



# Global Oil and Gas Market Outlook

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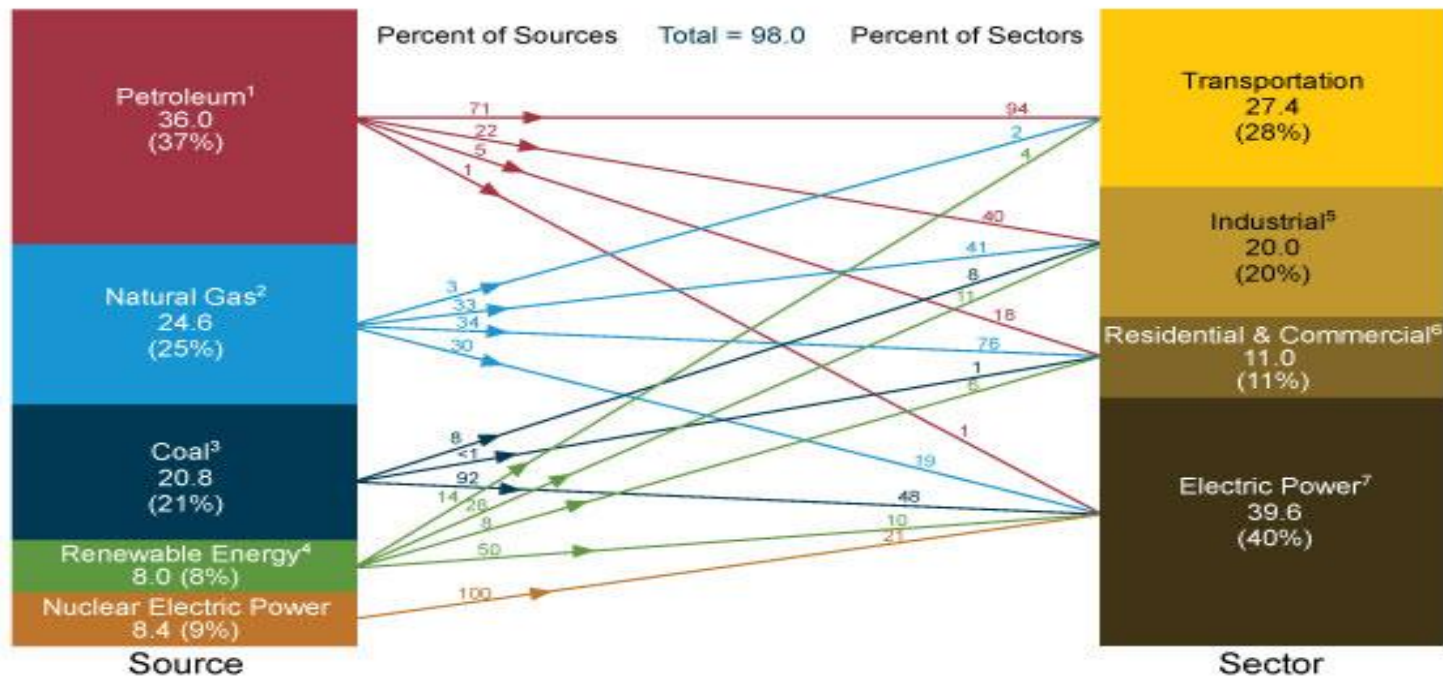
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# Primary Energy Consumption By Source and Sector, 2010

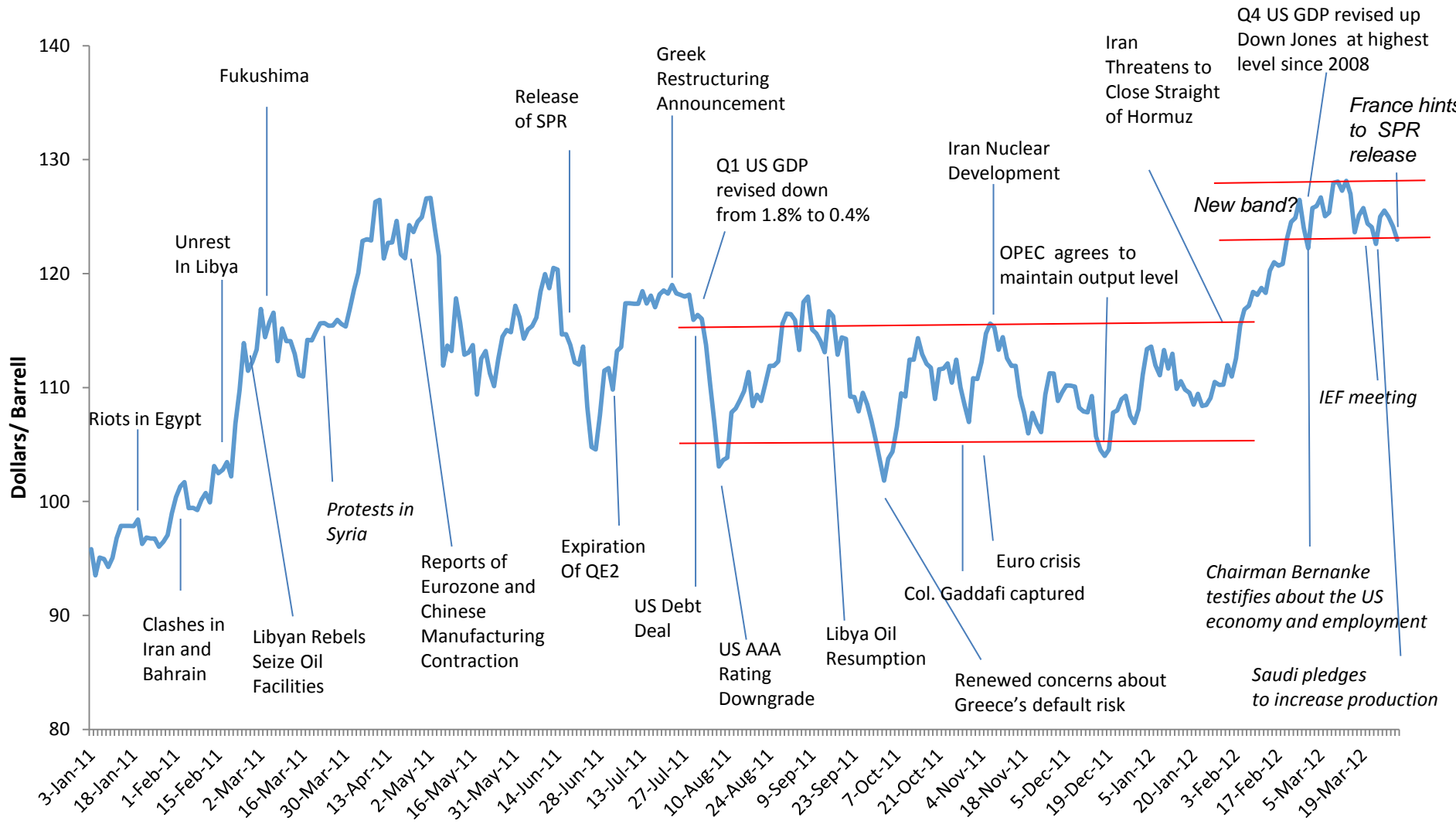
Quadrillion Btu



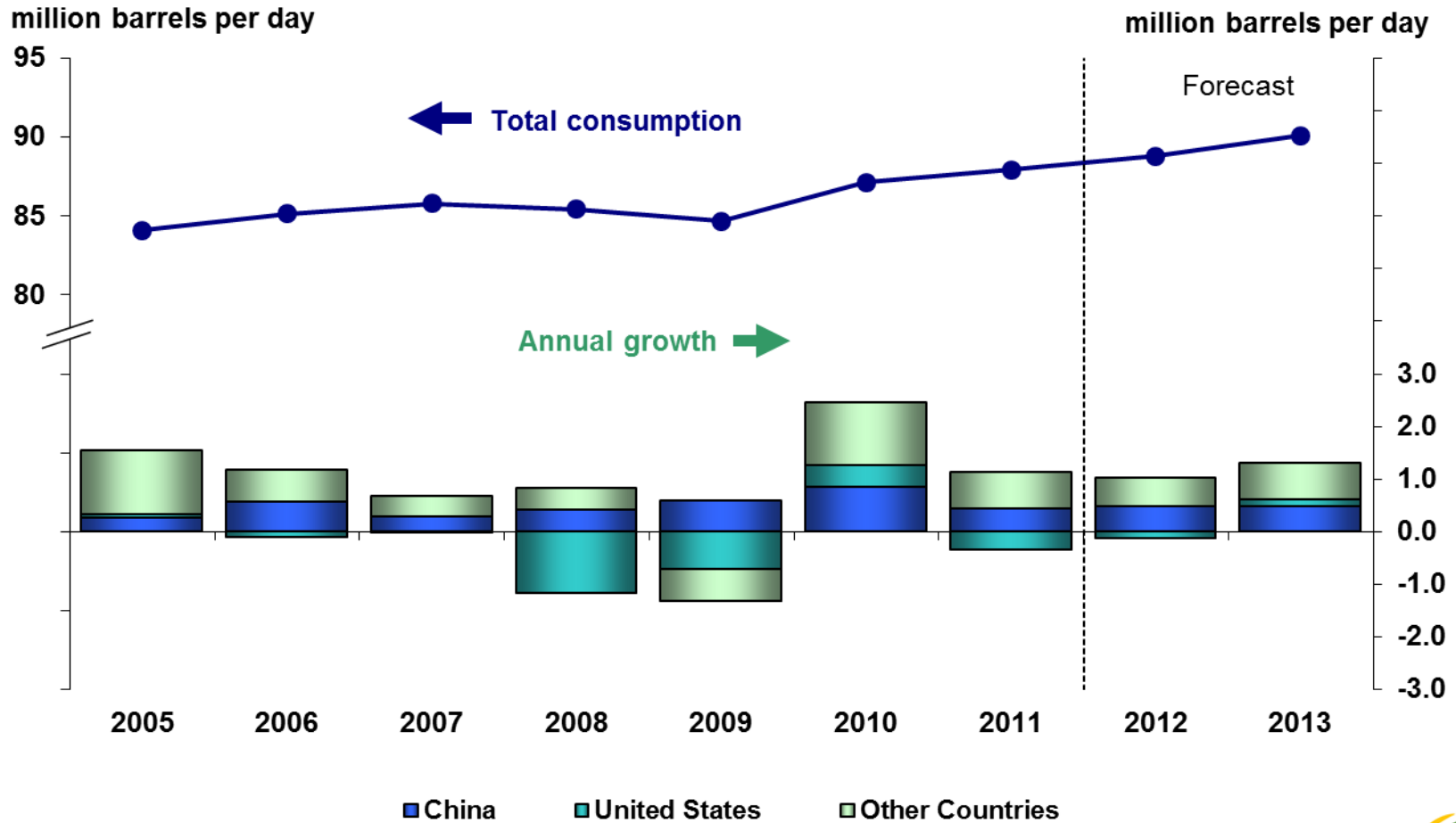
Sources: U.S. Energy Information Administration, *Annual Energy Review 2010*, Tables 1.3, 2.1b-2.1f, 10.3, and 10.4 (October 2011).

# Key Factors in Oil Market Security

- **The oil market is globalized.**
- **Production and reserves are highly concentrated and supply chain is vulnerable. Cheapest resources in the Middle East.**
- **Continual investment in new supplies needed to offset declining production as well as to accommodate demand growth.**
- **Global demand for oil will be driven by developing countries.**
- **Resource nationalism will affect investment flows**
- **However, unconventional oil and gas may modify the narrative.**

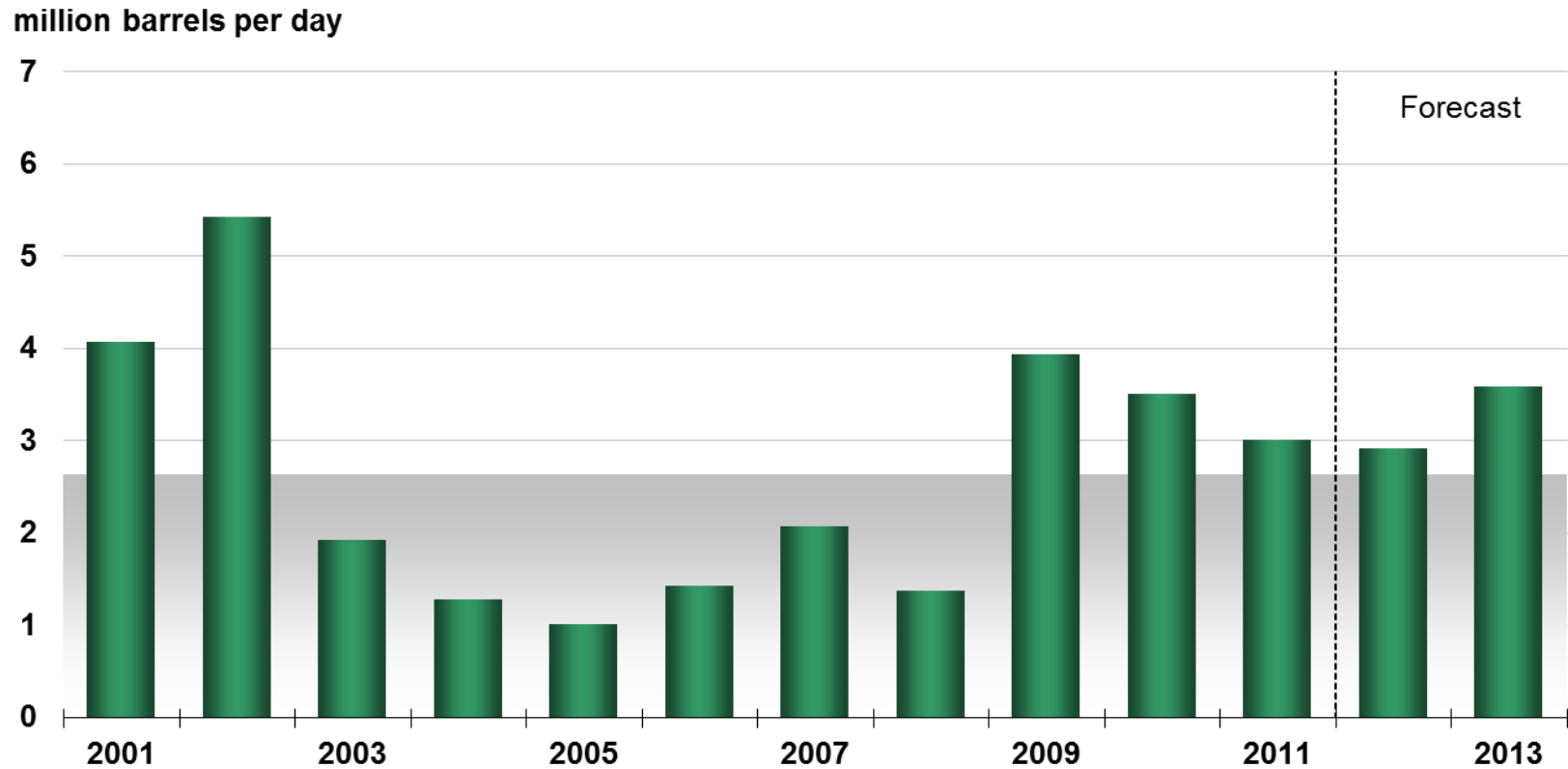


## World Liquid Fuels Consumption



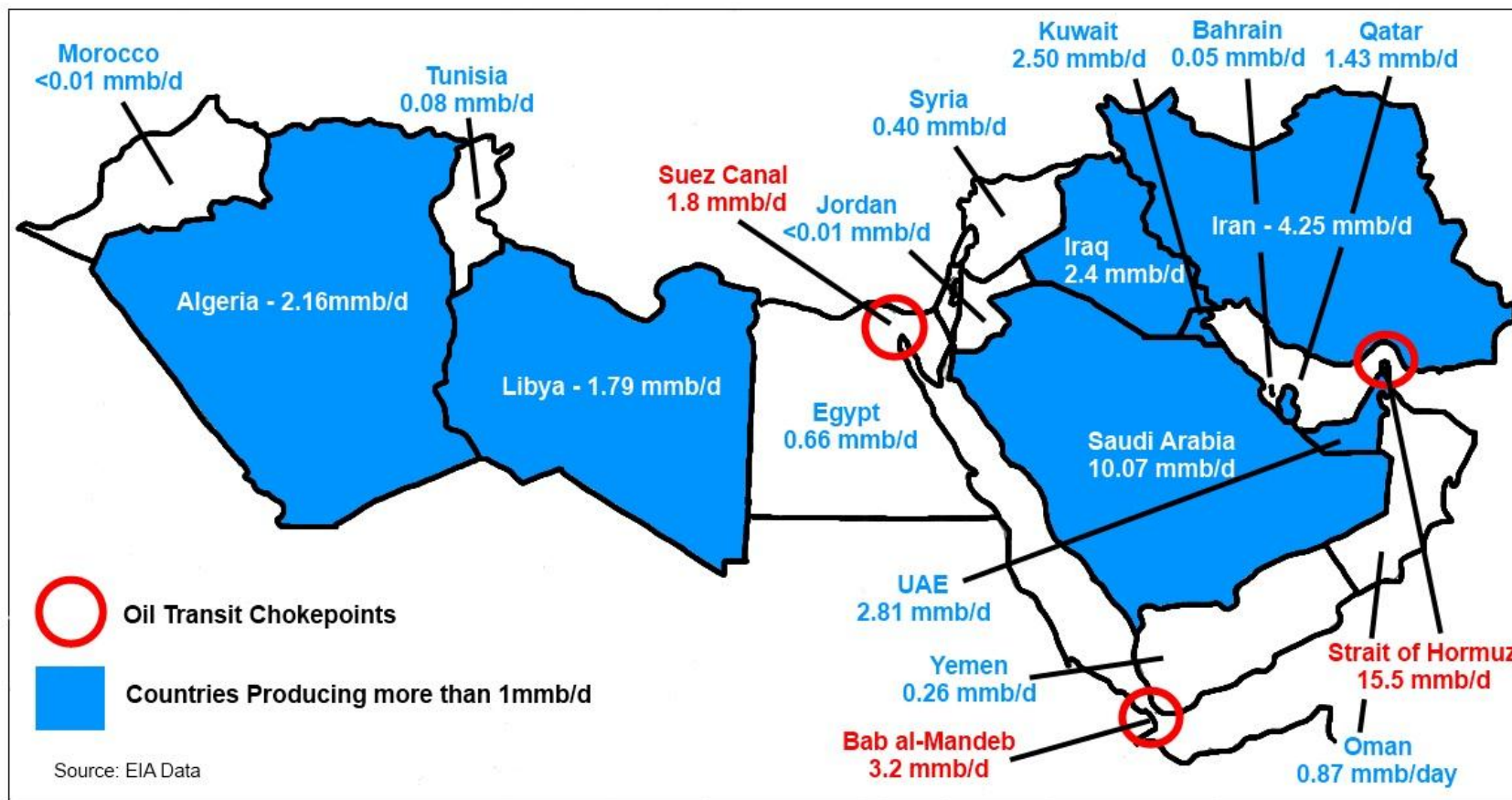
Source: Short-Term Energy Outlook, April 2012

## OPEC Surplus Crude Oil Production Capacity



*Note: Shaded area represents 2001-2011 average (2.6 million barrels per day)*

# Middle East and North Africa Critical to Oil Supply Chain

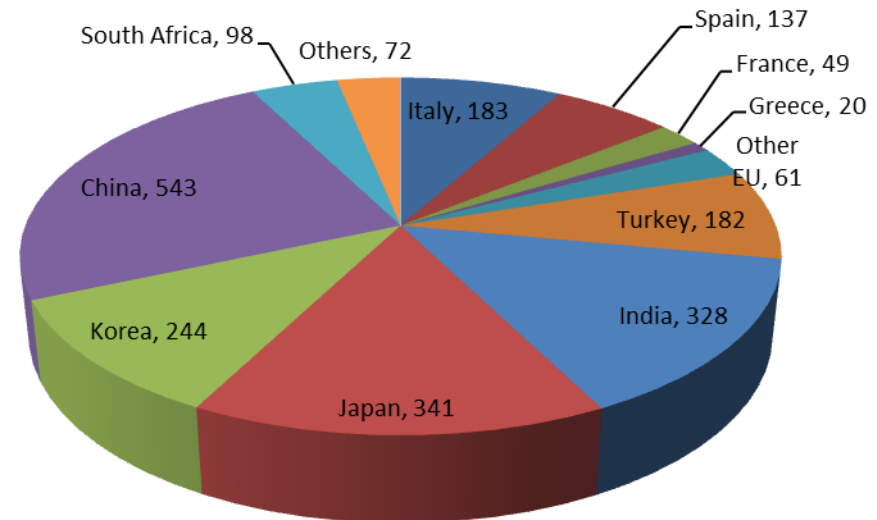


World liquids production, 2010: 86.29 mmb/d  
 MENA 2010 Liquids Production, 2010: 30.24 mmb/d  
 MENA share of world liquids production, 2010: 35%

## Oil Market Uncertainty for 2012 What Will Happen with Iran?

- *Pressure on Iran is increasing. New US sanctions imposed.*
- *EU agreed to phase in ban on Iranian oil imports.*
- *Korea and Japan in discussions about the application of CBI restrictions.*
- *How much additional volume will China be willing to absorb?*
- *How will Saudi Arabia react?*
- *Iran reacting with continued saber rattling mixed with possible compromise.*
- *US military position clear – will not tolerate interference with international shipping.*

*Iranian Oil Exports*

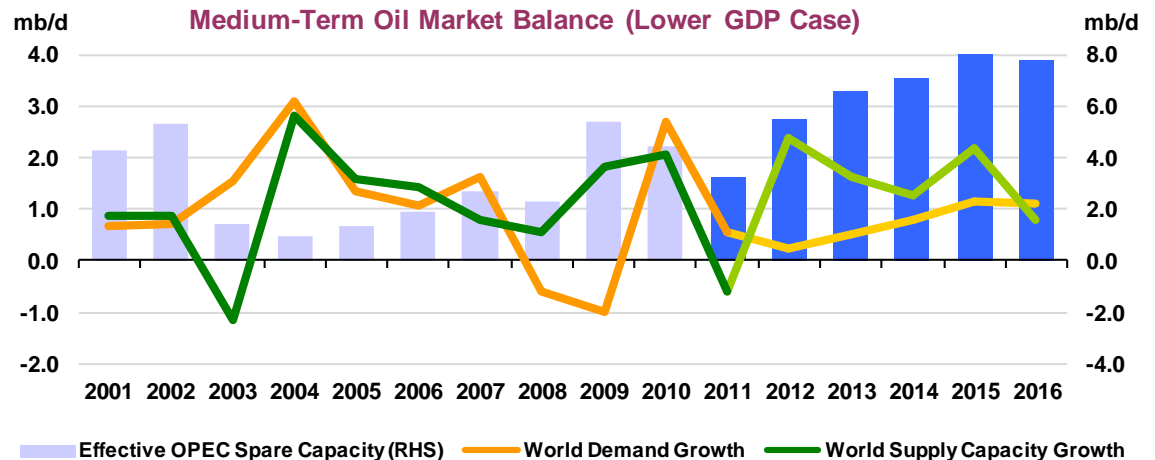
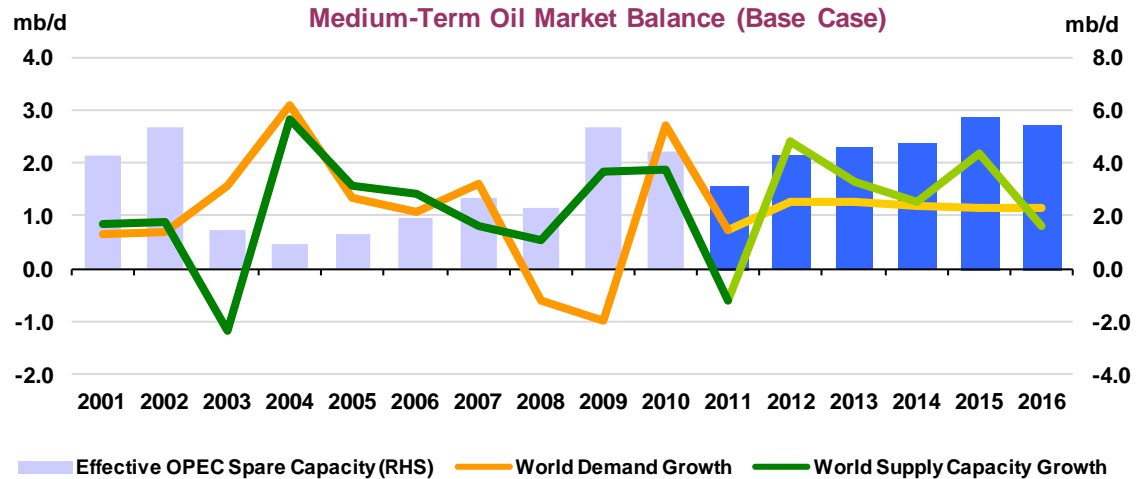


*Total exports 2.15 MMb/d*

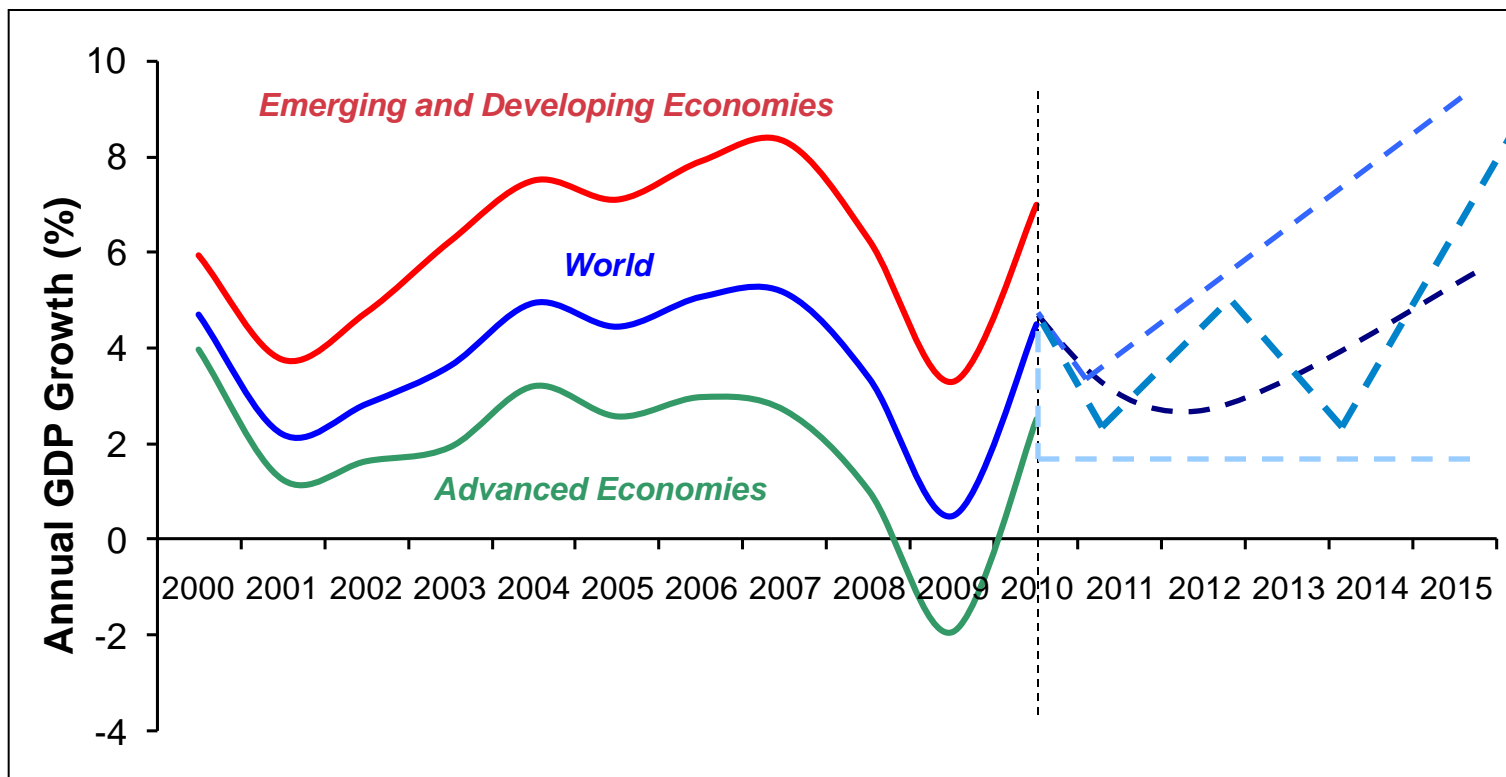


# The medium term in summary

- **Weaker demand baseline & stronger supply lead to easier market balances**
- **Spare capacity to increase from 2013 onwards in the base case**
- **Uncertainties persist – eurozone, global economy, China, subsidies, supply risks, boom & bust refining**
- **Supply growth struggles to exceed +1 mb/d annually, so outlook hinges critically on economic growth**
- **Demand migration to non-OECD, & shift to more difficult oil needs better data for better forecasts**

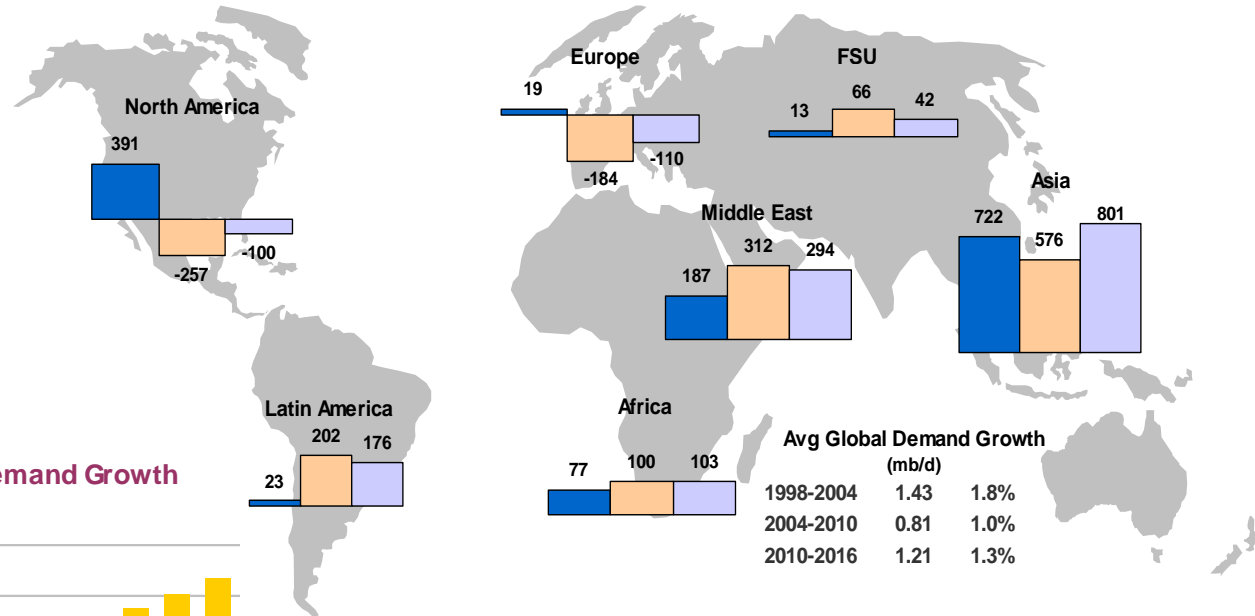


# The Shape Of The Economic Recovery Matters



# Demand growth is all about non-OECD & transport

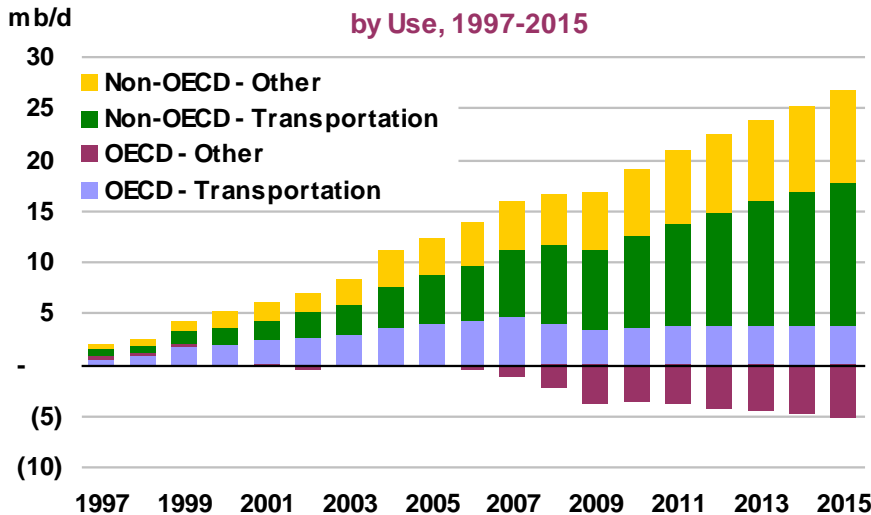
Average Global Oil Demand Growth 1998-2004/2004-2010/2010-2016  
thousand barrels per day



Avg Global Demand Growth (mb/d)

Period	1998-2004	2004-2010	2010-2016
1998-2004	1.43	1.8%	
2004-2010	0.81	1.0%	
2010-2016	1.21	1.3%	

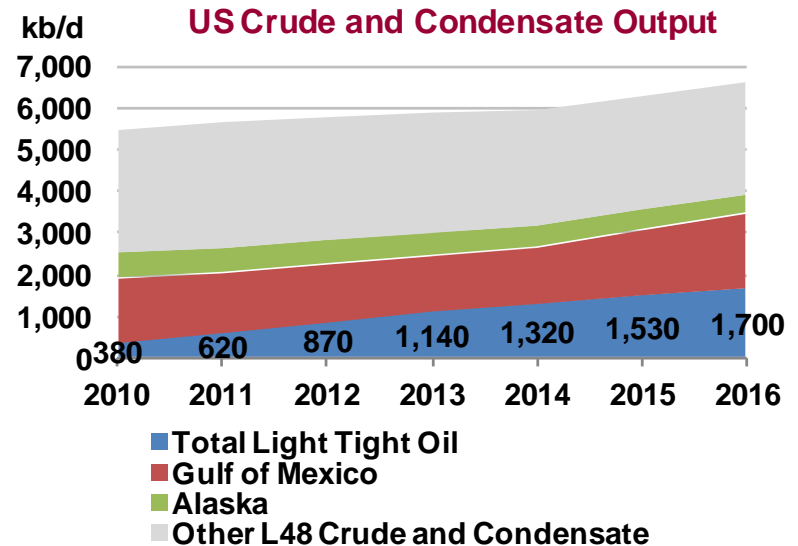
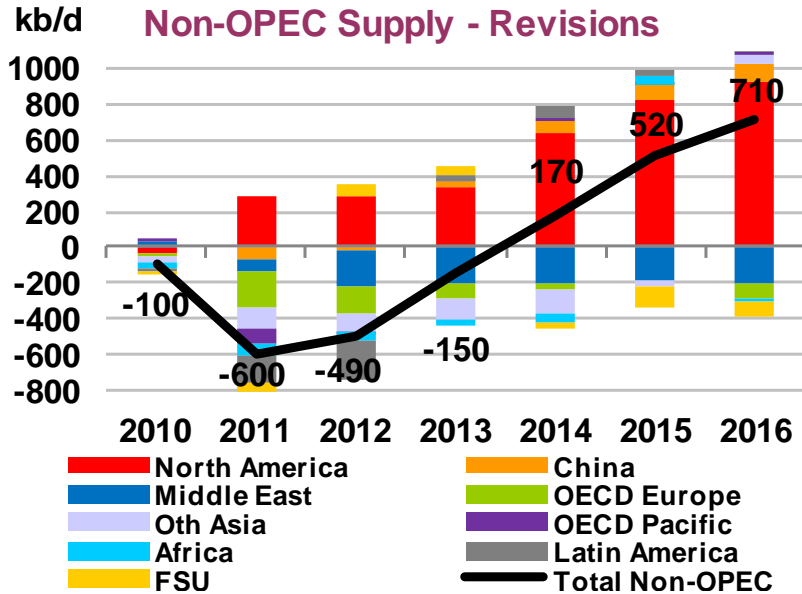
OECD vs. Non-OECD Cumulative Oil Demand Growth by Use, 1997-2015



- OECD demand peaked in 2005
- Demand growth now focused in 3 regions: Asia, Mid-East & L.America
- Asia alone generates 55% of the total and China 35%
- Premium & subsidised markets sustain growth, despite high prices
- Understanding market trends requires better non-OECD data

# Changing Supply Picture

## US Light Tight Oil Raises Non-OPEC Supply Estimates



Downward revisions in 2011-2013 due to unplanned outages, project delays, difficult investment climate in some MENA countries.

Upward revisions due to uptick in E&P spending (rises by 22% in 2011, 10% in 2012), rosier N. American outlook.

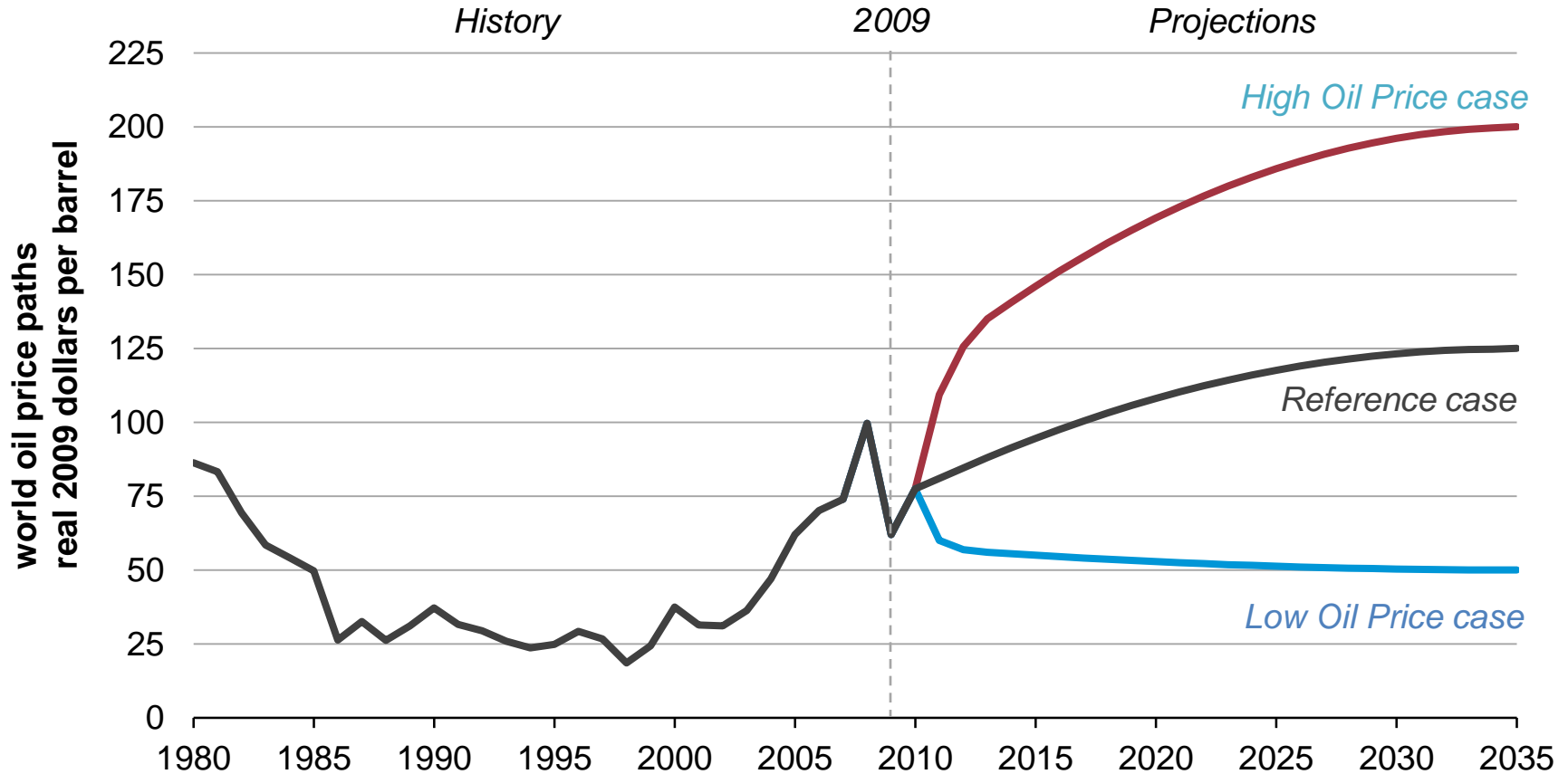
NGL supply revised up because producers are targeting liquids-rich tight oil plays.

Source: IEA Oil Market Report

- World energy consumption increases by 53% between 2008 and 2035 with half of the increase attributed to China and India
- Renewables are the world's fastest-growing energy source, at 2.8% per year; renewables share of world energy grows to roughly 15% in 2035
- Fossil fuels continue to supply almost 80% of world energy use in 2035
- Liquid fuels remain the largest energy source worldwide through 2035, but the oil share of total energy declines to 28% in 2035, as sustained high oil prices dampen demand and encourage fuel switching where possible and modest use of liquid biofuels

- Increasing supplies of unconventional natural gas support growth in projected worldwide gas use. Global natural gas consumption grows by 1.6% per year, and projected natural gas use in 2035 is 8 percent higher than in last year's outlook
- Worldwide energy-related carbon dioxide emissions rise 43 percent between 2008 and 2035, reaching 43.2 billion metric tons in 2035

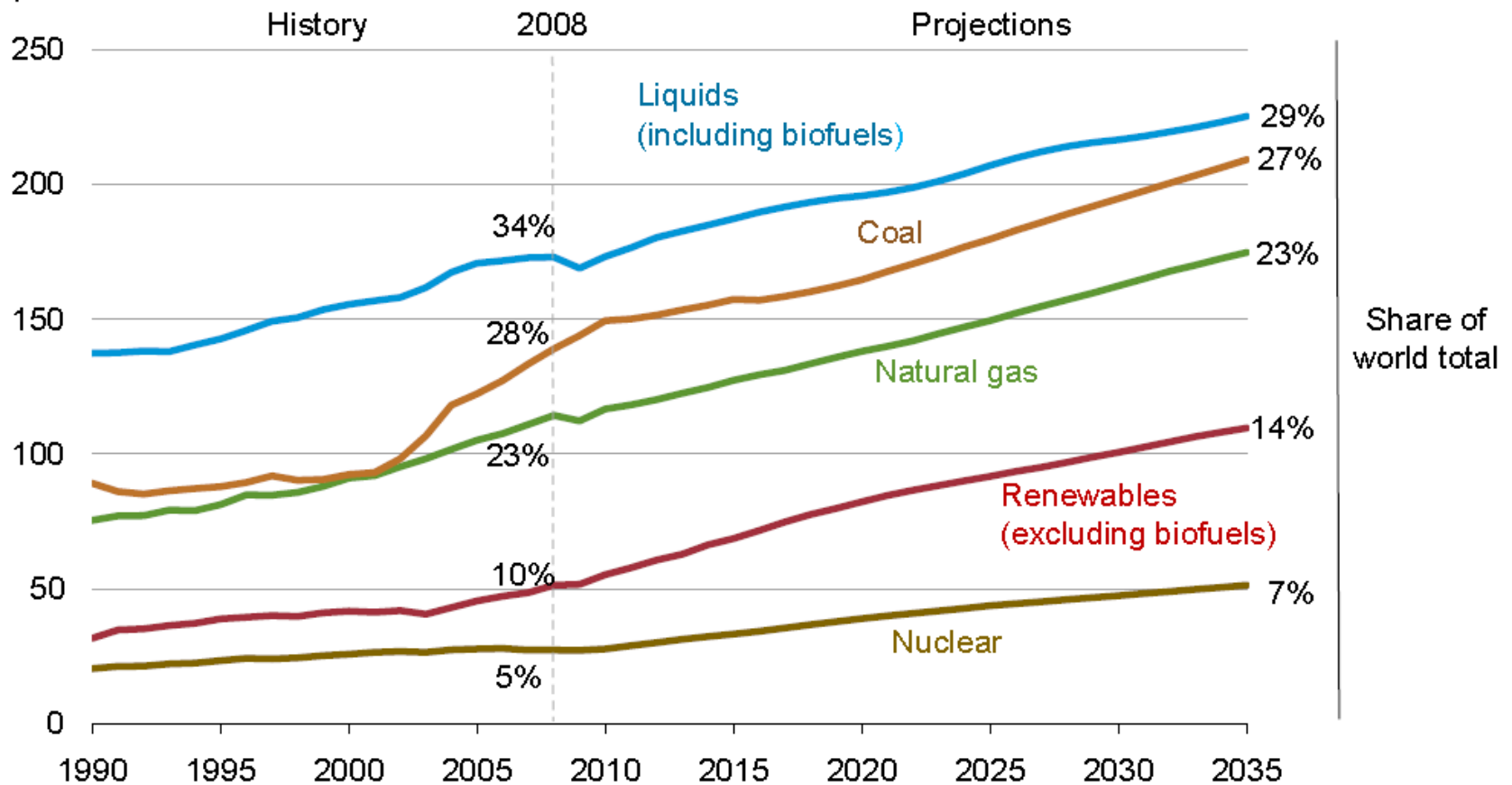
# Wide Range of Uncertainty About Future Oil Prices



Source: EIA, International Energy Outlook 2011

# Renewables are the fastest growing source of energy consumption

world energy consumption by fuel  
quadrillion Btu

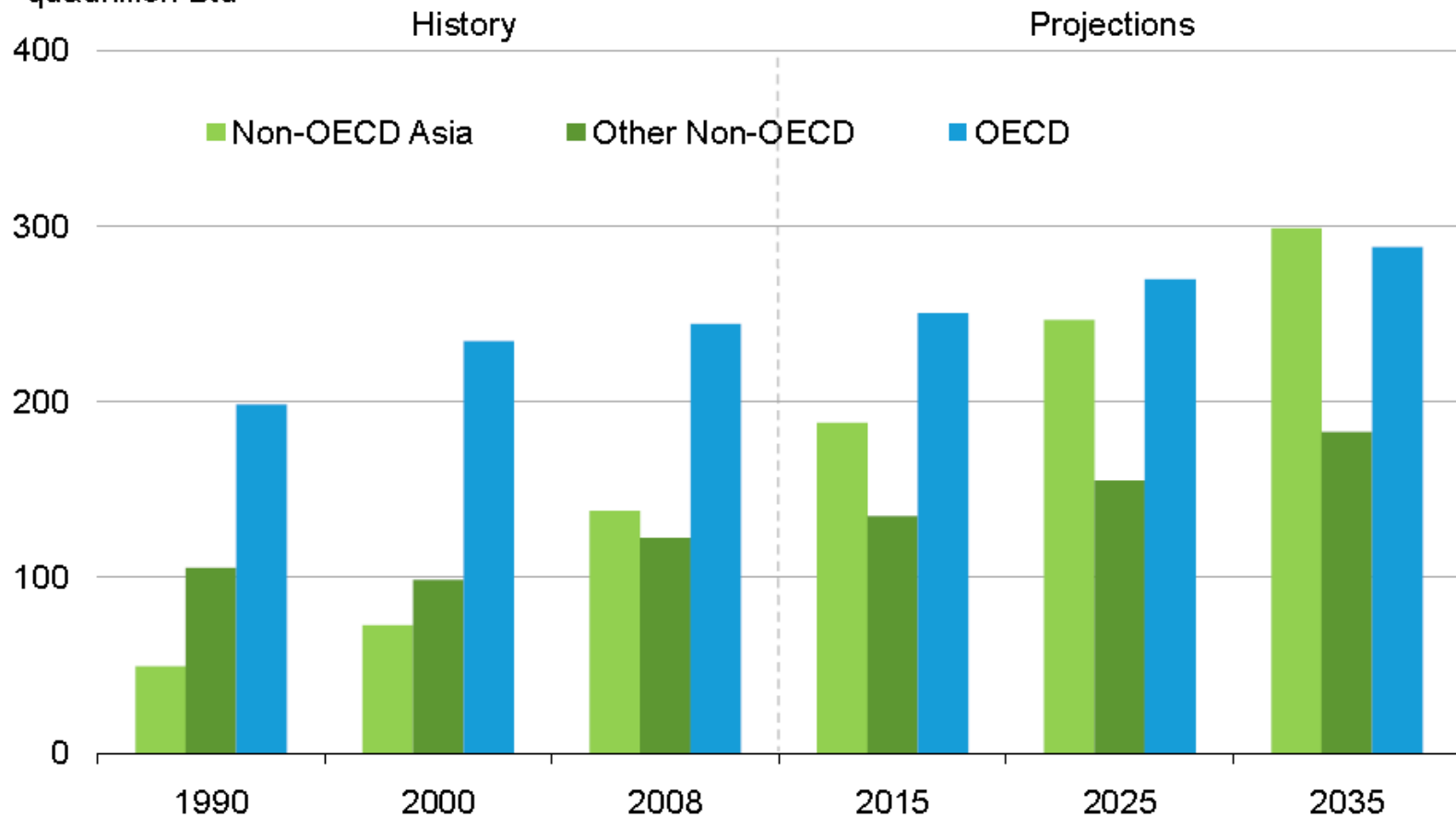


Source: EIA, International Energy Outlook 2011



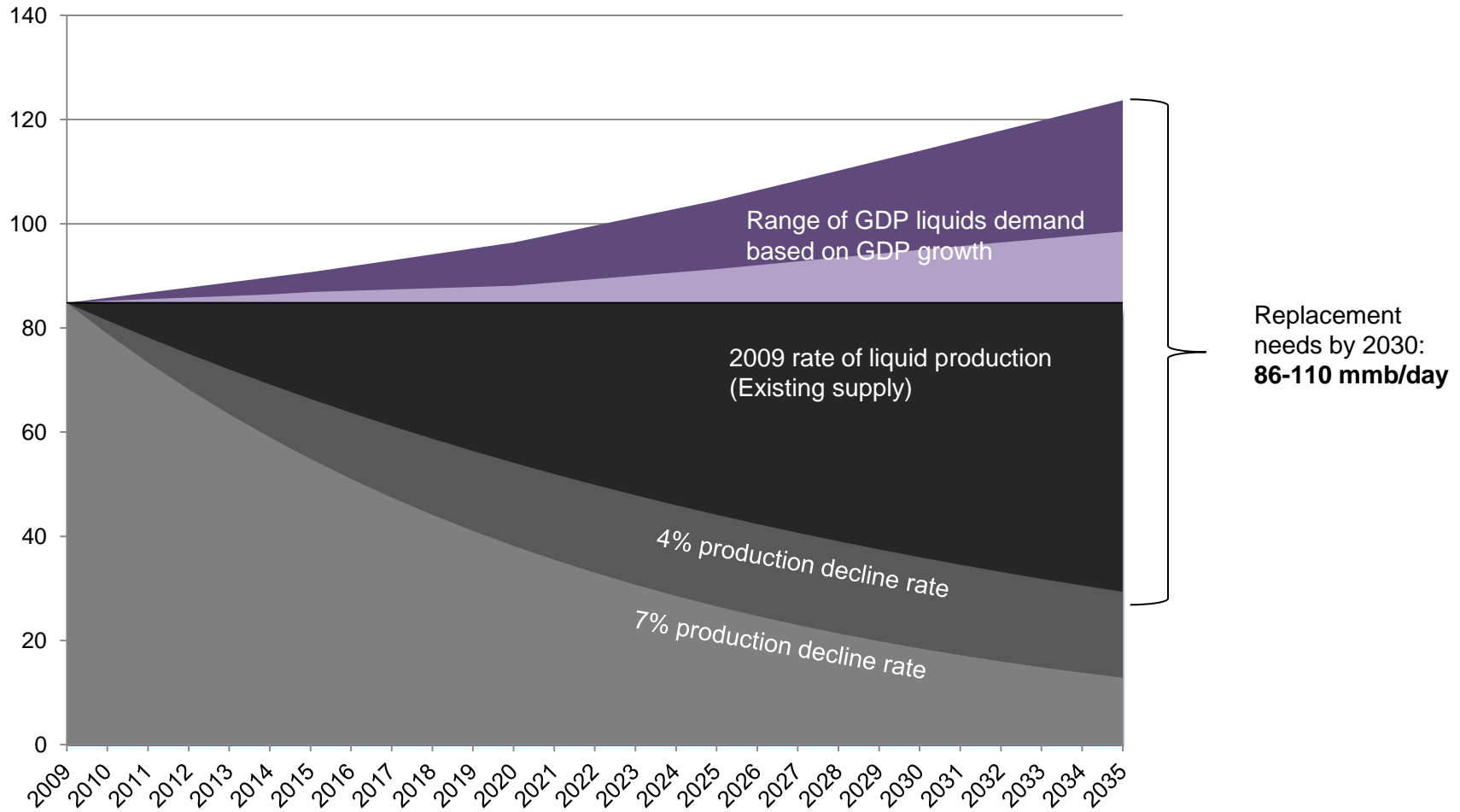
## China and India account for about half of the world increase in energy use

world energy consumption  
quadrillion Btu

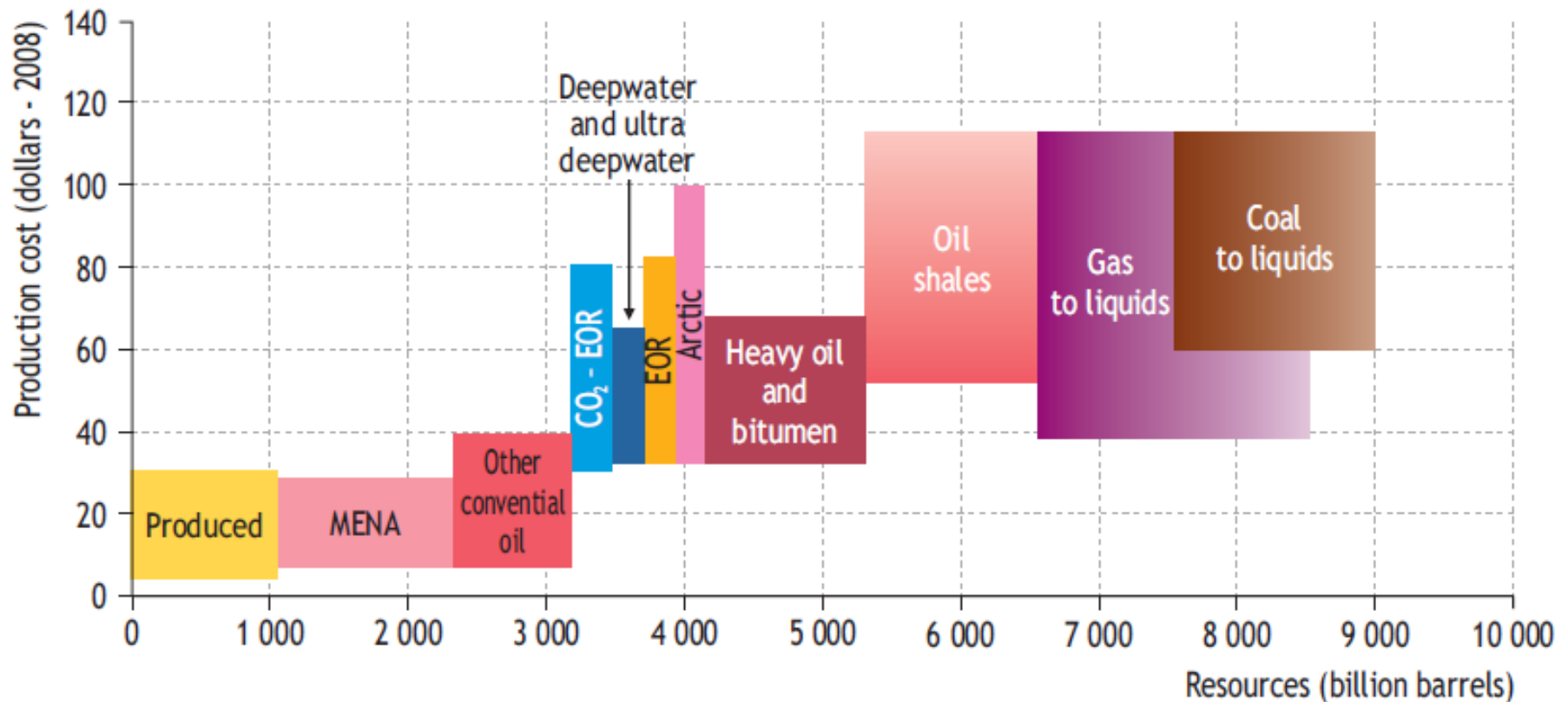


Source: EIA, *International Energy Outlook 2011*

## Demand Growth and Production Declines Cause Need for Large Investment in New Capacity

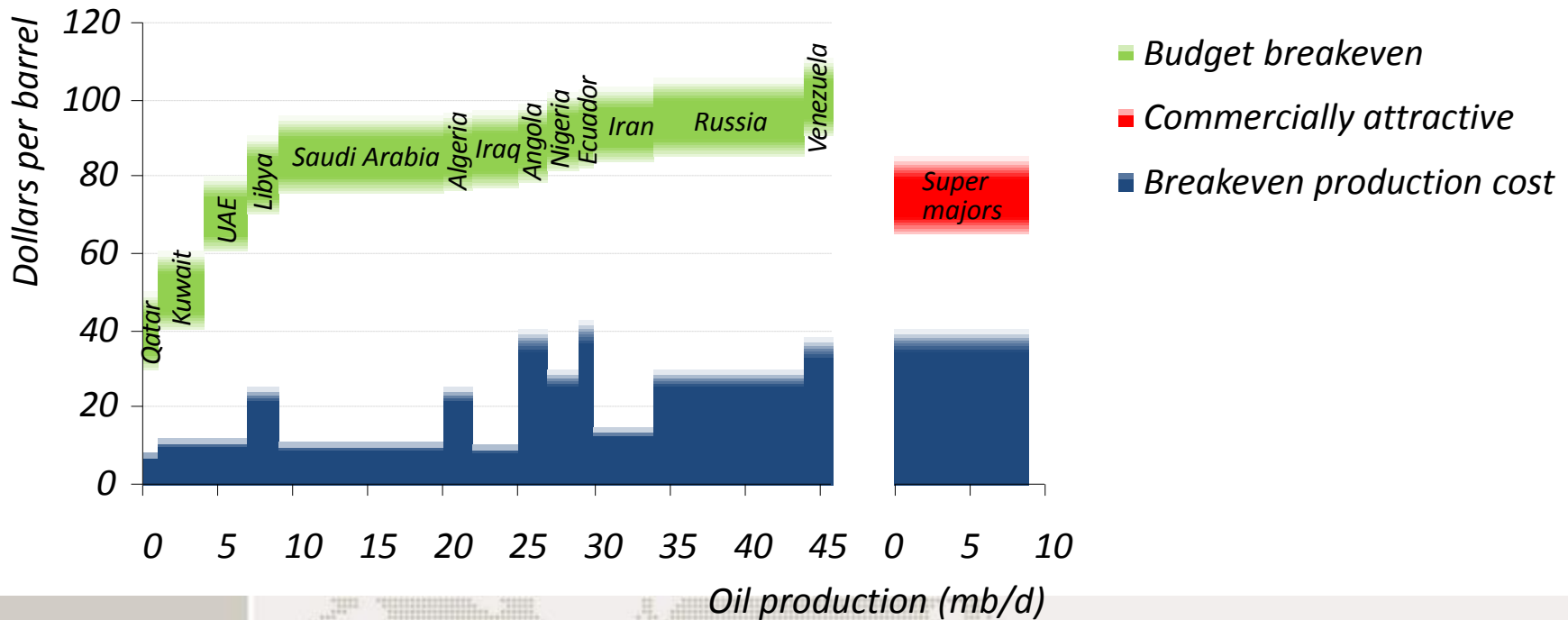


# Middle East and North Africa have World's Lowest Cost Petroleum Resources



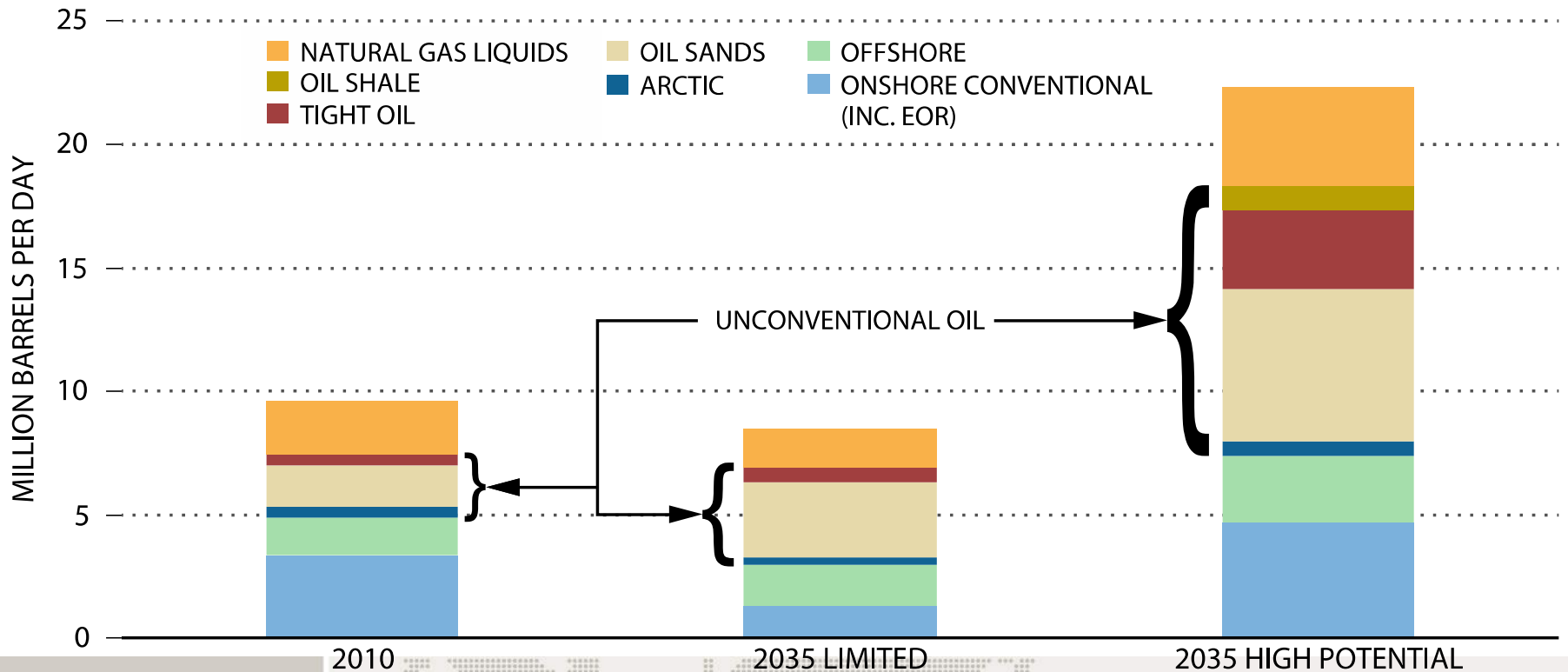
# Fiscal needs of key producing countries keep pressure on oil prices

Breakeven costs, budget breakeven and commercially attractive prices for current oil production for selected producers, mid-2011

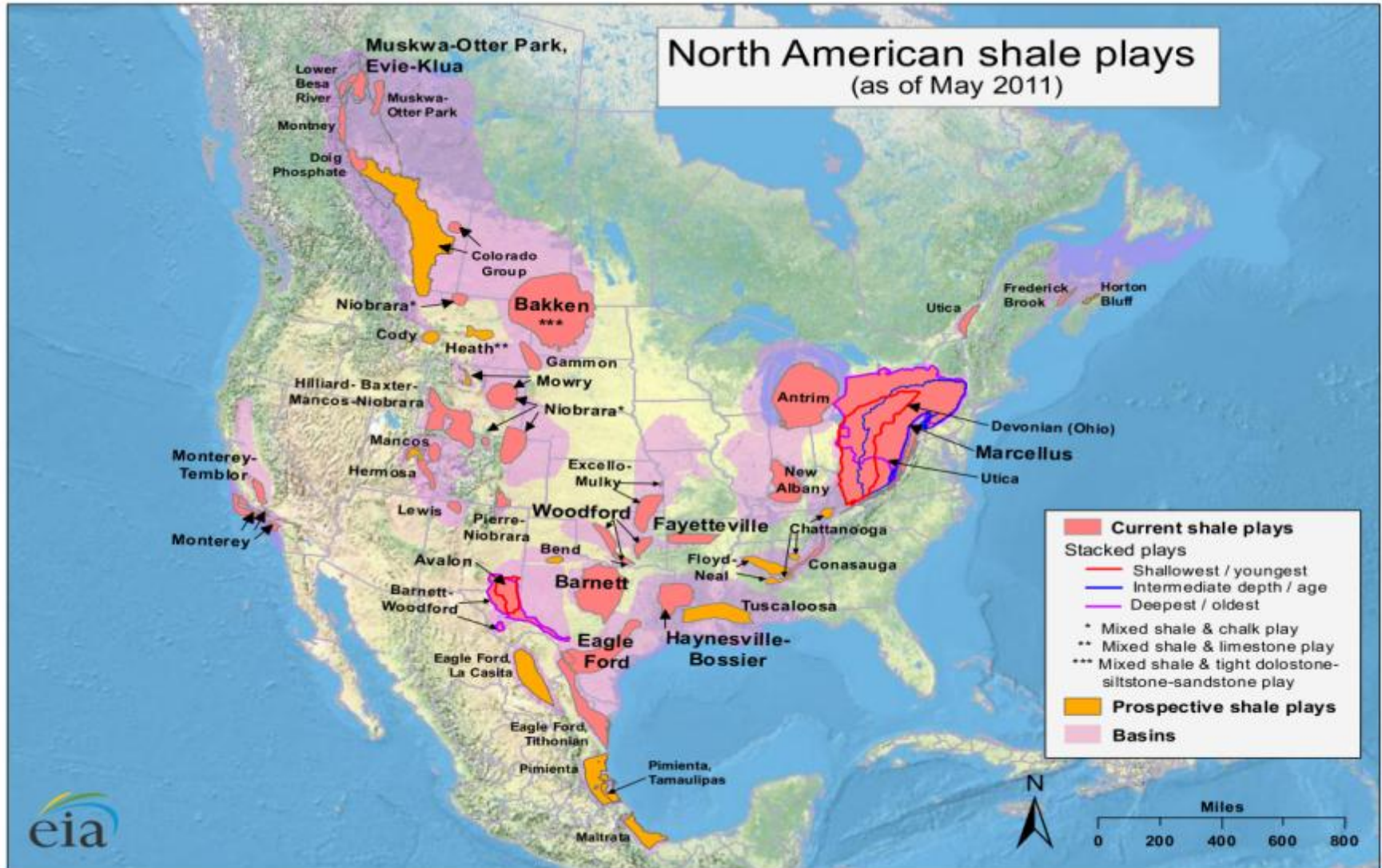


# N.A. Oil Supply Has Upside Potential But Risk of Decline

*High production opportunities enabled by access frameworks*

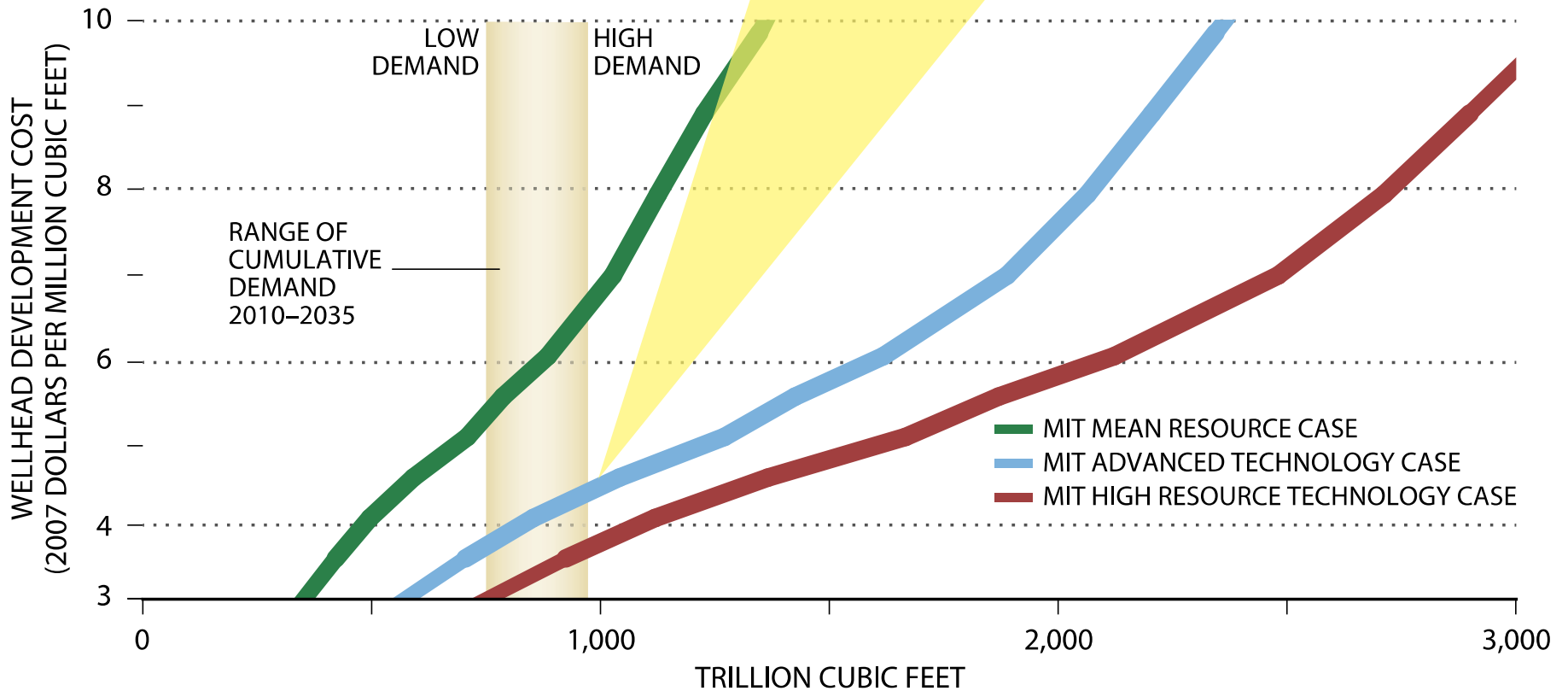


# North American Shale Resources are Wide Spread

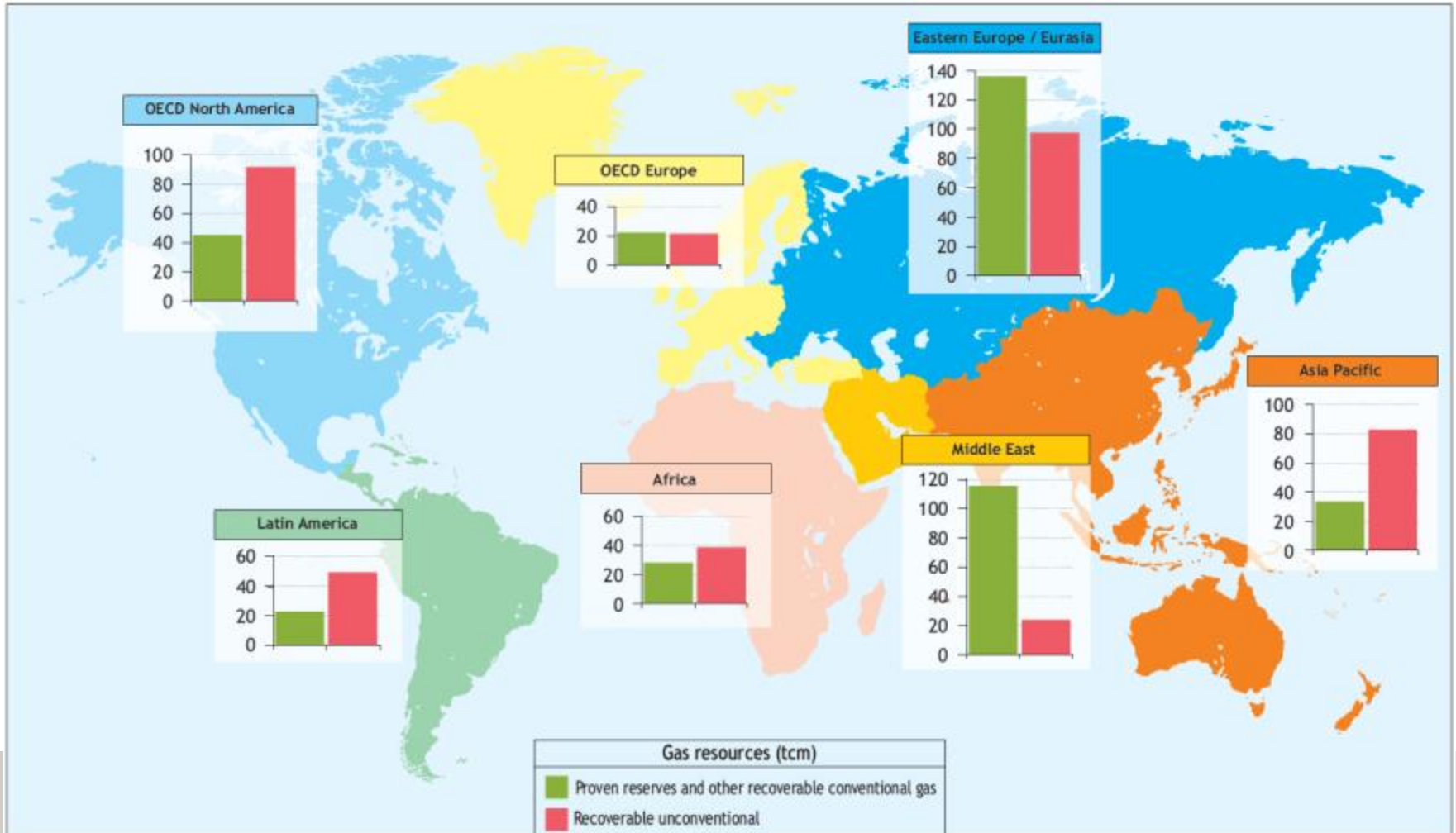


# N.A. Gas Resources Have Potential to Supply the Market for Decades

High demand, advanced technology, moderate development cost



# Unconventional Resources are Distributed Globally





# Implications of Shale Gas “Revolution”

- Natural gas and oil prices have been delinked in the North American market.
- Natural gas will be the fuel of choice for power generation. Affects coal, nuclear and renewables.
- Petrochemical and gas based industries beginning to consider expanding operations in US.
- Gas may begin to make serious penetration as a transportation fuel.
- Natural gas exports from North America will begin and may grow. Alaska gas export option being considered.

# **BUT ...realizing the full promise of shale resources is not a certainty and US domestic policy is important!**

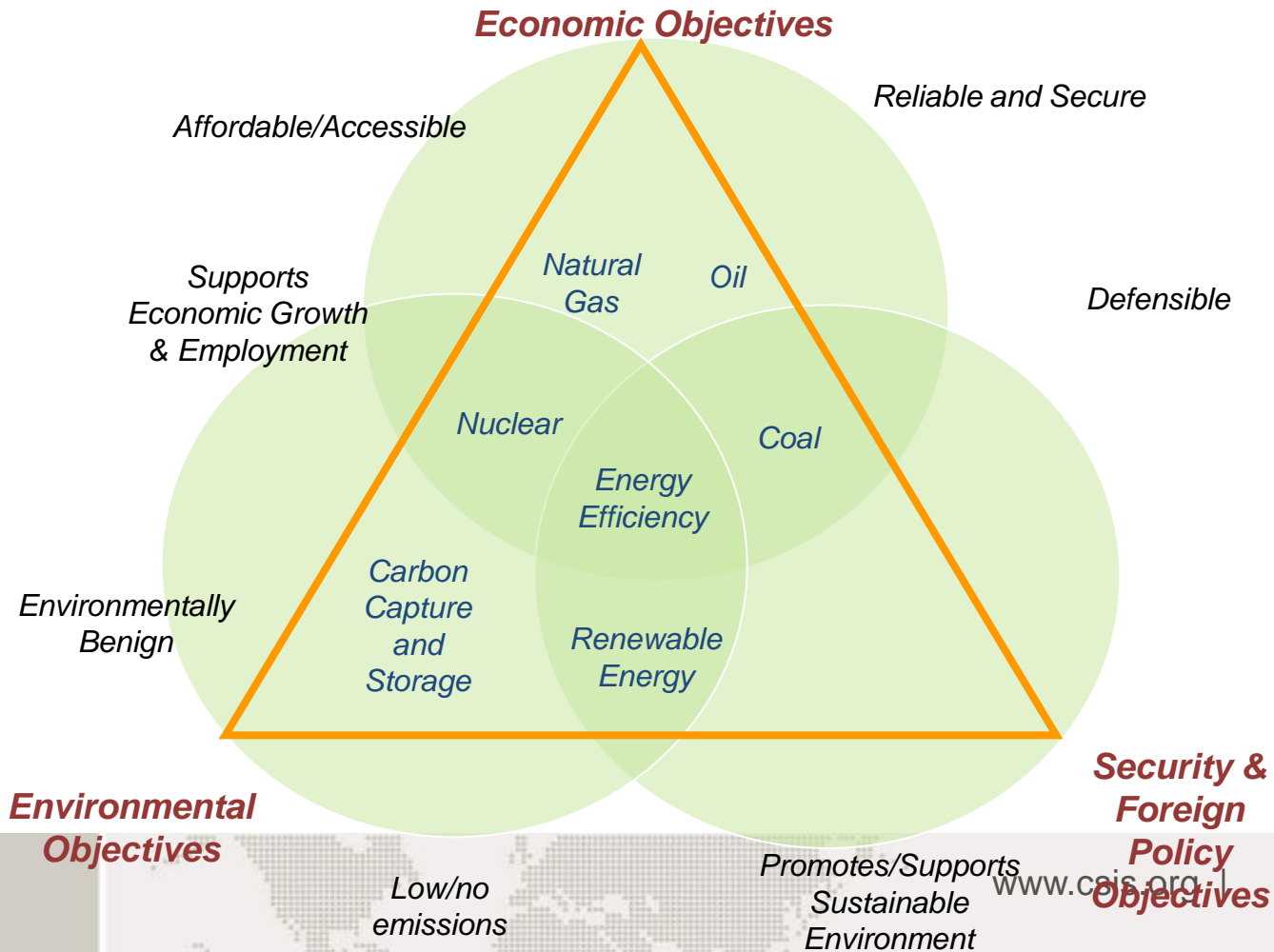
## **Technical/Economic Challenges**

- All shales are not alike; application of drilling/reservoir fracturing technology & operational experience matters
- Steep decline rates require ongoing investment and drilling; and repeated fracturing
- Cost escalation and low commodity prices limit prospects

## **Environmental/Regulatory/Societal Challenges**

- Well design and management of surface chemicals/materials are the best barriers to protecting water aquifers
- Disclosure of components of fracking fluids should/is happening
- Scale of water use, treatment & disposal are challenging
- Community Issues – infrastructure, land use, population density, noise, haze, road congestion and repair are “real” and need to be addressed
- Regulation and enforcement are essential

# POLICY MODEL



*Thank You*