

# ***Annual Energy Outlook 2009 Early Release***

Energy Information Administration  
December 17, 2008

[www.eia.doe.gov](http://www.eia.doe.gov)

Energy Information Administration  
*Official Energy Statistics from the U.S. Government*

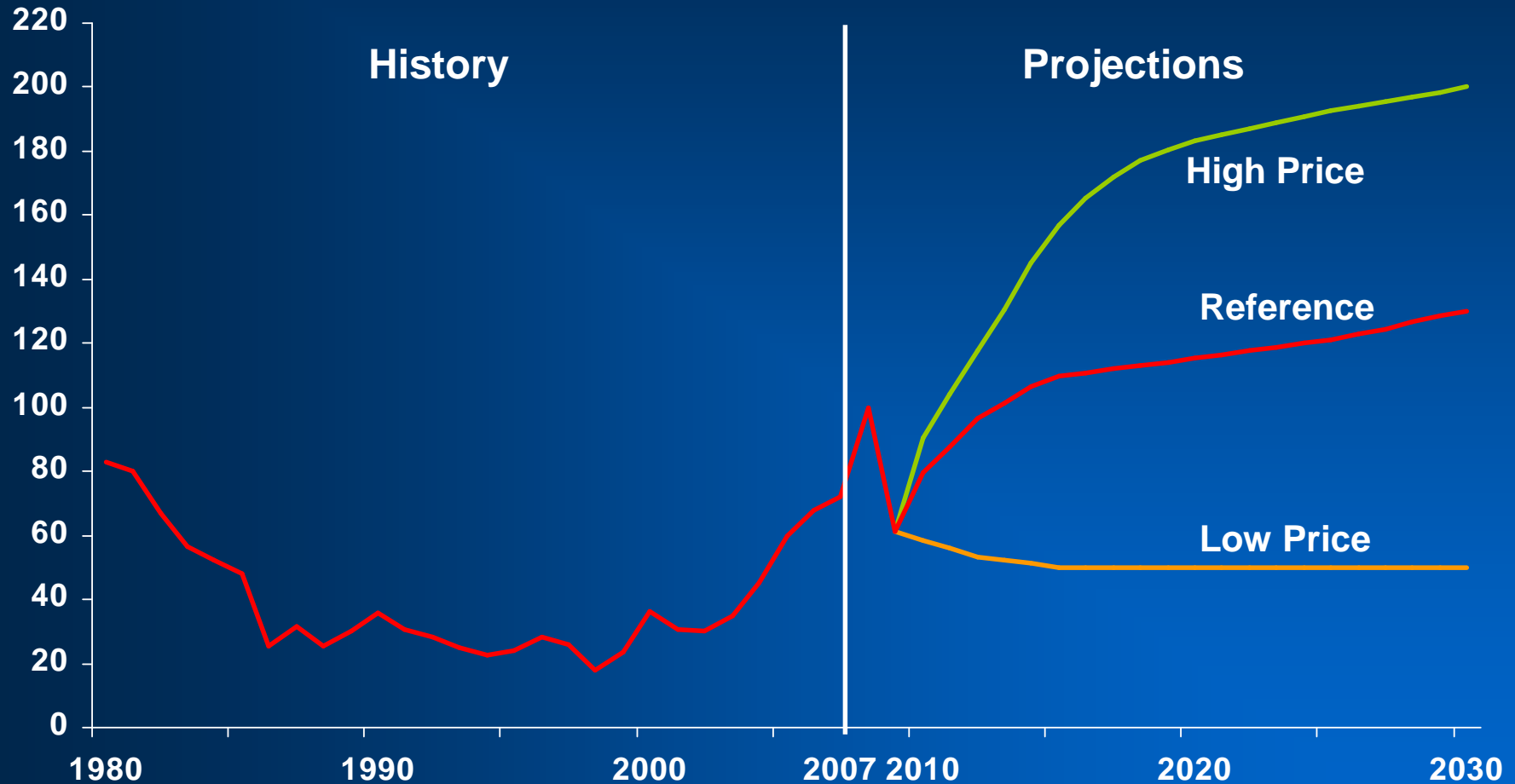


## ***The economy, oil prices, resources, policies, and behavior drive the AEO2009 reference case***

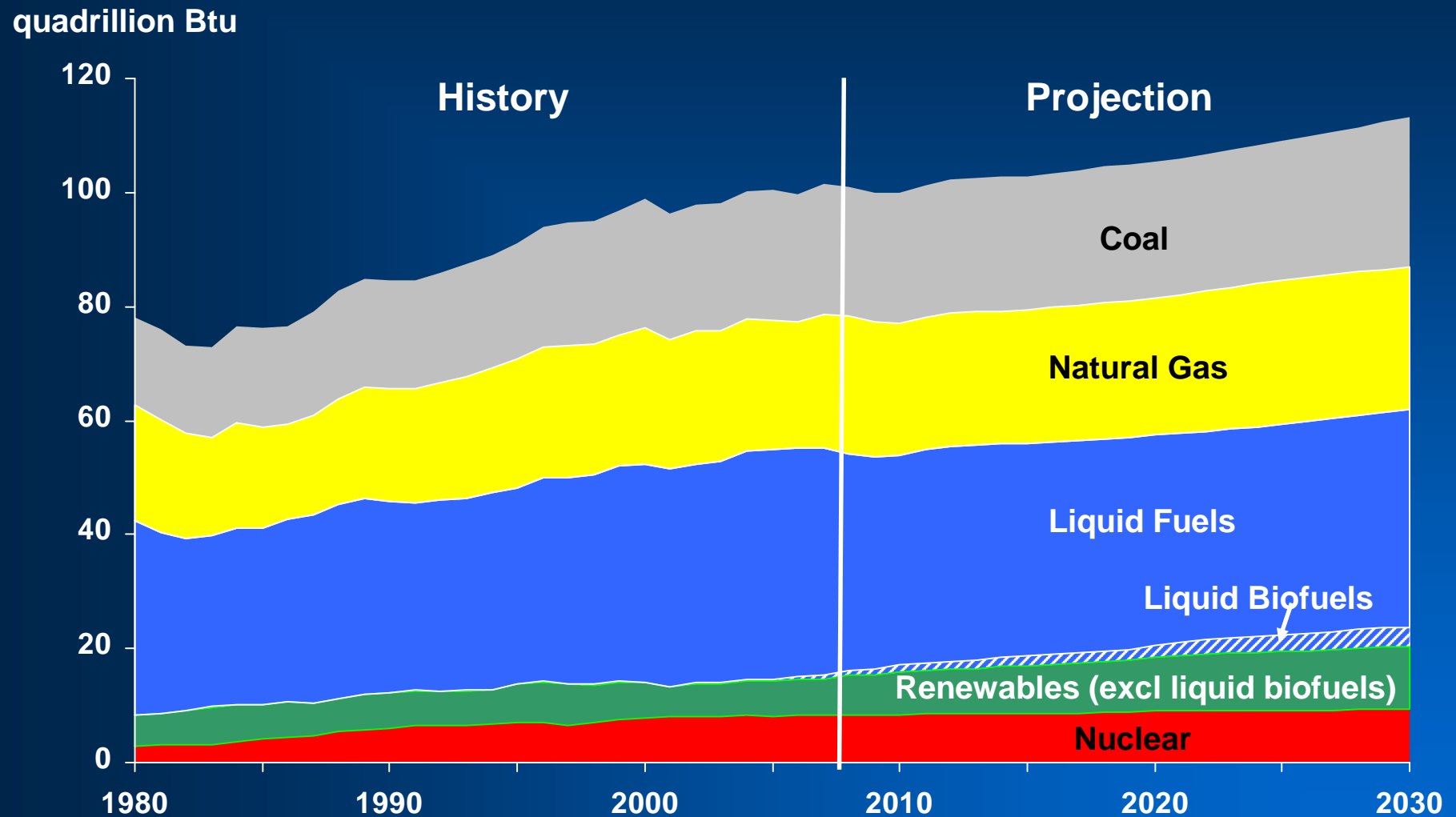
- Long-term economic growth averages about 2.5 percent per year between 2007 and 2030
- World crude oil prices recover from a near-term decline and reach \$130 per barrel (in 2007 dollars) by 2030
- A robust domestic natural gas resource base allows for a steady expansion of production given projected growth in demand and prices
- Recently-enacted policies and concerns over greenhouse gas (GHG) emissions, combined with high energy prices, moderate projected growth in energy consumption and emissions

# ***Oil prices in the reference case rise steadily; the full AEO includes a wide range of price cases***

2007 dollars per barrel

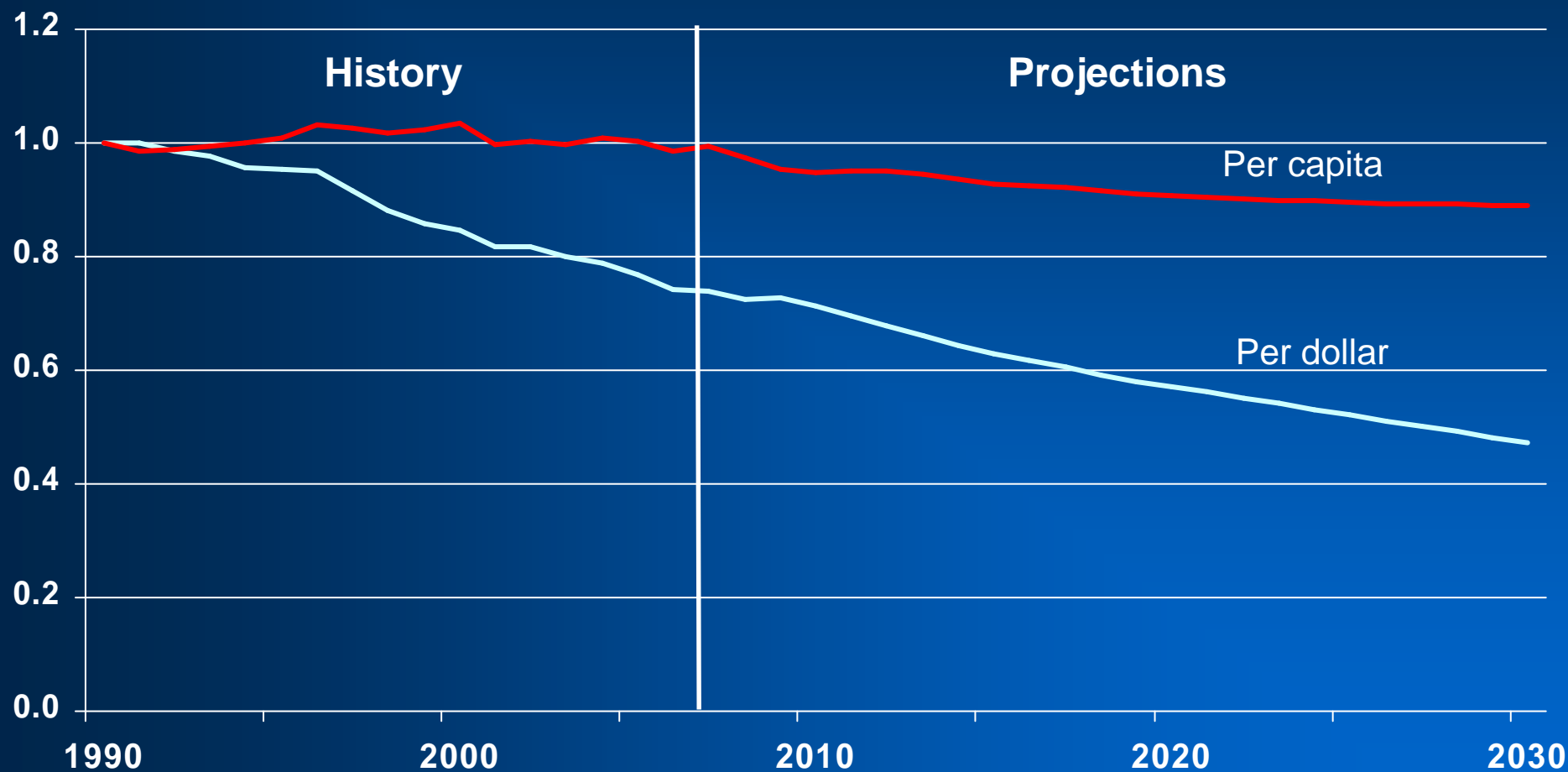


# Non-fossil energy use grows rapidly, but fossil fuels still provide 79 percent of total energy use in 2030



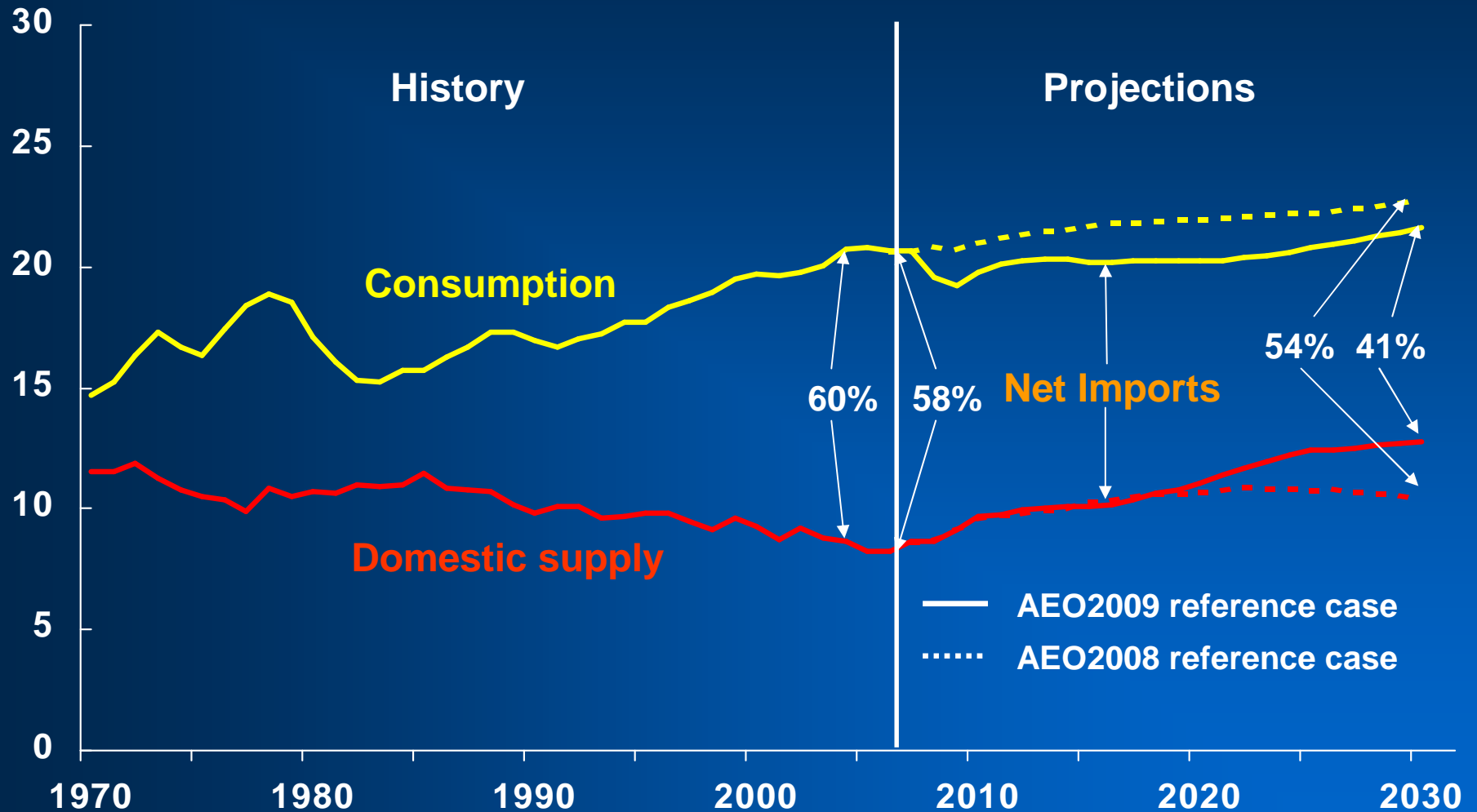
# Energy use per dollar of GDP continues to decline; per capita energy use also declines

index, 1990=1.0



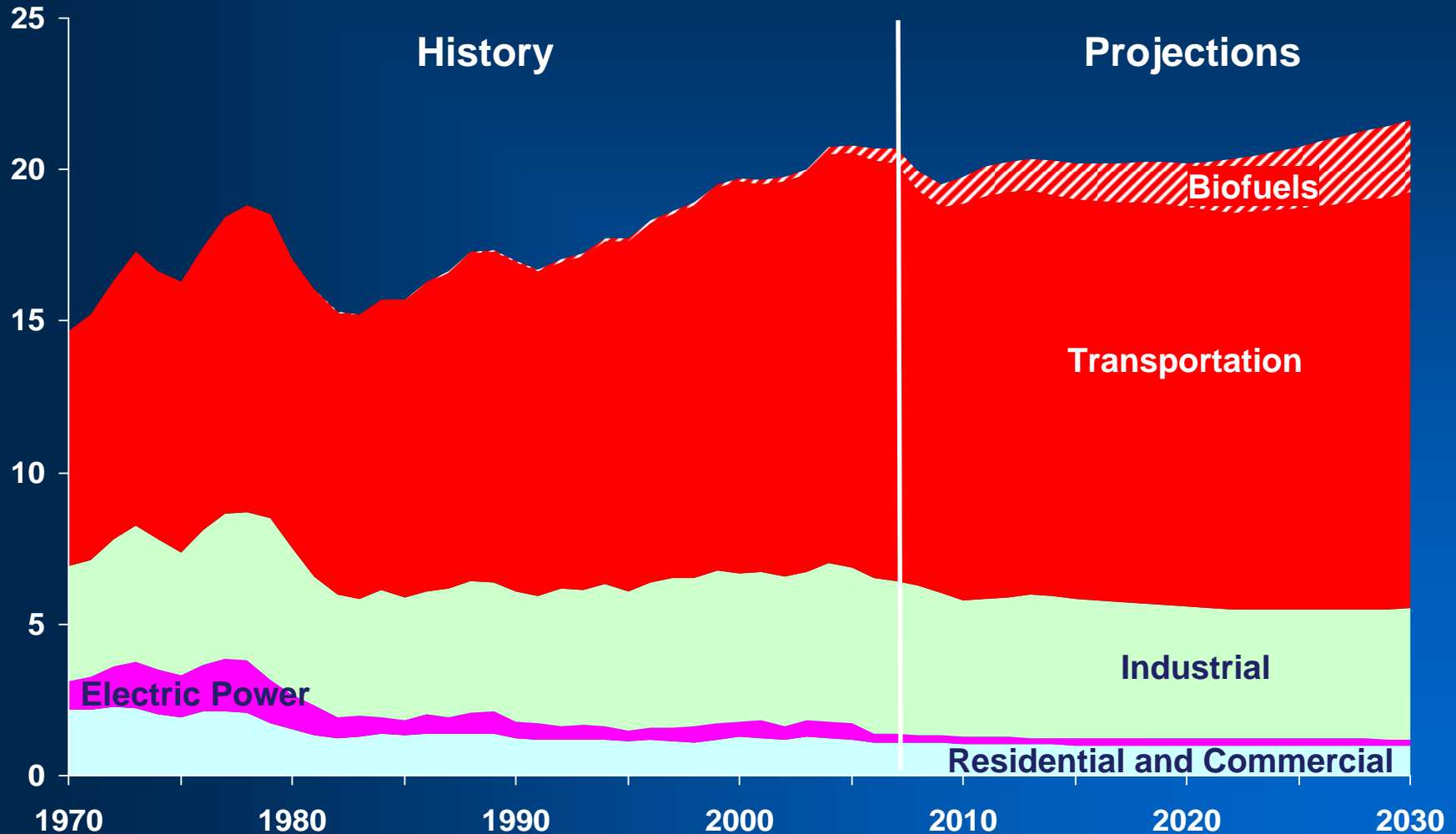
# Net dependence on imported liquids declines dramatically over the next 20 years

million barrels per day



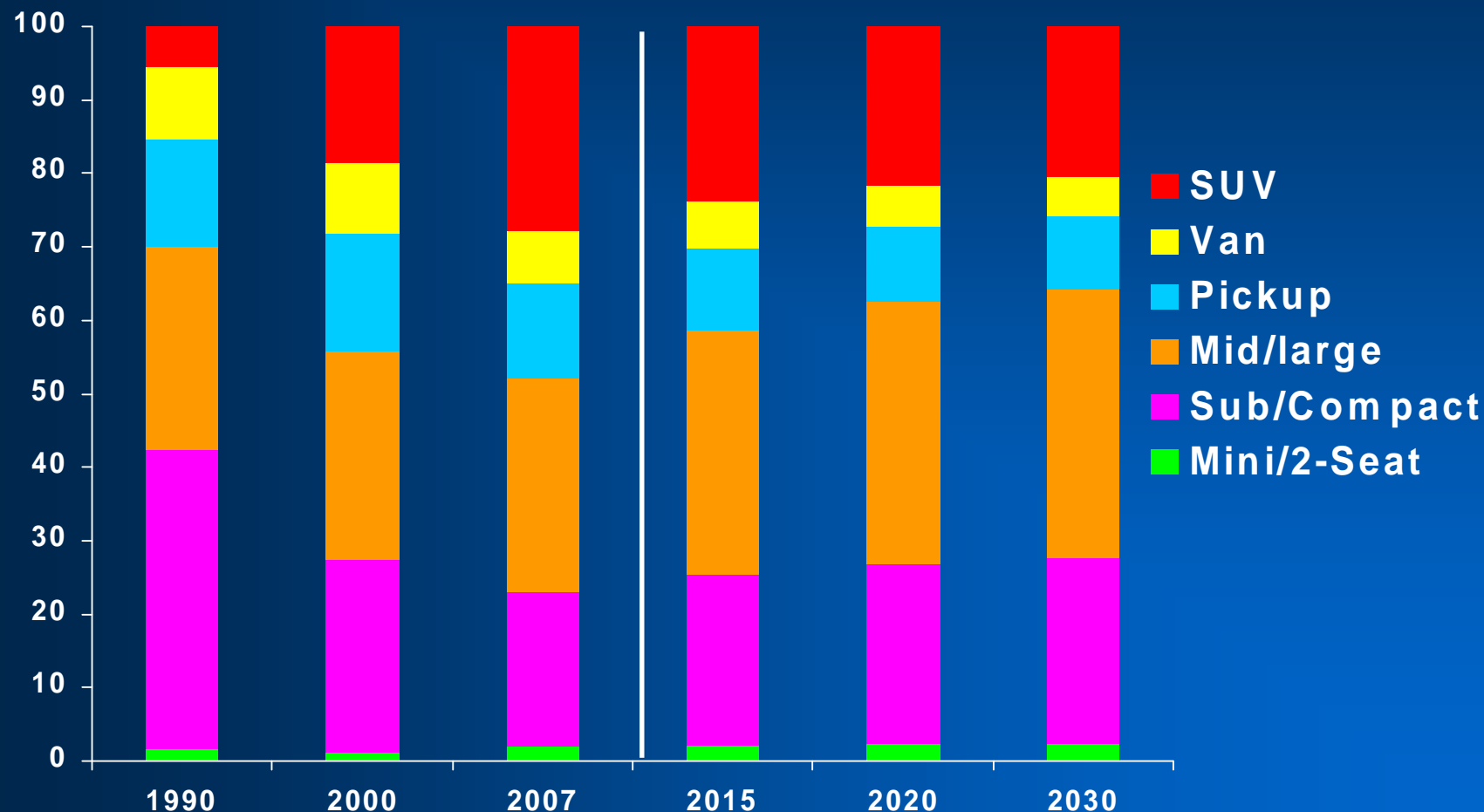
# ***Petroleum-based liquids consumption is projected to be flat as biofuels use grows***

million barrels per day



# *New light-duty vehicle sales shift from light trucks back to cars*

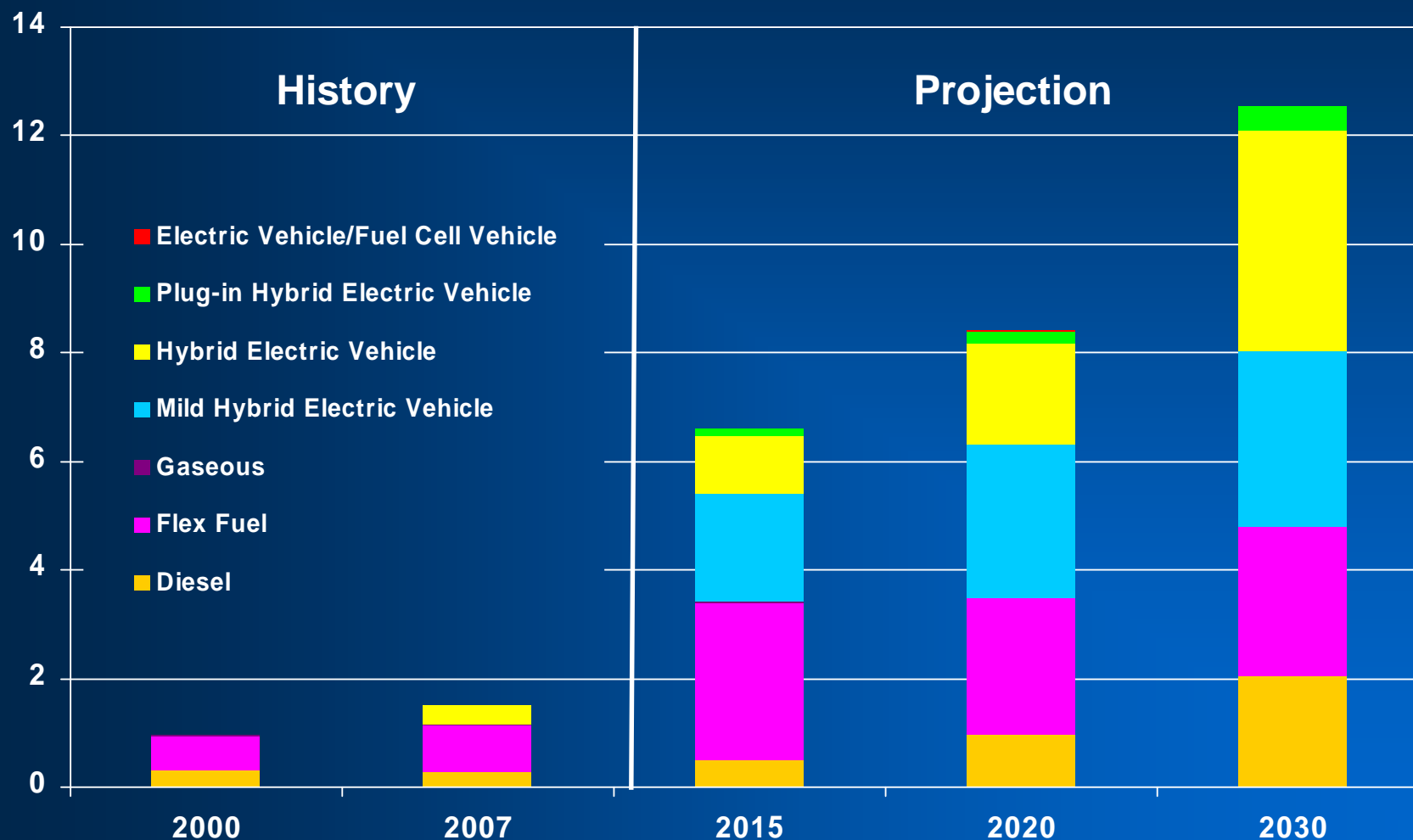
percent of total sales





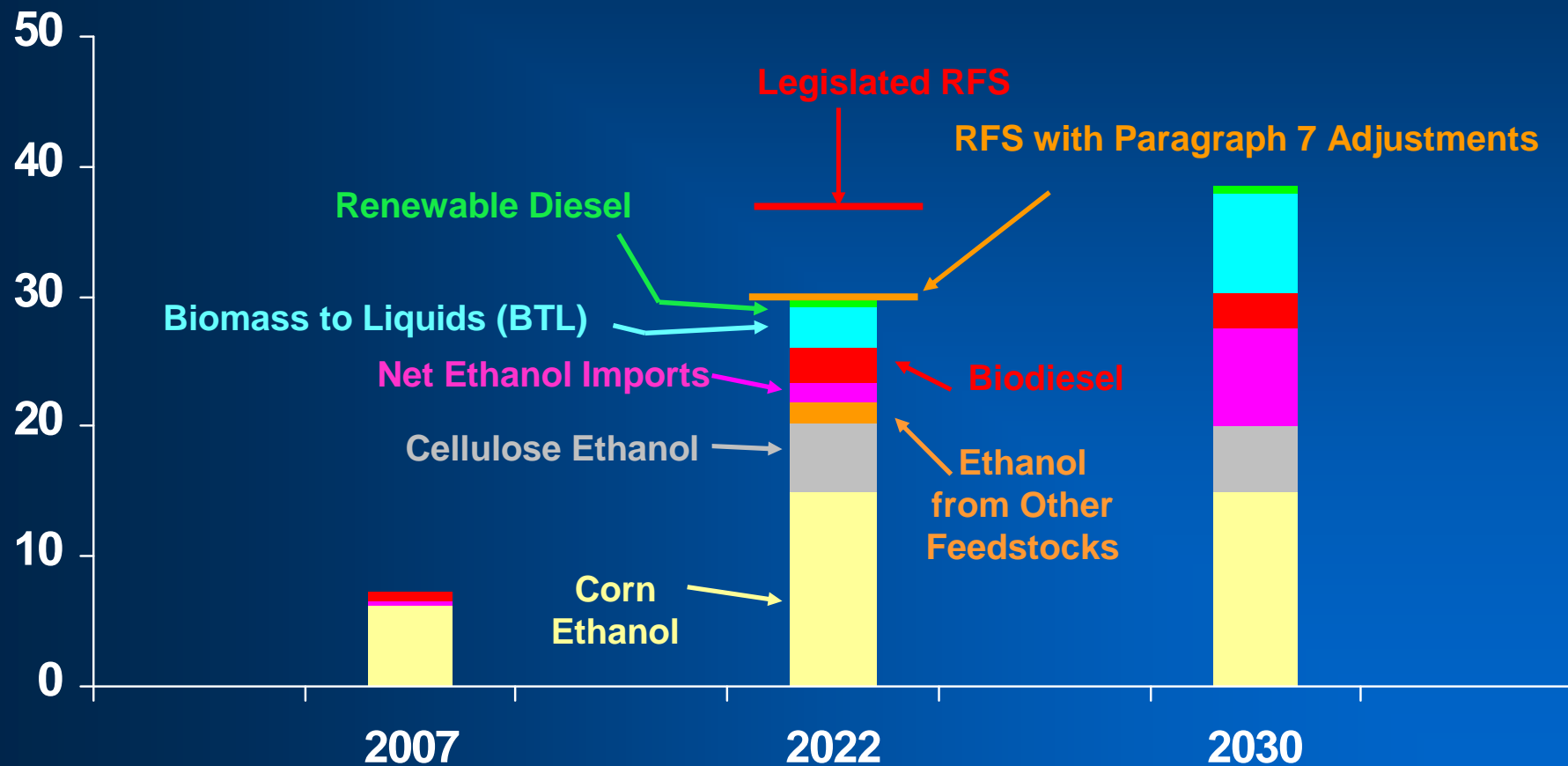
# Mild and full hybrid systems dominate new light-duty vehicle sales by 2030

millions of sales



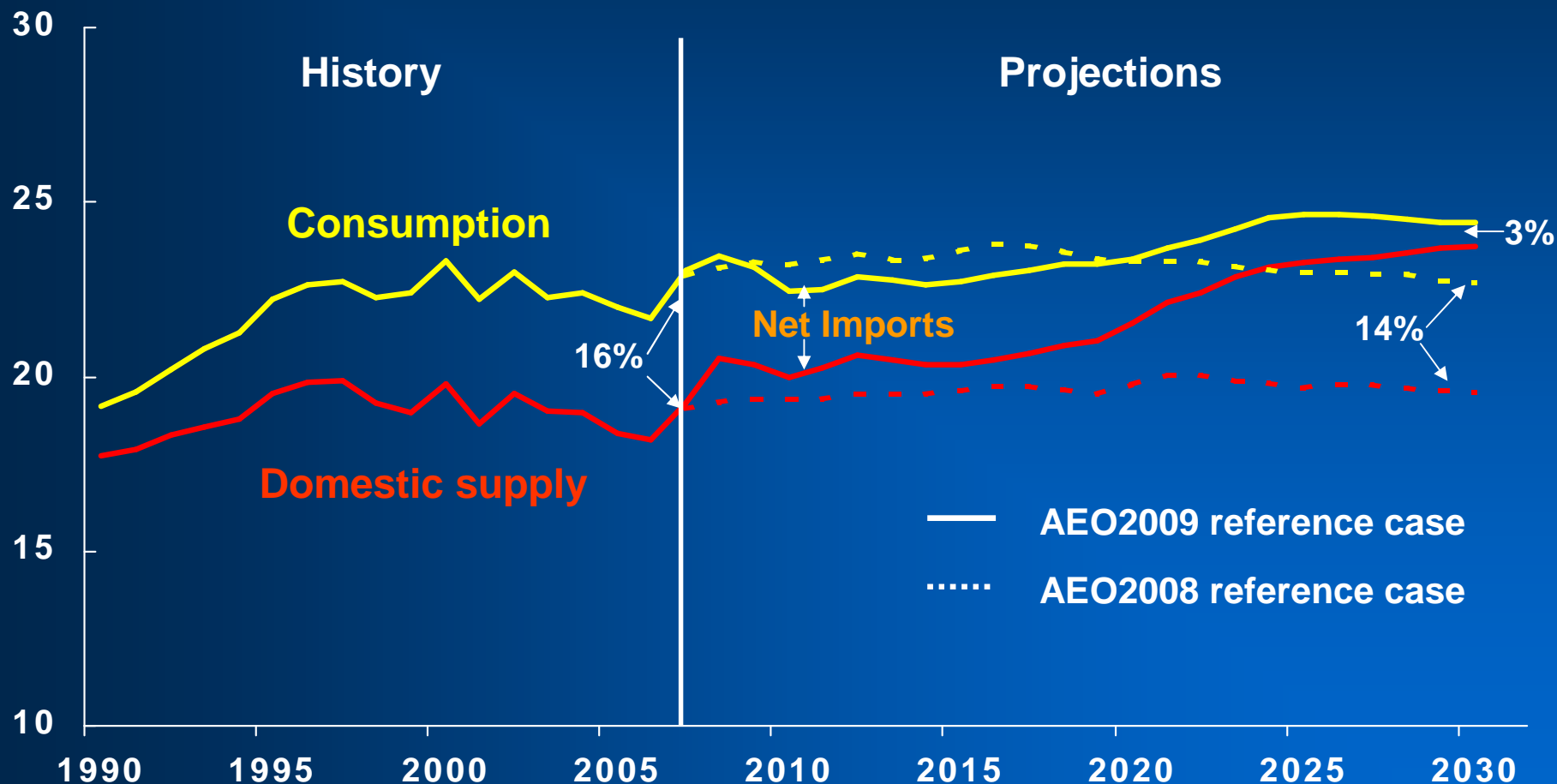
# Biofuels use falls short of the 36 billion gallon RFS target in 2022, but exceeds it by 2030

billion credits



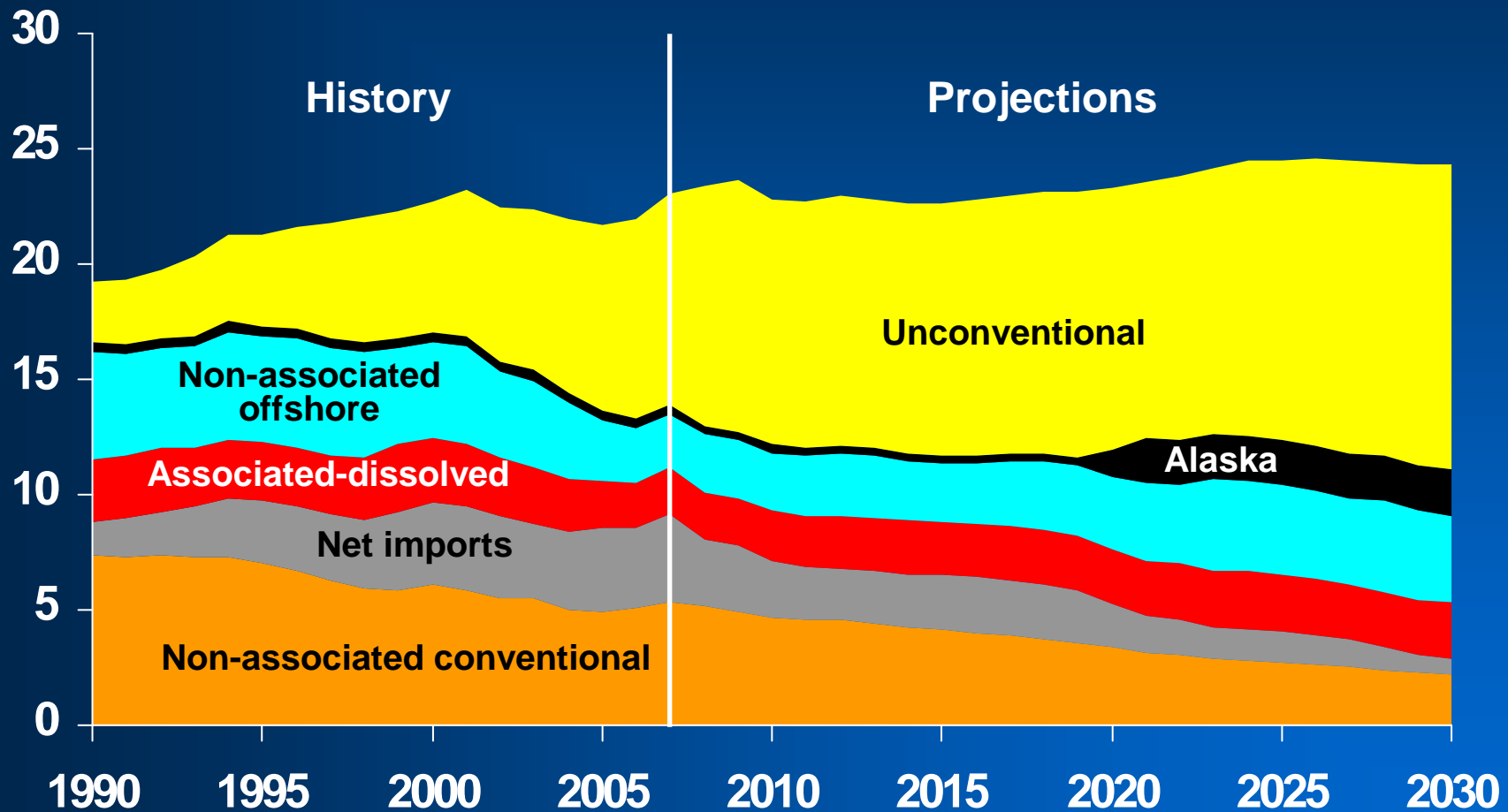
# The import share of natural gas supply declines sharply as domestic supply grows

trillion cubic feet



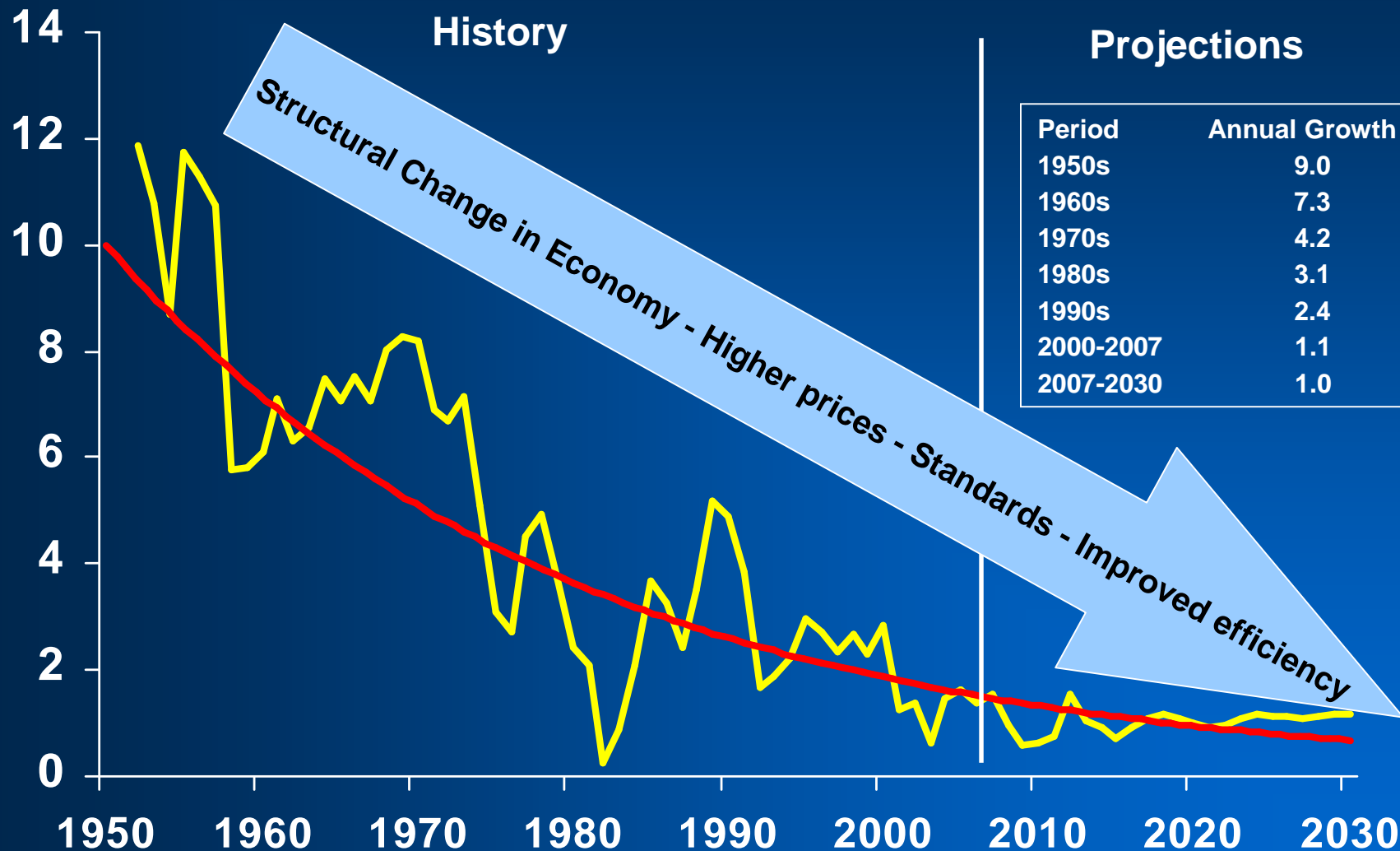
# Unconventional production meets most growth in natural gas demand and offsets the decline in conventional production and imports

trillion cubic feet



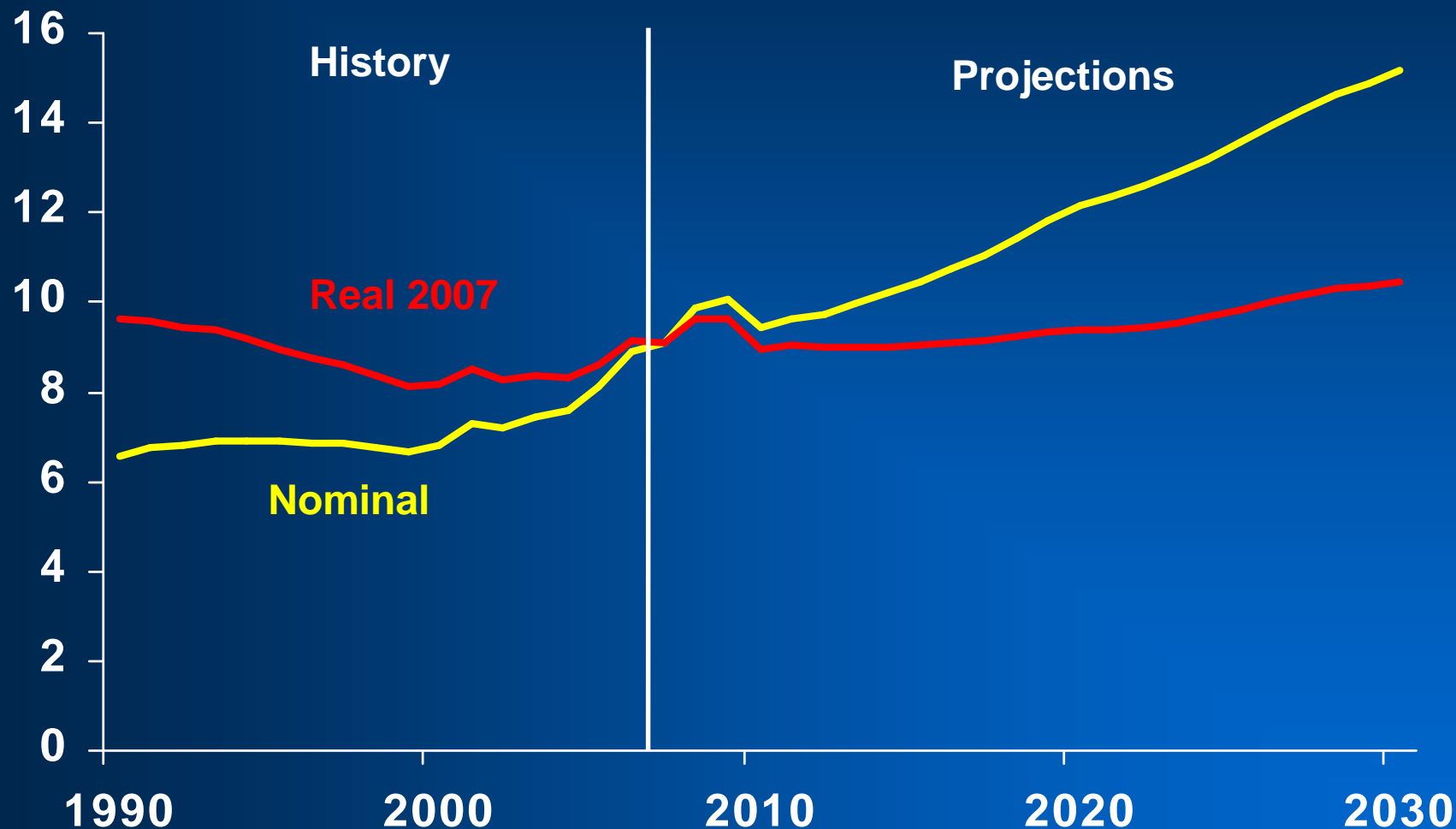
# Growth in electricity use continues to slow

3-year rolling average percent growth



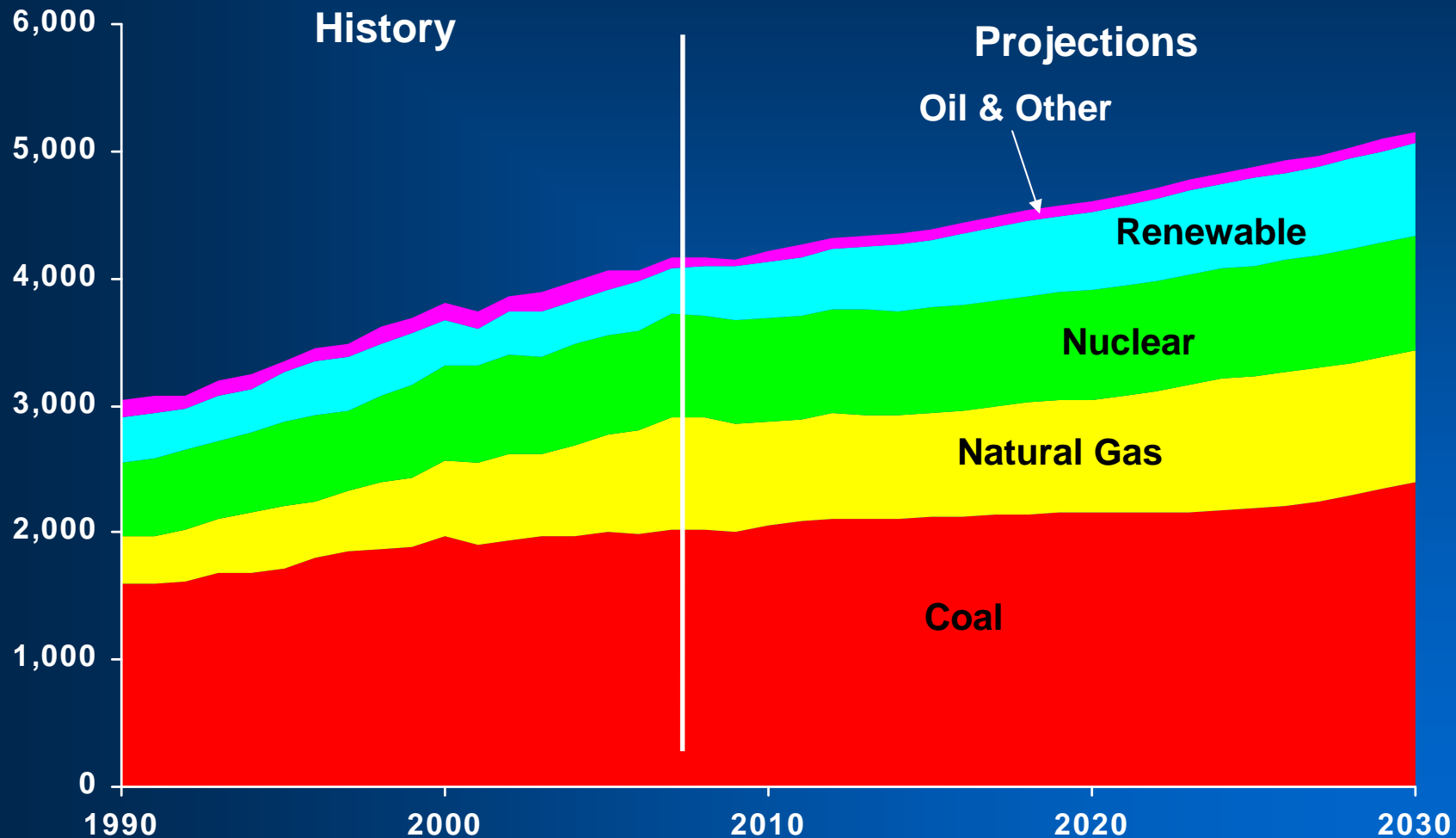
# Electricity prices rise with higher capital and fuel costs and growing demand

cents per kilowatthour



# Generation mix gradually shifts to lower carbon options

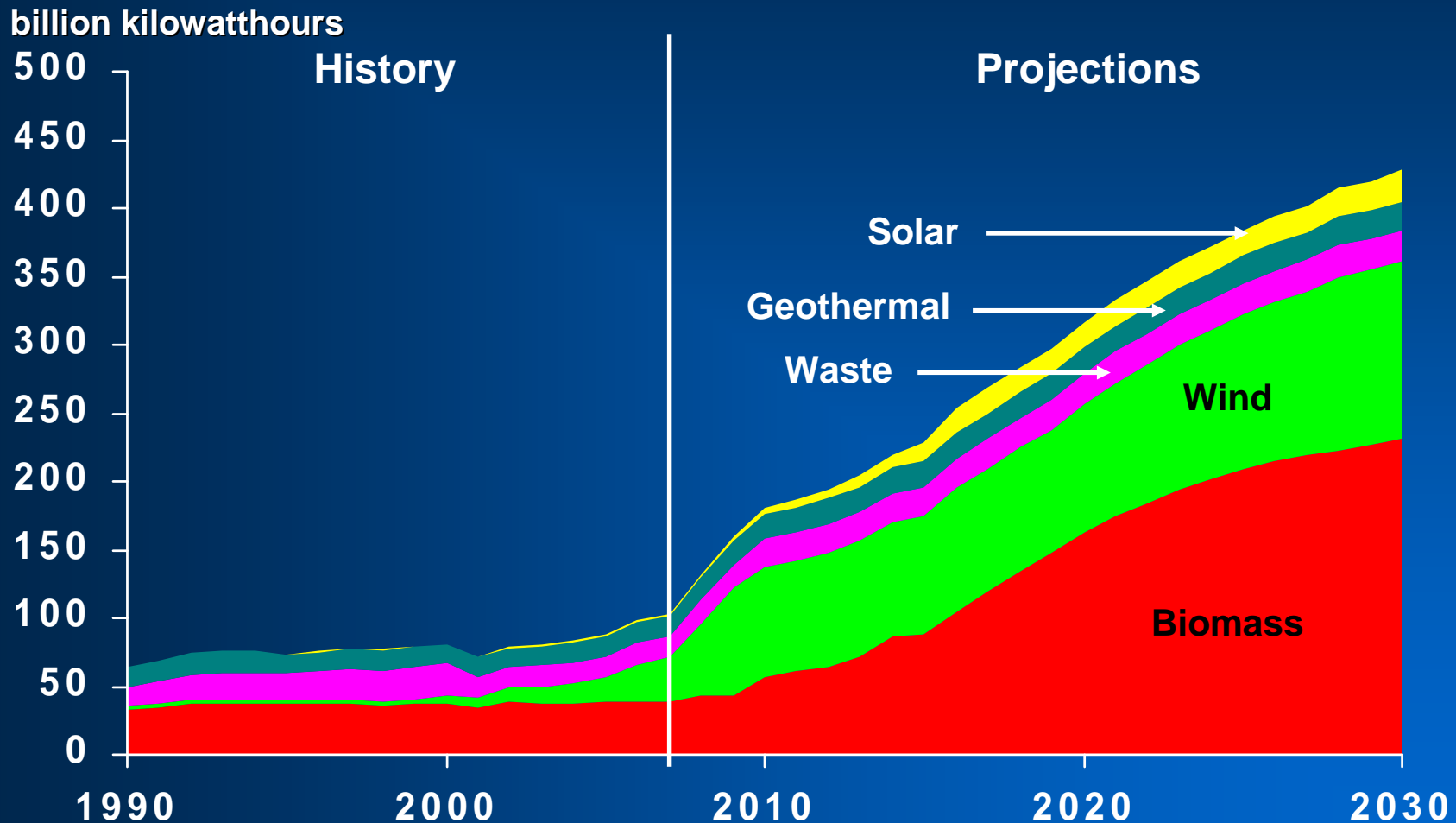
billion kilowatthours



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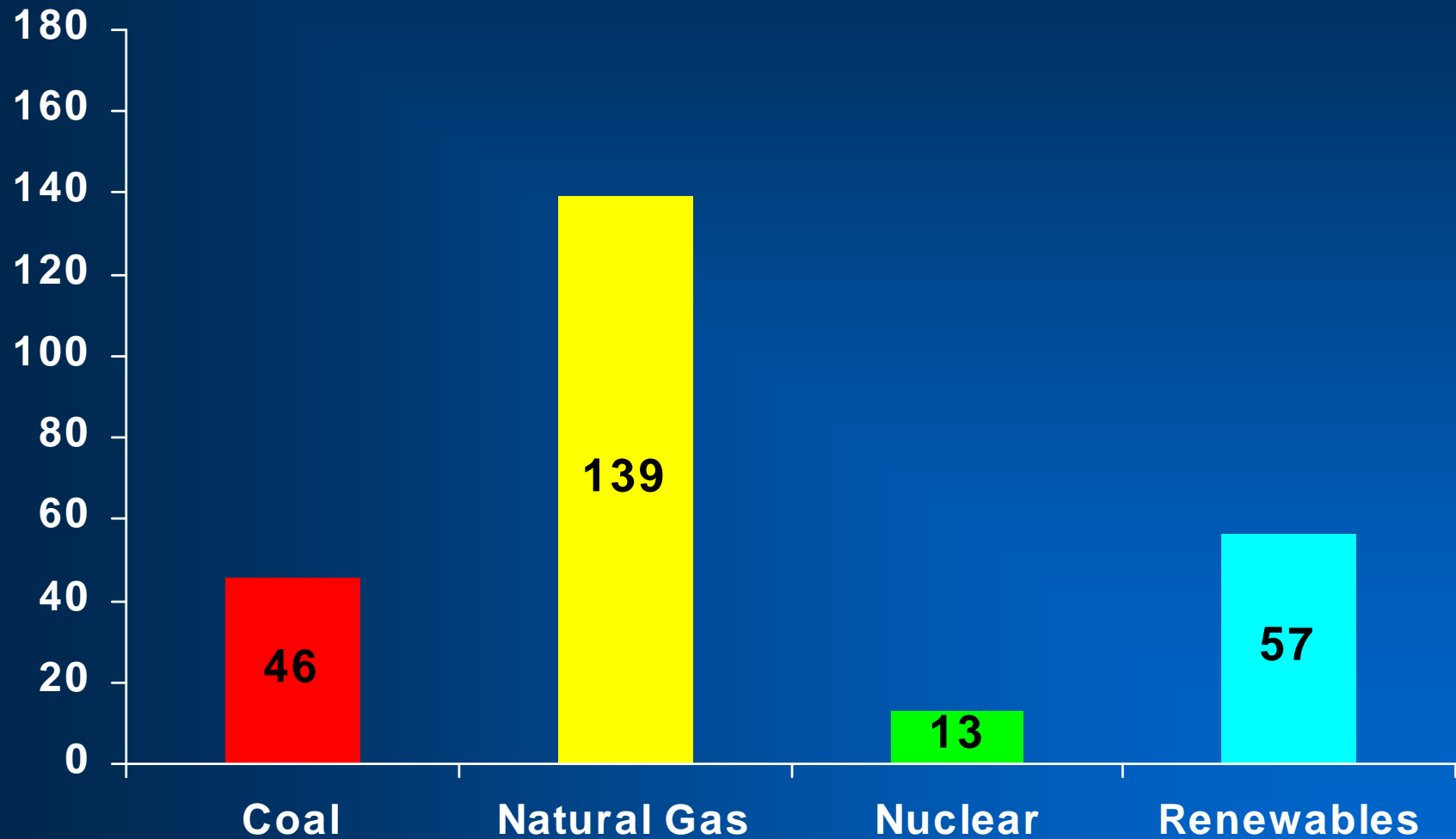
# Nonhydropower renewable power meets 33% of total generation growth between 2007 and 2030



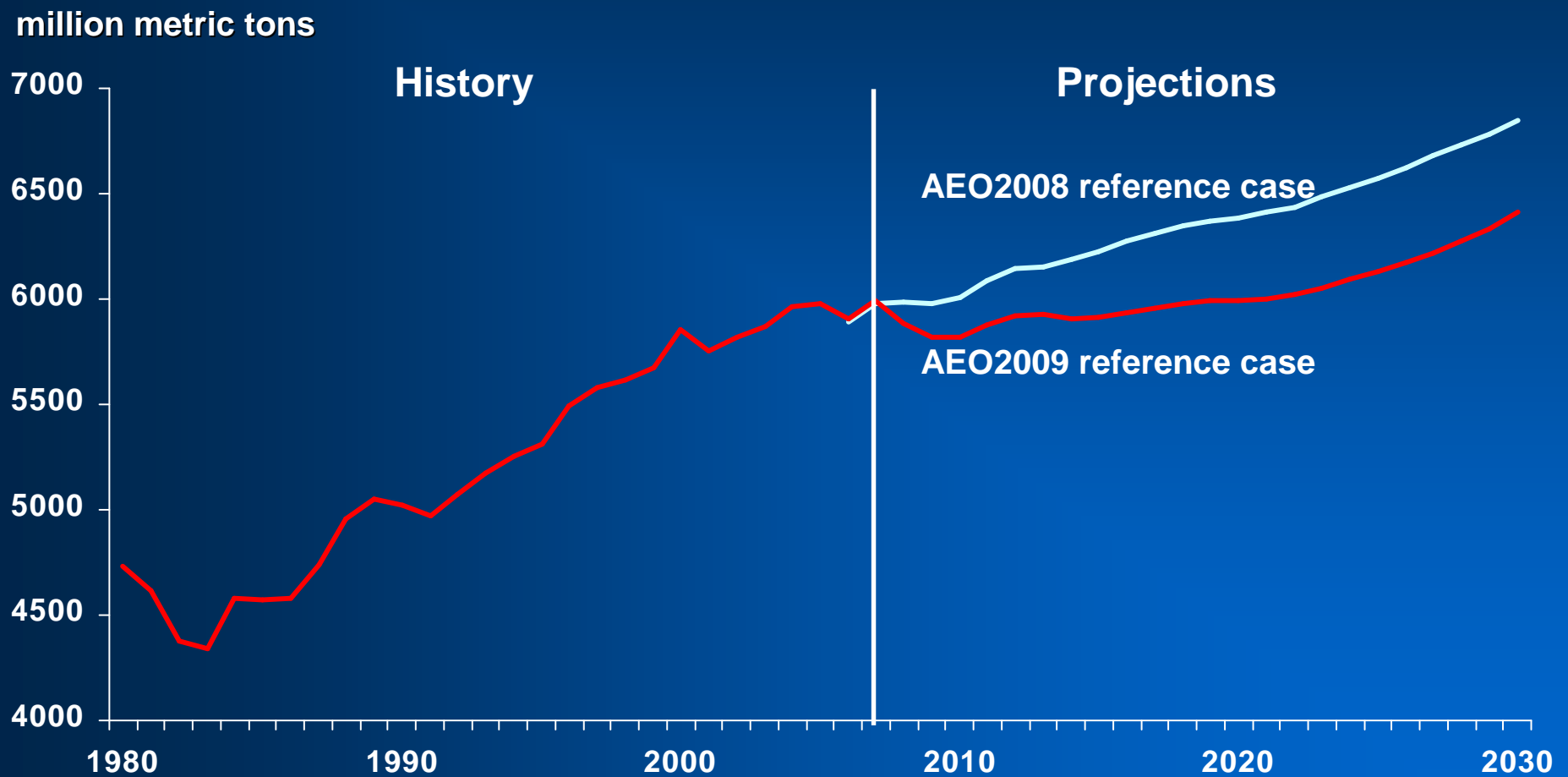


# **Natural gas and renewables provide most of the generating capacity added between 2007 and 2030**

gigawatts

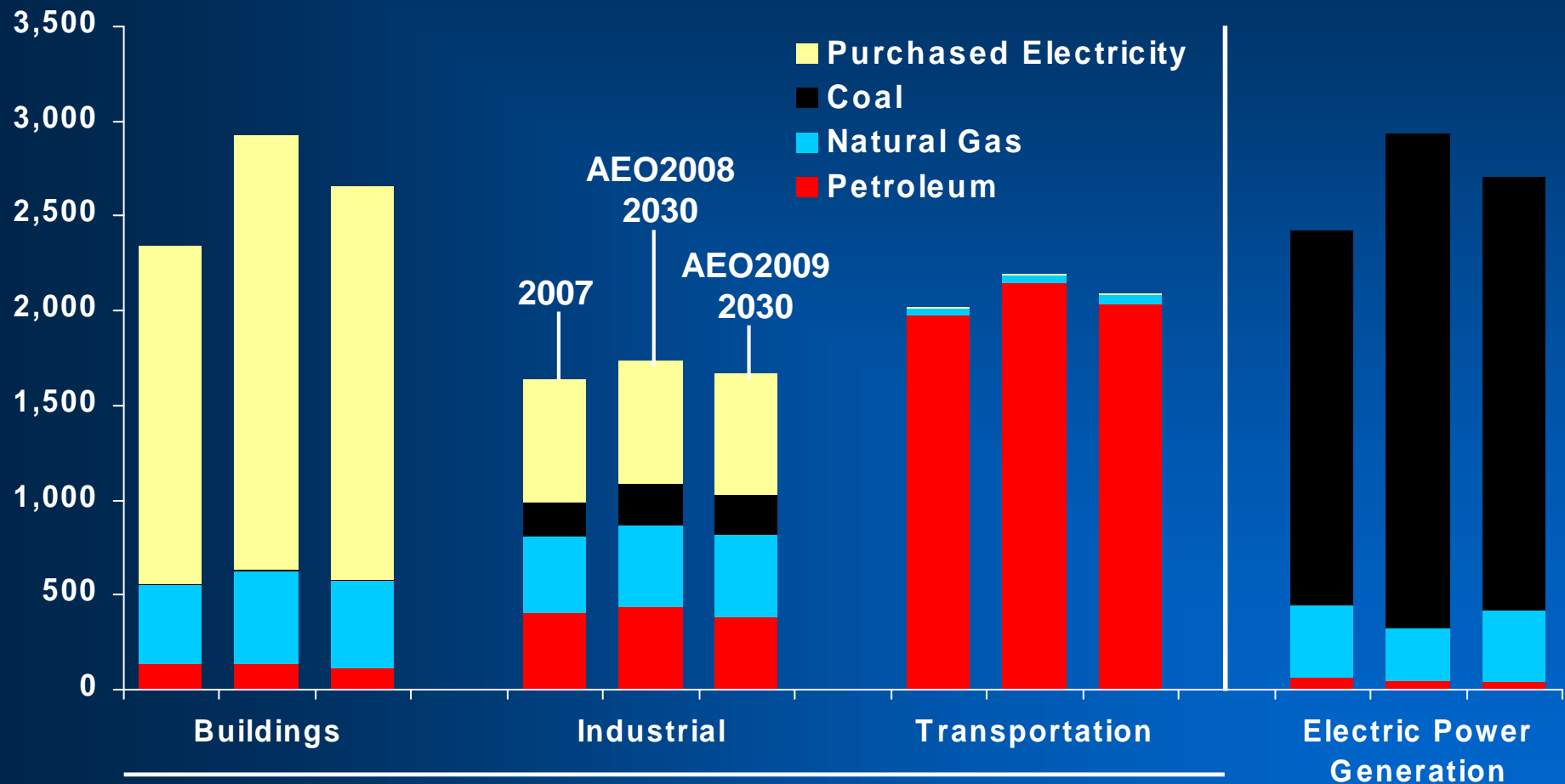


# Growth in energy-related CO<sub>2</sub> emissions slows with slowing growth in energy use and a shift to less carbon-intensive fuels



# Electricity generation is the dominant source of CO<sub>2</sub> emissions growth

million metric tons



Delivered, including losses in electricity generation

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## ***Key results from AEO2009 reference case***

- World oil prices rise to higher levels due to growth in world demand and more limited access to resources
- U.S. oil use remains near its present level through 2030 as modest growth in overall liquids demand is met by biofuels
- U.S. dependence on imported oil, measured as a share of U.S. liquids use, is expected to decline sharply over the next 25 years
- Natural gas import share of total supply also declines sharply due to increased domestic production with higher prices
- Unconventional natural gas production, lead by gas shales, is expected to provide the majority of growth in gas supply
- Energy-related CO<sub>2</sub> emissions grow at 0.3 percent per year, absent any new policy to control emissions

## Periodic Reports

*Petroleum Status and Natural Gas Storage Reports, weekly*

*Short-Term Energy Outlook, monthly*

*Annual Energy Outlook 2009, December 2008/ February 2009*

*International Energy Outlook 2008, August 2008*

*U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves 2007, October 2008 (Advance Summary), January 2009 (Full Report)*

## Examples of Special Analyses

*Analysis of Crude Oil Production in the Arctic National Wildlife Refuge, May 2008*

*Energy Market and Economic Impacts of S.2191, the Lieberman-Warner Climate Security Act of 2007, April 2008*

*“Impacts of Increased Access to Oil and Natural Gas Resources in the Lower 48 Federal Outer Continental Shelf,” Annual Energy Outlook 2007*

*The Global Liquefied Natural Gas Market: Status and Outlook, December 2003*

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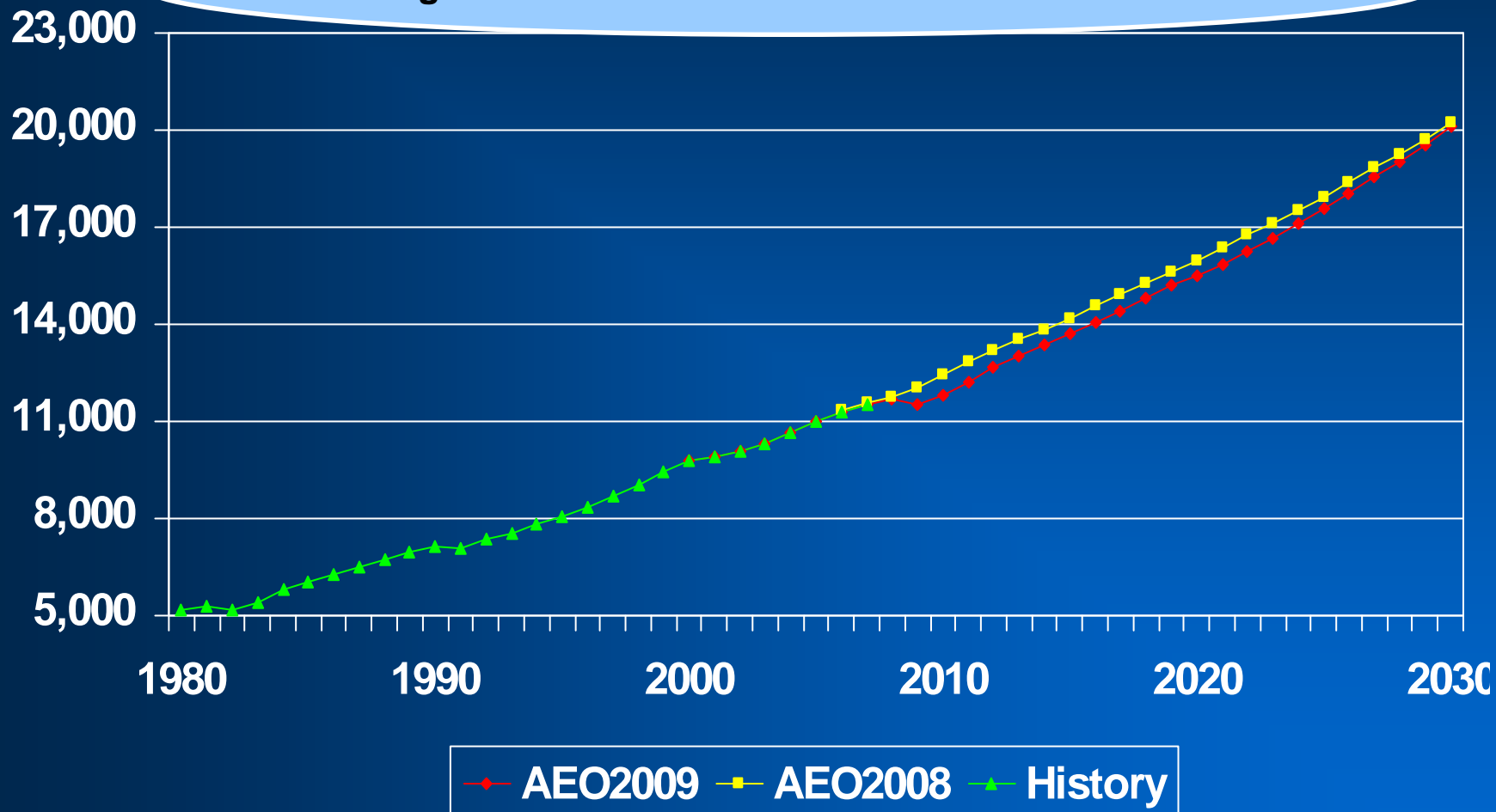


## ***GHG regulatory uncertainty in the AEO2009***

- Although no Federal legislation has been passed, regional groups and State regulators are enacting regulations and the financial community is behaving as if they anticipate regulations
- Energy companies are being encouraged to shift investments towards less GHG-intensive technologies
- To represent this behavior in the *AEO2009* reference case, a 3-percentage-point cost of capital penalty has been added when evaluating investments in GHG-intensive technologies
- This penalty is meant to represent the implicit cost being added to GHG-intensive projects to account for the risk that they may have to purchase allowances or make other investments in the future to offset GHG emissions

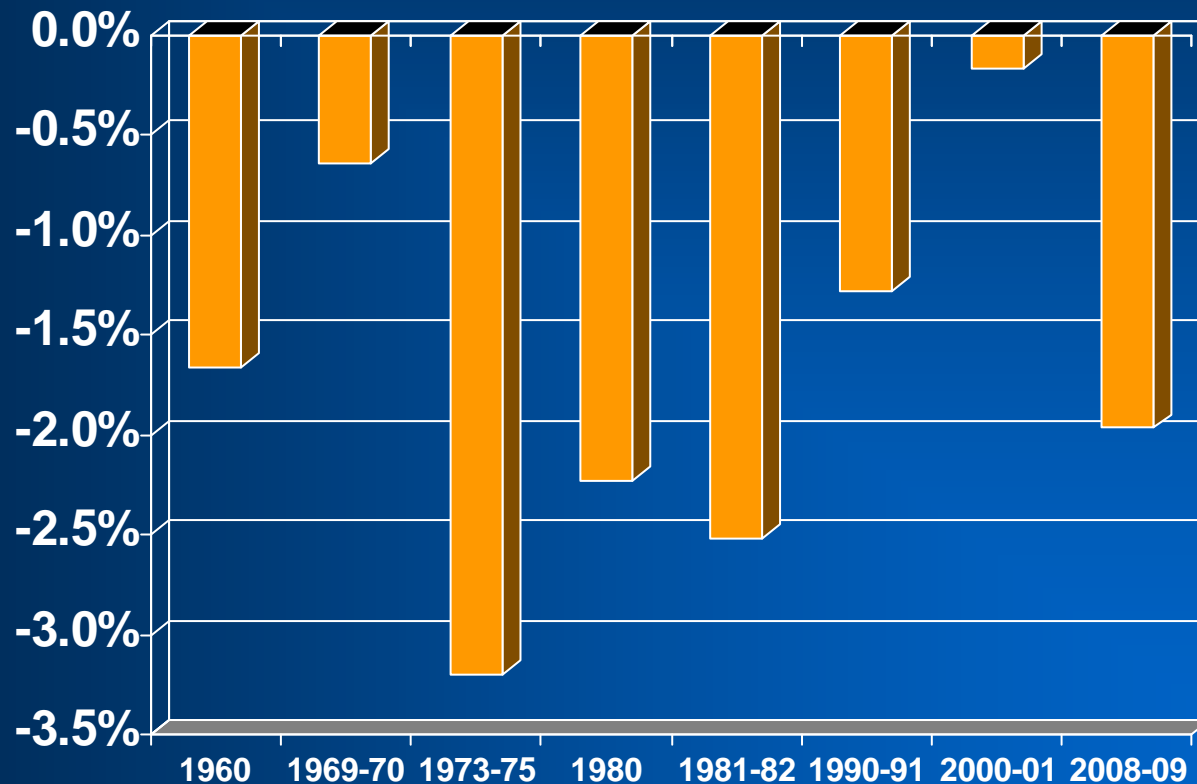
# U.S. Gross Domestic Product (billion 2000 chain-weighted dollars)

Economic growth returns to trend after near term slow down



# Peak to Trough Change in Real GDP (Percent)

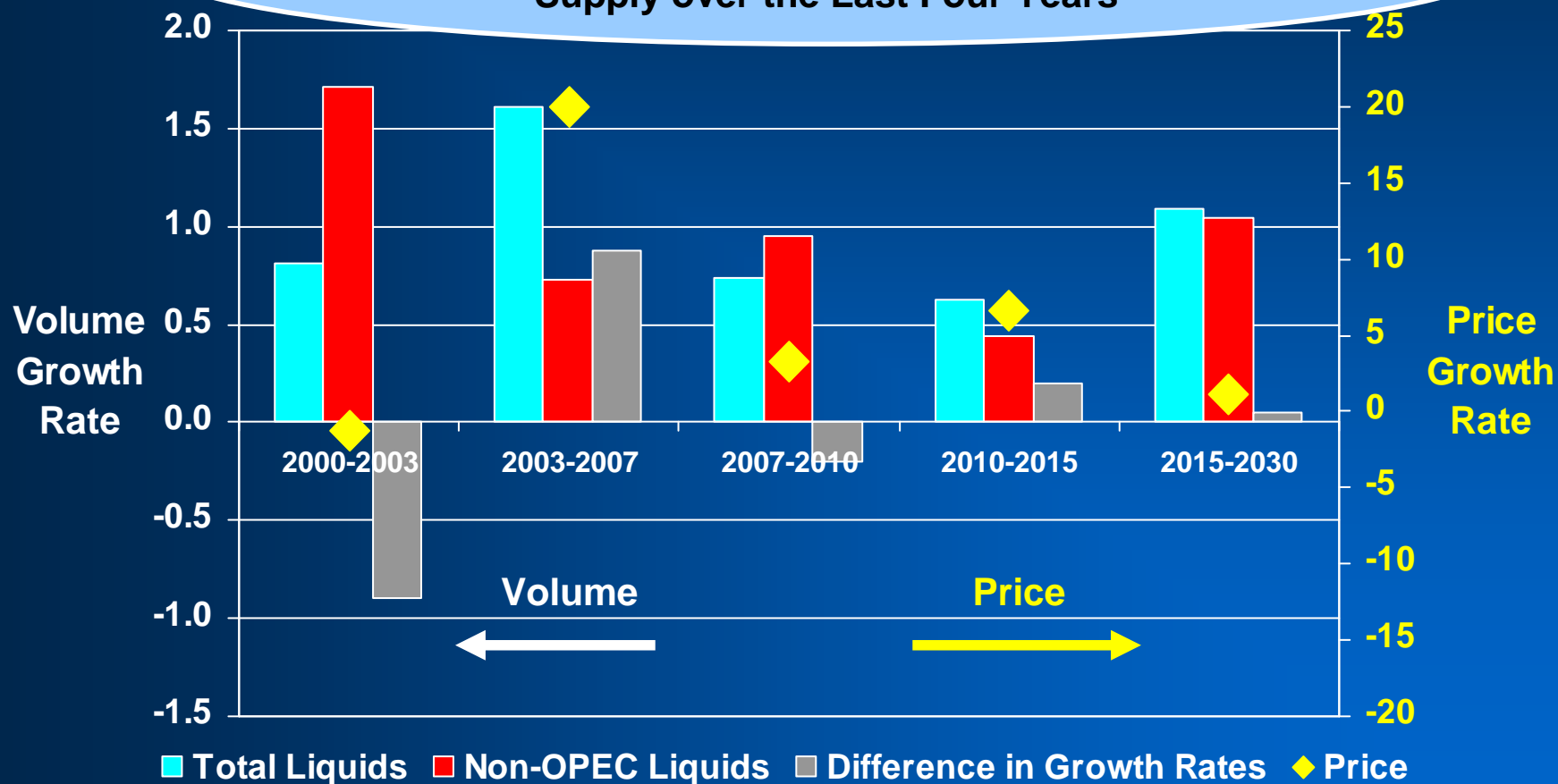
Reference Case Assumes Current Recession is Worse than  
Past Two Recessions



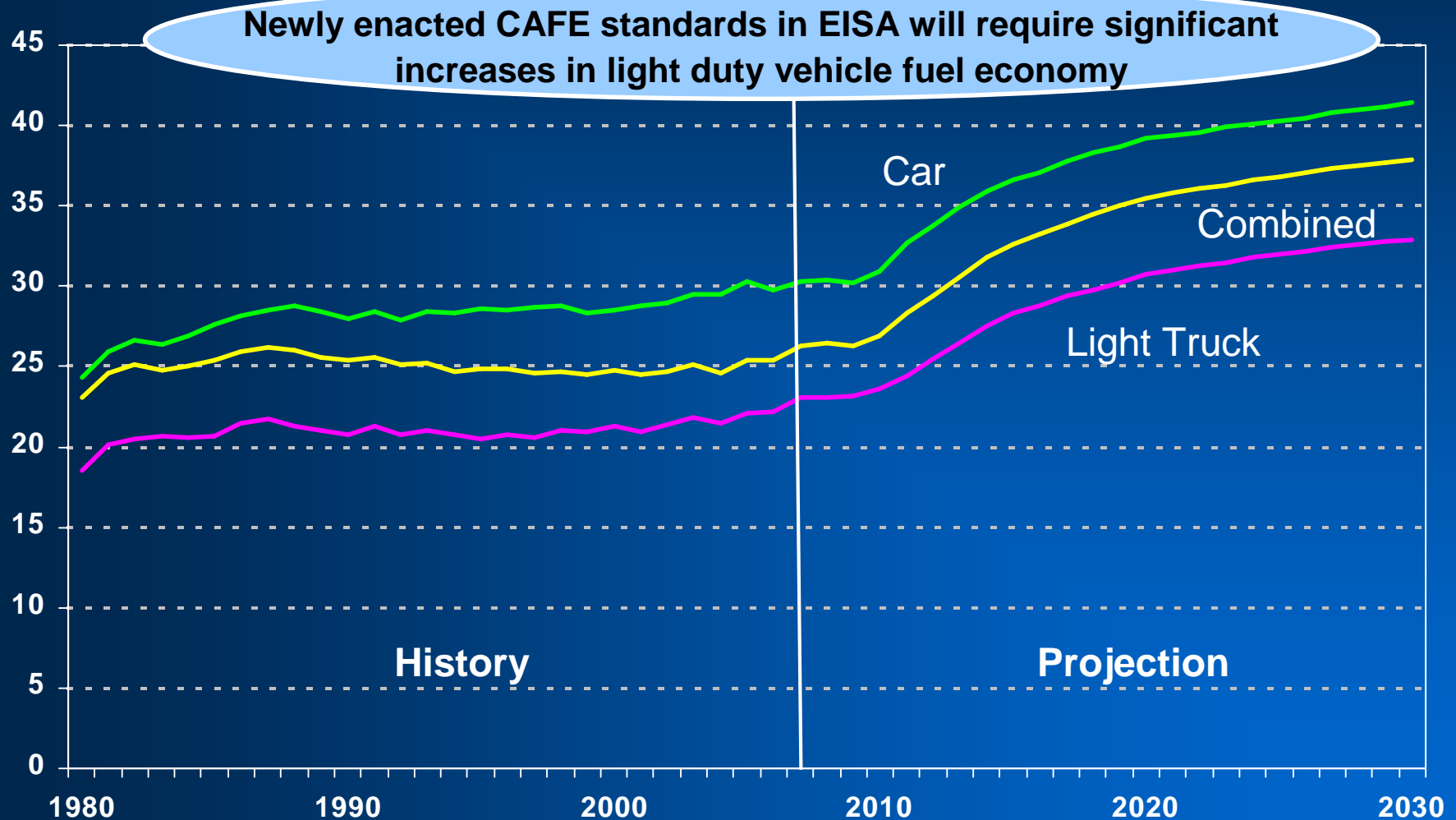


# Growth In Liquids Supply And Price (Average Percent Per Year)

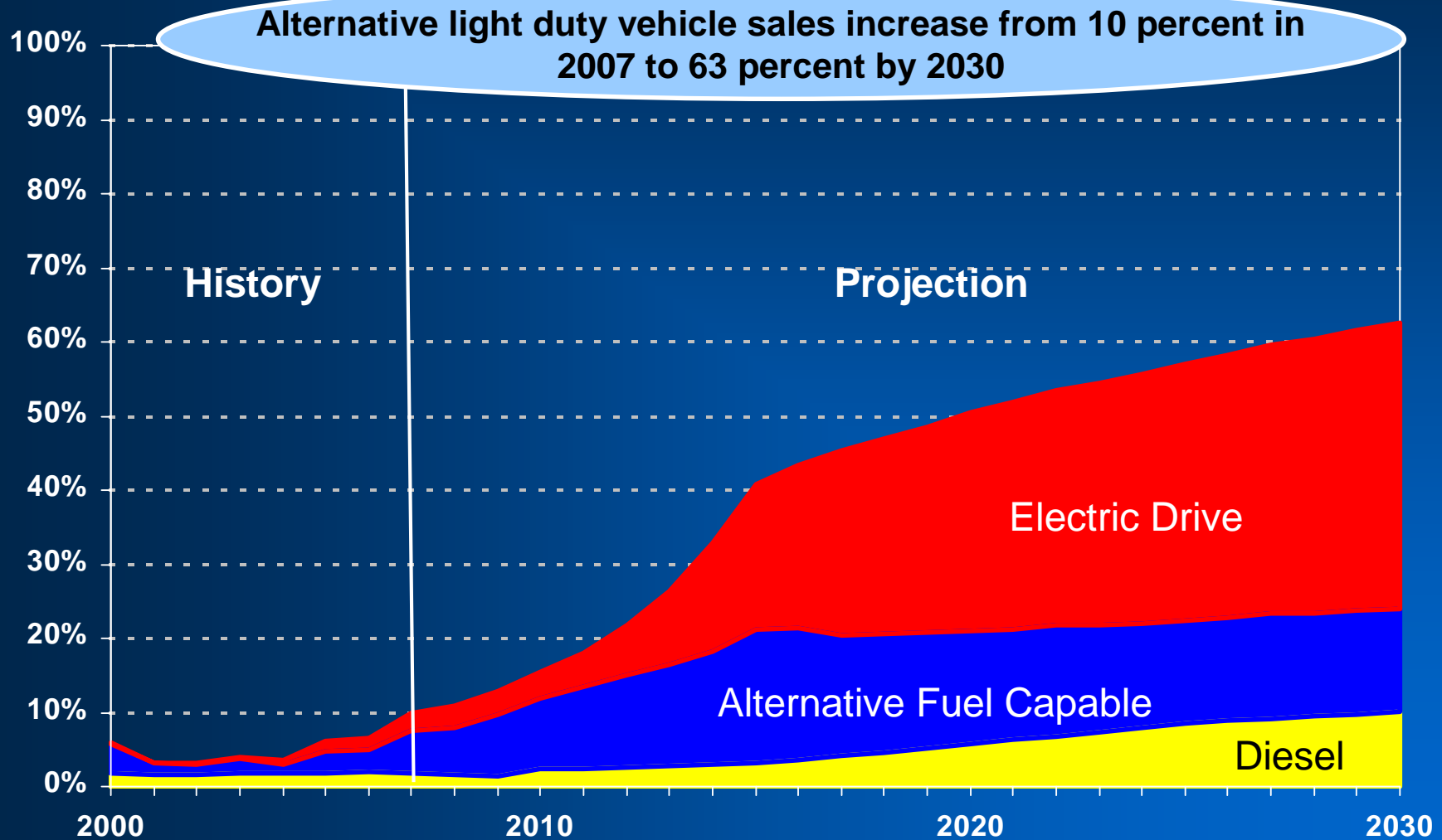
Demand for Liquid Fuels Grew More Rapidly than Non-OPEC Supply over the Last Four Years



# New Light Duty Vehicle Fuel Economy (miles per gallon, based on CAFE test)

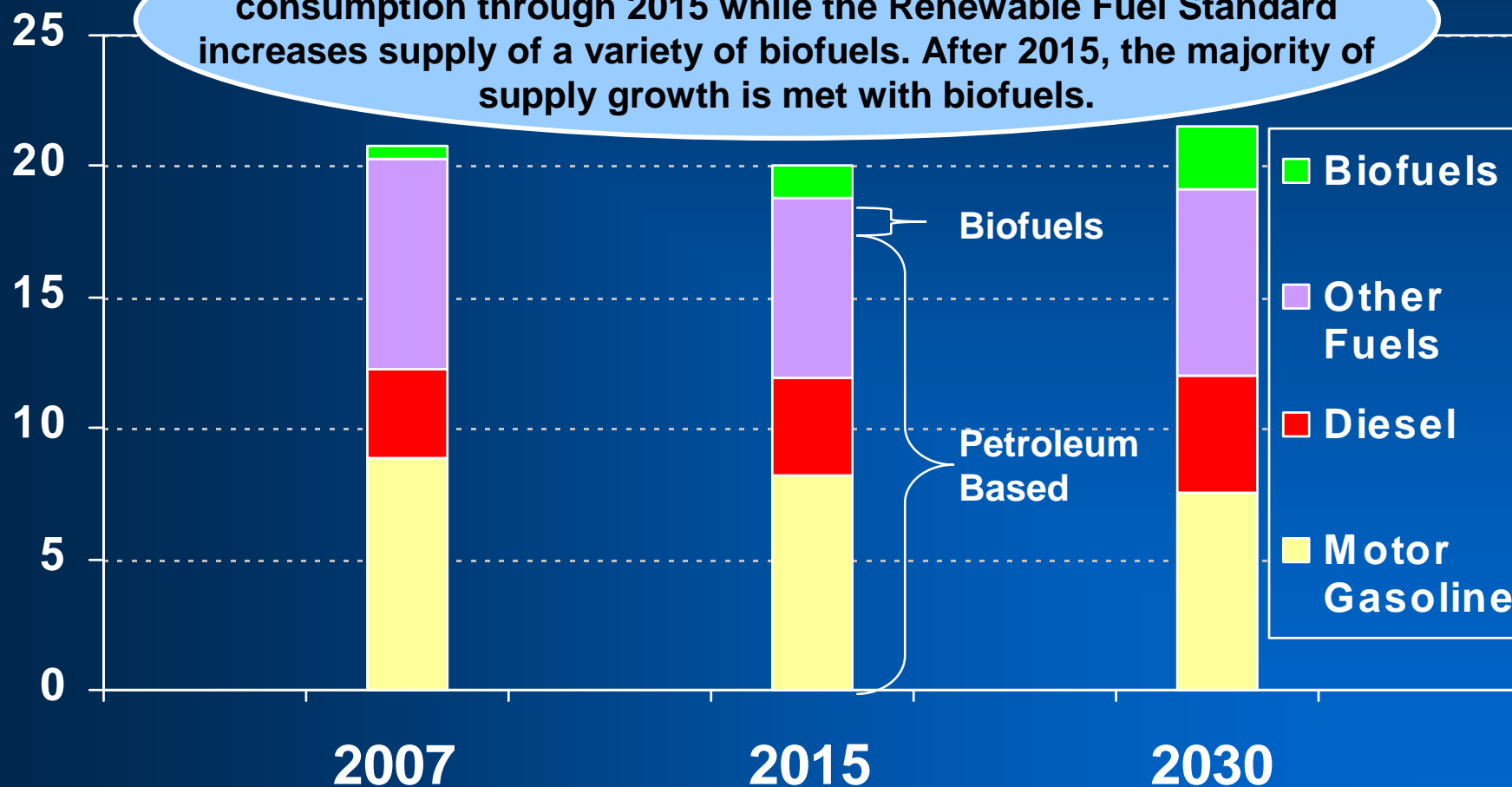


# New Alternative Light Vehicle Sales (percent of total sales)



# Components of Liquid Fuels (million barrels per day)

Higher world oil prices and technology dampen liquids consumption through 2015 while the Renewable Fuel Standard increases supply of a variety of biofuels. After 2015, the majority of supply growth is met with biofuels.



# Commercial electricity sales drive growth

billion kilowatthours

