

# *International Energy Outlook 2011*



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## Key findings in the IEO2011 Reference case

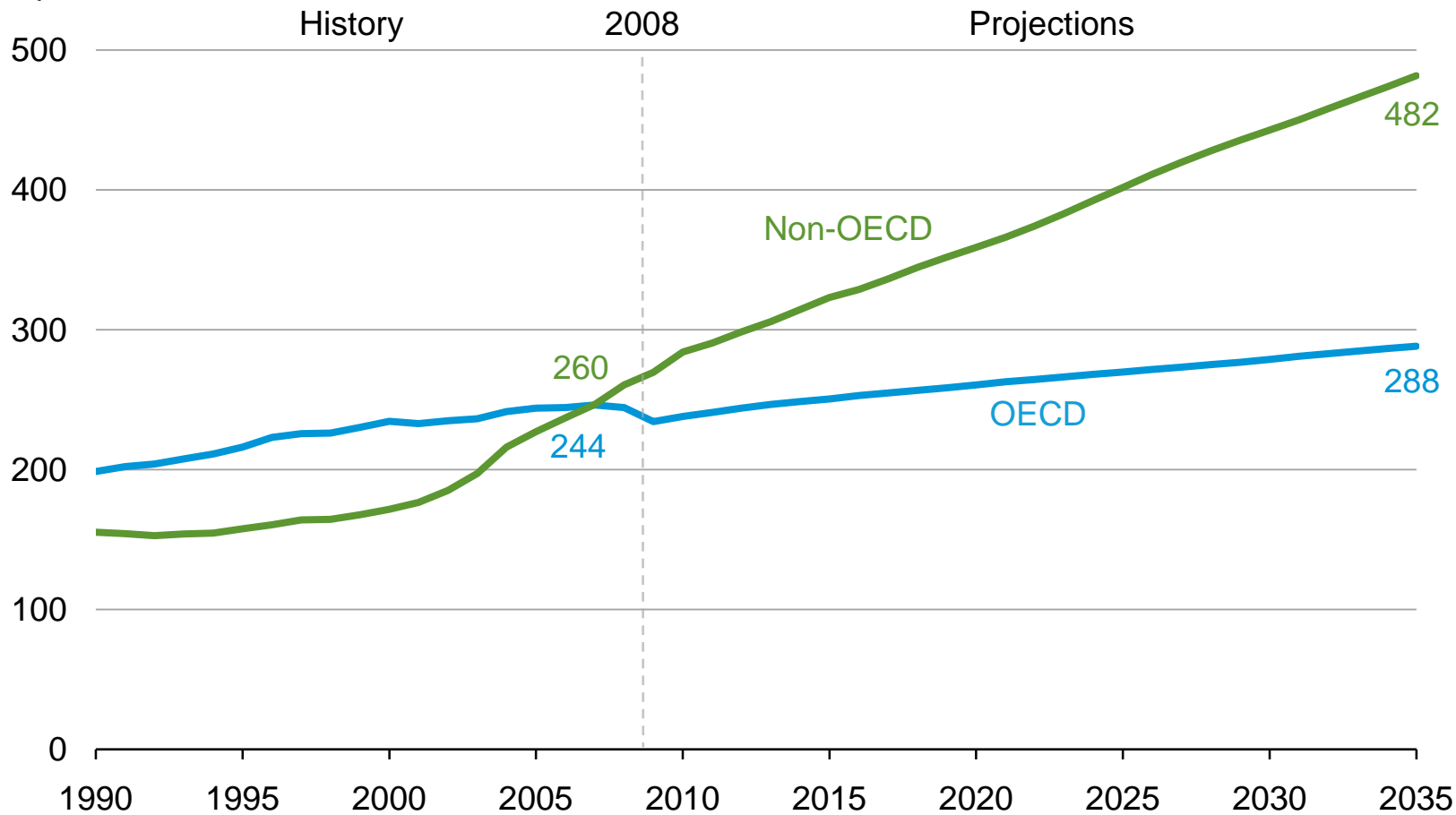
- World energy consumption increases by 53% between 2008 and 2035 with half of the increase attributed to China and India
- Renewables are the world's fastest-growing energy source, at 2.8% per year; renewables share of world energy grows to roughly 15% in 2035
- Fossil fuels continue to supply almost 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

## Key findings in the IEO2011 Reference case (continued)

- 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

# Non-OECD nations drive the increase in energy demand

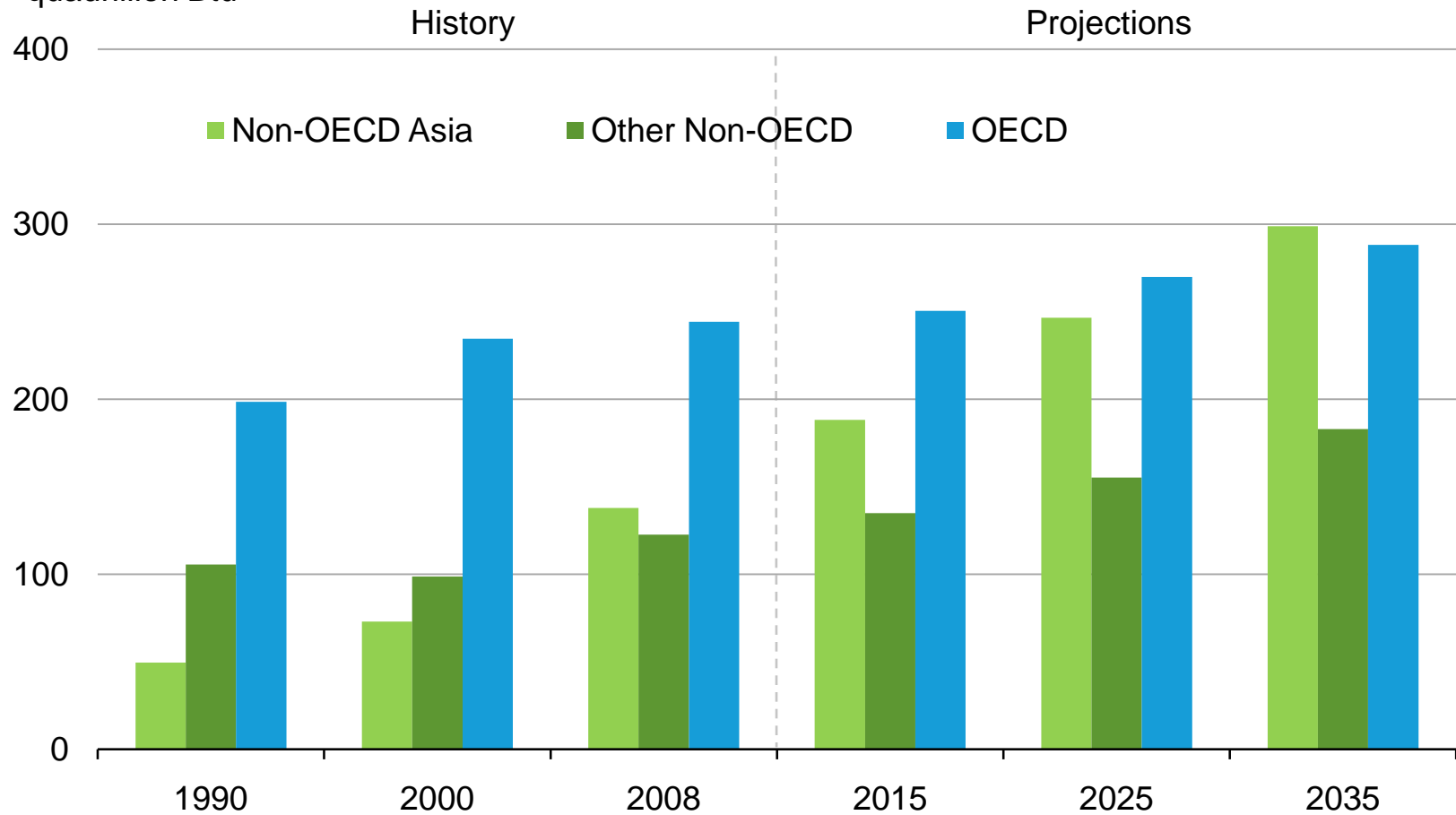
world energy consumption  
quadrillion Btu



Source: EIA, International Energy Outlook 2011

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

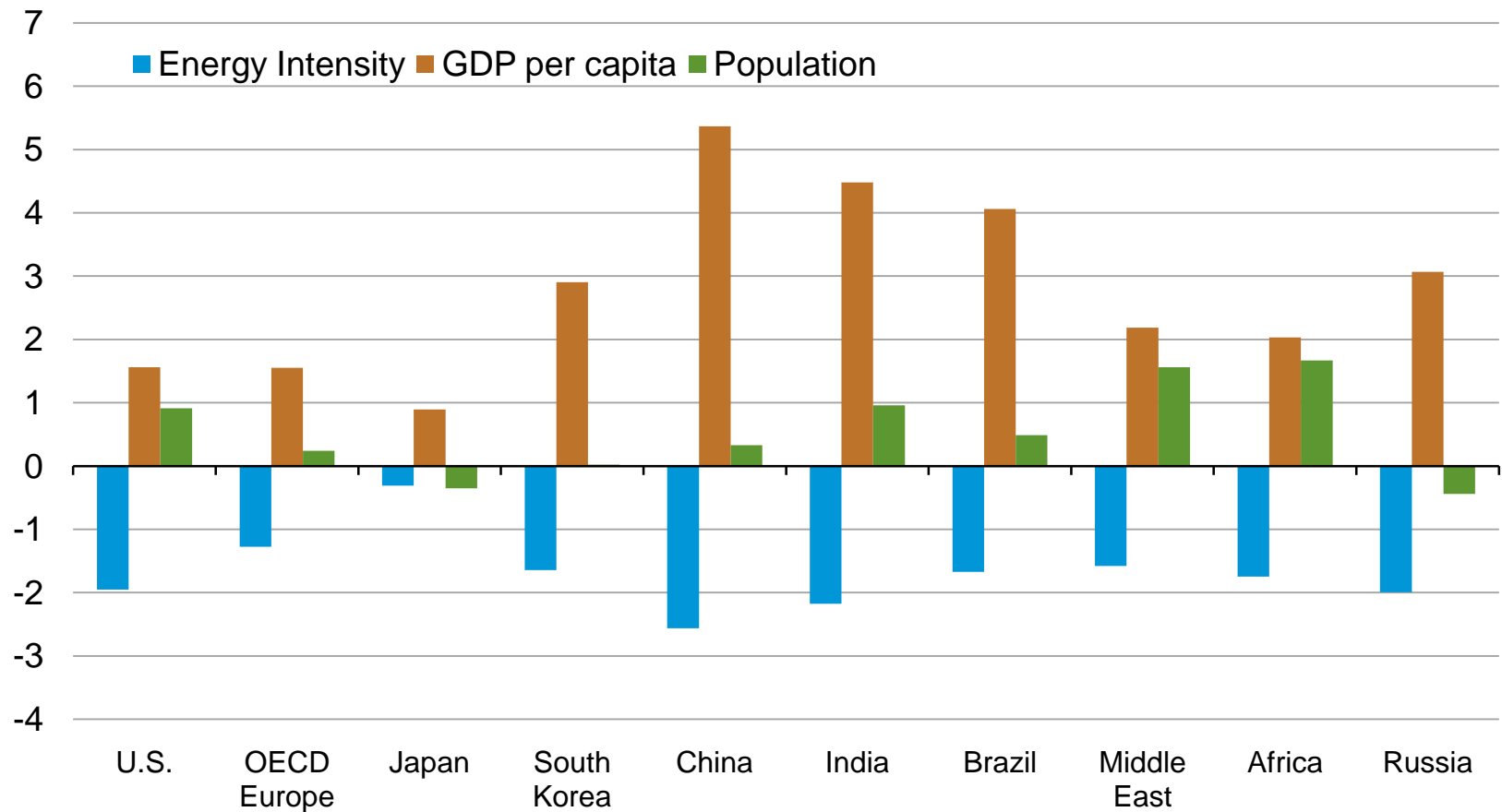
world energy consumption  
quadrillion Btu



Source: EIA, *International Energy Outlook 2011*

# Growth in income and population drive rising energy use; energy intensity improvements moderate increases in energy demand

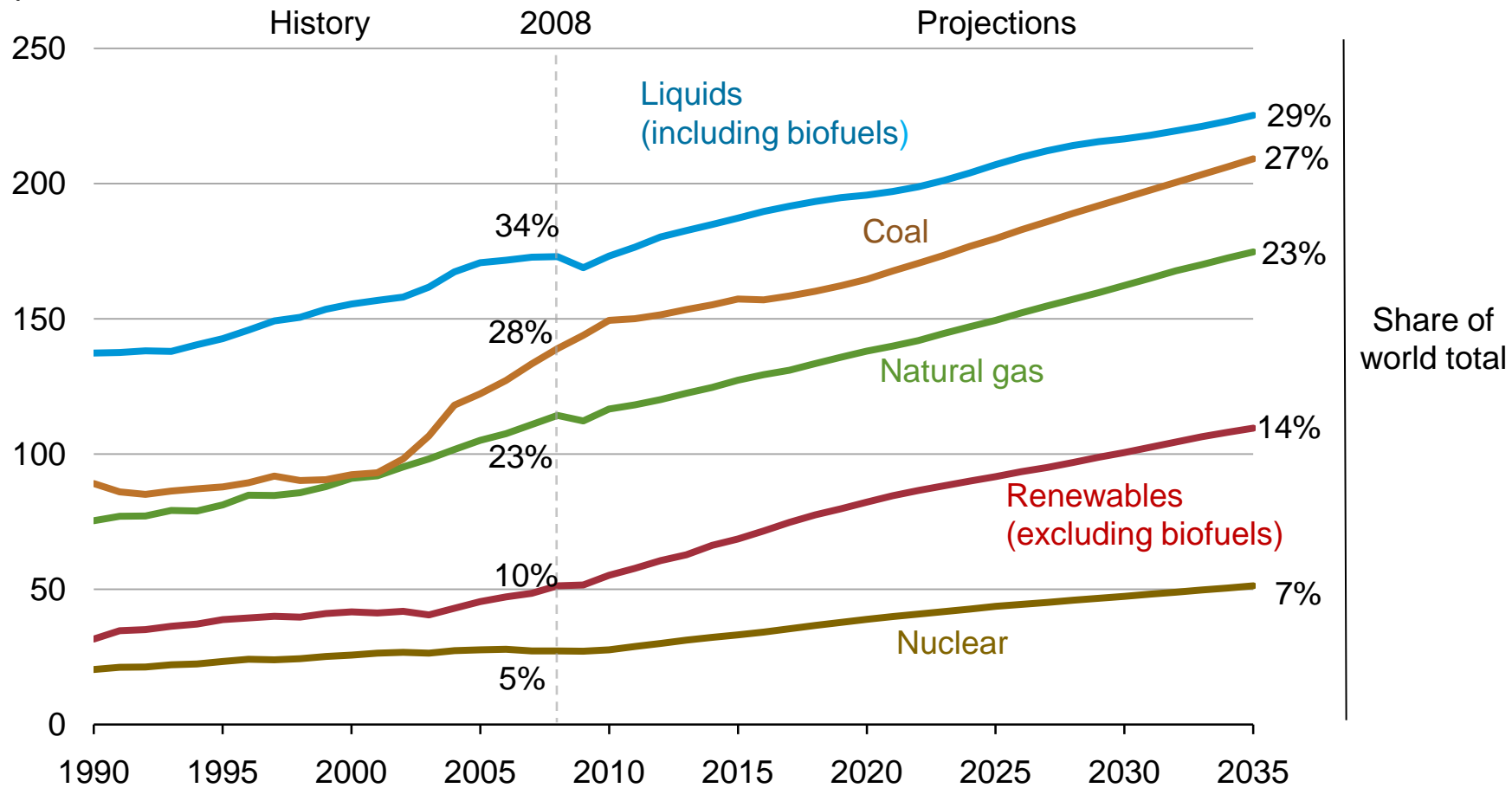
average annual change (2008-2035)  
percent per year



Source: EIA, International Energy Outlook 2011

# Renewables are the fastest growing source of energy consumption

world energy consumption by fuel  
quadrillion Btu



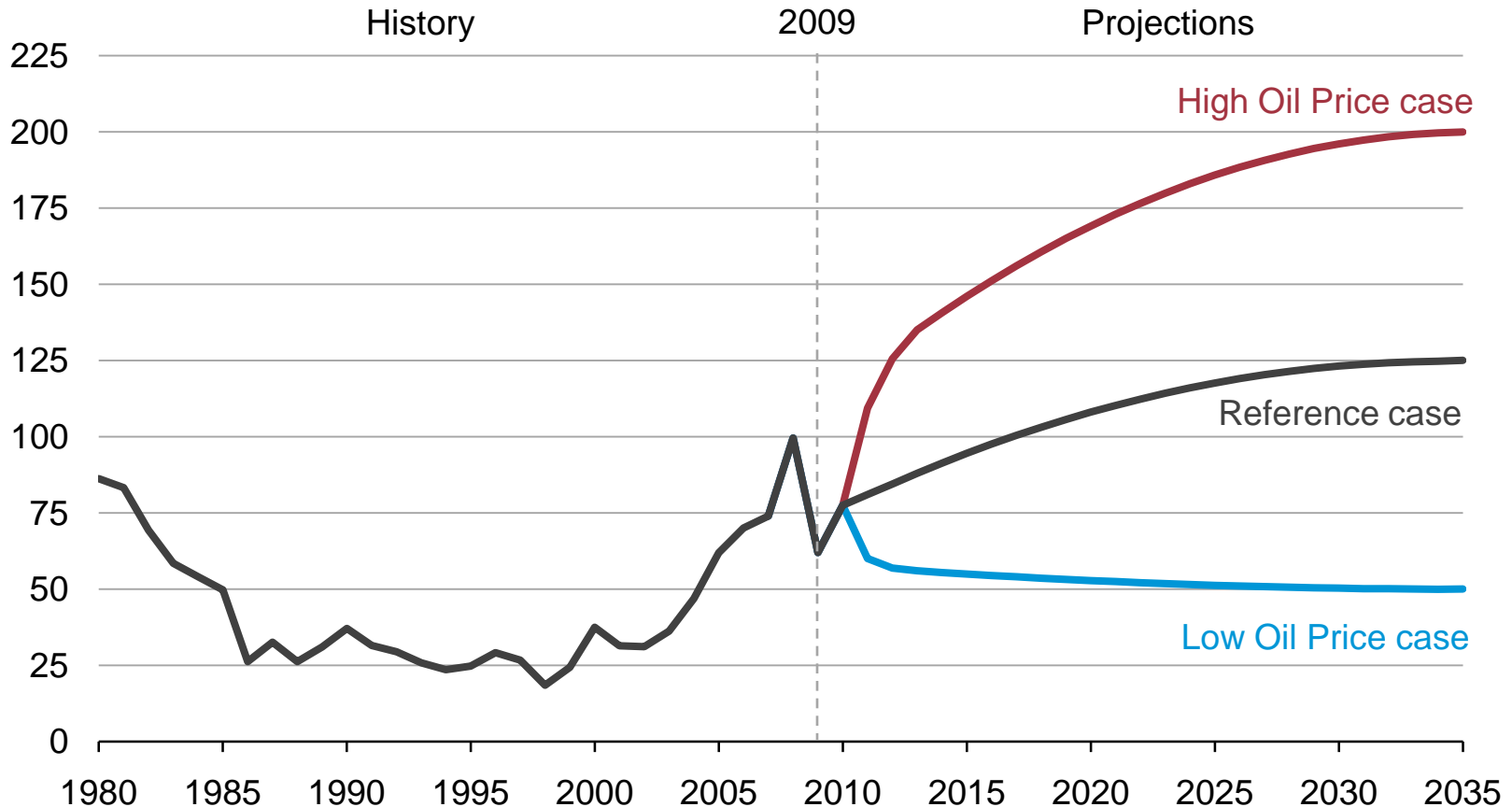
Source: EIA, International Energy Outlook 2011

# Liquid fuels markets



# Oil prices in the Reference case rise steadily; the other cases represent a wide range of prices

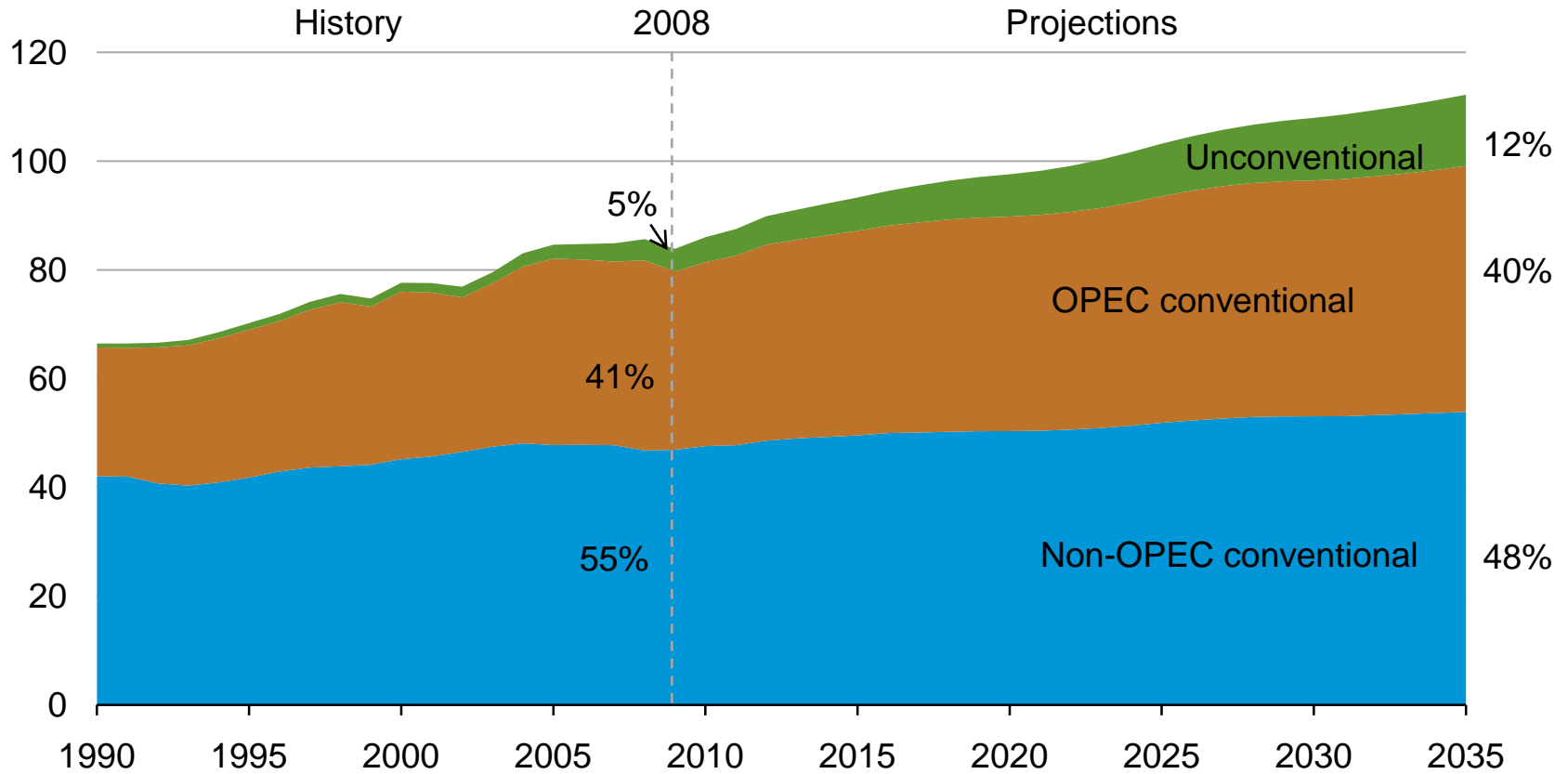
world oil price paths  
real 2009 dollars per barrel



Source: EIA, International Energy Outlook 2011

# Unconventional liquids become increasingly important in the total supply of liquid fuels

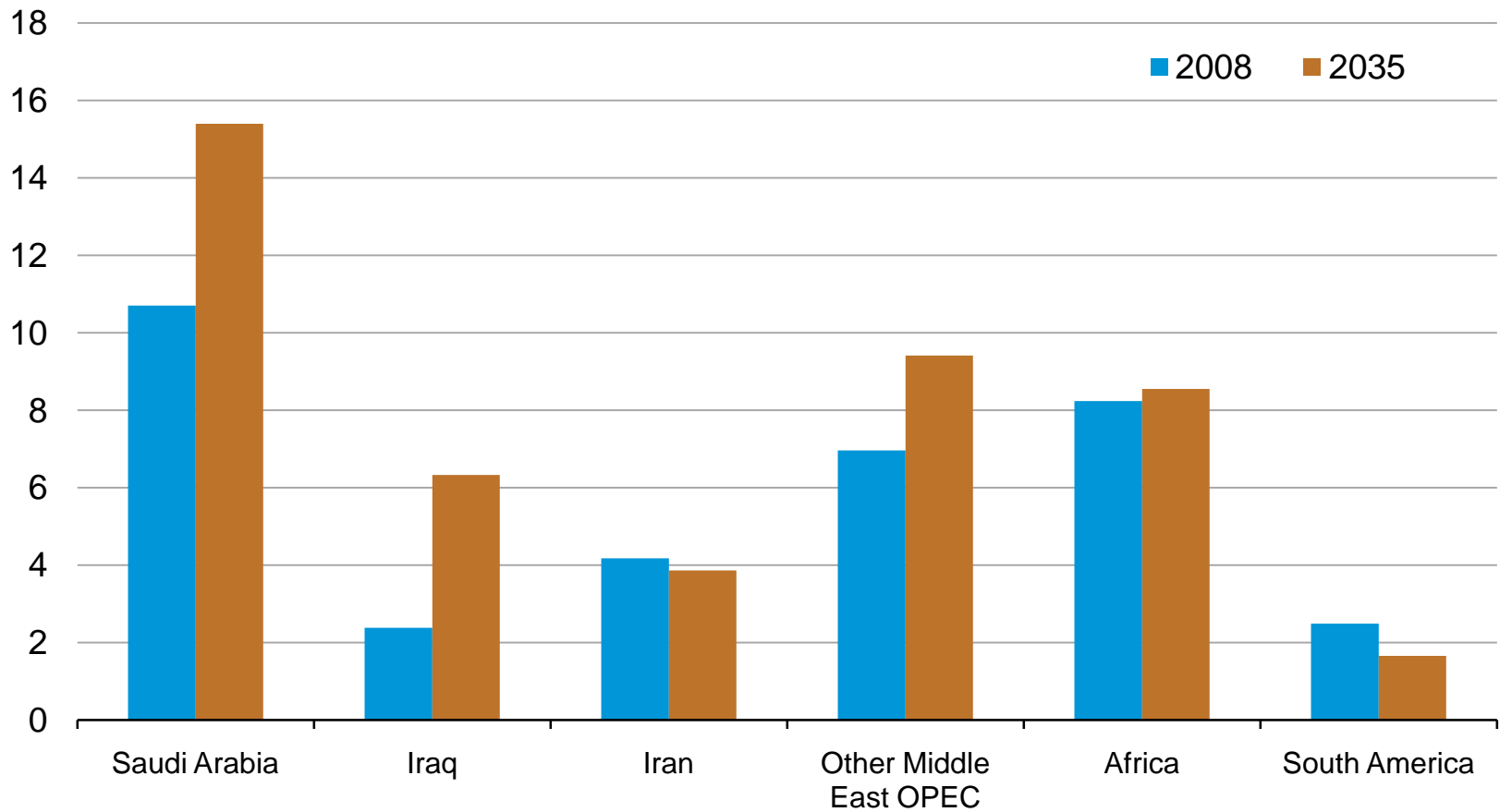
world liquids production  
million barrels per day



Source: EIA, International Energy Outlook 2011

# Growth in OPEC production comes mainly from the Middle East

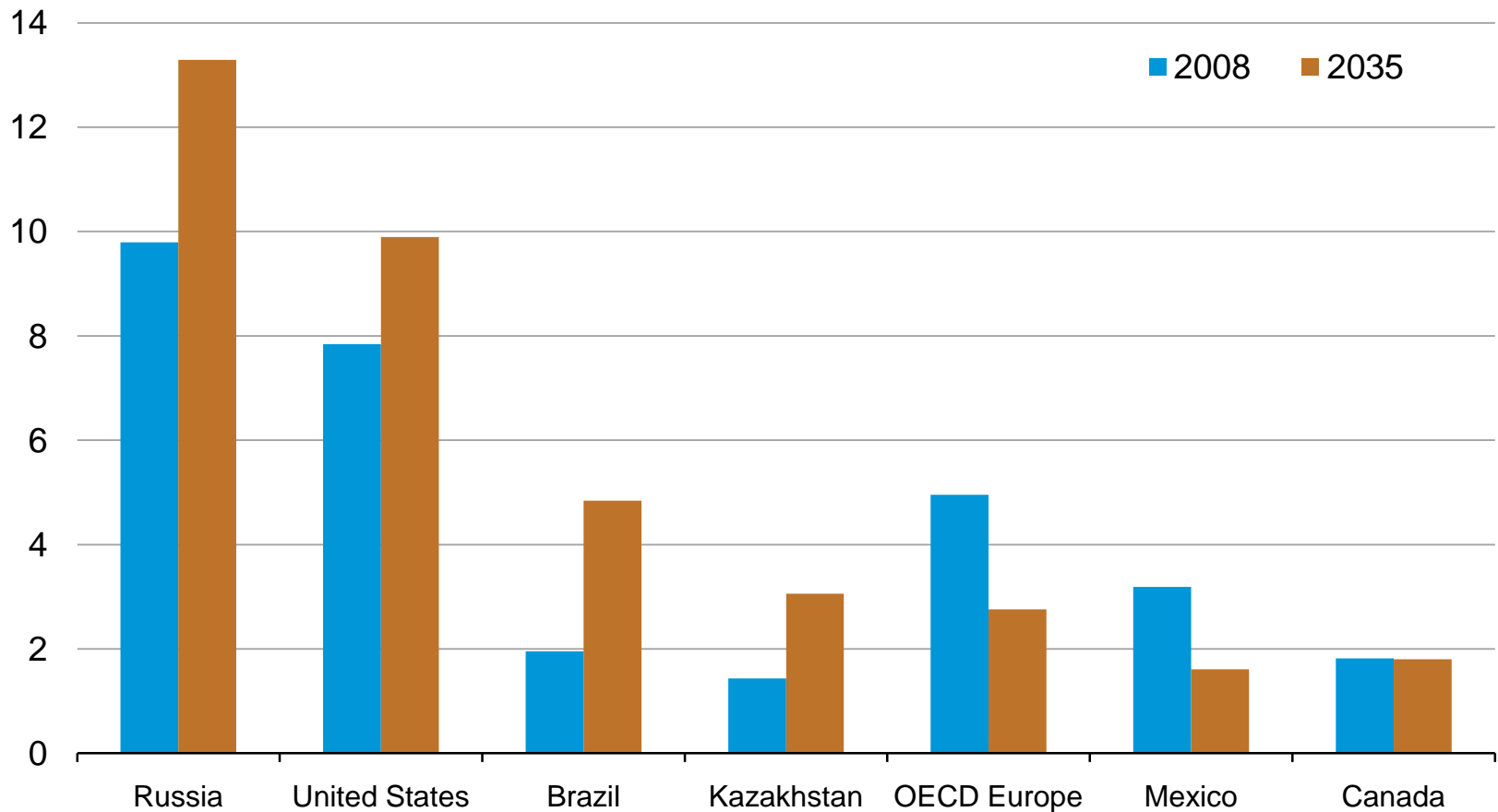
OPEC conventional production  
million barrels per day



Source: EIA, *International Energy Outlook 2011*

# Non-OPEC conventional supply growth comes mainly from Russia, United States, Brazil, and Kazakhstan

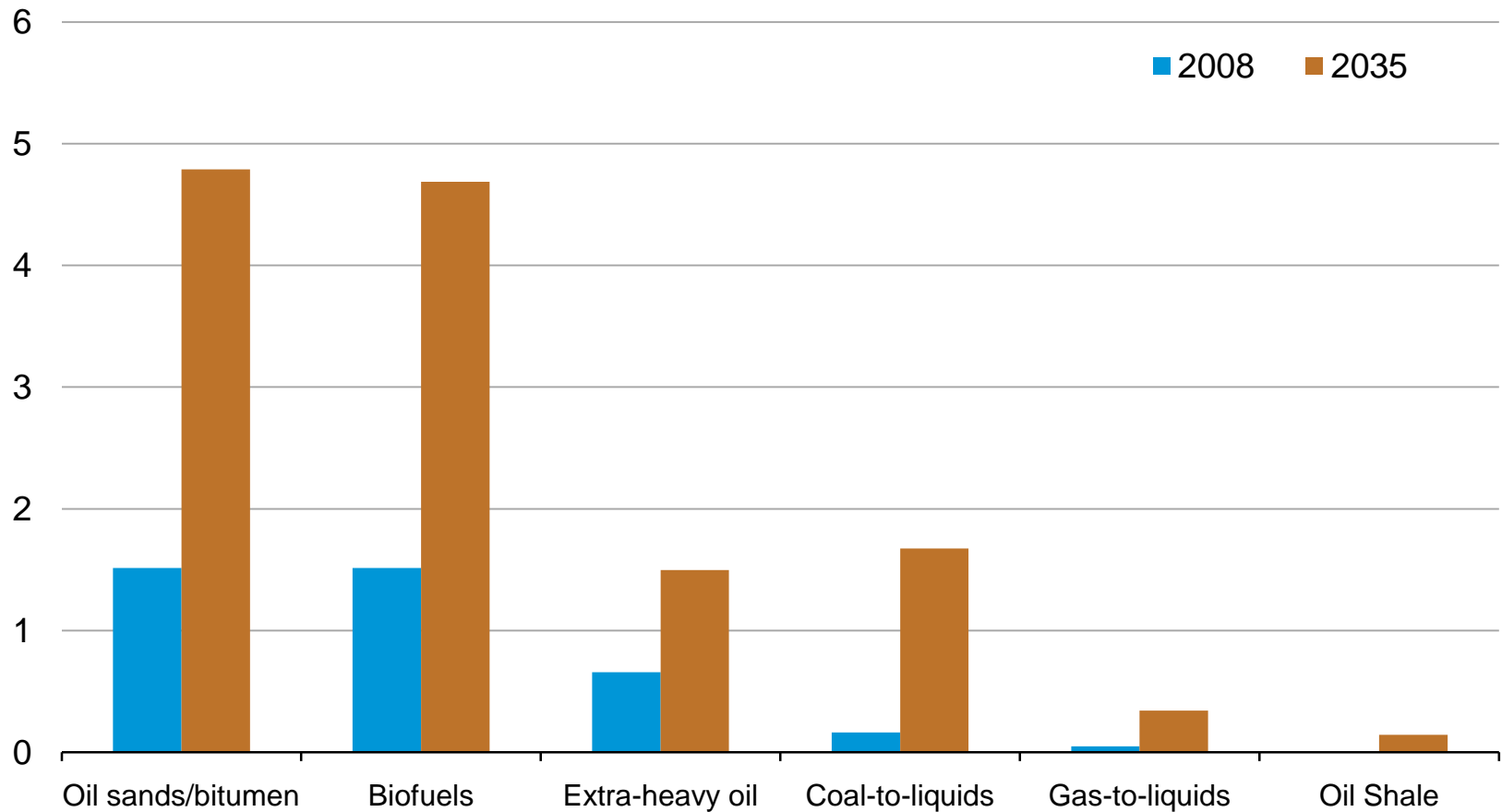
Non-OPEC conventional production  
million barrels per day



Source: EIA, *International Energy Outlook 2011*

# Oil sands/bitumen and biofuels account for 70 percent of the increase in unconventional liquid fuels

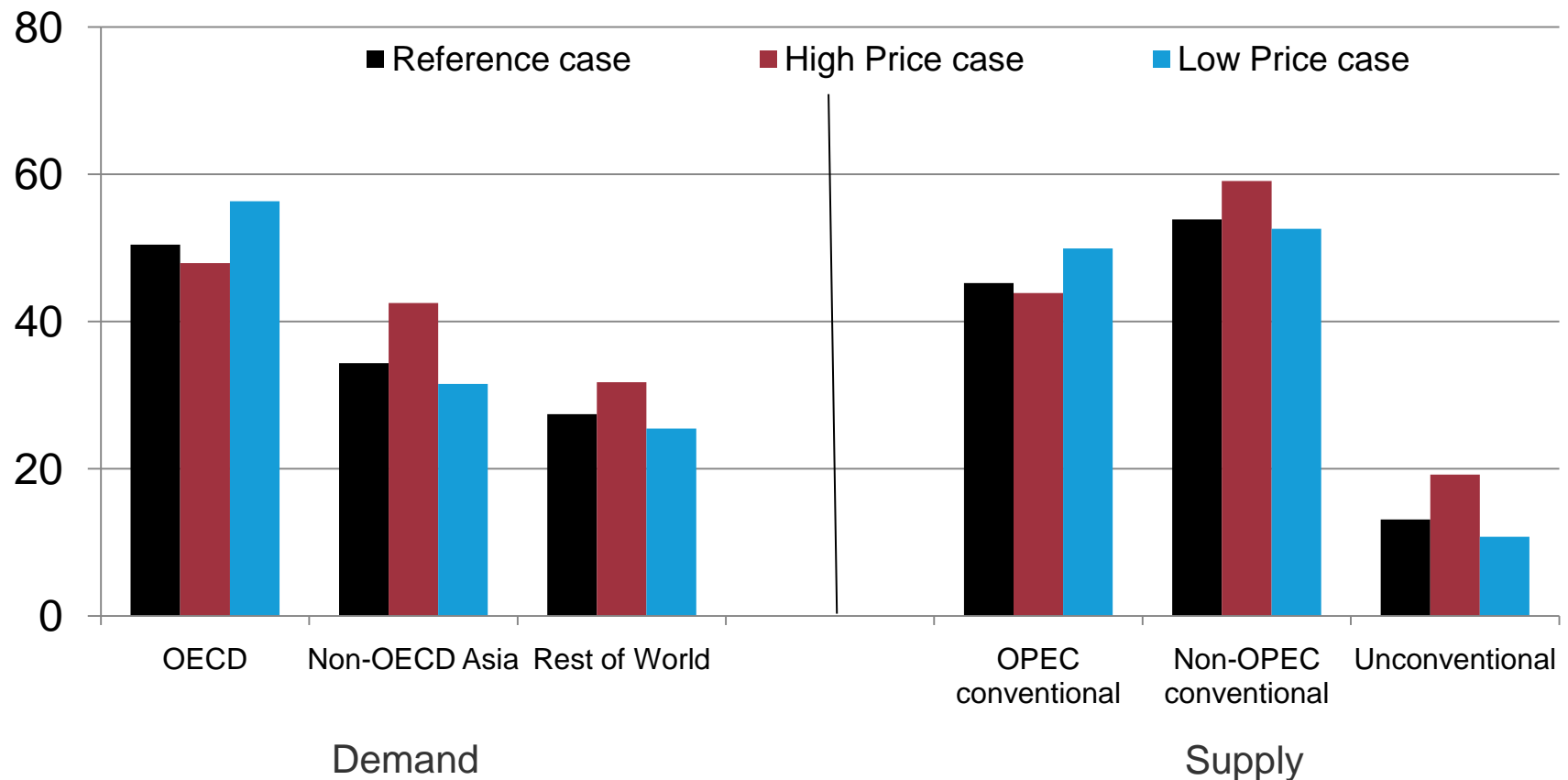
Unconventional production  
million barrels per day



Source: EIA, *International Energy Outlook 2011*

# High and Low Oil Price cases reflect shifts in both demand and supply schedules relative to the Reference case

worldwide liquids consumption and production in 2035  
million barrels per day

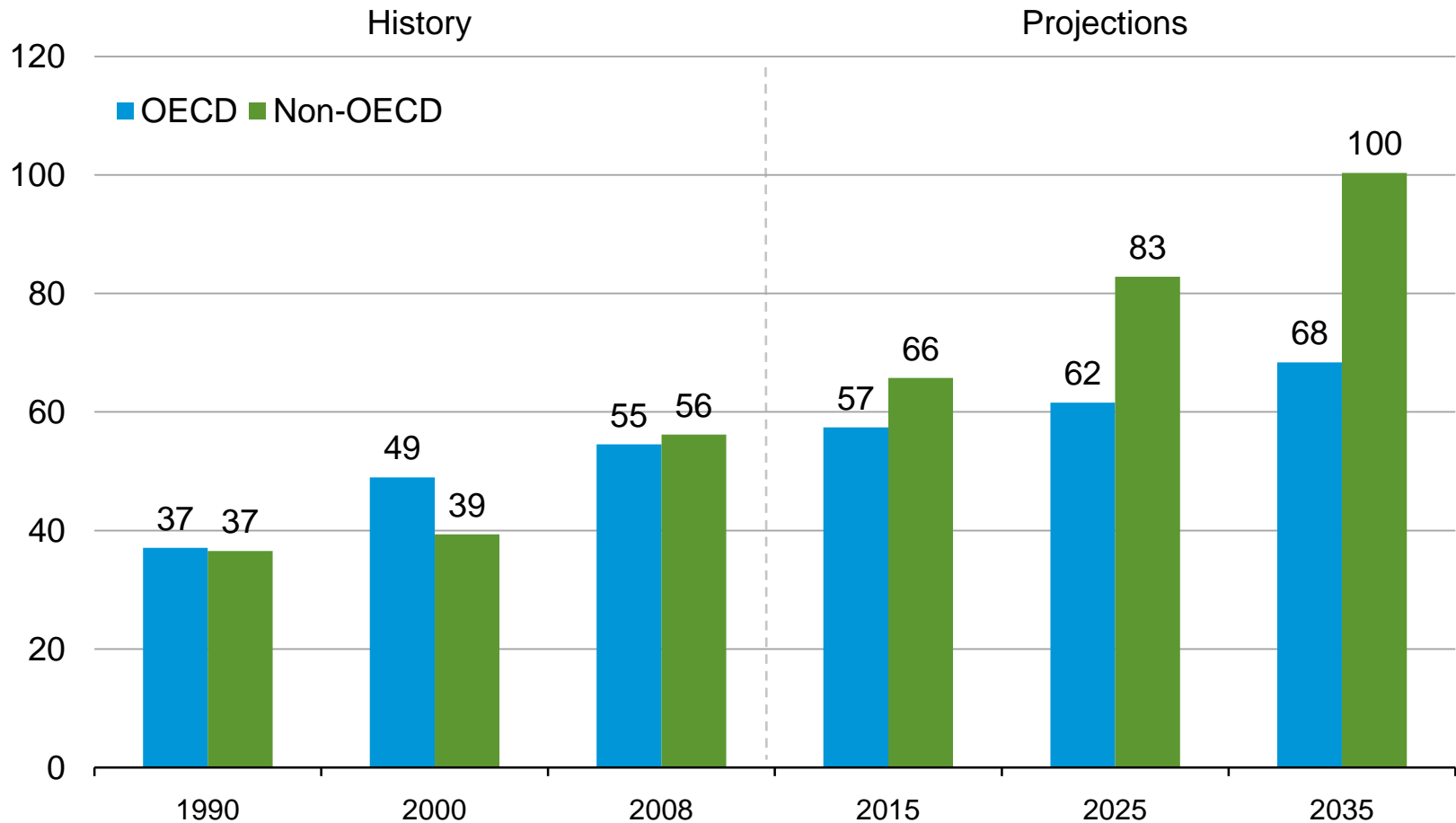


Source: *International Energy Outlook 2011*

# Natural gas markets

# Non-OECD nations account for 76% of the growth in natural gas consumption in the IEO2011 Reference case

world natural gas consumption  
trillion cubic feet



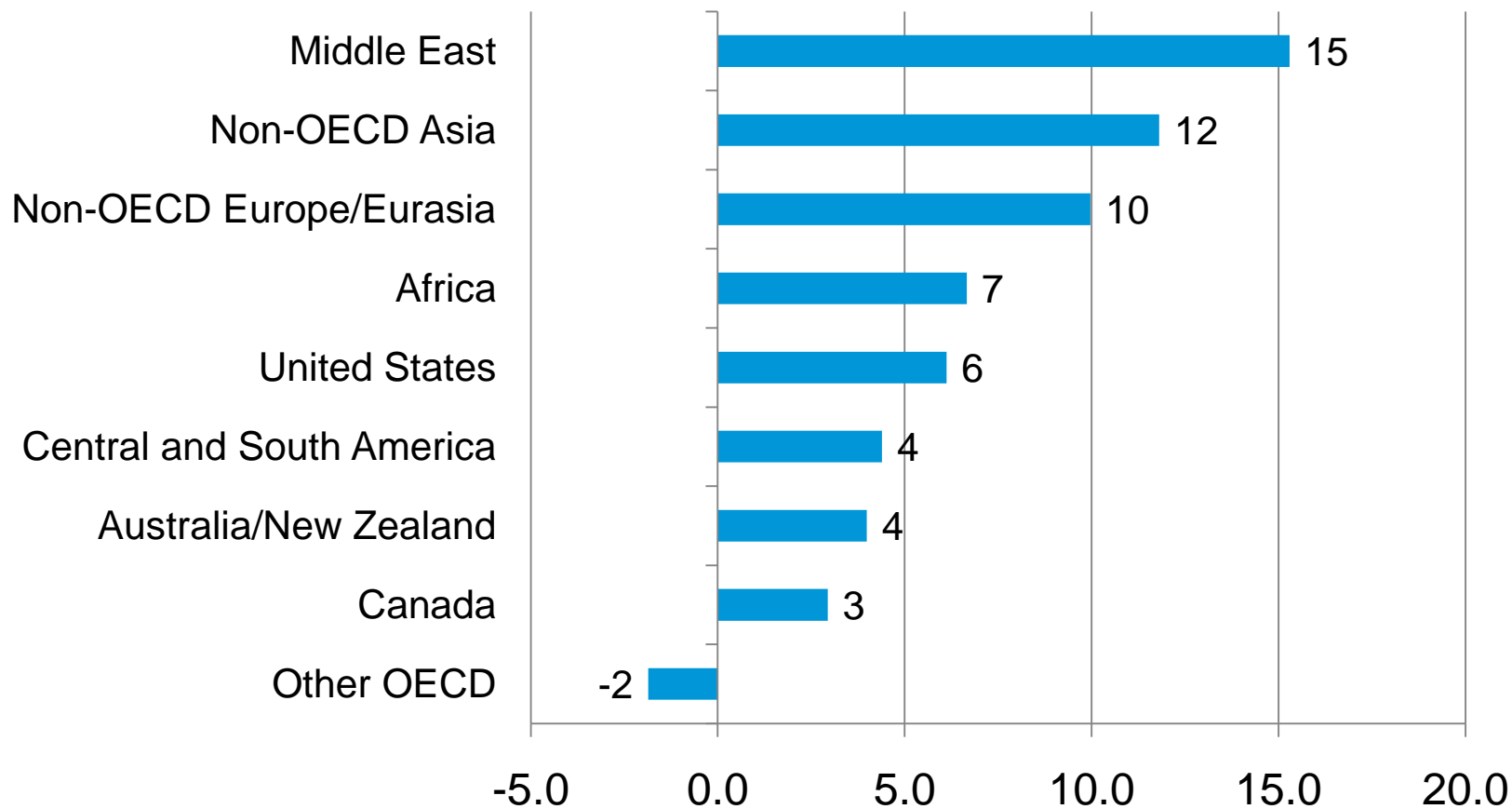
Source: EIA, International Energy Outlook 2011



# The Middle East and non-OECD Asia account for the largest increases in natural gas production

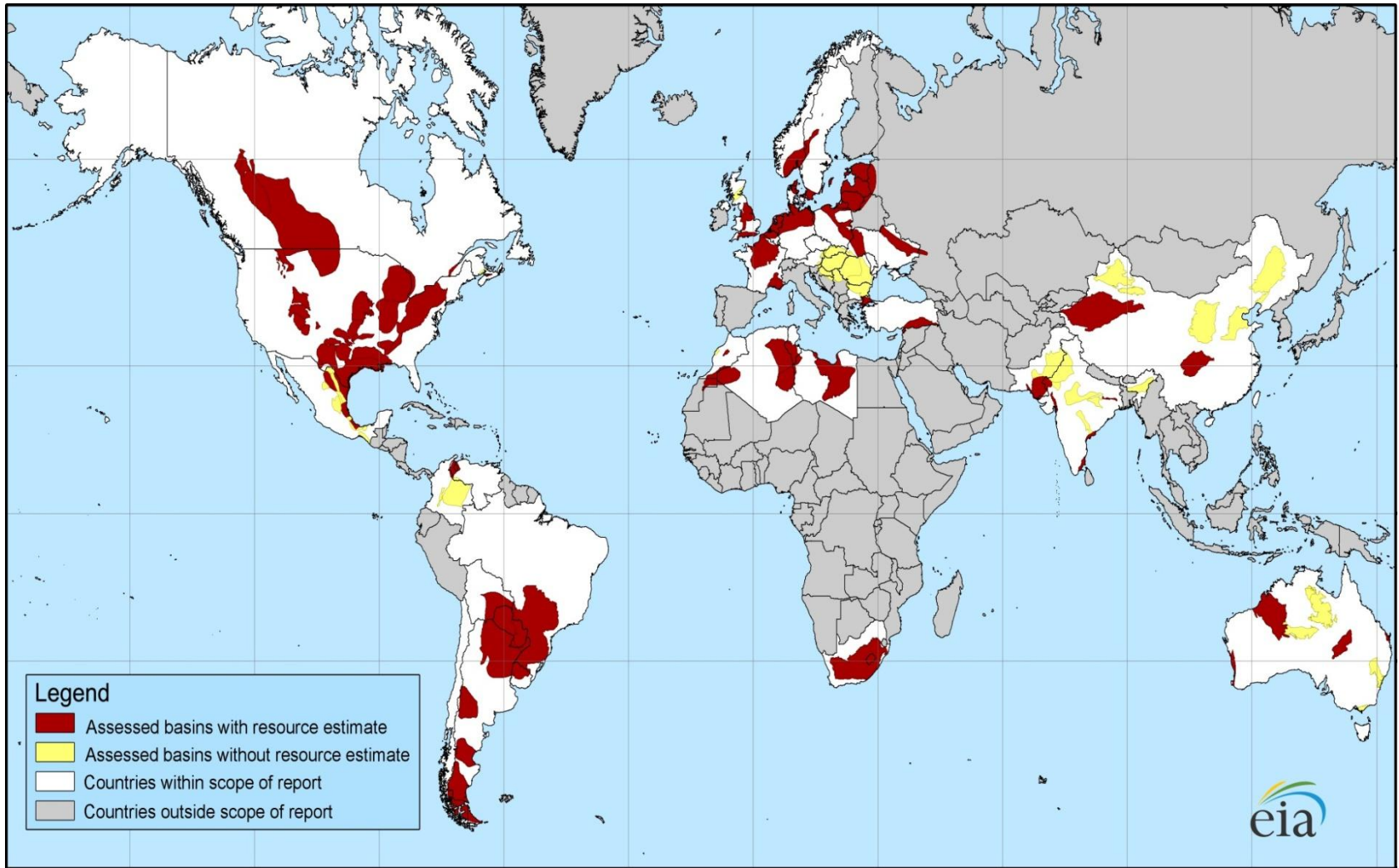
world natural gas production increment, 2008-2035

trillion cubic feet



Source: EIA, *International Energy Outlook 2011*

# Initial assessment of shale gas resources in 48 major shale basins in 32 countries indicates a large potential



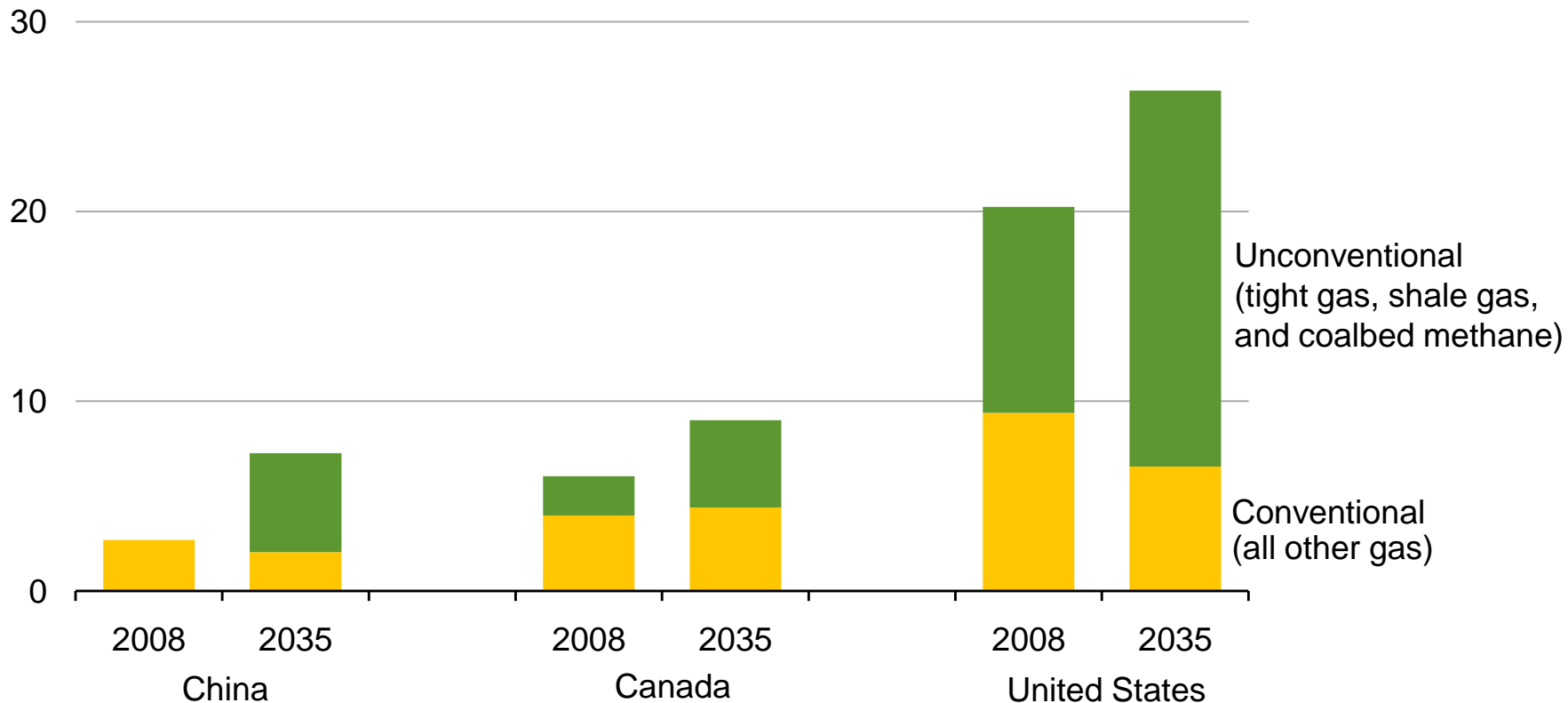
Source: U.S. Energy Information Administration

# Estimates of technically recoverable shale gas resources in the 48 shale gas basins that were recently assessed

<b>Continent</b>		<b>Technically Recoverable</b> (trillion cubic feet)
North America	Canada, Mexico	1,069
Africa	Morocco, Algeria, Tunisia, Libya, Mauritania, Western Sahara, South Africa	1,042
Asia	China, India, Pakistan	1,404
Australia		396
Europe	France, Germany, Netherlands, Sweden, Norway, Denmark, U.K., Poland, Lithuania, Kaliningrad, Ukraine, Turkey	624
South America	Colombia, Venezuela, Argentina, Bolivia, Brazil, Chile, Uruguay, Paraguay	1,225

# Unconventional gas is an increasingly important component of supply, not only for the U.S., but also China and Canada

natural gas production  
trillion cubic feet

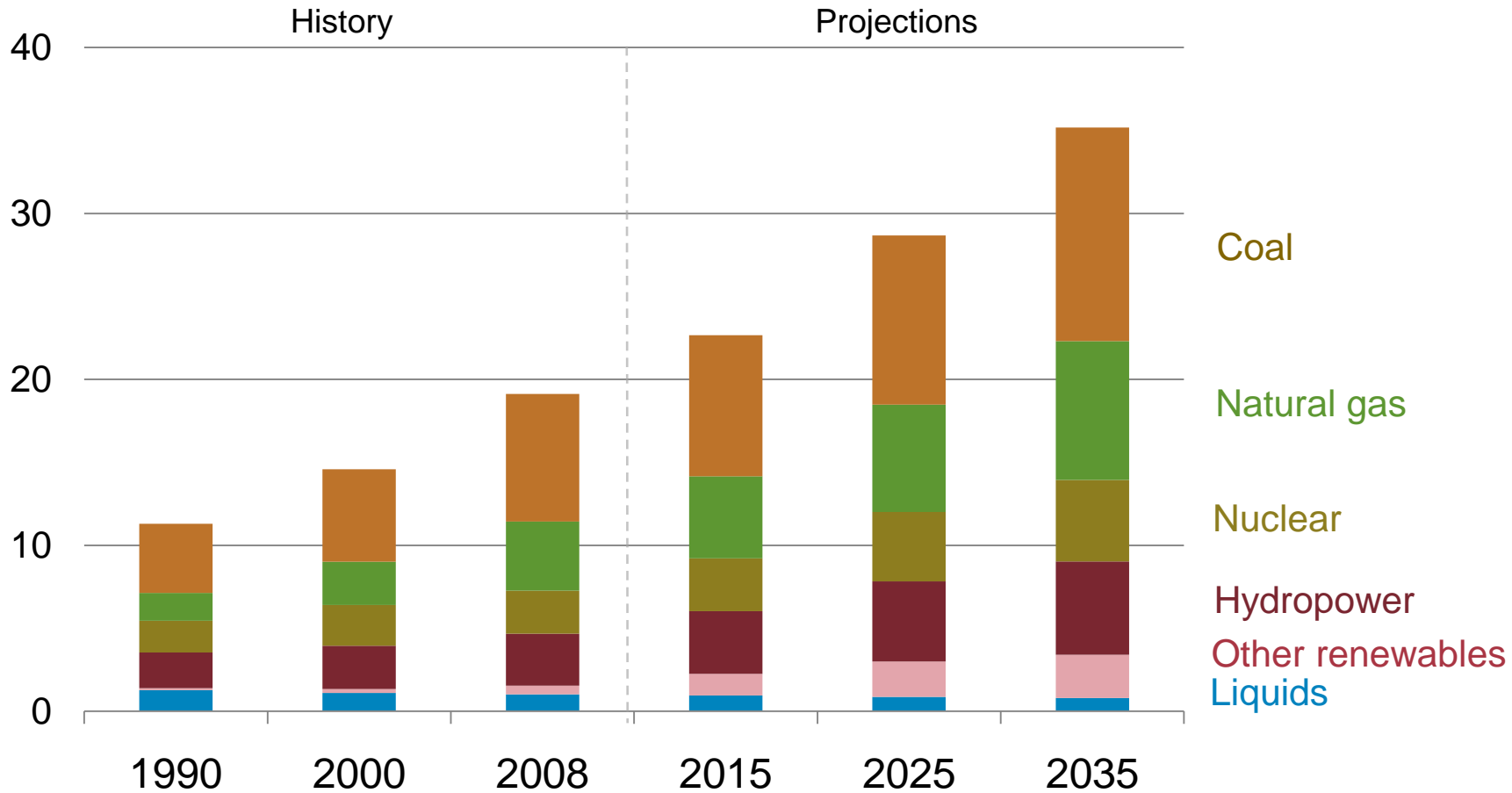


Source: EIA, International Energy Outlook 2011

# Electricity markets

# Renewables and natural gas are fastest growing, but coal still fuels the largest share of the world's electricity in 2035

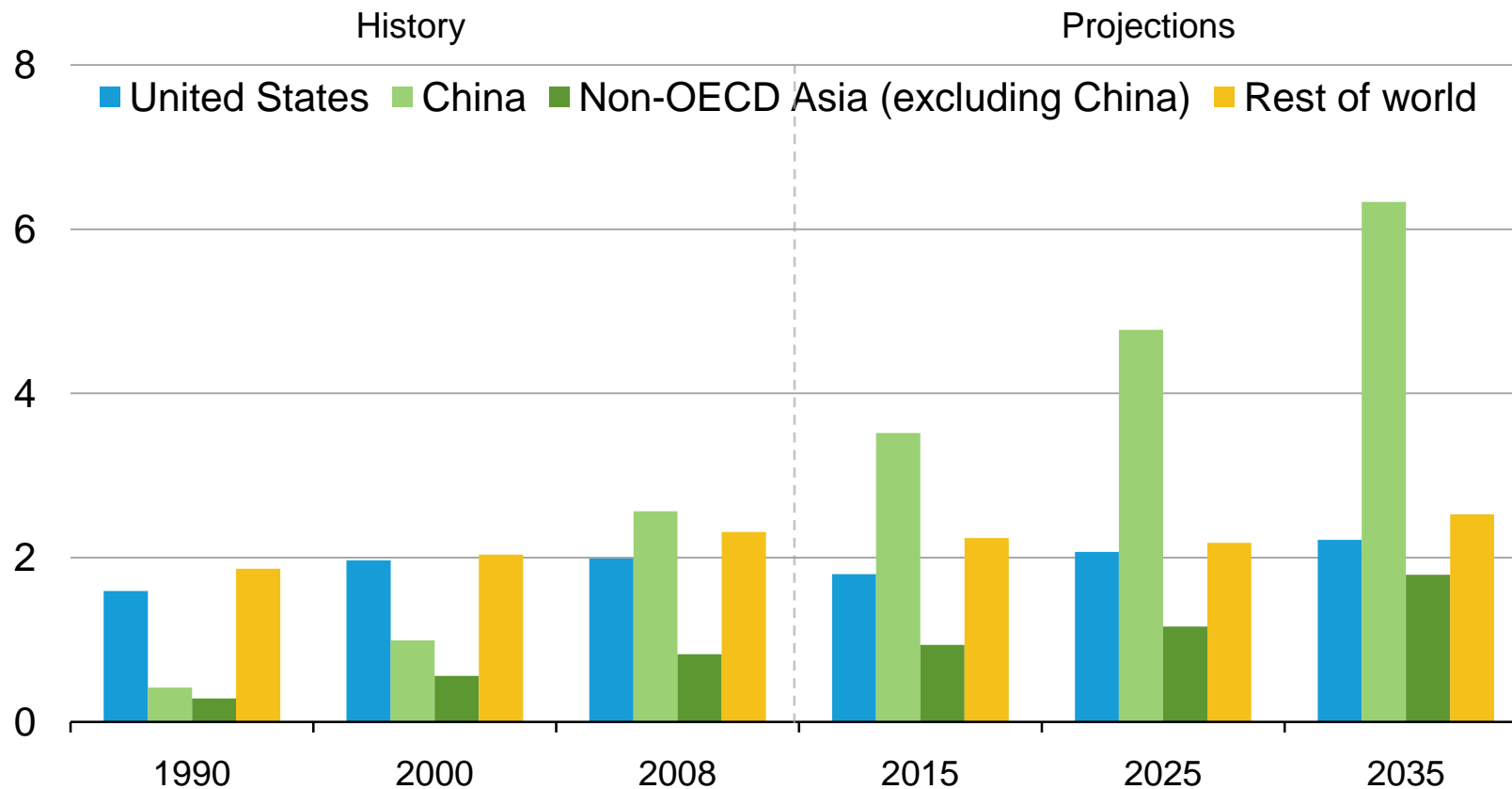
world electricity generation by fuel  
trillion kilowatthours



Source: EIA, International Energy Outlook 2011

# China accounts for nearly three-quarters of the world increase in coal-fired generation

coal-fired generation  
trillion kilowatthours



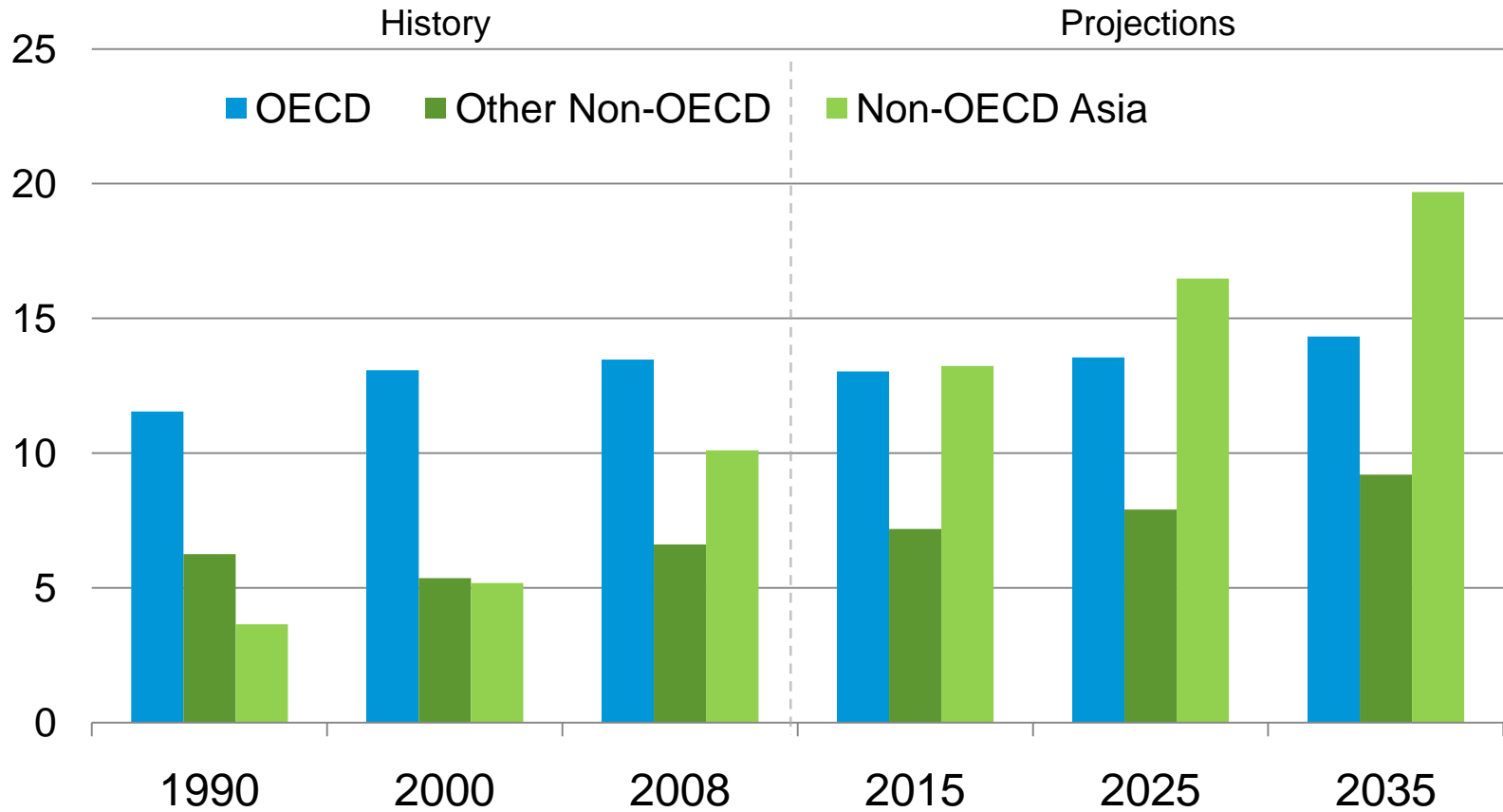
Source: EIA, International Energy Outlook 2011

# Energy-related carbon dioxide emissions



# Non-OECD Asia accounts for almost 75% of the world increase in energy-related carbon dioxide emissions

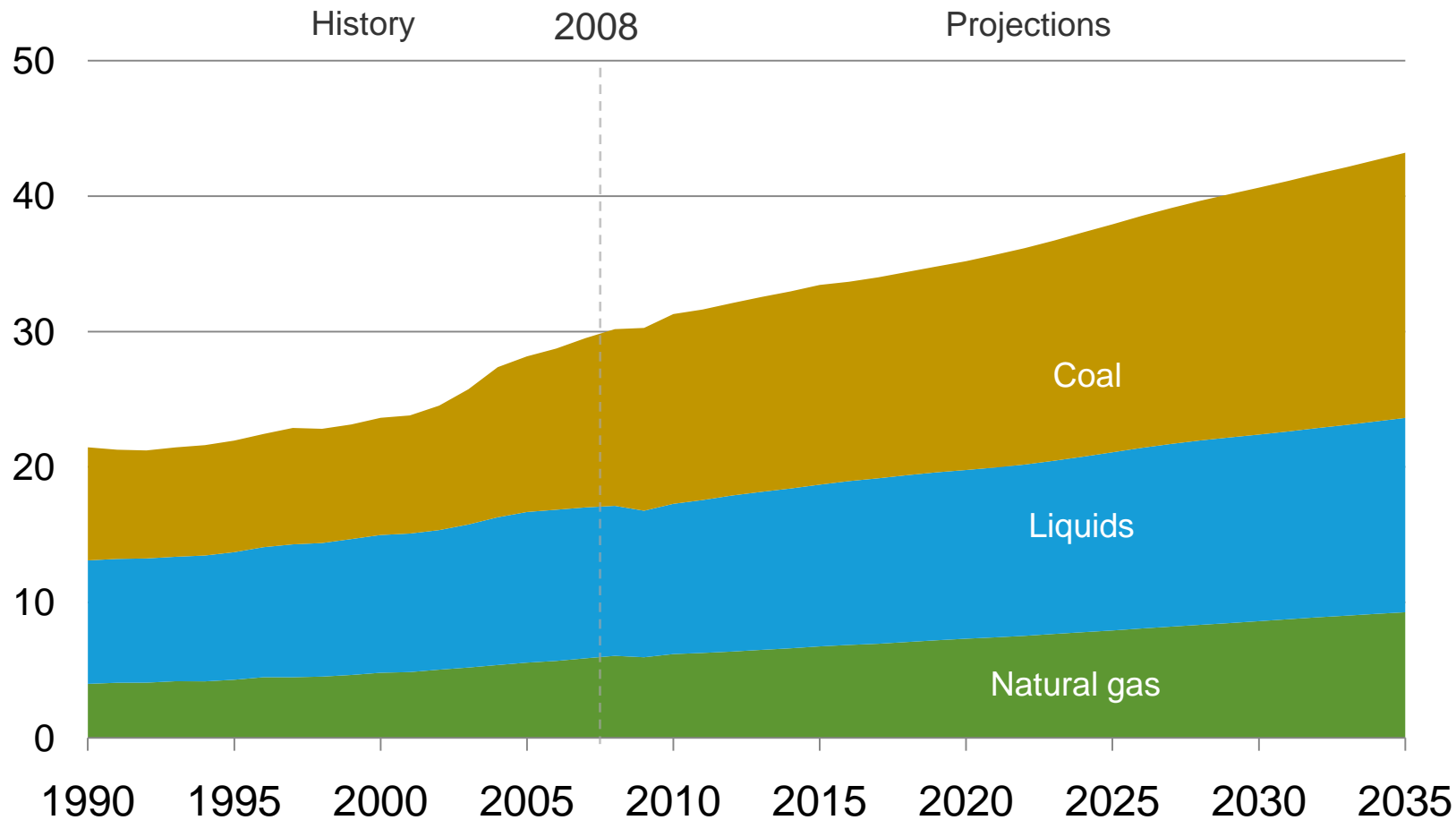
world energy-related carbon dioxide emissions  
billion metric tons



Source: EIA, International Energy Outlook 2011

# Coal continues to account for the largest share of carbon dioxide emissions throughout the projection

world energy-related carbon dioxide emissions by fuel  
billion metric tons



Source: EIA, International Energy Outlook 2011

# For more information

U.S. Energy Information Administration home page | [www.eia.gov](http://www.eia.gov)

Short-Term Energy Outlook | [www.eia.gov/steo](http://www.eia.gov/steo)

Annual Energy Outlook | [www.eia.gov/aeo](http://www.eia.gov/aeo)

International Energy Outlook | [www.eia.gov/ieo](http://www.eia.gov/ieo)

Monthly Energy Review | [www.eia.gov/mer](http://www.eia.gov/mer)