

International Energy Outlook 2016



SET Plan 2016 – Central European Energy Conference (CEEC) X

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Key findings in the IEO2016 Reference case

- World energy consumption increases from 549 quadrillion Btu in 2012 to 629 quadrillion Btu in 2020 and then to 815 quadrillion Btu in 2040, a 48% increase (1.4%/year). Non-OECD Asia (including China and India) account for more than half of the increase.
- The industrial sector continues to account for the largest share of delivered energy consumption; the world industrial sector still consumes over half of global delivered energy in 2040.
- Renewable energy is the world's fastest-growing energy source (increasing by 2.6%/year); nuclear is the second fastest-growing energy source (2.3%/year).
- Fossil fuels continue to supply more than three-fourths of world energy use in 2040.

Key findings in the IEO2016 Reference case (continued)

- Among the fossil fuels, natural gas grows the fastest. Coal use plateaus in the mid-term as China shifts from energy-intensive industries to services and worldwide policies to limit coal use intensify. By 2030, natural gas surpasses coal as the world's second largest energy source.
- In 2012, coal provided 40% of the world's total net electricity generation. By 2040, coal, natural gas, and renewable energy sources provide roughly equal shares (28-29%) of world generation.
- With current policies and regulations, worldwide energy-related carbon dioxide emissions rise from about 32 billion metric tons in 2012 to 36 billion metric tons in 2020 and then to 43 billion metric tons in 2040, a 34% increase.

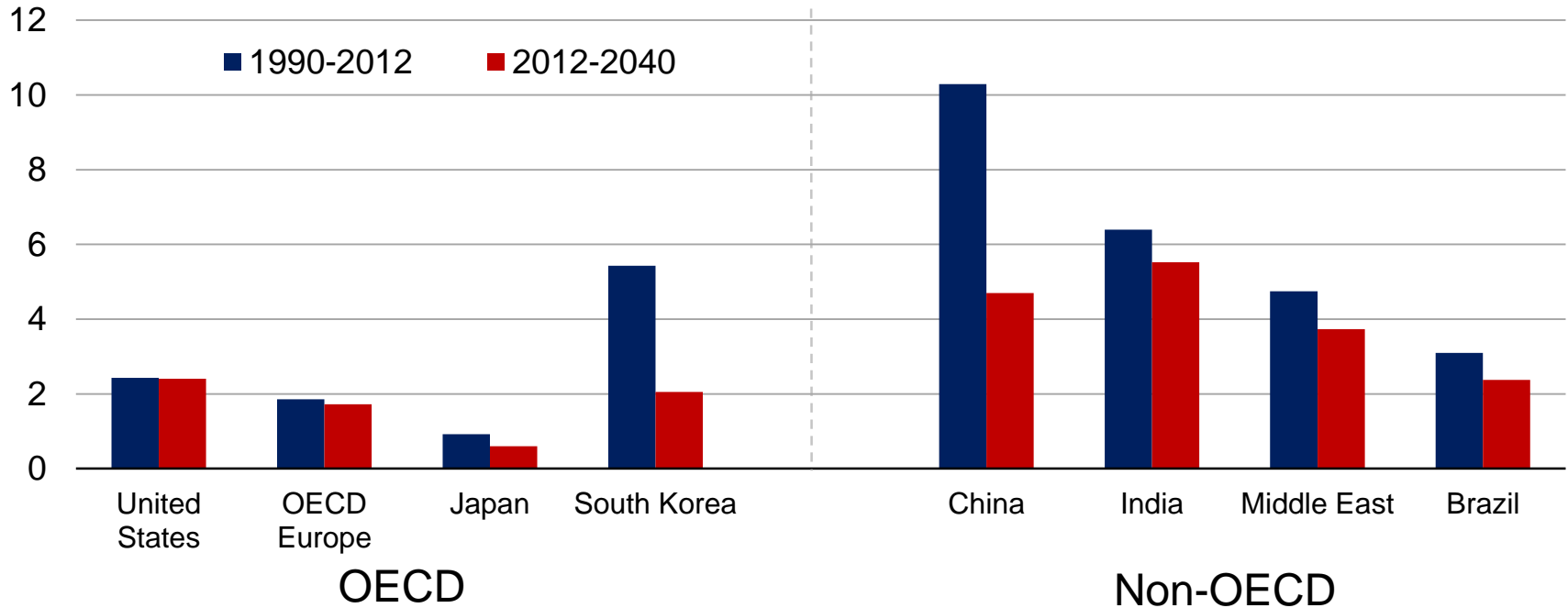
Many global issues increase uncertainty...

- Economic growth in key economies (China, Brazil, Russia, among others)
- Implementation and strength of climate policies
- Technology improvement rates (both supply and demand)
- Unrest in oil producing countries
- OPEC production
- Future of nuclear generating capacity

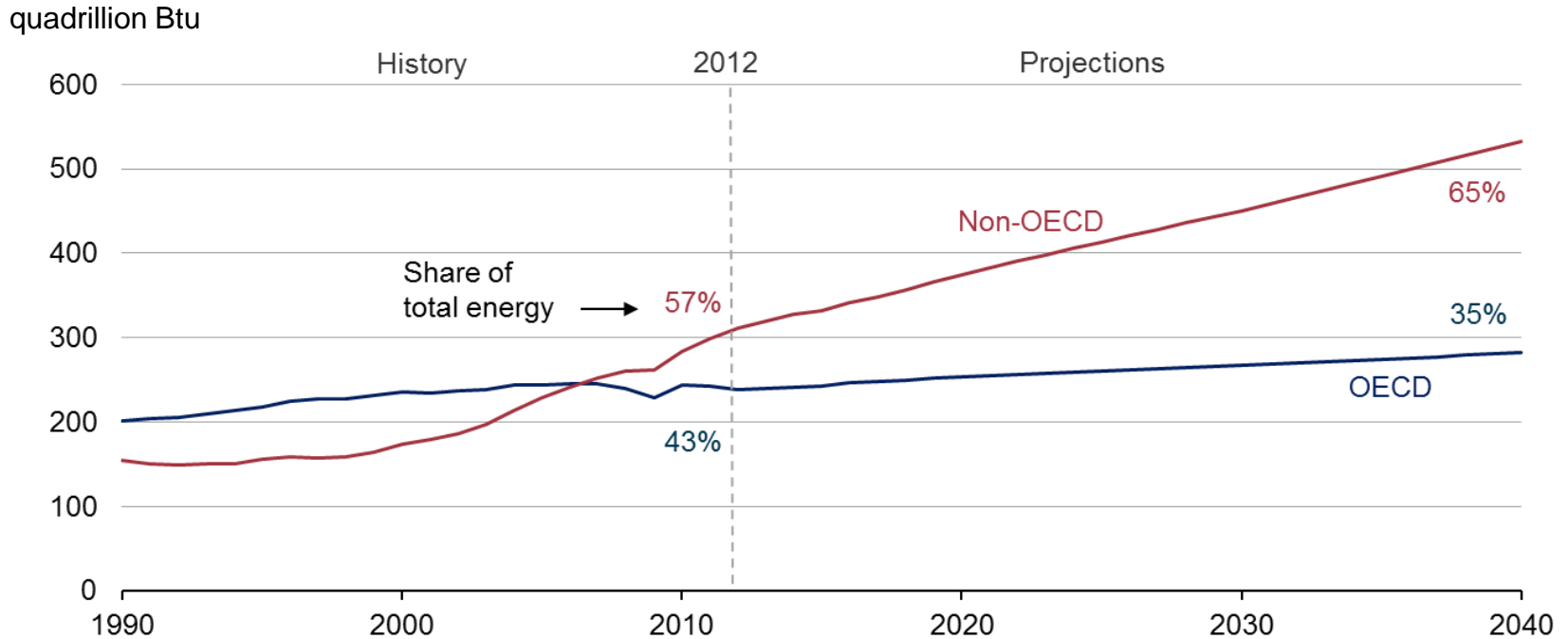
Global outlook

GDP growth rates in selected country groupings

percent per year

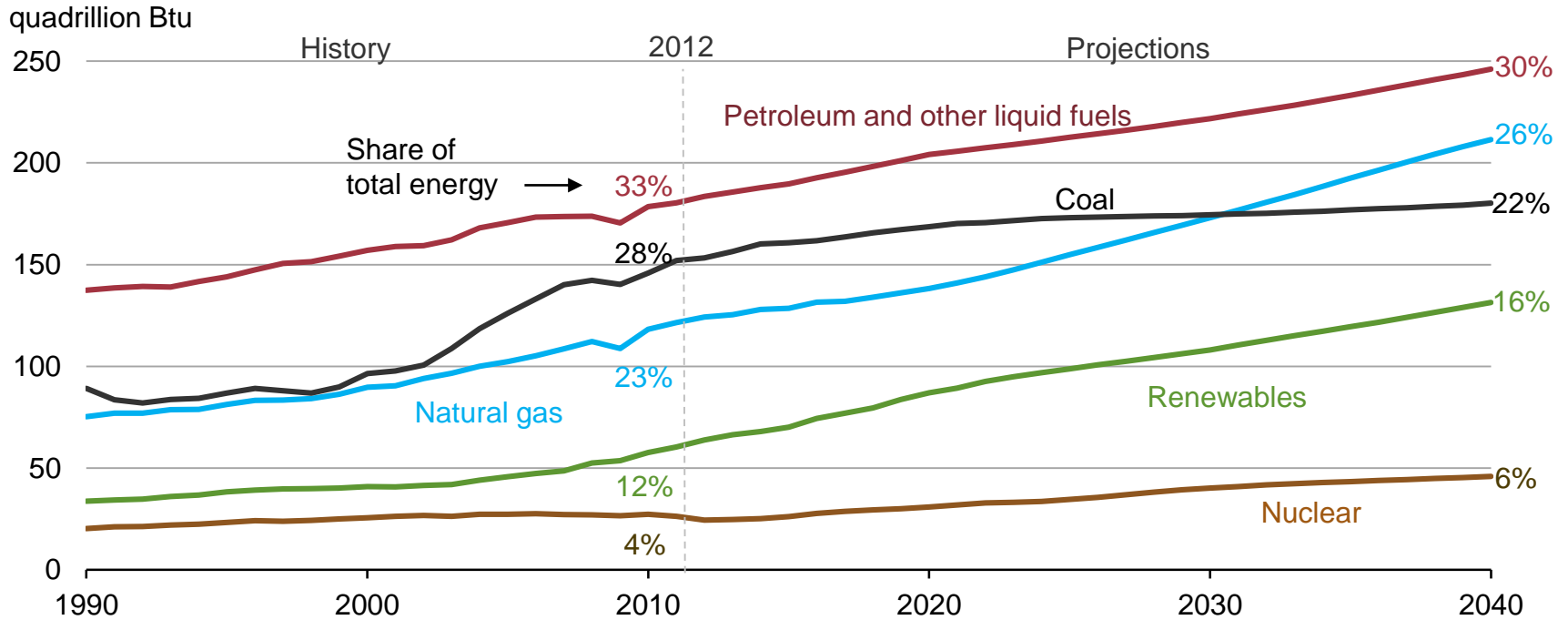


Primary energy consumption in the OECD and non-OECD, 1990-2040



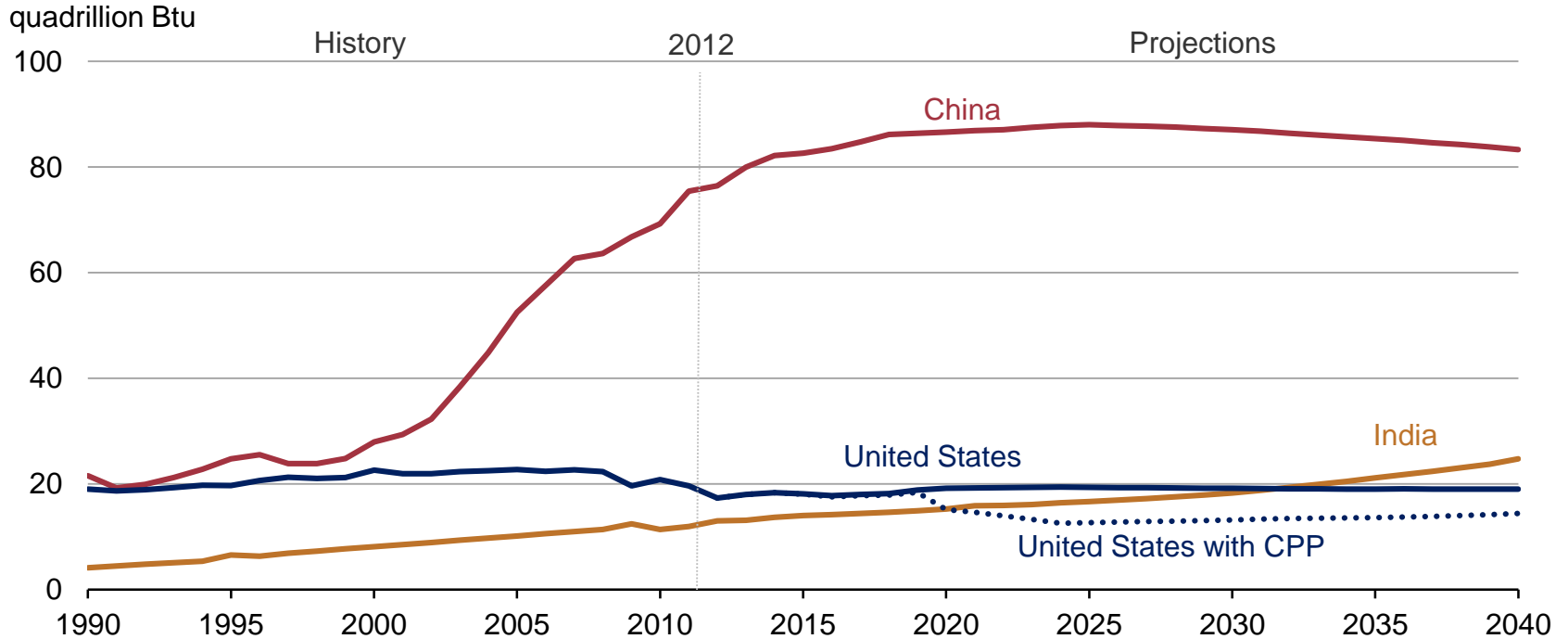
Source: EIA, International Energy Outlook 2016

World energy consumption by source, 1990-2040



Source: EIA, International Energy Outlook

Coal consumption in China, India, and the United States, 1990-2040

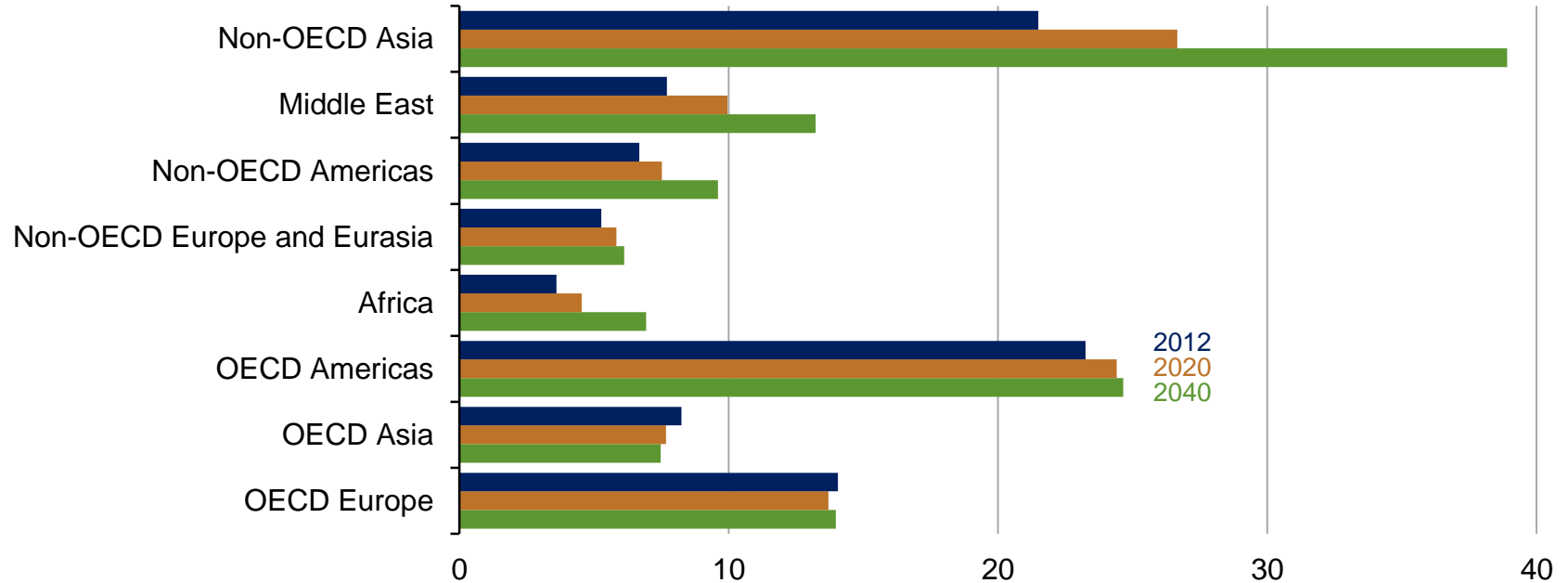


Source: EIA, *International Energy Outlook 2016* and EIA, *Analysis of the Impacts of the Clean Power Plan* (May 2015)

Liquid fuels markets

World petroleum and other liquid fuels consumption, 2012-40

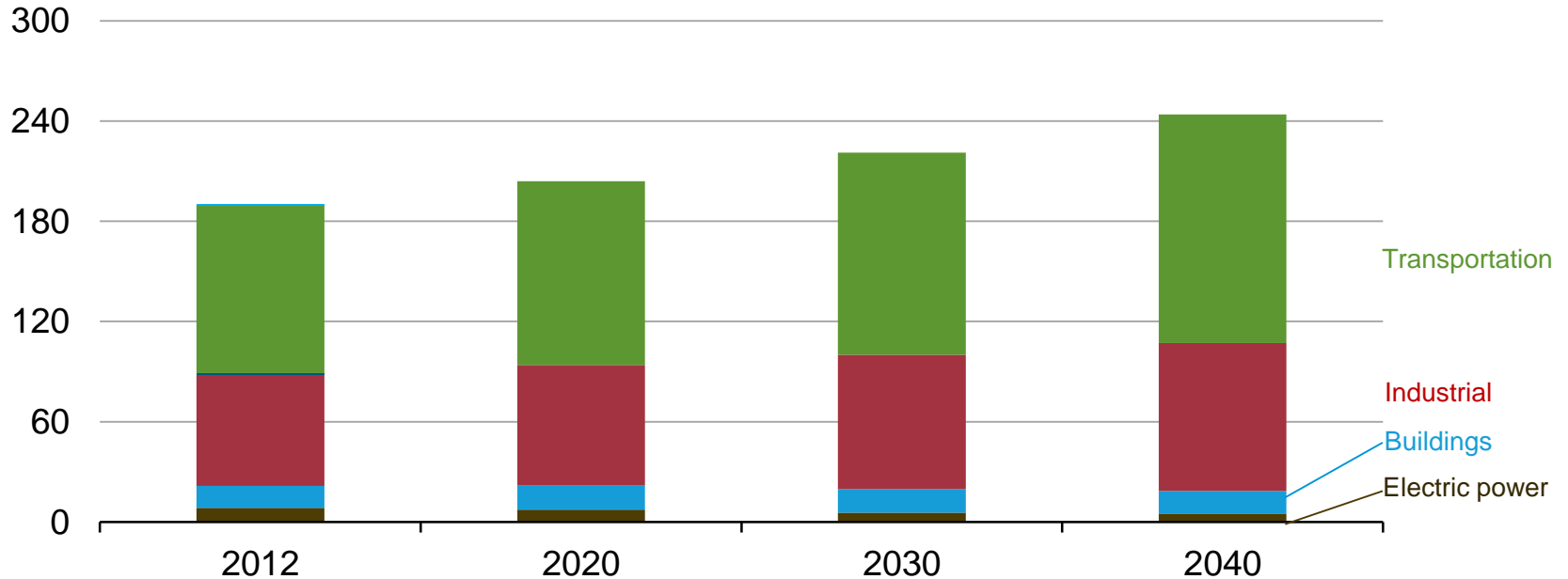
million barrels per day



Source: EIA, International Energy Outlook 2016

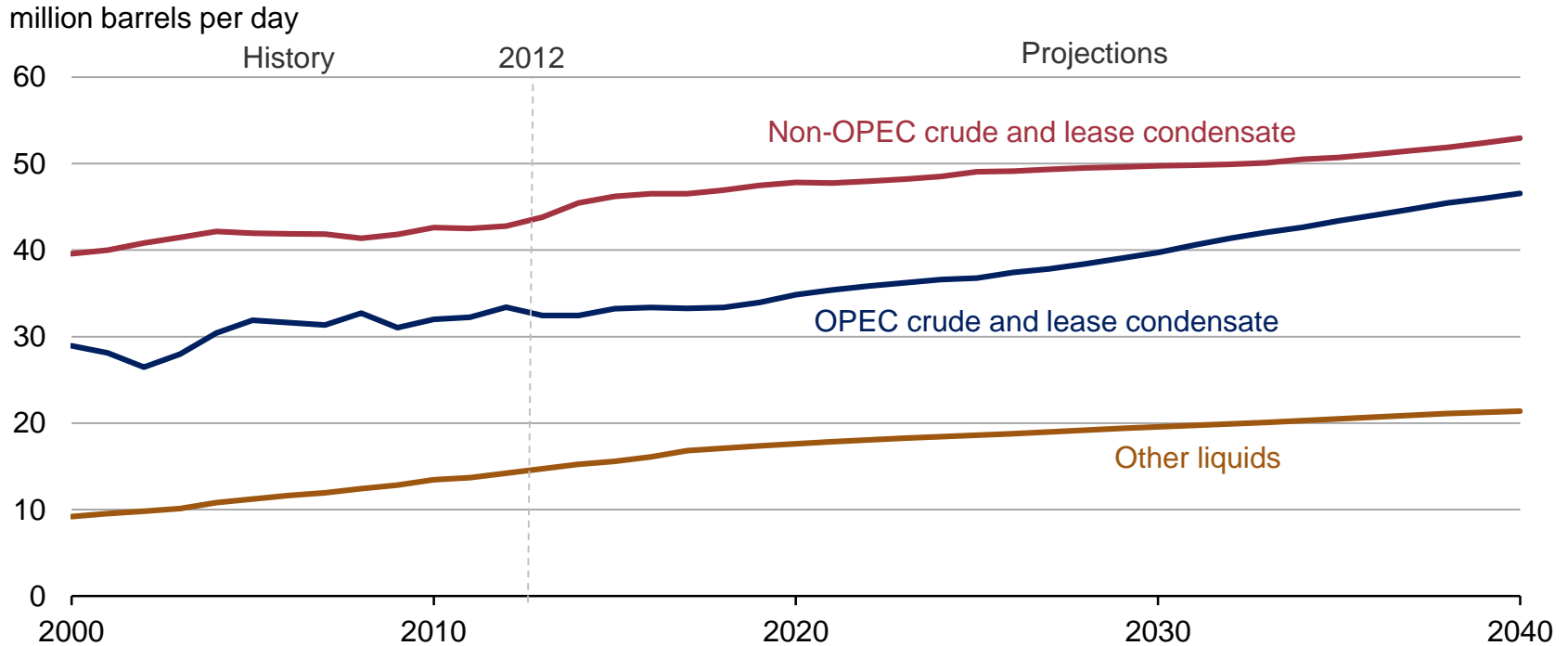
World petroleum and other liquid fuels consumption by end-use sector, 2012-40

quadrillion Btu



Source: EIA, International Energy Outlook 2016

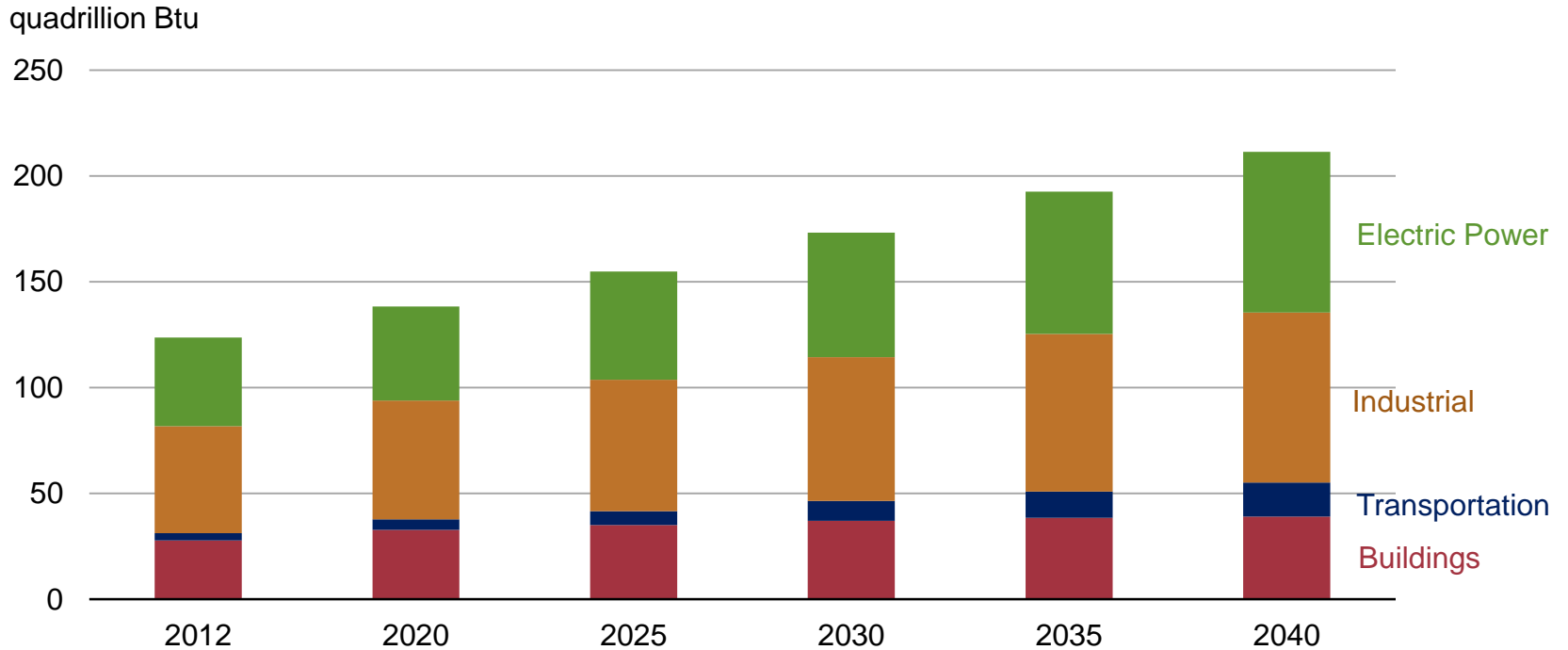
World production of petroleum and other liquid fuels, 2000-40



Source: EIA, *International Energy Outlook 2016*

Natural gas markets

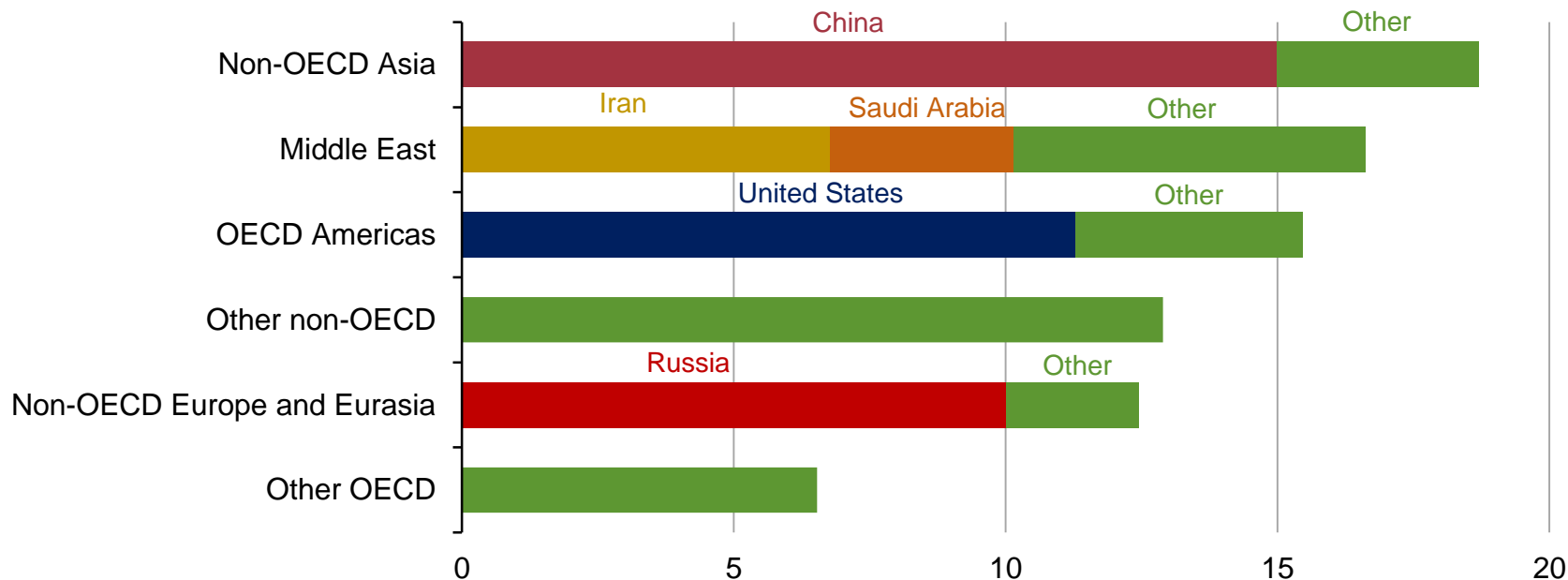
World natural gas consumption by end-use sector, 2012-40



Source: EIA, *International Energy Outlook 2016*

World change in natural gas production by region, 2012-40

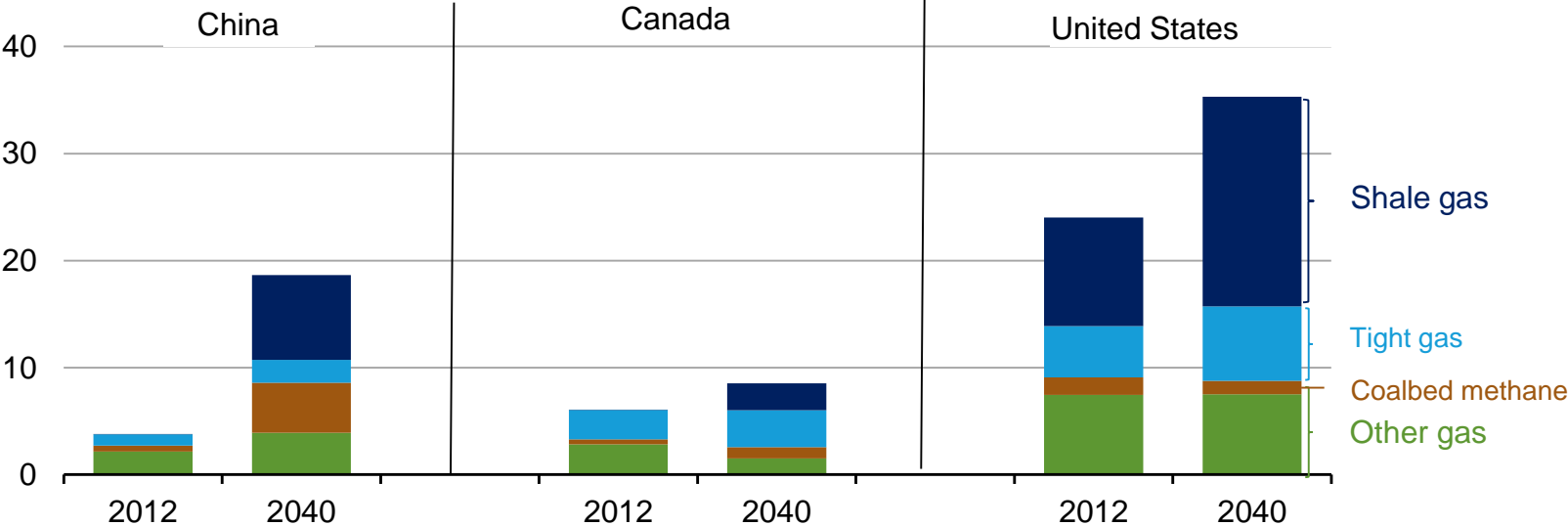
trillion cubic feet



Source: EIA, International Energy Outlook 2016

Natural gas production by type in selected countries, 2012 and 2040

trillion cubic feet



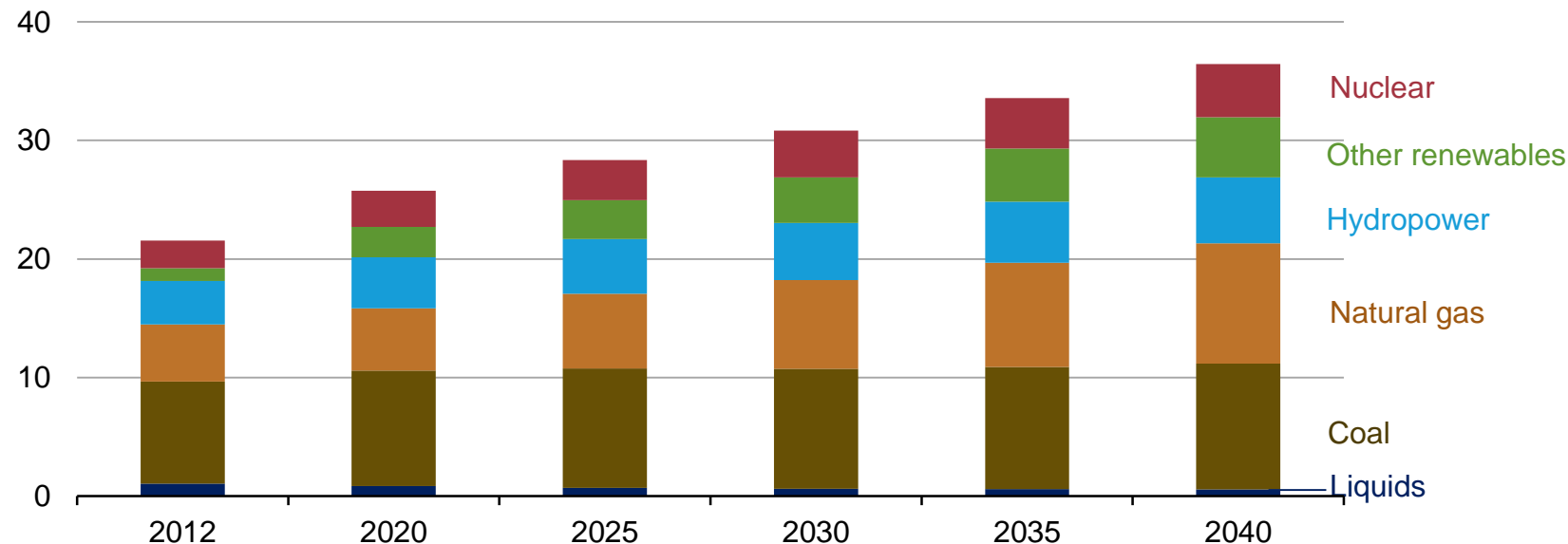
Other natural gas includes natural gas produced from structural and stratigraphic traps (e.g. reservoirs), historically referred to as 'conventional' production.

Source: EIA, International Energy Outlook 2016

Electricity markets

World net electricity generation by source, 2012-40

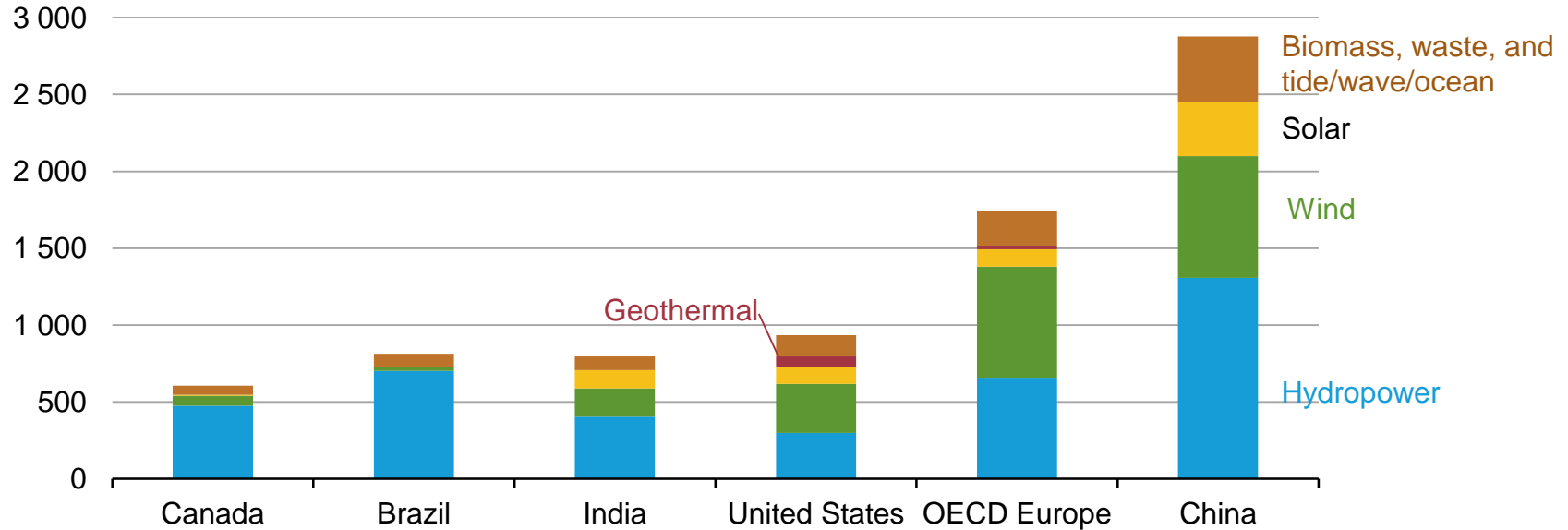
trillion kilowatthours



Source: EIA, International Energy Outlook 2016

Renewable net electricity generation by selected country and country grouping, 2040

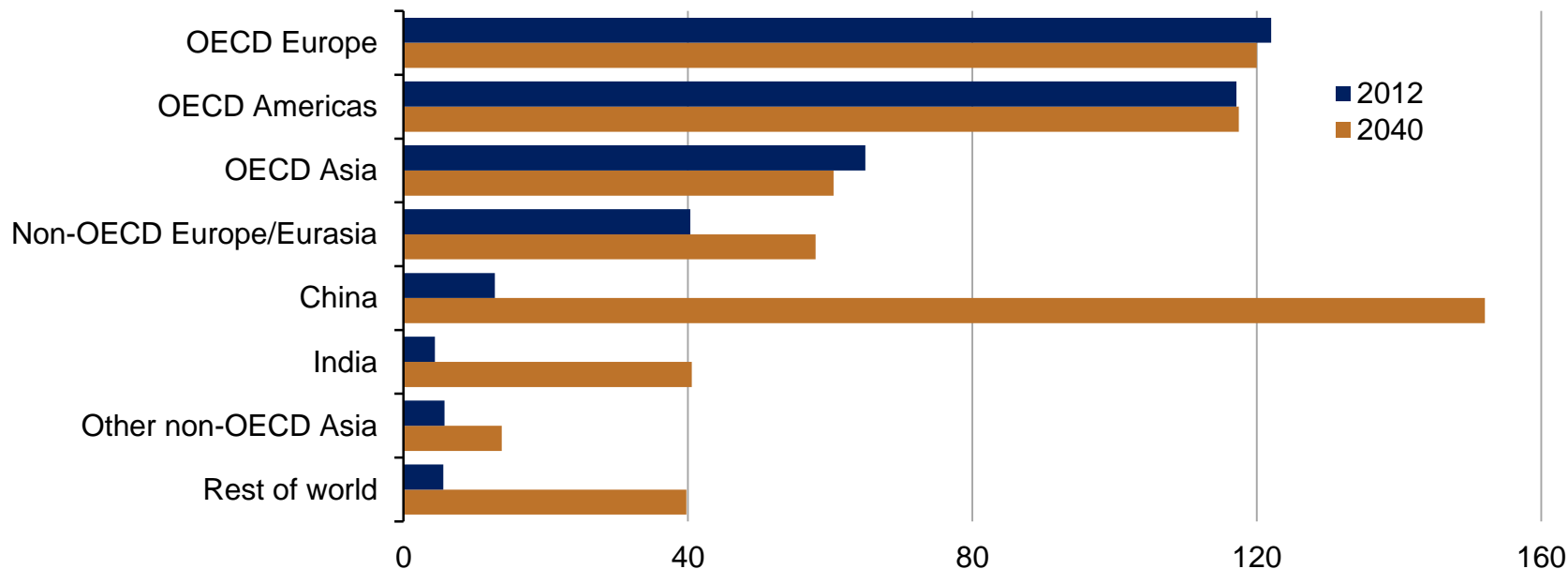
billion kilowatthours



Source: EIA, International Energy Outlook 2016

World installed nuclear capacity by region, 2012 and 2040

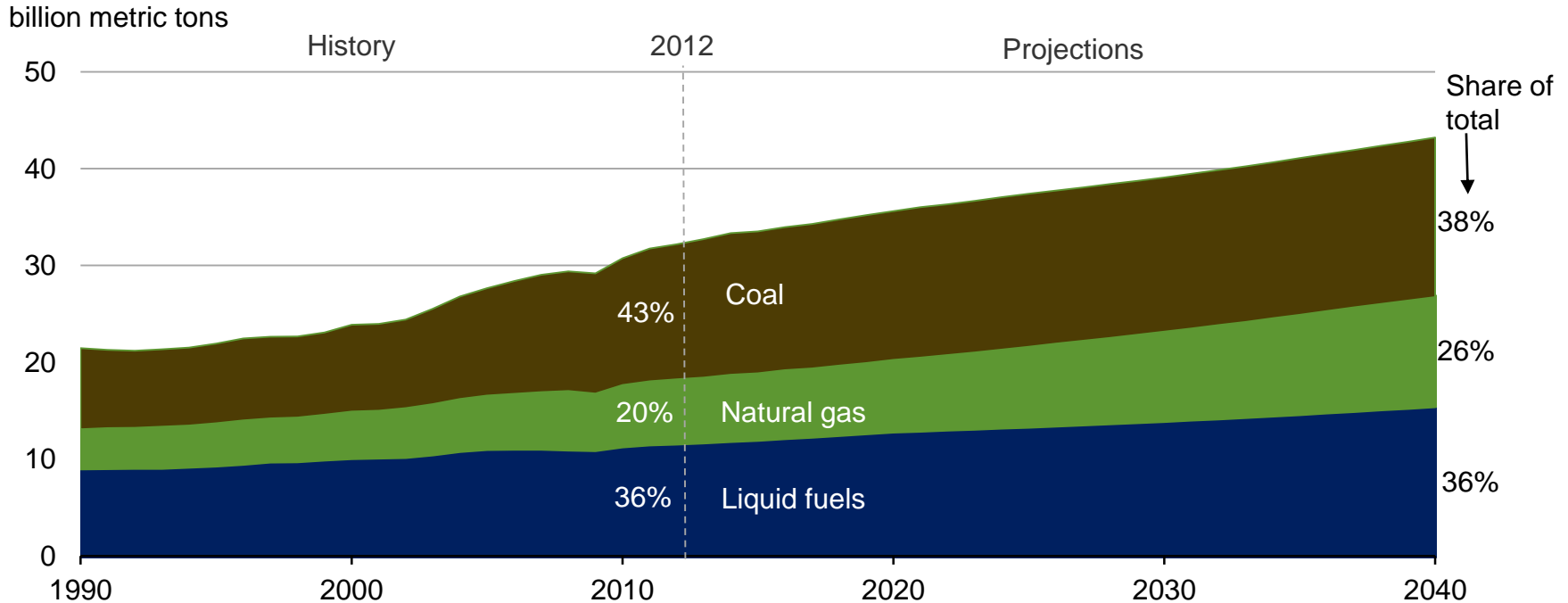
gigawatts



Source: EIA, *International Energy Outlook 2016*

Energy-related carbon dioxide emissions

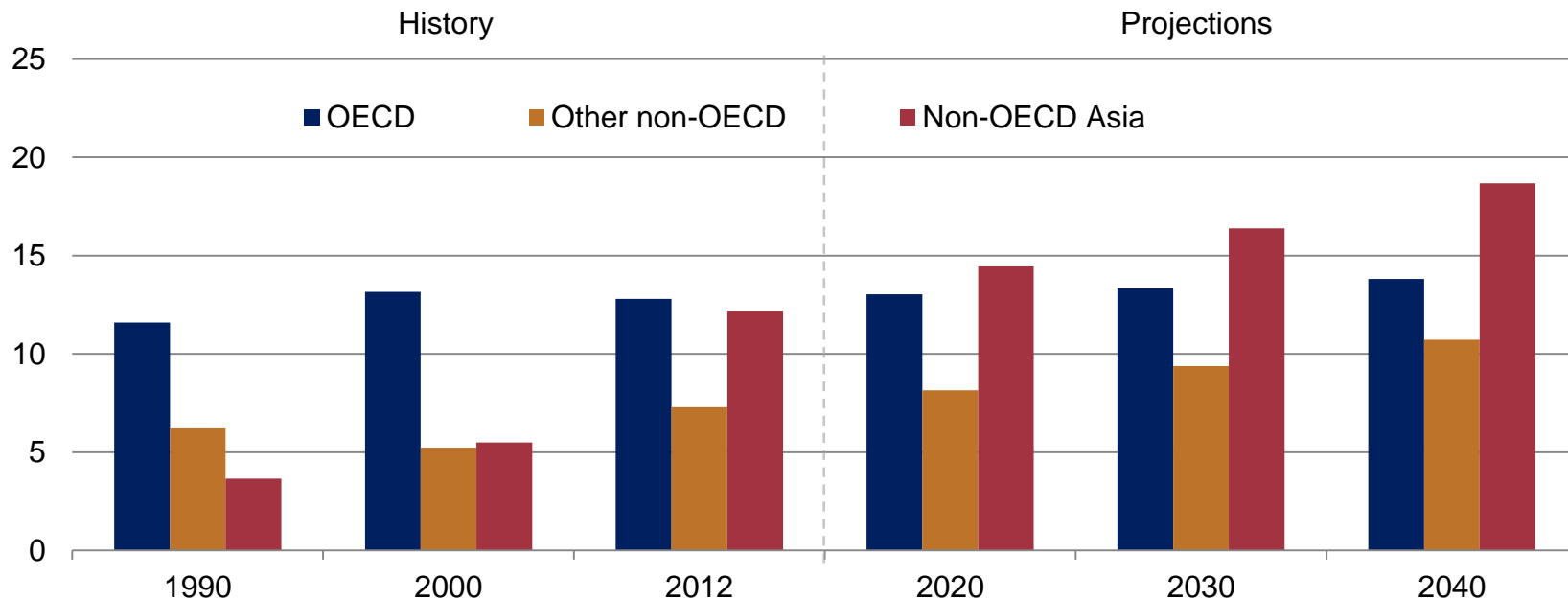
World energy-related carbon dioxide emissions by fuel, 1990-2040



Source: EIA, International Energy Outlook 2016

World energy-related carbon dioxide emissions, 1990-2040

billion metric tons



Source: EIA, *International Energy Outlook 2016*

For more information

U.S. Energy Information Administration home page | www.eia.gov

International Energy Outlook | www.eia.gov/ieo

Annual Energy Outlook | www.eia.gov/aeo

Short-Term Energy Outlook | www.eia.gov/steo

Monthly Energy Review | www.eia.gov/mer

Today in Energy | www.eia.gov/todayinenergy

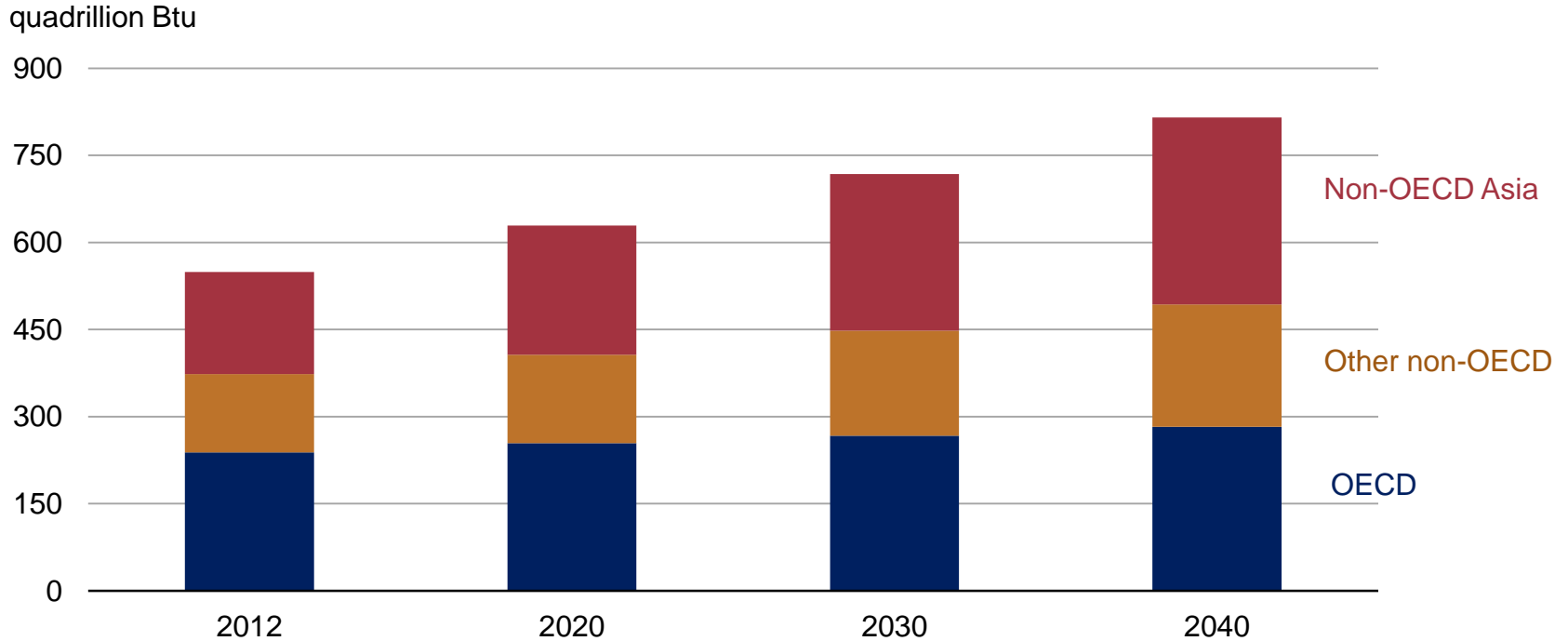
State Energy Profiles | www.eia.gov/state

Drilling Productivity Report | www.eia.gov/petroleum/drilling

International Energy Portal | www.eia.gov/beta/international

Background slides

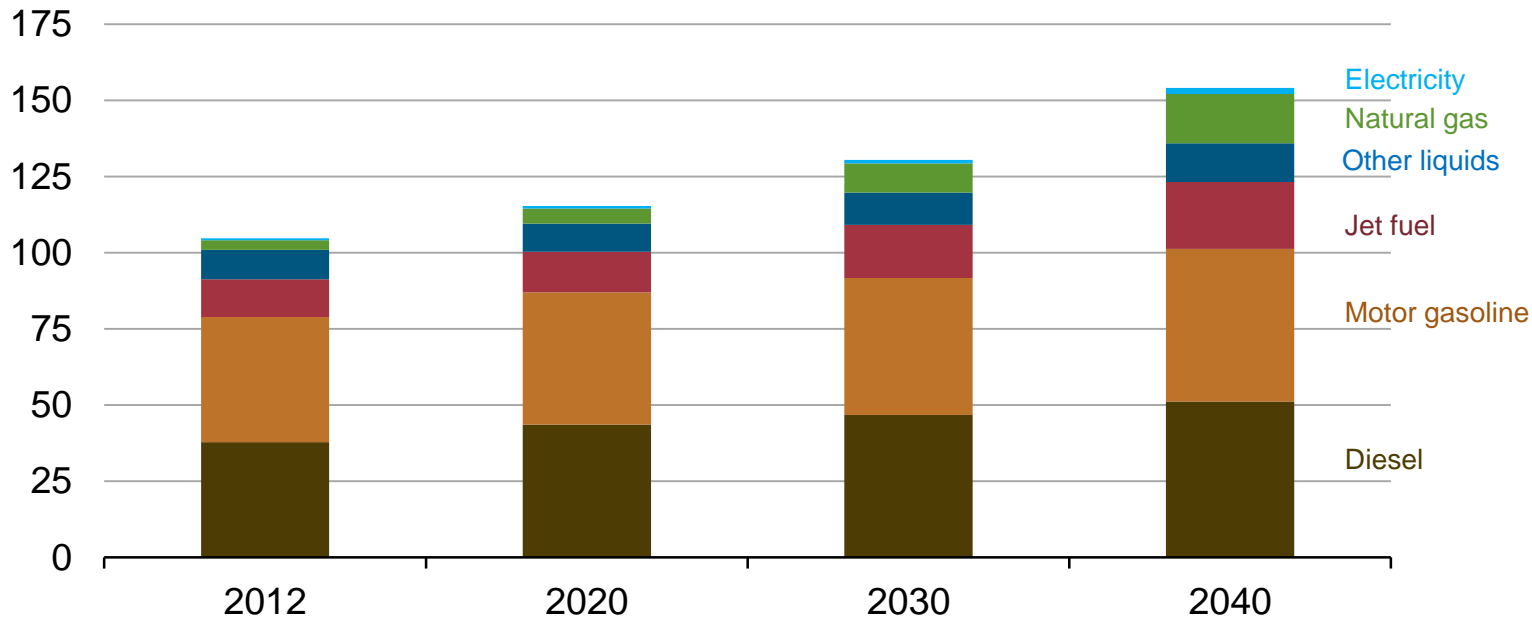
World energy consumption by country grouping, 2012-40



Source: EIA, *International Energy Outlook 2016*

World transportation sector delivered energy consumption by energy source, 2012-40

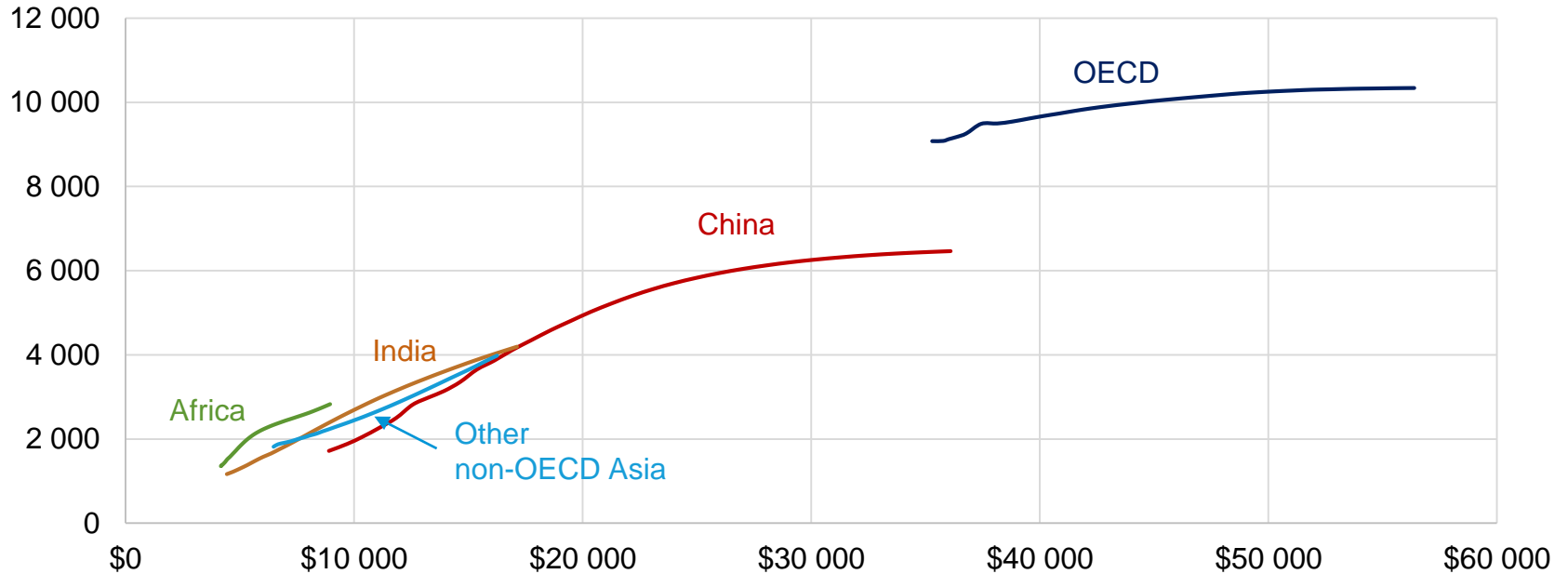
quadrillion Btu



Source: EIA, International Energy Outlook 2016

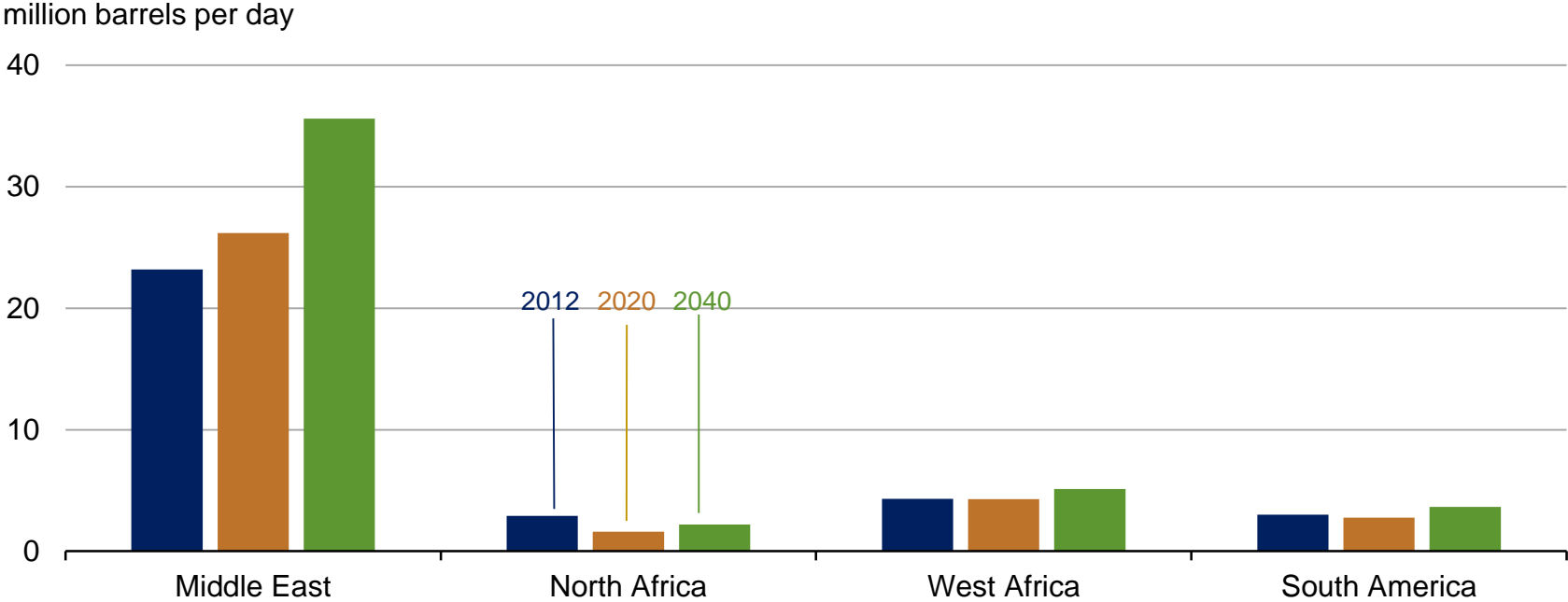
Passenger-miles per capita vs. GDP per capita for selected country groupings, 2010-40

passenger-miles per capita (left-axis) and GDP per capita (horizontal-axis) for selected country groupings 2010–40



Source: EIA, *International Energy Outlook 2016*

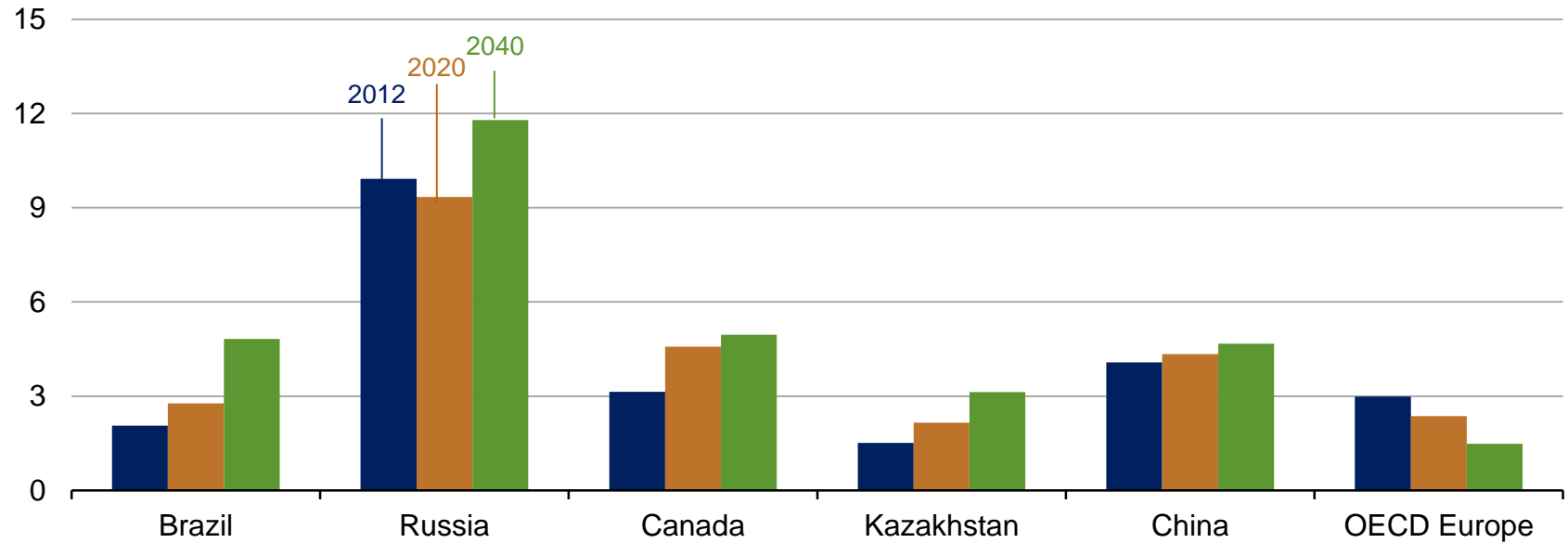
OPEC crude and lease condensate production by region, 2012, 2020, and 2040



Source: EIA, International Energy Outlook 2016

Non-OPEC crude and lease condensate production in selected country groupings, 2012, 2020, and 2040

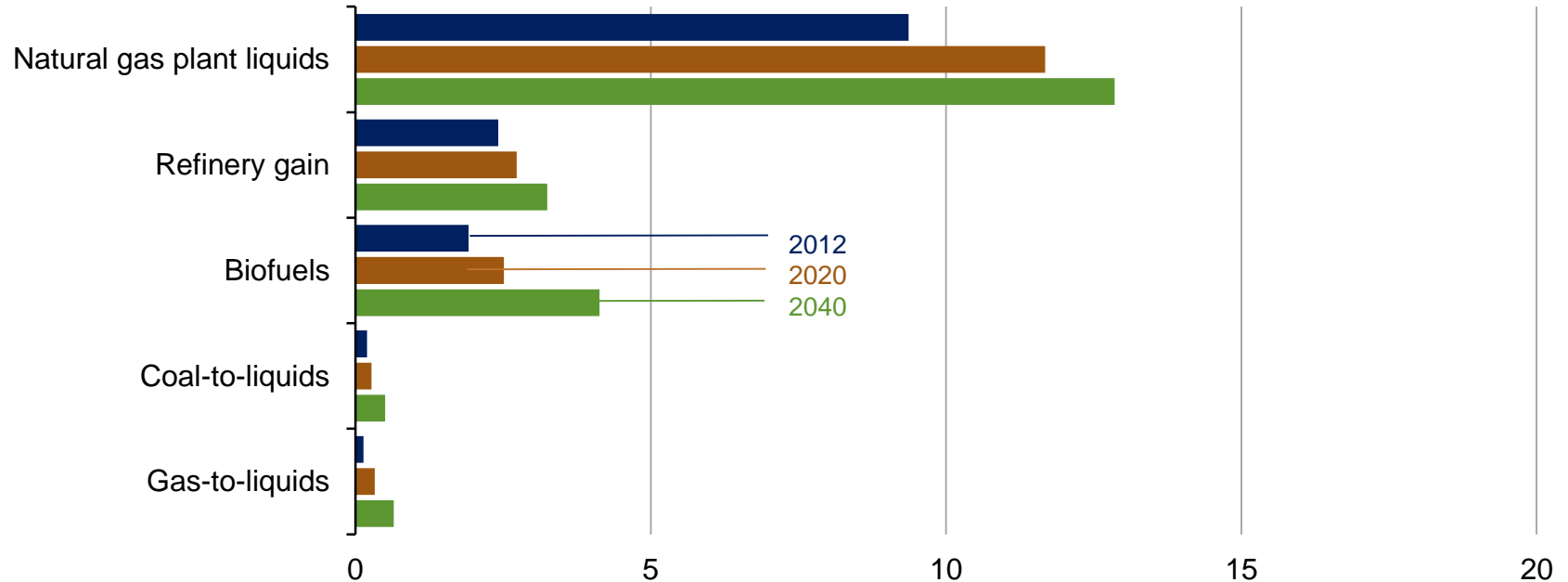
million barrels per day



Source: EIA, International Energy Outlook 2016

World production of other liquid fuels by type, 2012, 2020, and 2040

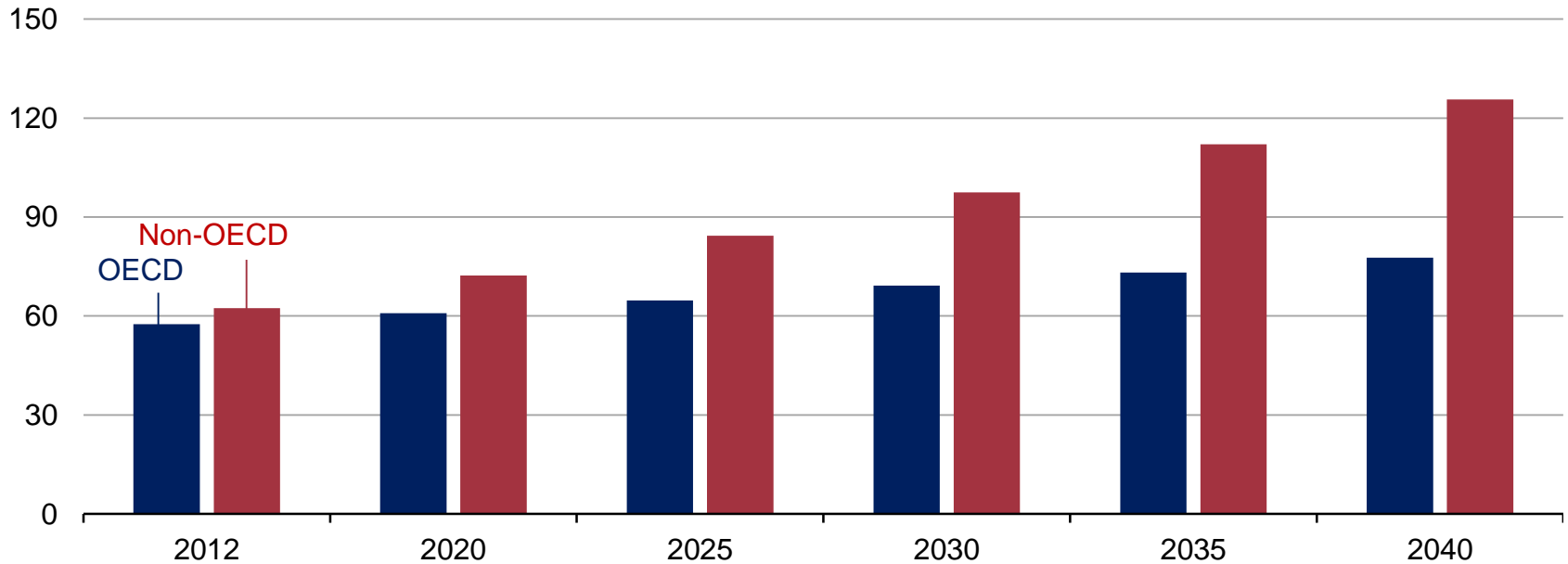
million barrels per day



Source: EIA, International Energy Outlook 2016

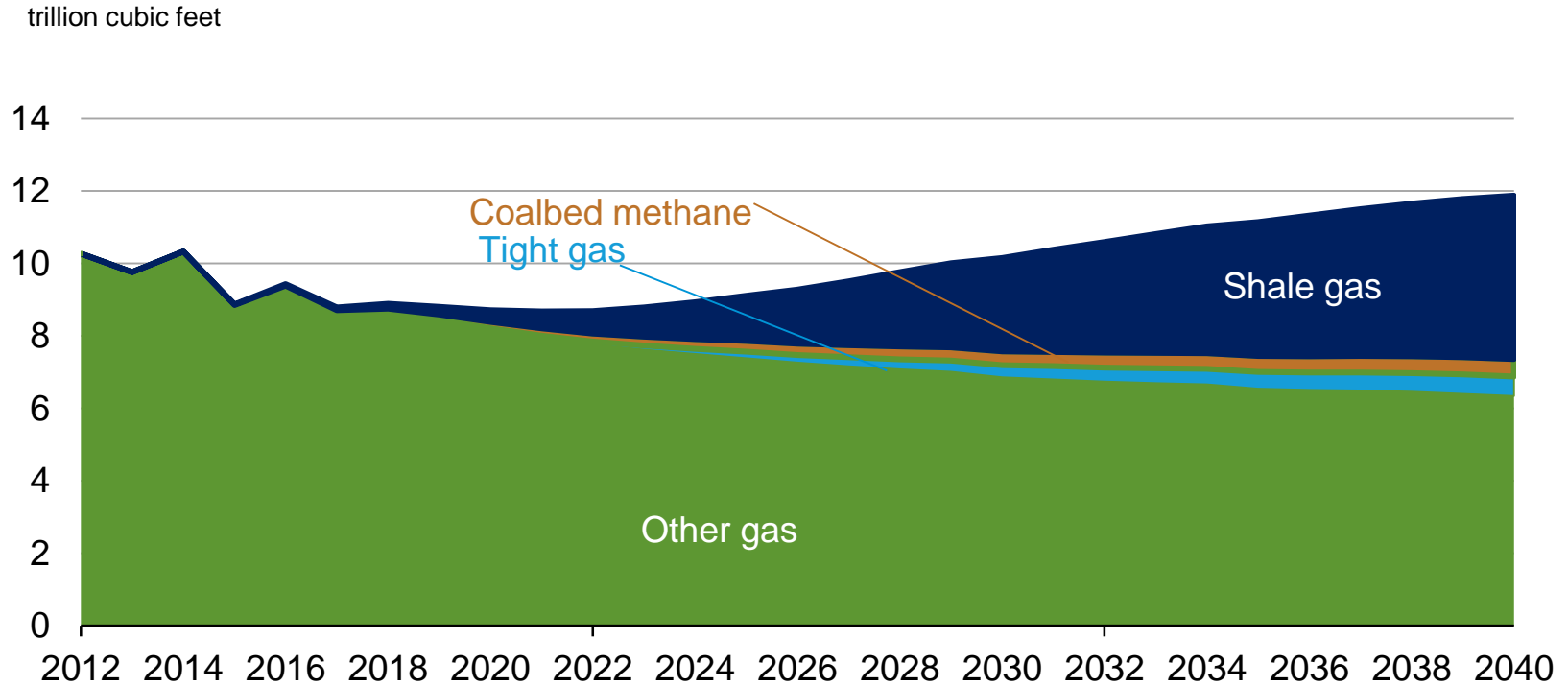
World natural gas consumption, 2012-40

trillion cubic feet



Source: EIA, *International Energy Outlook 2016*

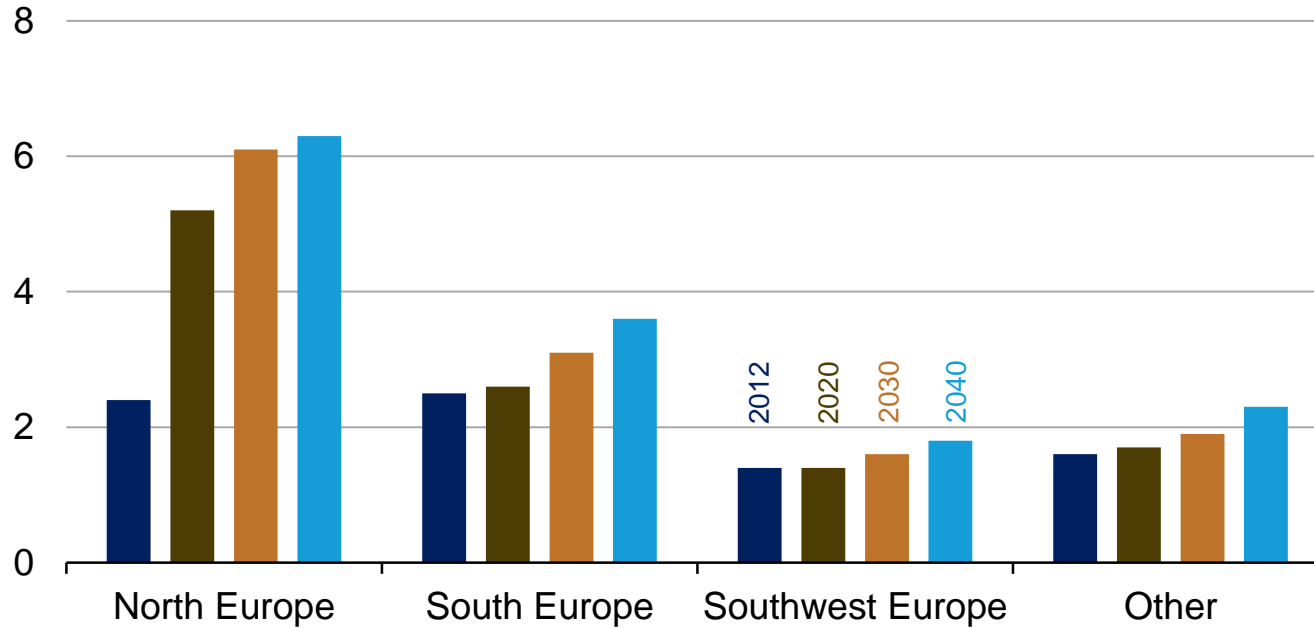
OECD Europe natural gas production, 2012–40



Source: EIA, International Energy Outlook 2016

OECD Europe net natural gas imports, 2012–40

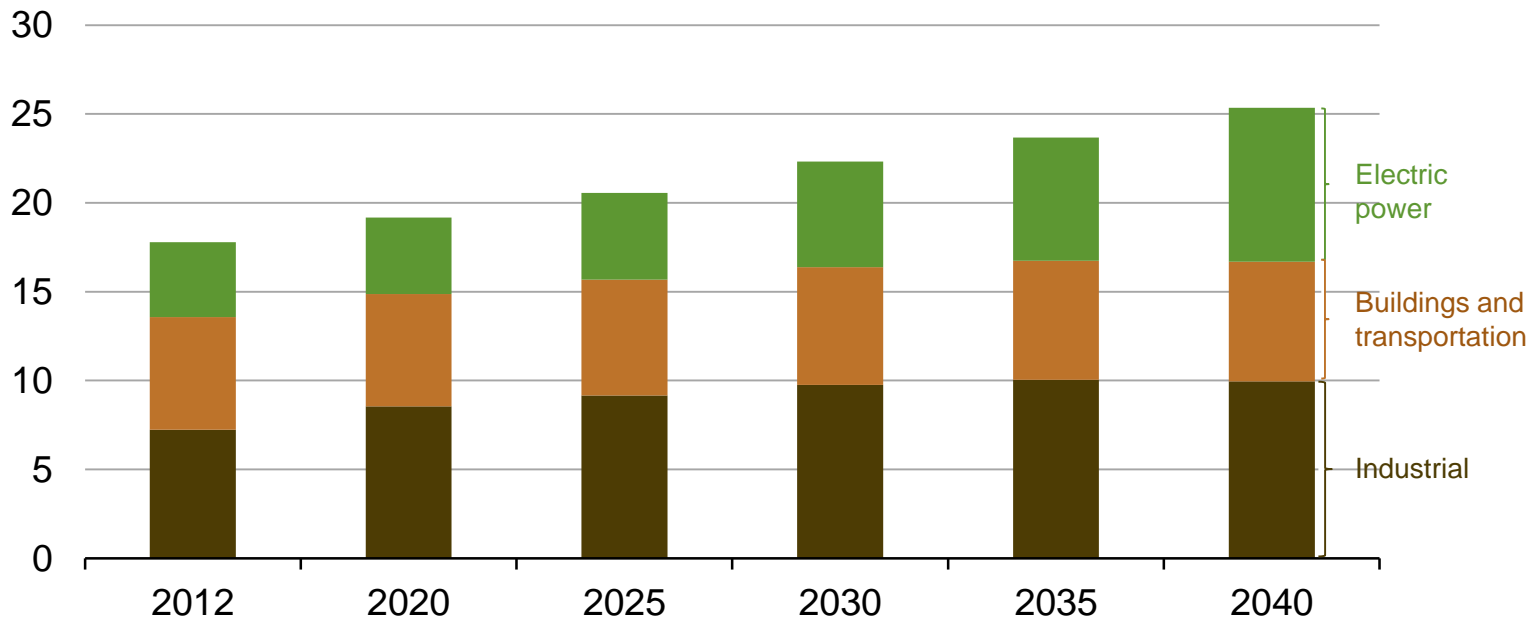
trillion cubic feet



Source: EIA, International Energy Outlook 2016

OECD Europe natural gas consumption by end-use sector, 2012–40

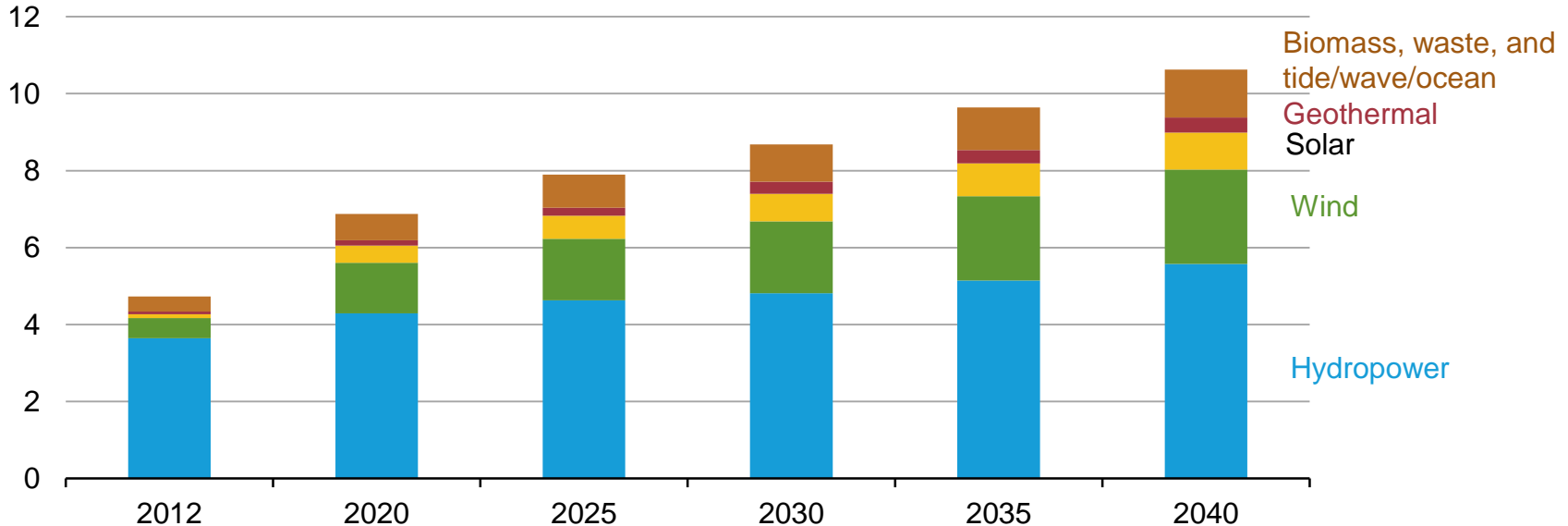
trillion cubic feet



Source: EIA, International Energy Outlook 2016

World net electricity generation from renewable energy by source, 2012-40

trillion kilowatthours



Source: EIA, International Energy Outlook 2016