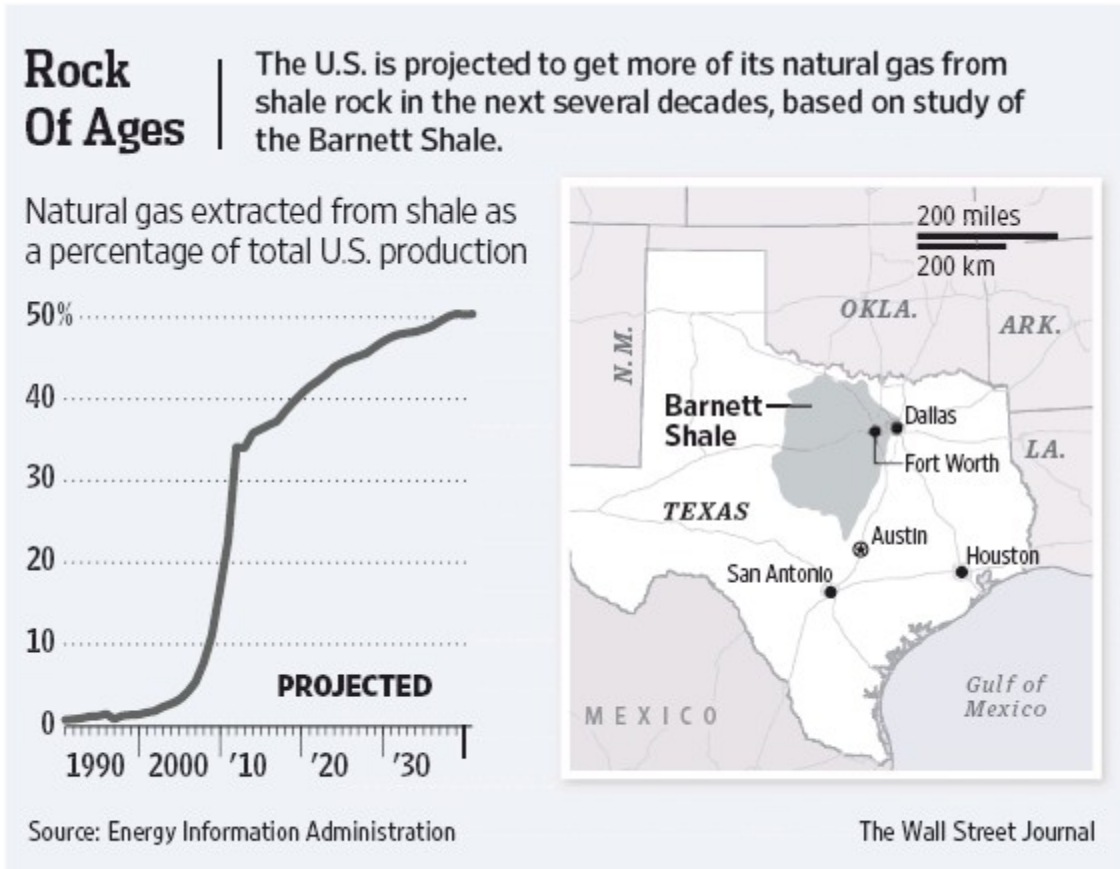


U.S. Gas Boom Likely to Grow for Decades

U.S. natural-gas production will accelerate over the next three decades, new research indicates, providing the strongest evidence yet that the energy boom remaking America will last for a generation.



The most exhaustive study to date of a key natural-gas field in Texas, combined with related research under way elsewhere, shows that U.S. shale-rock formations will provide a growing source of moderately priced natural gas through 2040, and decline only slowly after that. A report about the Texas field, that was to be released Thursday, was reviewed by The Wall Street Journal.

The research provides substantial evidence that there are large quantities of gas available that can be drilled profitably at a market price of \$4 per million British thermal units, a relatively small increase from the current price of about \$3.43.

The study, funded by the nonpartisan Alfred P. Sloan Foundation and performed by the University of Texas, examined 15,000 wells drilled in the Barnett Shale formation in northern Texas, mostly over the past decade. It is among the first to study the geology and economics of shale drilling, a relatively

recent development made possible by hydraulic fracturing, or fracking, in which a mixture of water, sand and chemicals is pumped at high pressure into rocks to release gas.

Looking at data from actual wells rather than relying on estimates and extrapolations, the study broadly confirms conclusions by the energy industry and the U.S. government, which in December forecast rising gas production.

“We are looking at multi, multi decades of growth,” said Scott Tinker, director of the Bureau of Economic Geology at the university and a leader of the study.

The shale-gas boom has led to a reorientation of the U.S. energy economy. This has led to a steep decline in coal consumption for electric generation and prompted companies to announce or consider multibillion-dollar investments to export gas and build chemical, steel and fertilizer plants that will consume enormous quantities of gas.

If these investments go forward, but gas production were to slip, higher prices for the fuel—which now accounts for 30% of electricity production and heats half of U.S. homes—are likely.

Art Berman, a petroleum geologist and consultant who has been a leading critic of what he says are overly optimistic projections of shale-gas production, said the research “is probably the most comprehensive study of the Barnett shale that will ever be done.” But he said it bolsters his view that only a quarter of Barnett wells generate an economic return. The question for the industry, he said, is, “why didn’t they identify the sweet spots initially, before spending \$40 billion on land and wells?”

The study does show that many of the wells drilled in the Barnett have been poor performers. And while the gas-bearing rock covers nearly 21,000 square kilometers in and around Fort Worth, Texas, the study suggests it can be economically developed in an area only half that size. Some of the energy companies that spent enormous sums to lease thousands of acres in far-flung parts of the Barnett may be sitting on acreage of little value.

Mr. Tinker agrees that the study shows the Barnett is highly variable, with some areas producing enough gas to make the wells profitable and other areas generating duds.

Even so, the study concludes that 1.32 trillion cubic meters of natural gas will be recovered from the Barnett—more than three times what has been produced so far and about two years’ worth of U.S. consumption at current rates.

The university also is examining shale formations in Pennsylvania, Louisiana and Arkansas, work that has led investigators to conclude that U.S. natural-gas production won’t plateau until 2040. Reports on these formations are expected to be released next year.

One reason there has been a dispute over projections of shale-gas output is that much of the research has been funded by groups with either pro- or anti- energy-development agendas. Many of the latter have strong views about the environmental impact of fracking.

The Sloan Foundation said it looked into whether the researchers who performed the new study were unduly influenced by outside ties and was satisfied that "potential conflicts of interest or sources of bias have not influenced the research."

The co-lead investigator of the study, Mr. Tinker, is paid to serve on the technical advisory boards of BP PLC and two smaller energy companies. He also receives speaking fees a few times a year for appearances before industry groups and private companies.

The Bureau of Economic Geology receives research funding from government, industry and the University of Texas. The other lead investigator, Svetlana Ikonnikova, didn't disclose any potential conflicts to the university.

Scott Anderson, who researches shale development for the Environmental Defense Fund, which is working on lowering the environmental impact of gas drilling, reviewed some of the study's preliminary results. He praised the report as "robust" and "sophisticated."

The U.S. energy industry welcomed the conclusion that a large number of successful gas wells remain to be drilled. The American Petroleum Institute, the lobbying arm of large U.S. oil and gas companies, said in a statement that the study "underscores the fact that the U.S. has substantial and growing natural gas resources that will be able to supply future domestic markets and provide exports as well."

To get at all this gas will require tens of thousands of new wells, spread throughout rural and some urban parts of the country. Even in the Barnett formation, which has been drilled intensively for a decade, there still may be room for 13,000 more wells, Mr. Tinker said.

He said existing wells "aren't draining giant areas, but they are draining pretty efficiently from areas around them." This means that even in densely drilled areas, he said, "there is a reasonable amount of good quality drilling still to be done."