



# North American Oil and Gas Infrastructure: Opportunities, Challenges and Policy Issues

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CSIS

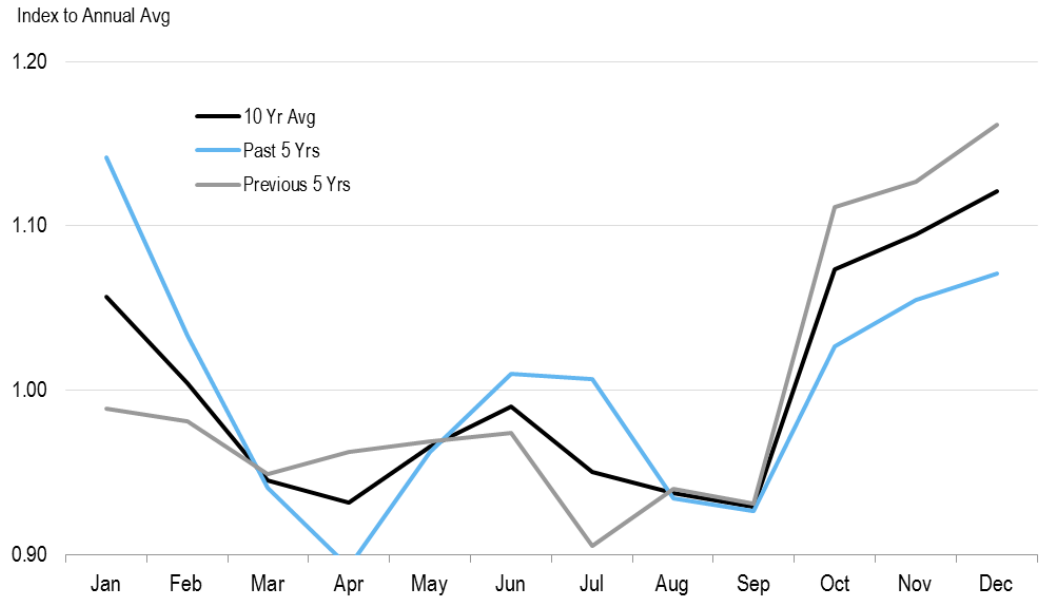
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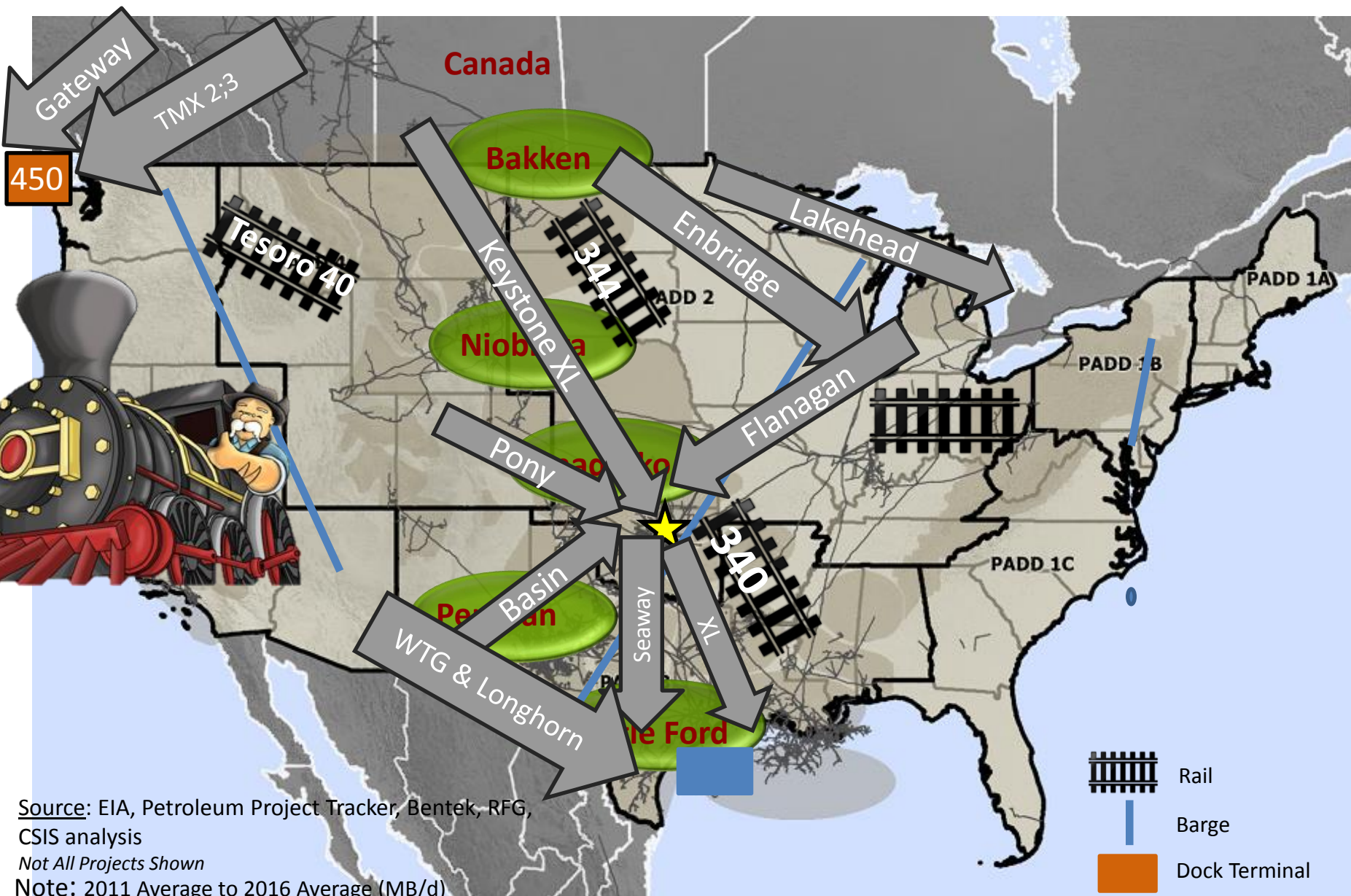
# Natural Gas Issues

- **Enormous Resource Base**
- **Geologically and Geographically diverse**
- **Dry/Liquids rich**
- **Above Ground Issues:**
  - Regional Infrastructure
  - Water Availability & Protection of Aquifers
  - Population Density
  - Regulations
  - Demand Use, Markets & Price
  - Seismicity Concerns
  - Emissions & Climate Issues

NG Seasonality— EX-2008

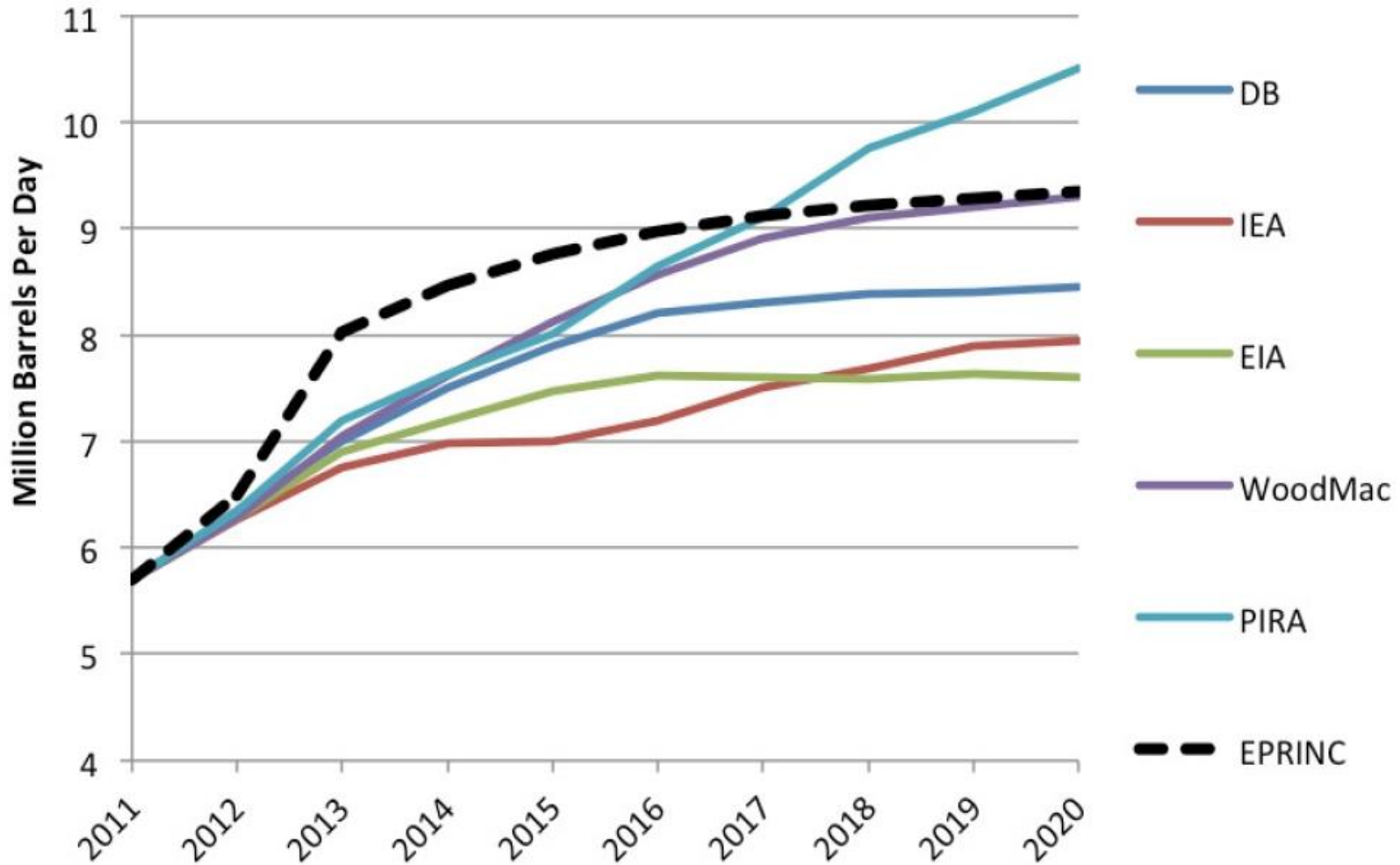


CIBC Commodities Strategy



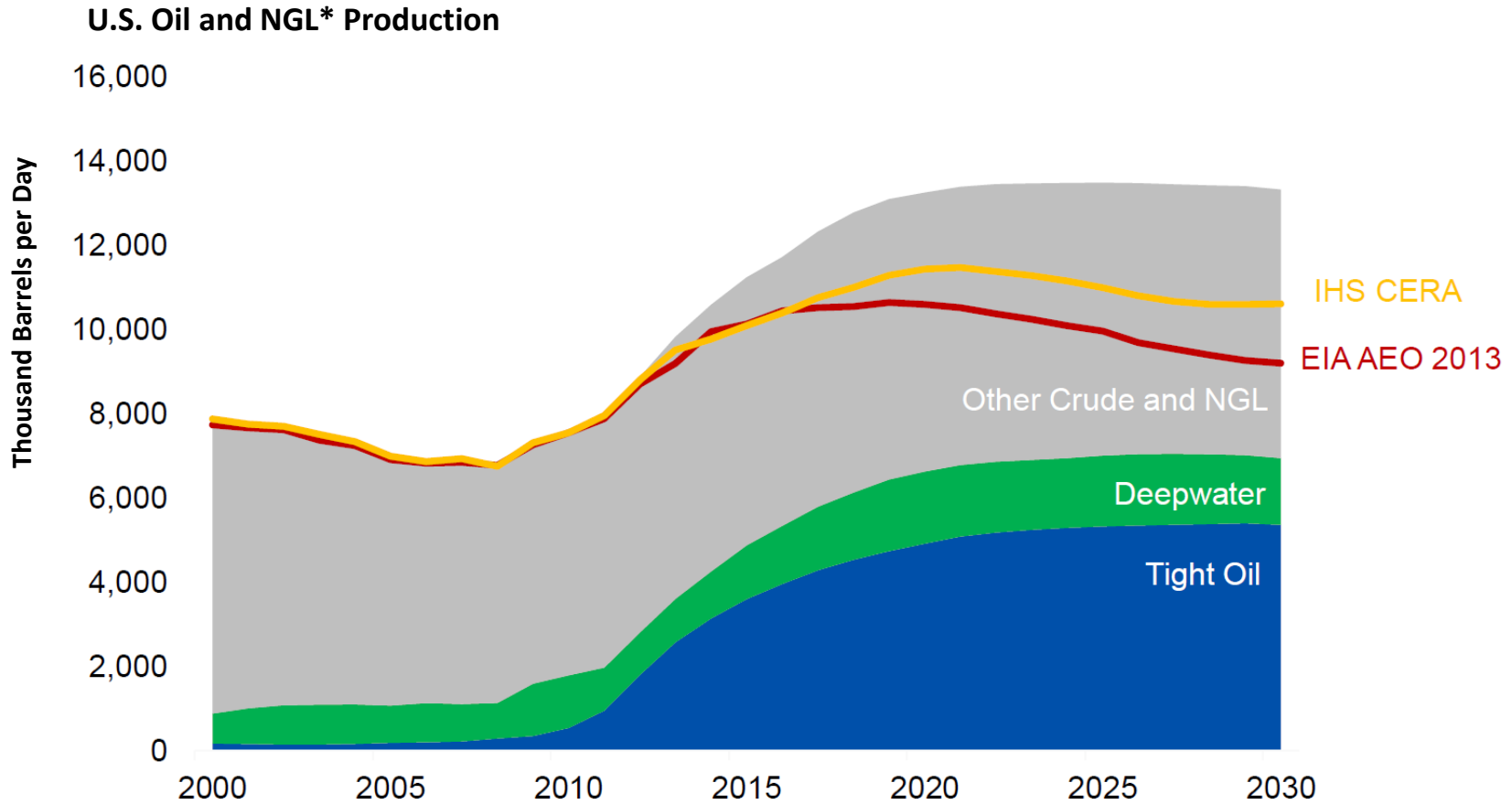
Source: EIA, Petroleum Project Tracker, Bentek, RFG, CSIS analysis  
 Not All Projects Shown  
 Note: 2011 Average to 2016 Average (MB/d)

## Oil Production Projected to Continue To Grow - At least until the end of the decade...



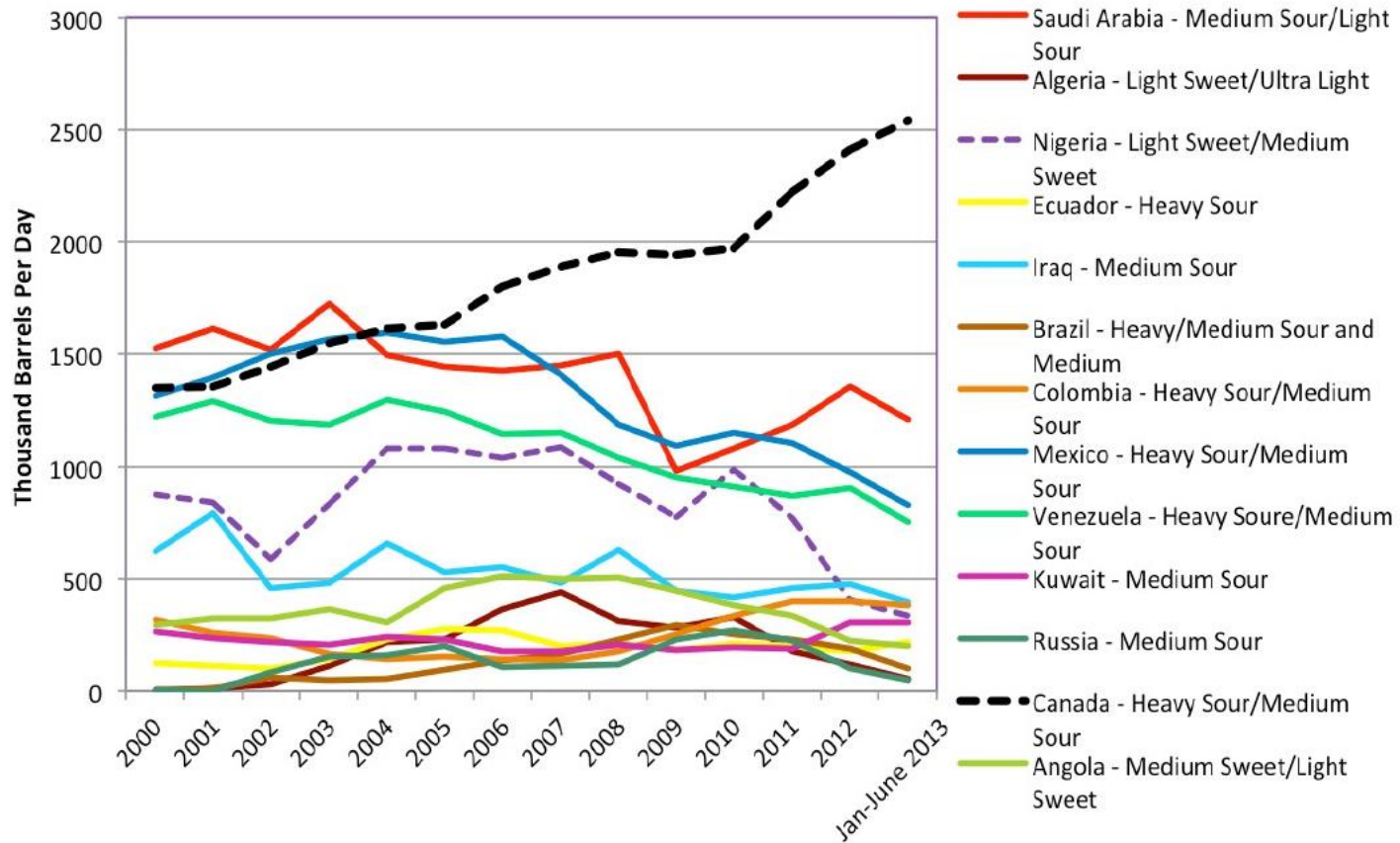
Source: EPRINC Forecast and Estimates compiled from Deutsche Bank Report Dec 2012 "Future of US Oil"

## But Outlook Post- 2020 is Less Certain...



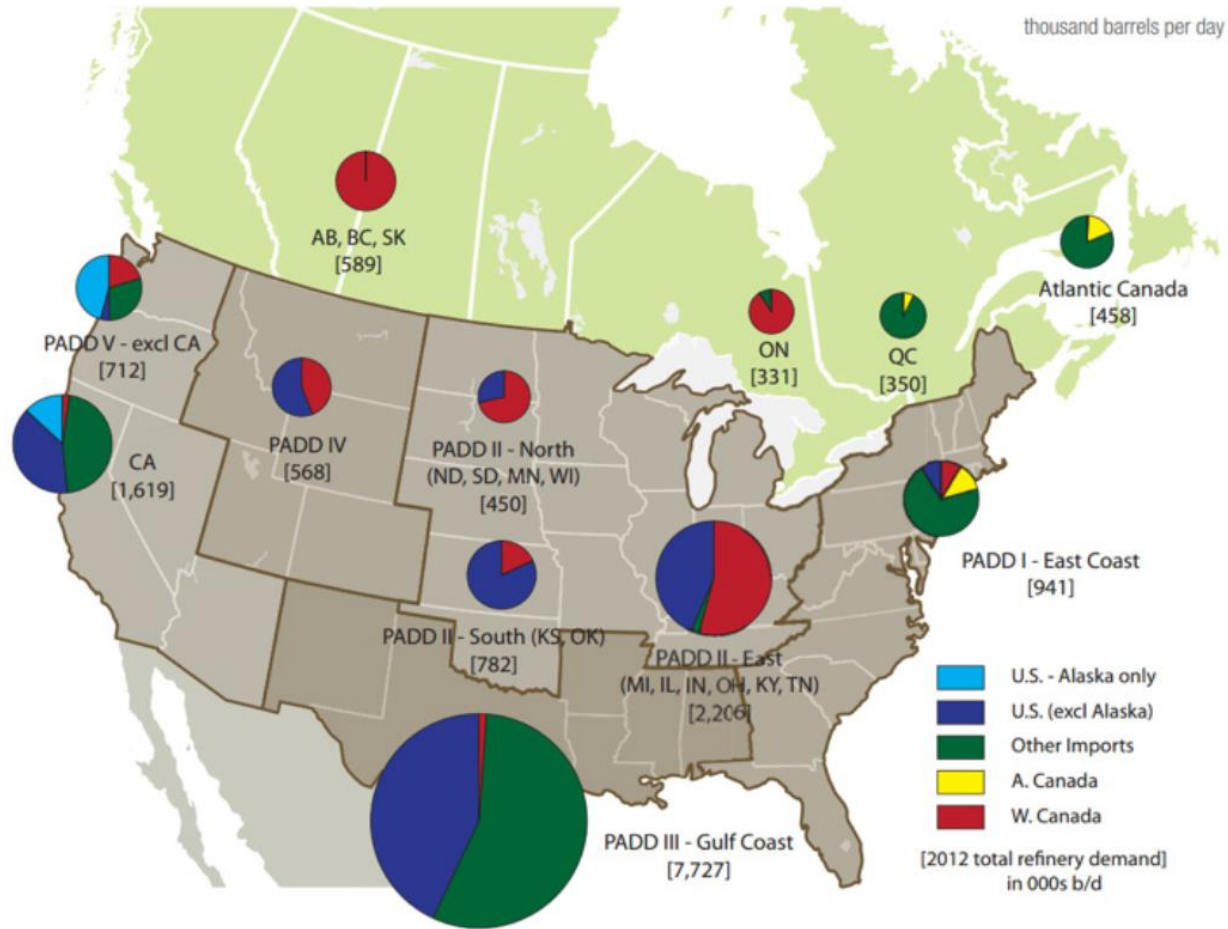
Source: Woodmac Global Oil Supply Service May 2013, EIA/DOE Annual Energy Outlook 2013, IHS CERA

## Increased US Production Displacing Crude Imports



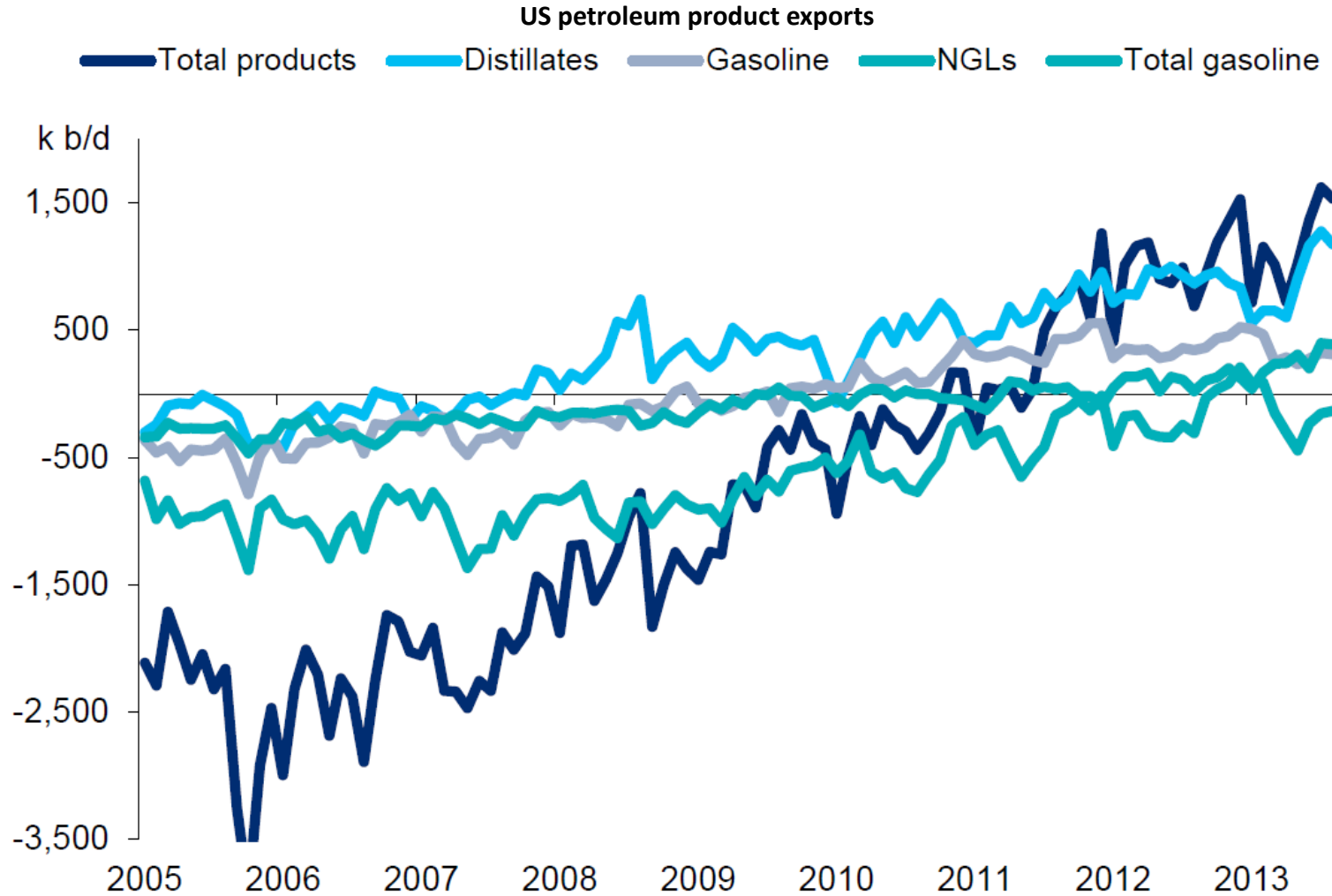
Source: EIA Data, Oil Types from ENI World Oil Book

# Inland Refineries Running Almost Exclusively on Domestic and Canadian Crudes



Source: CAPP, CA Energy Commission, EIA, Statistics Canada

# U.S set to Become World's Largest Net Exporter of Petroleum Products

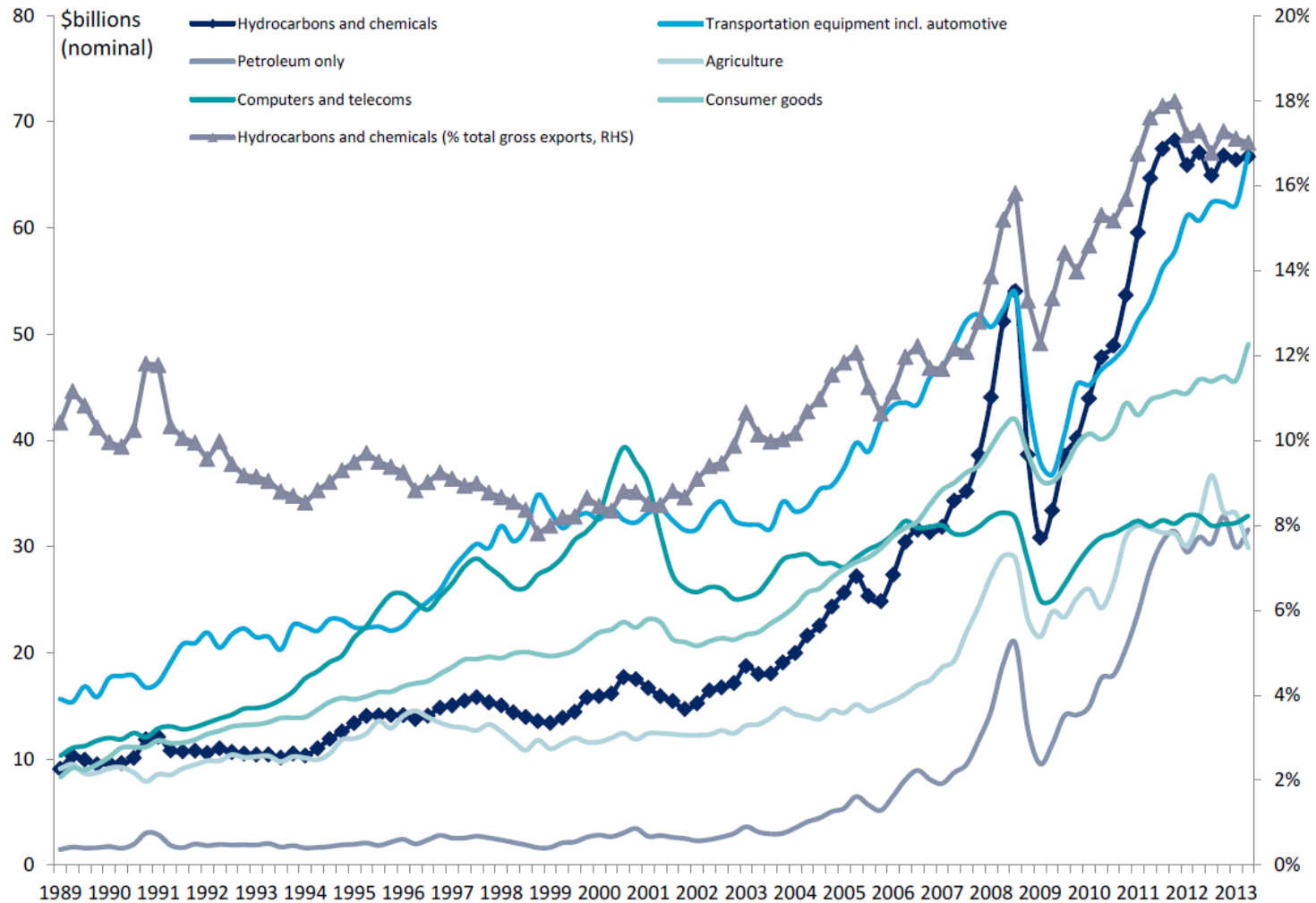


Source: EIA, Citi Research



# Hydrocarbons & Chemicals Represents over 16% of Total Gross Exports – now outpacing computers and agriculture

Major categories of US gross exports



Source: JODI, Citi Research

## **But...Major Policy Questions Remain**

- **Industry desire for “demand pull” to increase prices vs. gov’t need to ensure development is done right**
- **Gas Utilization Options (power generation, transport, petrochem or refinery feedstocks, industrial use?)**
- **NGLs and Condensates**
- **Funding & Pace of Infrastructure buildout**
- **Crude match given refinery configuration and product slates**
- **Regulation at Federal or State/Local levels**
- **Export Policy and Volumes**
- **SPR - size, composition, logistics (Jones Act)**
- **Compatibility with Industrial Policy, Energy Security and Environmental Goals**

## What Could Change the Storyline?

- Resource Over/Under Performance
- Technology Advancements, including disruptive technologies in competing areas
- Commerciality: Energy Prices & Costs
- Investment Climate & Risk for Participants (capex now exceeding income for some)
- Timing/Expense of Infrastructure Buildout
- Public Sentiment – License to Operate
- Geopolitical and/or Catastrophic Events
- Policy and Regulations
- Climate Change and the Transformation to Low Carbon Energy