

## What is Fracking?

During his February 24 Hot Science – Cool Talks lecture entitled “From Fracking to the 40 Acres: Energy Challenges for UT, Texas, and the World”, Dr. Michael Webber predicted that within 10-20 years, natural gas would overtake petroleum as the dominant energy source in the United States. Texas is the 3<sup>rd</sup> largest producer of natural gas behind other U.S. regions combined, and Russia. Dr. Webber described several benefits from natural gas, including its wide range of availability, applications at power plants, industry, and transportation, and the fact that it produces lower emissions than petroleum. He also discussed drawbacks to natural gas such as water contamination risks, land surface disturbance, and air contamination. Most of these drawbacks are related to processes of natural gas extraction from shale formations deep underground.

One of these extraction methods is called “Fracking”, which is a term coined for hydraulic fracturing. Hydraulic fracturing was pioneered in Texas. It involves drilling thousands of feet underground with a well bore to reach shale formations. Often times the well bore levels out, and digs horizontally for thousands of feet into the shale. Water and sand is pumped into the shale at high pressure, where it breaks up rock formations in order to permit gas to flow to the well bore. Although the size of the extraction and disturbance to the overall rock structure is small, the wells are so deep they must drill through sensitive layers such as groundwater to reach the gas deposits. Gas wells must be encased to protect these external environments, and internal pressure within the well must be carefully controlled to prevent accidents and environmental contamination. Furthermore, many shale (and hence natural gas) deposits are close to heavily populated human areas, which increases exposure risks and often makes extraction operations controversial.

This technique is being deployed in other shale deposits across the United States due to their abundance, and the efficiency with which gas can be extracted from them. Combined with other energy sources such as solar PV and wind turbines, Texas is positioned to contribute significantly to meeting U.S. Energy demand. Because solar and wind power contribute less carbon dioxide emissions in their production and use, they may supersede natural gas in the future as they become cheaper and more efficient to produce.

### Sources and Further Reading:

- Webber, Michael, E. “From Fracking to the 40 Acres: Energy Challenges for UT, Texas, and the World” Hot Science – Cool Talks, February 24, 2012  
<http://mediasite.esi.utexas.edu/UTMediasite/Viewer/?peid=913b790ca9e04263a49c1ee4654b936f1d>
- U.S. EIA Global Gas Production Data: <http://205.254.135.7/naturalgas/reports.cfm?t=80>
- “Haynesville” (Kallenberg & Bullard, 2011); A movie about our nation’s hunt for an energy future  
<http://www.haynesvillemovie.com/>