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The Energy Future: Transformational Trends in the Oil and Gas Industry

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Tehran, Iran 1979 – Qatif, Saudi 2013



**Unpredictable forces at work that might take years,
if not decades, to resolve**

Political Contagion Effect Now a Major Component to Long Term Outlook For Mideast Oil

Post-Egypt, oil market faces new concerns related to the nature of domestic societies, economies, political leadership and “legitimacy” in key oil producing countries

- Contagion:
 - Many oil producing countries have experienced similar kinds of demonstrations and social unrest both recently and in the recent past
 - Arabian Gulf is not immune
 - Saudi Arabia’s leading rulers are old and in failing health; reshuffling of key governorships, key ministries highlight ongoing instability
 - Oil field worker strikes in Oman, protests over wages and pensions
 - Demonstrations even in democratic Kuwait

What Would A Crisis in the Middle East Look Like? What Would It Mean?

Nightmare Scenarios:

!!Major Cyberattack

!!Sudden Factional or Social Turmoil

!!Use of Chemical Weapons Beyond Syria

There is no replacement for Saudi exports. Some Implications:

***Expect A Sharp Reversal in Economic Recovery**

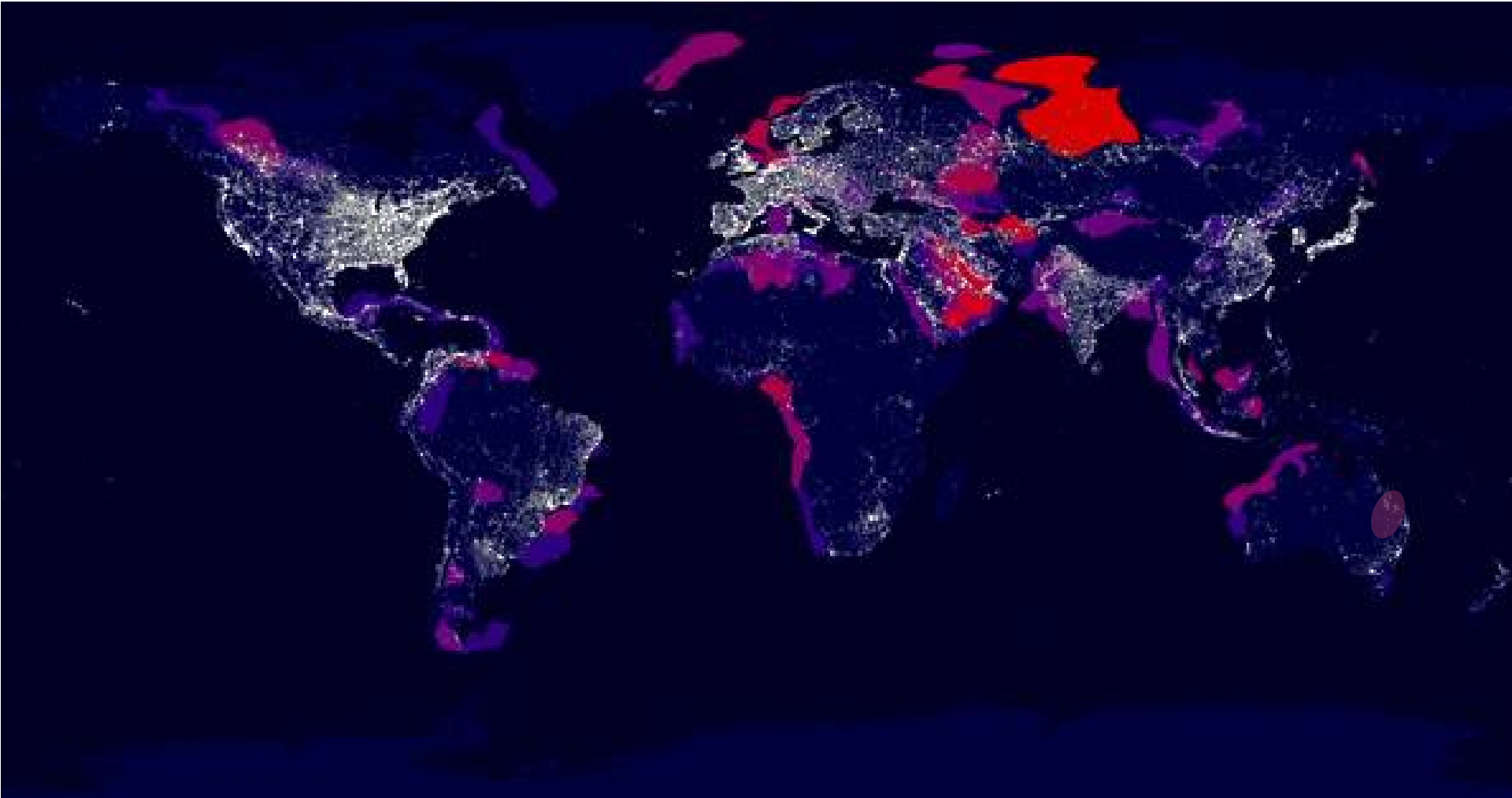
***Guard Against A Renewed Financial and Banking Crisis (Saudi SWF funds previously stabilized IMF and private banks)**

***Bet on Alternative Fuels, Especially Natural Gas in Transportation**

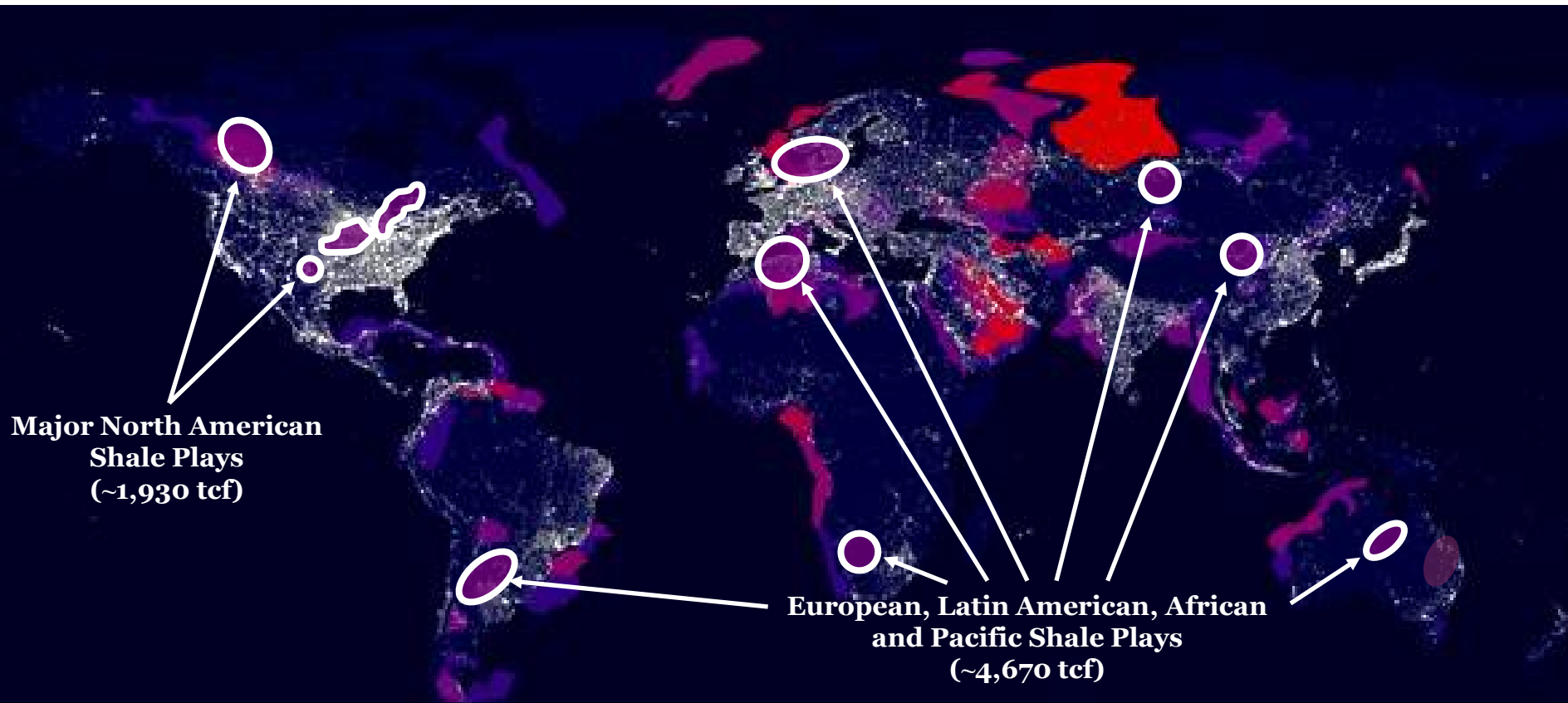
***Adjust Businesses to Take On Board Millenials Trends Such as Urban Density/Living Local, CCA, Telecommuting**

***Look For Accelerated Investment in U.S. Shale**

Prior to 2005, it looked like remaining large reserves were far from end-use markets and Middle East/FSU supplies would dominate the global market a la “peak oil”



New World: Shale will have a transformational impact on energy supply and pricing, energy trade patterns and geopolitics, and industry structure

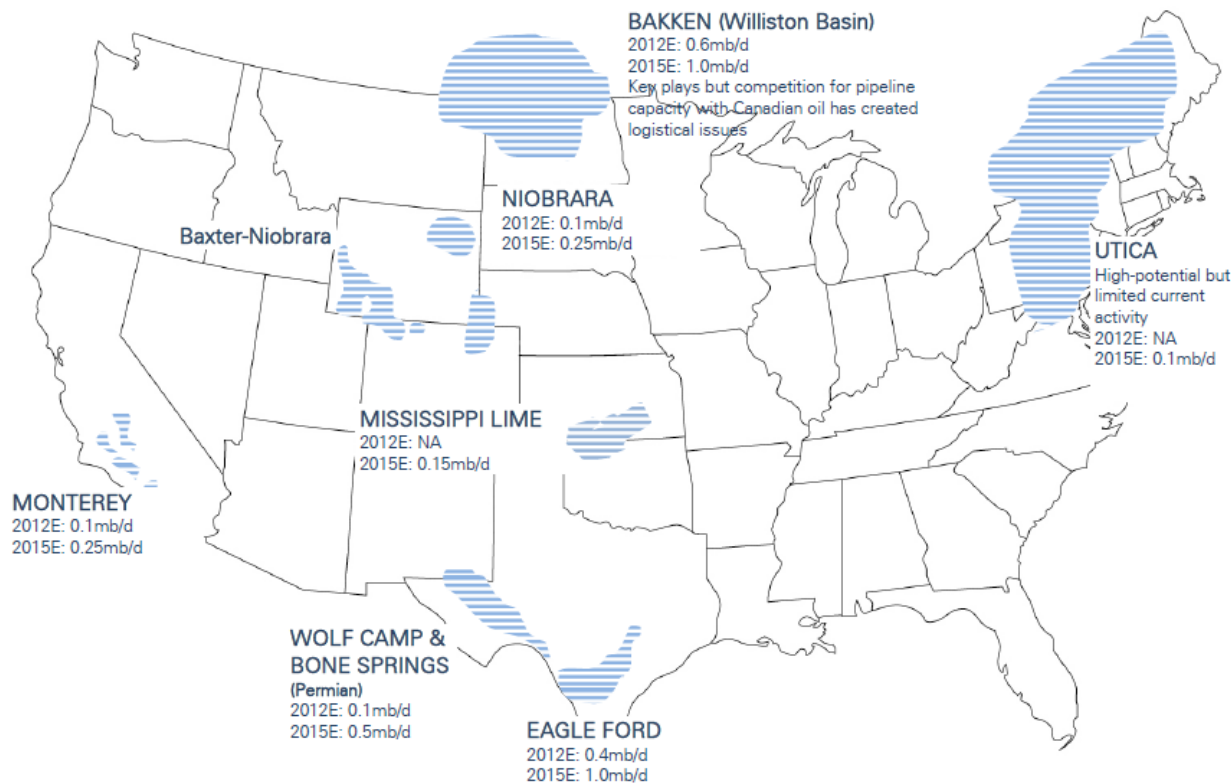


**Over 6,600 tcf of shale according to ARI/EIA report, 2011*

Center of the Energy World Shifting Back to the Americas

- Oil and Gas Upstream Capital Investment Totaled a Record High of \$550 Billion in 2012
- Investment in North America Over 30% of Total and Will Represent Bulk of Future Investment Growth
- Investment in Tight Oil Prospects in North America Has Quadrupled Since 2010; Expected to Reach \$80 Billion by 2015
- **NEW PIPELINES, REFINERY UPGRADES WILL CHANGE U.S. OIL AND GAS TRANSPORT PATTERNS AND EXPORT ECONOMICS**
- Panama Canal Expansion Will Take On New Meaning

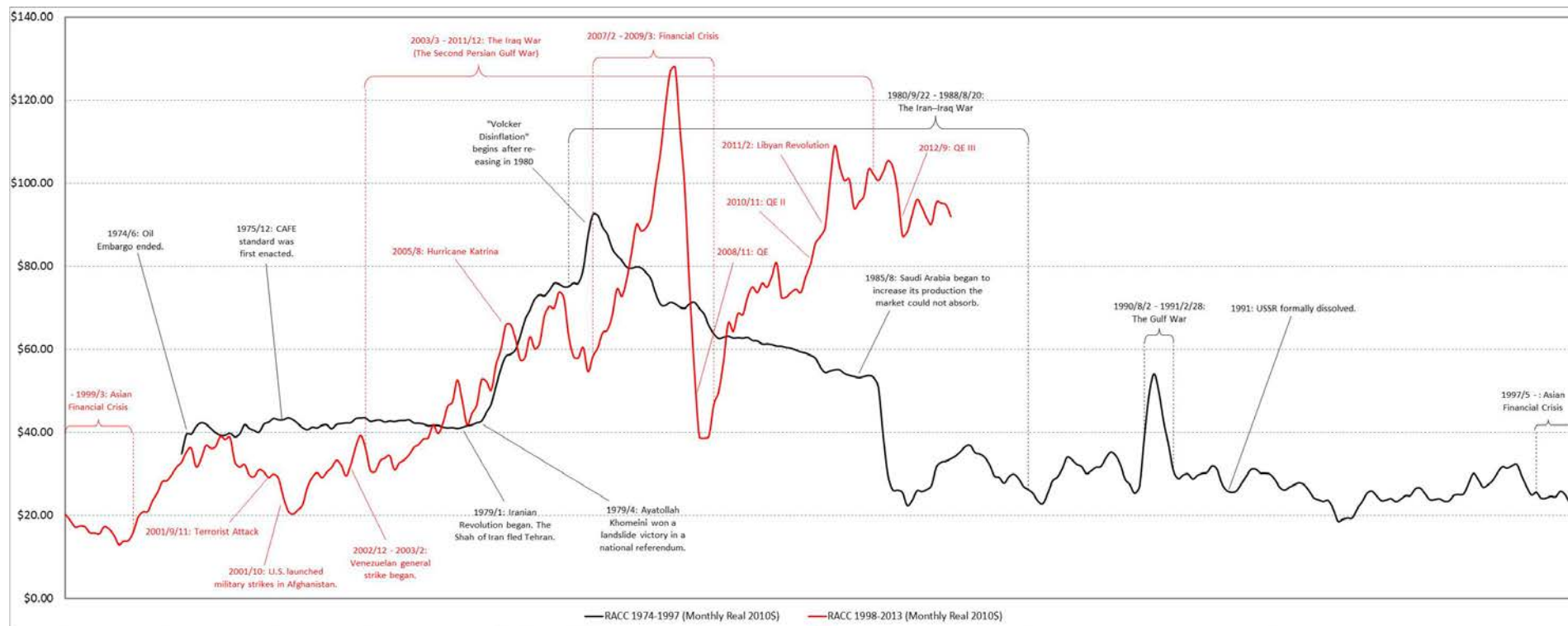
Over ten U.S. shale plays have high liquids potential



Source: Deutsche Bank, Integrated Oils: Oil & Gas for Beginners

- U.S. Shale oil and gas potential is widely distributed geographically
- Technical and cost challenges rapidly being overcome through experience and innovation; Production increases again this year

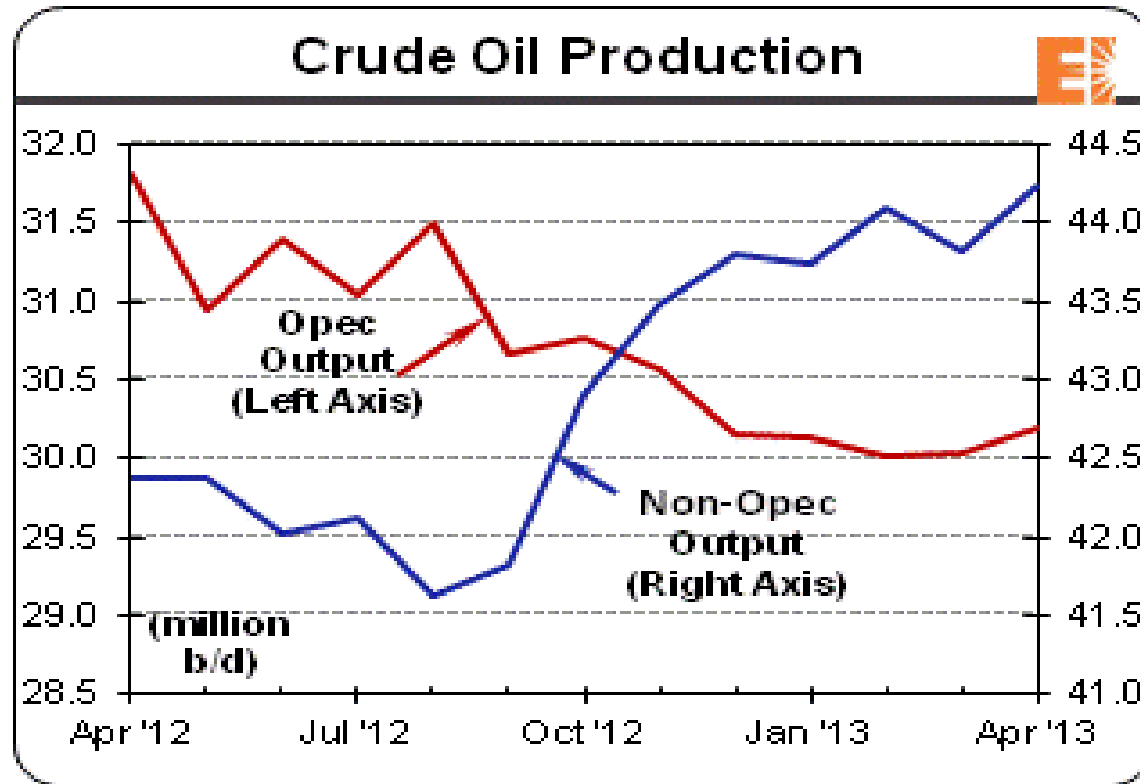
Two time periods compared: Crude oil prices impacted by various factors



Source: Medlock, K.B., Amy Jaffe, "The price of crude oil: deja vu all over again?" (2013), EIA

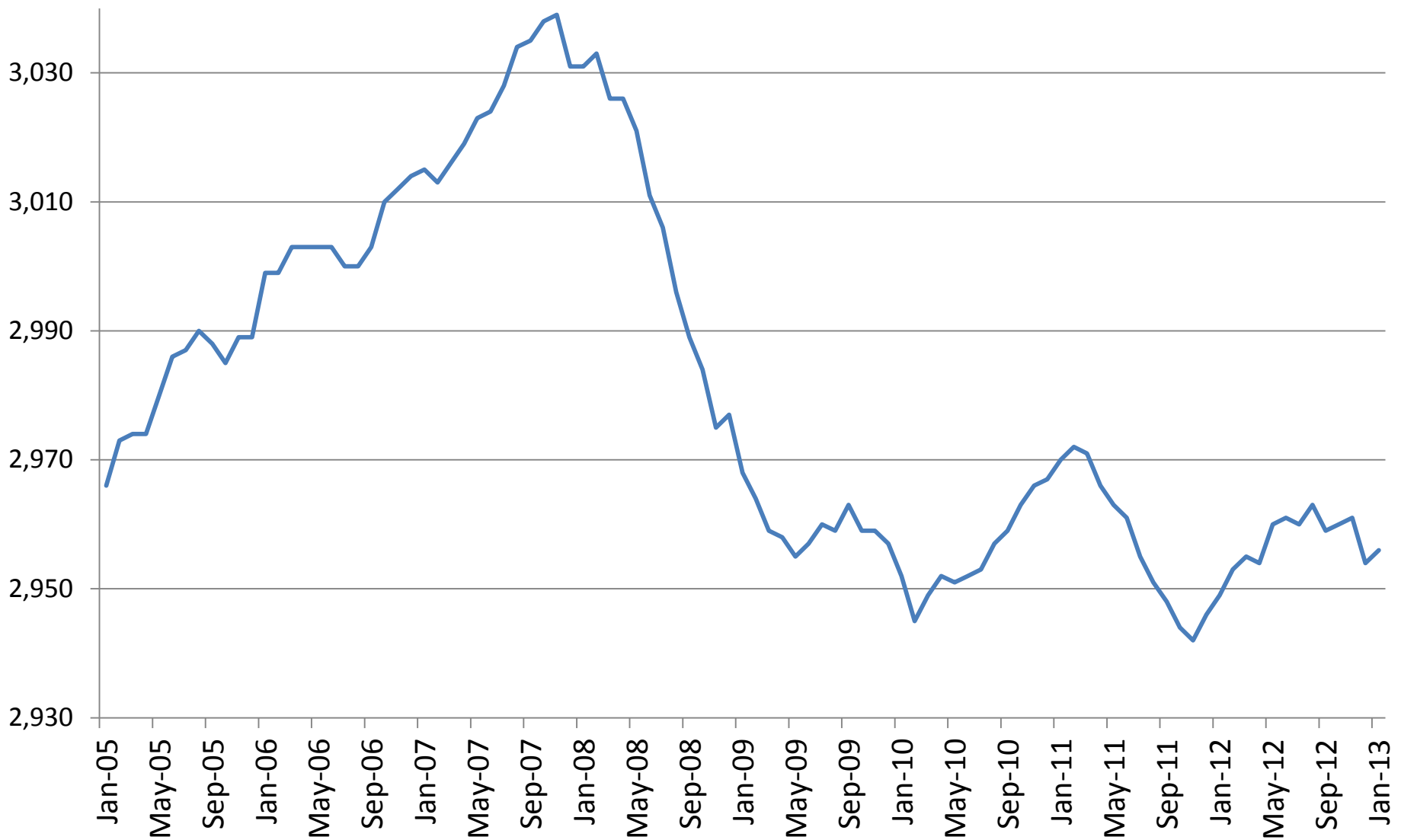
- Geopolitical developments, US monetary policy, supply and demand factors have each influenced the price of oil in the last 40 years.
- There are similarities between the two ten-year periods spanning 1973-1982 and 1999-2008. So, how might 2009-2025 ultimately compare to 1983-1998?

Non-OPEC gaining market share reminiscent of early 1980s



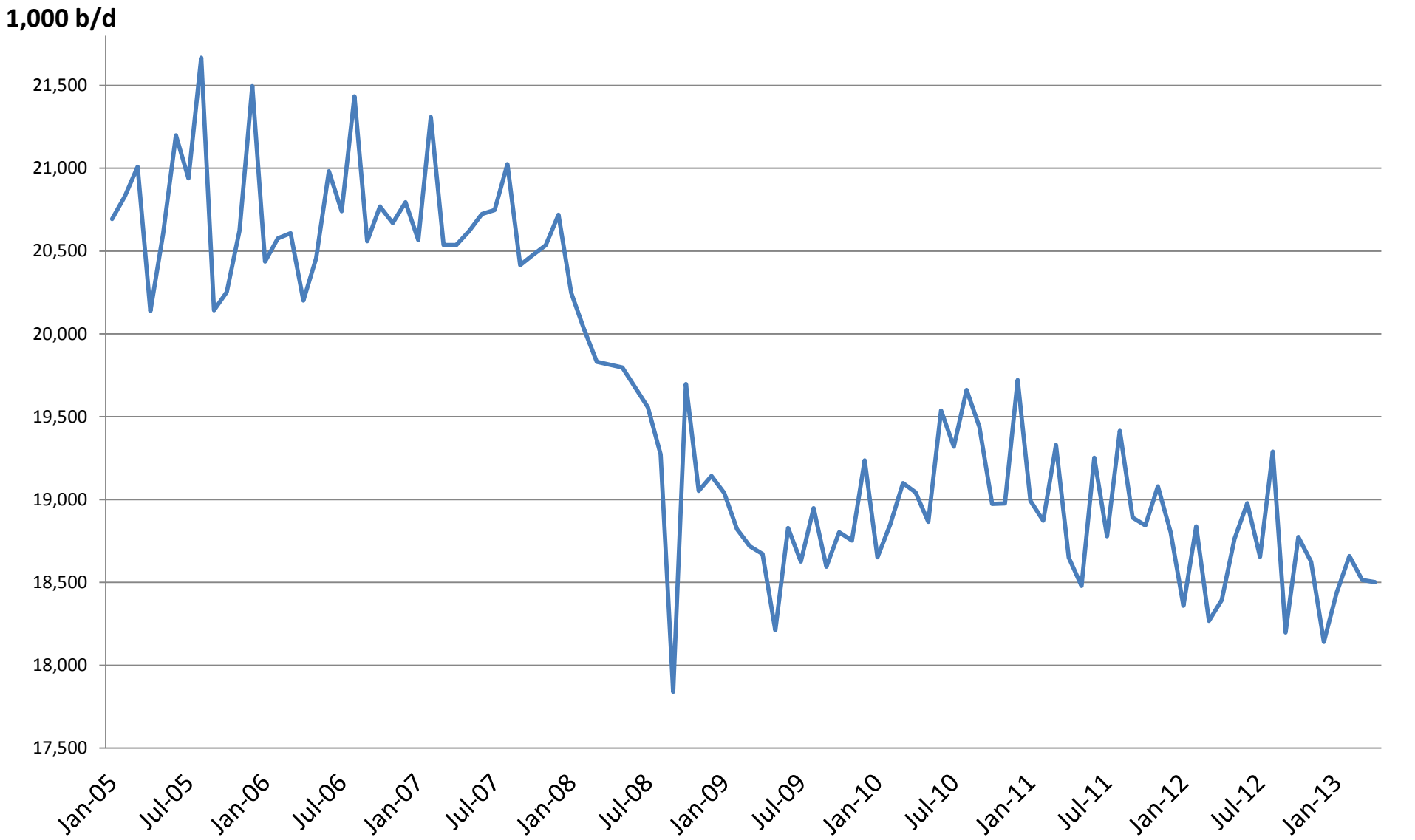
Tight oil is the new North Sea. OPEC will be under new pressure to defend either prices or marketshare. Chances are OPEC can do neither.

Vehicle Distance Traveled in the US (billions of miles)



Source: US DOT Federal Highway Administration [Office of Highway Policy Information], January 2013

US Monthly Oil Demand, 2005-2013



US LNG Export Policy: A Discussion

- Geopolitical drivers exist to propel US LNG Exports to Asian allies
- On a practical level, uphill to block exports given existing free trade agreements
- US LNG export projections range from 20 to 30 MM MTA but same volumes also possible from Canada
- US Propane exports might also supply the Asian transport market
- US NGLs production to rise from 2.1 mb/d in 2011 to 3.25 mb/d by 2016, with high export potential of ethane, propane, butane, iso-butane, natural gasoline and possibly condensate (per change in US rule making)
- US shale related exports offer a unique opportunity for US to push competitive spot related pricing and market transparency globally to the detriment of OPEC's ability to exert monopoly and price setting power
- OPEC, Russia will have more trouble keeping contract pricing systems in place