



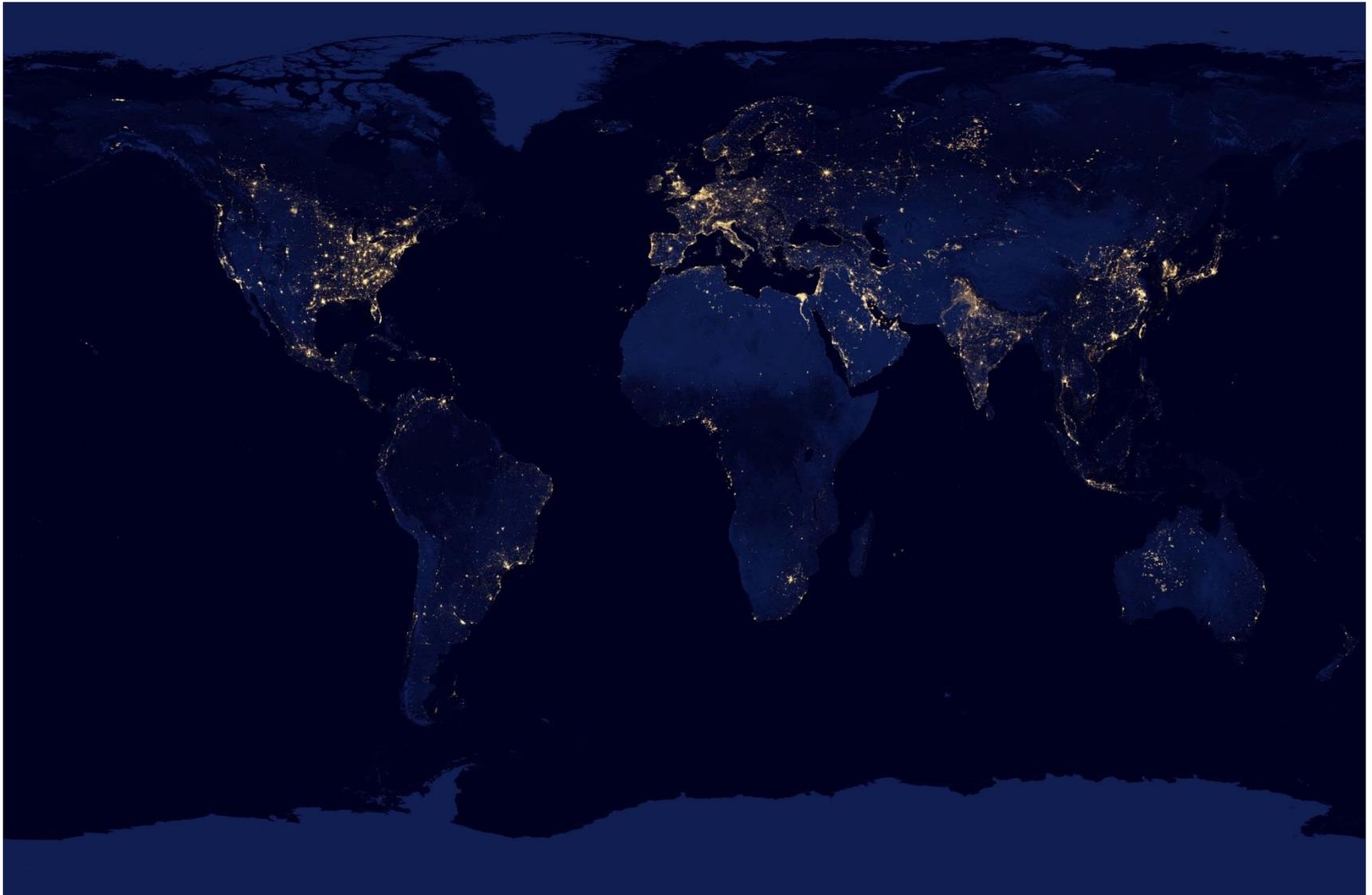
Innovation in the Energy Industry

Ram Shenoy
TiEcon Conference
May 17, 2014





Energy: Fundamental to the Global Economy & Quality of Life



Credit: NASA Earth Observatory/NOAA NGDC



Yes, We Are Innovative



*Oil well, Woodhouse, Mich. built Sept. 1885. First well
drilling about 100 barrels. First - James Wood, Michigan Valley
Co. Mich.*

Credit: The Museum of HP Calculators



Why Were These Energy Predictions Wrong? – Innovation!

“There’s little or no chance of oil being discovered in California.” – *U.S. Geological Survey, 1885 (in 1891, it said the same about Kansas and Texas)*

“American oil supplies will last only another 13 years.” – *Dept. of the Interior, 1939*

“The end of U.S. oil is in sight.” – *Sec. of the Interior, 1949*

“The U.S. has only a 10-year supply of natural gas.” – *U.S. Geological Survey, 1974*

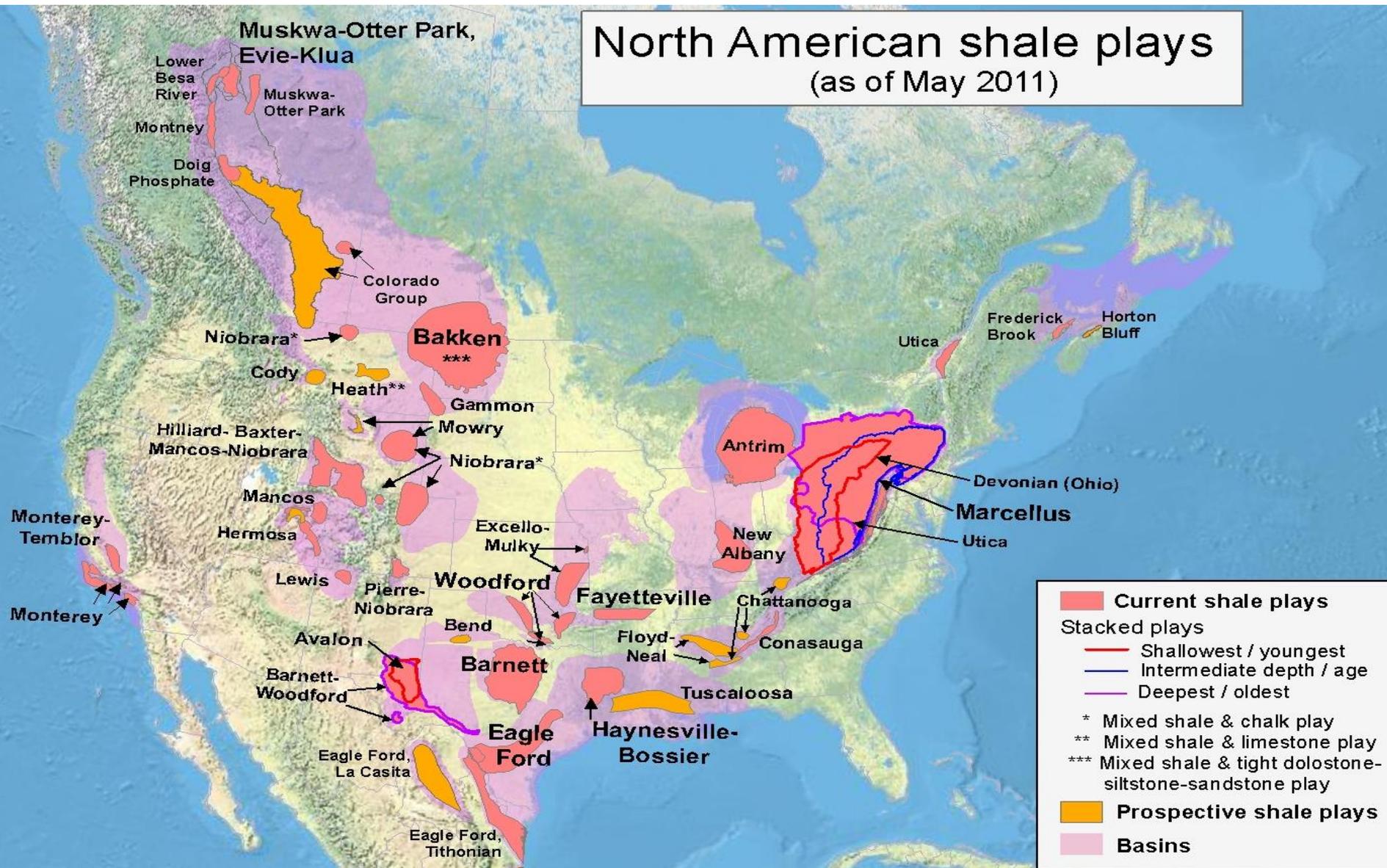


The Continuing March of Progress Offshore



North American Shale Plays

North American shale plays (as of May 2011)



Current shale plays

Stacked plays

- Shallowest / youngest
- Intermediate depth / age
- Deepest / oldest

* Mixed shale & chalk play
 ** Mixed shale & limestone play
 *** Mixed shale & tight dolostone-siltstone-sandstone play

Prospective shale plays

Basins

Source: U.S. Department of Energy, EIA



A Bold Approach

“You have to take your own bold approach, and if you do you will be rewarded with success. Or calamitous failure. That can happen too.” - *Steven Moffat, writer and producer*

"Now that we have met with paradox we have some hope of making progress." – *Niels Bohr, physicist*



“That’s how we’re going to stay innovative. We’re going to continue to attract entrepreneurs who say, ‘I found an idea, and I can go to Google and have a demo in a month and be launched in six.’” — *Marissa Mayer, Yahoo CEO, formerly of Google*





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