

# The Texas Energy Disaster

Robert A. Hefner III

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By understanding natural gas, the Texas energy disaster will be used as a big wake-up call on how to achieve President Biden's goals for reliable clean energy, climate change, and the environment.

To understand “what went wrong” and “how we got there” in the Texas energy disaster and solutions for the future, we must first look closely at a fundamental, little-understood fact and that is the big difference between oil production and the gas that comes with it and natural gas production. ASSOCIATED GAS is produced in relatively small quantities from hundreds of thousands of OIL WELLS from fields like the Permian of West Texas, and NATURAL GAS is produced from a fraction as many high-volume natural gas wells from natural gas fields like the Haynesville of East Texas and West Louisiana. ASSOCIATED GAS is an unreliable byproduct of the more polluting oil production industry, whereas NATURAL GAS is a carbon-light, highly reliable bridge fuel to America's clean energy future. It was associated gas coupled with multiple problems with the Texas electric grid, not wind or solar, that were the real culprits.

“How did we get here” is a larger story, but the quick answer is that America's energy markets work within the constraints of our laws, regulations, and tax systems that reward oil production over natural gas production. As a result, over the last five years or more, the average market price of oil has been about \$60 per barrel, while our domestically produced, cleaner natural gas sold for about \$18 to \$20 a barrel for the same quantity of energy. These economic incentives for oil helped to unleash America's oil and fracking boom across the western United States while also accelerating a large decline in drilling natural gas wells. Oil's economic incentives are at the same time a disincentive for drillers to target natural gas and therefore today the majority of gas production in Texas and most of America's west is produced from oil wells, not natural gas wells.

Back to “what went wrong”. Very large numbers of oil wells must be pumped from shale and tight sands that produce oil, water, and low-pressure, low-volume associated gas that is not a reliable source during severe weather. The reason is that in order to produce these rapidly declining oil wells, large mechanical, energy-consuming, often electric-powered machines called “pump jacks” that rise ten to fifteen feet above the surface and deep below the surface mechanical mechanisms and pumps are required to get the oil, along with water and associated gas, to the surface. Like all unprotected machinery scattered across open fields, these pumping machines must be maintained and need human attention. In severe cold weather and winds, immense numbers of oil wells are difficult to keep on line and likely to freeze up, lose power or break down. Next, even more unreliability occurs because all this low-pressure, low-volume oil well gas must be collected from so many wells in low-pressure pipe systems that also require energy-consuming, often electric-powered compressors to gather the associated gas. Then, more compressors to once, or sometimes twice or more, are needed to again boost the pressure and move it through pipelines to gas-fired electric generating plants.

In times of winter storms or other weather extremes, at every step of the way this low-pressure associated natural gas requires so many energy-consuming mechanical machines and human attention that the system itself is fragile because there are so many opportunities to shut down, like mechanical failures, human failures, and the loss of electric power to run the pump jacks and compressors. So it is clearly foreseeable that system failure is a high probability during extremes. As we all know, in historic record-breaking storms that have become the norm, each weak link that fails creates a self-reinforcing feedback loop of additional failures so that in such a crisis “everything that can go wrong, always does!” And unfortunately, that is where we are today with a critical component of America’s baseload power generation at the same time climate extremes of all kinds are accelerating.

On the other hand, natural gas produced from a relatively small number of high-pressure, high-volume natural gas wells from fields like the Haynesville and America's East coast giant the Marcellus, is totally different and a much more reliable and cleaner source of energy. Natural gas is lighter than air and therefore flows naturally at high volumes under its own high pressure and requires very little if any energy to produce and significantly smaller additional sources of energy to transport the natural gas to electric generation plants. The entire natural gas system from the "well head" to electric generating plants requires significantly fewer wells drilled, much less energy use to transport, and very few moving parts to go wrong, freeze up or maintain, so it is enormously more efficient and reliable.

If all of Texas's natural gas-fired electricity had come from the natural gas industry's high-pressure, high-volume natural gas fields like the Haynesville, most if not nearly all the failures to produce natural gas-fired electricity during the recent Texas energy disaster could have been avoided.

It is imperative for America's future that we learn from this energy disaster and its human suffering because in order to achieve President Biden's goals for reliable, clean energy and the environment, these fundamental differences between America's oil production and natural gas production must be recognized. Only then can our energy laws, tax system, and regulations be adjusted to place our energy markets on a level playing field. The simplest straightforward fix would be a "carbon tax" that also recognizes the fact that in addition to the higher carbon and higher levels of CO<sub>2</sub>, the production and use of coal and oil and its products also cause large amounts of additional toxic pollution that is harmful to human health, drives up the cost of healthcare, and degrades our natural environment. These toxins are virtually absent in natural gas. A carbon/pollution tax would equalize the playing field that removes the economic incentives for our energy polluting past and will accelerate us toward our clean energy future.