

Notes, Panel Presentation
OSUE Energy Infrastructure Workshop
27 October 2015

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The United States is unique in that gas and oil deposits, like other subsurface resources, are privately owned. Property rights do not extend below ground in continental Europe. Likewise, gas and oil deposits are not in private hands in the United Kingdom, Canada, and other nations with legal traditions and institutions similar to this country's. Instead, those resources belong to the state.

Private ownership insures that economic incentives guide the development of gas and oil deposits. And in the United States, economic incentives are market signals, which energy companies have responded to by improving technology. Daniel Yergin, a leading energy economist and consultant, emphasizes that technological advances normally account for three-quarters of the additions to gas and oil reserves (defined as resources that not only have been discovered but also can be extracted profitably under current market conditions).

The advance with the greatest impact on energy supplies since the late twentieth century has been the combination of hydraulic fracturing and horizontal drilling popularly known as fracking. Significantly, the fracking revolution did not get underway when prices were elevated. To the contrary, commercial extraction of shale gas using unconventional technology began around the turn of the twenty-first century, when fossil fuels were cheap. Thanks to fracking, gas and oil prices are less variable than they used to be. Prices have been driven down as well, to the benefit of consumers and the economy as a whole.

Diminished variation of fossil fuel prices in the United States is in part a consequence of geographic diversification. Before fracking allowed shale gas to be extracted throughout the country, domestic production was heavily concentrated along the Gulf Coast – a region that also has a large number of liquid natural gas (LNG) import terminals. As a result, major tropical storms curtailed supplies periodically, which caused prices to spike. For example, gas prices rose above \$10 per thousand cubic feet after Hurricane Ike struck the Gulf Coast in September 2008. But since then, more than 90 percent of the increases in domestic production (which has risen faster than domestic consumption) have occurred in the northern Appalachians and other parts of the country and fluctuations in prices have been remarkably modest by historical standards.

Price stability during the last half dozen years has another cause. Tapping into new supplies of shale gas tends to be much less expensive than ramping up the exploitation of conventional resources, which means that the elasticity of supply (i.e., the responsiveness of production to changes in price) is higher in the U.S. gas market than it used to be – in the days before fracking. Because of a greater elasticity, any rise in prices unleashes a substantial increase in production, which in turn prevents prices from spiking. For example, there have been no major run-ups in U.S. gas prices during the last seven years – not even when crude oil prices peaked at nearly \$150 per barrel in June 2008 and exceeded \$100 per barrel less than two years ago.

The supply of natural gas in the United States has not only become more elastic. It has also increased, in the sense that there is more production at any given price. Indeed, supply has consistently gone up faster than demand in the gas market, which has pulled down prices. Since spiking in the wake of

Hurricane Ike, gas prices have stayed below \$4 per thousand cubic feet. Thus, technological change has had the same impact in the energy industry as in the food sector and other parts of the economy, primarily benefiting consumers – in the specific and tangible form of lower prices – far more than anyone else, producers included.