WINNING PLAY

BY JENNIFER WARREN | PHOTOGRAPHY BY SCOTT WOMACK

Besides boosting the economy, natural-gas fields like the BARNETT SHALE may help the U.S. solve its energy problem

FIRST CAME ACTOR TOMMY LEE JONES IN A SPATE OF "Let's get behind the Barnett" ads. Then came longtime TV news anchor Tracy Rowlett's announcement that he'll leave KTVT-TV (Channel 11) to work on a new Web program owned by Chesapeake Energy called Shale.TV. And, all over the news, legendary oilman T. Boone Pickens has been touting a plan focusing on natural gas as a means of reducing U.S. dependence on foreign oil.

Given the booming state of the Barnett Shale natural-gas field in North Texas, the timing of these events seems to make perfect sense.

Indeed, the Barnett natural-gas field was responsible last year for a whopping $8.2 billion of Fort Worth's economic output, including nearly 84,000 jobs—up from $5.2 billion and about 55,000 jobs in 2006. In January, no fewer than 191 companies were operating in the shale, 60 more than the year before. And the number of operating wells in Fort Worth alone has jumped to more than 500, up from 300 in the entirety of the Barnett Shale five years ago.

It's all a testament to good times in the Barnett, one of the largest onshore natural-gas plays in the United States. And it's continuing evidence that, in addition to bolstering the Dallas-Fort Worth economy, natural gas produced in North Texas and elsewhere could help the country clean up the environment and reduce its dependence on foreign oil over time.

The largest producing natural-gas play in Texas, and one of the biggest in North America, the Barnett Shale is an underground field of fine-grained, sedimentary rock that stretches more than a mile deep and covers at least 5,000 square miles. While it historically has been centered in Denton, Tarrant, and Wise counties, its known area now stretches beneath a total of 21 counties, and it's boundaries keep expanding with exploration.

The natural gas that's trapped in the shale is exceedingly difficult to extract and, in fact, wasn't extracted to any degree at all until the 1980s. That's when Houston-based Mitchell Energy & Development started using a method called "fracing" (FRACK-ing) to literally fracture the shale and release the gas around it. A decade later, improvements in the fracing process—and the introduction of horizontal drilling, whereby the shale can be perforated laterally—helped the play take off.

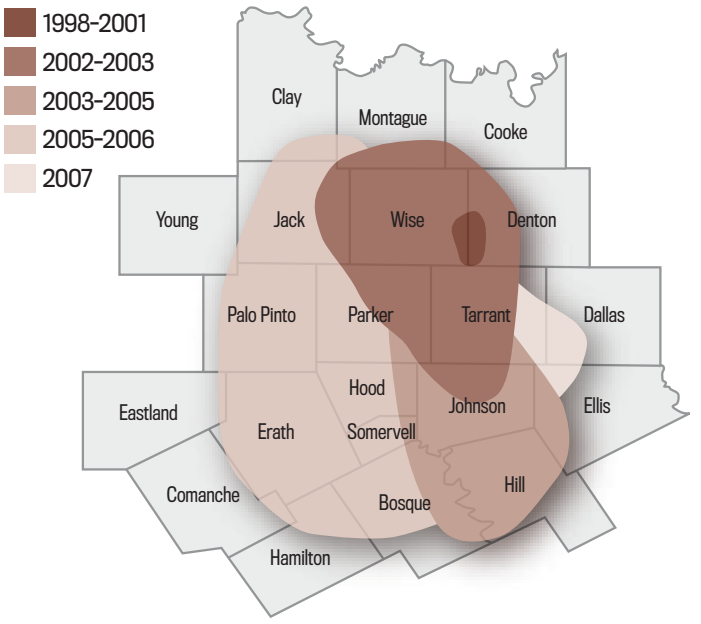
"It took a long time for the Barnett Shale to turn into the highly prolific economic engine that it is today," recalls Trevor Rees-Jones, president and CEO of Chief Oil & Gas LLC, a Barnett pioneer whose firm began drilling there in the 1990s, mainly in Wise County.

Bob Best, CEO of Dallas-based Atmos Energy Corp., concurs. "At one time, people thought they had gotten all the gas that the Barnett Shale had to offer," he says.

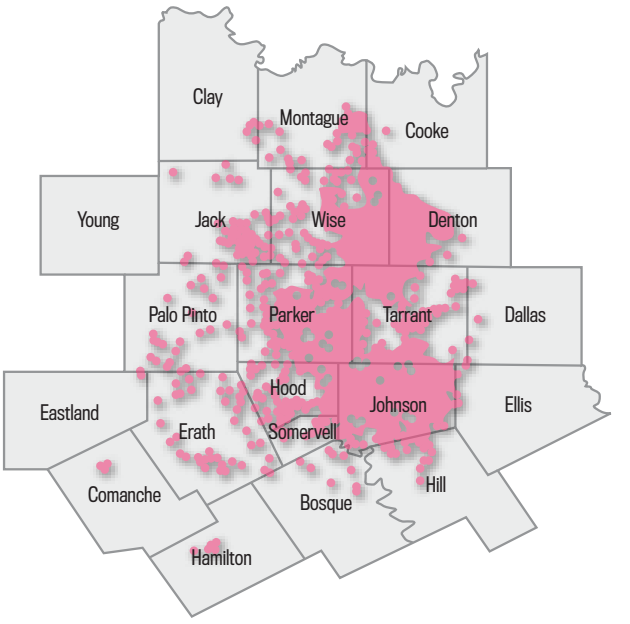
The field became truly bankable around 2000, when spot gas prices soared from $2 per million British thermal units (MMBtu) to $6, then $8, then $10. That allowed for capital-cost recovery and sufficient returns

BARNETT SHALE'S LONG REACH

STAGES OF EXPLORATION



WHERE THE WELLS ARE



to lure major production companies. Today, Oklahoma City-based Devon Energy, XTO Energy of Fort Worth, Oklahoma City-based Chesapeake Energy, and EOG Resources of Houston are the field's top developers, in that order.

In 1996, total potential production in the Barnett Shale was estimated at just 3 trillion cubic feet (Tcf) by the U.S. Geological Survey. Ten years later, that figure was upped to an estimated 39 Tcf, with more anticipated. Last year alone, the field produced more than 1 Tcf—a 29 percent increase over 2006. That's more than 4 percent of the country's annual consumption of natural gas, which currently totals 23 Tcf.

According to experts with The Perryman Group, a Waco-based economic-forecasting firm, Barnett drilling is expected to last another 20 to 30 years, with decades of production activity to follow after that. Five major firms plan to invest a total of $34 billion in the play over the next 10 years alone.

With natural-gas prices ticking upward in recent years, fields like the Barnett have become increasingly lucrative for mineral-rights holders, government entities, and energy companies alike. The cost of drill-site leases has skyrocketed, with Tarrant County landowners nabbing "signing bonuses" of more than $20,000 per acre this year, up from $3,000 to $5,000 in 2007. In Texas last year, local and state government coffers enjoyed a nearly $1.1 billion stimulus from the play. New jobs have been created in energy transfer and transport and in support businesses that drill wells and carry away wastewater.

When Rees-Jones began drilling in the Barnett Shale, prices were down around $2 per thousand cubic feet, or Mcf; (a measure preferred by gas producers, one Mcf is very close in volume to one MMBtu). "In fact, if someone had told me in the 1990s that I could count on gas averaging $2 Mcf, I would have been ecstatic," he says. "There were many times when gas was much lower, dipping down to a buck or less." (Persistence paid off for Rees-Jones in 2006, when he sold most of Chief's Barnett assets to Devon and Crosstex Energy for $2.6 billion.)

As exploration has gradually expanded the Barnett's boundaries, even Dallas County has joined the party. Drillers with Chesapeake descended on Dallas/Fort Worth International Airport in 2007, resulting in a $186 million windfall for the airport, plus royalties.

DEMAND COULD GROW

Meantime, gas from the Barnett and other "unconventional" plays—they're called that because they require more technology or investment to extract the gas—is being hailed as a godsend for the nation's hard-pressed energy supply, especially in light of troublesome current trends. Crude oil prices have risen nearly 100 percent over the last 12 months, and prices for gasoline and diesel have hit new highs as well.

Experts say natural gas is an abundant fossil fuel that performs well based on its cost, its availability, its ability to morph into numerous energy forms, and its "carbon footprint." It burns cleaner than oil and coal for power generation, emitting 30 percent less CO2 than oil and 45 percent less than coal, according to the American Gas Association. In addition, homes that use natural-gas appliances have a 20 percent smaller carbon footprint than homes using electric appliances, according to the AGA.

Coal, which currently produces half of all the country's electric power, is abundant and relatively inexpensive, but it's also the most-polluting fossil fuel. The most heavily-subsidized forms of energy—wind and solar power—have clear advantages in terms of greenhouse-gas emissions, but they're more expensive than natural gas, at least for now. And nuclear power, while the cleanest of all the alternative energies, poses waste-disposal problems and won't be viable on a large scale until 2020, when more supply comes online.

The Department of Energy reports that natural-gas consumption in the U.S. rose 6.2 percent—to that 23 Tcf figure—in 2007. The Energy Information Administration's July short-term energy outlook predicted a 2.1 percent increase for 2008, with slower growth anticipated next year. (In the past,

MAP SOURCE: THE PERRYMAN GROUP

energy efficiency and conservation efforts have helped in slowing demand over time.) Even so, experts say natural-gas demand could grow beyond these modest expectations. One reason: Construction of gas-fired power plants is on the rise. Of the next 1,000 power plants to be built, 900 are expected to use natural gas.

To meet such expected demand, uncon–ventional gas plays like the Barnett Shale, the promising Haynesville Shale in East Texas and northwest Louisiana, and the up-and-coming Marcellus play in Pennsylvania's Appalachian basin are expected to bring considerably more supply online.

James Smith, a finance professor and Maguire chair of oil and gas management at Southern Methodist University's Cox School of Business, believes such promising reserves could have a big impact on the price of natural gas, which was hovering around $12.40 at press time. "You have to think of the counterfactual," Smith says. "If we hadn't discovered the Barnett Shale, natural gas prices would be a lot higher than they are now."

And in terms of production, Rees-Jones says, we ain't seen nothin' yet. "At the time we sold [our assets] in the summer of 2006, the Barnett Shale was producing less than one billion cubic feet a day. Now, two years later, it's producing 3.7 Bcf per day," he says. "I've heard projections down the road of upwards to 8-10 Bcf per day. That's a significant dent in the nation's requirements from just that one field."

Still, opinions vary as to whether the various shale plays, combined with other resources, are enough to keep prices in check. "There's an enormous gas resource in Pennsylvania, the Marcellus Shale, so it's not just the Barnett Shale, or other shale reserves, which used to be high-cost until we developed horizontal and directional drilling technology," Smith says. "There will be expansion in liquefied natural gas supplied to the U.S., though not every project or LNG terminal will be built. These many developments will be important in keeping gas prices in bounds.

"People are looking below $10 [per MMBtu] in the long run, not above," Smith adds. "I hear $8 is a fair cost base, a price level that would stimulate enough supply to balance that market." Smith expects volatility in prices, bouncing from a low of $6 to $8 to a high of $10 to $12 over the next five years, barring the passage of federal climate legislation.

Rees-Jones thinks that in the long run—three, five, or 10 years down the road—the relatively new plays could have a moderating effect on prices. U.S. gas production had been declining in fields like the Gulf of Mexico, reversing only in the last year or two. "One wild card, though, is that the price of natural gas is supposed to bear a relation to the price of oil," Rees-Jones says. "Even with natural gas at $10, it's out of whack with oil at $130 [per barrel]. If the price of oil stays high, then regardless of supply, gas may stay high as well."

Atmos Energy's Best believes environmental issues can't be discounted, either. "There is going to be a huge cost to solve the environmental problems, and I don't think the public realizes this," he says. "If you want natural gas instead of coal, you'll put pressure on the price of gas."

ENVIRONMENTAL BENEFITS

No doubt, the current hoopla over climate change and pollution is boosting the attrac–tiveness of natural gas as an energy source. Currently, 22 percent of total U.S. energy consumption comes from natural gas. Gas heats more than half of all U.S. homes and fuels 20 percent of the country's power plants. It's also a feedstock for products like plastics, fertilizer, antifreeze, and fabrics.

The cost of natural gas drill-site leases has skyrocketed, with Tarrant County landowners nabbing "signing bonuses" of more than $20,000 per acre this year, up from $3,000 to $5,000 in 2007.

In Texas, slightly more natural gas than coal is currently used to produce electricity. Residential prices for electric-power genera–tion using natural gas rose 2.7 percent na–tionally in 2007, when gas averaged about $13 per MMBtu. That trend hasn't gone unnoticed in the Lone Star State—despite DFW's poor air quality and Texas' standing as the nation's No.1 carbon emitter. In June, the state's Competitiveness Council recommended that Texas reduce its dependence on "expensive" but cleaner-burning natural gas and rely more on coal and nuclear power to meet its growing electricity demand.

Natural-gas proponents counter that, besides being environmentally friendly, the fuel can help the U.S. become less dependent on imported oil. The increased use of hybrid vehicles, as well as soaring gasoline prices, will help turn natural gas and coal into at least a partial substitute for oil-refined gasoline, they say. "I think there will be an interplay between natural gas and gasoline," says Smith, the professor at SMU. "General Motors announced it would move ahead with its plug-in Chevrolet Volt. We will be substituting less gasoline demand with more electricity demand, using natural gas and coal to generate the power."

But, isn't there a carbon-footprint cost for powering your car's battery overnight? "Well, it uses more energy. You're paying a higher price to acquire the energy to do that," Smith says. So why do it? "Because natural gas and coal are not controlled by [the Organization of Petroleum Exporting Countries]. ... That's why we're considering other forms of energy to de-lever that situation."

That prospect has helped attract some big-time investors. T. Boone Pickens, the Dallas billionaire pushing a new energy plan, is bullish on natural gas as a vehicle fuel, for example. He owns and operates natural-gas fuel facilities that supply municipal fleets and various city vehicles with the cleaner fuel. Also, Shell Oil has broken new ground with a gas-to-liquids fuel, which is natural gas converted to a synthetic. GTL offers big cities in Europe and Asia the benefits of cleaner air and less dependence on imported oil.

Down the road, natural gas also is expected to benefit from potential federal climate-change legislation, and analysts are trying to estimate its possible cost. "It's hard to say that climate-change legislation will be worth $2 Mcf" on top of the "market" price for gas, Smith says. "But it will certainly sustain strong demand for natural gas, and ensure that anyone developing reserves will find ready buyers. It will be priced at a premium compared to fuels that have a higher carbon content."

Ironically, those higher prices could encourage the recovery of still more gas resources—at home here in the Barnett Shale and around the world. D