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Short Communication

Petroleum and Chemical Industry International

The Role of Enhanced Shale Oil & Gas Recovery in the Us & Development & Pricing of Significant Potential Shale Production in Other Countries Such As South America, Canada, & Europe/Asia2018/2019

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Abstract

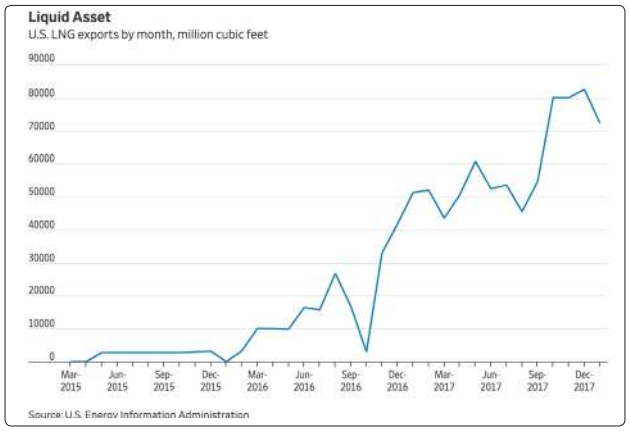
The Role of Science in Developing Enhanced Oil & Gas Resources, Being Environmentally Sound, & Protecting Water Use

- *Global transformation with fossil fuel as primary source which have an effect on GDP, export/import changes, and global effects on pricing*
- *History of evolution of oil and gas production in the United States*
- *Global development: European Community, India, China, Brazil, Chile, Argentina and Mexico all have proven reserves*
- *All time high extraction of tight natural gas and oil being environmentally sound and protecting domestic water supplies*
- *Hydraulic fracking below potable water supplies*
- *Drilling Diagrams – Vertical and Horizontal, Proper Casing*
  - *Record pace of pipeline construction to supply refineries & terminal ports*
  - *Pronounced effect on GDP*
- *Natural gas treatment, delivery, from source to energy deficient countries exported as LNG*
- *Cost subsidies and economic pricing of oil and gas extraction, hydro power, coal, nuclear, wind, and solar. Cost of power by region*
- *There are no "Dry Holes" and more attributes of highly advanced geological technology*

Key Points

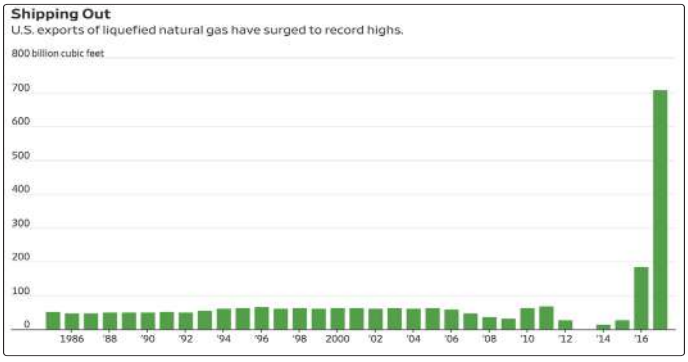
- Fossil fuels are here to stay for at least the next three or four decades
- The impact on GDP changes people's lives
- Increase in GDP makes for a better world

Get Ready for Another LNG Boom (WSJ April 2018)



Get Ready for another LNG Boom (WSJ April 2018)

US Exports of LNG Wall Street Journal April 14, 2018



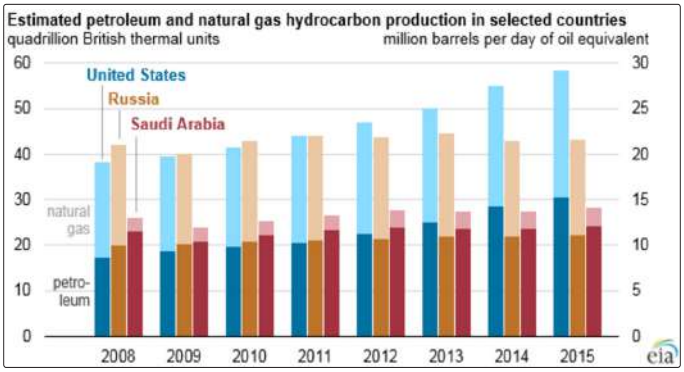
Current Oil and Gas Extraction Status

- Major producers of oil and gas extraction: United States, Russia and Saudi Arabia
- Price of Brent Crude in the Range of $60-70 dollars per BBL (2018)
- With increase in proven yet undeveloped reserves, prices may temporarily decline

- Proven reserves in the world plan to develop production, such as Chile and Argentina, China, Canada, Mexico and Norway (off shore)
- Countries with a sound GDP will be importing oil and gas as the most cost effective way from competitive countries in the International Market
- George Mitchell "unlocked the key" to the extraction of tight oil and gas (1970s) in the Barnet Shale in Texas.

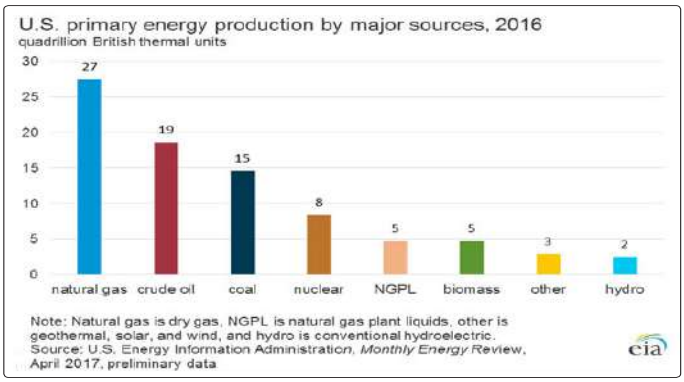
Us Moving Toward Net Exports

Note: aggressive increase in natural gas (light blue) and petroleum (dk blue)



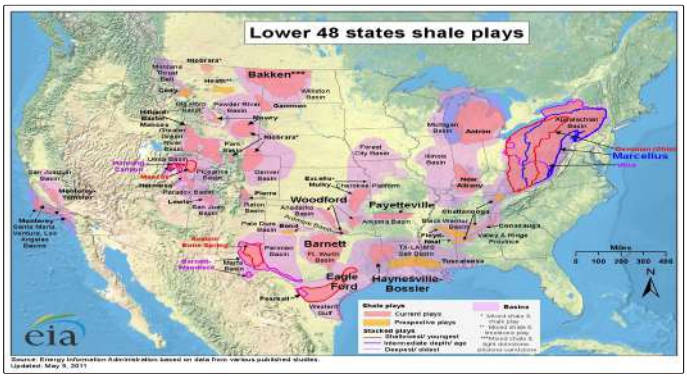
Sources of U.S. Energy Production

Note: fossil fuels make up majority of Btu Production

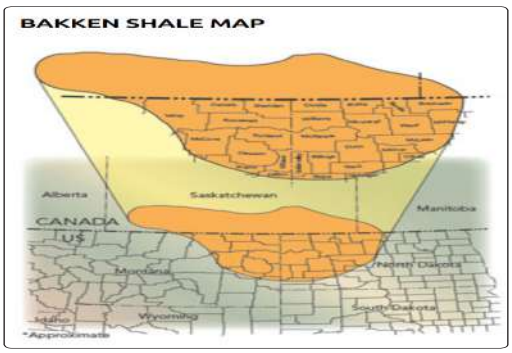


Shale Gas Plays, U.S

We Are Experiencing an Energy Renaissance



Baakan Formation



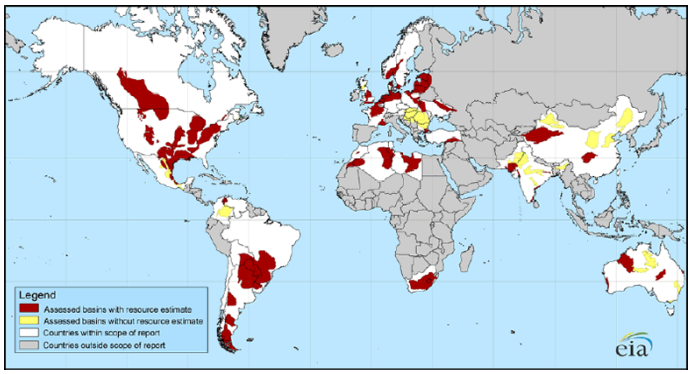
The Baakean shale formation has the 2nd most prolific oil producing formation. Its reserve is crude (29%), natural gas (28%).

Global Perspective on U.S. Export Positions of Natural Gas

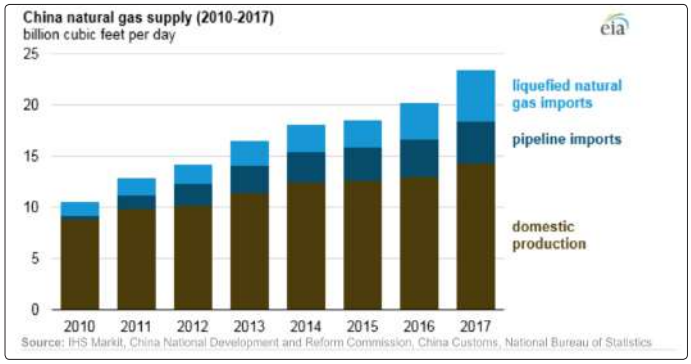
- Boom of fracture related oil and natural gas production and U.S. exporting
- Many in European Community are planning on natural gas as the primary supply of energy in the future

- ◆ Ukraine, Poland, Germany, and contiguous countries
- ◆ Major opportunity for domestic (U.S.) production

World Shale Gas Reserves



China Oil and Gas Projections

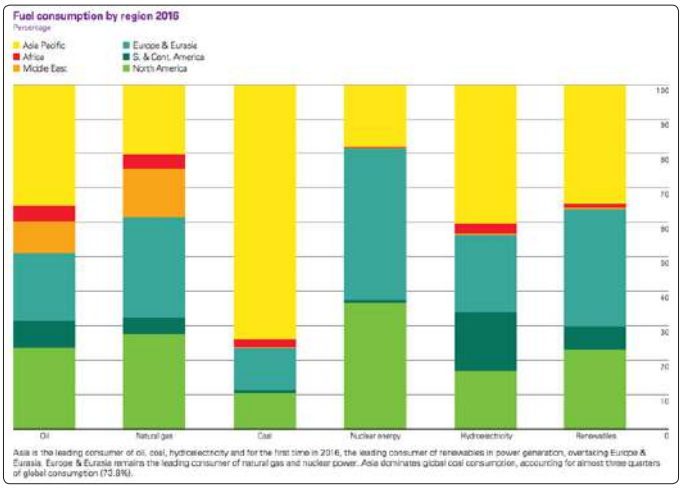


Argentina

- Enhanced extraction just beginning to occur
- Vast amounts of natural gas
- Current major importer of fossil fuel
- Key difference is in US, citizens own most mineral rights
- Government ownership makes it more complex

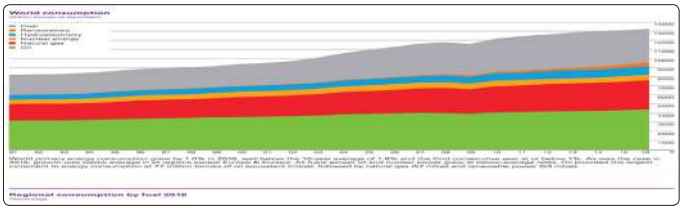
Fuel Consumption by Region

Note: Asia in yellow is 73% of coal consumption, with the USA at 11%

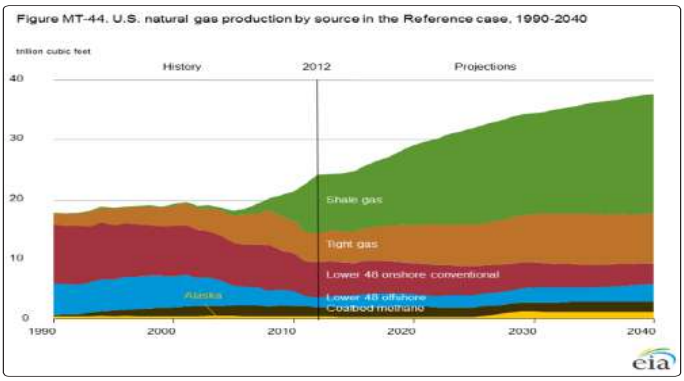


Overall World Fuel Consumption

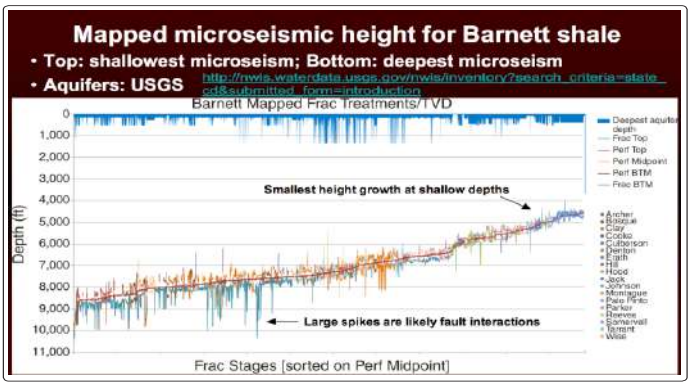
Note: coal in grey, oil in green, natural gas in red



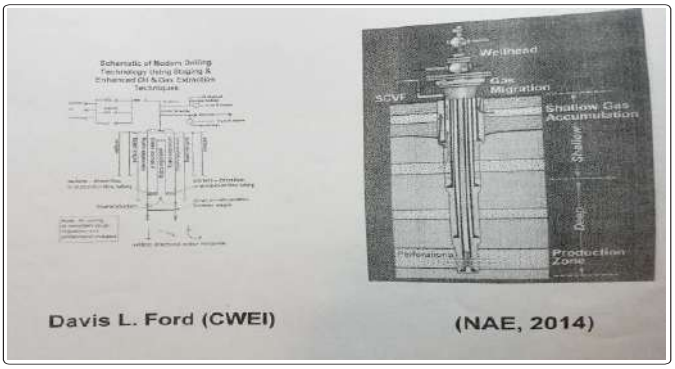
U.S Natural Gas Production
Growth of Shale and Tight Gas is TECH driven



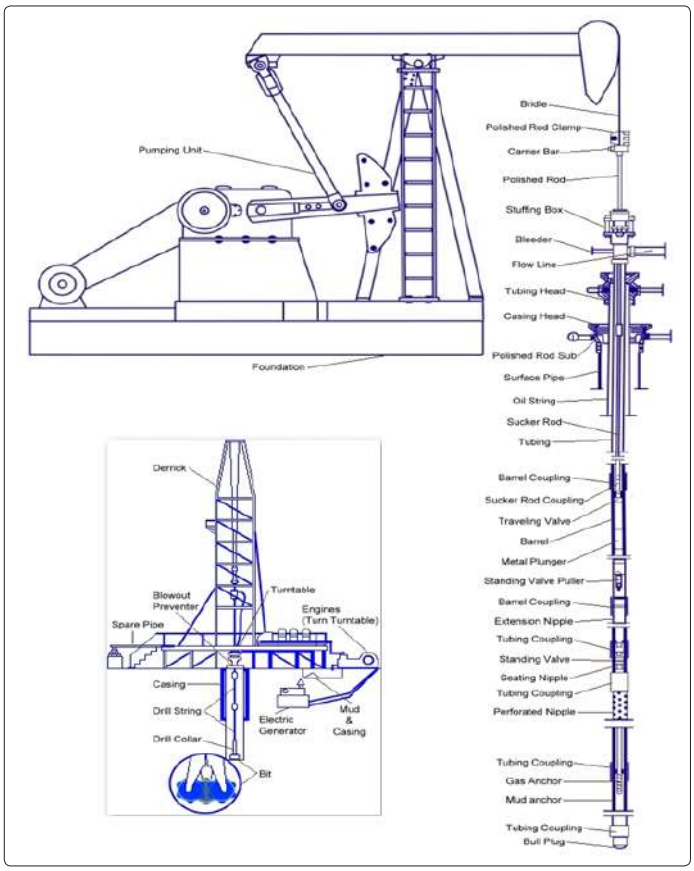
Microseismic Barnett Shale
Fracking is No Threat to Fresh Water Resources



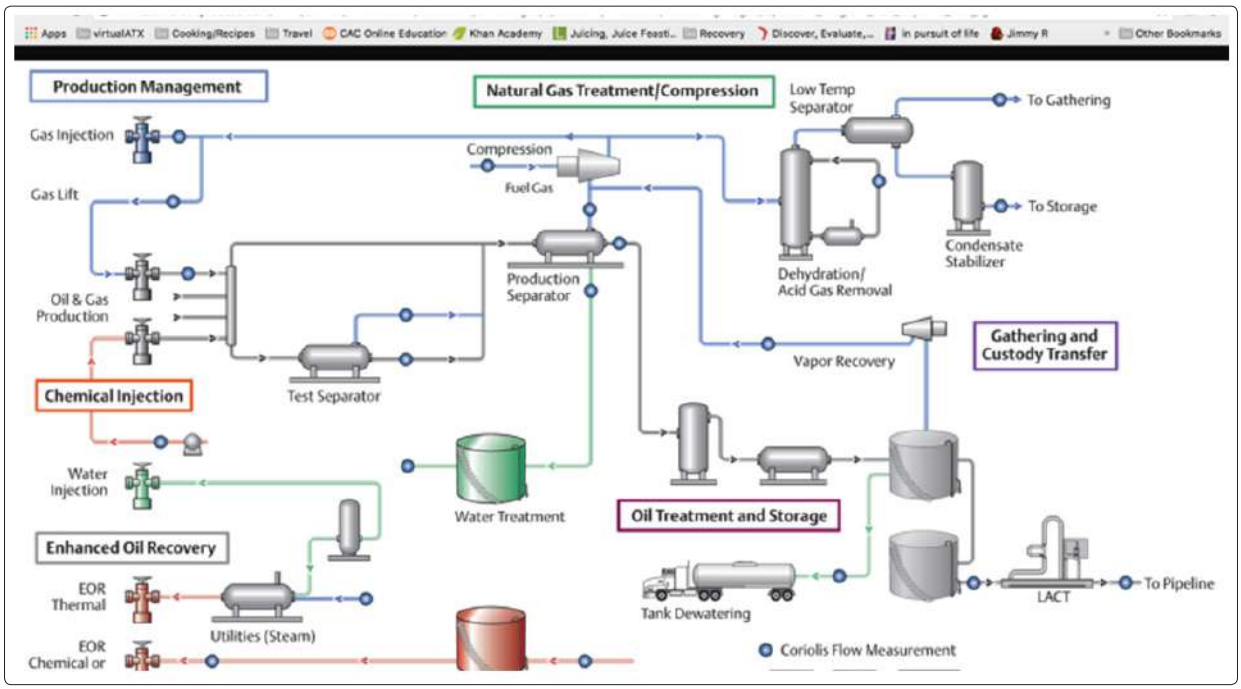
Drilling Diagram
Redundant Casing and Cement



Production Diagram



Natural Gas Treatment

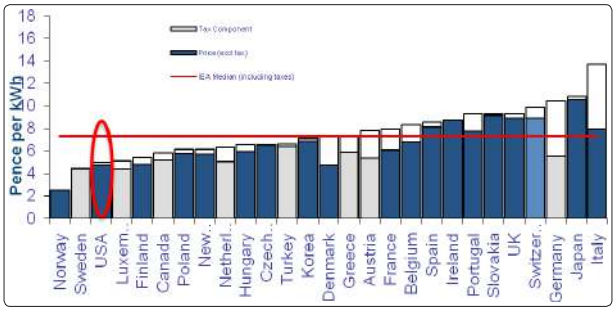


Federal Subsidies for Energy

Dollars per Megawatt Hour (US Dpt of Energy)	
Oil and Gas	$0.00
Hydro	$0.84
Coal	$0.64
Nuclear	$3.14
Wind	$56.29
Solar	$775.64

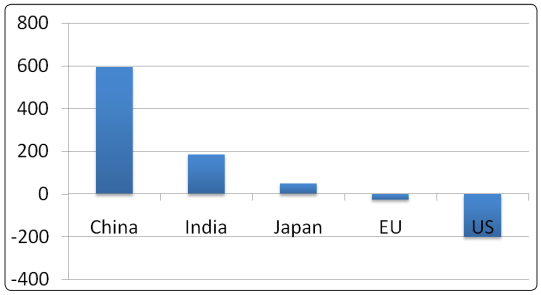
Global Industrial Electricity Prices

Note: the US is one of the lowest in the world with one of the smallest tax components



Largest Emissions Changes

Decrease in US without Carbon Tax, or Gov't Intervention



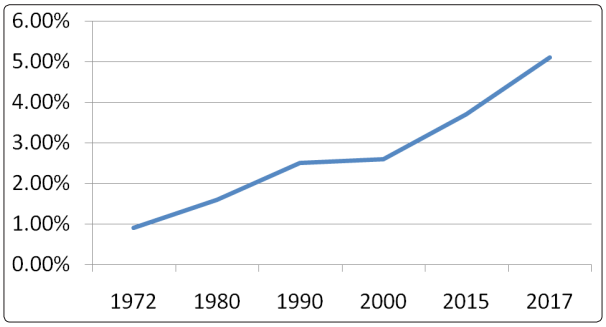
GDP Impact

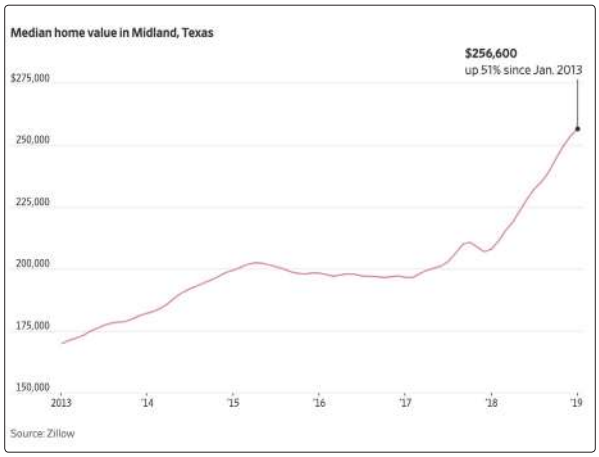
- GDP
  - Consumption
  - Investments
  - Government spending
  - Exports minus imports

• Conclusion

- When US become energy independent the GDP increases accordingly. This is a major national issue.

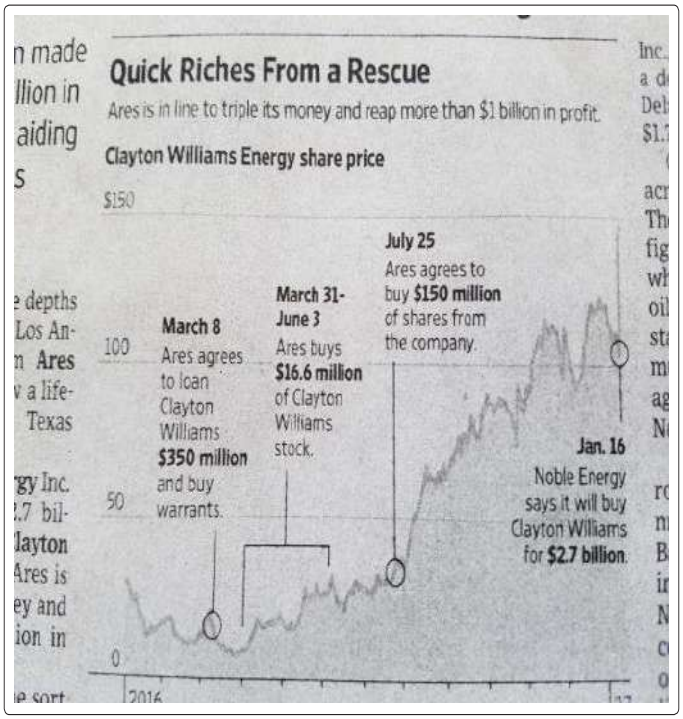
Fossil Fuel Development and GDP USA





WSJ Jan 18, 2017

How to Rescue a Company in Oil and Gas



Noble Sets $2.7 Billion Deal

Energy Powers Stocks to New Hig

Producers Gear Up For Oil's Recovery

Exxon Joins Land Rush in Southwest

Old Style Oil Wells Get New Life

New West Texas-to-Corpus pipeline set

The pipeline will carry 440,000 barrels of oil a day over its 730 miles.

By Rye Druzin
San Antonio Express-News

Three companies have raised $1 billion to build a 730-mile oil pipeline from the heart of West Texas to the Gulf of Mexico in Corpus Christi in what would be the state's longest pipeline since at least 2008.

The "EPIC" pipeline – which stands for Eagle Ford, Permian, Ingleside and Corpus – would transport upwards of 440,000 barrels per day of crude oil and condensate out of the Permian Basin Shale field to the Corpus Christi region when it comes online in the first quarter of 2019.

Additionally, Eagle Ford connections could add 150,000 barrels or more of capacity, bringing the total to 590,000 barrels a day.

"The Permian production is growing at an incredible rate with lots of money being spent on acquiring acreage, and the rig counts continue to grow," said Jeff Dorrow, vice president of business development for San Antonio-based TexStar Midstream Logistics, the lead company on the project.

The pipeline to the port in Corpus Christi is necessary because the refineries in the Houston market all are full, Dorrow said.

The port has become increasingly important as U.S. oil production takes off. Almost $1.5 billion in oil was exported out of Corpus Christi last year, according to the website U.S. Trade Numbers.

The port's website says more than 29.7 million tons of crude oil was outbound from the port in 2015, which would equal more than 217 million barrels for the year or 600,000 barrels of oil a day.

With Texas drilling more oil than it can handle, "the next barrel that's going to be produced is

Pipeline continued on B6