

7th IEA-IEF-OPEC Outlook Symposium

Comparative Analysis Findings

Richard G. Newell, President, Resources for the Future

Flow

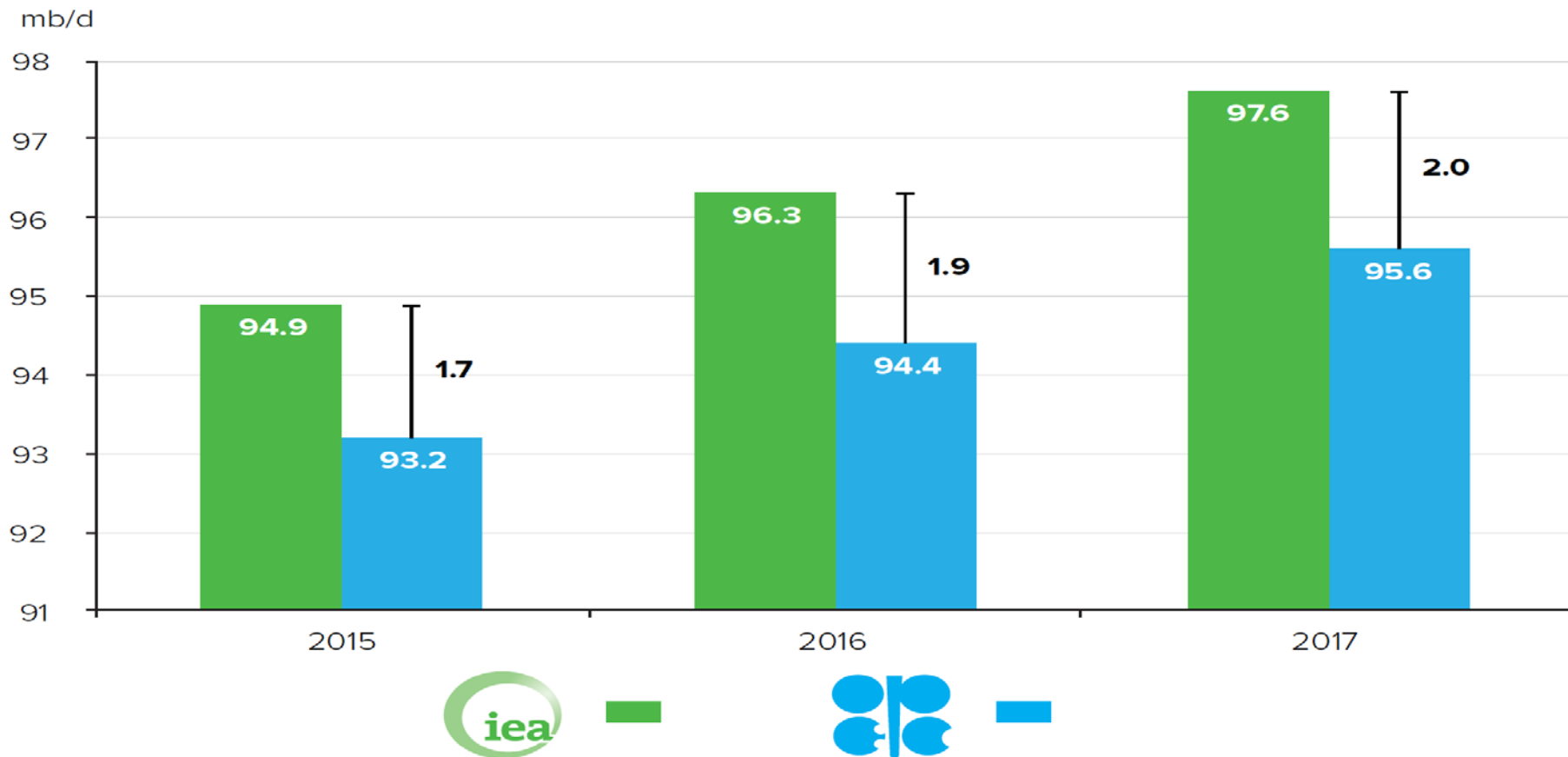
1. Short-term IEA and OPEC outlooks
2. Medium-term IEA and OPEC outlooks
3. Long-term IEA and OPEC outlooks
4. Key remaining differences
5. Remarks on outlook comparability

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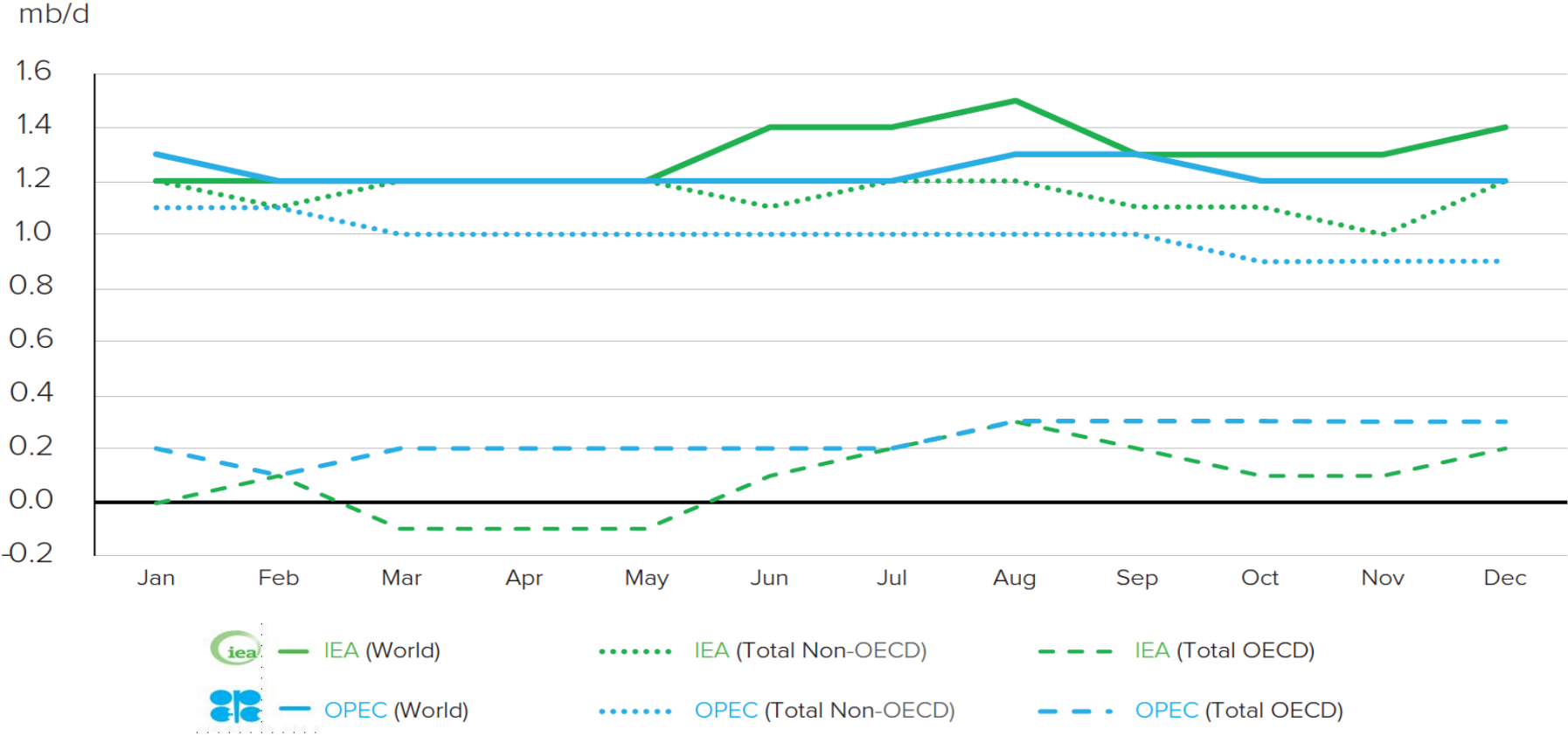
A 1.7 mb/d difference in base year 2015 liquids demand creates significant demand forecast differences

Short-term World Liquids Demand: 2015-2017



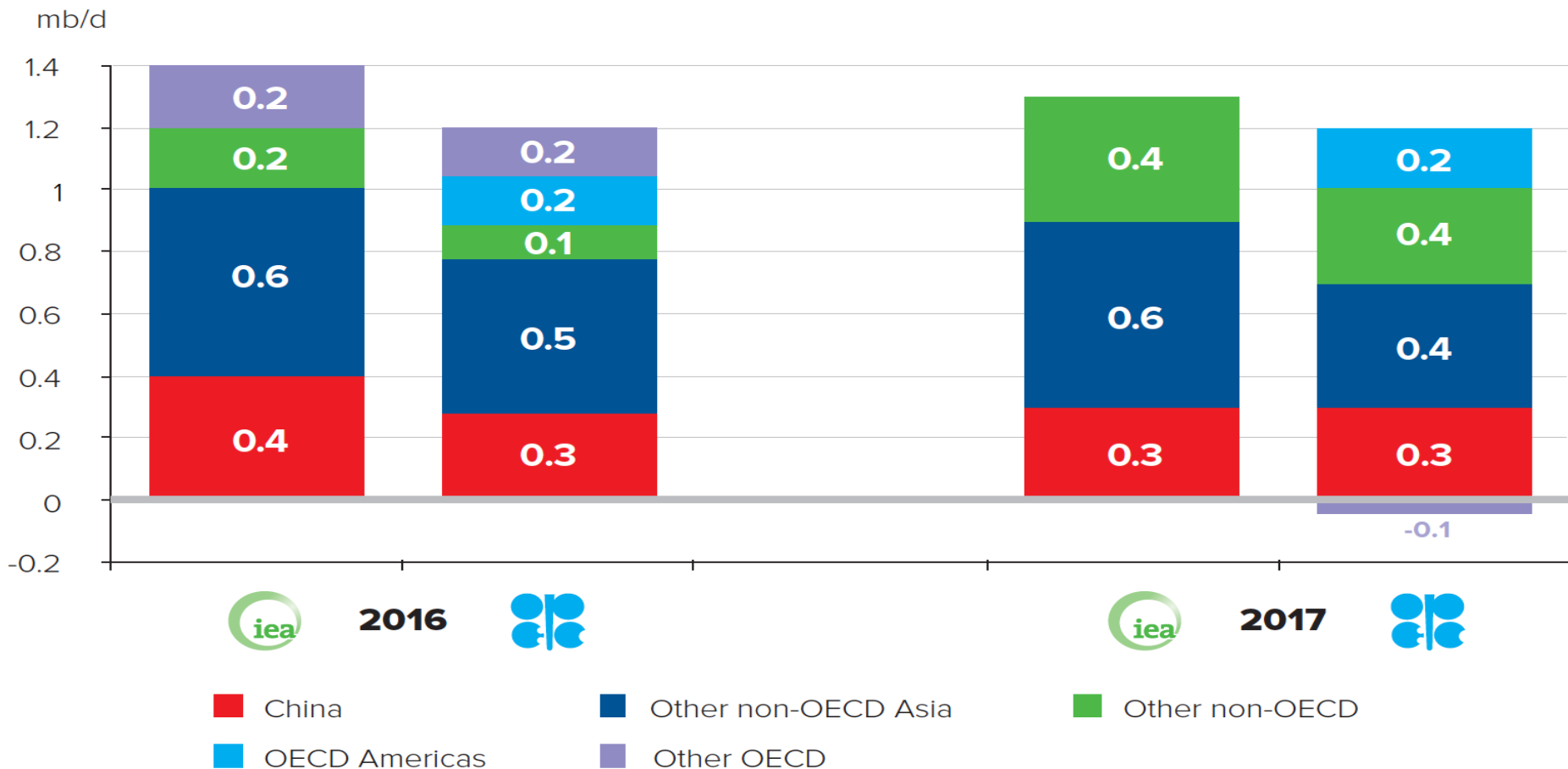
IEA and OPEC made modest adjustments to liquids demand growth forecasts during 2016, mostly in OECD countries

Monthly Revisions of Annual Estimates for 2016 World, OECD, and Non-OECD Liquids



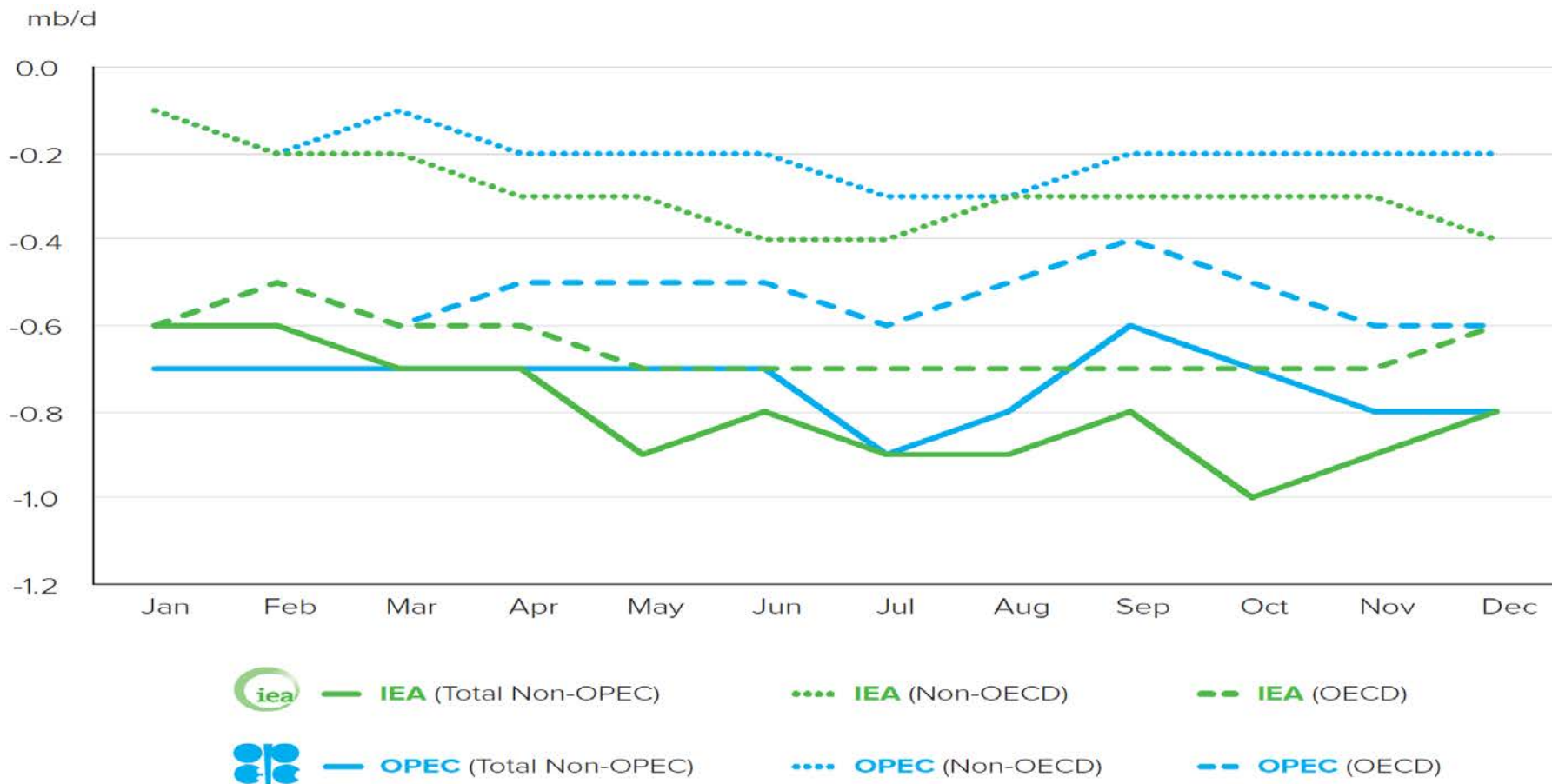
Differences in annual demand growth estimates relate to both Non-OECD Asia and OECD Americas

Short-term World Liquids Demand Annual Growth



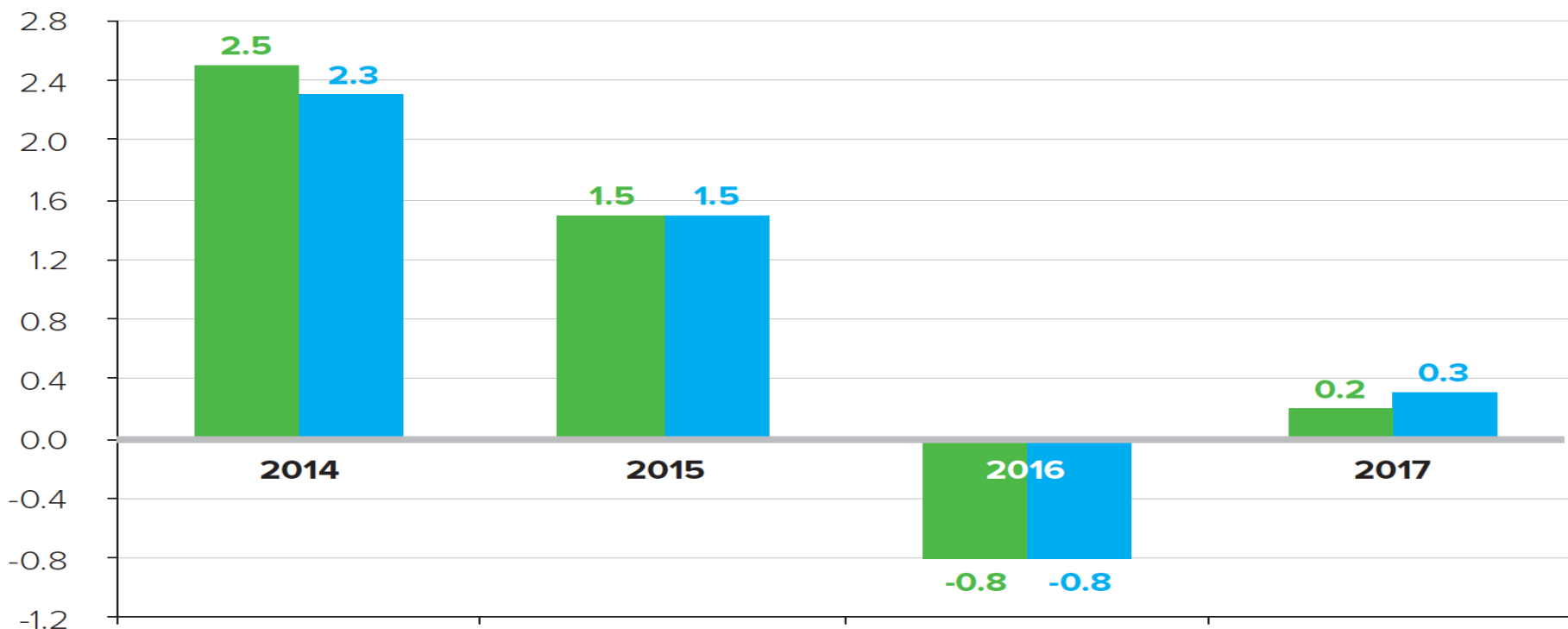
Non-OPEC liquids supply growth forecasts have been revised downwards during 2016

Monthly Revisions of Annual Estimates for 2016 Non-OPEC Liquids Supply Growth



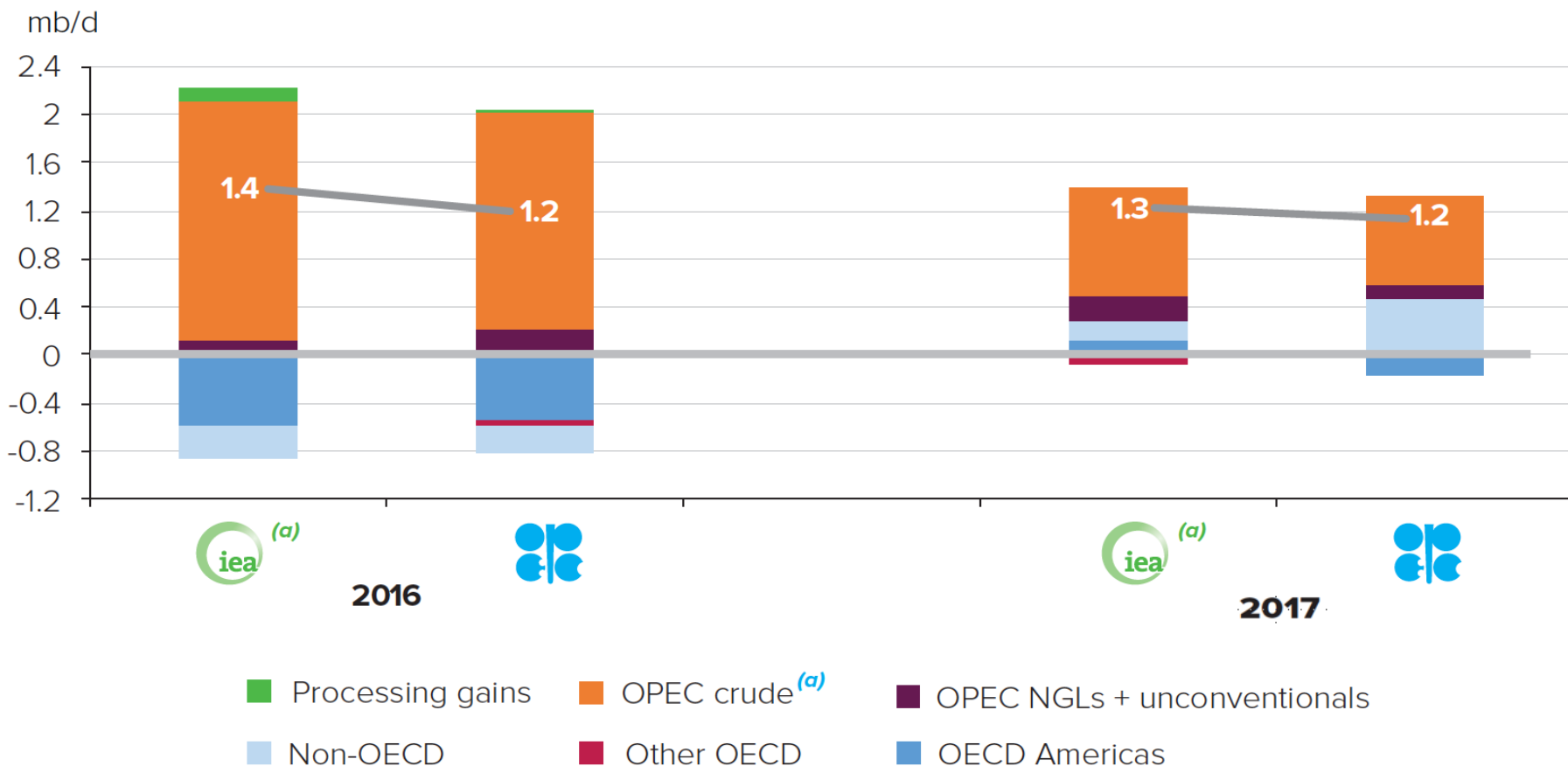
Short-term forecasts of non-OPEC supplies show negative growth in 2016 followed by modest gains in 2017

Short-term Non-OPEC Liquids Supply Annual Growth



2016 and 2017 supply growth is led by OPEC, OECD Americas and non-OECD producers recover somewhat in 2017

Short-term Liquids Supply Net Annual Growth Forecasts

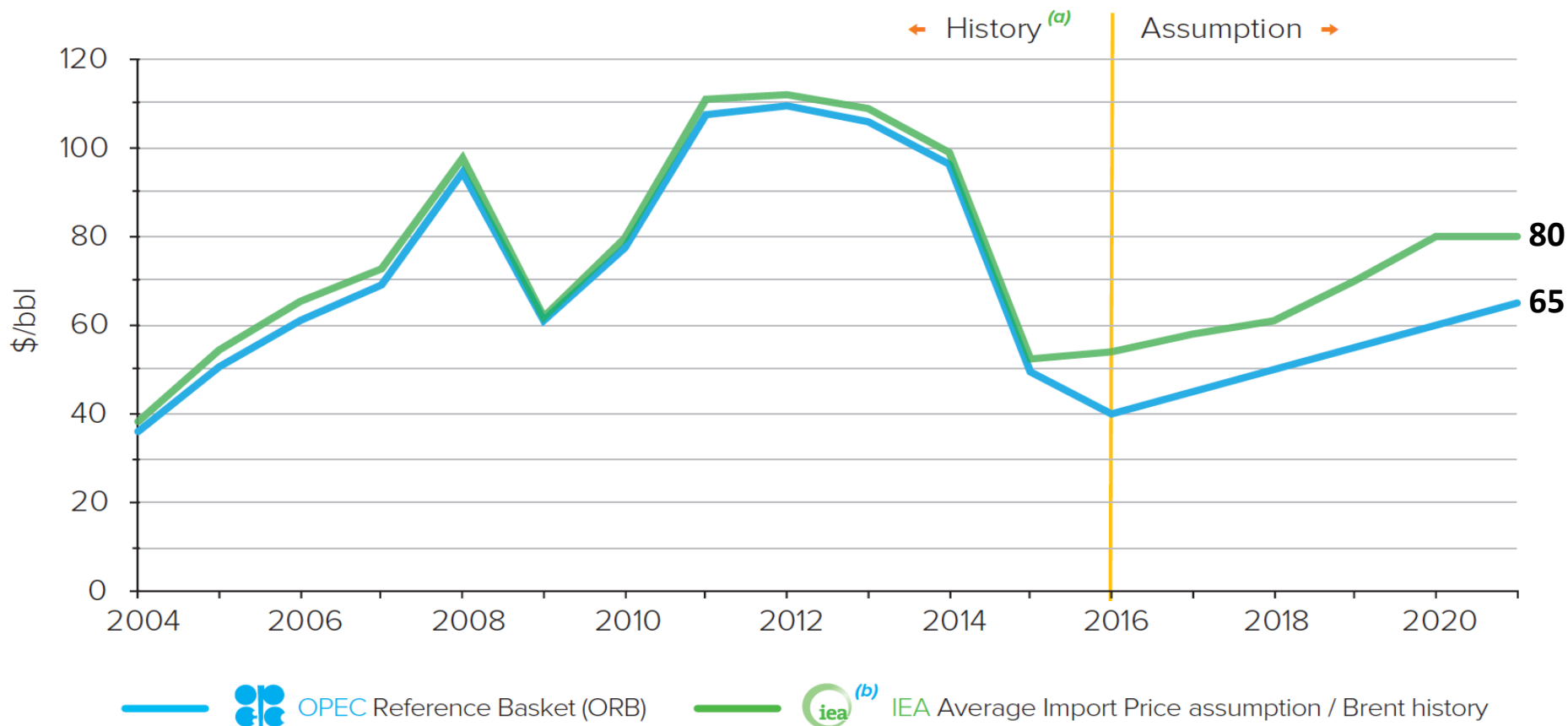


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Medium-term price assumptions diverge by \$11 to \$20/bbl through 2021

Medium-term Oil Price Assumptions (nominal US\$)

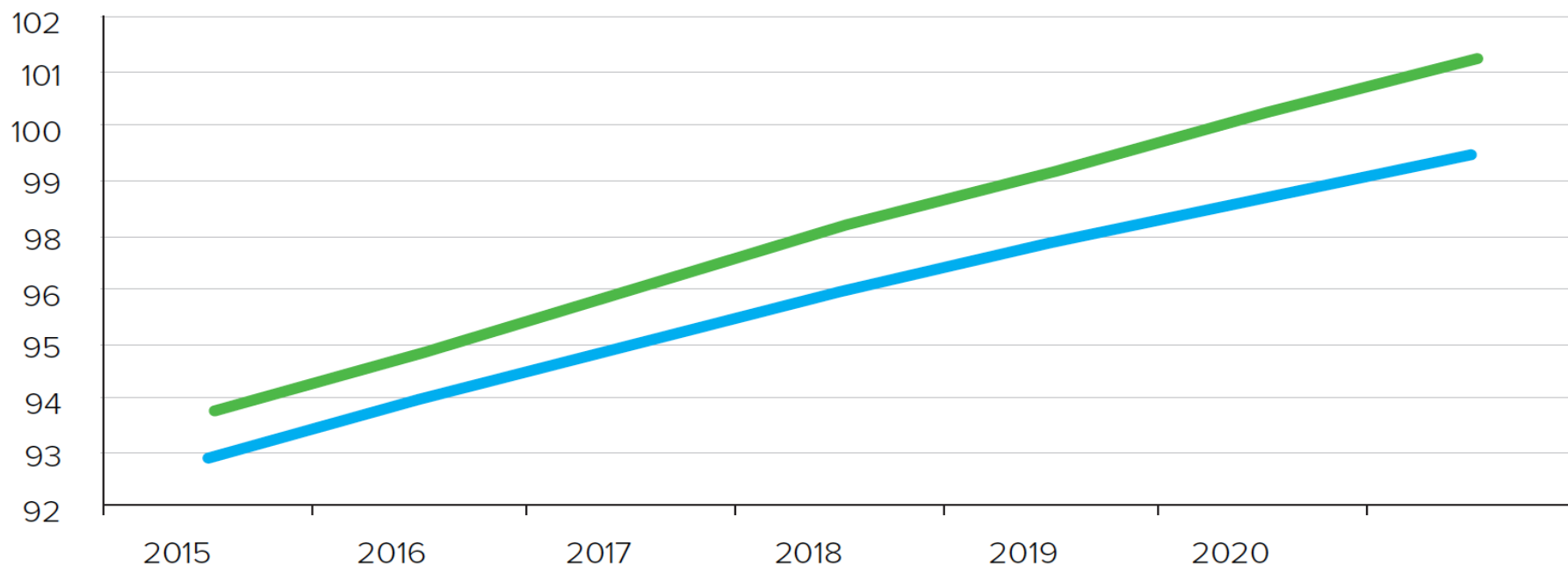


IEA projects demand growth to be slightly faster and reach higher levels than OPEC

Medium-term Liquids Demand

(a) World Liquids Demand

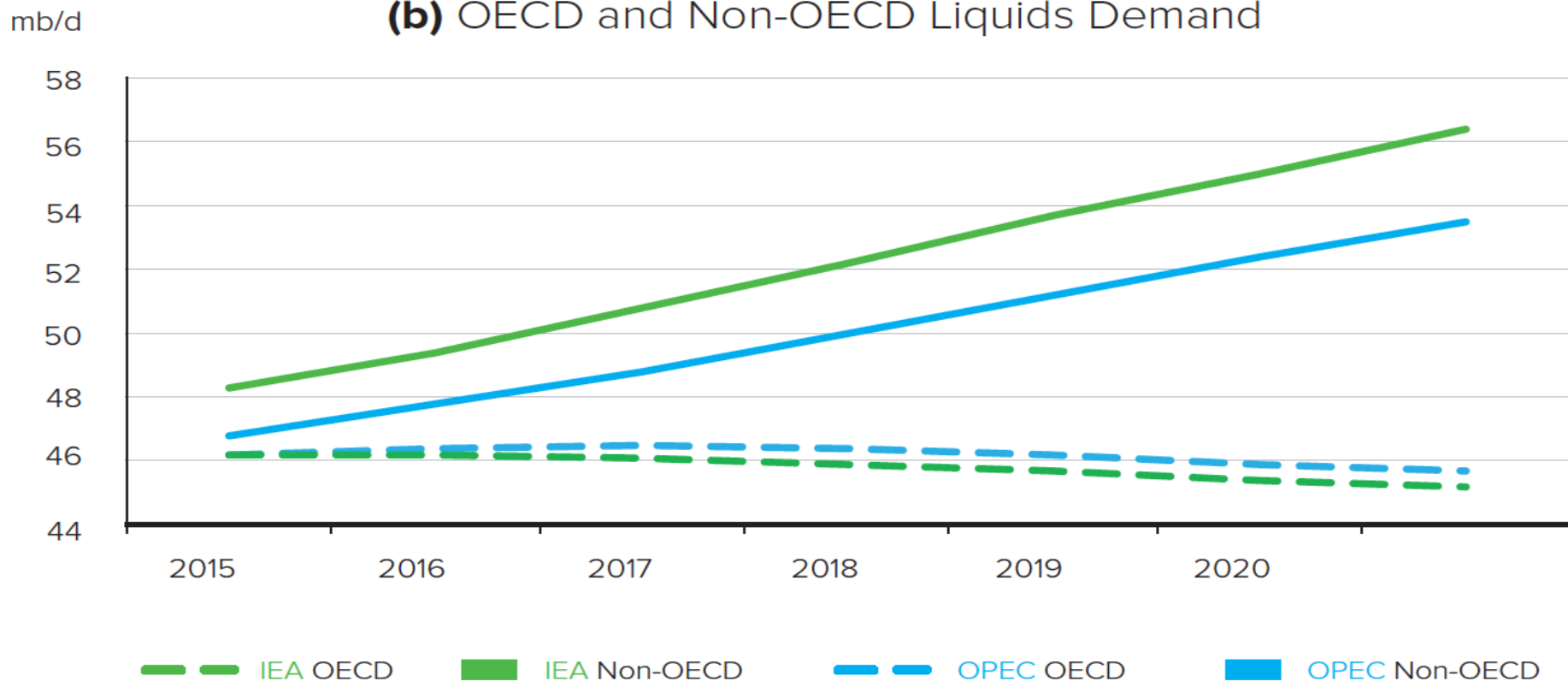
mb/d



Medium-term demand projection difference mainly comes from Non-OECD regions

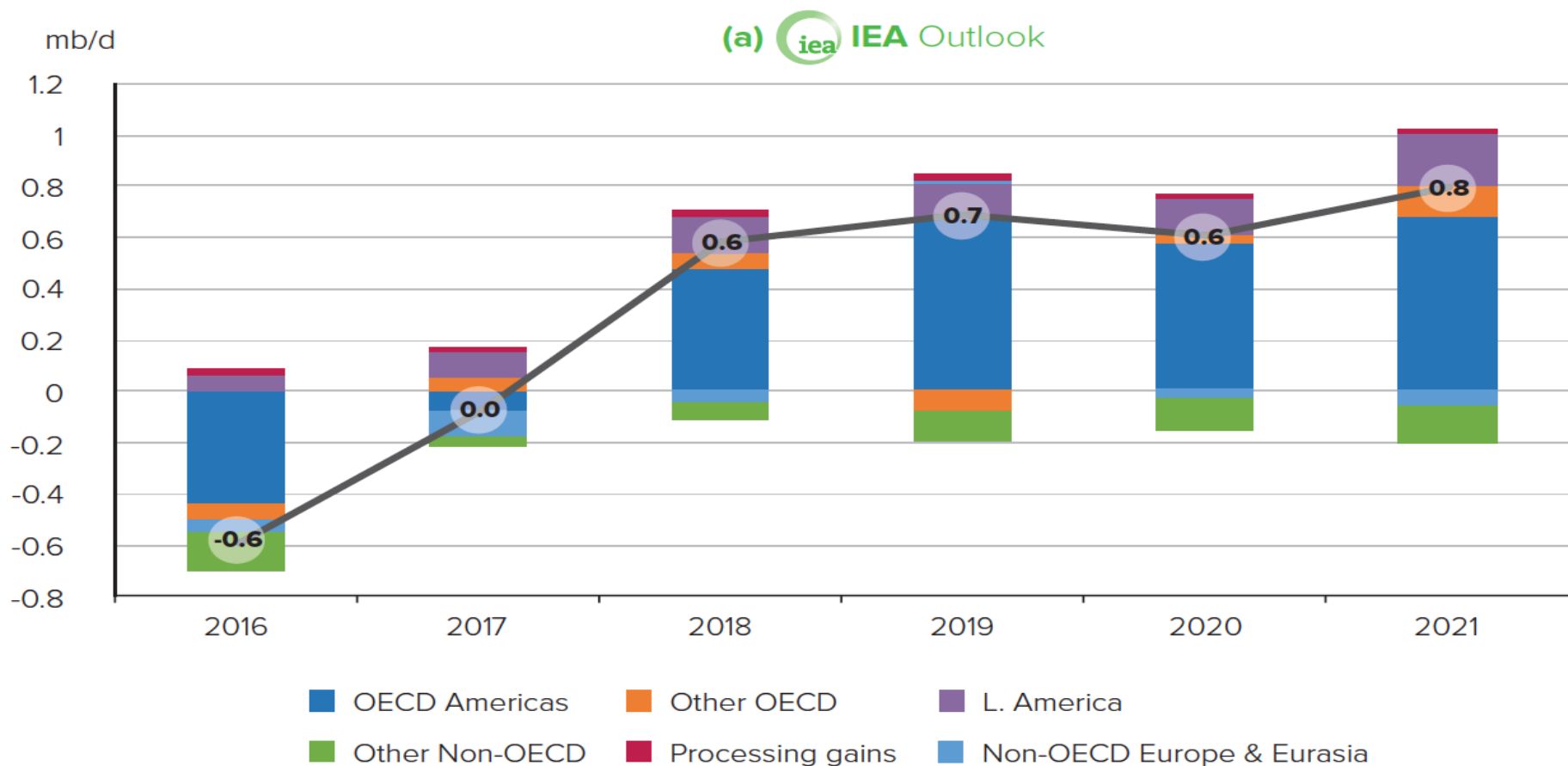
Medium-term Liquids Demand

(b) OECD and Non-OECD Liquids Demand



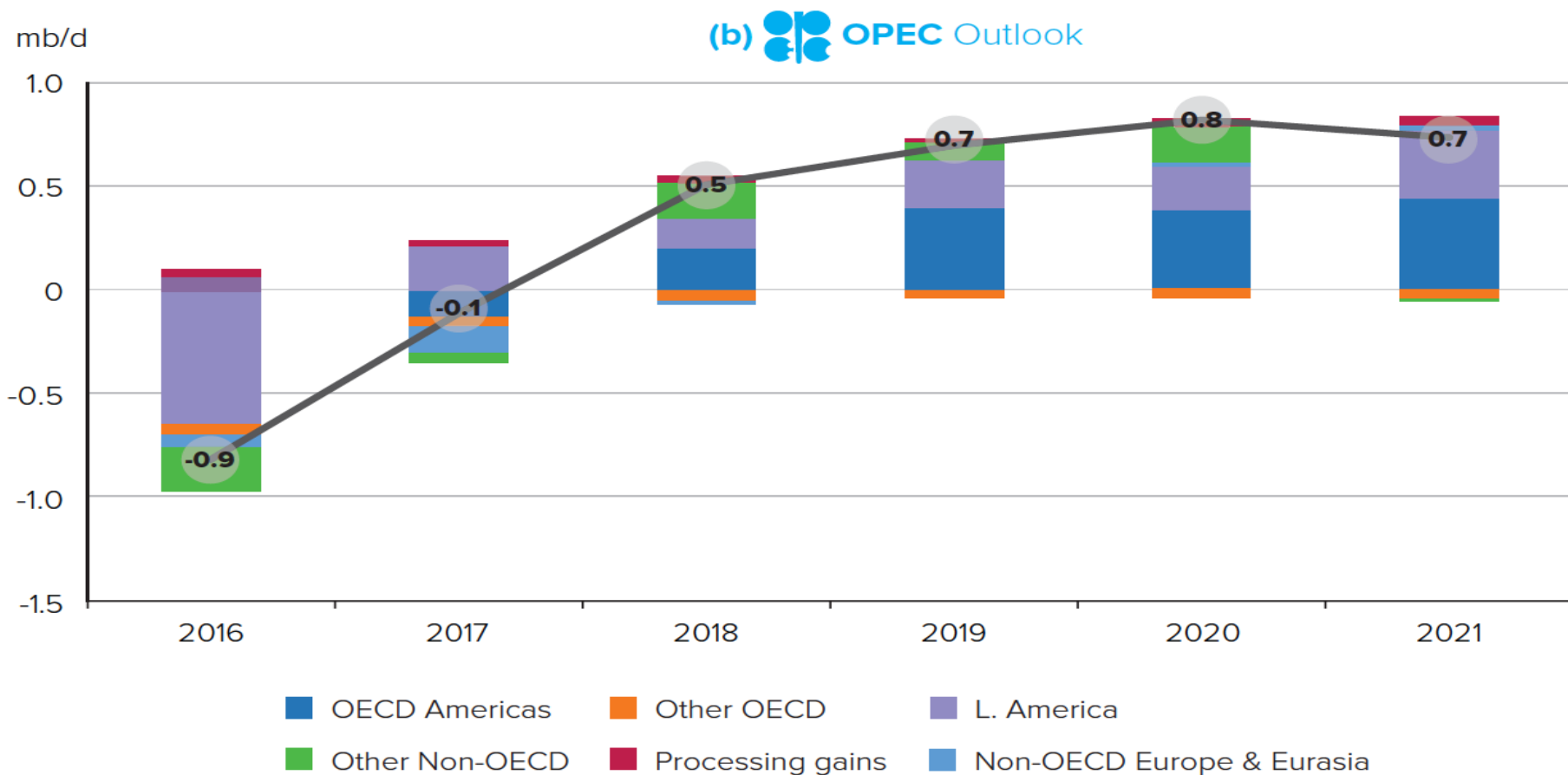
Medium term Non-OPEC liquids supply growth forecasts show growth after 2017 led by OECD Americas and Latin America

Medium-term Non-OPEC Liquids Supply Annual Growth



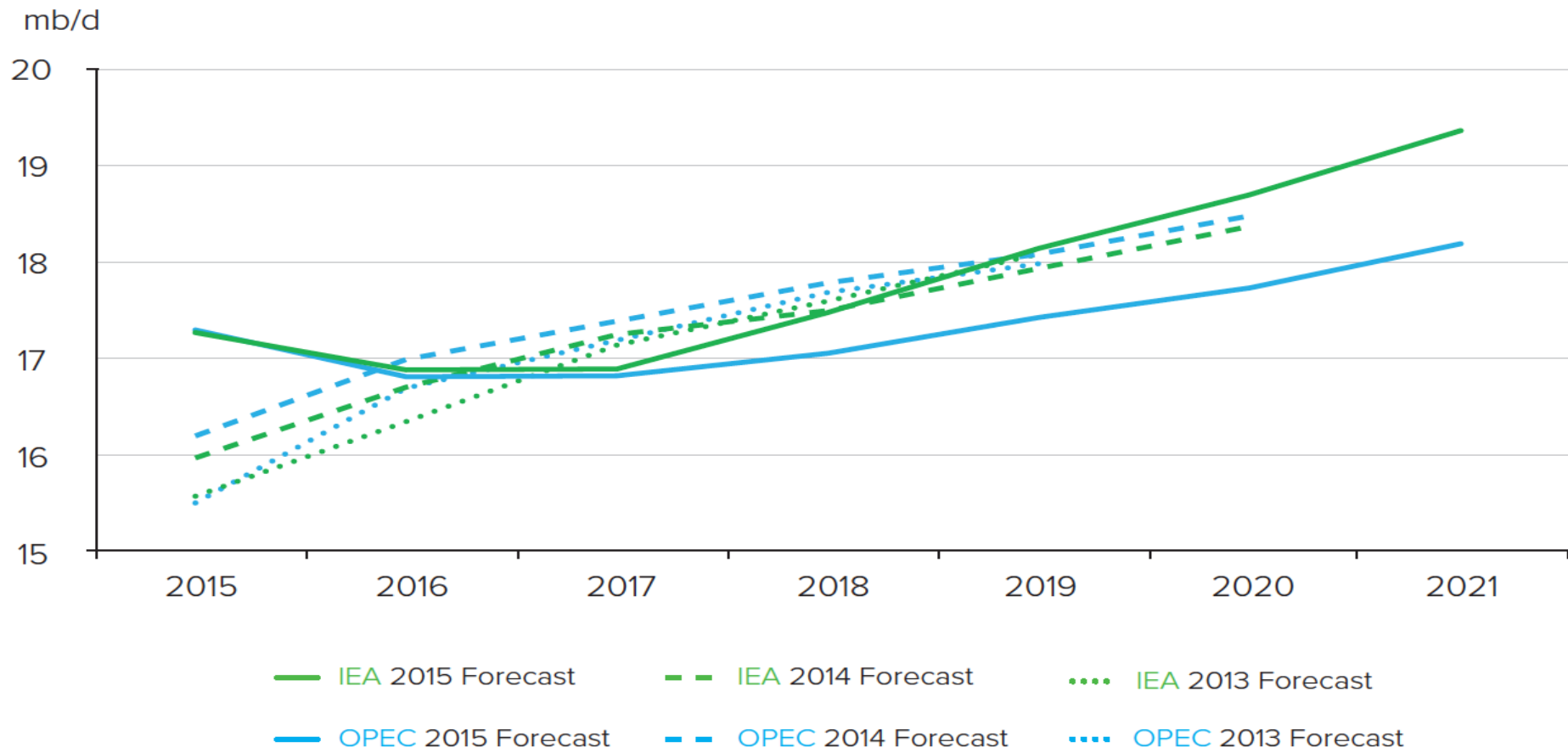
Medium term Non-OPEC liquids supply growth forecasts show growth after 2017 led by OECD Americas and Latin America

Medium-term Non-OPEC Liquids Supply Annual Growth



IEA and OPEC differ on US and Canadian supply growth outlooks

Medium-term US and Canadian Oil Supply (excluding biofuels)

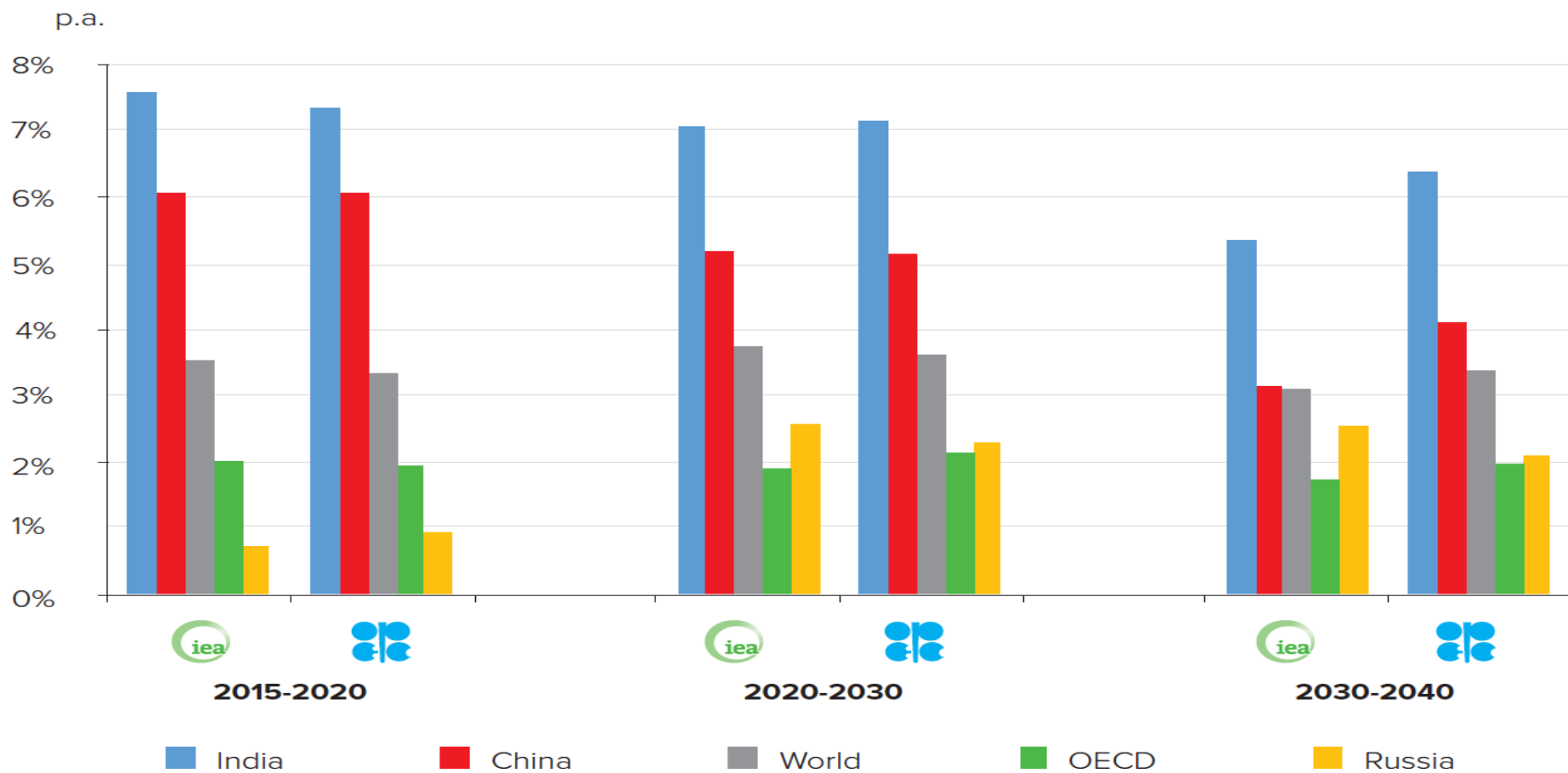


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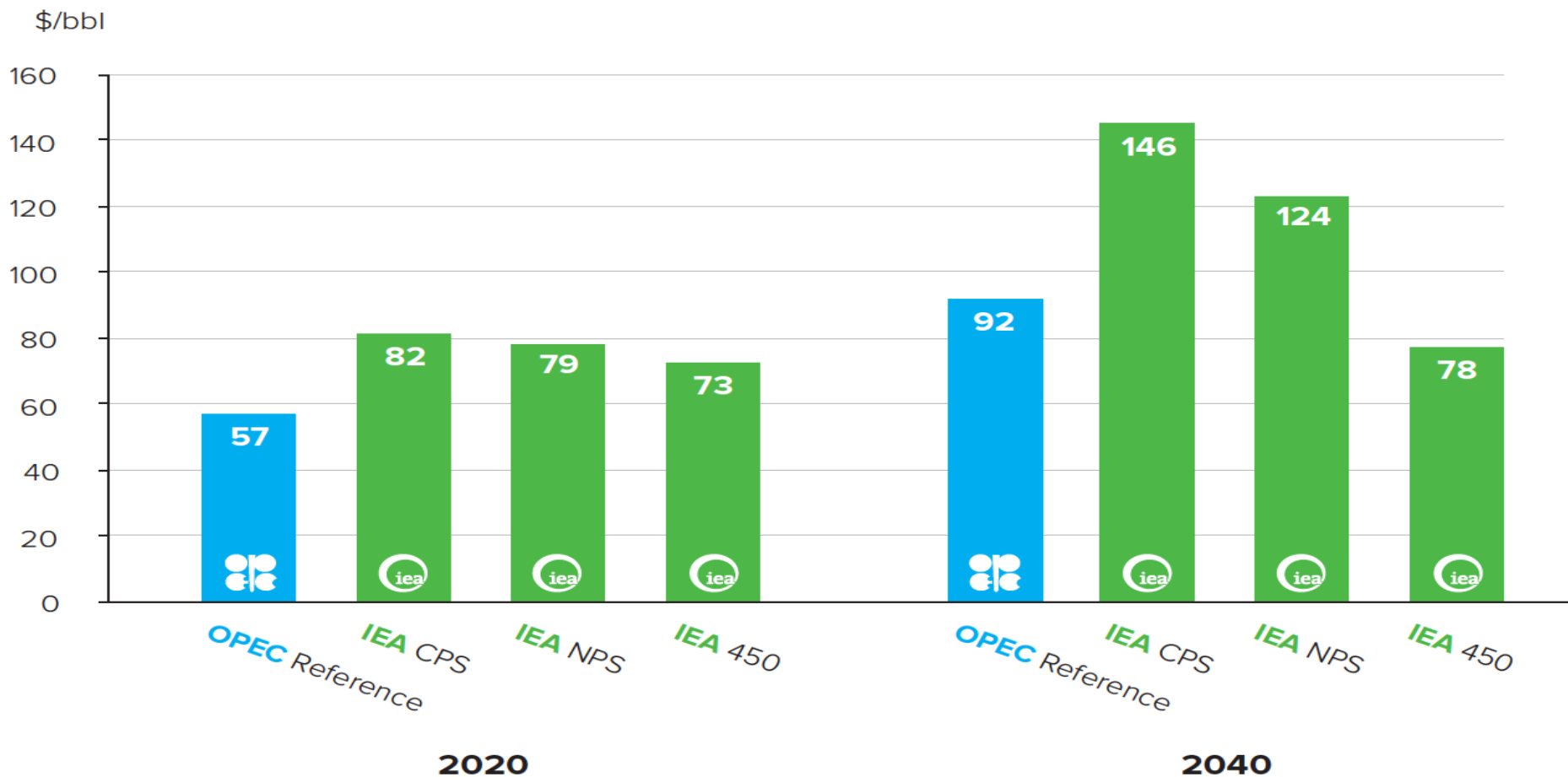
Global GDP projections show significant differences for China, India, and Russia after 2030

Long-term GDP Growth Assumptions for Selected Regions



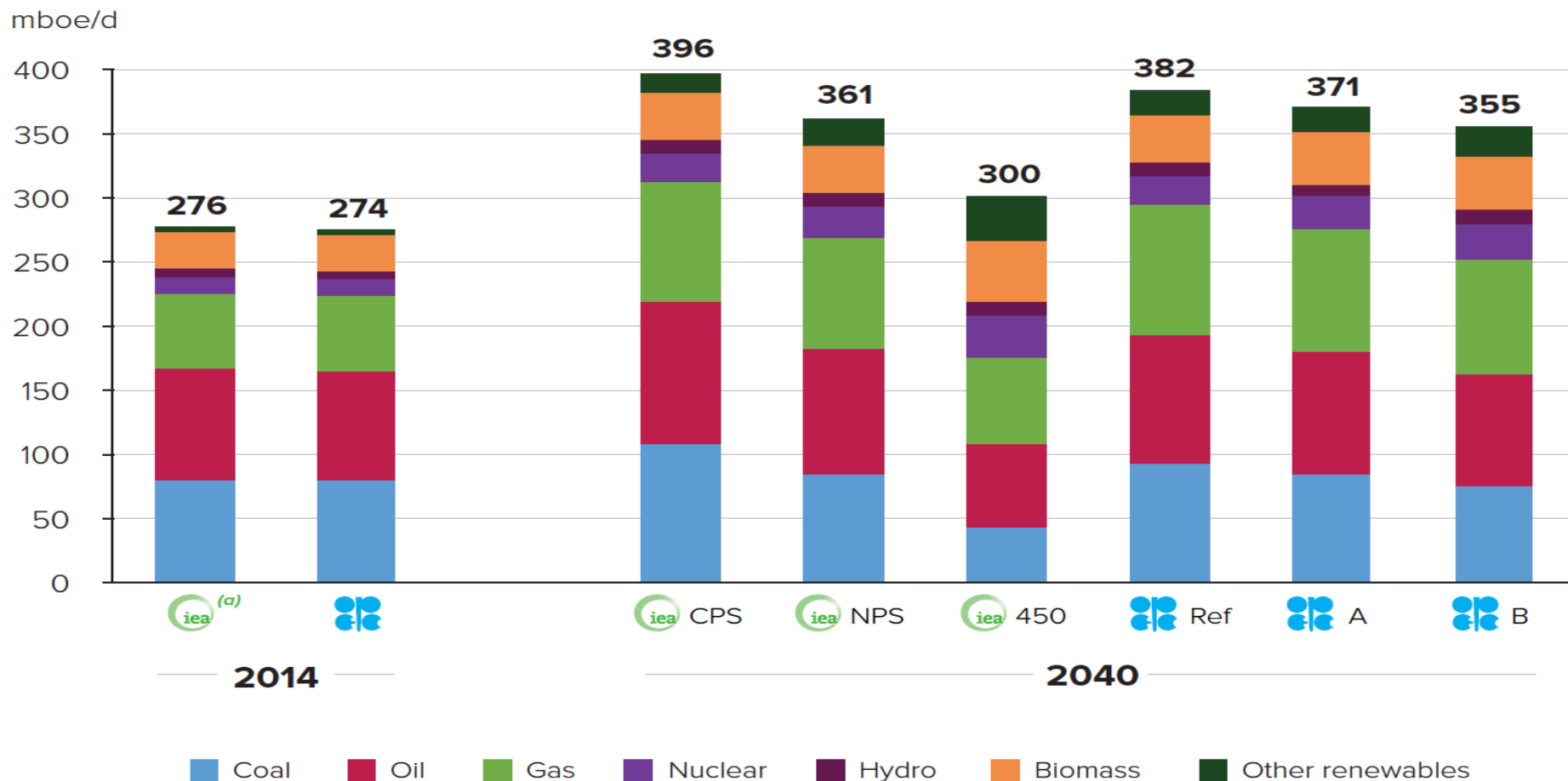
IEA's long-term oil price assumptions are substantially higher than those of OPEC

Long-Term Oil Price Assumptions (real 2015 US\$/bbl)



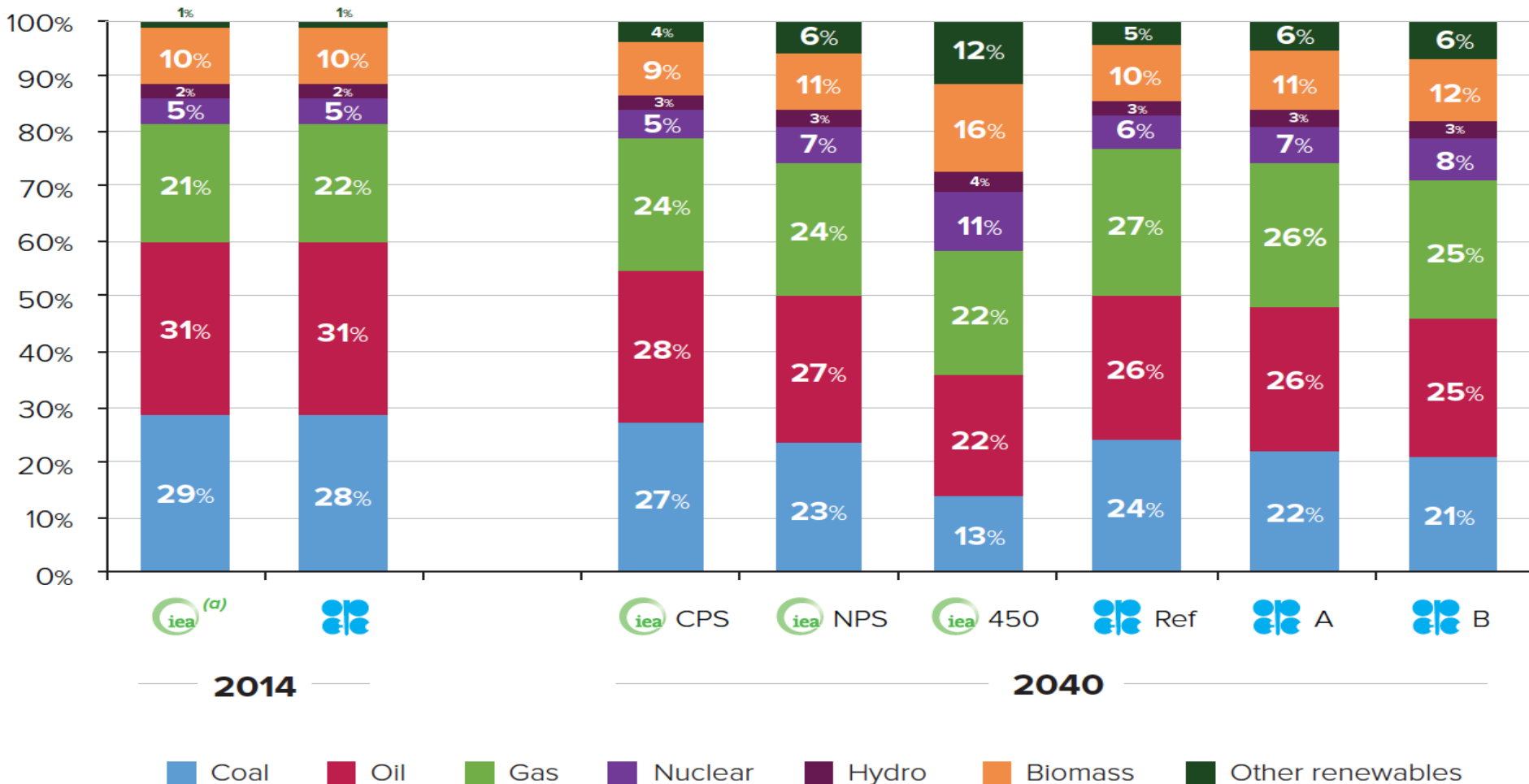
OPEC's Reference Case is close to IEA's Current Policies Scenario estimate of total primary demand

World Primary Energy in 2014 and Outlook for 2040 (mboe/d)



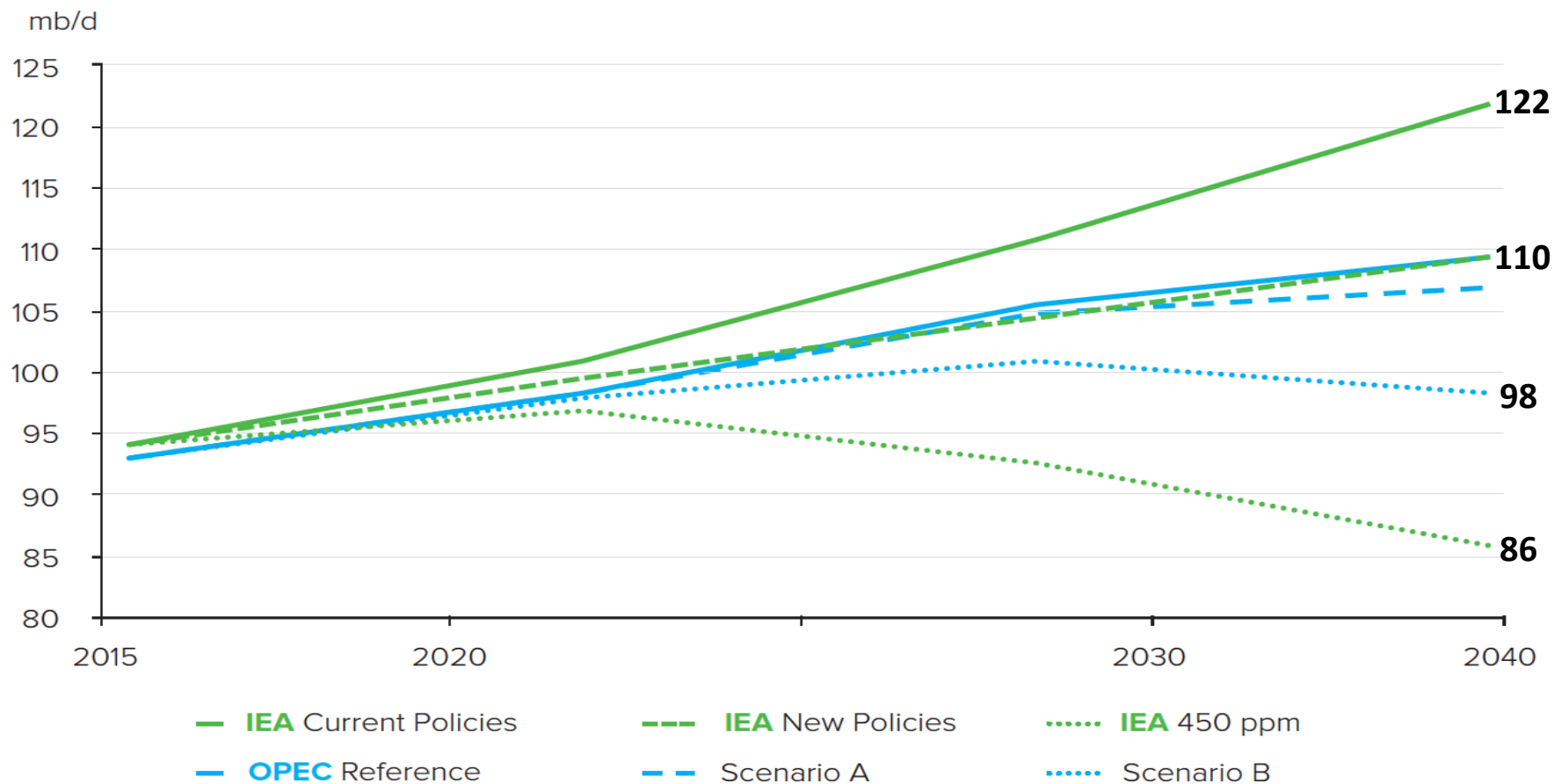
The IEA's New Policies Scenario shows lower fossil fuel consumption than OPEC projects

World Primary Energy Fuel Shares in 2014 and Outlook for 2040



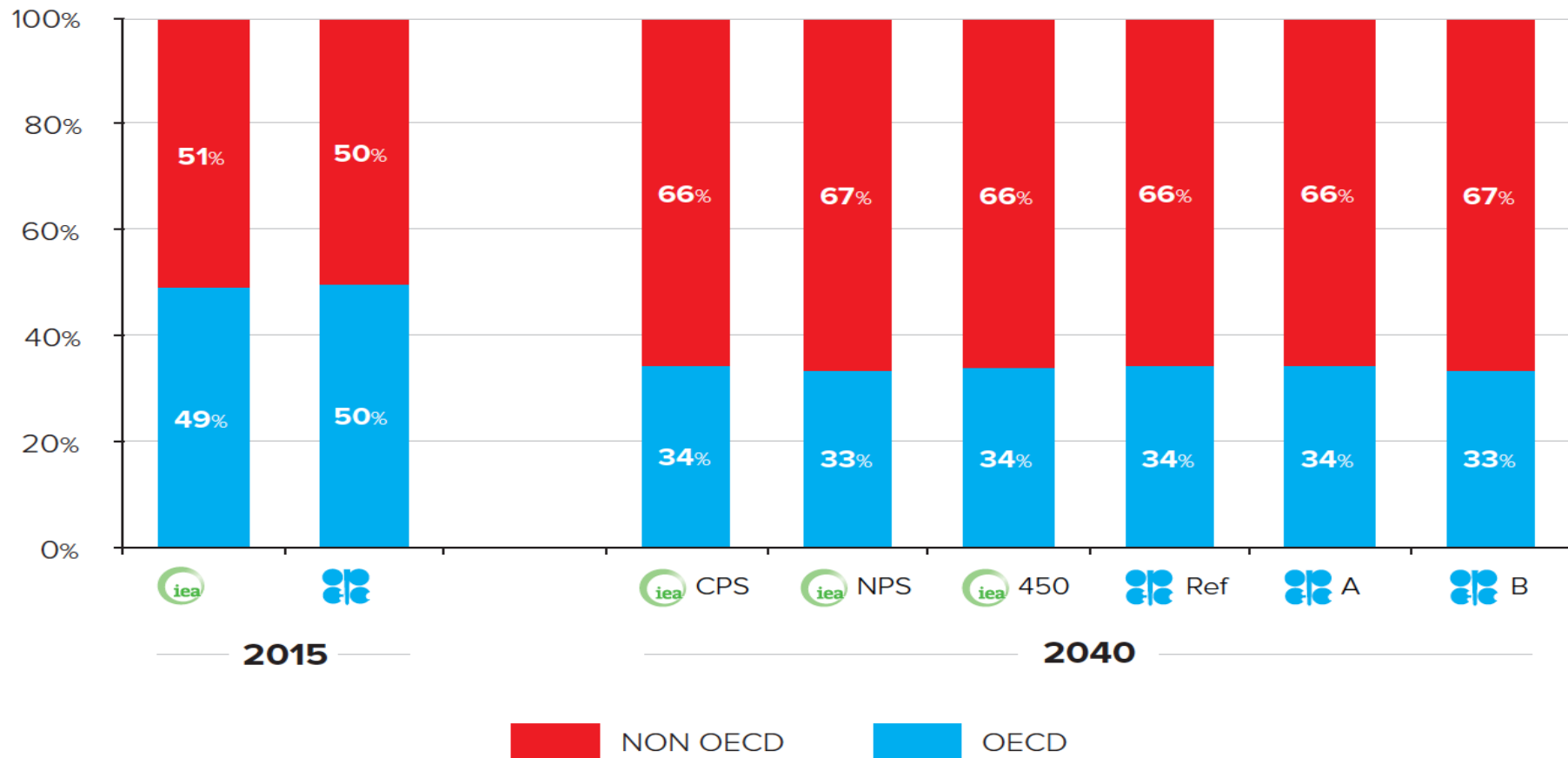
Liquids demand projections vary widely, yet OPEC Reference and IEA New Policy scenarios are within 1 mb/d in 2040

World Liquids Demand Projections in Various Scenarios (mb/d)



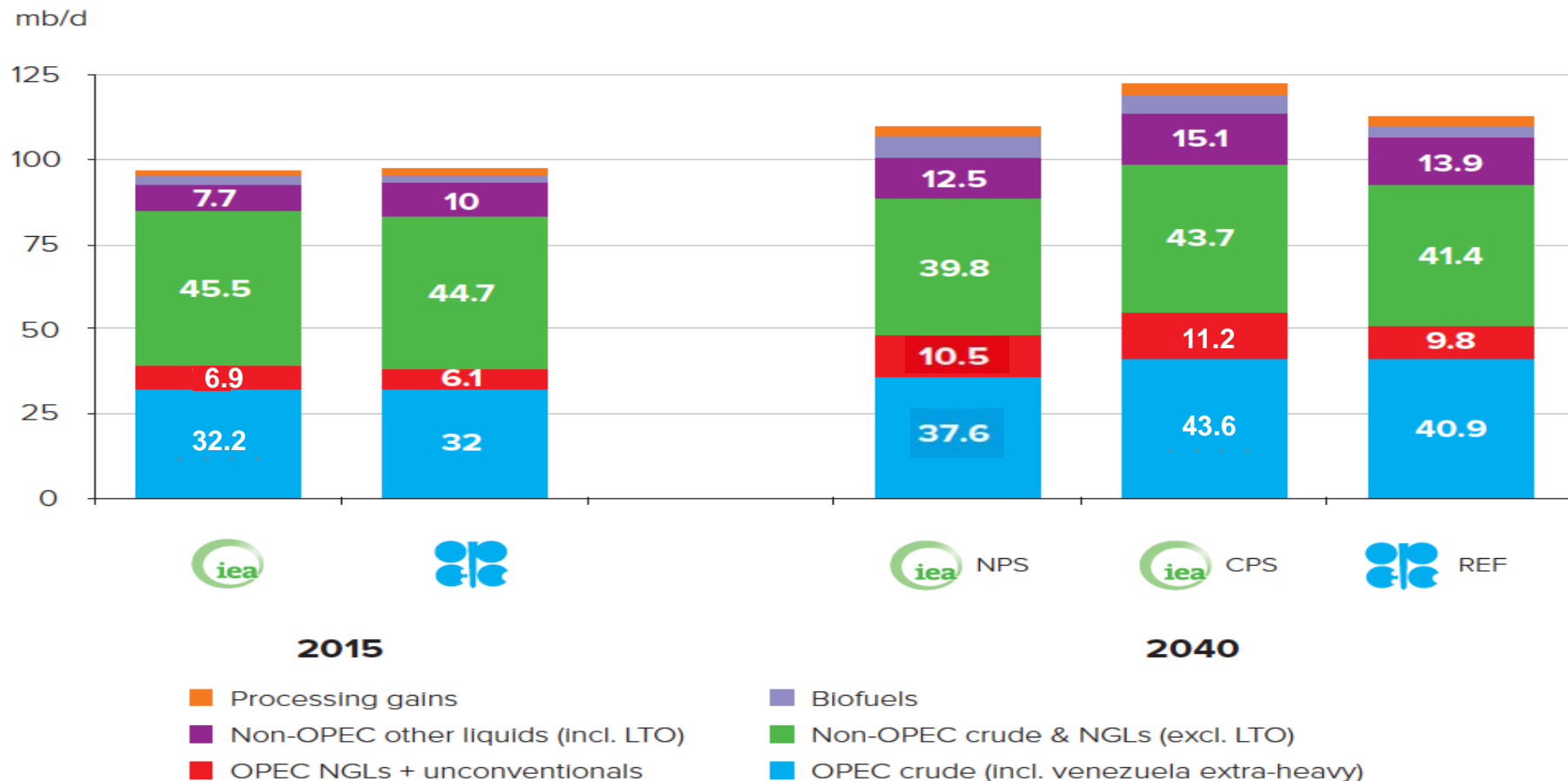
Outlooks for the share of OECD and Non-OECD demand are strikingly similar across all scenarios

OECD and Non-OECD Shares of Liquids Demand in 2015 and Outlook for 2040



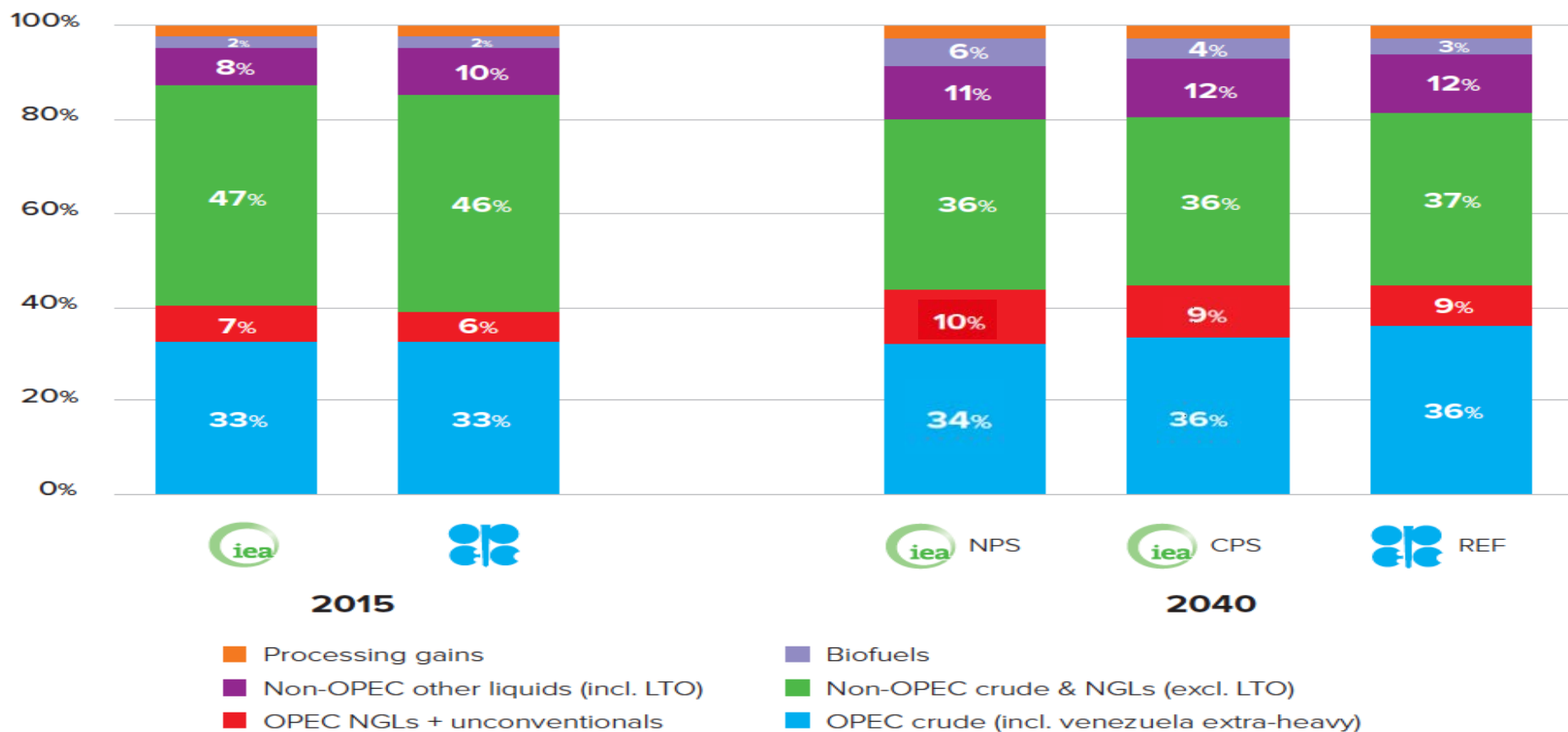
Non-OPEC conventional supply declines but unconventional supply grows

Liquids Supply Sources in 2015 and Outlook for 2040 (mb/d)



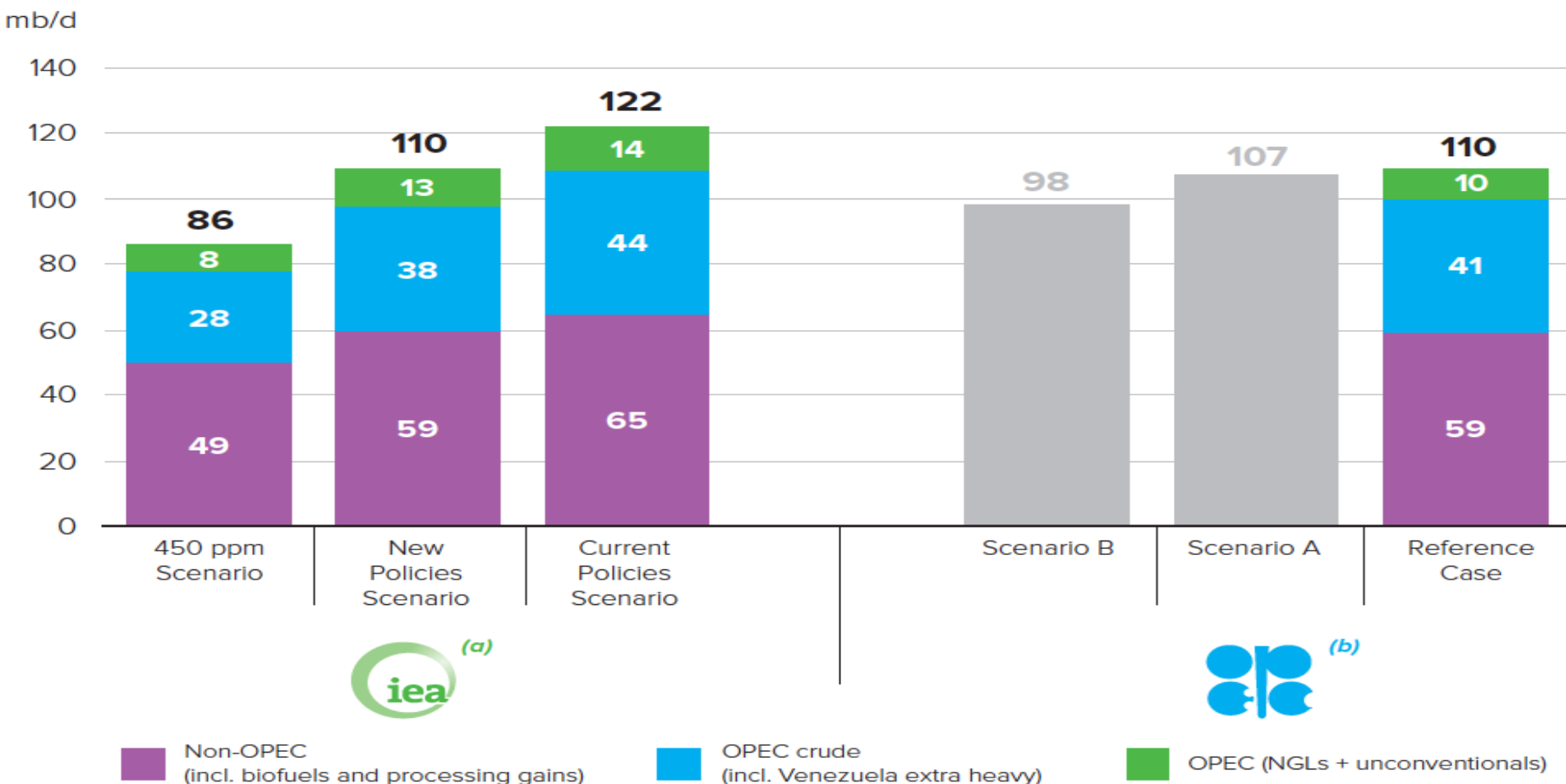
The share of OPEC crude grows in all scenarios

Share of Liquids Supply by Types in 2015 and Outlook for 2040



Long-term oil supply scenarios vary strongly, yet similar projections for OPEC Reference and IEA New Policies scenarios

2040 Liquids Supply Outlook in Different Scenarios (mb/d)



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Key remaining differences in IEA OPEC outlooks

- World liquids baseline demand and supply differ by 1.7 mb/d and 1.4 mb/d, respectively
- Different publication dates of medium-term outlooks make direct comparisons difficult
- Different units (mb/d, mboe/d, mtoe), and sometimes unclear conversion factors between units
- Different treatment of biofuels/bunkers within global versus regional liquids supply
- Different regional groupings, in particular separate OPEC treatment of member country demand in medium-term projections
- Different conception of “central” policy scenarios
- Oil price assumptions

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IEA and OPEC in the context of other long-term energy outlooks

Challenges in comparing IEA and OPEC projections to other energy outlooks

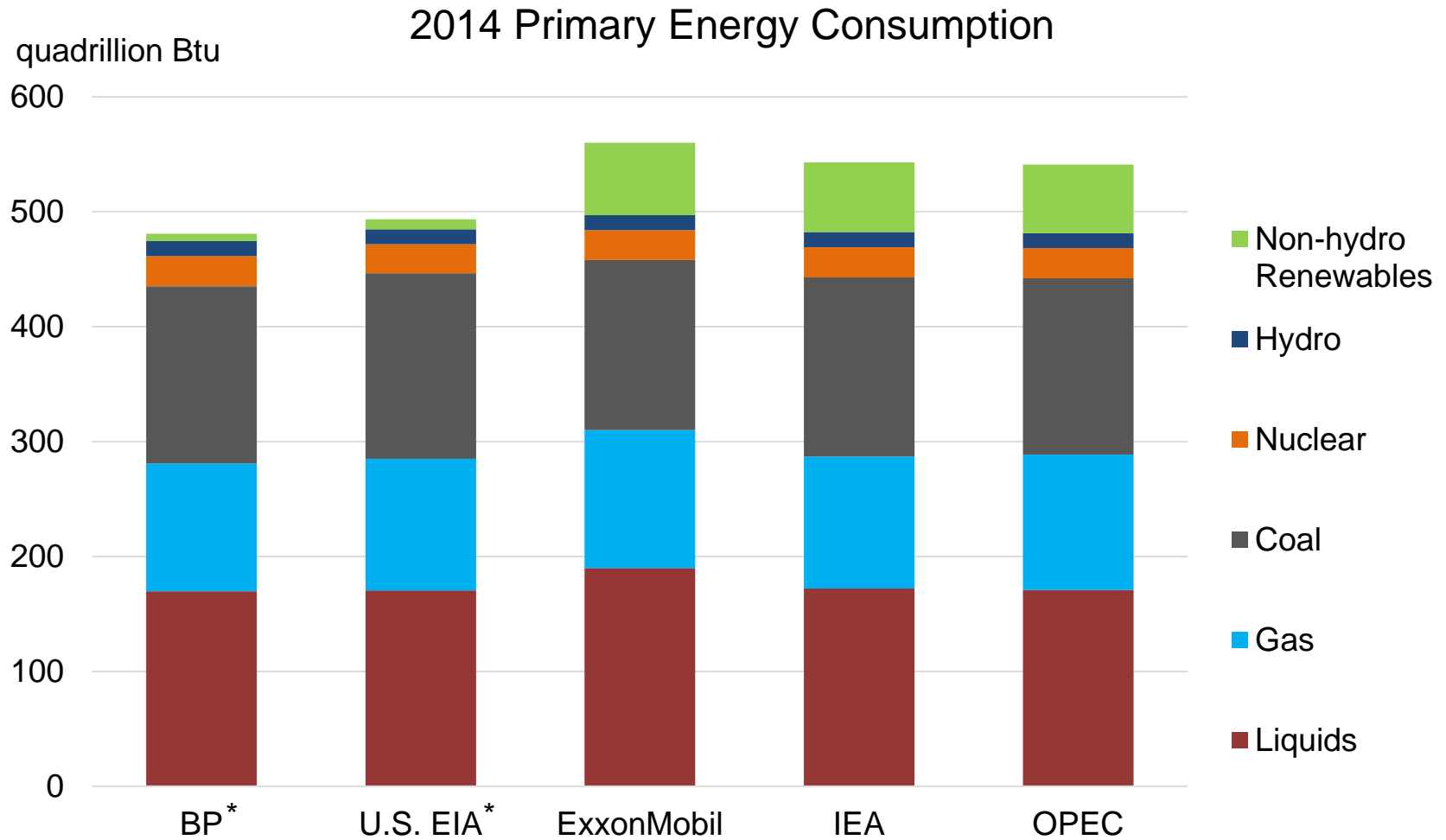
Some challenges similar to comparison of IEA and OPEC

- Different primary energy units and fuel-specific physical units
- Different categorization of biofuels and renewable power
- Different regional groupings
- Different assumptions for policy and about economic growth

Plus, several additional challenges

- Assumptions about energy content of fossil fuels can vary by 1-12%
- Different conversion factors for renewables and nuclear can alter primary energy estimates for these sources by -65% to +153%
- Omission of traditional non-marketed biomass by U.S. EIA and BP leads to primary energy consumption estimates that are 10-16% lower than other outlooks

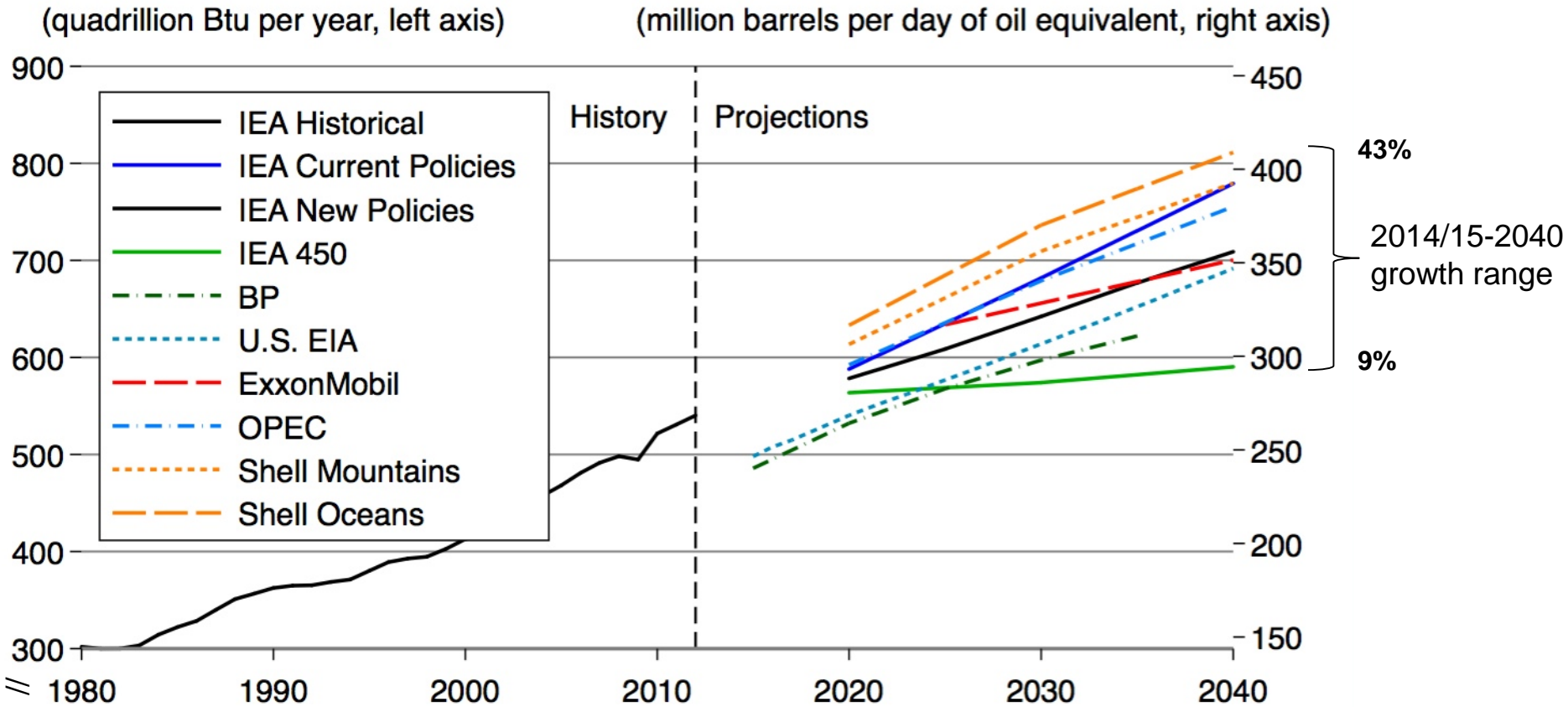
Differences in baseline primary energy consumption data exist among various long-term outlooks



* BP and U.S. EIA do not include non-marketed energy

Future energy consumption growth varies widely across energy outlook scenarios, depending largely on policy assumptions

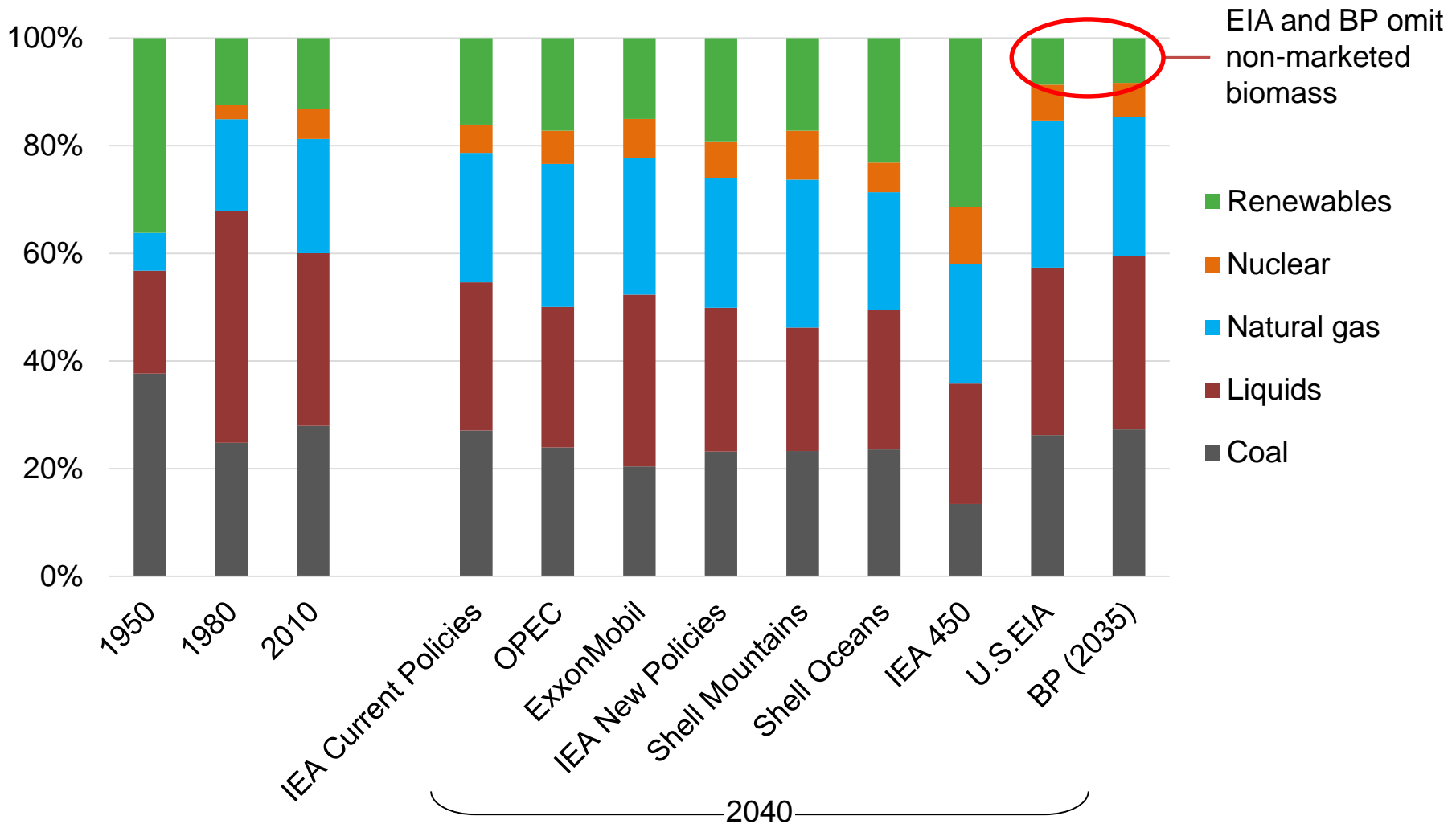
primary energy consumption



Outlook sources: IEA 2016, OPEC 2016, US EIA 2016, BP 2016, ExxonMobil 2017, Shell 2013. Note that U.S. EIA and BP estimates omit non-marketed biomass.

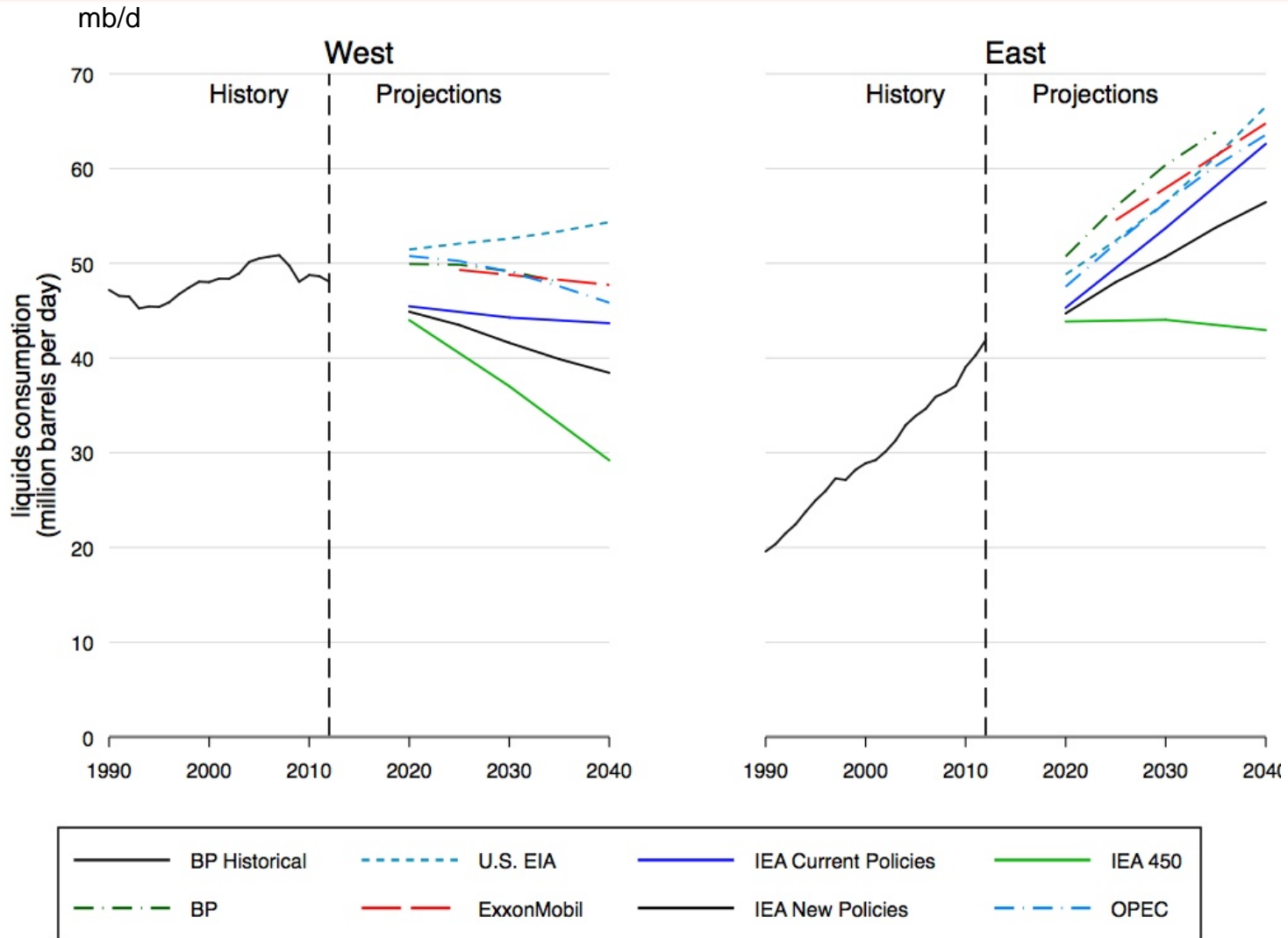


Global fuel shares: history and future scenarios



1950 data from Grubler (2008). 1980 and 2010 data from IEA (2014). Outlook sources: IEA 2016, OPEC 2016, US EIA 2016, BP 2016, ExxonMobil 2017, Shell 2013.

Liquids consumption growth shifts decisively to the East



Outlook sources: IEA 2016, OPEC 2016, US EIA 2016, BP 2016, ExxonMobil 2017, Shell 2013. Note that U.S. EIA and BP estimates omit non-marketed biomass.

Thank you

For more information:

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