

# The Outlook for Energy: A View to 2040

Ken Golden  
February 3, 2016

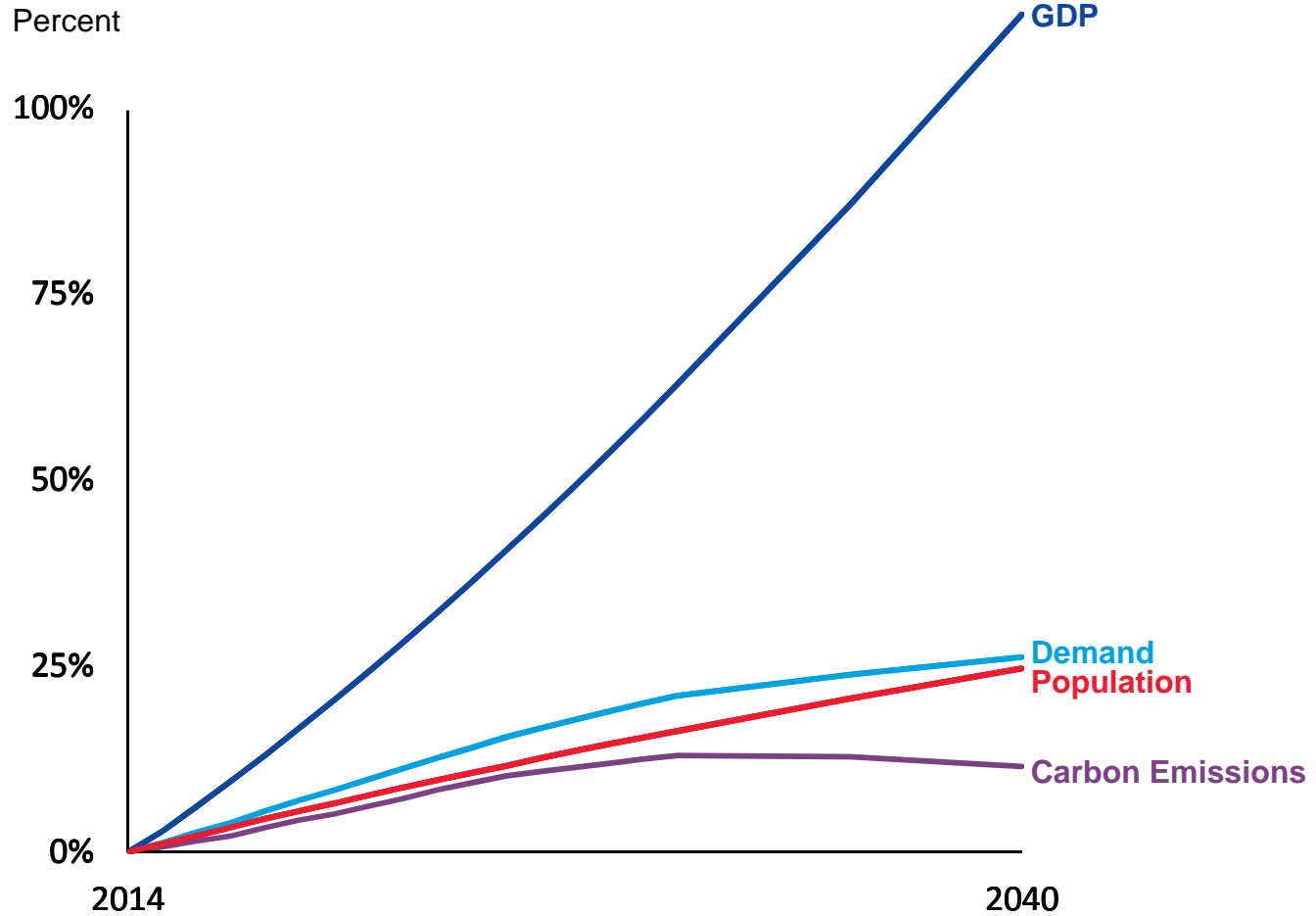
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Energy lives here™

# 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.

# Global Trends Continue to Evolve

Growth from 2014 Level



## Key Energy Outlook Themes



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



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



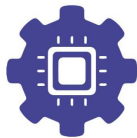
**Economics** and **policies** impact the fuel mix.



**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.

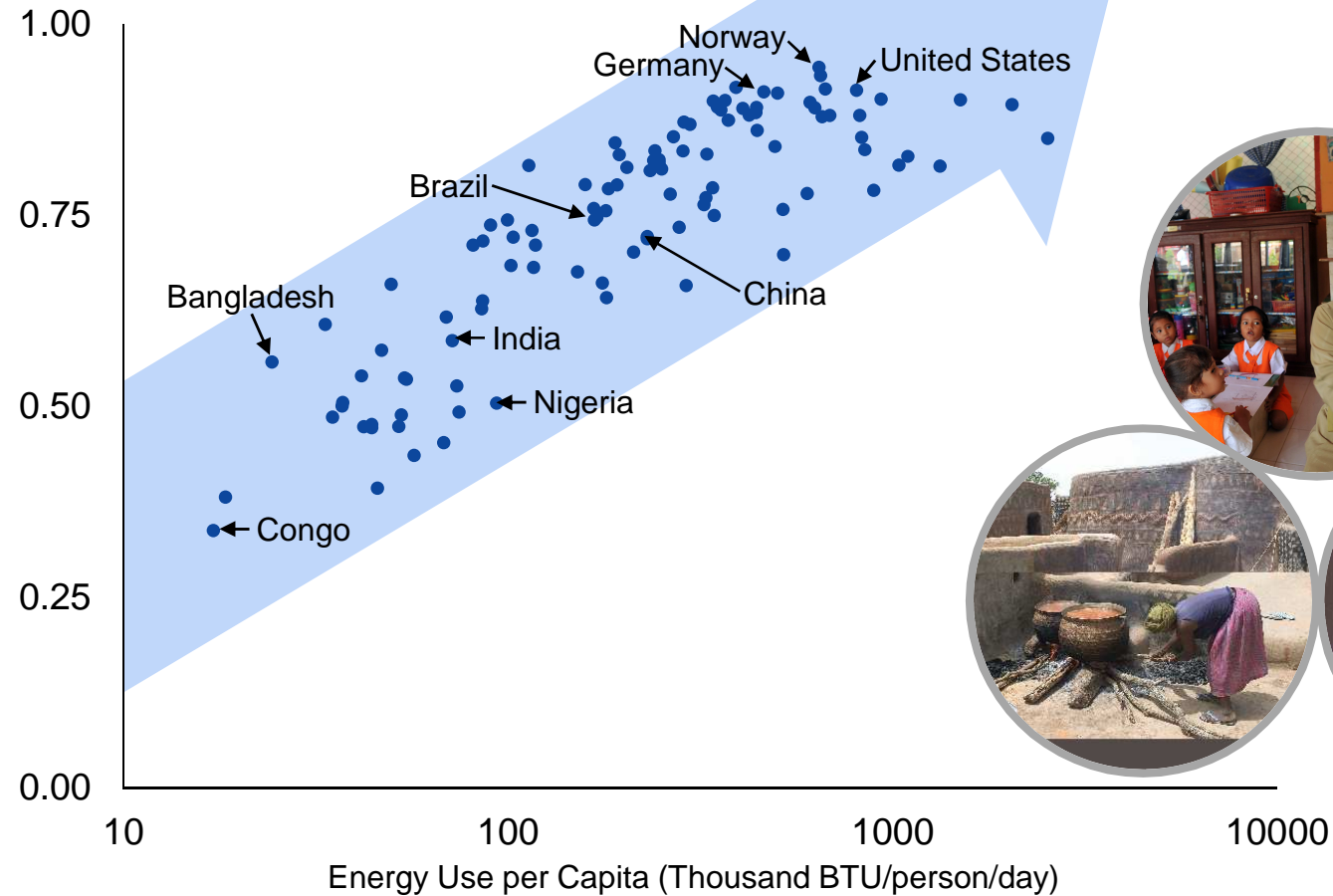


**Energy** is fundamental  
to **standards of living.**

# Energy Fuels Human Development

## U.N. Human Development Index

2013 Index



Source: United Nations, ExxonMobil estimates



# The energy equation

People



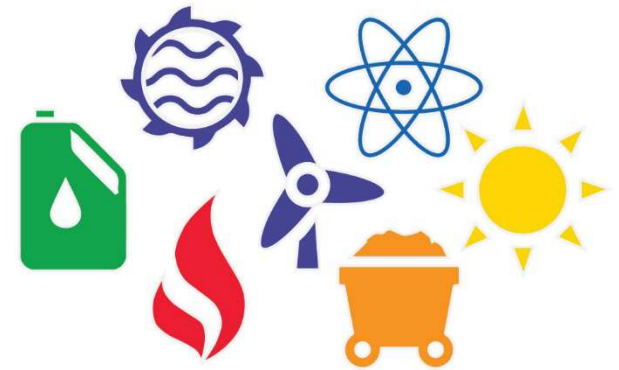
×

living standards



=

energy needs



# The energy equation

**U.S. daily usage**



**7** gallons/day

or



**27,000**  
cell phone batteries

# The energy equation

**U.S. daily usage**



**7** gallons/day

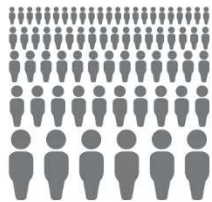
**World daily usage**



**1.7** gallons/day



# The energy equation



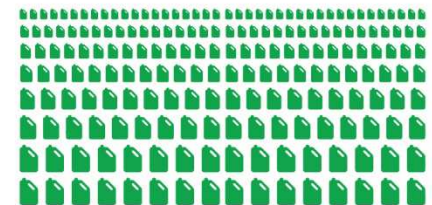
**7 billion**  
people

**×**



**1.7 gallons**  
per person

**=**

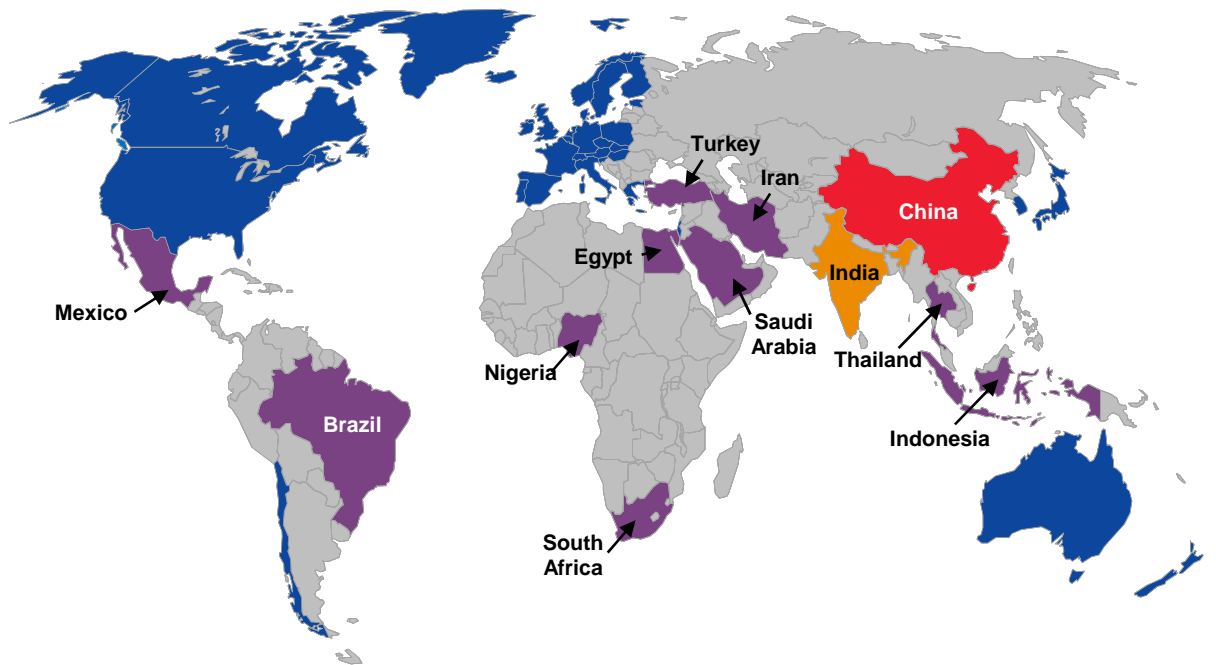
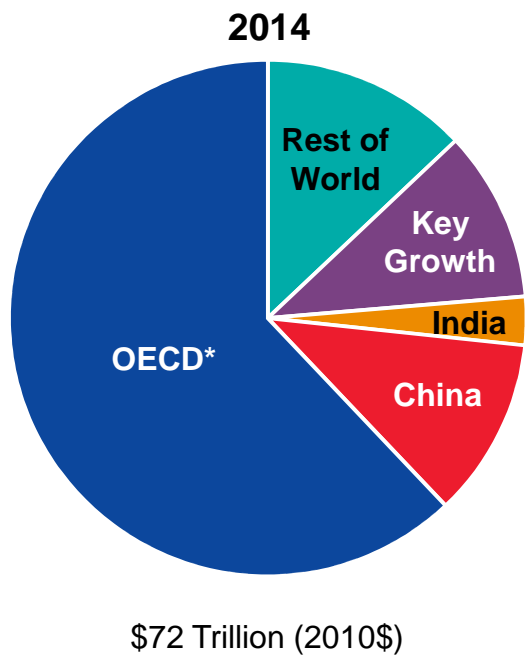


**12 billion**  
gallons per day



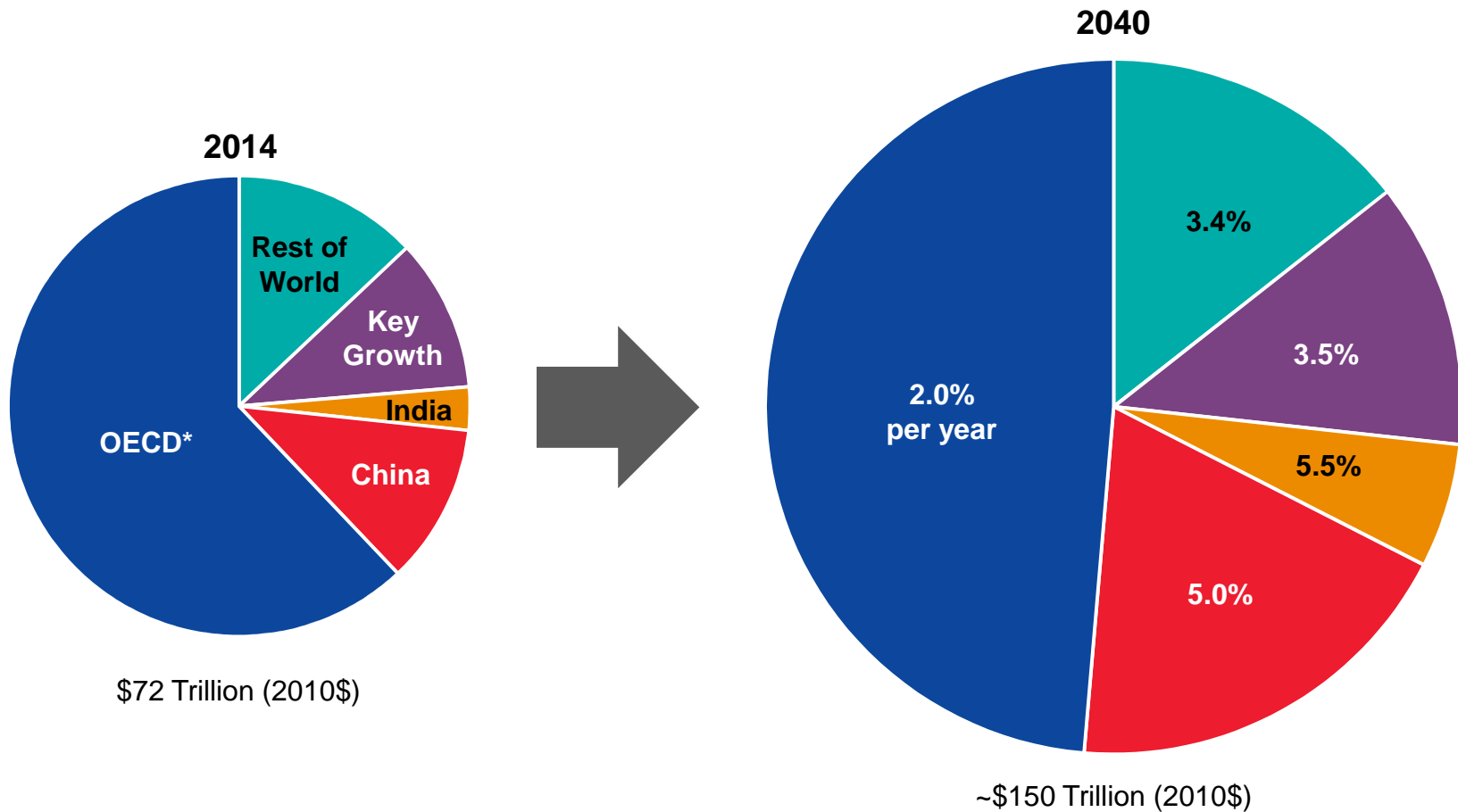
**Developing nations lead**  
in GDP growth and living  
standard improvements.

# Global GDP Shifts Toward Developing Nations



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

# Global GDP Shifts Toward Developing Nations

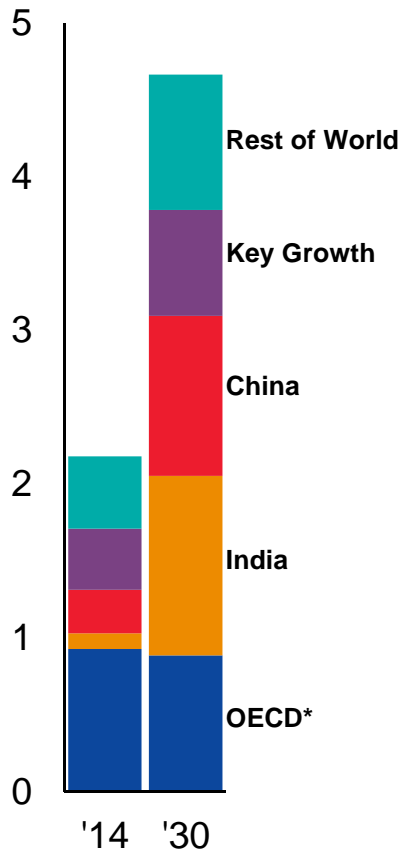


\*Mexico and Turkey included in Key Growth countries

# Middle Class and Urbanization Increase

## Global Middle Class

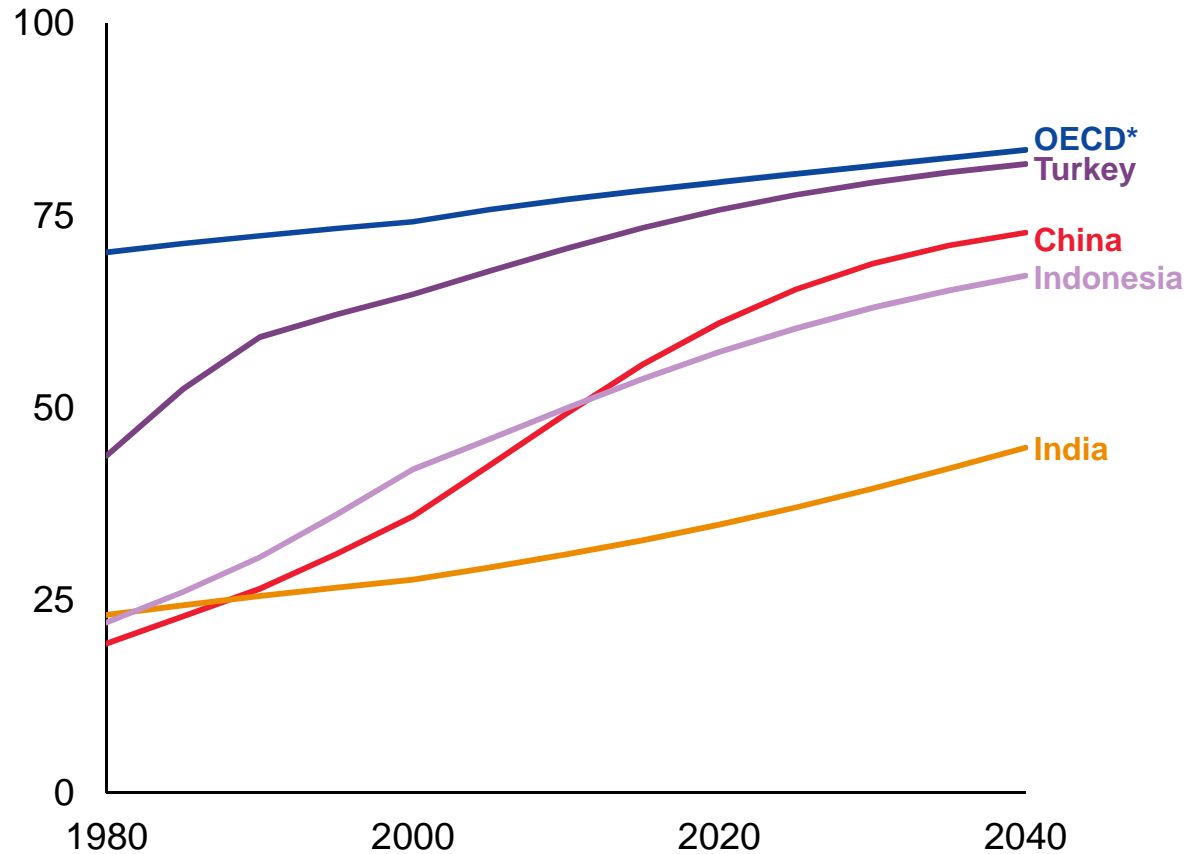
Billion People



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

## Urbanization

Percent



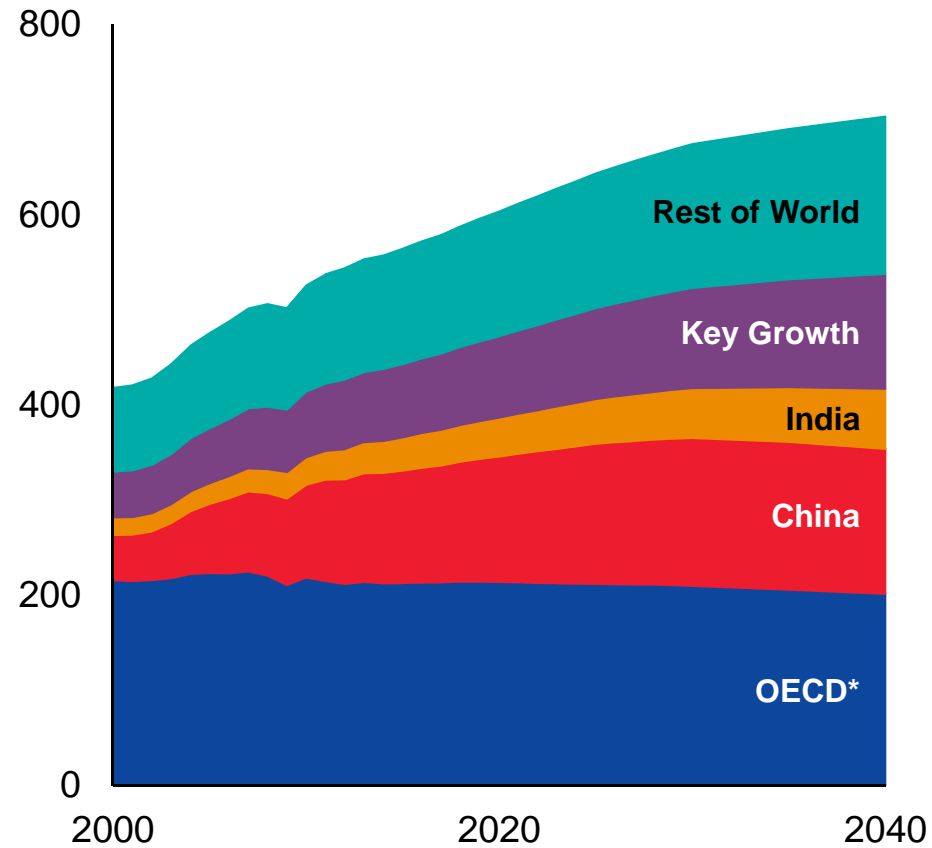
Source: United Nations



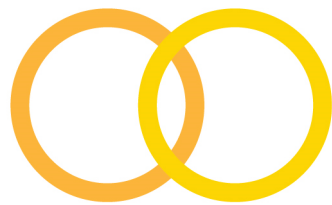
# Demand Growth From Developing Nations

## Energy Demand

Quadrillion BTUs



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



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

“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



“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.”

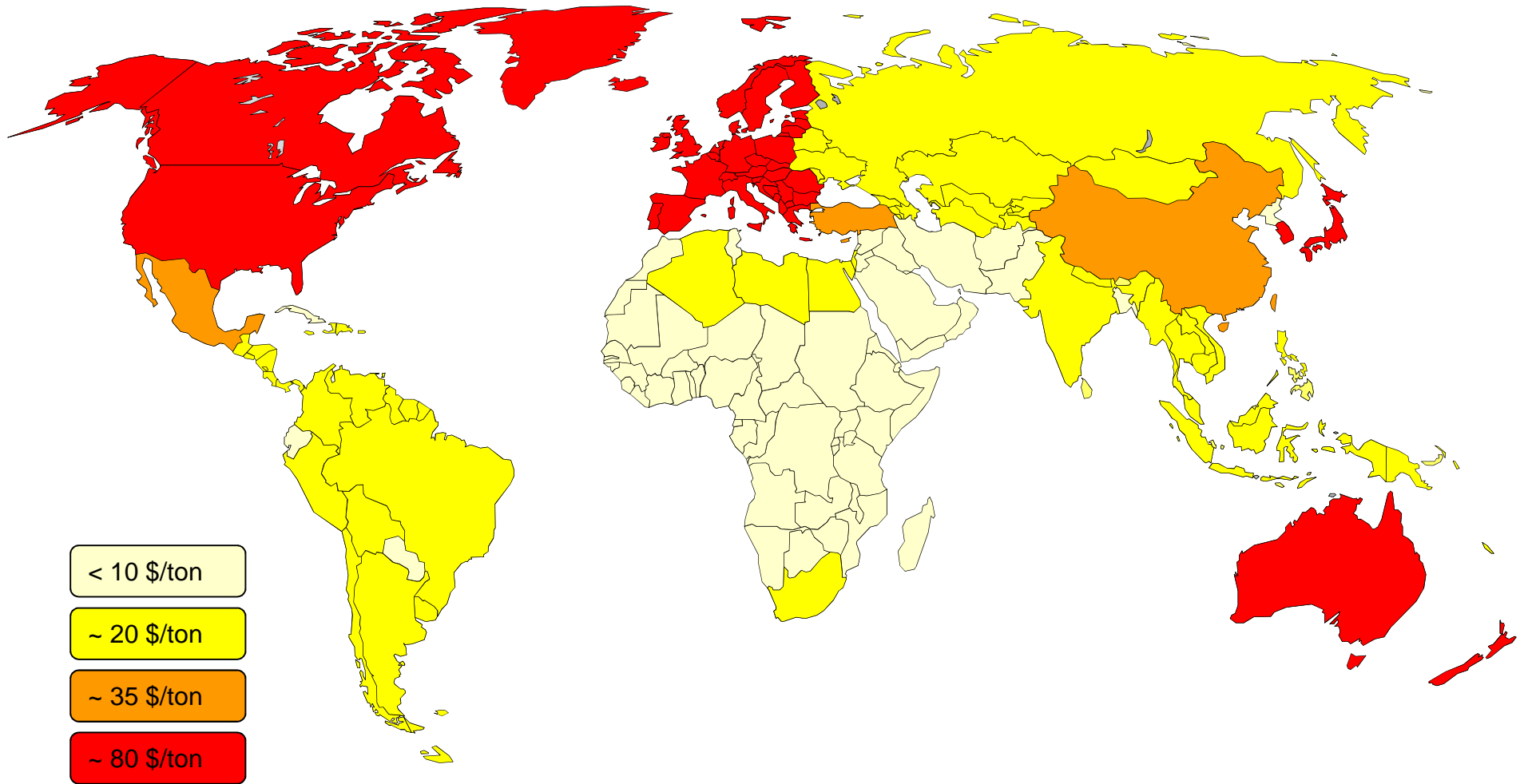
President Jim Yong Kim  
World Bank Group

“We believe the risks of climate change are serious and warrant thoughtful action.”

Rex Tillerson, CEO  
Exxon Mobil Corporation

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

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

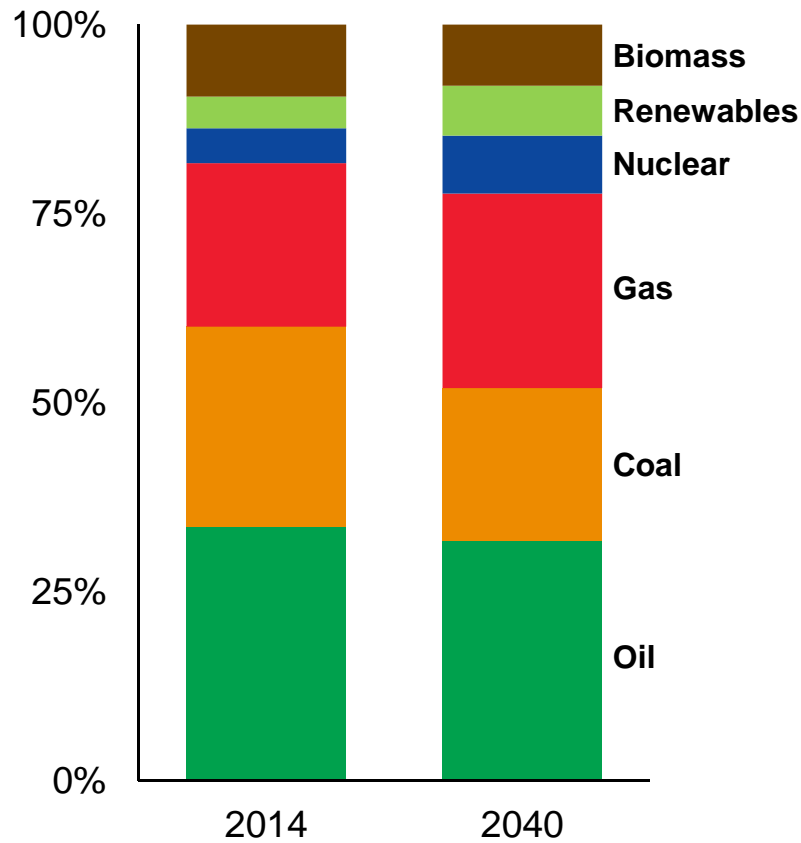


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# Energy Mix Shifts to Lower-Carbon Fuels

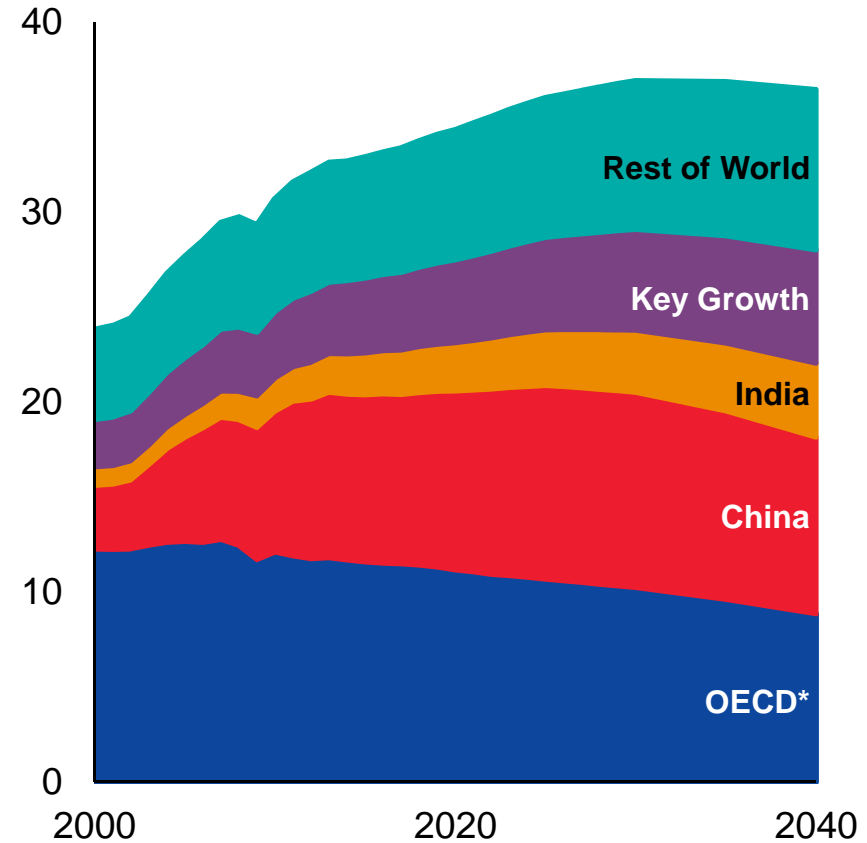
**Global Energy Mix**

Percent



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

Billion Tonnes



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

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

Bill Gates

*The Atlantic*, Nov. 2015

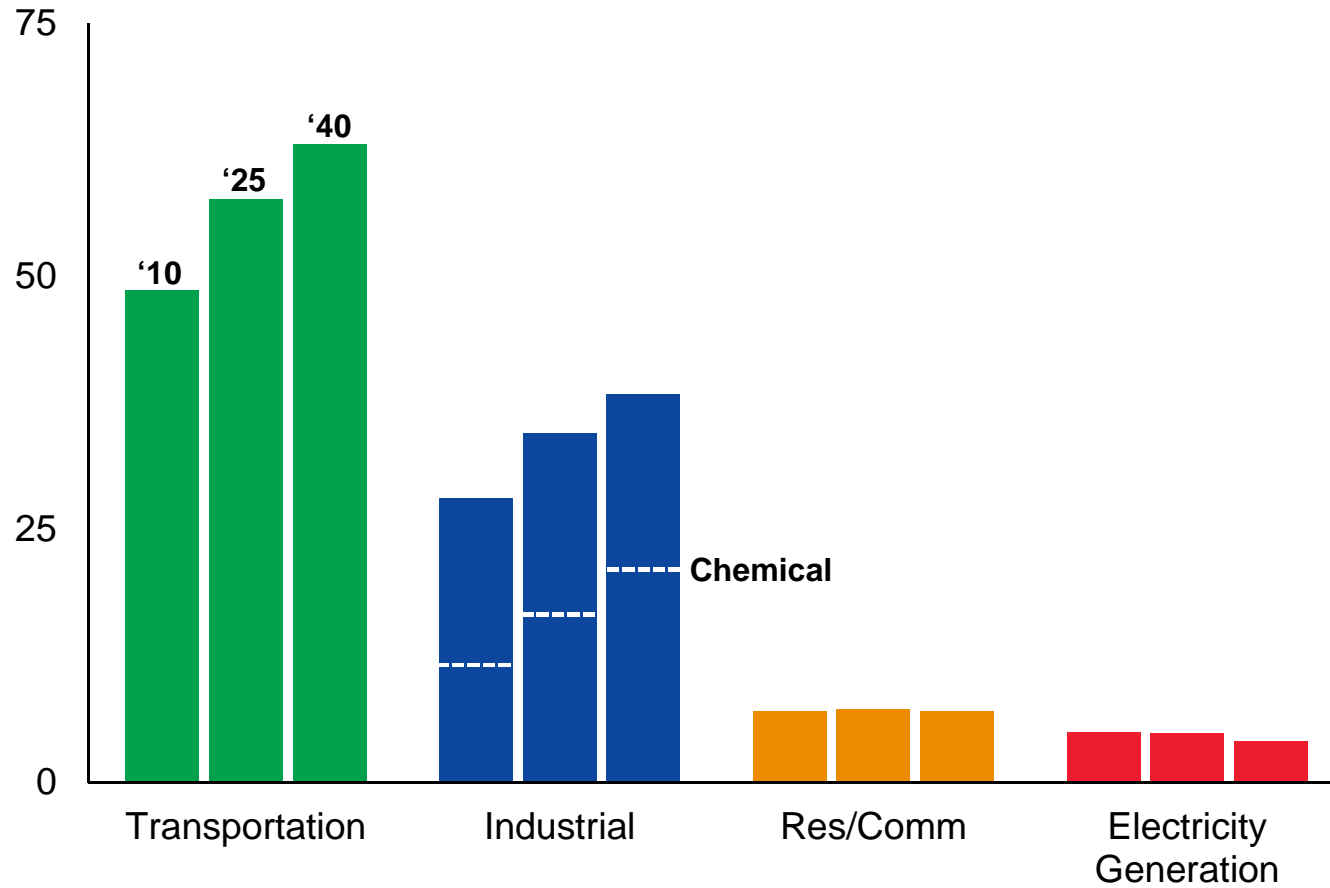


**Oil** remains the world's primary fuel through 2040.

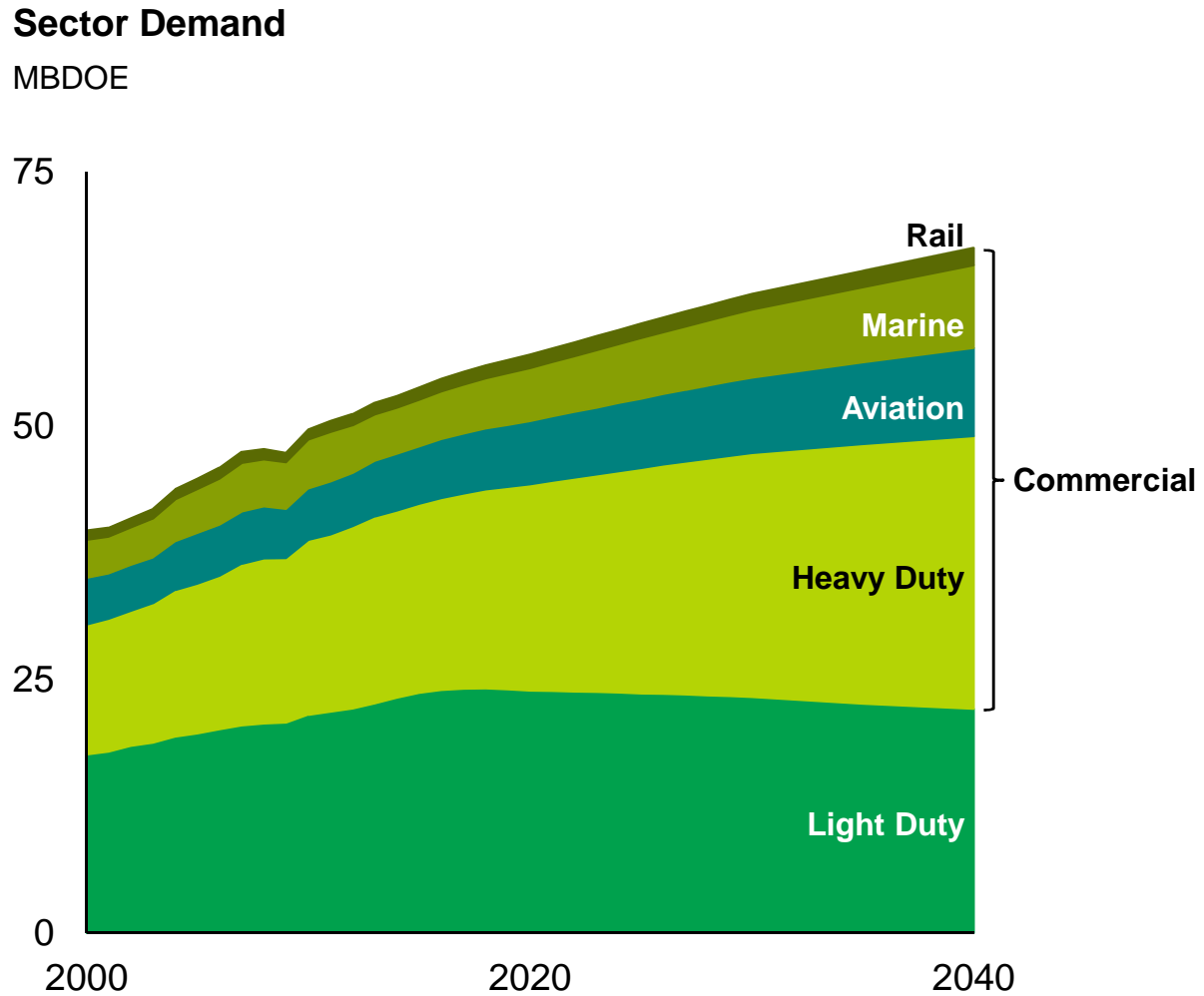
# Transportation and Chemicals Drive Growth

Liquids Demand by Sector

MBDOE

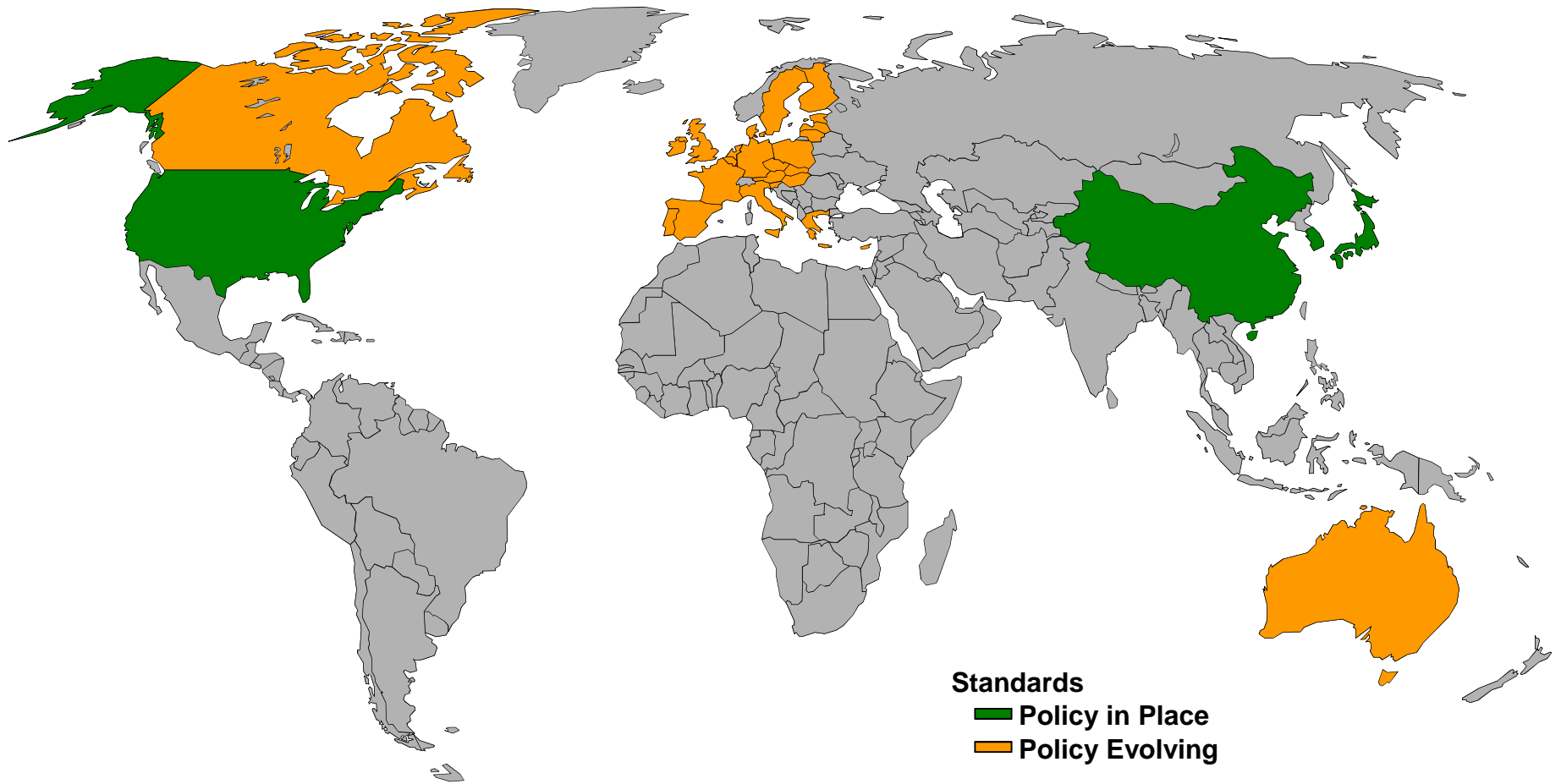


# Transportation Demand



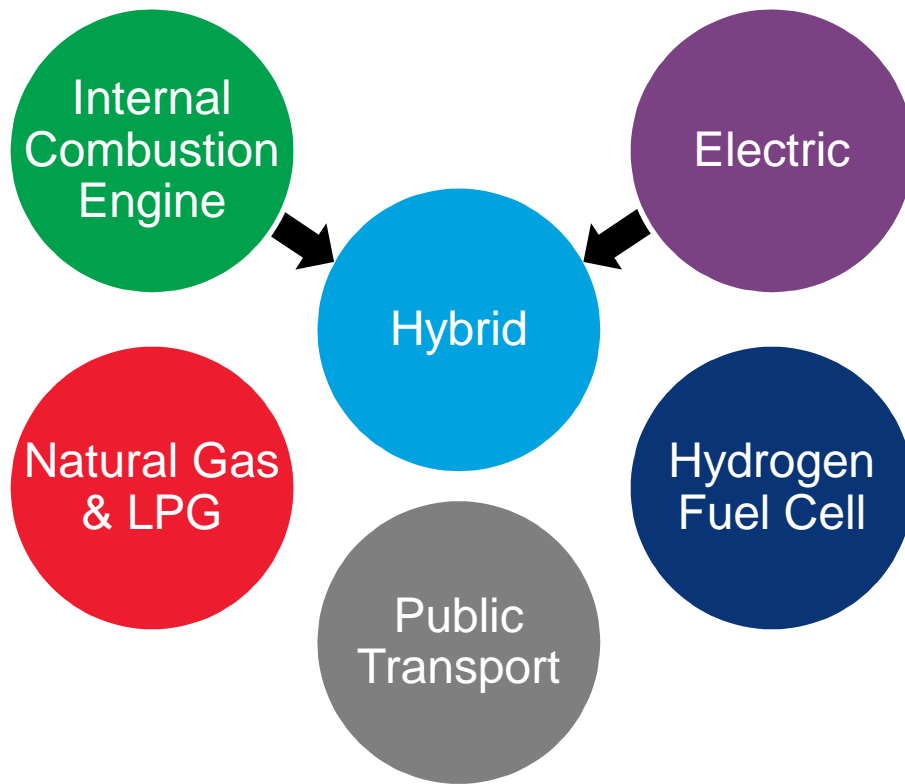


# Global Fuel Economy Standards (2008)

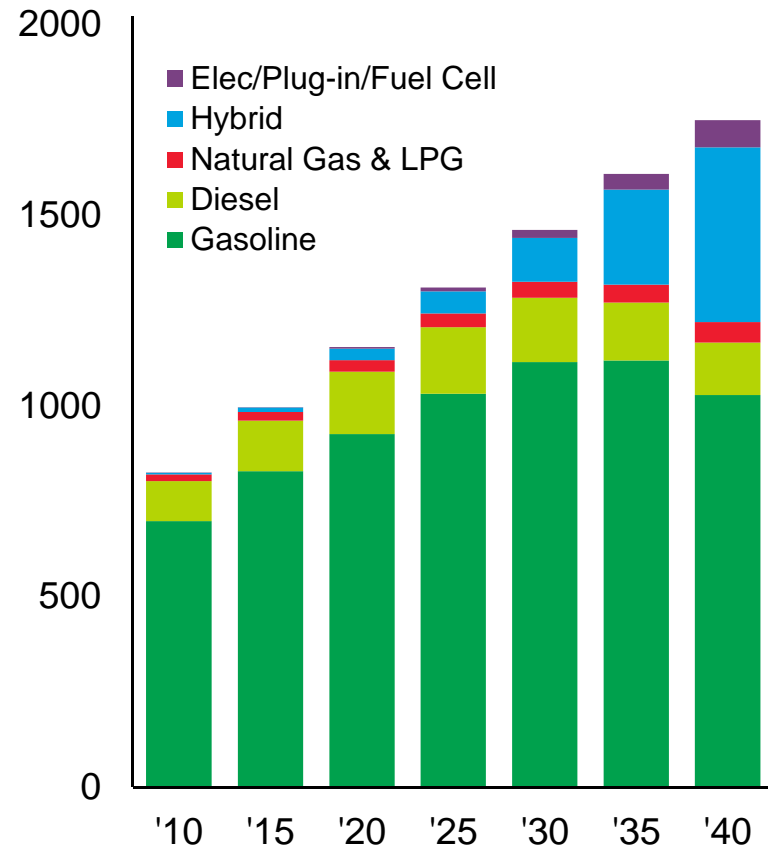




# Global Vehicle Fleet



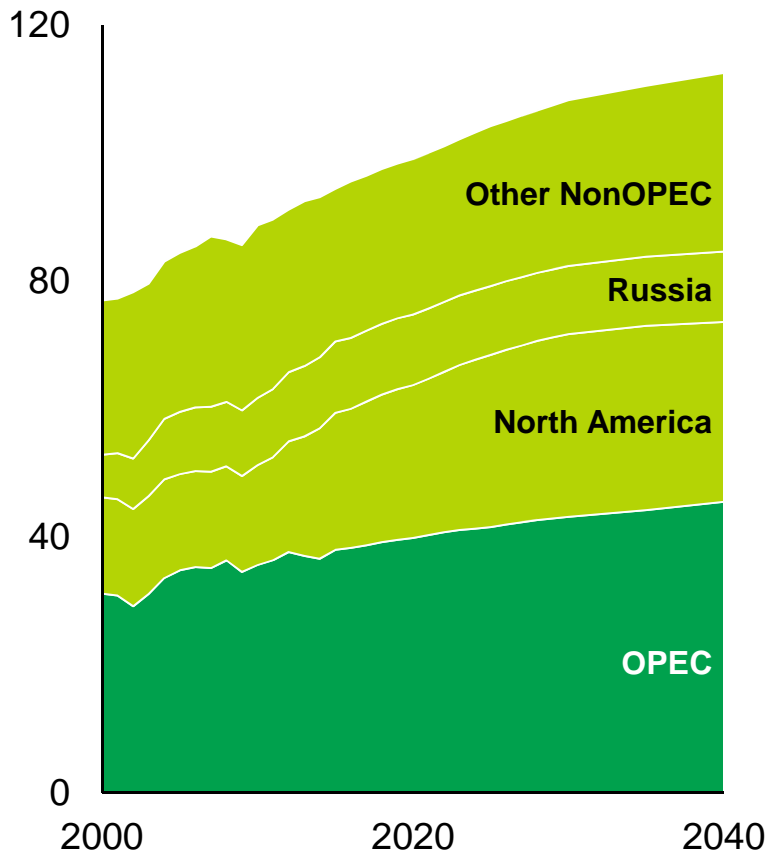
**By Type**  
Million Cars



# Liquids Production

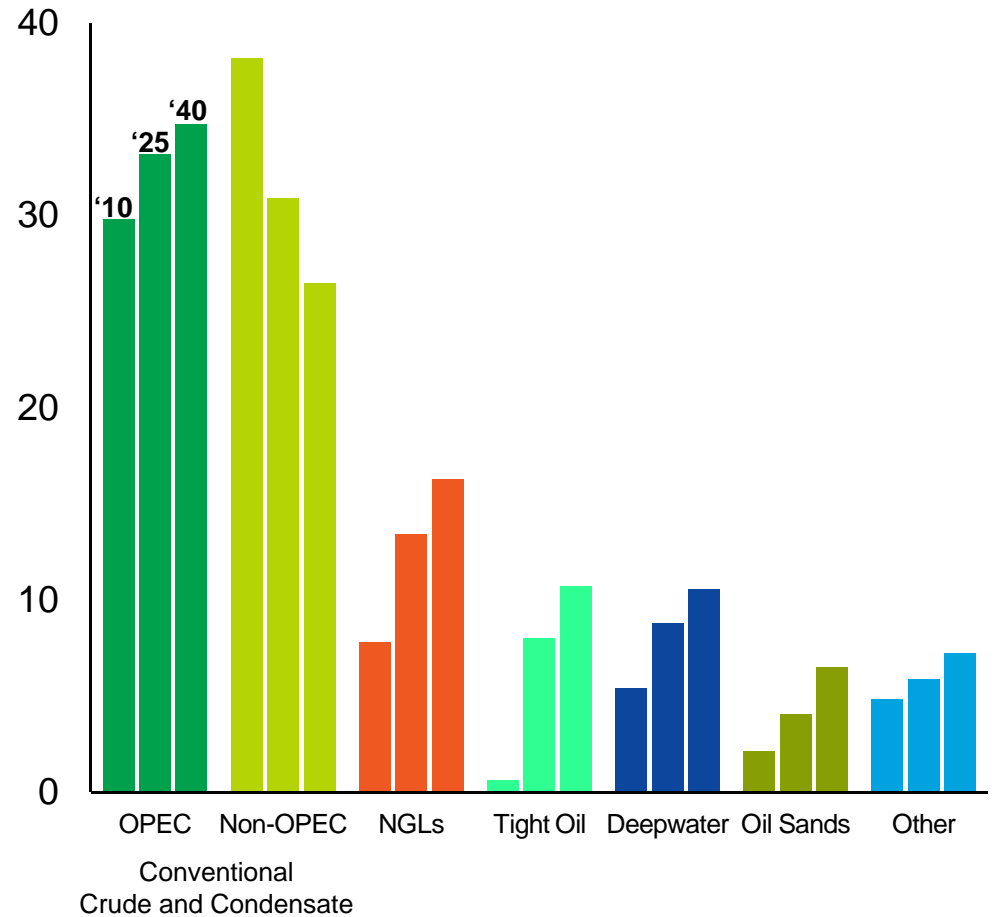
## By Region

MBDOE



## By Type

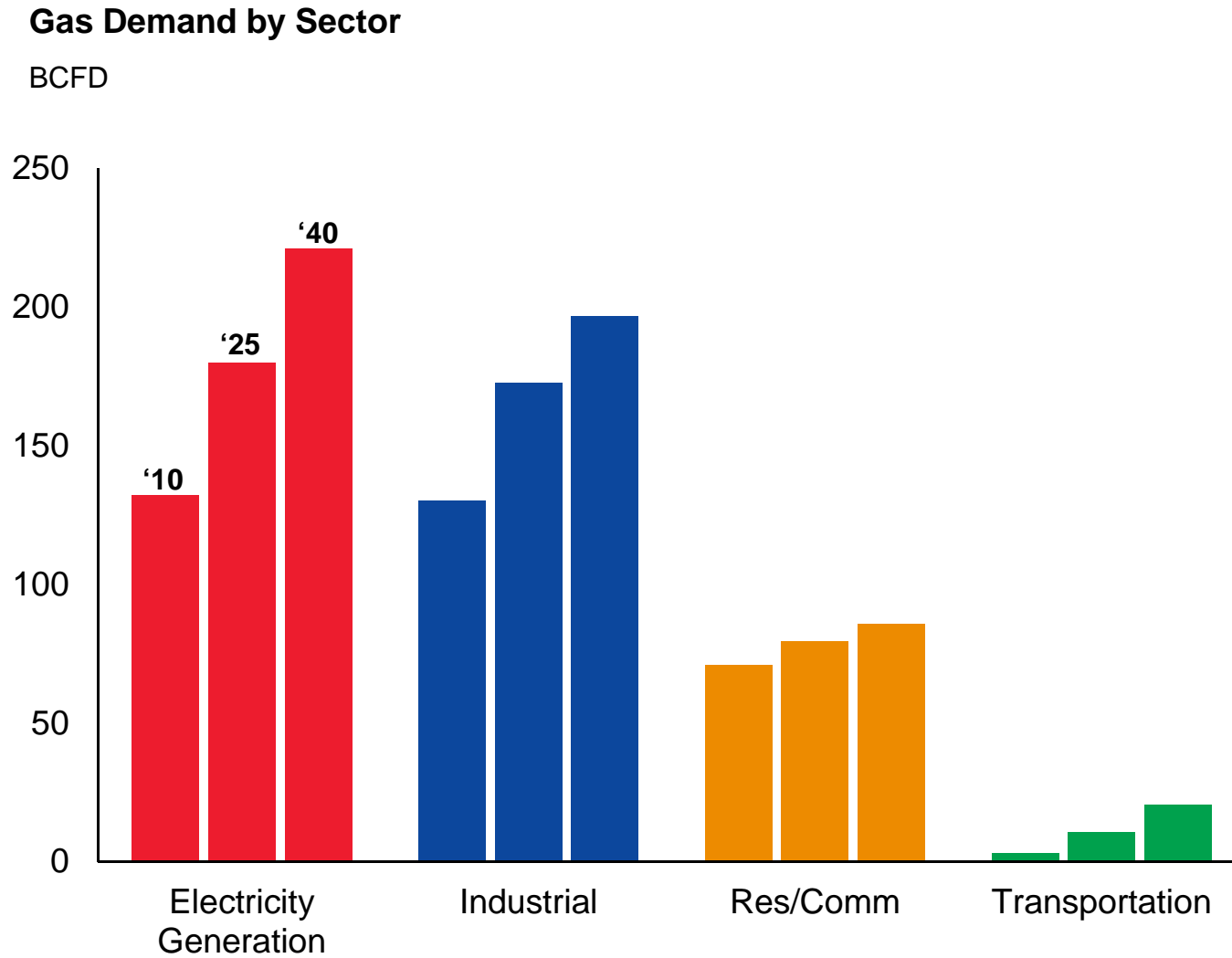
MBDOE





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

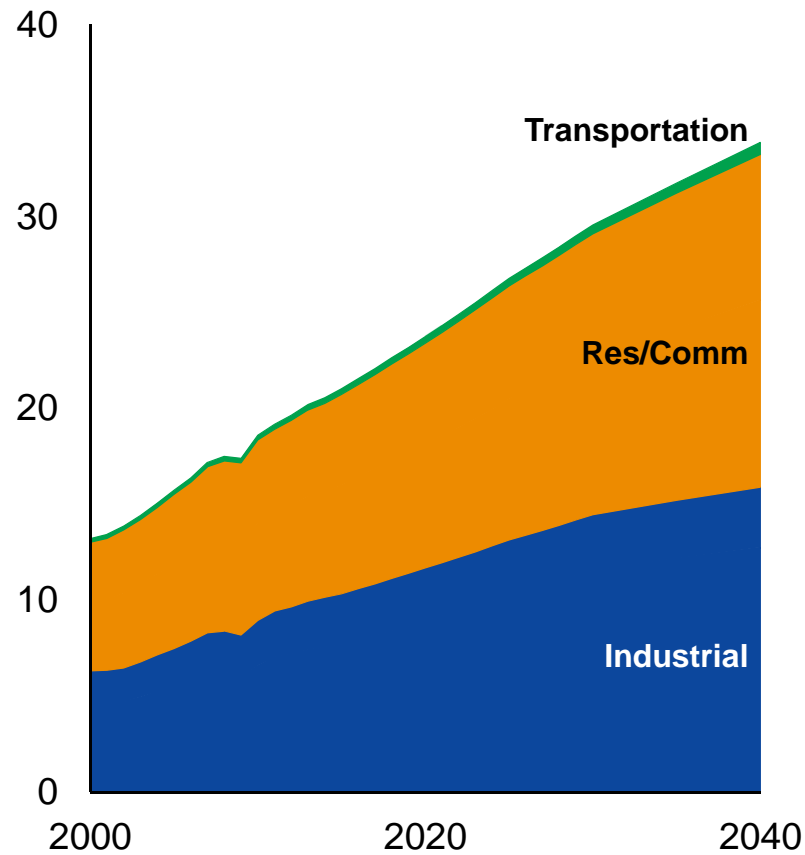
# Gas Demand Grows in All Sectors



# Electricity Demand Continues to Surge

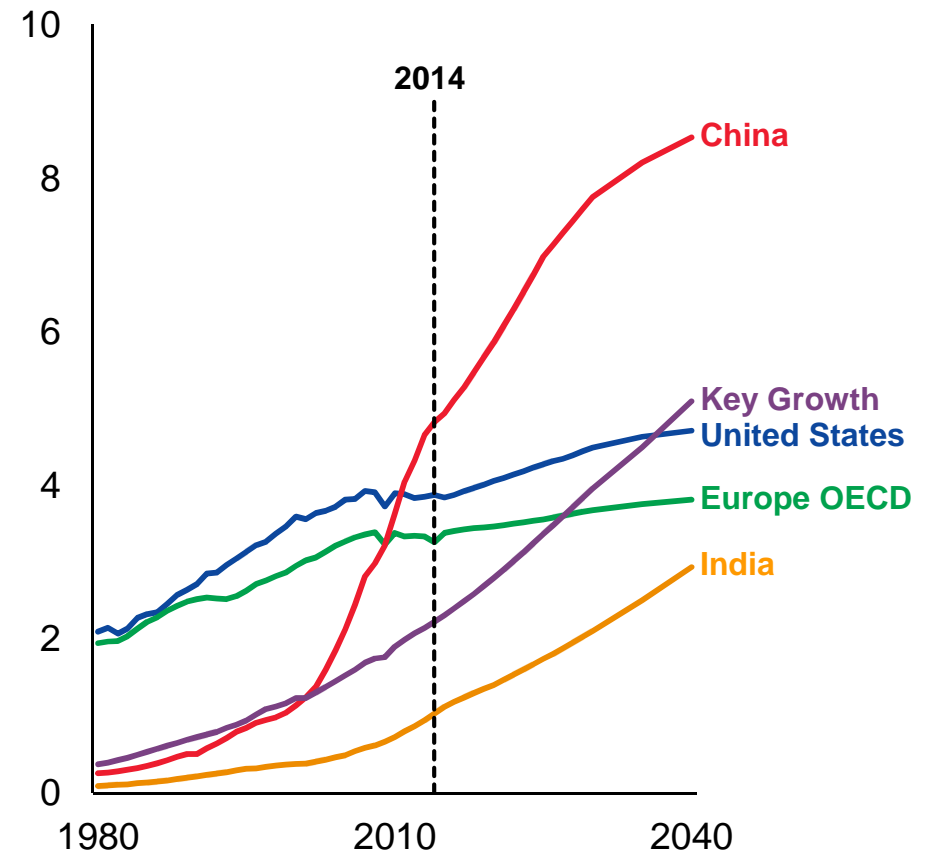
## By Sector

Thousand TWh



## Electricity Demand by Region

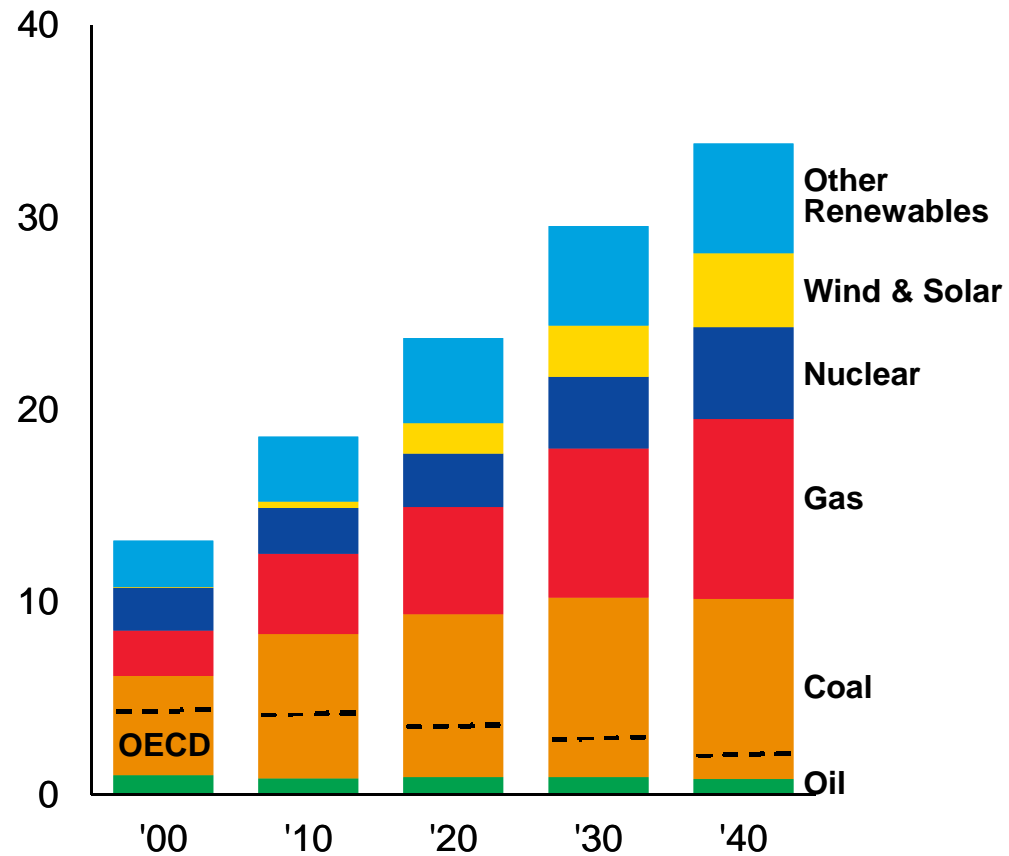
Thousand TWh



# Fuel for Electricity Transitions

Electricity Delivered by Type

Thousand TWh

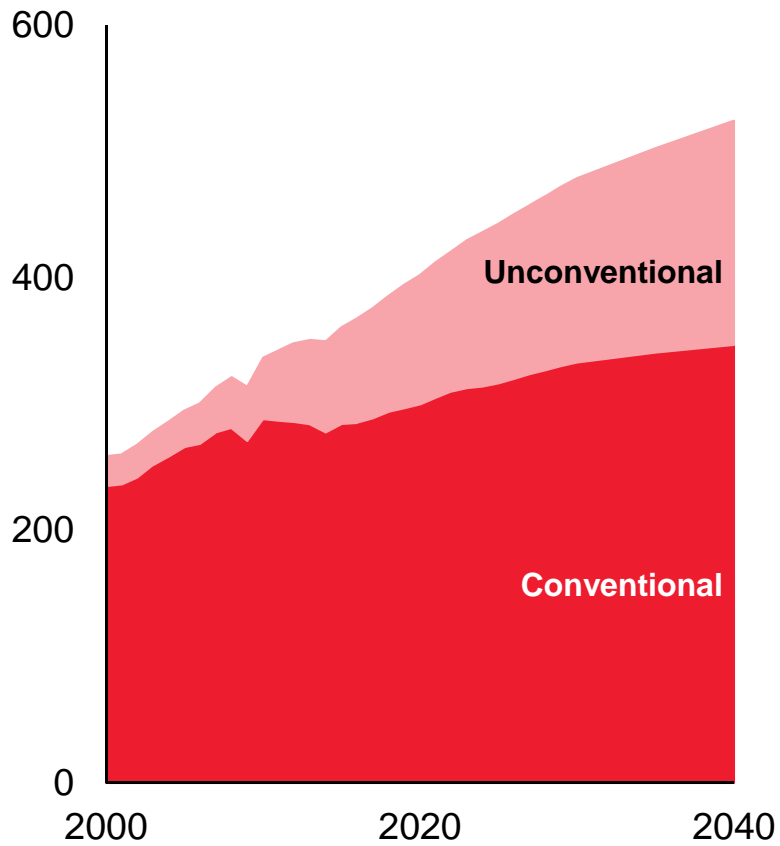




# Natural Gas Supply

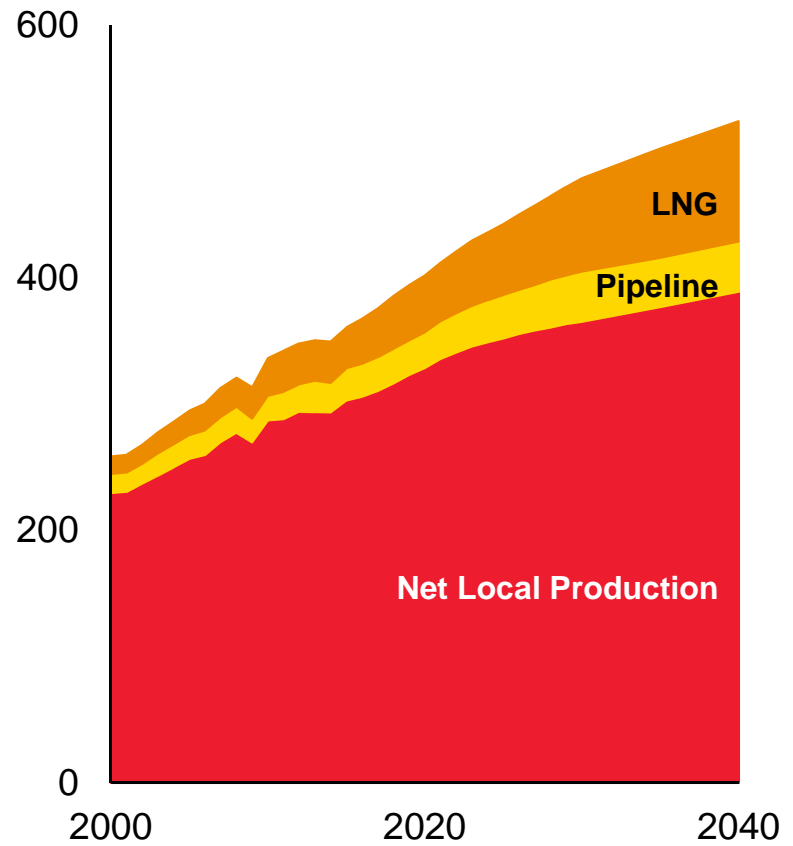
### By Production Type

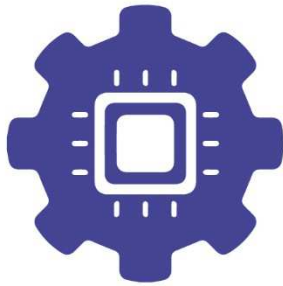
BCFD



### By Delivery Type

BCFD

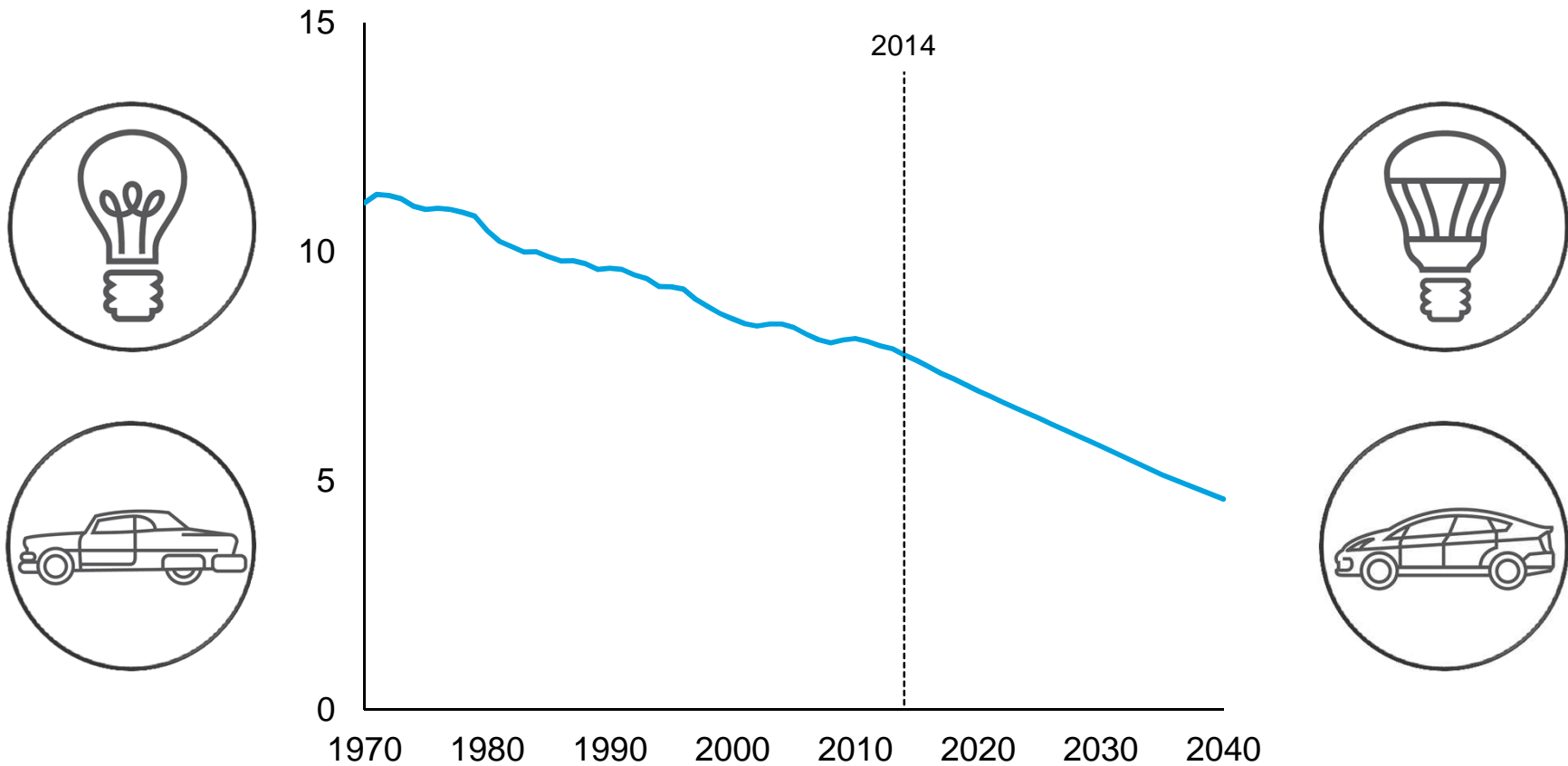




**Technology** has the highest potential and greatest uncertainty.

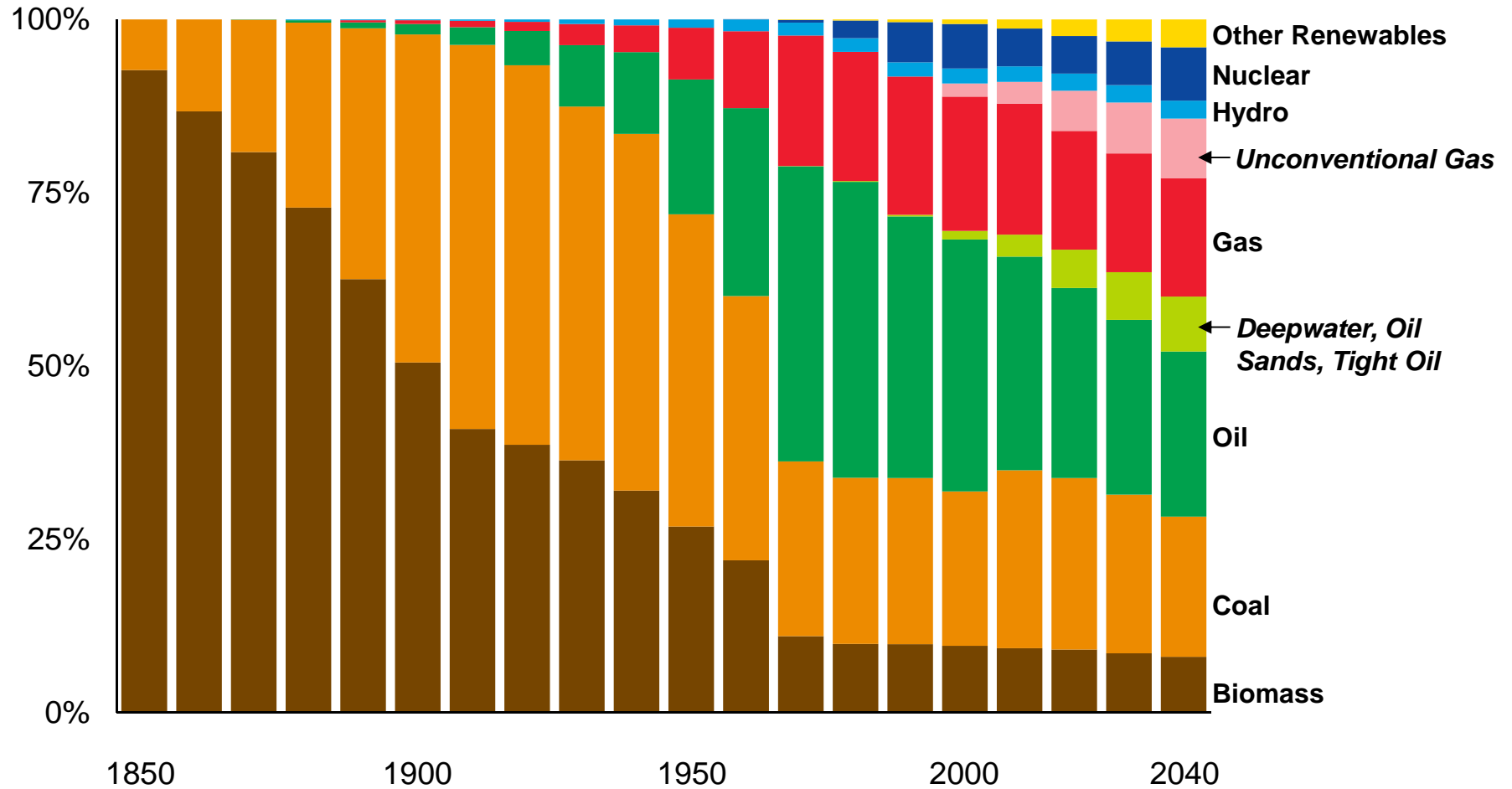
# Technology Helps Us Do More With Less

**Global Average Energy Intensity**  
Thousand BTUs per dollar GDP (2010\$)



# Technology Contributes to the Fuel Mix

Global Mix of Fuels

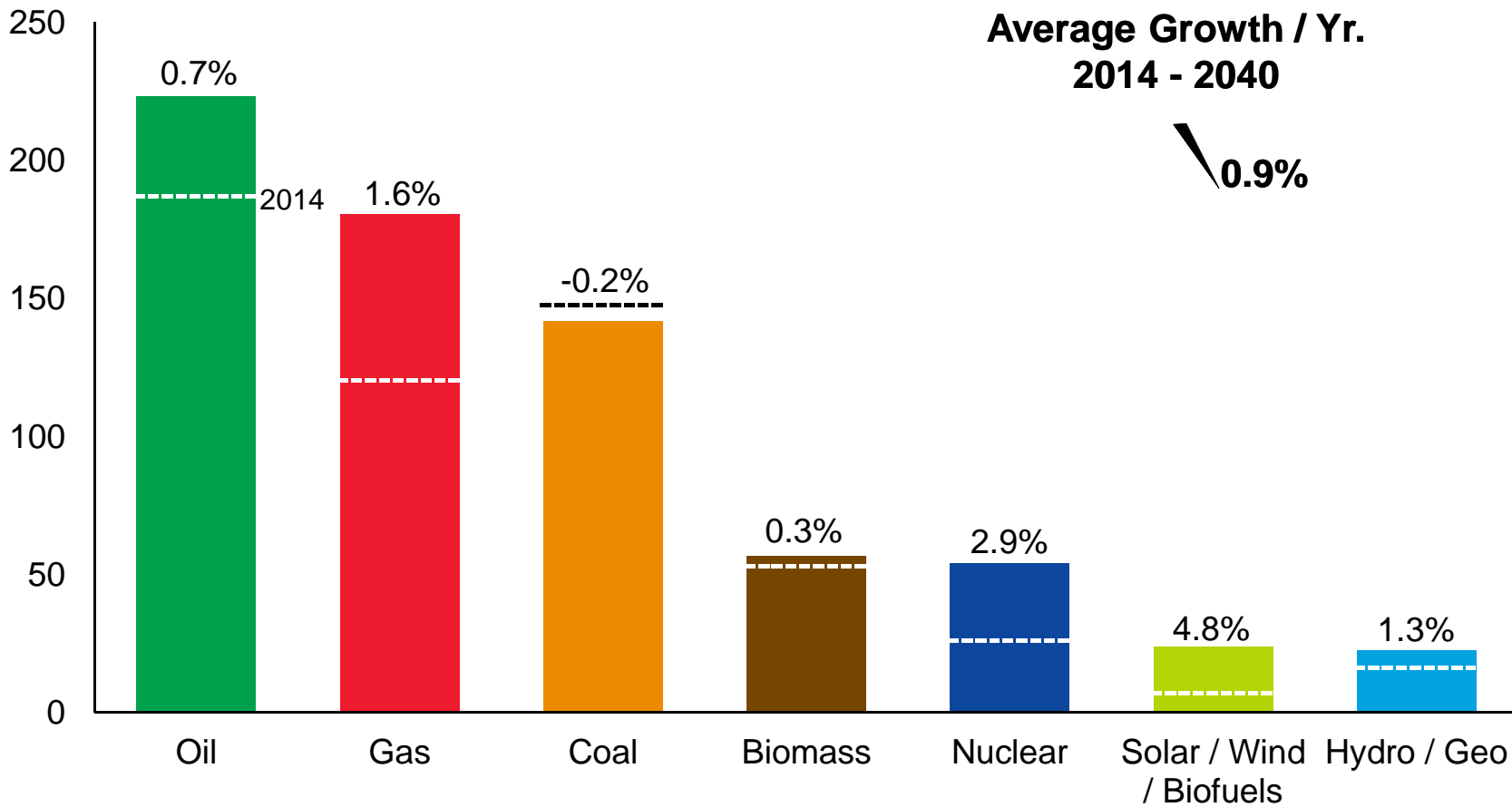


Source: Smil, Energy Transitions (1800-1960)



# Global Demand

**2040 By Fuel**  
Quadrillion BTUs



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[exxonmobil.com/energyoutlook](http://exxonmobil.com/energyoutlook)  
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