares estimates. Specifically, the linear model implies about 5,300 additional miles of gas pipeline per year (Appendix Table 2, column 2), and the Poisson estimate of 1.57 implies that gas construction ran about 4.8 times its counterfactual level (column 4).

Appendix Table 3 reports a robustness test that attempts to adjust both series for companies that enter or leave the reports. This alternative leaves the estimates for annual new pipeline additions nearly unchanged and lowers the year-end stock estimates by about 20 to 25% relative to the baseline magnitude. Estimated precision remains similar.

3.2 Interstate Versus Within-State Natural Gas Pipelines

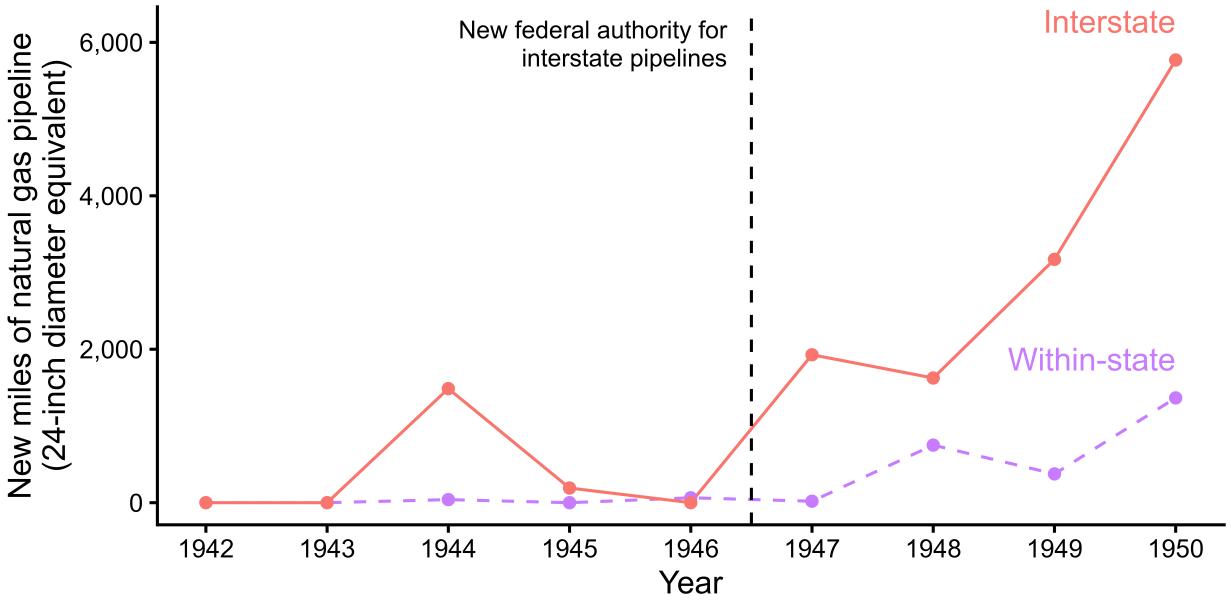
Figure 2 compares construction of interstate and within-state natural gas pipelines, using project-level data from *The Oil Weekly*. Each point shows the pipeline mileage completed in that year, measured in miles of 24-inch-equivalent pipe.

Before 1947, almost no large transmission pipelines were completed in most years (Figure 2).[9] Construction expanded rapidly after 1947 for both interstate and within-state pipelines. Annual interstate construction rose rapidly in capacity-weighted miles, while within-state construction rose much less (Appendix Table 8). Because within-state construction started

[9]Figure 1 shows steady growth in interstate gas mileage before 1947. The difference between Figures 1 and 2 partly reflects the 22-inch minimum diameter we use to proxy for transmission pipelines (Appendix A.4 and Appendix Figure 13).

from nearly zero, it grew faster in percentage terms, so we compare changes in miles rather than ratios. The gap between interstate and within-state pipelines widened over time. In 1950, the last year of the sample, new interstate construction exceeded new within-state construction by over 4,000 capacity-weighted miles.

Figure 2: For Natural Gas, Interstate Pipelines Expanded Relative to Within-State Pipelines Beginning in 1947



Note: Data are from the yearbook listings of *The Oil Weekly*. The sample covers completed new construction of pipeline segments at least 22 inches in diameter; it excludes segments with no reported diameter, pipeline conversions, and projects still under construction. Capacity-weighted mileage is reported in miles of 24-inch-equivalent pipe.

After 1947, interstate pipelines added about 2,200 more capacity-weighted miles per year than within-state pipelines did, relative to the gap before 1947 (Appendix Table 4). This estimate is statistically significant at conventional levels and represents an increase in capacity-weighted miles of about 230% over the counterfactual baseline. The estimate and its standard error are similar if we include all pipes at least 12 inches in diameter, a sample that likely mixes some distribution lines with transmission lines. Including pipes of all diameters, the estimated increase is smaller and less precise.

As with our quantification of the patterns in Figure 1, we focus our quantification of the patterns in Figure 2 on ordinary least squares estimates, which directly estimate changes in capacity-weighted miles in a way that matches our graphical presentation of the data. For completeness, we also report Poisson pseudo-maximum likelihood estimates (Appendix Table 5). The Poisson point estimates are negative, reflecting within-state construction that started from nearly zero before 1947, and have large standard errors that fail to reject either

the main estimates from Appendix Table 4 or an effect of zero.

4 Discussion and Alternative Explanations

The previous section presents evidence suggesting that interstate gas pipelines expanded rapidly after 1947, relative to both interstate oil pipelines and within-state gas pipelines. Each comparison has advantages. Gas and oil pipelines used similar inputs and had similar cost structures, so shocks to input costs such as steel prices or technological advancements affected both. For this reason, we view the gas-versus-oil estimates as slightly more informative. The interstate versus within-state comparison holds the fuel fixed, so changes in demand for gas relative to oil do not affect it. However, the interstate versus within-state comparison has the challenge that pipelines form networks. To the extent that a new interstate pipeline may induce construction of connected within-state pipelines, this would raise construction in the comparison group and would lead this comparison to understate the effects of the 1947 amendment. Restricting the sample to segments at least 22 inches in diameter removes most field, gathering, and distribution lines, which reduces but may not eliminate this concern. The pattern of smaller estimates when we loosen that restriction is consistent with these network effects understating this comparison.

We also consider explanations for these findings other than the eminent domain authority in the 1947 amendment. One alternative explanation is that U.S. demand for natural gas shifted outward after World War II. The Federal Power Commission attributed demand growth to gas space heating, higher prices and wartime shortages of other fuels, construction postponed during the war, and its own reductions in pipeline companies' wholesale rates (Federal Power Commission 1947; Federal Power Commission 1948). The Commission reported a postwar shortage of large-diameter steel pipe as well(Federal Power Commission 1948). Gas reserves were also declining in some populous and industrially productive areas, including Appalachia and California, so developers proposed long interstate pipelines from the South. Our comparison of gas against oil accounts for demand growth common to both fuels. The question is therefore whether demand grew more for gas than for oil.

If demand for gas rose relative to demand for oil, gas prices might have risen relative to oil prices. Wholesale and retail gas prices barely moved after the war while oil prices rose sharply (Appendix Figure 8), but regulators set these gas rates, so they say little about demand.[10] Wellhead gas prices, which the Federal Power Commission did not regulate in

[10]The Federal Power Commission regulated interstate wholesale gas rates from 1938 (U.S. Congress 1938) but did not regulate independent producers' wellhead sales before 1954 (Supreme Court of the United States 1954). Federal price ceilings on petroleum, in place since early in World War II, ended in 1946 (U.S. Congress 1946). Korean War price controls covered both oil and wellhead gas from 1951 to 1953 (Office of

general before 1954, provide a cleaner comparison. From 1947 through 1950, when neither wellhead gas nor oil faced federal price ceilings, wellhead gas prices rose less than oil prices. This does not point to demand for gas substantially outpacing demand for oil, though prices also reflect supply: new pipelines and growing gas supply could have held down gas prices even if demand for gas grew faster.

Fuel consumption provides a second basis for assessment. In absolute terms, consumption of natural gas and oil rose by similar amounts after World War II, measured in British thermal units (Appendix Figure 9), which does not suggest a relative demand shock for gas. Because gas began from a smaller base than oil, though, its consumption grew faster in percentage terms. Consumption is also an imperfect test, because gas could reach new customers through new pipelines, so part of the growth in gas consumption may reflect the new pipelines themselves rather than demand. For this reason, we put somewhat more weight on the wellhead price comparison than on the consumption data.

A related concern is that oil could also move by rail or water, so suppliers could meet some postwar demand for oil without building pipelines. Gas, by contrast, could travel long distances in volume only by pipeline (Klass and Meinhardt 2015; Coleman and Klass 2019). This difference could help explain why oil pipeline mileage grew at about the same rate before and after 1947 (Figure 1). It would also bias the gas–oil comparison toward finding an effect of the 1947 amendment, since demand growth common to both fuels would raise gas pipeline construction more than oil pipeline construction. The comparison of interstate and within-state gas pipelines does not face this concern, since both types of pipeline carry gas.

Demand growth raises a different question for the interstate versus within-state comparison, which holds the fuel fixed: did postwar demand shift toward gas that had to cross state lines? Gas reserves were concentrated in a few southwestern states and declining in Appalachia and California (U.S. House Committee on Interstate and Foreign Commerce 1947), so growing demand in distant population centers required interstate pipelines. This shift would make the comparison overstate the amendment's effect. Such a shift would likely raise interstate construction gradually, though, while Figure 2 shows interstate construction pulling away from within-state construction beginning in 1947.

The winter of 1946–47 brought a sharper shock. Gas shortages in the Midwest and Appalachia led the Federal Power Commission to ration pipeline capacity and, as an emergency stopgap, to let the wartime Big Inch and Little Big Inch oil pipelines carry gas (Federal Power Commission 1948). Our data exclude these conversions, but the shortages themselves could have spurred new gas pipeline construction after 1947. These shortages are hard to

Price Stabilization 1951c,a,b, 1953).

separate from the amendment, though, because supporters of the amendment argued that difficulties acquiring rights of way were delaying pipelines needed to meet winter demand (U.S. House Committee on Interstate and Foreign Commerce 1947). If the right-of-way problem helped cause the shortages, then the construction that followed partly reflects the constraint the amendment removed, and belongs to the amendment's effect rather than to a separate confound.

Other regulatory changes around 1947 are, in our assessment, less likely to explain our findings. In 1946, the Federal Power Commission adopted an expedited process for certificate hearings, but this followed previous informal efforts to speed certificate grants and applied only to uncontested applications, which would have faced little resistance in any case, and did not make approval more likely (Federal Power Commission 1946b). A postwar crackdown by Texas regulators on flaring gas at oil wells (Olien 1995) may have provided a motivation to build out a transportation network for the new gas supply, but a rush to comply with the orders may have favored quicker within-state construction, which would have narrowed the gap between interstate and within-state construction.

The historical data limit what these tests can show. Year fixed effects absorb shocks common to both groups, but with 18 to 24 observations we cannot add controls for changes that differ between them, as a study with modern microdata might. We instead use historical and institutional evidence. That evidence suggests that the alternative explanations above are unlikely to account for most of the increase in interstate gas pipelines, though we cannot rule out contributions from these other explanations.

5 Conclusion: Lessons for Permitting Electricity Transmission

The 1947 setting resembles interstate electricity transmission today in three ways. First, the 1947 amendment to the Natural Gas Act removed obstacles much like those facing transmission developers today. Before 1947, pipeline opponents who lost before the Federal Power Commission could relitigate their opposition in every state along a pipeline's route. Many states denied eminent domain to out-of-state corporations and to pipelines that crossed the state without serving local residents. Transmission developers report facing similar veto points. A power line may need separate approvals in each state it crosses, and each state reassesses whether the project is needed (Klass 2015). State law often lets state commissions approve only lines that benefit their own state, and some states deny condemnation powers to private transmission developers, which leaves developers exposed to landowner holdouts

(Klass 2015; Mackenzie 2026).

Second, both settings involve moving energy from distant sources to growing markets. Postwar demand for gas grew steadily, and depleted reserves in Appalachia and California meant that new supply had to come from distant fields in the Southwest (Federal Power Commission 1949, 1950). Today, low-cost renewable generation is often located far from population centers, and the grid increasingly moves electricity across state lines (Klass 2015), even as data centers drive rapid growth in electricity demand (Gillett 2026).

Third, the same federal agency regulates both types of lines. Interstate gas pipelines around 1947 and interstate transmission lines today recover costs through rates set by the Federal Energy Regulatory Commission, which succeeded the Federal Power Commission. BAAJA, the legislation currently under consideration by Congress, would also use a mechanism similar to the one in the 1947 amendment—allowing the Federal Energy Regulatory Commission to approve an interstate transmission line, with federal eminent domain, when a state denies the project or fails to act within a year and the Federal Energy Regulatory Commission finds the line to be in the national interest (Mackenzie 2026). BAAJA goes further than the 1947 amendment in one respect and less far in another. The 1947 amendment preempted only state control over condemnation, while under BAAJA the Federal Energy Regulatory Commission would also approve the route. But BAAJA's federal authority applies only as a backstop after the state process.

These parallels bear on a central question in the debate over BAAJA: how much transmission would federal siting authority create? Most evaluations of recent permitting legislation (Teplin et al. 2024; Rennert and Bergman 2026) and of transmission reforms more generally (Greenline Insights and Center for Climate and Energy Solutions 2026) rely on modeled scenarios that partly assume an answer. Energy modelers note that their models struggle to capture the effects of permitting reforms (Robertson et al. 2024). Our estimates offer ex post evidence on this question from one important historical precedent.

Important differences remain. Modern transmission projects face environmental review and complex regional planning processes that differ from pipeline siting in 1947. Utilities operate as regulated monopolies that can pass some costs to captive customers (Macey 2024), and they have incentives to favor local projects they control over regional lines whose costs must be divided among many beneficiaries (Mackenzie 2026). For these reasons, Elmendorf et al. (2025) argue that permitting reform without reform of utility incentives might have "much less effect" than the two reforms combined.

BAAJA pairs federal siting authority with several such complementary reforms: deadlines and litigation limits for environmental review, mandatory interregional planning using common methods to measure benefits, beneficiary-pays cost allocation reviewed by the Federal

Energy Regulatory Commission, and penalties for utilities that favor inefficient local projects (Mackenzie 2026). In this respect BAAJA comes closer to the 1947 setting, where a federal framework for approving interstate pipelines and regulating their rates already existed when the amendment added condemnation power. It also comes closer than the backstop siting authority Congress created in 2005, which has never been used (Lawson 2026).

Our estimates do not forecast how much transmission BAAJA would add; that would require accounting for modern cost drivers, planning processes, utility incentives, and demand. But the last time Congress gave interstate energy infrastructure federal eminent domain that developers could readily use, construction rose sharply within a few years, relative to both comparison groups. Together with the institutional parallels, this history suggests that BAAJA's siting provisions, combined with its planning and cost-allocation reforms, could markedly increase construction of interstate transmission.

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Appendix

The online appendix is available at: https://tinyurl.com/pipelines-appendix

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A Data Sources

A.1 Interstate Natural Gas Company Data from the Federal Power Commission

The Federal Power Commission published the *Statistics of Natural Gas Companies* annually from 1942. Each volume reports detailed statistics on companies that, "for administrative purposes, have been determined to be natural gas companies within the meaning of the Natural Gas Act."[11] However, each volume from 1942–1952 also cautions that "as the jurisdictional status of certain companies remains in question, the compilation does not contain information on all such companies" (Federal Power Commission 1942–1954). The volumes compile reports that companies submitted to the Commission at the end of each year.

We digitize the volumes for 1942–1954 but found no volume for 1943. In its fiscal year 1947 budget hearings, the Federal Power Commission reported that "[d]uring the war years, as a result of curtailments required on behalf of the war effort, a number of important statistical publications were temporarily discontinued or reduced in size. Those temporarily discontinued include ... Statistics of Natural Gas Companies" (U.S. House Committee on Appropriations 1946, p. 87). We therefore interpolate 1943 mileage as the average of 1942 and 1944.

[11]The Act defines a natural gas company to be any "person engaged in the transportation of natural gas in interstate commerce, or the sale in interstate commerce of such gas for resale," where natural gas means "either natural gas unmixed, or any mixture of natural and artificial gas" (U.S. Congress 1938).

We digitize the scanned PDFs with the Google Gemini API, using the Gemini 3 Flash Preview large language model (`gemini-3-flash-preview`; accessed October 7, 8, and 15, 2026). We send one scanned page per request, together with a written prompt and a structured output schema that fixes each variable and its allowed values. We then check that the transmission mileage in each diameter range sums to the reported total (Appendix Figure 1 shows how the mileage is printed), correct discrepancies by hand, and spot-check additional records.

Because coverage depends on each company's jurisdictional status rather than on individual pipelines, a jurisdictional company's within-state pipelines may be reported alongside its interstate pipelines. We believe the reported transmission mileage is predominantly interstate, but the statistics provide no way to separate interstate from within-state mileage.

Pipeline mileage is reported separately for transmission and field[12] pipelines (Appendix Figure 1). Transmission mileage is also broken down by inner diameter in five-inch increments, which we are able to corroborate against data from *The Oil Weekly* in Appendix A.4. We restrict our sample to transmission pipelines because the Natural Gas Act excludes production, gathering, and distribution (U.S. Congress 1938). We rely on the publication's classification of pipelines, although the volumes do not define field or transmission pipelines. The boundary between gathering and transmission had no clear legal test until 1951, when the Commission's "behind the plant" test classified pipelines running from wells to a processing plant as gathering and pipelines leaving the plant as transmission, regardless of their diameter or length (Federal Power Commission 1951). It is unclear whether the volumes exclude distribution pipelines or combine them with transmission mileage.

We interpret the inclusion of field pipelines in the Federal Power Commission's forms as further evidence that the transmission mileage may include a mix of interstate and within-state pipelines, because field pipelines fall outside the jurisdiction of the Act. Footnotes in the source show that some companies also combine their field and transmission pipelines.

We also drop the 2,848 miles that the Texas Eastern Transmission Corporation reported in 1947. Texas Eastern bought the Big Inch and Little Big Inch, two wartime oil pipelines, from the federal government and converted them to natural gas. Texas Eastern lobbied for the 1947 amendment, but the conversion involved no new pipe. Conversions between natural gas and oil are rare in either direction. A large language model search of every *Oil Weekly* yearbook from 1943 to 1951 finds only two other conversions between oil and gas.[13]

[12]Field pipelines gather gas within producing fields.

[13]The two conversions identified were both wartime conversions of natural gas pipelines to crude oil: Stanpec Natural Gas Company's 195-mile pipeline from Kettleman Hills to San Francisco, and the government's 150-mile Southwest Emergency Pipe Line in Texas.

A.1.1 Estimating New Construction

Because the *Statistics of Natural Gas Companies* reports each company's year-end pipeline stock, the annual change in total mileage mixes new construction with other events, including acquisitions, mergers, changes in reporting thresholds, and changes in the jurisdictional coverage of the Natural Gas Act.

To account for these events, we link companies across volumes by name. We digitize footnotes associated with each record to infer the nature of change events, including name changes, acquisitions, mergers, leases, new operations, and construction. These footnotes let us follow a company across name changes. When an acquisition or merger happens mid-year, we avoid counting the same mileage under both the predecessor and the successor companies. After linking companies across change events, we treat a company's first and last appearances in the data as entries or exits.

Through 1950, the Federal Power Commission volumes report mileage only for companies with annual gas operating revenues above $250,000. From 1951, the volumes also include smaller companies with revenues between $25,000 and $250,000. The number of companies in the report rises by nearly 20%, from 115 in 1950 to 137 in 1951, and we attribute over 2,000 miles to this reporting change.

In 1954, the Hinshaw Amendment exempted certain pipeline companies from the jurisdiction of the Federal Power Commission. Specifically, it exempted any company that receives natural gas from a separate company within or at the boundary of a state, provided that all of the gas is ultimately consumed within that state and the company's rates and service are regulated by a state commission (U.S. Congress 1954). The number of companies reporting to the Federal Power Commission falls by almost 30%, from 158 in 1953 to 112 in 1954, and we estimate that this change removes over 10,000 miles from the reports.

Without an adjustment, a company with existing pipelines that begins reporting to the Federal Power Commission adds its entire existing stock to our measure of new investment. Similarly, a company that stops reporting without removing any pipeline subtracts its entire stock.

In a robustness check, we control for entry and exit events by assuming that before an entry and after an exit, a company maintains a constant stock of pipelines equal to that in the first or last reporting year, respectively. (The report will occasionally indicate, through explicit footnotes, that a new company has begun operations; these observations are tracked separately from artificial entries and exits.) We apply a similar adjustment to the Interstate Commerce Commission's company-level oil data (Appendix A.2). Appendix Figures 5 and 6 compare natural gas and oil pipeline mileage with both series adjusted. The adjustment attenuates natural gas pipeline growth after 1947, but the qualitative trends remain the same

in both the stock series (Appendix Figure 5) and new pipeline investment series (Appendix Figure 6).

A.2 Interstate Oil Company Data from the Interstate Commerce Commission

The Interstate Commerce Commission's statistics cover pipeline companies that are "common carriers engaged in the interstate transportation of oil or other commodity, except water and natural or artificial gas, by pipe line" (Interstate Commerce Commission, Bureau of Transport Economics and Statistics 1948–1954). The data combine pipeline mileage for crude oil and refined products.

As with the Federal Power Commission data, coverage depends on each company's jurisdictional status rather than on individual pipelines, so a jurisdictional company's within-state oil pipelines may be reported alongside its interstate pipelines.

Pipeline mileage is reported separately for trunk and gathering pipelines (Appendix Figure 2). The Interstate Commerce Commission defines trunk pipelines as "such pipe-line facilities as are used in the transportation of oil which has been gathered from the wells of producers, or has been received from connecting lines, refineries, or vessels" and gathering pipelines as "such pipe-line facilities as are used in transporting oil from the wells of producers to points of delivery within the gathering district, or to points of connection with trunk lines for transportation beyond the gathering district" (Interstate Commerce Commission, Bureau of Statistics 1939). We use trunk pipelines as the oil counterpart to natural gas transmission pipelines: both begin where gathering ends and carry fuel over long distances to refineries, other pipelines, or markets, so both require assembling rights of way across many properties and often across state lines. Again, it is unclear whether the statistics exclude distribution pipelines or combine them with trunk mileage.

The Interstate Commerce Commission's jurisdiction over oil pipelines did not change meaningfully over our sample period (Johnson 1967). The only notable development concerned companies that carry only their own products between their own facilities in different states. The Supreme Court held that such a company must file valuation data with the Commission (Supreme Court of the United States 1946) but, at least where other pipelines serve the same area, need not operate as a common carrier or file tariffs (Supreme Court of the United States 1951). These rulings affected only a narrow set of companies, so we do not expect them to affect our mileage series.

We digitize company-level trunk pipeline mileage for 1943–1953 from the scanned statements using the Google Gemini API, with the Gemini 3 Flash Preview large language model

(`gemini-3-flash-preview`; accessed October 26, 27, and 28, 2026), following the same process as for the Federal Power Commission statistics (Appendix A.1). We entered the 1942 company-level data by hand. We reconcile the company mileage with the totals reported in each statement and correct discrepancies by hand, then sum trunk pipeline mileage across companies to national totals. A robustness check adjusts the annual change for companies that enter or leave the reports, though we lack detailed information on acquisitions and mergers for oil companies. Appendix Figure 2 shows an example page.

A.3 Project Construction Listings from the Trade Press

We digitize project construction data from *The Oil Weekly*, a petroleum industry trade journal. The journal covered oil and gas industry news, including regular reports on pipeline construction. Annual yearbook issues compiled lists of pipeline projects at various stages of planning, construction, and completion. The listings typically report the operating company, origin and terminus, fuel carried, and length. Many also report the pipe diameter and whether a project has segments of different diameters. The level of detail varies, so we cannot extract every variable for every entry (Appendix Figure 3).

We use the listings of completed projects from the 1943–1951 yearbooks, which cover construction in 1942–1950. Coverage outside this window is less complete or less consistent. Before 1943, the yearbooks only summarize notable projects (1935–1937 and 1940–1942) or list extended pipelines (1938–1939). After the 1951 yearbook, construction news moved to a recurring monthly section. From January 1951 to October 1952, the monthly lists of announced, started, and completed projects appear similarly comprehensive, but we found no documentation of how they were compiled, so the reporting method may have changed. The monthly lists may also count the same mileage twice, once as each segment is finished and again when the full system is completed. From November 1952 onward, the section shifted to news stories focused on proposed, newly started, and ongoing projects; completions were rarely reported. In July 1954, pipeline coverage moved to a new publication from the same publisher, *Pipe Line Industry*, which similarly focuses on pre-construction news.

We also found little documentation of how the 1943–1951 yearbooks collected data or which projects they covered. The 1950 yearbook describes the data as compiled from monthly surveys of contractors, pipeline companies, the Federal Power Commission, and other agencies, but no yearbook describes how complete or consistent coverage was over time. The only descriptions of scope are in the 1943 yearbook, which states that its total "does not include many miscellaneous short carriers or gathering systems," and in the 1951 yearbook, which appears to exclude "lines under 4-inch, lines less than 5 miles long, or natural gas

distribution lines" (Gulf Publishing Company 1943–1951). The 1951 yearbook indeed lists no pipelines under 4 inches in diameter or under 5 miles long, though other years list such pipelines, which suggests that coverage changed. But the 1951 yearbook also lists what appear to be natural gas distribution pipelines, contrary to its own description, so it is unclear how well that description fits the listings. Appendix A.4 compares the trade press data with other sources.

The listings may under-report within-state gas pipelines if coverage favored larger projects. The journal also relied partly on Federal Power Commission filings, which cover interstate companies, and pipeline applications to the Commission accelerated after World War II. If the listings miss more within-state construction after 1946, our estimates could overstate the growth of interstate relative to within-state construction, and the true effect of the amendment could be smaller than we report. As Appendix A.3.1 discusses, however, we also misclassify some interstate pipelines as within-state, which biases the estimates the other way, so the direction of any net bias is unclear.

We digitize the scanned listings with the Google Gemini API, using the Gemini 2.5 Pro large language model (`gemini-2.5-pro`; accessed November 21, 2025). One page of the 1949 yearbook, covering 1948 construction, comes from an earlier run with Gemini 2.5 Flash (`gemini-2.5-flash`; accessed November 18, 2025). We send one scanned page per request, together with a written prompt and a structured output schema that fixes each variable and its allowed values. Some wartime yearbooks list privately owned and government pipelines in separate sections with different formats, so we use a separate prompt and schema for each. Research assistants then checked every record against the scans and corrected errors.

After digitizing every entry, we keep only the projects that are explicitly noted to be completed construction, and that involve laying new pipe.[14]

A.3.1 Inferring Interstate and Within-State Status

Classifying the pipeline projects in the trade press listings as interstate or within-state requires some simplifying assumptions because the trade press does not report every relevant variable. Under the Natural Gas Act, a pipeline's interstate status hinges on whether the gas is transported for interstate sale, rather than on the physical location of the pipe.[15] The

[14]New construction excludes, for instance, conversions, reconditioning, reversals, replacement of existing pipe, and removals.

[15]For instance, the Supreme Court held that a company whose pipelines lay entirely within Ohio was subject to the Act because those pipelines carried gas from other states (U.S. Congress 1938; Supreme Court of the United States 1950). Congress passed the 1954 Hinshaw Amendment in response to this decision. It exempted companies like the one in that Supreme Court case, provided that all of the gas they receive comes from a separate company, is delivered within or at the border of a state, is consumed within the same state, and that their sales and transportation are regulated by a state commission (U.S. Congress 1954).

function of a pipeline also affects classification. The Act exempts the production, gathering, and local distribution of gas, so only transmission pipelines could obtain the certificate that the 1947 amendment made a prerequisite for federal eminent domain (U.S. Congress 1947).

Inferring Pipeline Function Section 1(b) of the Natural Gas Act specifies that its provisions apply to "the **transportation** of natural gas in interstate commerce" but "shall not apply to **any other transportation** or sale of natural gas or to the **local distribution** of natural gas" or to "the production or **gathering** of natural gas" (emphasis added) (U.S. Congress 1938). The Act does not define these functions operationally; Commission decisions in 1951 and 1957 first classified pipelines by their functional endpoints. The 1951 "behind the plant" test classifies pipelines leading from the wellhead to a processing plant as gathering pipelines regardless of their diameter or length, and those emanating from the plant as jurisdictional transmission pipelines (Federal Power Commission 1951). The 1957 "central point" test generalizes this to natural gas that did not require processing: pipelines were classified as gathering if they were used before gas from multiple wells was collected into a single pipeline or facility, and as transmission thereafter (Federal Power Commission 1957).

The trade press listings rarely mention pipeline function. Instead, we use pipeline diameter as a first pass to distinguish transmission pipelines from gathering and distribution pipelines, because diameter is correlated with function.

For natural gas, transmission pipelines tend to be larger, while gathering pipelines, distribution pipelines, and laterals tend to be smaller. Industry and government sources report that transmission pipelines commonly range from 6 to 48 inches (Pipeline Safety Trust 2024), from 16 to 48 inches (Argonne National Laboratory, Environmental Science Division 2008), or above 12 inches (Clark et al. 2005). A 2005 industry report characterizes vintage pipelines as follows: "[n]early all of the lines with diameters greater than 12 inches are transmission pipelines, while those with diameters between 4 and 12 inches are roughly split between distribution mains and transmission lines. Roughly 8 percent of the transmission pipelines have diameters less than 4 inches, while nearly 78 percent of the distribution lines are below 4 inches" (Clark et al. 2005).

We corroborate these statistics against pipeline data collected by the Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) starting in 1970; earlier data are not available. As shown in Appendix Figure 10, distribution pipelines are almost all under 12 inches. For most years from 1970 to 1979, 90% of gathering pipelines are under 12 inches.[16] By contrast, transmission pipeline diameters are distributed more

[16]The exceptions are 1974 and 1975, which saw a large spike in wider gathering pipelines of around 18 to

uniformly. Panel B of Appendix Figure 10 presents the distribution of pipelines with a diameter of at least 12 inches, suggesting that a threshold somewhere between 12 and 22 inches could filter out gathering and distribution pipelines while still preserving a good portion of transmission pipelines. Our main specification uses the 22-inch threshold because nearly all mileage at that size is transmission. Appendix Table 4 also reports results without any minimum diameter cutoff and with a 12-inch threshold.

Inferring Interstate Status Because we could not observe variables such as the intended sale of the transported fuel, we infer the treatment status of a pipeline project by its endpoints, classifying pipeline projects as interstate if the origin and terminus lie in different states. The listings usually report a pipeline's origin and terminus state, so this rule is usually easy to apply.

This rule may understate treatment, however: a project that lies strictly within one state but feeds an interstate system could still be subject to the Natural Gas Act because it involves transporting fuel ultimately sold in a different state.

We make one exception to the endpoint rule to reduce this error: if a listing describes a project as part of, or a loop of, a larger interstate pipeline, we code it as interstate even when it starts and ends within one state. However, we are unable to apply this exception consistently, because it depends on whether the listing happens to mention the connecting pipeline. As a result, otherwise similar short segments may be coded differently across listings. This classification error likely understates interstate construction and biases the regression estimates downward.

Appendix Figure 11 illustrates this problem with an example. Although each project sits strictly within a single state,[17] both were regulated by the Federal Power Commission—Panel A of each figure indicates that each project sought or was granted authorization for construction by the Commission—implying that they must be involved in interstate commerce in some capacity. However, the Federal Power Commission is never mentioned in the reports of completed projects, which is the only data we keep for analysis. Under the endpoint rule, these projects are coded incorrectly as within-state. Without further ability to link the same project over time, we are unable to amend the misclassified within-state pipelines using information on prior Federal Power Commission involvement.

To gauge the size of this error, we count the listings that mention the Federal Power Commission. Of the 164 project listings that explicitly mention the Federal Power Commission across our sample, only 53 were incorrectly coded as within-state; the remaining 111

20 inches that makes the aggregate distribution for the decade look bimodal.

[17]The Egyptian Natural Gas Company project is in Illinois, while the Northern Natural Gas Company project is in Iowa.

were already correctly coded as interstate. The 53 within-state projects add up to 4,000 miles across all years, or only 8% of the mileage represented by the 164 listings invoking the Federal Power Commission. Not all planned pipelines ultimately get completed, but if we assume they do for the sake of an approximate upper bound, the 53 misclassified projects would represent 12% of all new and complete natural gas pipelines, or 27% of *within-state* new and complete natural gas pipelines. Correcting this error would likely increase the measured growth of interstate relative to within-state pipelines.

A.3.2 Weighting Pipeline Construction by Capacity

Pipelines differ in size, so a mile of pipeline is not a fixed unit of capacity. Because the trade press reports pipe diameters, which our other sources lack, we can weight mileage by capacity, a more economically meaningful measure.

In standard gas flow equations, flow is proportional to a pipe's diameter raised to an exponent between around 2.5 and 2.67. Because our data mix pipelines of many sizes and functions, we use the exponent of 2.5 from the Colebrook–White equation, which is intended to produce "the greatest consistency of accuracy over the widest possible range of variables" (Technical Toolboxes 2021). Other industry-standard equations include the Weymouth equation (exponent of $8/3 \approx 2.67$) used for small, low- to medium-pressure pipelines such as distribution and gathering systems, and the Panhandle A (2.618) and Panhandle B (2.53) equations for large, high-pressure transmission pipelines.

To scale pipelines by capacity, we compute for each pipe segment of diameter d a weight of $d^{2.5}$ and multiply it by the segment's length. We convert the capacity-weighted mileage into a more intuitive measure, the equivalent in terms of 24-inch diameter pipes, by dividing the result by $24^{2.5}$.

Not every listing reports a diameter and length for each segment. Sometimes only a range of diameters is known; in this case we average the weights of the upper and lower limits. Other times no diameter is given at all. Segment diameters and lengths are known for most of the mileage of completed new gas construction. When the diameter and length are missing for one segment in a project that otherwise supplies these data for the remaining segments, we use the average capacity weight computed over the other segments in the listing, weighted by the length of each known segment. Finally, when a listing reports no diameter at all, we use the average capacity weight of all listings of the same fuel type, weighted by the pipeline lengths.

A.4 Corroboration of Data Sources

Because the coverage of the trade press is uncertain, we compare it with two other sources: the Federal Power Commission and the American Gas Association.

Federal Power Commission The Federal Power Commission series covers transmission pipelines, so to make the trade press data comparable, we use the 22-inch diameter threshold as a proxy for transmission segments and keep only interstate projects. Because the trade press reports new additions rather than stock, we take the change in Federal Power Commission mileage from the previous year-end. Appendix Figure 12 shows that the series move together and rise sharply after 1947. While there remains a small gap between the two data sources, a few reasons may explain this difference. First, not all projects in the trade press reported pipeline diameter. Second, the minimum diameter threshold drops some smaller transmission pipelines. Third, we are likely misclassifying some interstate pipelines from the trade press as within-state. As a result, it is possible that the data from the trade press are closer to the Federal Power Commission series than presented here.

Appendix Figure 13 also demonstrates how the minimum diameter threshold explains much of the discrepancy between Figure 1, which shows interstate gas mileage growing steadily from 1942 to 1946, and Figure 2, which shows almost no interstate construction in most of these years. Federal Power Commission transmission mileage grew by about 4,500 miles between the end of 1942 and the end of 1946 (not adjusted for companies entering or exiting the report). Over the same years, the trade press records about 4,700 combined miles for interstate and within-state pipelines. Filtering out pipelines under 22 inches in diameter helps to remove gathering and distribution pipelines, but may also inadvertently exclude a fraction of transmission pipelines. In total, the filter cuts around 3,000 miles from the trade press data, leaving 1,700 miles of combined construction of interstate and within-state pipelines in these years.

American Gas Association The American Gas Association (AGA), a trade organization, reports stocks of natural gas pipelines in several publications, including the annual *Gas Facts*, later compiled in the *Historical Statistics of the Gas Industry*.

The AGA compiled these figures from its annual questionnaire, which it mailed to all private and municipal gas utilities with annual revenues of at least $25,000. In 1946, reporting utilities accounted for more than 95% of industry customers, sales, and revenues; the AGA filled in the rest from secondary sources or estimates based on earlier years (American Gas Association 1947). The AGA data combine field, gathering, transmission, and distribution mains but exclude service pipe; the AGA did not publish separate figures by pipe function

until 1946.

We digitize year-end miles of utility gas main from *Historical Statistics of the Gas Industry*, covering 1942–1950 (American Gas Association 1961, Table 47). We estimate new construction as the change in natural gas main from the previous year-end and do not make any adjustments to these differences. This measure is imperfect because we cannot observe removals, and the change may include existing mains converted from manufactured or mixed gas to natural gas, which would inflate new construction.

Because the AGA series includes distribution mains, it is much larger than our trade press data in levels (Appendix Figure 15). However, if we assume that both sources capture a stable share of construction—for instance, if they each capture projects above a certain size threshold, and if pipeline construction generally scales up all pipelines proportionally—then the two series should move in parallel in logs. They track each other broadly (Appendix Figure 14), which suggests that the two sources are consistent under these assumptions.

A.5 Regression Specifications

In the comparison between interstate natural gas and interstate oil pipelines, we estimate

$$\text{Mi}_{ft} = \beta \left(\text{Post}_t \times \text{Gas}_f\right) + \alpha_f + \delta_t + \varepsilon_{ft}, \tag{1}$$

where Mi_{ft} is either year-end pipeline mileage or new pipeline investment, measured as the change in year-end pipeline mileage from the previous year, for fuel f and year t. Post_t is an indicator variable for years after 1946, and Gas_f is an indicator variable for natural gas. Year fixed effects δ_t absorb shocks common to both fuels, such as steel availability, and fuel fixed effects α_f absorb fixed differences between gas and oil pipelines, such as typical pipe size. The coefficient β measures the change in gas pipeline miles relative to oil pipeline miles from 1947 on. We also estimate equation (1) by Poisson pseudo-maximum likelihood. Ordinary least squares and Poisson pseudo-maximum likelihood estimates are reported in Appendix Table 2 without adjustments for companies entering and leaving the reports, and in Appendix Table 3 with adjustments for companies entering and leaving the reports.

In the comparison of interstate versus within-state natural gas pipelines, we estimate

$$\text{Mi}_{jt} = \beta \left(\text{Post}_t \times \text{Interstate}_j\right) + \alpha_j + \delta_t + \varepsilon_{jt}, \tag{2}$$

where Mi_{jt} is the capacity-weighted mileage of natural gas pipeline construction completed in year t in treatment class $j \in \{\text{interstate}, \text{within-state}\}$. Interstate_j indicates the inferred treatment group and δ_t are year fixed effects. Fixed effects α_j absorb fixed differences between

interstate and within-state construction. Appendix Tables 4 and 5 report the ordinary least squares and Poisson pseudo-maximum likelihood estimates, respectively.

B Appendix Tables and Figures

This appendix section collects all of the appendix tables and figures.

Data Sources Appendix Table 1 summarizes the data sources. Appendix Figures 1, 2, and 3 show example pages from each source. Appendix Figures 10 and 11 support the classification of pipelines in Appendix A.3.1, and the final four appendix figures support the corroboration in Appendix A.4.

Interstate Gas Versus Oil Appendix Tables 6 and 7 report summary statistics of the Federal Power Commission and Interstate Commerce Commission data, first without and then with adjustments for companies entering or leaving the reports, which would otherwise appear as construction or retirement (described further in Appendix A.1). Appendix Table 2 reports the difference-in-differences estimates that correspond to Figure 1, and Appendix Table 3 repeats the regression on the adjusted data for robustness. Appendix Figure 4 plots annual new additions against the pre-1947 natural gas trend, and Appendix Figures 5 and 6 plot the adjusted series, both for year-end pipeline stock and for annual new additions.

Interstate Versus Within-State Natural Gas Appendix Table 8 reports summary statistics of pipeline construction data plotted in Figure 2. Appendix Table 4 reports the difference-in-differences estimates with and without diameter filters. Appendix Table 5 also reports Poisson pseudo-maximum likelihood estimates for completeness. Appendix Figure 7 mirrors Figure 2 in unweighted miles.

Other Historical Economic Context Finally, Appendix Figures 8 and 9 plot fuel prices and fuel consumption, supporting the discussion of the contemporaneous economic environment in Section 4.

Appendix Table 1: Data Sources and Their Implications for Each Comparison

Source	Attributes	Implication for analysis
Panel A. Natural gas versus oil		
Federal Power Commission (Appendix A.1)	Company-level year-end stock of natural gas pipeline mileage. Diameter ranges for transmission pipelines.	New pipelines inferred as the change in year-end stock.
Interstate Commerce Commission (Appendix A.2)	Company-level year-end stock of oil pipeline mileage. No diameter.	Cannot weight mileage by capacity due to lack of data on oil pipe diameter.
Panel B. Interstate versus within-state natural gas		
The Oil Weekly (Appendix A.3)	Construction reports. Often reports pipe diameter. Reports origin and terminus state of pipelines.	Can compute mileage weighted by capacity. Variation in interstate and within-state observations derived from the origin and terminus of a pipeline.
Panel C. Corroboration		
American Gas Association (Appendix A.4)	National year-end stock of gas main mileage. Does not distinguish between transmission, distribution, and gathering pipelines for a critical portion of our study period.	Used only to corroborate total gas pipeline mileage with the trade press.

Appendix Table 2: Interstate Pipeline Construction, Natural Gas Versus Oil

	OLS		PPML	
	Year-end stock	New additions	Year-end stock	New additions
	mi	mi	mi	mi
	(1)	(2)	(3)	(4)
Post-1946 × natural gas	14,356.01**	5,290.48***	0.20***	1.57***
	(4,603.80)	(1,311.41)	(0.05)	(0.38)
Natural gas	−7,936.42***	−546.15*	−0.12***	−0.39**
	(422.63)	(216.11)	(0.00)	(0.17)
Observations	24	22	24	20
Adjusted R^2	0.753	0.573	0.906	0.835
Year Fixed Effects	X	X	X	X

Notes: Significance levels: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. HC2 heteroskedasticity-robust standard errors are reported in parentheses. The ordinary least squares p-values also use the Bell–McCaffrey degrees of freedom adjustment. Observations are at the year-fuel level. Years cover 1942–1953 for year-end mileage and 1943–1953 for new pipelines. Data are transmission pipeline miles from the Federal Power Commission's *Statistics of Natural Gas Companies* and trunk pipeline miles from the Interstate Commerce Commission's *Statistics of Oil Pipe-Line Companies*, summed across companies. Mileage is not adjusted for companies entering or leaving the reports (Appendix A.1). Federal Power Commission data are not available for 1943; 1943 natural gas year-end mileage is interpolated as the average of 1942 and 1944, which splits the 1942–1944 change evenly between 1943 and 1944. Column 4 excludes 1953, when new oil pipeline mileage is negative, because Poisson pseudo-maximum likelihood requires nonnegative outcomes.

Appendix Table 3: Federal Power Commission Natural Gas Transmission Versus Interstate Commerce Commission Oil Trunk Pipelines (Both Adjusted for Entries and Exits)

	OLS		PPML	
	Year-end stock	New additions	Year-end stock	New additions
	mi	mi	mi	mi
	(1)	(2)	(3)	(4)
Post-1946 × natural gas	10,689.82**	5,320.45***	0.16***	1.68***
	(4,435.86)	(1,455.91)	(0.05)	(0.57)
Natural gas	−8,195.16***	−921.38	−0.13***	−0.49
	(789.81)	(745.95)	(0.01)	(0.44)
Observations	24	22	24	20
Adjusted R^2	0.722	0.406	0.887	0.750
Year Fixed Effects	X	X	X	X

Notes: Significance levels: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. HC2 heteroskedasticity-robust standard errors are reported in parentheses. The ordinary least squares p-values also use the Bell–McCaffrey degrees of freedom adjustment. Observations are at the year-fuel level. Years cover 1942–1953 for year-end mileage and 1943–1953 for new pipelines. Data are transmission pipeline miles from the Federal Power Commission's *Statistics of Natural Gas Companies* and trunk pipeline miles from the Interstate Commerce Commission's *Statistics of Oil Pipe-Line Companies*, summed across companies. Both series are adjusted for companies entering or leaving the reports (Appendix A.1). Federal Power Commission data are not available for 1943; 1943 natural gas year-end mileage is interpolated as the average of 1942 and 1944, which splits the 1942–1944 change evenly between 1943 and 1944. Column 4 excludes 1953, when new oil pipeline mileage is negative, because Poisson pseudo-maximum likelihood requires nonnegative outcomes.

Appendix Table 4: Capacity-Weighted Natural Gas Pipeline Construction, Interstate Versus Within-State

Dependent variable: capacity-weighted mileage (24-in.-equiv. mi.)			
	All diameters	≥12 in.	≥22 in.
	(1)	(2)	(3)
Post-1946 × interstate	1,839	2,188**	2,182**
	(1,029)	(904)	(800)
Interstate	254	285	315
	(323)	(309)	(286)
Observations	18	18	18
Adjusted R^2	0.703	0.719	0.739
Year fixed effects	X	X	X

Notes: Significance levels: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Ordinary least squares estimates. HC2 heteroskedasticity-robust standard errors are reported in parentheses, and p-values use the Bell–McCaffrey degrees of freedom adjustment. Each observation is a year × {interstate, within-state} cell of natural gas pipelines. Years cover 1942–1950.

Appendix Table 5: Capacity-Weighted Natural Gas Pipeline Construction, Interstate Versus Within-State, Poisson Pseudo-Maximum Likelihood

Dependent variable: capacity-weighted mileage (24-in.-equiv. mi.), PPML			
	All diameters	≥12 in.	≥22 in.
	(1)	(2)	(3)
Post-1946 × interstate	−0.10	−0.33	−1.18
	(1.14)	(1.56)	(1.50)
Interstate	0.91	1.60	2.78*
	(1.10)	(1.53)	(1.47)
Observations	18	18	14
Year fixed effects	X	X	X

Notes: Significance levels: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Poisson pseudo-maximum likelihood estimates. HC2 heteroskedasticity-robust standard errors are reported in parentheses. Each observation is a year × {interstate, within-state} cell of natural gas pipelines. Years cover 1942–1950. Column 3 has fewer observations because years in which both cells are zero are dropped due to statistical separation issues.

Appendix Table 6: Interstate Natural Gas and Oil Pipeline Mileage, 1942–1953

	N	Zeros	Mean	SD	Min	Median	Max
Panel A. Natural gas year-end stock (mi)							
All years (1942–1953)	12	0	75,604	18,019	57,792	69,035	107,732
1942–1946	5	0	60,242	1,761	57,792	60,691	62,334
1947–1953	7	0	86,577	16,001	67,818	83,649	107,732
Panel B. Natural gas new pipeline additions (mi)							
All years (1943–1953)	11	0	4,540	3,674	461	4,674	12,864
1943–1946	4	0	1,135	467	461	1,316	1,449
1947–1953	7	0	6,485	3,201	2,433	6,545	12,864
Panel C. Oil year-end stock (mi)							
All years (1942–1953)	12	0	75,166	7,083	64,956	75,222	84,193
1942–1946	5	0	68,179	2,642	64,956	68,349	71,682
1947–1953	7	0	80,158	4,190	73,389	80,996	84,193
Panel D. Oil new pipeline additions (mi)							
All years (1943–1953)	11	0	1,719	1,221	-323	1,707	3,667
1943–1946	4	0	1,682	450	1,207	1,696	2,126
1947–1953	7	0	1,741	1,544	-323	1,707	3,667

Note: An observation is a year. Data are transmission pipeline miles from the Federal Power Commission's *Statistics of Natural Gas Companies* and trunk pipeline miles from the Interstate Commerce Commission's *Statistics of Oil Pipe-Line Companies*, summed across companies. Mileage is not adjusted for companies entering or leaving the reports (Appendix A.1). Federal Power Commission data are not available for 1943; 1943 natural gas year-end mileage is interpolated as the average of 1942 and 1944, which splits the 1942–1944 change evenly between 1943 and 1944.

Appendix Table 7: Interstate Natural Gas and Oil Pipeline Mileage, Adjusted for Entries and Exits, 1942–1953

	N	Zeros	Mean	SD	Min	Median	Max
Panel A. Natural gas year-end stock (mi)							
All years (1942–1953)	12	0	74,608	15,927	57,792	68,580	104,028
1942–1946	5	0	61,295	2,352	57,792	62,360	63,644
1947–1953	7	0	84,116	14,429	67,576	81,680	104,028
Panel B. Natural gas new pipeline additions (mi)							
All years (1943–1953)	11	0	4,203	3,062	244	3,932	10,738
1943–1946	4	0	1,463	1,002	244	1,662	2,284
1947–1953	7	0	5,769	2,694	2,008	5,453	10,738
Panel C. Oil year-end stock (mi)							
All years (1942–1953)	12	0	76,567	7,058	64,956	77,717	85,156
1942–1946	5	0	69,490	3,724	64,956	68,921	74,493
1947–1953	7	0	81,622	3,246	76,116	82,642	85,156
Panel D. Oil new pipeline additions (mi)							
All years (1943–1953)	11	0	1,739	1,221	-1,072	1,623	3,202
1943–1946	4	0	2,384	576	1,565	2,584	2,805
1947–1953	7	0	1,370	1,372	-1,072	1,335	3,202

Note: An observation is a year. Data are transmission pipeline miles from the Federal Power Commission's *Statistics of Natural Gas Companies* and trunk pipeline miles from the Interstate Commerce Commission's *Statistics of Oil Pipe-Line Companies*, summed across companies. Both series are adjusted for companies entering or leaving the reports (Appendix A.1). Federal Power Commission data are not available for 1943; 1943 natural gas year-end mileage is interpolated as the average of 1942 and 1944, which splits the 1942–1944 change evenly between 1943 and 1944.

Appendix Table 8: New Pipeline Construction Completed in the United States, Minimum Diameter 22 Inches, 1942–1950

	N	Zeros	Mean	SD	Min	Median	Max
Panel A. Natural gas pipelines: total mileage							
All	18	6	728	1,091	0	125	3,748
1942–1946	10	6	173	450	0	0	1,442
1947–1950	8	0	1,421	1,281	19	1,105	3,748
Interstate	9	3	1,249	1,353	0	1,442	3,748
1942–1946	5	3	327	629	0	0	1,442
1947–1950	4	0	2,402	1,079	1,515	2,172	3,748
Within-State	9	3	206	293	0	40	694
1942–1946	5	3	20	28	0	0	59
1947–1950	4	0	440	310	19	523	694
Panel B. Natural gas pipelines: capacity-weighted mileage (miles of 24-inch-equivalent pipe)							
All	18	6	933	1,512	0	127	5,770
1942–1946	10	6	178	464	0	0	1,487
1947–1950	8	0	1,876	1,857	19	1,495	5,770
Interstate	9	3	1,575	1,925	0	1,487	5,770
1942–1946	5	3	336	649	0	0	1,487
1947–1950	4	0	3,124	1,887	1,625	2,550	5,770
Within-State	9	3	290	476	0	40	1,366
1942–1946	5	3	21	30	0	0	64
1947–1950	4	0	627	576	19	563	1,366

Note: An observation is a year × {interstate, within-state} class cell. Data are from the yearbook listings of *The Oil Weekly*. The sample covers completed new construction of natural gas pipeline segments at least 22 inches in diameter; it excludes segments with no reported diameter, pipeline conversions, and projects still under construction.

Appendix Figure 1: Example Page of Company-Level Pipeline Mileage from the Federal Power Commission's *Statistics of Natural Gas Companies*, 1944

Panel A. Page header and company names

STATISTICS OF NATURAL GAS COMPANIES FOR YEAR ENDED DECEMBER 31, 1944 301

GAS UTILITY PLANT, GAS ACCOUNT, AND PHYSICAL QUANTITIES

LINE NO	ITEM	Allegany Gas Company	Arkansas Louisiana Gas Company	Arkansas-Oklahoma Gas Company	Atlantic Seaboard Corporation	Belmont Quadrangle Drilling Corporation	Billings Gas Company	LINE NO

Panel B. Pipeline mileage and footnotes

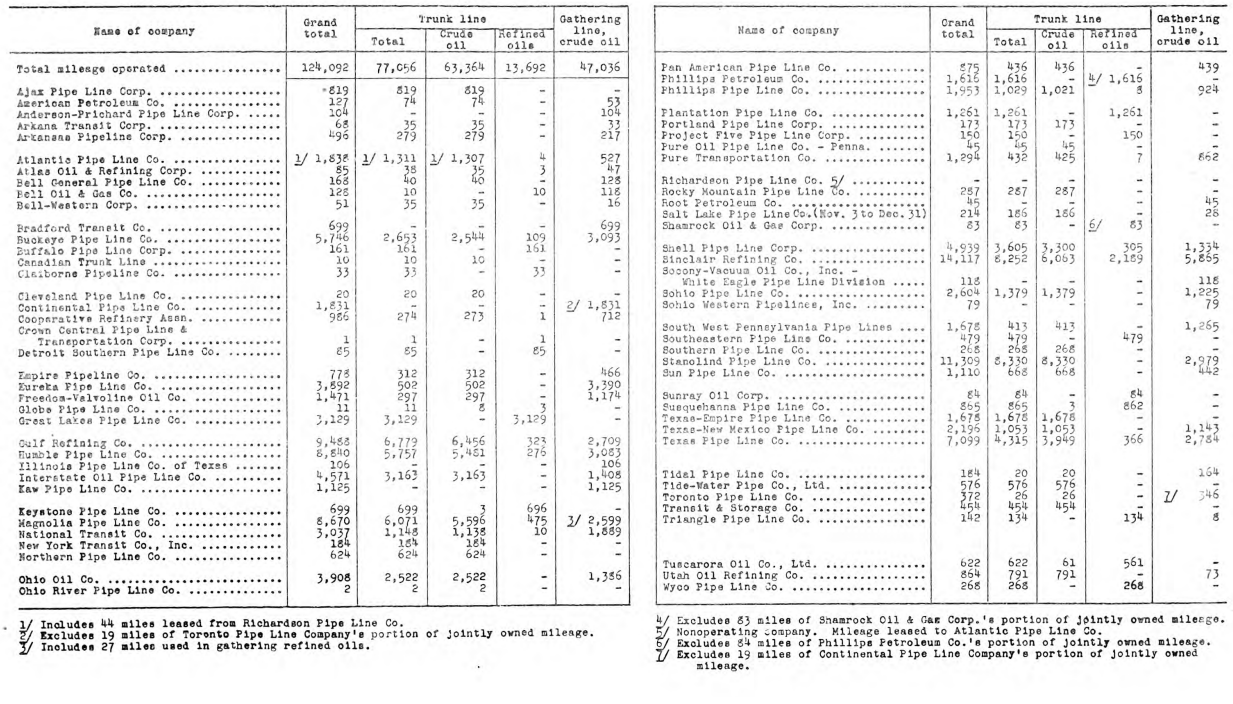
PHYSICAL QUANTITIES

56	GAS RESERVES - Thousands Cubic Feet	17,600,500	874,564,511	52,118,433		3,735,000		56
	PRODUCING WELLS: - Number							
57	Gas	969	b 143	162		e 25		57
58	Oil					f 77		58
	PIPE LINES - Miles							
59	Field	347.2	158.5	54.7		g 30.9	2.6	59
	Transmission:							
	Inside Diameter - Inches							60
60	0.0 - 5.0	42.1	269.5	32.0	12.6			60
61	5.1 - 10.0	16.2	649.8	136.0			52.2	61
62	10.1 - 15.0	35.8	269.3				55.9	62
63	15.1 - 20.0		495.2		219.2			63
64	20.1 - 25.0							64
65	over 25.0							65
66	Total Transmission	94.1	1,633.8	168.0	231.8		108.1	66
	COMPRESSOR STATIONS:							
67	Number - Field					3		67
68	Transmission		9	2	1		1	68
69	Rated H P - Field					525		69
70	Transmission		27,335	1,065	6,600		675	70

NR Not reported.
a. Includes unclassified gas plant purchased in the amount of $1,177,914.
b. Includes 14 producing wells in which respondent's interest is approximately as follows: one-third in 2 wells, one-half in 6 wells, two-thirds in 2 wells, three-fourths in 1 well, and seven-eighths in 3 wells; and also 35 nonoperating wells in which respondent's interest is as follows: one-third in 19 wells, one-half in 2 wells, and full ownership in 14 wells.
c. Natural gas received from storage.
d. Natural gas delivered to storage.
e. Includes 2 wells in which respondent holds 50 percent interest.
f. Jointly owned.
g. Includes 7.5 miles jointly owned.

Note: Top and bottom of page 301 of the 1944 volume. The "Physical Quantities" section in Panel B reports field pipelines and transmission pipelines by inside-diameter class for each company. Footnotes for each page are printed below the table.

Appendix Figure 2: Example Page of Company-Level Oil Pipeline Mileage from the Interstate Commerce Commission's *Statistics of Oil Pipe-Line Companies*, 1948



8

STATISTICS OF OIL PIPE-LINE COMPANIES FOR THE YEAR ENDED DECEMBER 31, 1948

TABLE 4.--PIPE-LINE MILEAGE OPERATED AT CLOSE OF YEAR, BY INDIVIDUAL COMPANIES

Name of company	Grand total	Trunk line			Gathering line, crude oil
		Total	Crude oil	Refined oils	
Total mileage operated	124,092	77,056	63,364	13,692	47,036
Ajax Pipe Line Corp.	819	819	819	-	-
American Petroleum Co.	127	74	74	-	53
Anderson-Prichard Pipe Line Corp.	104	-	-	-	104
Arkana Transit Corp.	68	35	35	-	33
Arkansas Pipeline Corp.	496	279	279	-	217
Atlantic Pipe Line Co.	1/ 1,838	1/ 1,311	1/ 1,307	4	527
Atlas Oil & Refining Corp.	85	38	35	3	47
Bell General Pipe Line Co.	168	40	40	-	128
Bell Oil & Gas Co.	128	10	-	10	118
Bell-Western Corp.	51	35	35	-	16
Bradford Transit Co.	699	-	-	-	699
Buckeye Pipe Line Co.	5,746	2,653	2,544	109	3,093
Buffalo Pipe Line Corp.	161	161	-	161	-
Canadian Trunk Line	10	10	10	-	-
Claiborne Pipeline Co.	33	33	-	33	-
Cleveland Pipe Line Co.	20	20	20	-	-
Continental Pipe Line Co.	1,831	-	-	-	2/ 1,831
Cooperative Refinery Assn.	986	274	273	1	712
Crown Central Pipe Line & Transportation Corp.	1	1	-	1	-
Detroit Southern Pipe Line Co.	85	85	-	85	-
Empire Pipeline Co.	778	312	312	-	466
Eureka Pipe Line Co.	3,892	502	502	-	3,390
Freedom-Valvoline Oil Co.	1,471	297	297	-	1,174
Globe Pipe Line Co.	11	11	8	3	-
Great Lakes Pipe Line Co.	3,129	3,129	-	3,129	-
Gulf Refining Co.	9,488	6,779	6,456	323	2,709
Humble Pipe Line Co.	8,840	5,757	5,481	276	3,083
Illinois Pipe Line Co. of Texas	106	-	-	-	106
Interstate Oil Pipe Line Co.	4,571	3,163	3,163	-	1,408
Kaw Pipe Line Co.	1,125	-	-	-	1,125
Keystone Pipe Line Co.	699	699	3	696	-
Magnolia Pipe Line Co.	8,670	6,071	5,596	475	3/ 2,599
National Transit Co.	3,037	1,148	1,138	10	1,889
New York Transit Co., Inc.	184	184	184	-	-
Northern Pipe Line Co.	624	624	624	-	-
Ohio Oil Co.	3,908	2,522	2,522	-	1,386
Ohio River Pipe Line Co.	2	2	2	-	-

1/ Includes 44 miles leased from Richardson Pipe Line Co.
2/ Excludes 19 miles of Toronto Pipe Line Company's portion of jointly owned mileage.
3/ Includes 27 miles used in gathering refined oils.

Name of company	Grand total	Trunk line			Gathering line, crude oil
		Total	Crude oil	Refined oils	
Pan American Pipe Line Co.	875	436	436	-	439
Phillips Petroleum Co.	1,616	1,616	-	4/ 1,616	-
Phillips Pipe Line Co.	1,953	1,029	1,021	8	924
Plantation Pipe Line Co.	1,261	1,261	-	1,261	-
Portland Pipe Line Corp.	173	173	173	-	-
Project Five Pipe Line Corp.	150	150	-	150	-
Pure Oil Pipe Line Co. - Penna.	45	45	45	-	-
Pure Transportation Co.	1,294	432	425	7	862
Richardson Pipe Line Co. 5/	-	-	-	-	-
Rocky Mountain Pipe Line Co.	287	287	287	-	-
Root Petroleum Co.	45	-	-	-	45
Salt Lake Pipe Line Co.(Nov. 3 to Dec. 31)	214	186	186	-	28
Shamrock Oil & Gas Corp.	83	83	-	6/ 83	-
Shell Pipe Line Corp.	4,939	3,605	3,300	305	1,334
Sinclair Refining Co.	14,117	8,252	6,063	2,189	5,865
Socony-Vacuum Oil Co., Inc. - White Eagle Pipe Line Division	118	-	-	-	118
Sohio Pipe Line Co.	2,604	1,379	1,379	-	1,225
Sohio Western Pipelines, Inc.	79	-	-	-	79
South West Pennsylvania Pipe Lines	1,678	413	413	-	1,265
Southeastern Pipe Line Co.	479	479	-	479	-
Southern Pipe Line Co.	268	268	268	-	-
Stanolind Pipe Line Co.	11,309	8,330	8,330	-	2,979
Sun Pipe Line Co.	1,110	668	668	-	442
Sunray Oil Corp.	84	84	-	84	-
Susquehanna Pipe Line Co.	865	865	3	862	-
Texas-Empire Pipe Line Co.	1,678	1,678	1,678	-	-
Texas-New Mexico Pipe Line Co.	2,196	1,053	1,053	-	1,143
Texas Pipe Line Co.	7,099	4,315	3,949	366	2,784
Tidal Pipe Line Co.	184	20	20	-	164
Tide-Water Pipe Co., Ltd.	576	576	576	-	-
Toronto Pipe Line Co.	372	26	26	-	7/ 346
Transit & Storage Co.	458	454	454	-	4
Triangle Pipe Line Co.	142	134	-	134	8
Tuscarora Oil Co., Ltd.	622	622	61	561	-
Utah Oil Refining Co.	864	791	791	-	73
Wyco Pipe Line Co.	268	268	-	268	-

4/ Excludes 83 miles of Shamrock Oil & Gas Corp.'s portion of jointly owned mileage.
5/ Nonoperating company. Mileage leased to Atlantic Pipe Line Co.
6/ Excludes 84 miles of Phillips Petroleum Co.'s portion of jointly owned mileage.
7/ Excludes 19 miles of Continental Pipe Line Company's portion of jointly owned mileage.

Note: Table 4 of the statement for 1948, which reports the miles of trunk pipelines (crude oil and refined oils) and gathering pipelines that each company operated at the close of the year. We use each company's total trunk pipeline mileage.

Appendix Figure 3: Example Page of Pipeline Construction Data from *The Oil Weekly*'s 1947 Yearbook Issue



Pipe Line Construction in 1946

Southern California Gas Company is building a 20½-mile natural gas line between the northern end of the Trico gas field, Kern County, and the 16-inch PG&E Buttonwillow carrier. The new line, third connection into this field, consists of 10-, 8-, 6-, and 4-inch pipe.
Pacific Pipeline Company is building for **Pacific Public Service Company** a natural gas line from the Suisun Bay, Kirby Hill and West Rio Vista gas fields to the Stanpac junction near Pittsburg. The line is made up of 4- to 12-inch pipe with an aggregate length, including all spur lines, of 35 miles.
Standard Oil Company of California completed a 176-mile, 18-inch crude line from Kettleman Hills to the company's Los Medanos tank farm near Pittsburg.

Colorado

Colorado Interstate Gas Company proposes to build a natural gas line from the Hugoton gas field in Kansas to Denver.
Standard Oil Company (Indiana) proposes to build a 12-inch crude outlet from Rangely field to Wamsutter, Wyo., paralleling Utah Oil Refining Company's (Standard of Indiana subsidiary) existing 10-inch line, and a 10-inch extension from Wamsutter to Casper, Wyo.
Phillips Petroleum Company and **Shamrock Oil & Gas Company** are building a 360-mile, 6⅝-inch products line from Phillips' refinery at Phillips, Texas, connecting with Shamrock's refinery at McKee, Texas, to LaJunta and Denver.

Illinois

Chicago District Pipe Line Company completed 23 miles of 24-inch natural gas line between Joliet and Chicago.
Chicago District Pipe Line Company completed 11.6 miles of 24-inch natural gas line paralleling the Crawford line.
North Shore Gas Company, Waukegan, completed 6 miles of 12¾-inch and 2 miles of 10¾-inch distribution lines in Lake County.
Panhandle Eastern Pipe Line Company completed 24 miles of 26-inch natural gas line near its compressor station at Tuscola.
Wood River Oil and Refining Company, Inc., Wichita, Kansas, completed a 70 mile, 8-inch products pipe line from its new marine terminal at Peru to Rockford.

Indiana

Kentucky Natural Gas Corporation completed 30 miles of 6-inch natural gas line from Panhandle Eastern Pipe Line Company's system near Danville to Martinsville.
Eastern Indiana Gas Company completed a 23-mile, 3-inch natural gas line near Muncie.
Standard Oil Company (Indiana) is completing a 662-mile combination 10 and 8-inch products pipe line from Whiting to Moorehead, Minn., via Minneapolis and St. Paul.

Kansas

Cities Service Gas Company proposes to build a 405-mile, 26-inch natural gas transmission line from the Hugoton gas field to Wichita and Kansas City.
Mid-Continent Gas Transmission Company proposes to build 1236 miles of 26-inch natural gas transmission line from Liberal to Kansas City and St. Paul, Minn. The line from Liberal to Kansas City would be a 400-mile double pipe line and the line from Kansas City to St. Paul would be a single 436-mile string.
Kansas-Nebraska Natural Gas Company is building 56 miles of 16-inch and 21 miles of 12¾-inch natural gas line from Phillipsburg to Hastings, Neb. The company is also constructing approximately 100 miles of lateral pipe lines to serve Nebraska communities.
Sinclair Refining Company, pipe line department, is building a 50 mile, 18-inch loop in the vicinity of Iola.

Kentucky

Cincinnati Gas Transportation Company completed 70 miles of 14-inch natural gas line from its main line near Foster to an interconnection with Tennessee Gas and Transmission Company near Means.

Louisiana

Mississippi River Fuel Corporation is building 265 miles of 22-inch loop and 14 miles of 12-inch loop to increase the capacity of its Louisiana-Illinois natural gas transmission line.
United Gas Pipe Line Company is building a 24-mile, 12-inch natural gas transmission line from Barataria, Delta Farms, Bayou Perot and Stella fields to New Orleans. Previously flared gas will be utilized by this line.
United Gas Pipe Line Company is building 17 miles of 12¾-inch natural gas transmission line from a dehydration plant in Hayes field to the Iowa compressor station; 10 miles of 12¾-inch from Baxterville field to Bogalusa transmission line, Mississippi, and completed 14 miles of 10¾-inch from a dehydration plant in Gwinville field to the Benton Junction-Mobile main line, Mississippi.
Humble Oil & Refining Company completed a 10-mile, 4- and 6-inch natural gas line from North Crowley field to its 14-inch Pecan Island-Opelousas main carrier.
Humble Oil & Refining Company completed a 65-mile, 14-inch natural gas transmission line from Pecan Island field to Opelousas.
Interstate Oil Pipe Line Company completed a 35.5-mile, 8-inch crude line from the Holley Ridge field station, Mississippi, to Delhi field, Louisiana.
Interstate Natural Gas Company completed 103 miles of 8-, 12- and 16-inch natural gas line from Tepetate to Baton Rouge.
Magnolia Pipe Line Company completed 14 miles of 4-, 5- and 6-inch crude line in the Lake Arthur area.
Southern Natural Gas Company completed 116 miles of 6⅝-inch to 22-inch natural gas loop on its Louisiana, Mississippi, Alabama and Georgia line.

Michigan

E. V. Hilliard proposes to build 26 miles of 6-inch natural gas transmission line from Roscommon gas field to Wise Junction on Dow Chemical Company's Evart to Midland gas transmission line.
Consumers Power Company and **Panhandle Eastern Pipe Line Company** are building 150 miles of 24-inch natural gas line from Panhandle's present Michigan terminal at Chelsa to the Winterfield and Cranberry Lake shallow gas fields for storage.
Michigan Consolidated Gas Company completed 30 miles of 8-inch natural gas transmission line from Lincoln-Freeman field to Austin storage field, replacing an old 4-inch line.

Panhandle Eastern Pipe Line Company is building 70 miles of 16-inch line from Allen Park to Union Gas Company of Canada's lines across the Detroit River.

Mississippi

United Gas Pipe Line Company proposes to build a gathering system in the Baxterville field and a 12-mile, 12-inch natural gas line from the field west to connect with the company's present system.
Southern Natural Gas Company is building 80 miles of 16-inch natural gas transmission line from Gwinville field to Pickens.
United Gas Pipe Line Company is building 86 miles of 6-inch natural gas line from the Jackson compressor station to Philadelphia Neshoba County.
Gulf Refining Company completed a 12-mile, 14-inch crude line from Baxterville field to a loading rack at Lumberton.
Interstate Oil Pipe Line Company completed 10¾ miles of 6-inch crude line from the Brookhaven field to the Mallalieu field station.
Interstate Oil Pipe Line Company completed 10½ miles of 8-inch crude line from the Eucutta field, Wayne County, and its loading rack that serves the Heidelberg field, Jasper County.
Interstate Oil Pipe Line Company completed 12 miles of 6-inch and 4 miles of 4-inch crude line from the Fayette field, Jefferson County, to its booster station at Cranfield field.
Sohio Petroleum Company completed a 40-mile, 8-inch line from Tinsley field, Yazoo County, to a terminal on the Mississippi River at Mayersville.
United Gas Pipe Line Company completed a 10- and 12-inch natural gas line from the Gwinville field to its Jackson-Mobile transmission line.

Montana

Montana-Dakota Utilities Company will build 28½ miles of 10¾-inch natural gas line in Valley County.

New Mexico

Midway Pipe Line Company, to be sponsored by middle west cooperative and independent refiners, proposes to build approximately 625 miles of 12- to 16-inch crude trunk line from Southeastern New Mexico and West Texas field via Wichita Falls to Valley Center, Kansas, where the line will connect with existing distribution lines.
El Paso Natural Gas Company is building a 737-mile, 26-inch natural gas transmission line from its Permian Basin terminal, near Eunice to Blythe, Calif., where it connects with a California line now being constructed. El Paso Natural will extend this line in 1948 from Eunice terminal to Dumas, Moore County sector of the Texas Panhandle, with a 251-mile, 24-inch natural gas line.
El Paso Natural Gas Company is building a 31-mile, 14-inch feeder from Jal Station west to the Pecos River where it will intercept the Eunice-Blythe 26-inch carrier. The company is also building a 31 mile, 16-inch feeder line extension from Jal Station to Keystone and TXL fields, West Texas.
El Paso Natural Gas Company is building a 31 mile, 14-inch feeder line extension from the Eunice terminal to Fullerton field, Andrews County, West Texas.
Magnolia Pipe Line Company completed 11¼ miles of 4-inch crude gathering line in the Brunson, Drinkard and Paddock fields to a tank farm near Eunice.
Southern Union Gas Company completed 22 miles of 8-inch natural gas extension line from its 8-inch trunk line near Santa Fe to the Los Alamos atomic bomb project; 10 miles of 10-inch loop parallel to its 8-inch trunk line from Barker Creek Dome to Santa Fe, and 4 miles of 4-inch loop on its gas trunk line from Carlsbad to Potash Center.

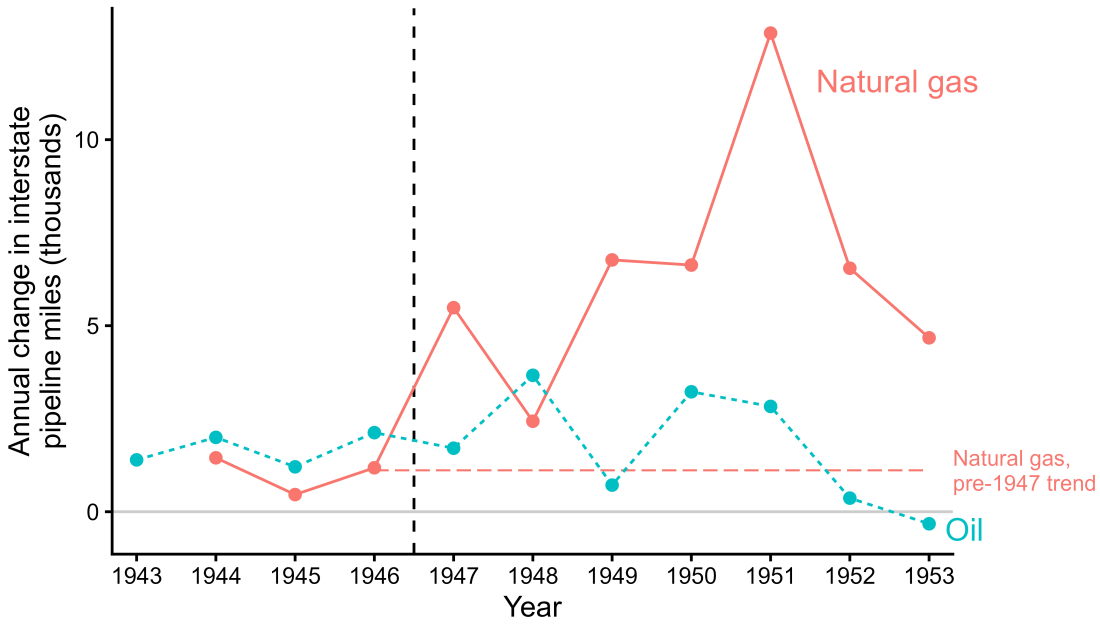
Ohio

East Ohio Gas Company completed 144 miles of 18- and 20-inch natural gas line from Pipe Creek, Hope Natural Gas Company's terminal on the Ohio River, to Cleveland.
Ohio Fuel Gas Company completed 19 miles of natural gas gathering lines in Lorain and Medina counties and 25 miles of 16-inch line connecting stations.
Sinclair Refining Company is building 56 miles of 6-inch products line from Toledo to Detroit, 118 miles of 6-inch products line from Toledo to Columbus through Marion, and 225 miles of 6-inch products line from Marion to Cleveland, Akron and Youngstown.
Ohio Fuel Gas Company completed 15 miles of 12¾-inch natural gas line to connect its system with that of the Dayton Power and Light Company.
Ohio Fuel Gas Company completed 18 miles of 5-inch natural gas transmission line from its terminal at Urbana to Bellfontaine.

Oklahoma

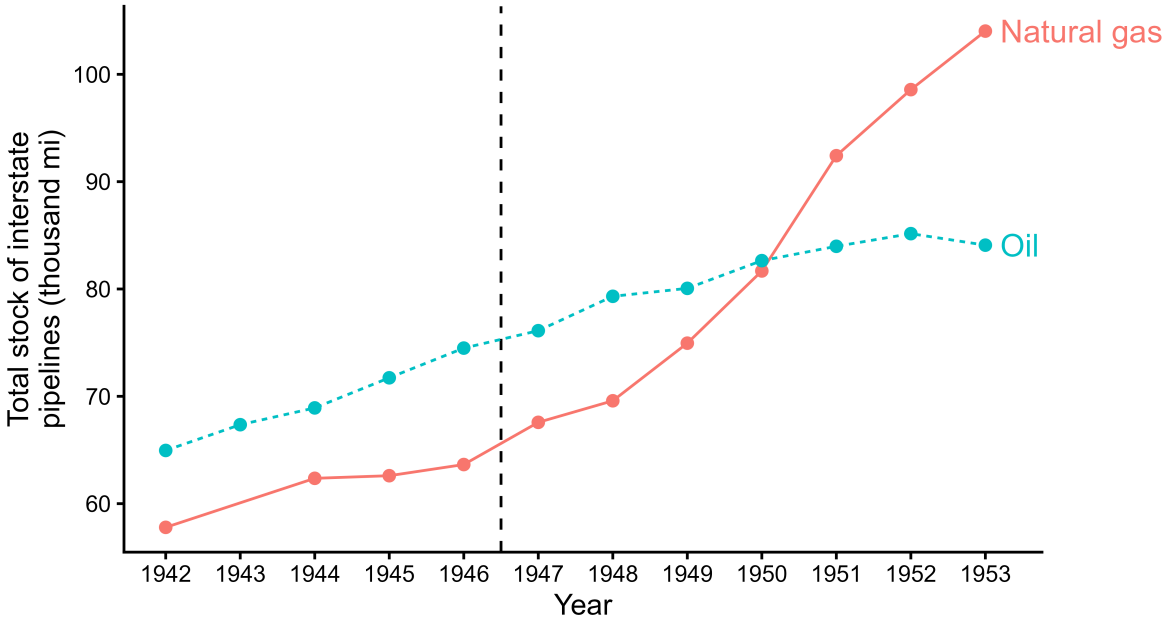
Natural Gas Pipe Line Company of America and **Texoma Natural Gas Company** propose to make additions to their combined transportation system. Texoma proopses to make additions to its dehydration and gasoline plants, to its compressor stations, and to build 11 miles of 26-inch loop. Natural Gas Pipe Line proposes to make additions to its compressor stations, construct a new compressor station and dehydration plant near Guymon, and build 120 miles of 24- and 26-inch loop.
Kerr-McGee Oil Industries, Inc., is building a 6-inch crude line from the North Davis field in Garvin County to Wynnewood.
Lone Star Gas Company is building a 21-mile, 10-inch natural gas line from the Cumberland field, Marshall County, to Denison, Texas.
Stanolind Pipe Line Company is looping its Drumright to Whiting, Ind., crude transmission system with 20-inch pipe that will eventually provide a complete 632-mile 20-inch system between the two points.
Sunray Oil Corporation is building 83 miles of 8-inch products pipe line from its Allen refinery to Drumright where it will connect with the Great Lakes Pipe Line Company system.
Stanolind Pipe Line Company replaced a 4-inch gathering line in the Cache Creek field with a new 6-inch line.
Cities Service Gas Company completed a 64-mile, 12-inch natural gas line from West Edmond field to Drumright.
Great Lakes Pipe Line Company completed a 600-mile, 8-inch products

Appendix Figure 4: Annual Change in Interstate Natural Gas and Oil Pipeline Mileage, 1943–1953



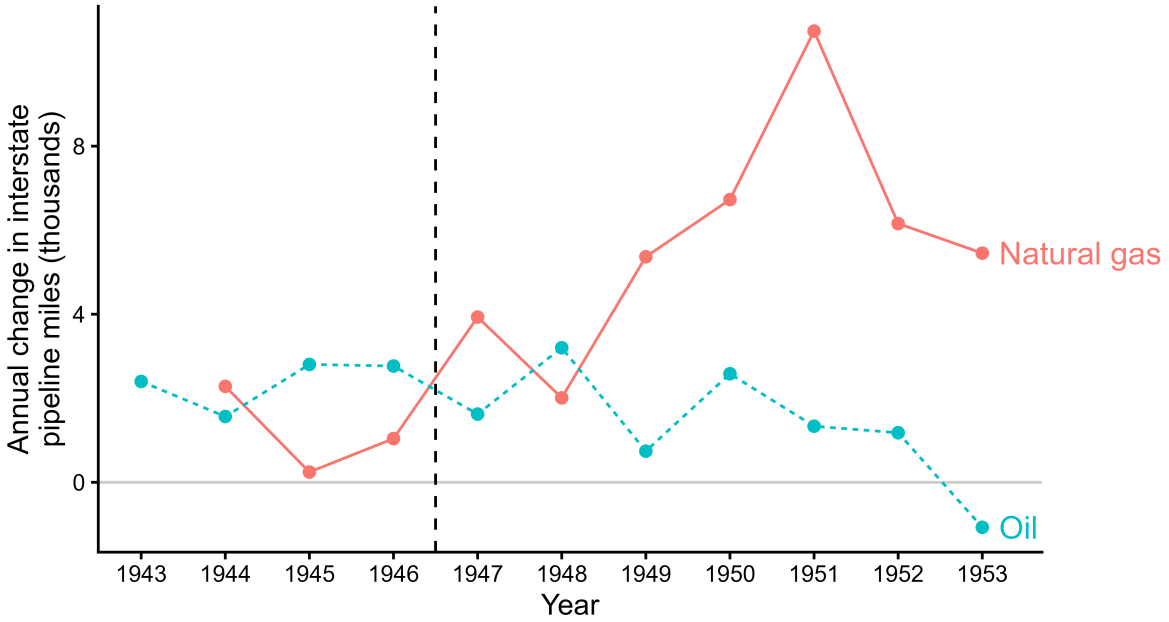
Note: Data are transmission pipeline miles from the Federal Power Commission's *Statistics of Natural Gas Companies* and trunk pipeline miles from the Interstate Commerce Commission's *Statistics of Oil Pipe-Line Companies*, summed across companies. Mileage is not adjusted for companies entering or leaving the reports (Appendix A.1). Federal Power Commission data are not available for 1943, so the 1942–1944 change in natural gas year-end mileage is split evenly between 1943 and 1944. The dashed line is the pre-1947 linear trend in natural gas mileage, expressed as annual additions.

Appendix Figure 5: Interstate Natural Gas and Oil Pipeline Mileage, Both Adjusted for Entries and Exits, 1942–1953



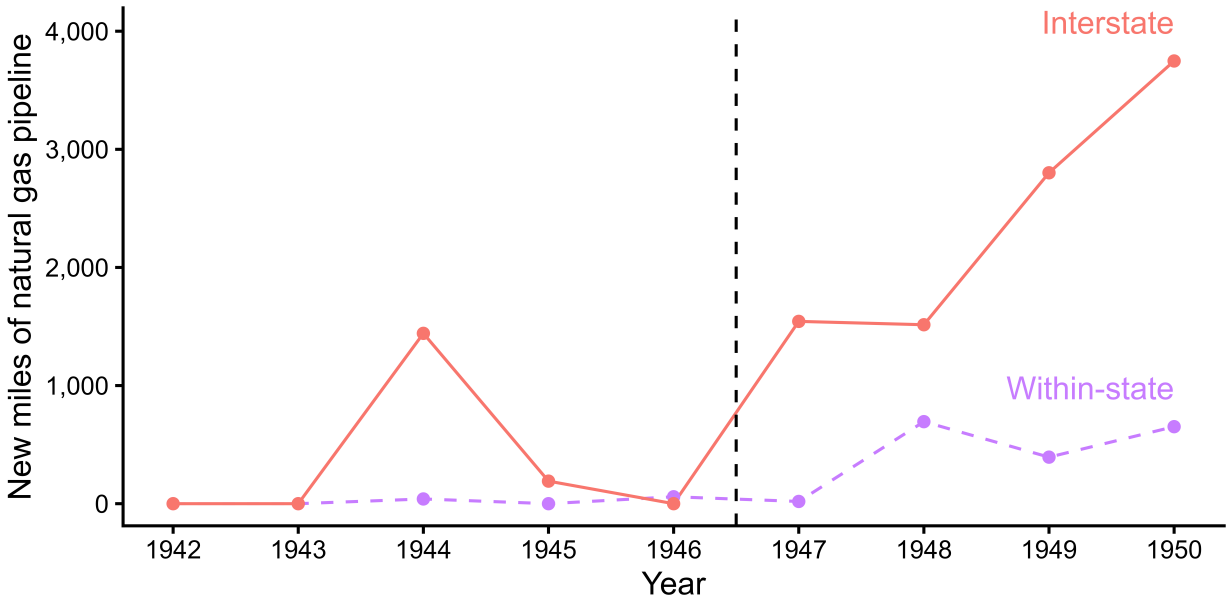
Note: Data are transmission pipeline miles from the Federal Power Commission's *Statistics of Natural Gas Companies* and trunk pipeline miles from the Interstate Commerce Commission's *Statistics of Oil Pipe-Line Companies*, summed across companies. Both series are adjusted for companies entering or leaving the reports (Appendix A.1). Federal Power Commission data are not available for 1943; 1943 natural gas year-end mileage is interpolated as the average of 1942 and 1944.

Appendix Figure 6: Annual Change in Interstate Natural Gas and Oil Pipeline Mileage, Both Adjusted for Entries and Exits, 1943–1953



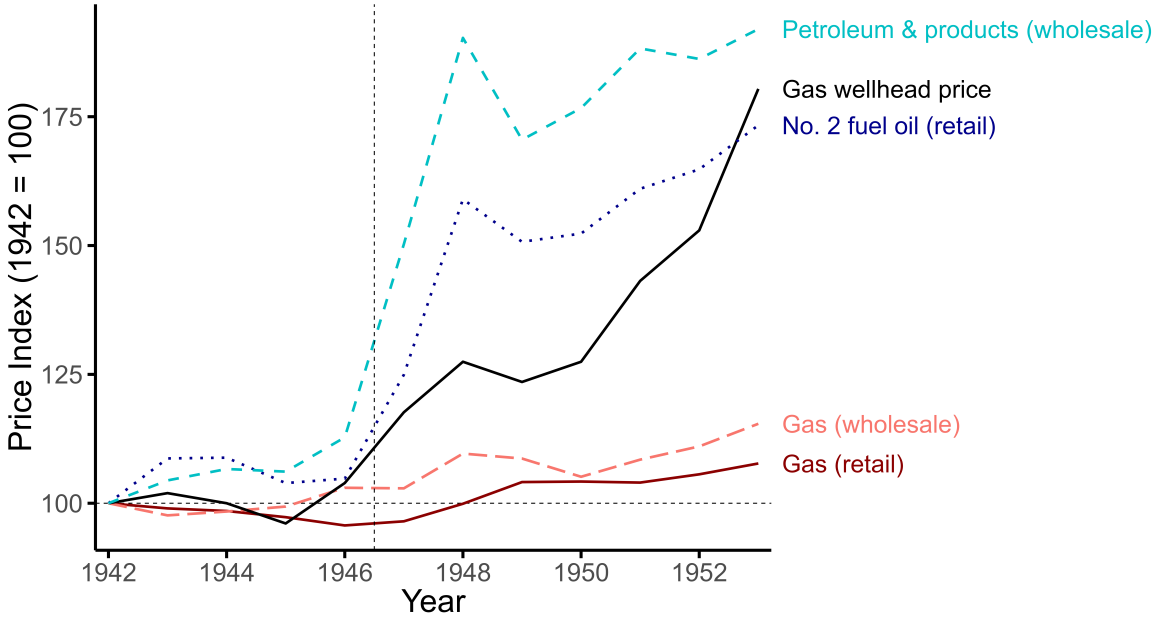
Note: Annual change in the year-end mileage series in Appendix Figure 5. The natural gas change into the interpolated 1943 value is not shown.

Appendix Figure 7: Interstate and Within-State Natural Gas Pipeline Construction in Unweighted Miles, Minimum Diameter 22 Inches, 1942–1950



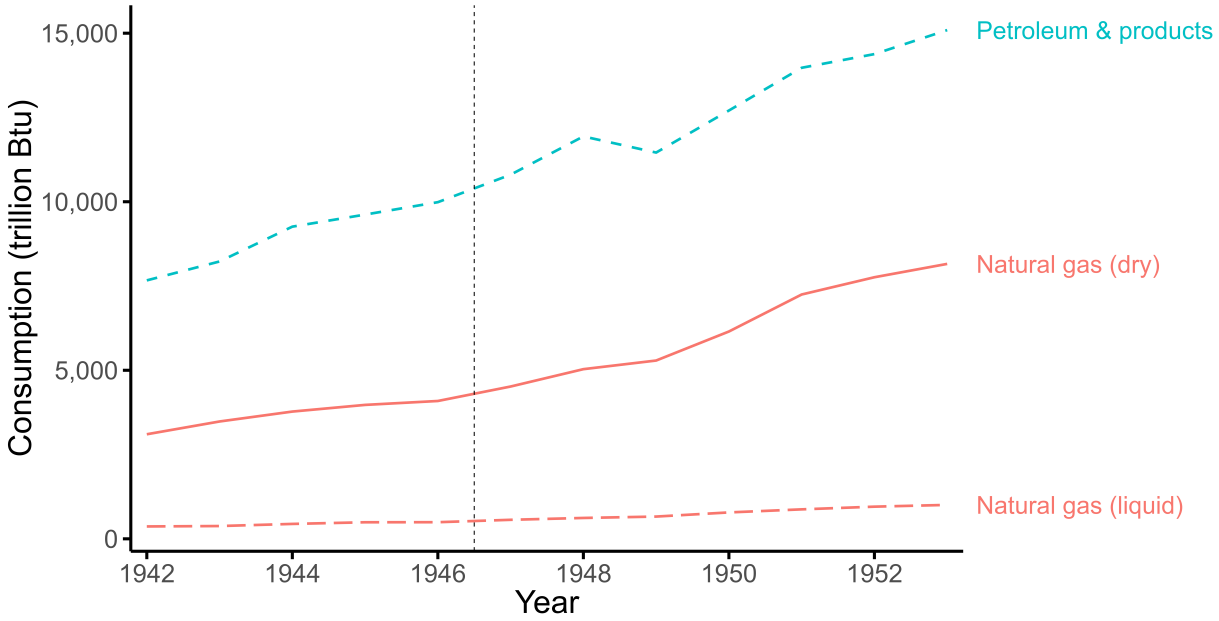
Note: Data are from the yearbook listings of *The Oil Weekly*. The sample covers completed new construction of pipeline segments at least 22 inches in diameter; it excludes segments with no reported diameter, pipeline conversions, and projects still under construction.

Appendix Figure 8: All Gas and Liquid Fuel Price Indices, 1942–1953



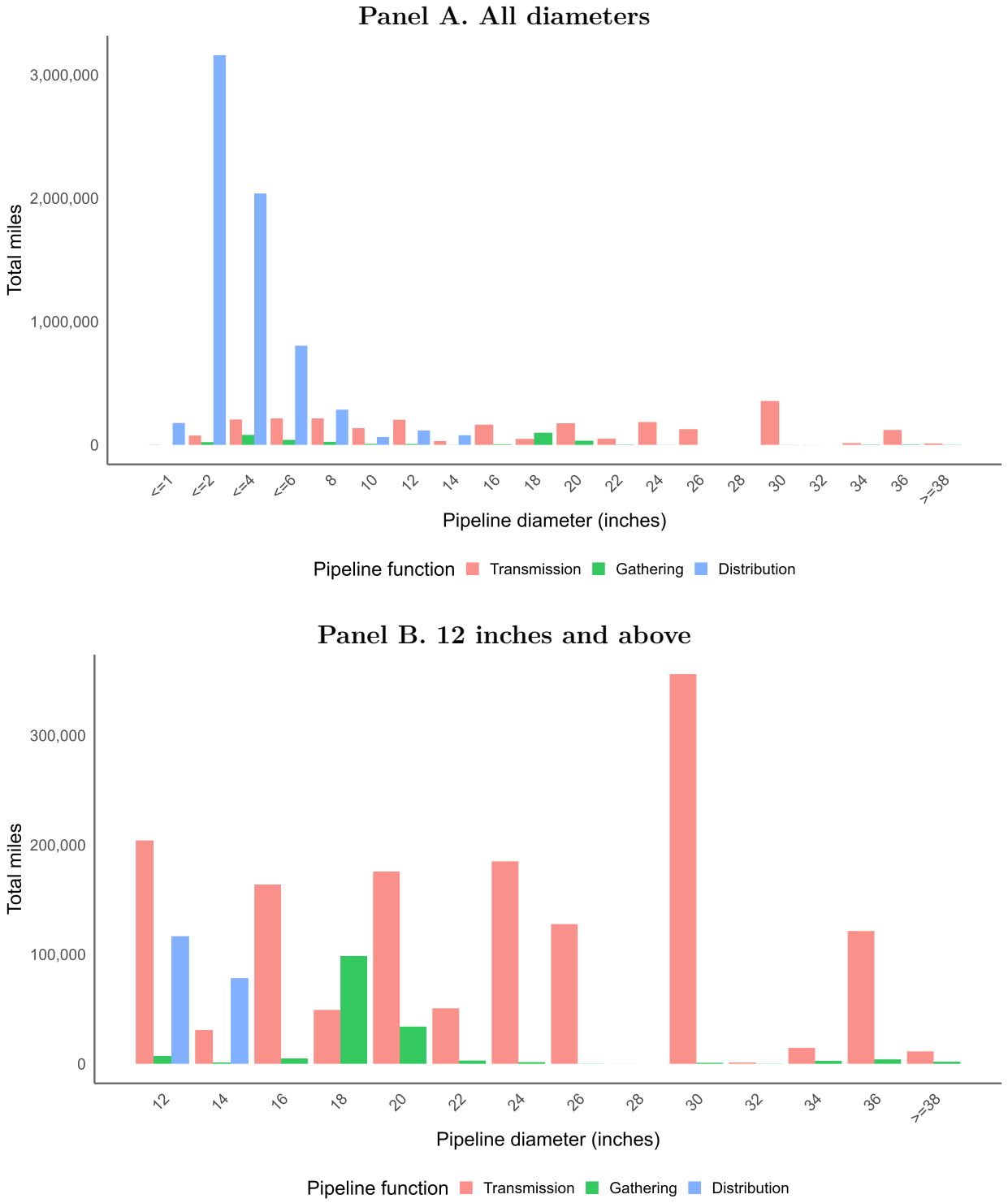
Note: Data are from the American Gas Association's *Historical Statistics of the Gas Industry* (1961), which draws wellhead prices from the U.S. Bureau of Mines and price indices from the Bureau of Labor Statistics. All series are normalized to 100 in 1942. The vertical dashed line separates the years before and after the 1947 amendment.

Appendix Figure 9: Annual Consumption of Energy Fuels, 1942–1953



Note: Data are from the American Gas Association's *Historical Statistics of the Gas Industry* (1961), which draws consumption from the U.S. Bureau of Mines. Units are trillions of British thermal units. The vertical dashed line separates the years before and after the 1947 amendment.

Appendix Figure 10: Distribution of Natural Gas Pipeline Mileage by Diameter, 1970–1979



Note: Data are from the Pipeline and Hazardous Materials Safety Administration annual reports for natural gas transmission, gathering, and distribution operators, summed over 1970–1979. Not all companies reported pipeline diameters: from 1970 to 1972, about 50% of transmission mileage and 80% of gathering mileage had reported diameters, as did over 95% of distribution mileage; from 1973 to 1979, over 90% of transmission and gathering mileage and over 99% of distribution mileage had reported diameters. Distribution pipelines were censored at 14 inches in the data. All other data were censored at 38 inches.

Appendix Figure 11: Pending Project by the Northern Natural Gas Company in *The Oil Weekly* Yearbook, 1948 and 1950

Panel A. 1948

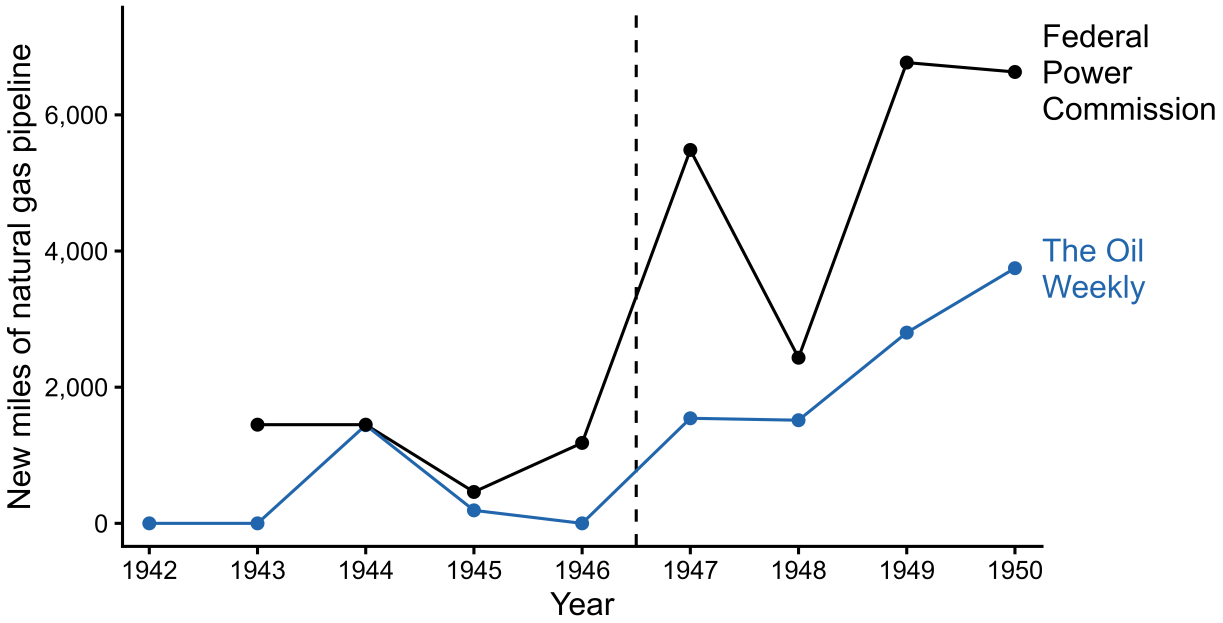
Northern Natural Gas Company was authorized by the FPC to construct about 34 miles of 10-inch natural gas lines extending from Ames to Marshalltown. Construction to be completed in 1949.

Panel B. 1950

Northern Natural Gas Company completed 37 miles of ten-inch between Ames and Marshalltown. Knupp Construction Company, Inc., Great Bend, Kansas, was the contractor.

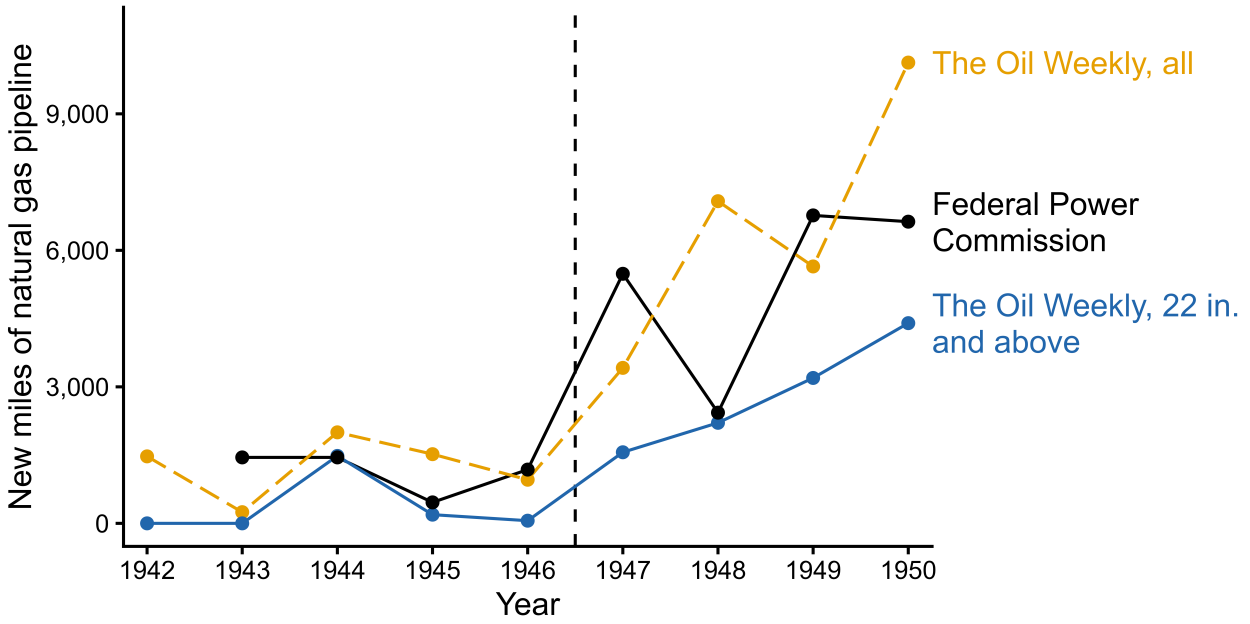
Note: Excerpts from the yearbook listings of pending construction (Gulf Publishing Company 1943–1951). The project lies entirely within Iowa.

Appendix Figure 12: New Natural Gas Pipelines from the Federal Power Commission and *The Oil Weekly*



Note: Data are from the Federal Power Commission's *Statistics of Natural Gas Companies* and the yearbook listings of *The Oil Weekly*. Federal Power Commission mileage is the annual change in year-end transmission miles, not adjusted for companies entering or leaving the reports (Appendix A.1). Trade press mileage covers completed new interstate construction of segments at least 22 inches in diameter. Federal Power Commission data are not available for 1943, so the 1942–1944 change in natural gas year-end mileage is split evenly between 1943 and 1944. The vertical dashed line separates the years before and after the 1947 amendment.

Appendix Figure 13: New Natural Gas Pipelines from the Federal Power Commission and *The Oil Weekly*, by Diameter



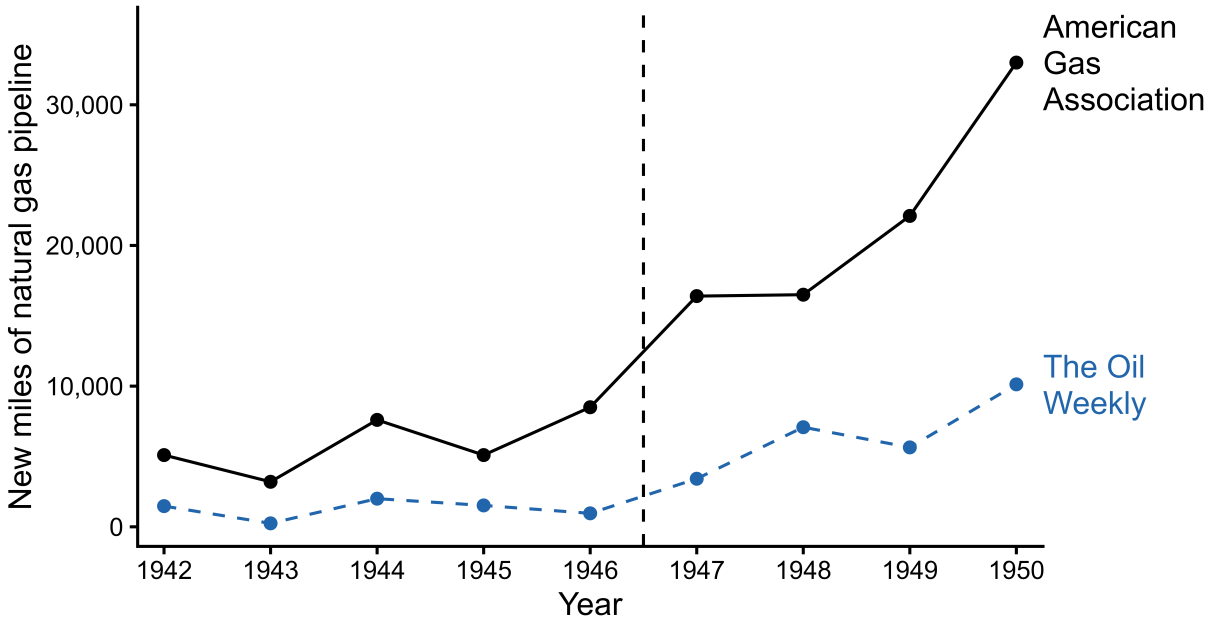
Note: Data are from the Federal Power Commission's *Statistics of Natural Gas Companies* and the yearbook listings of *The Oil Weekly*. Federal Power Commission mileage is the annual change in year-end transmission miles, not adjusted for companies entering or leaving the reports (Appendix A.1). Trade press mileage covers completed new interstate and within-state construction, both for all diameters and for segments at least 22 inches in diameter. Federal Power Commission data are not available for 1943, so the 1942–1944 change in natural gas year-end mileage is split evenly between 1943 and 1944. The vertical dashed line separates the years before and after the 1947 amendment.

Appendix Figure 14: *Oil Weekly* Versus AGA, Log Scale



Note: Data are from the American Gas Association's *Historical Statistics of the Gas Industry* (1961) and the yearbook listings of *The Oil Weekly*. American Gas Association mileage is the annual change in year-end miles of natural gas main, including field, gathering, transmission, and distribution mains, with no adjustment for retirements or conversions. Trade press mileage covers completed new interstate and within-state construction of all diameters. The vertical axis uses a log scale. The vertical dashed line separates the years before and after the 1947 amendment.

Appendix Figure 15: *Oil Weekly* Versus AGA, Levels



Note: Data are from the American Gas Association's *Historical Statistics of the Gas Industry* (1961) and the yearbook listings of *The Oil Weekly*. American Gas Association mileage is the annual change in year-end miles of natural gas main, including field, gathering, transmission, and distribution mains, with no adjustment for retirements or conversions. Trade press mileage covers completed new interstate and within-state construction of all diameters. The vertical dashed line separates the years before and after the 1947 amendment.