

# The Outlook for Energy: A View to 2040

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May 12, 2016

**ExxonMobil**  
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# 2016

*The Outlook for Energy* includes Exxon Mobil Corporation's internal estimates and forecasts of energy demand, supply, and trends through 2040 based upon internal data and analyses as well as publicly available information from external sources including the International Energy Agency. Work on the report was conducted throughout 2015. This presentation includes forward looking statements. Actual future conditions and results (including energy demand, energy supply, the relative mix of energy across sources, economic sectors and geographic regions, imports and exports of energy) could differ materially due to changes in economic conditions, technology, the development of new supply sources, political events, demographic changes, and other factors discussed herein and under the heading "Factors Affecting Future Results" in the Investors section of our website at [www.exxonmobil.com](http://www.exxonmobil.com). This material is not to be used or reproduced without the permission of Exxon Mobil Corporation. All rights reserved.

# Key Energy Outlook Themes



**Energy** is fundamental to **standards of living**.



**Developing nations lead** gains in GDP and living standards.



**Economics** and **policies** impact the fuel mix.



**Oil** remains the world's primary fuel through 2040.



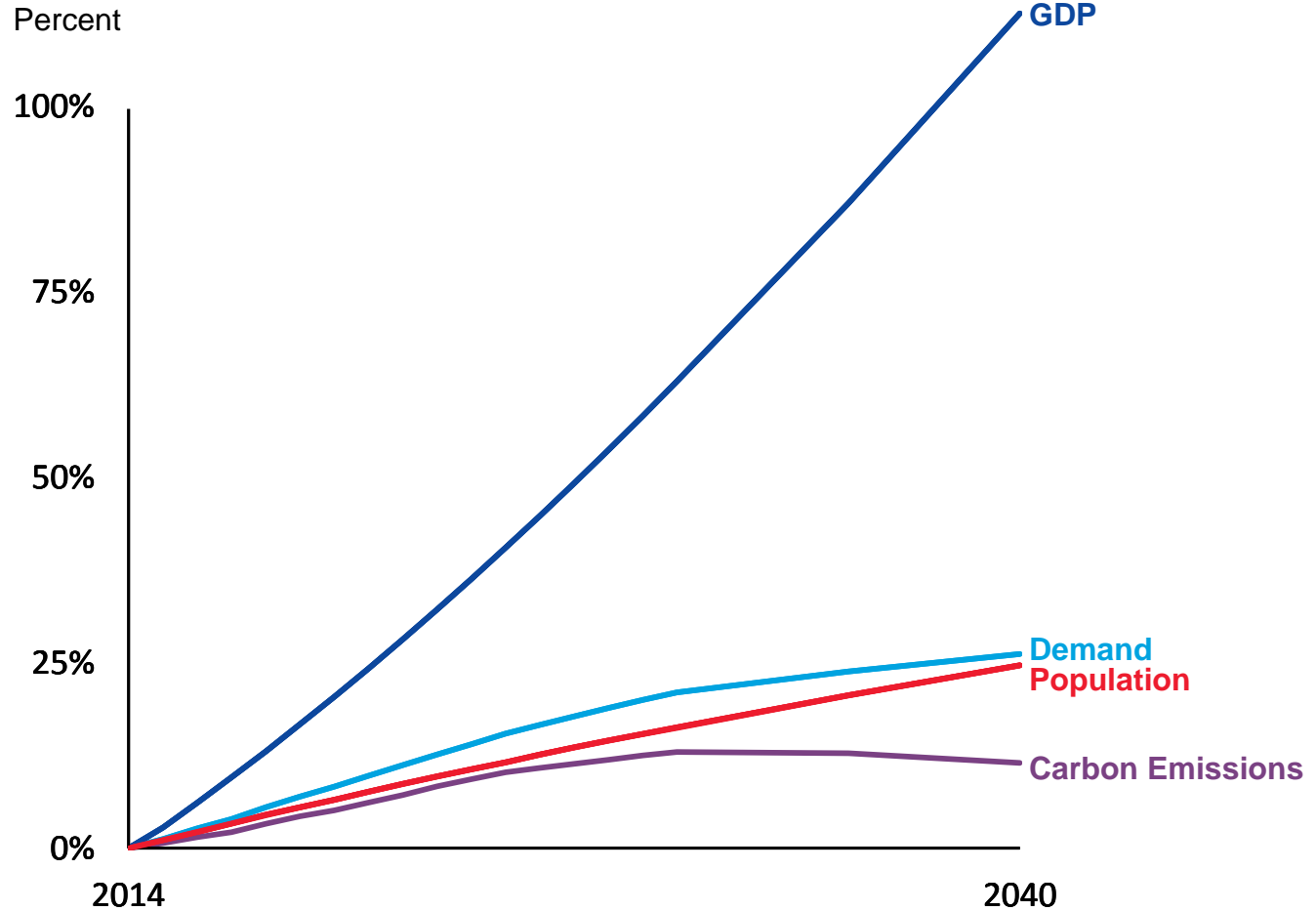
**Natural gas** grows more than any other energy source.



**Technology** has the highest potential and greatest uncertainty.

# Global Trends Continue to Evolve

## Growth from 2014 Level





**Energy** is fundamental  
to **standards of living.**

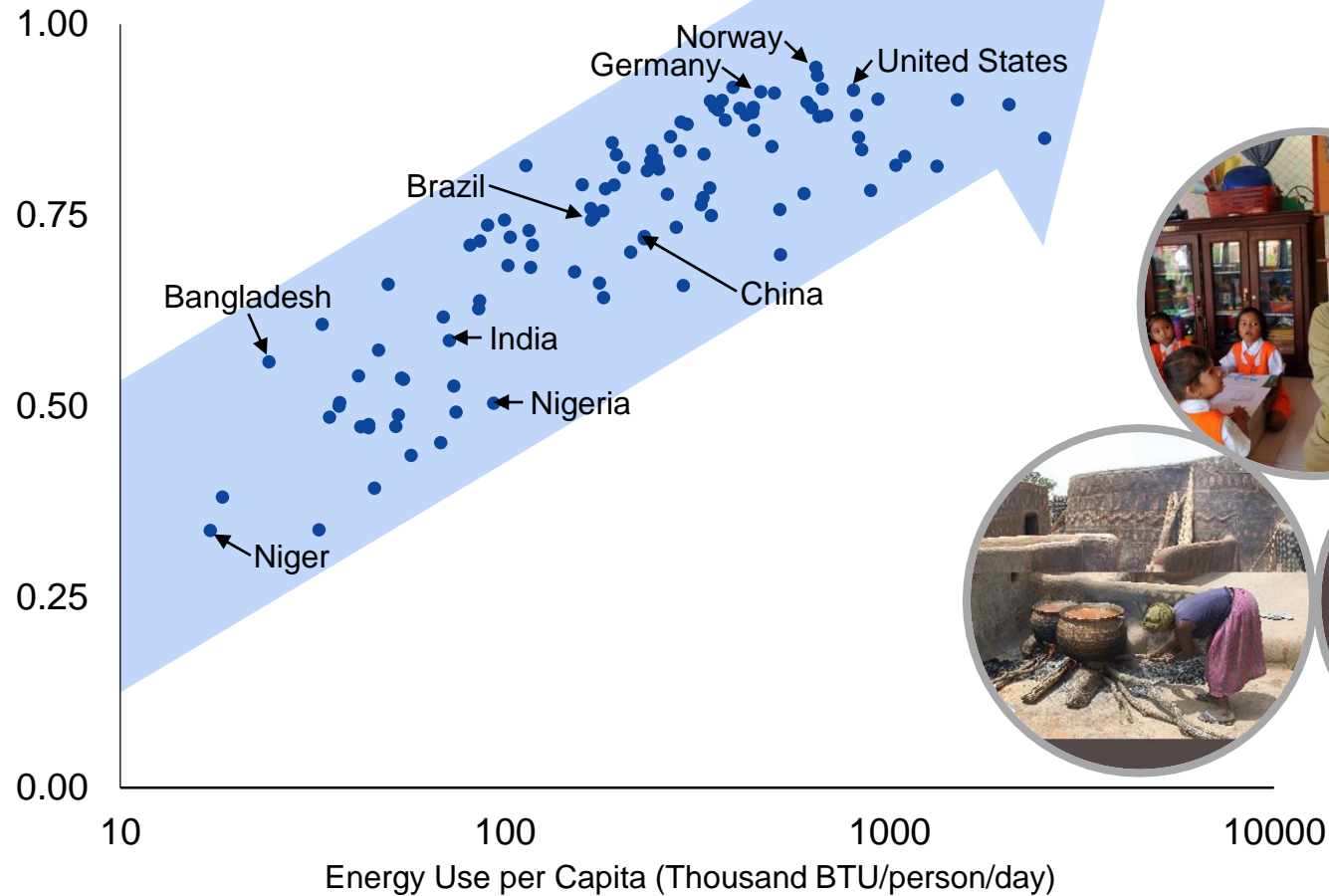
“Children cannot study in the dark.  
Girls and women cannot learn or be  
productive when they spend hours a  
day collecting firewood. Businesses and  
economies cannot grow without power.”

Secretary-General Ban Ki-moon  
United Nations Foundation

# Energy Fuels Human Development

## U.N. Human Development Index

2013 Index



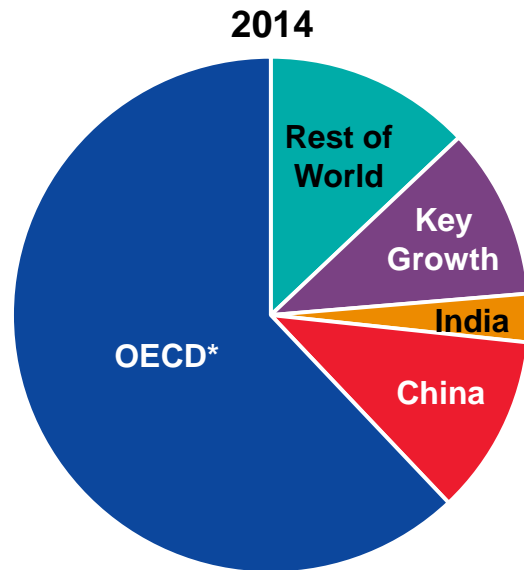
Source: United Nations, ExxonMobil estimates



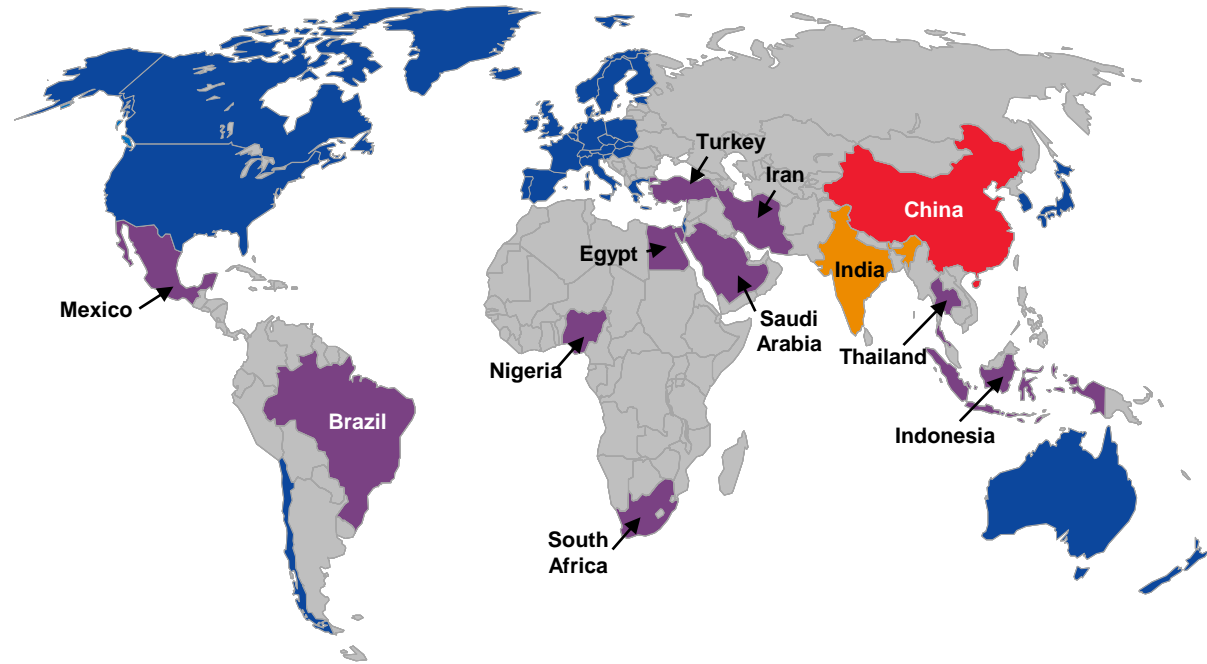


**Developing nations lead**  
in GDP growth and living  
standard improvements.

# Global GDP Shifts Toward Developing Nations



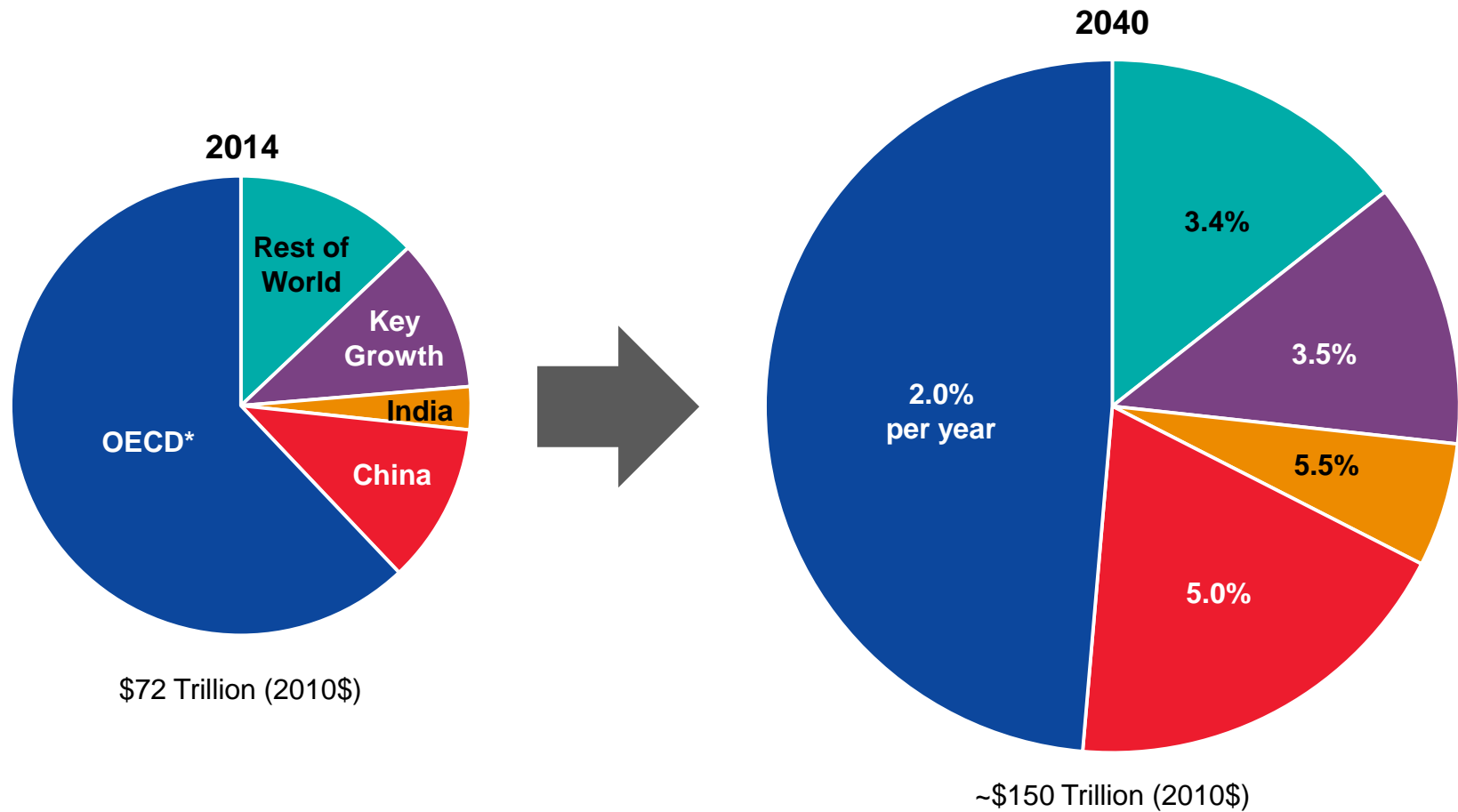
\$72 Trillion (2010\$)



*\*Mexico and Turkey included in Key Growth countries*



# Global GDP Shifts Toward Developing Nations

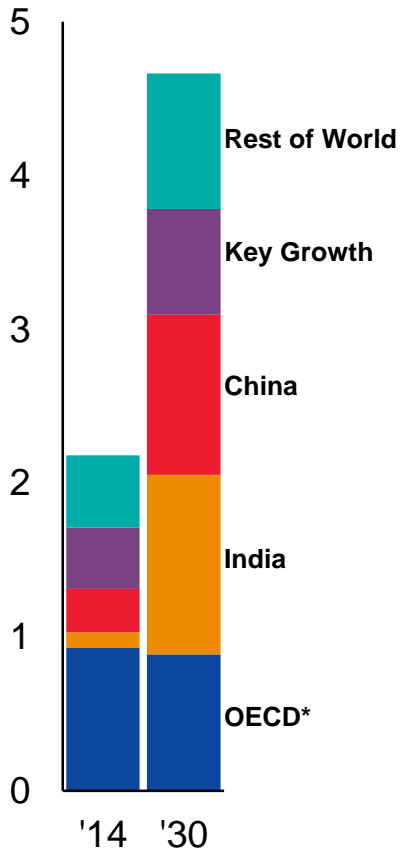


\*Mexico and Turkey included in Key Growth countries

# Middle Class and Urbanization Increase

## Global Middle Class

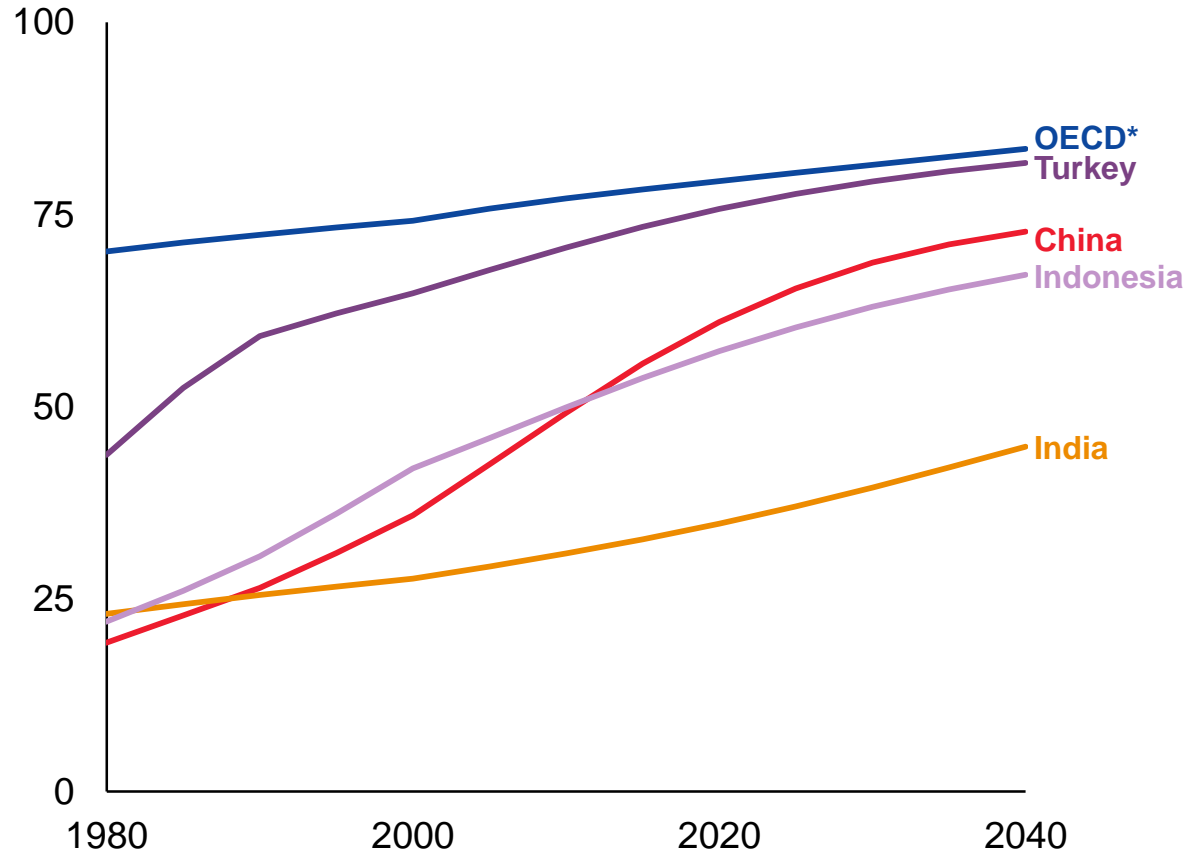
Billion People



Source: The Brookings Institution  
 \*Mexico and Turkey included in Key Growth countries

## Urbanization

Percent

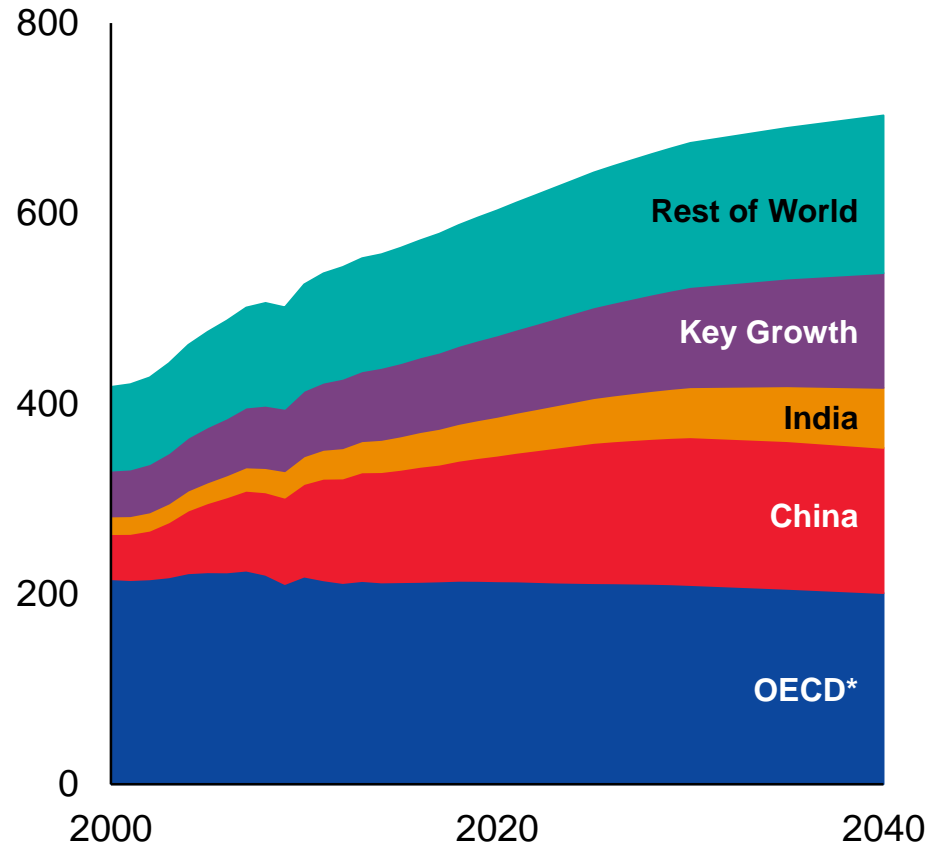


Source: United Nations

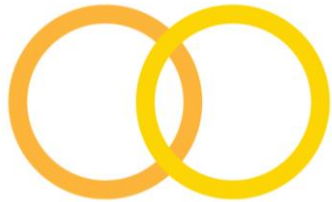
# Demand Growth From Developing Nations

## Energy Demand

Quadrillion BTUs



*\*Mexico and Turkey included in Key Growth countries*



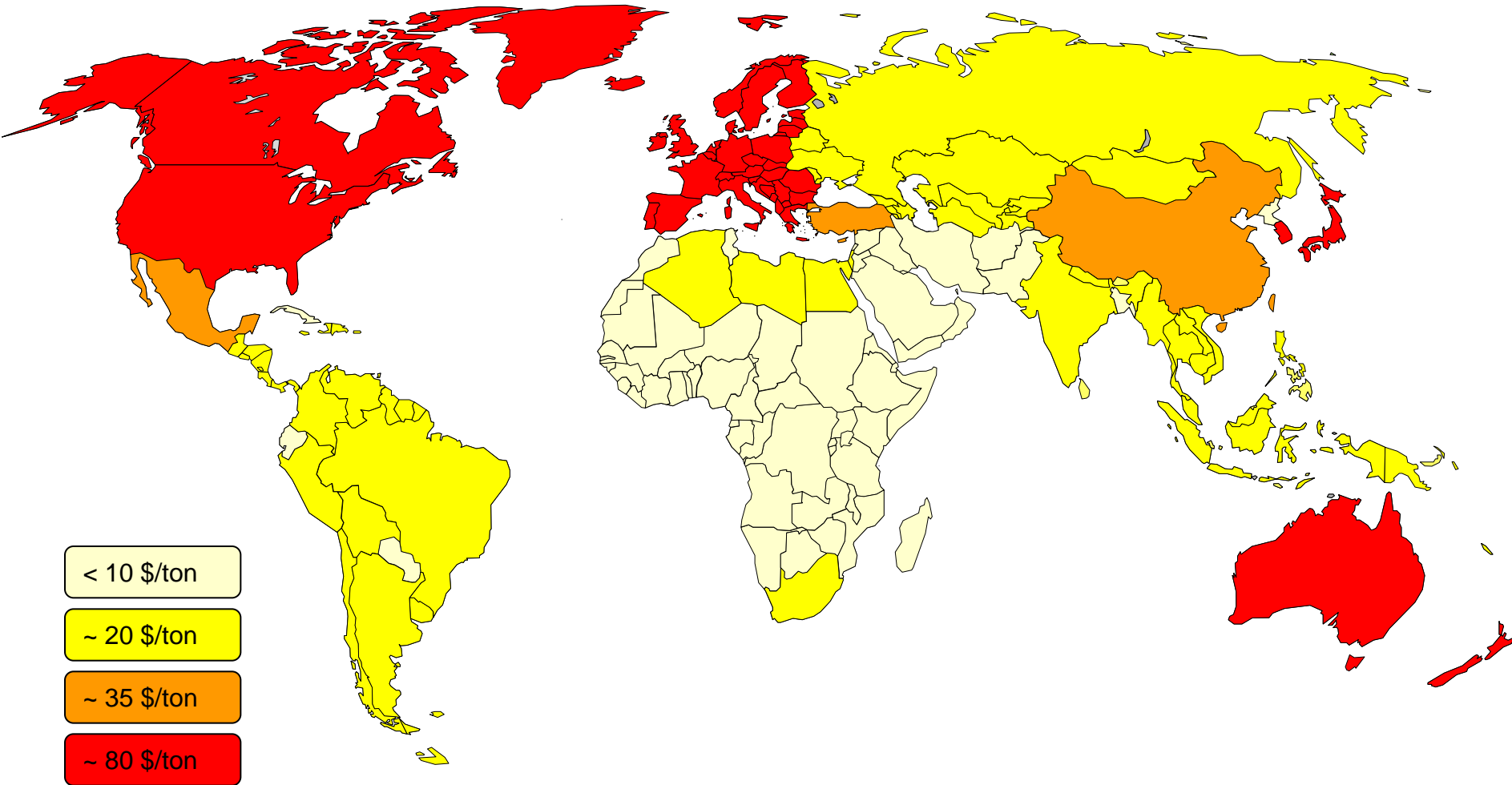
**Economics** and **policies**  
impact the fuel mix.

“Every country finds itself at a different point in the development journey. Therefore, the pace and rhythm of their emissions reductions and investments in adaptation will vary.”

President Jim Yong Kim  
World Bank Group

# CO<sub>2</sub> Policy Assumptions Vary by Region

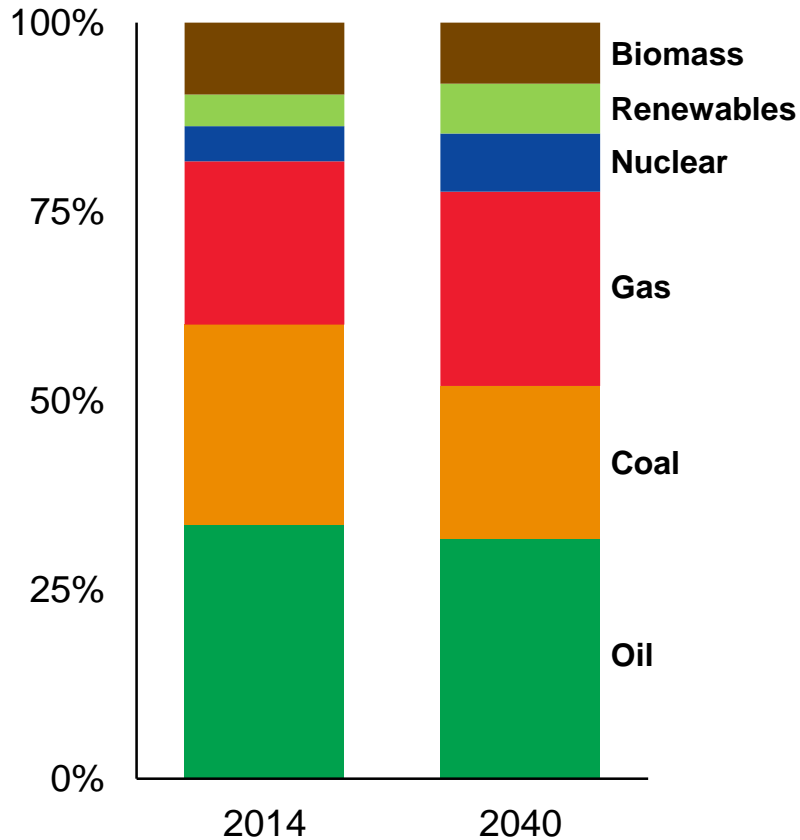
2040 CO<sub>2</sub> "Proxy" Cost



# Energy Mix Shifts to Lower-Carbon Fuels

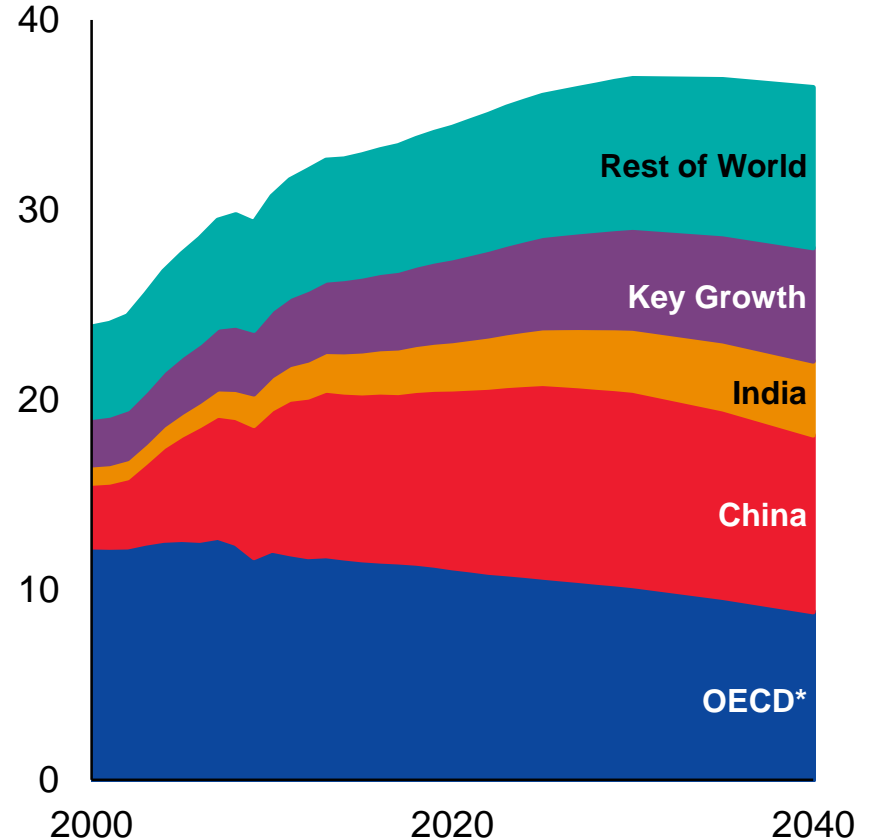
## Global Energy Mix

Percent

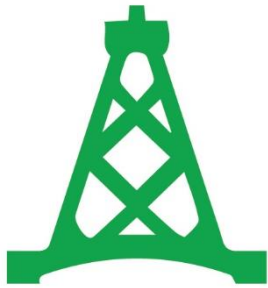


## Energy-Related CO<sub>2</sub> Emissions by Region

Billion Tonnes



*\*Mexico and Turkey included in Key Growth countries*



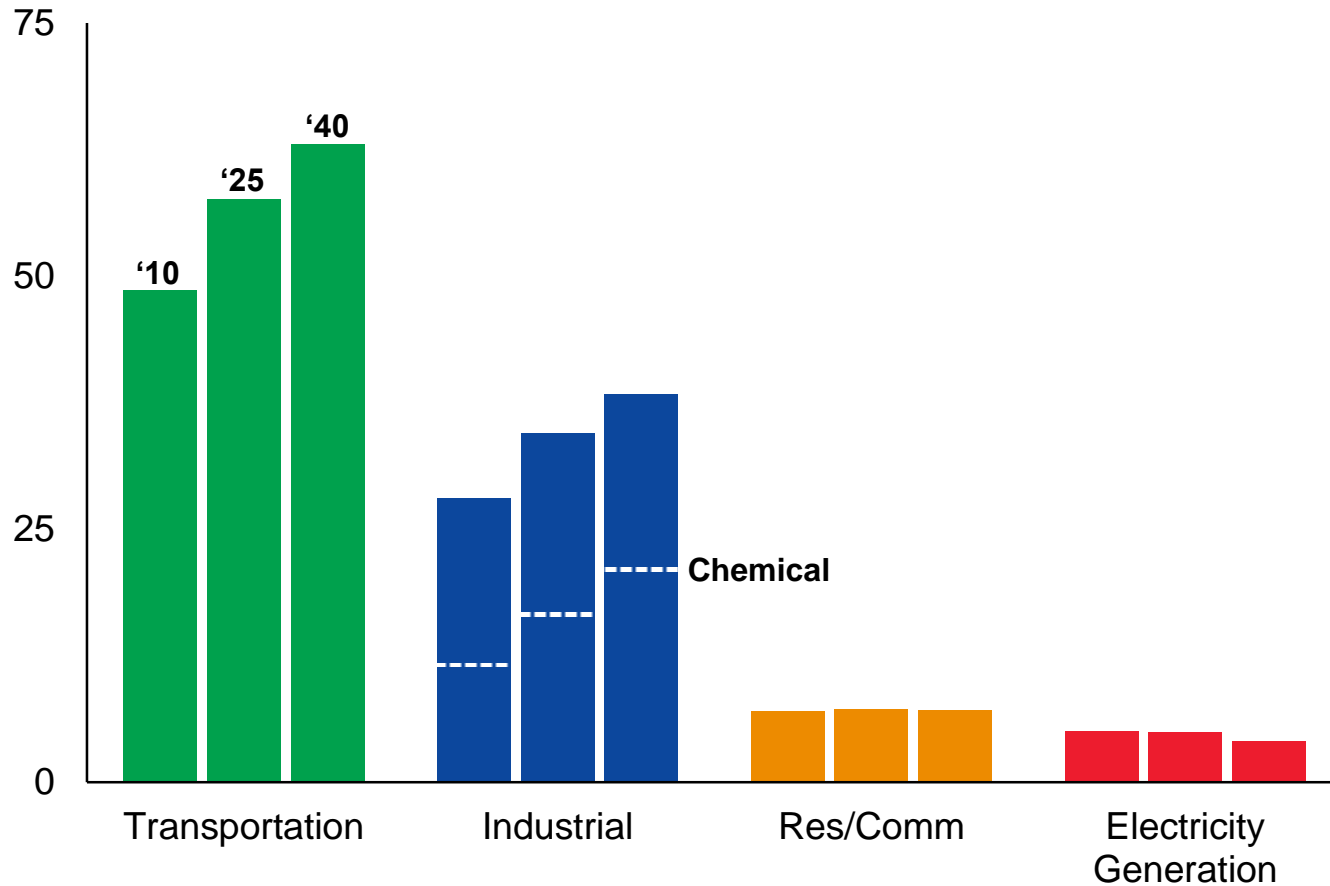
**Oil** remains the world's primary fuel through 2040.



# Transportation and Chemicals Drive Growth

Liquids Demand by Sector

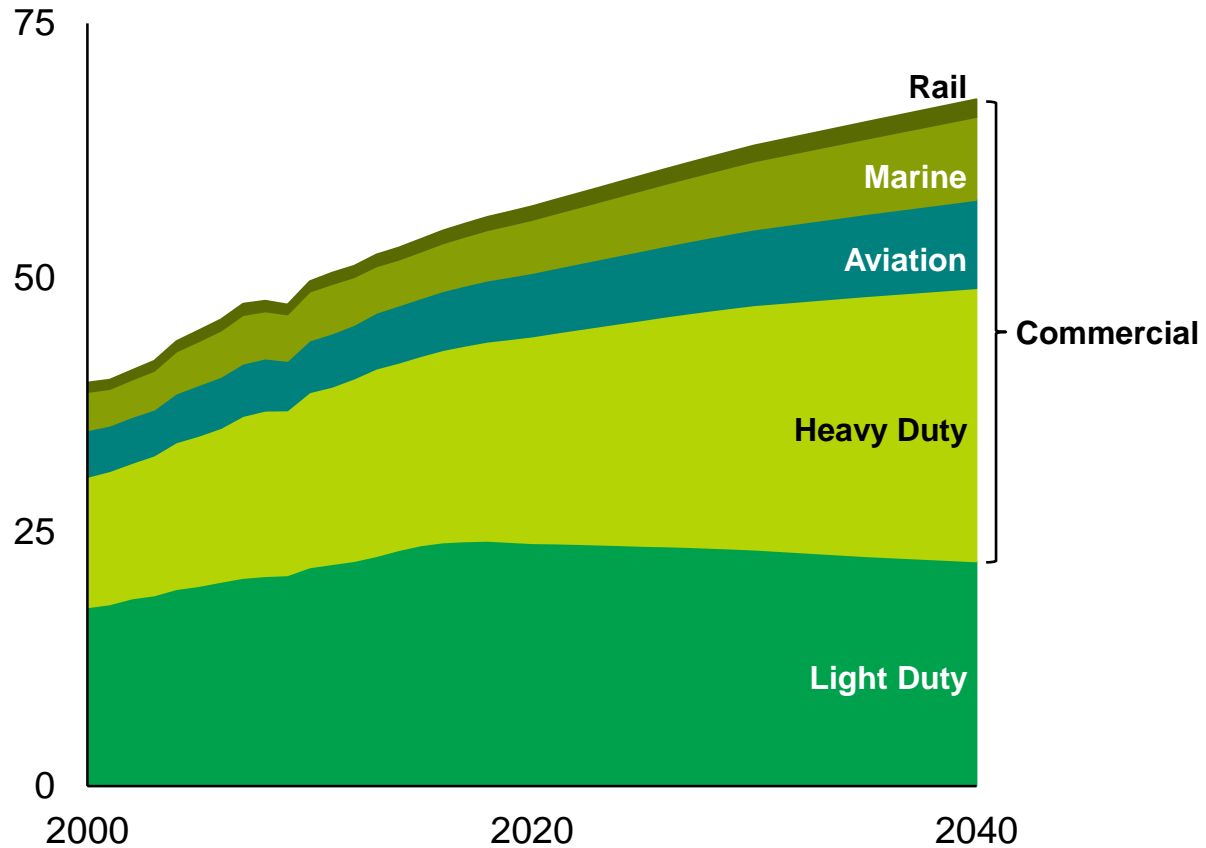
MBDOE



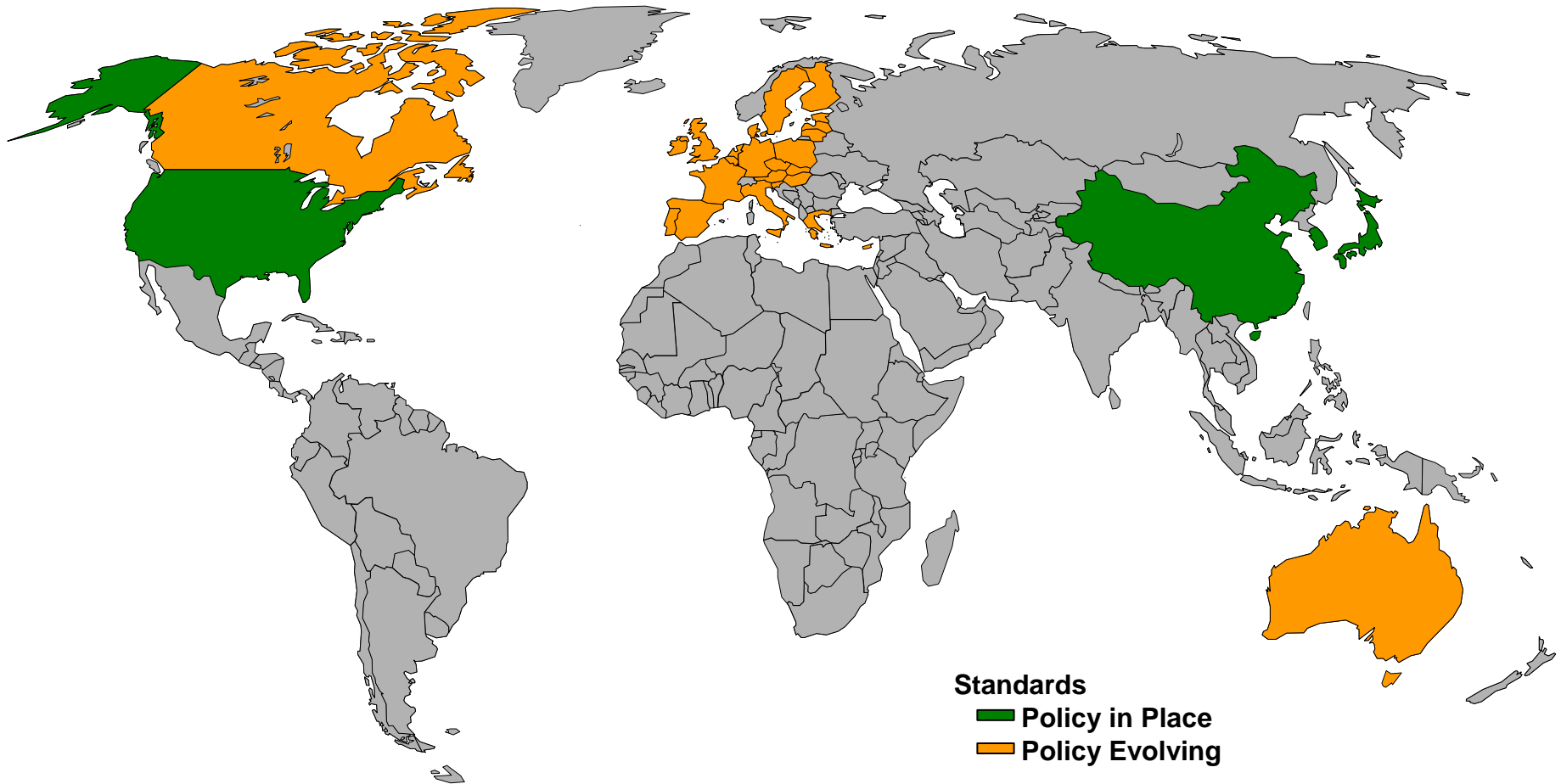
# Transportation Demand

## Sector Demand

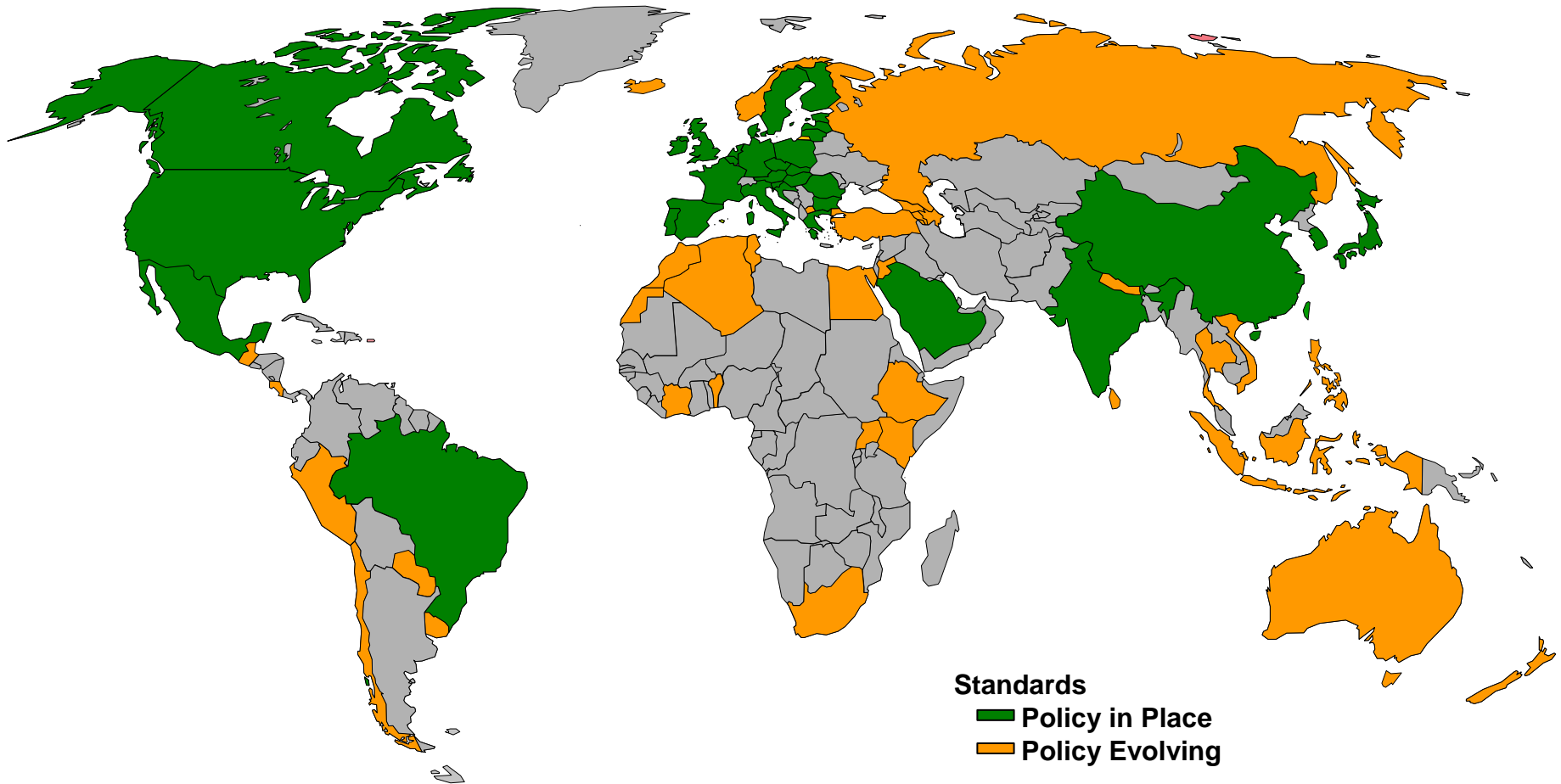
MBDOE



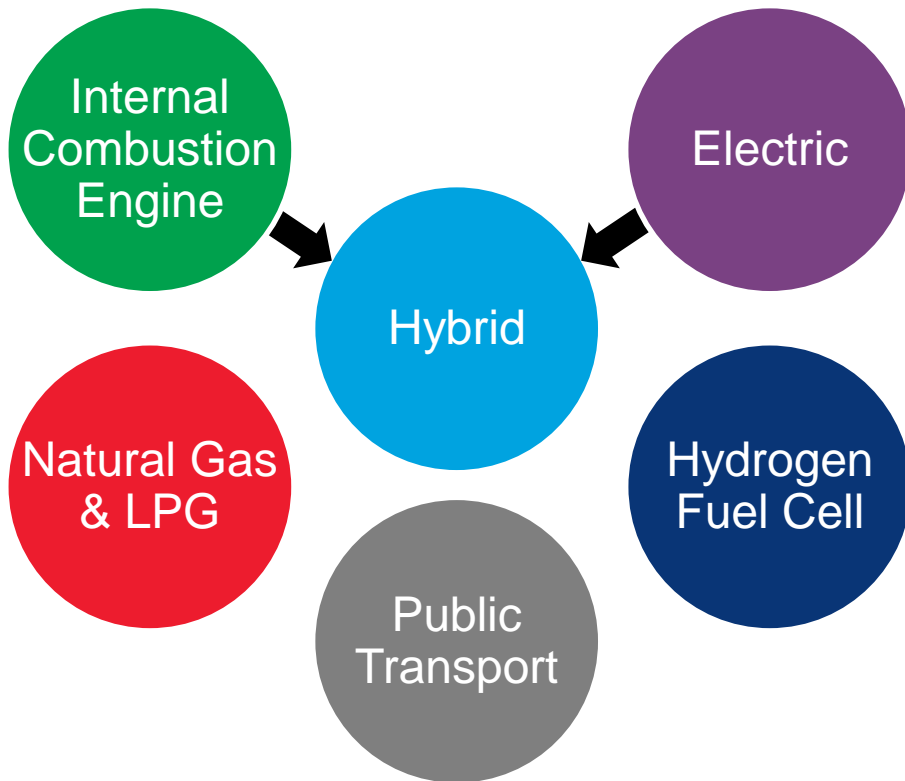
# Global Fuel Economy Standards (2008)



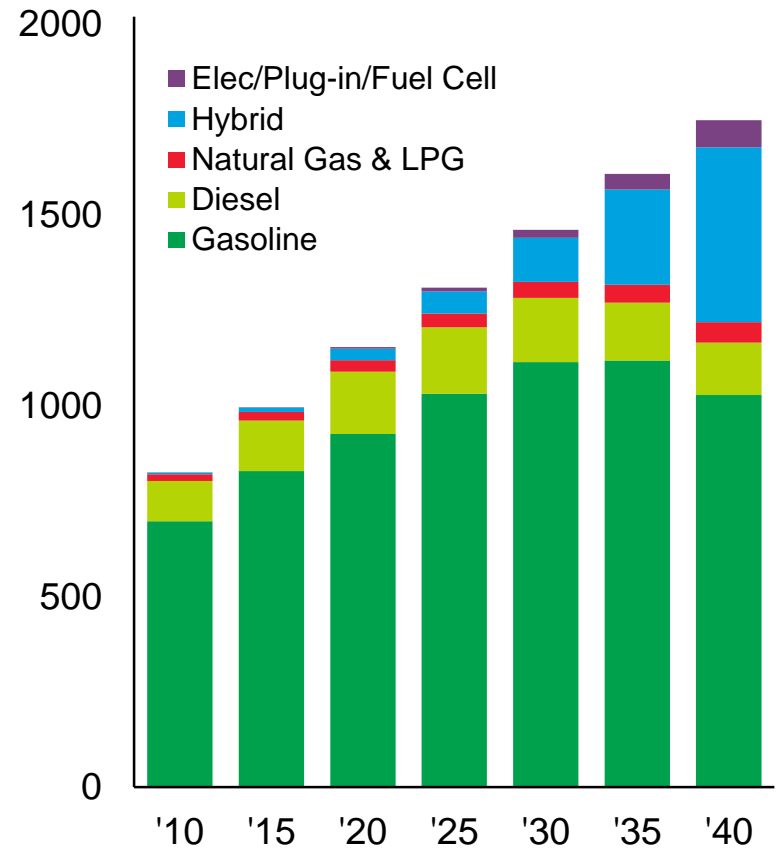
# Global Fuel Economy Standards (2014)



# Global Vehicle Fleet



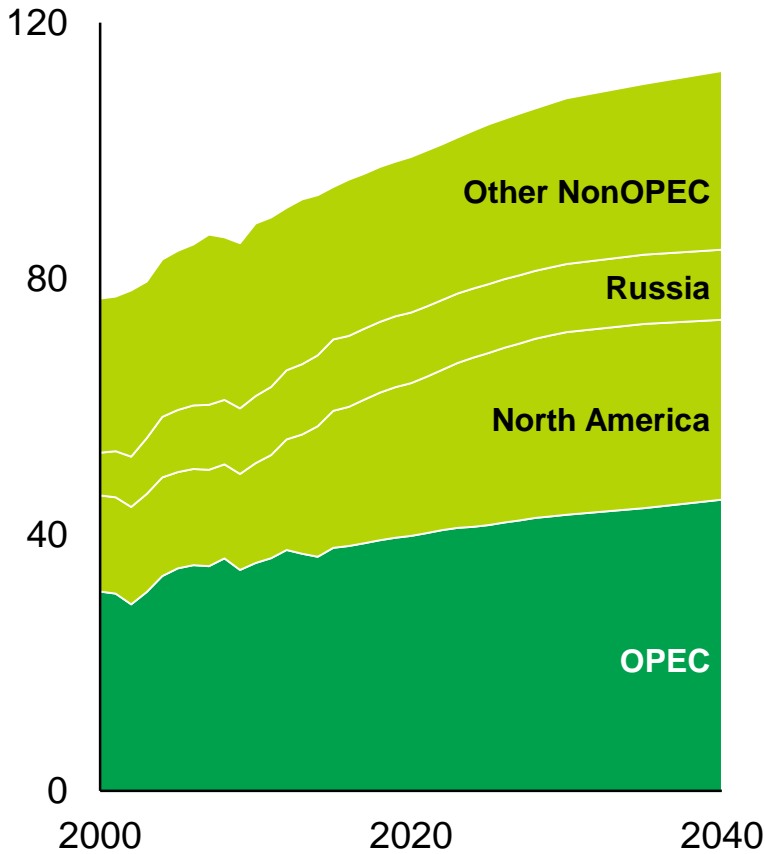
**By Type**  
Million Cars



# Liquids Production

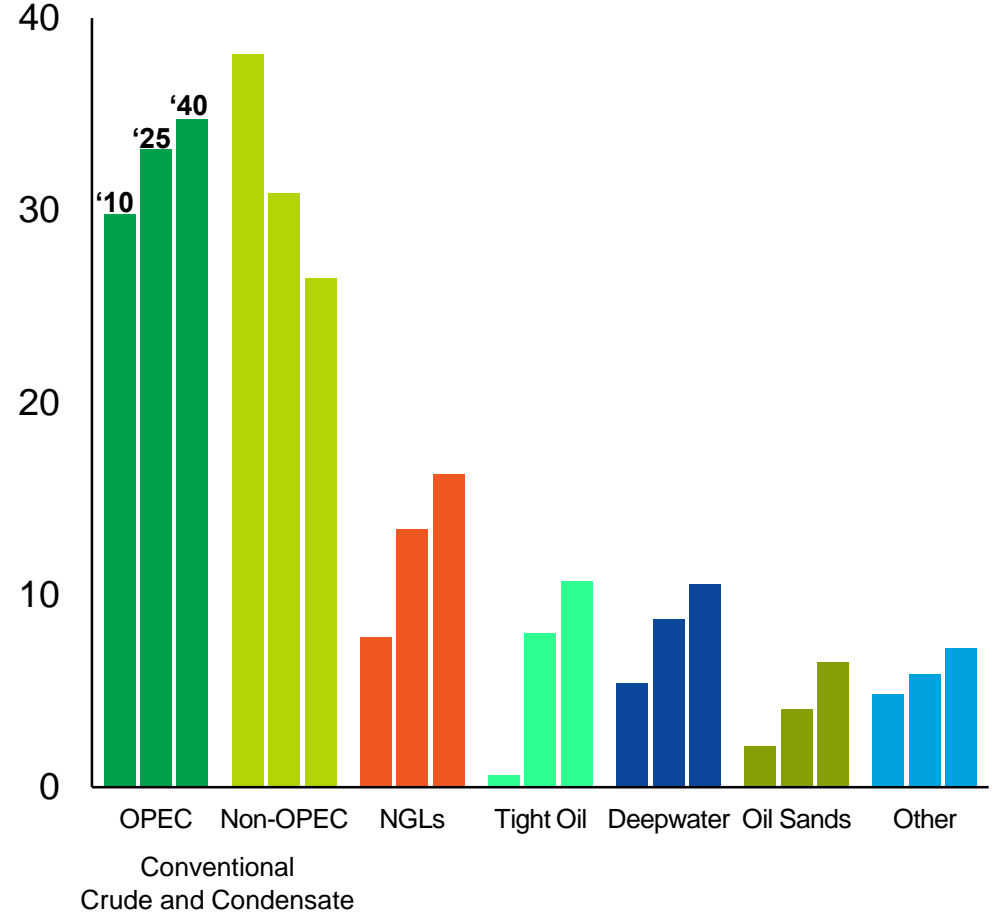
## By Region

MBDOE

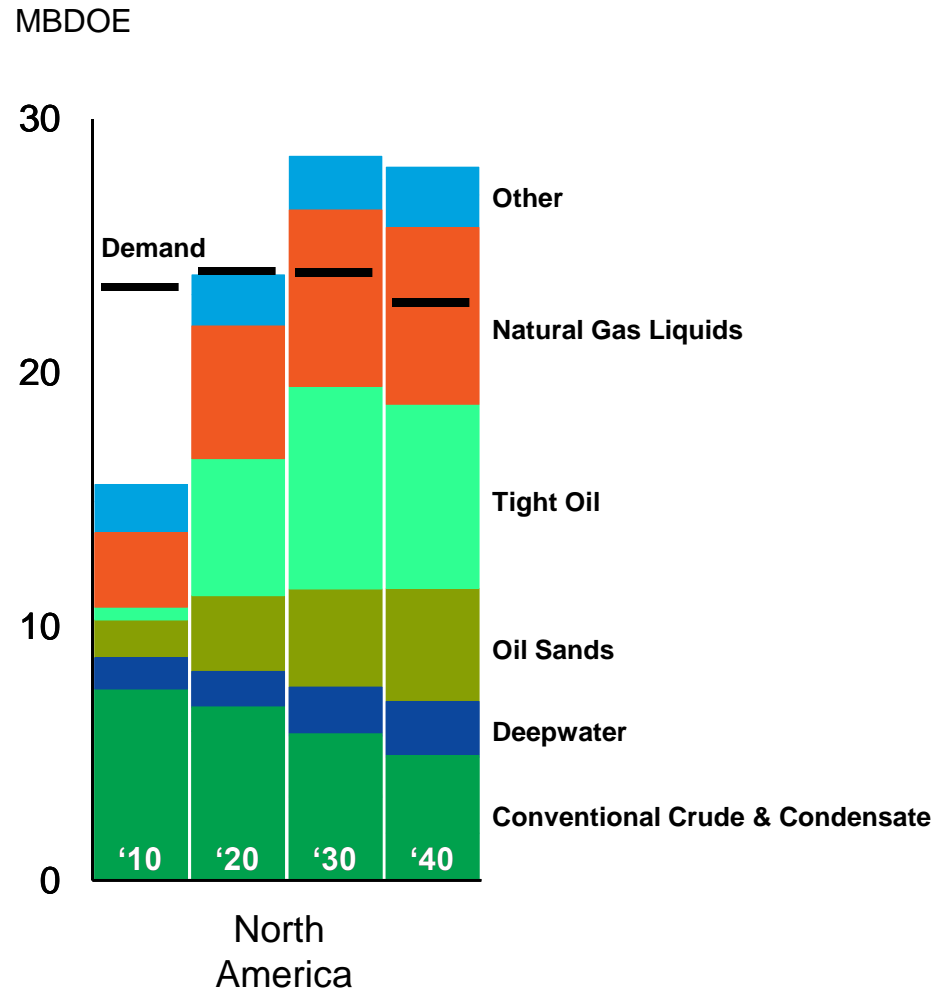


## By Type

MBDOE

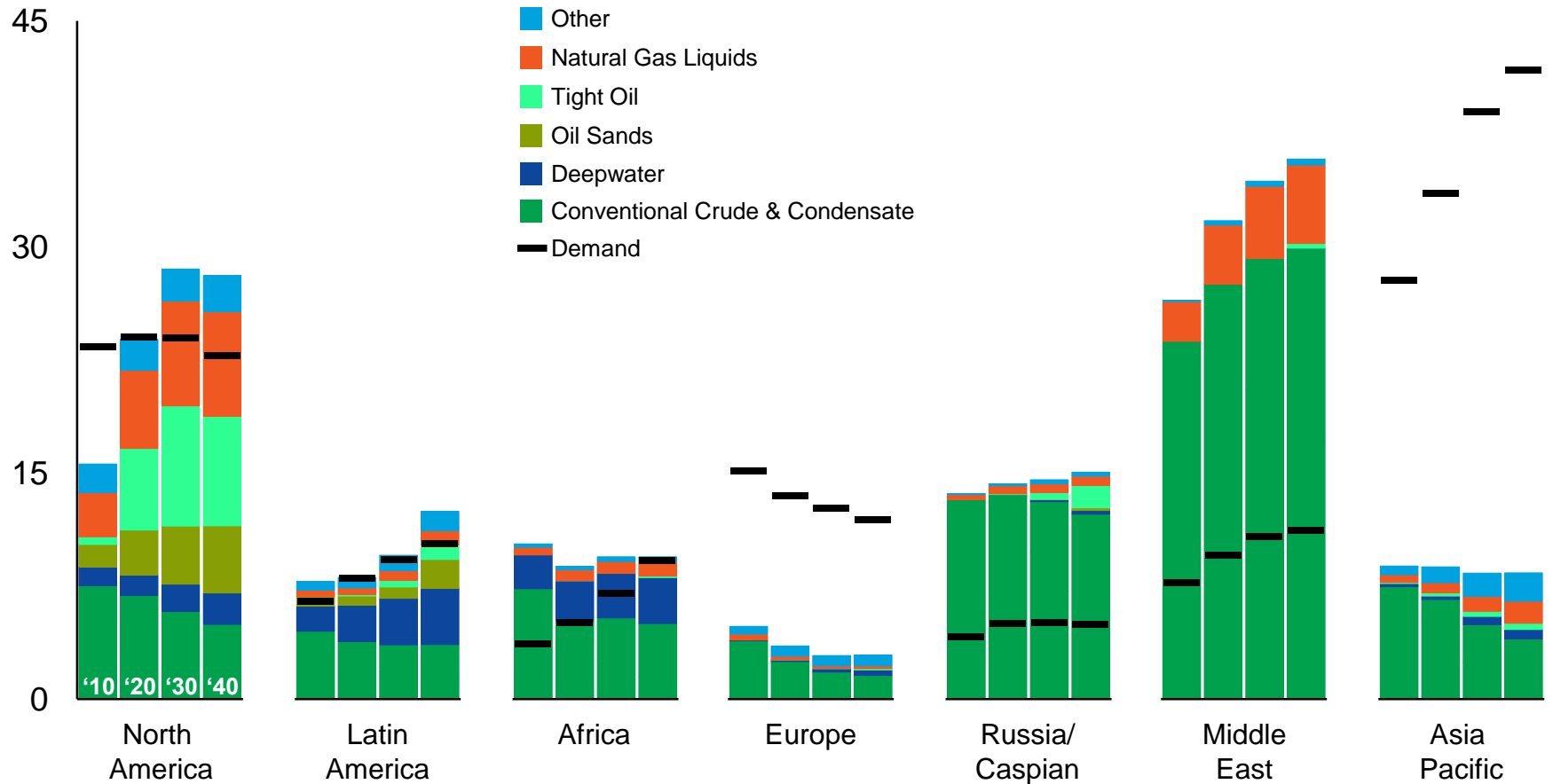


# Liquids Trade Balance by Region



# Liquids Trade Balance by Region

MBDOE





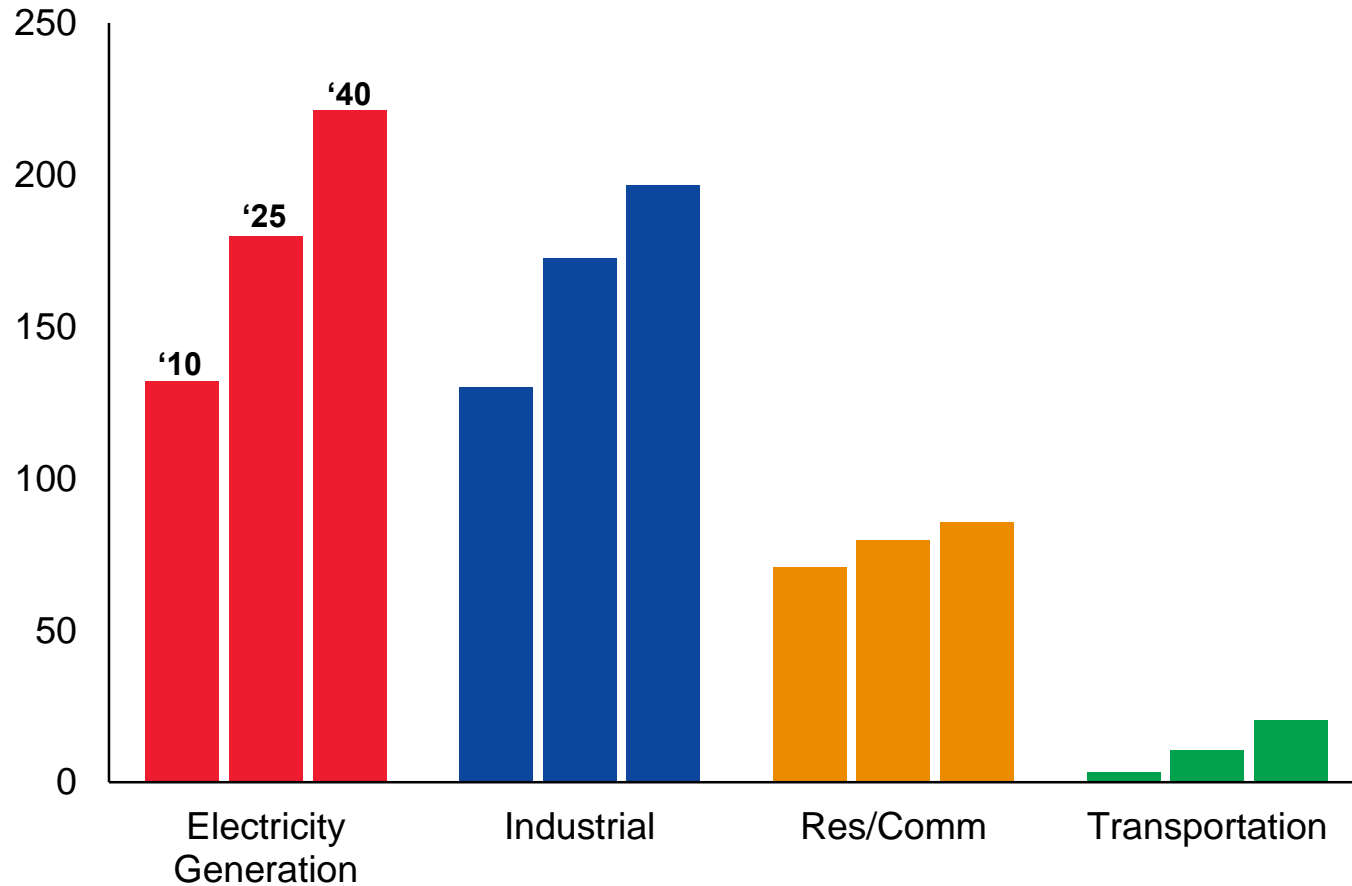


**Natural gas** grows  
more than any other  
energy source.

# Gas Demand Grows in All Sectors

Gas Demand by Sector

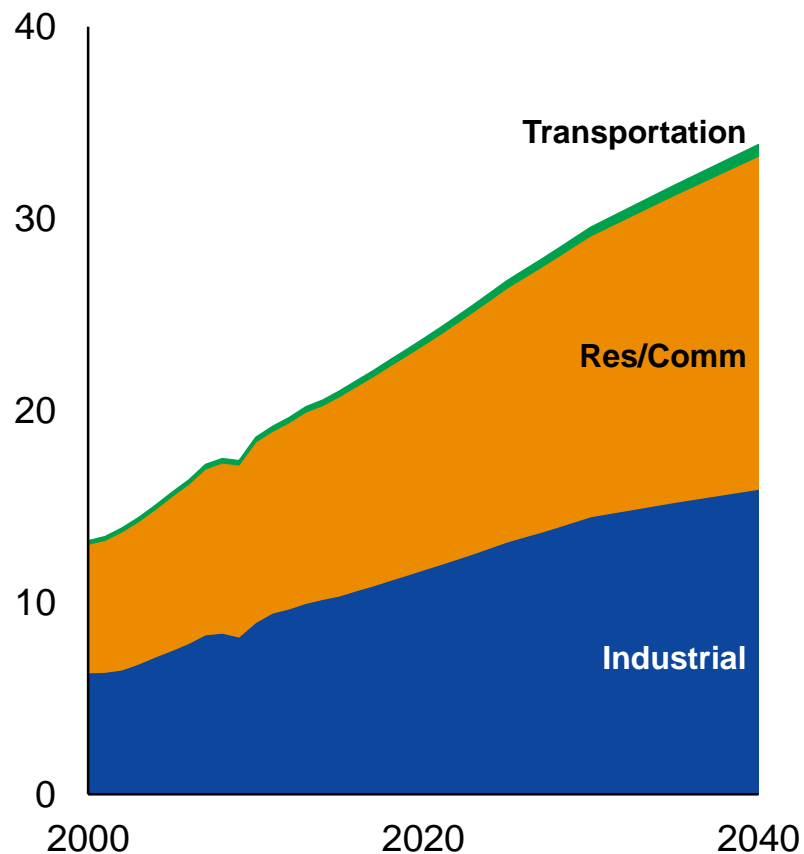
BCFD



# Electricity Demand Continues to Surge

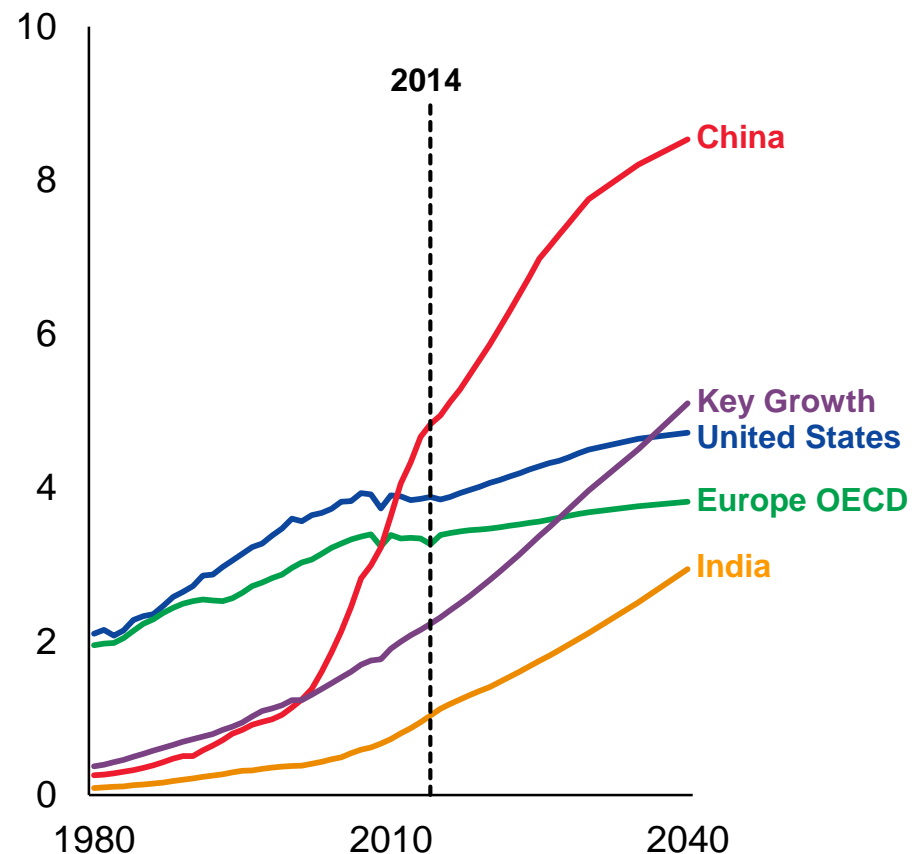
## By Sector

Thousand TWh



## Electricity Demand by Region

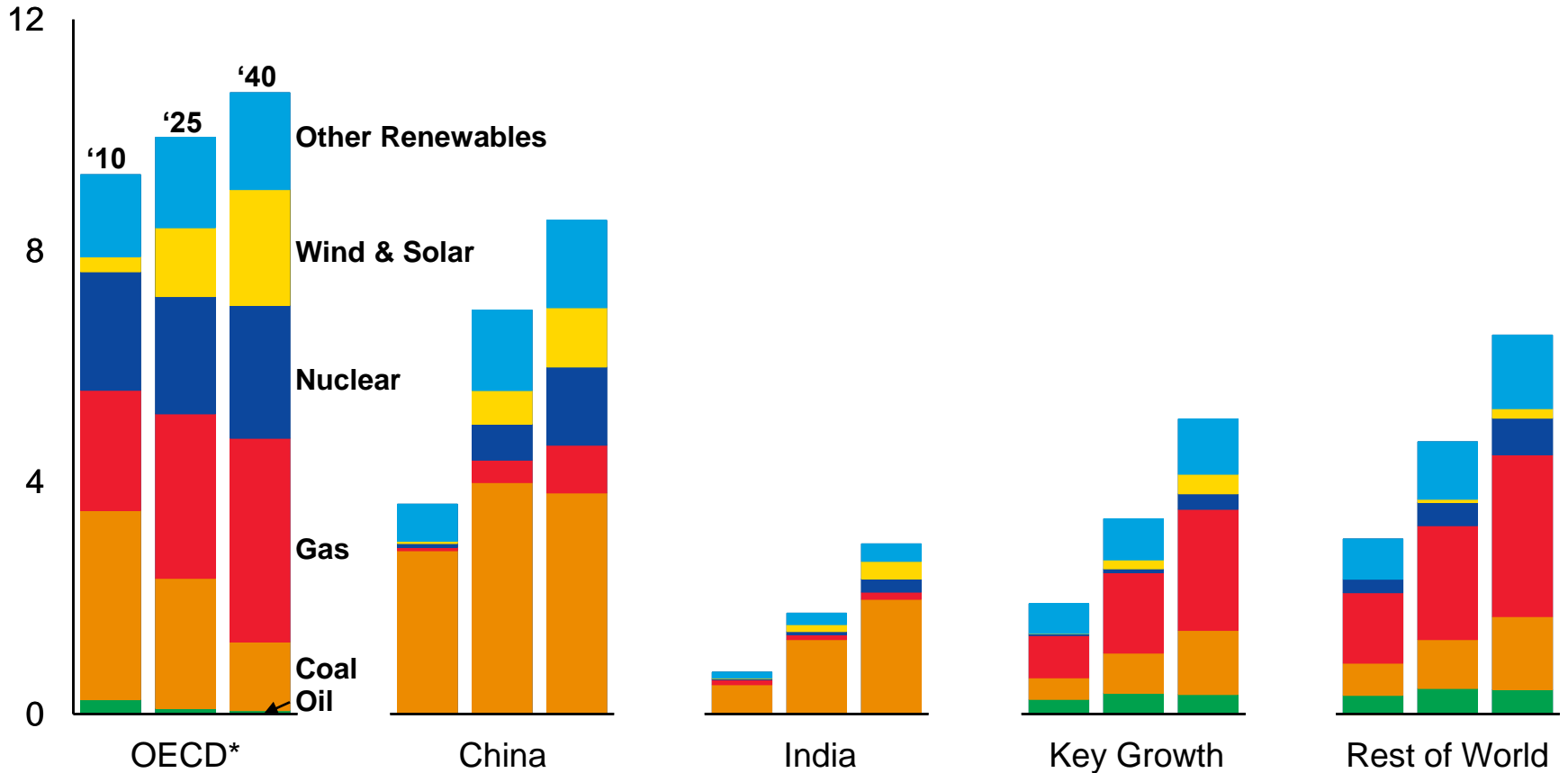
Thousand TWh



# Global Electricity Transitions

## Regional Generation

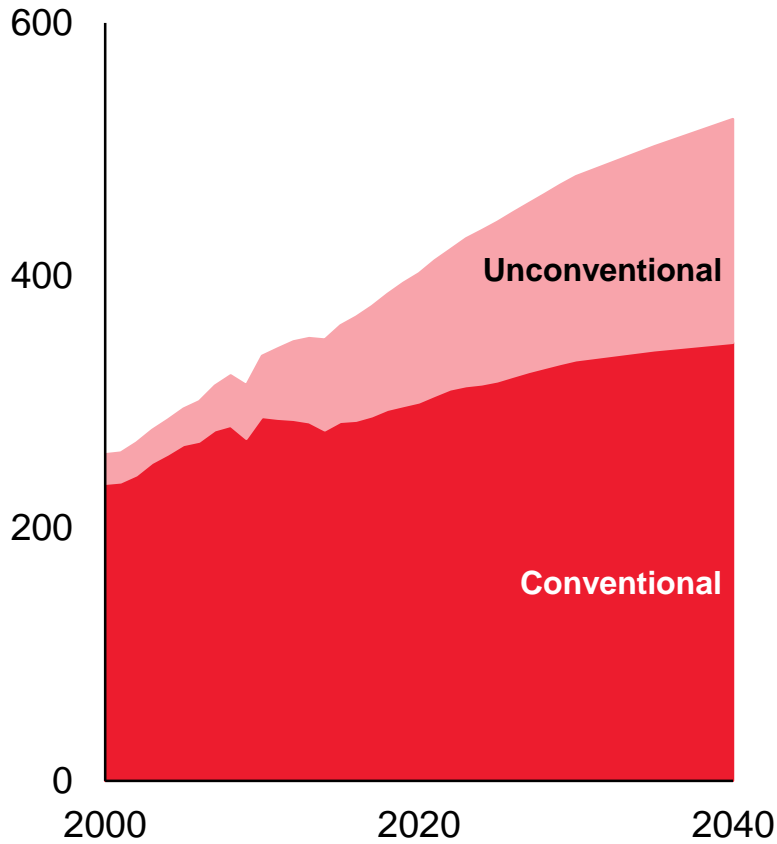
Thousand TWh



# Natural Gas Supply

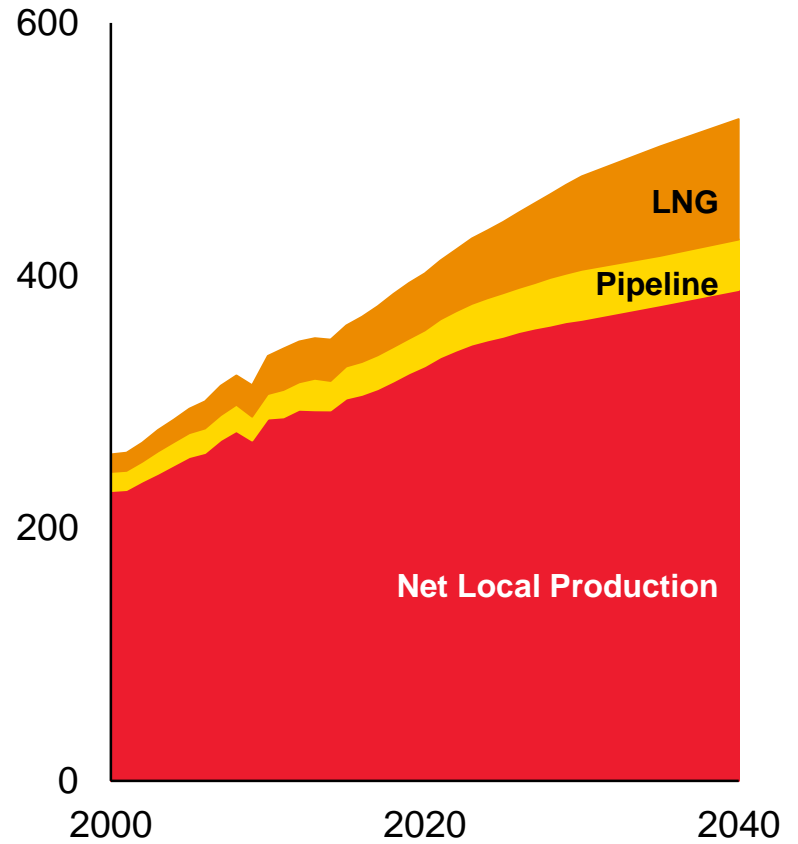
## By Production Type

BCFD

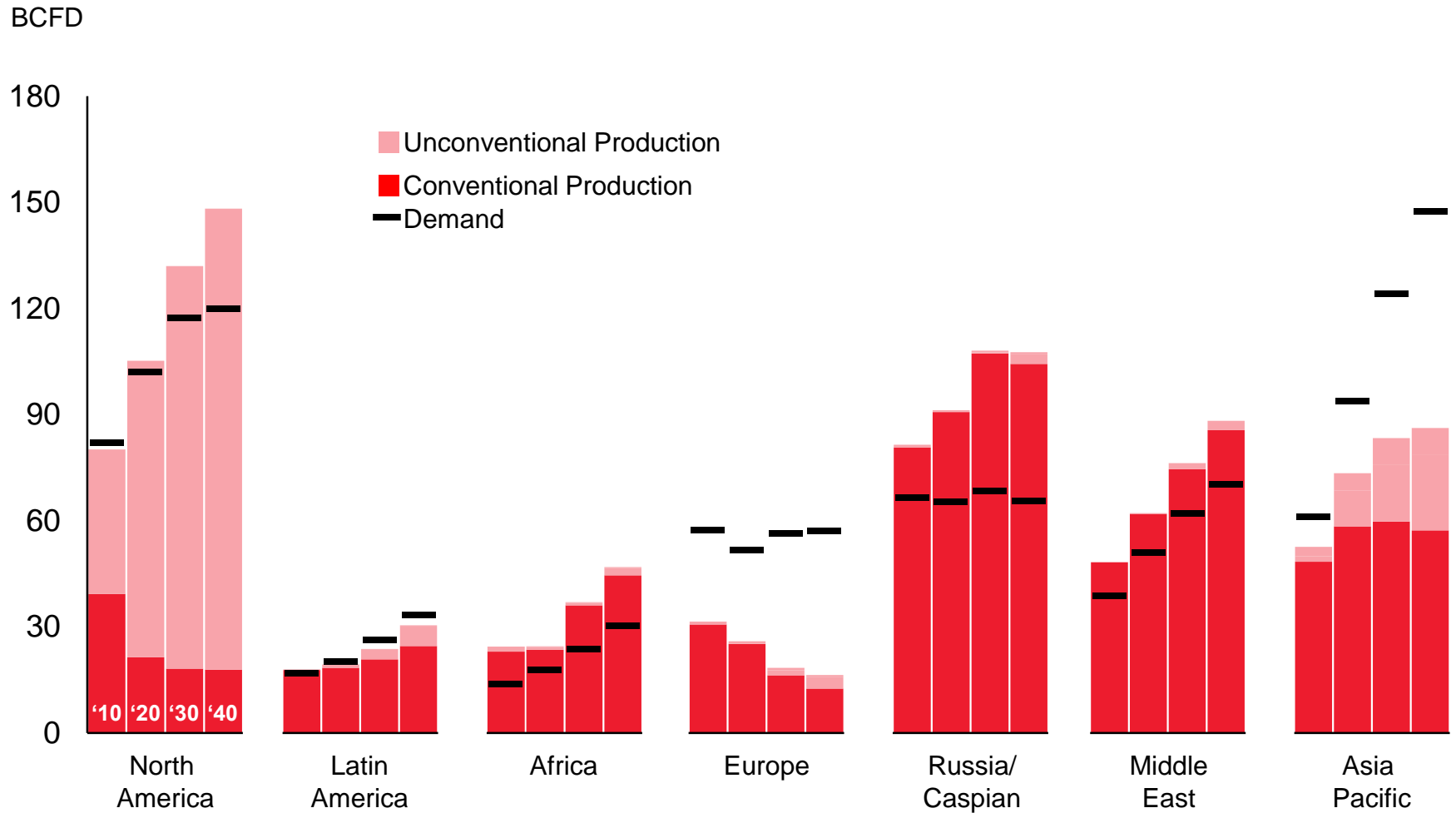


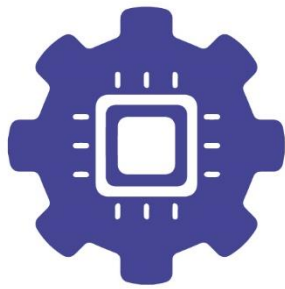
## By Delivery Type

BCFD



# Gas Trade Balance by Region





**Technology** has the highest potential and greatest uncertainty.

“The only reason I’m optimistic about this problem is because of innovation.”

Bill Gates

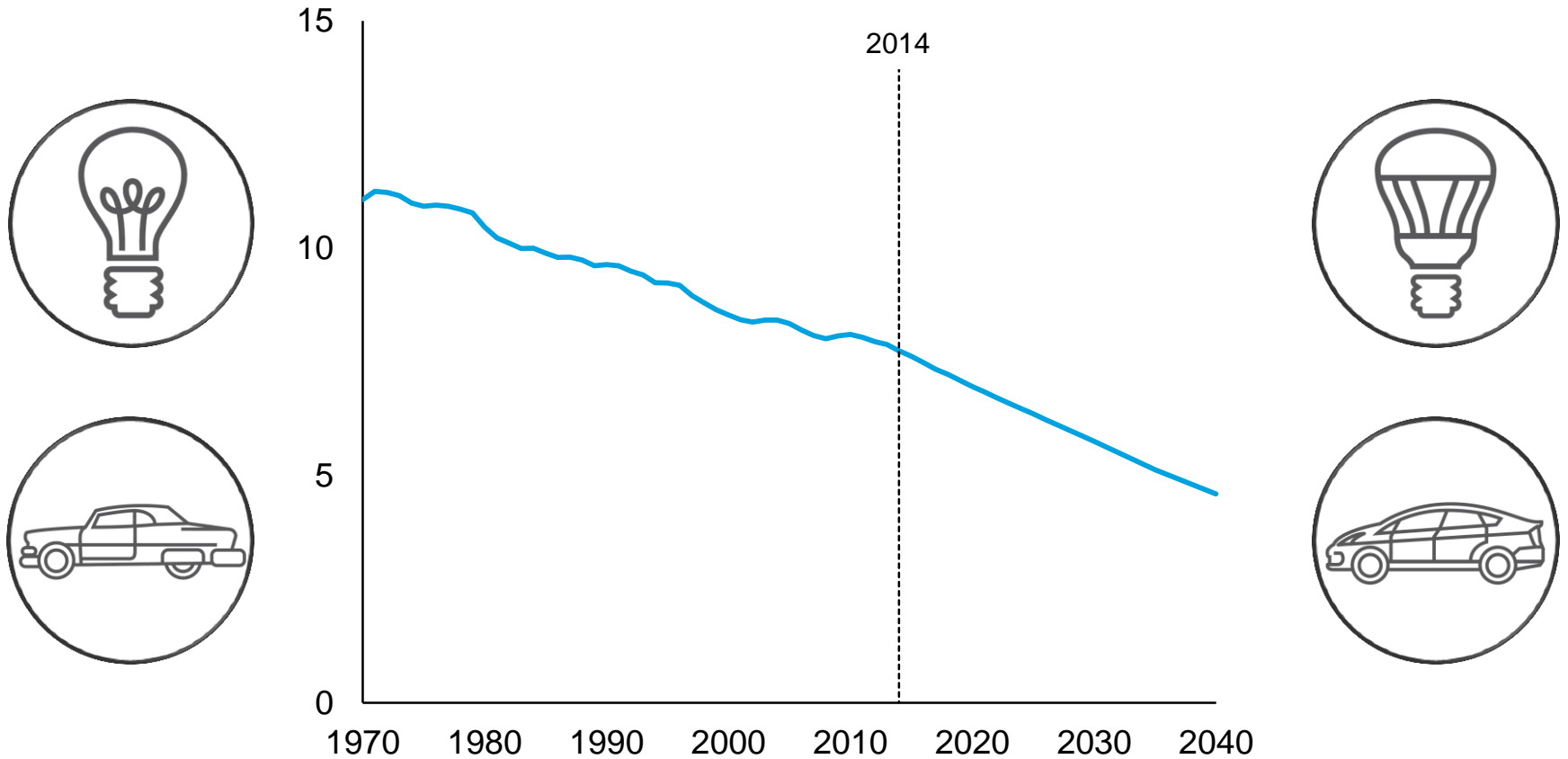
*The Atlantic*, Nov. 2015



# Technology Helps Us Do More With Less

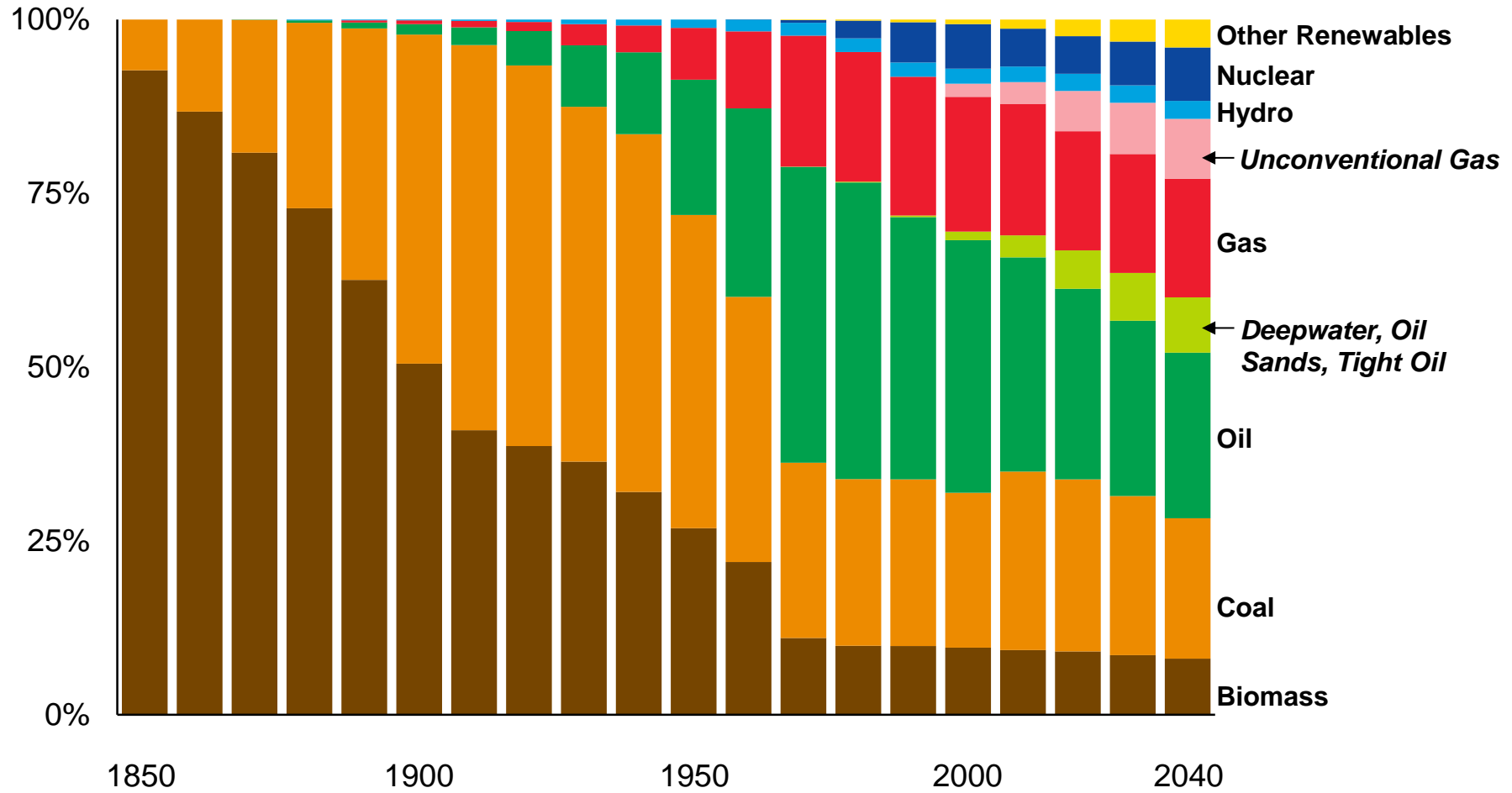
## Global Average Energy Intensity

Thousand BTUs per dollar GDP (2010\$)



# Technology Contributes to the Fuel Mix

Global Mix of Fuels

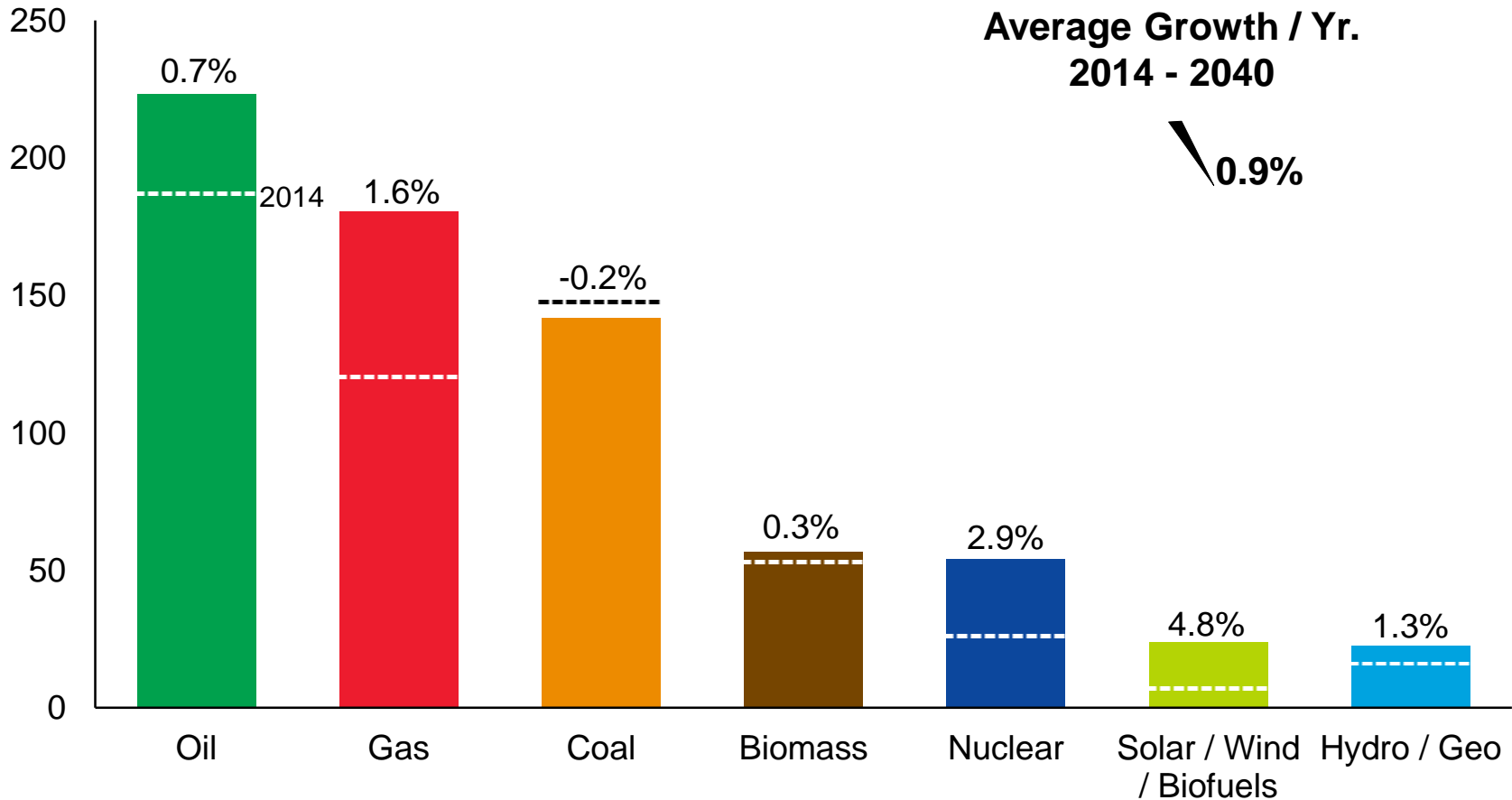


Source: Smil, Energy Transitions (1800-1960)

# Global Demand

## 2040 By Fuel

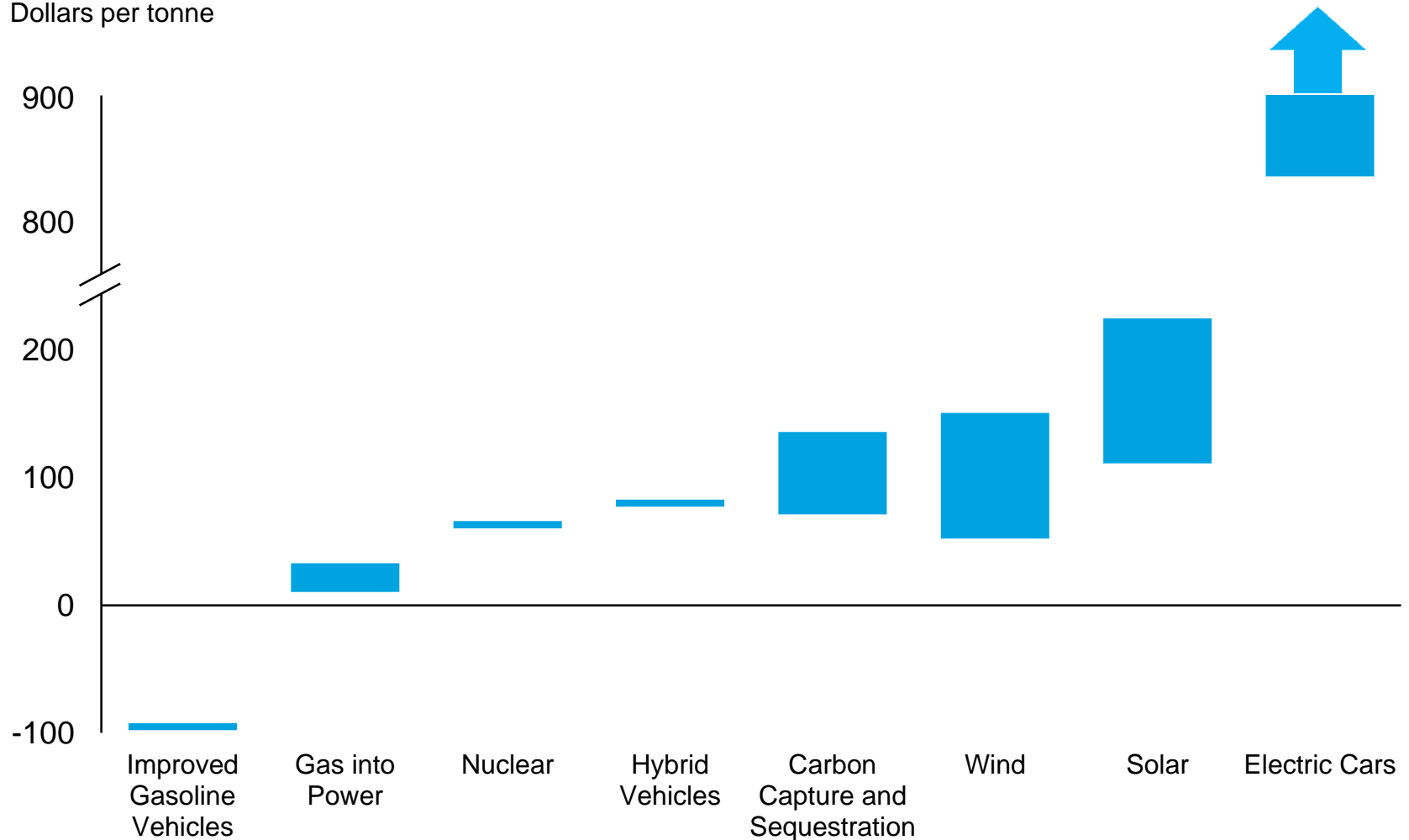
Quadrillion BTUs



# Managing Climate Risk

## U.S. CO<sub>2</sub> Abatement Costs

Dollars per tonne



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