

Congreso Geologia Peru 2026



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Global Energy Outlook 2026 – 2050

Paradigms, uncertainties and decisions

Max Torres

Managing Partner, Plata Energy



“Prediction is very difficult, especially if its about the future”

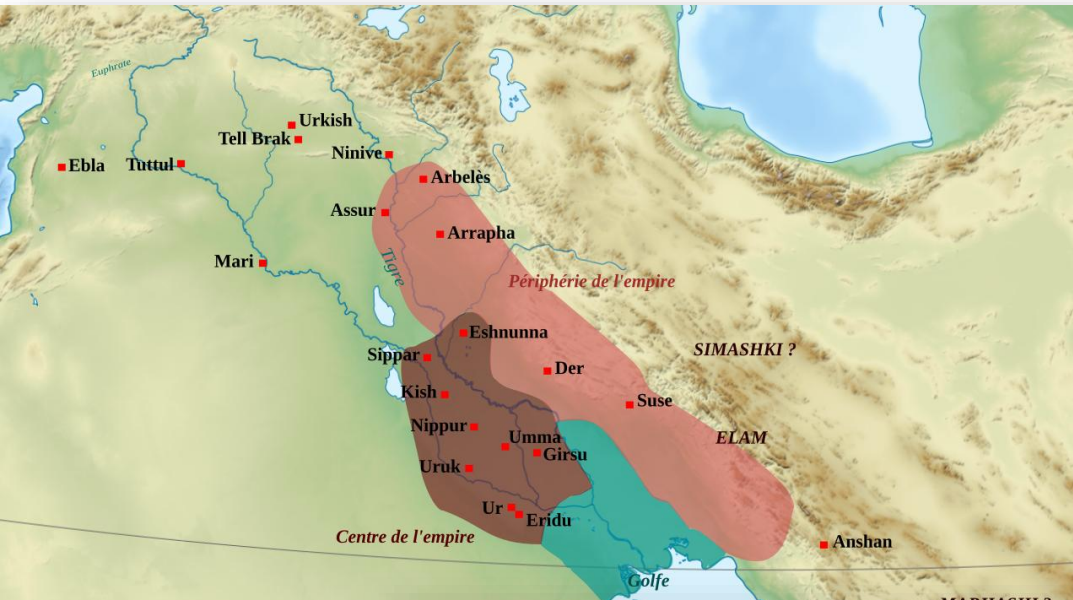
Niels Bohr

Our start: Mesopotamian Culture 14000 - 500 BC

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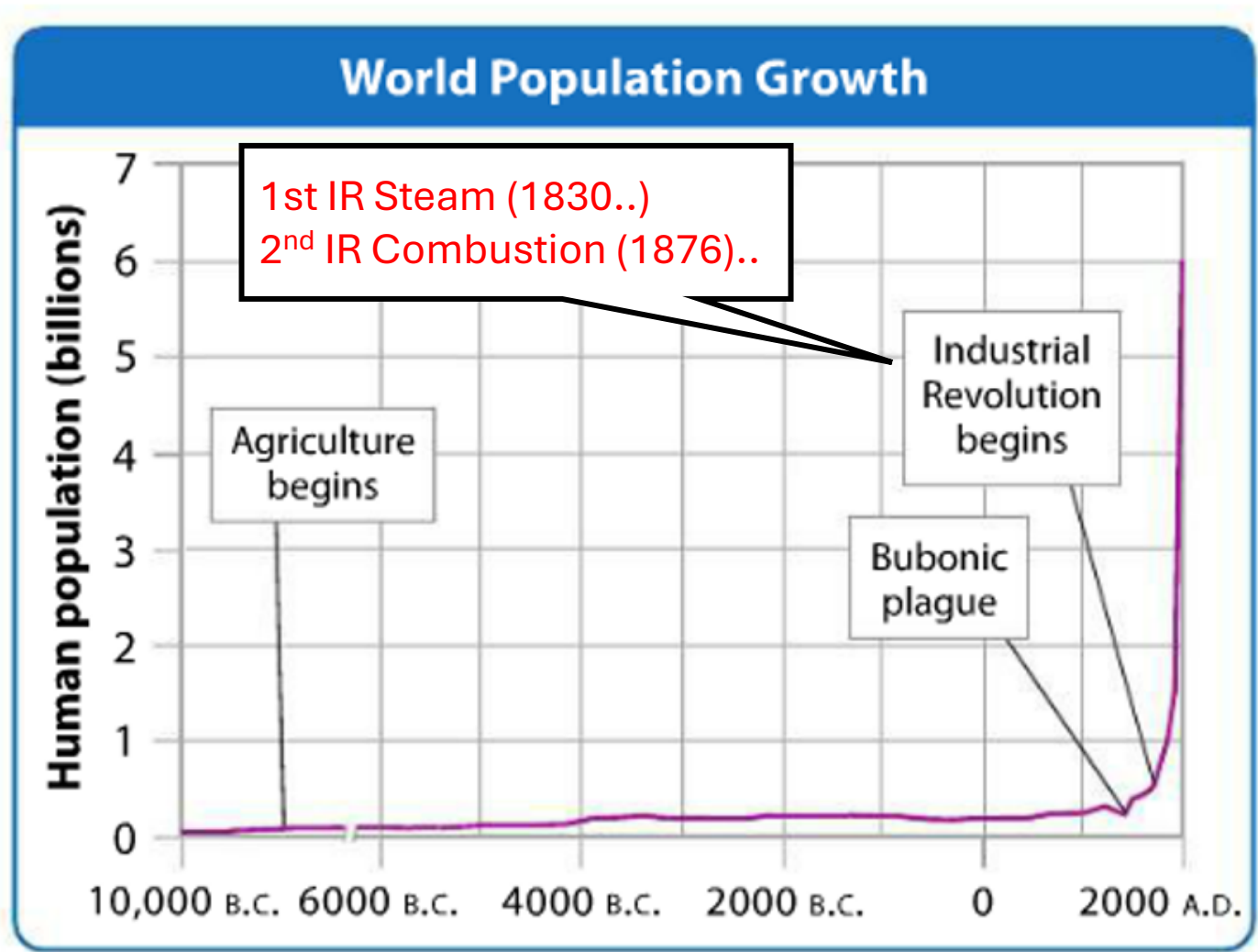
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Epic of Gilgamesh (2900 BC)



Fact: Population growth – Key milestones

We became a world of **8 billion in 2021** After passing the 7 billion milestone in 2009, it only took 12 years to add the latest billion.

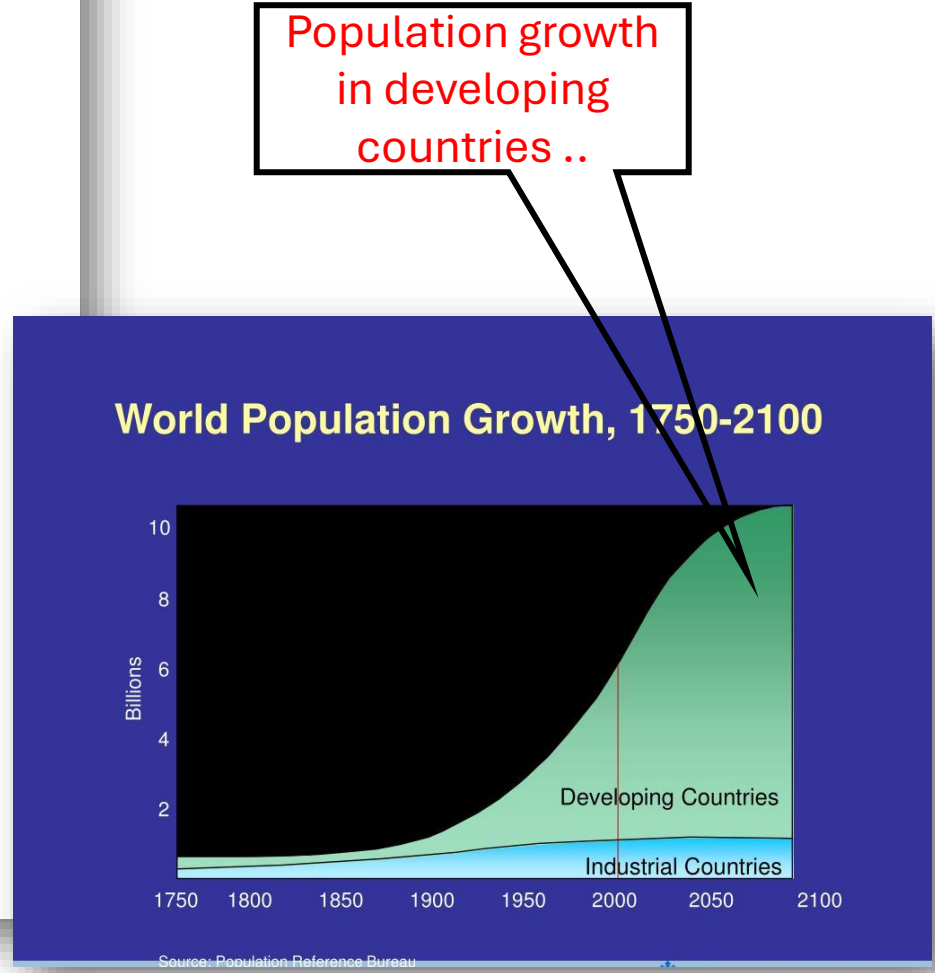
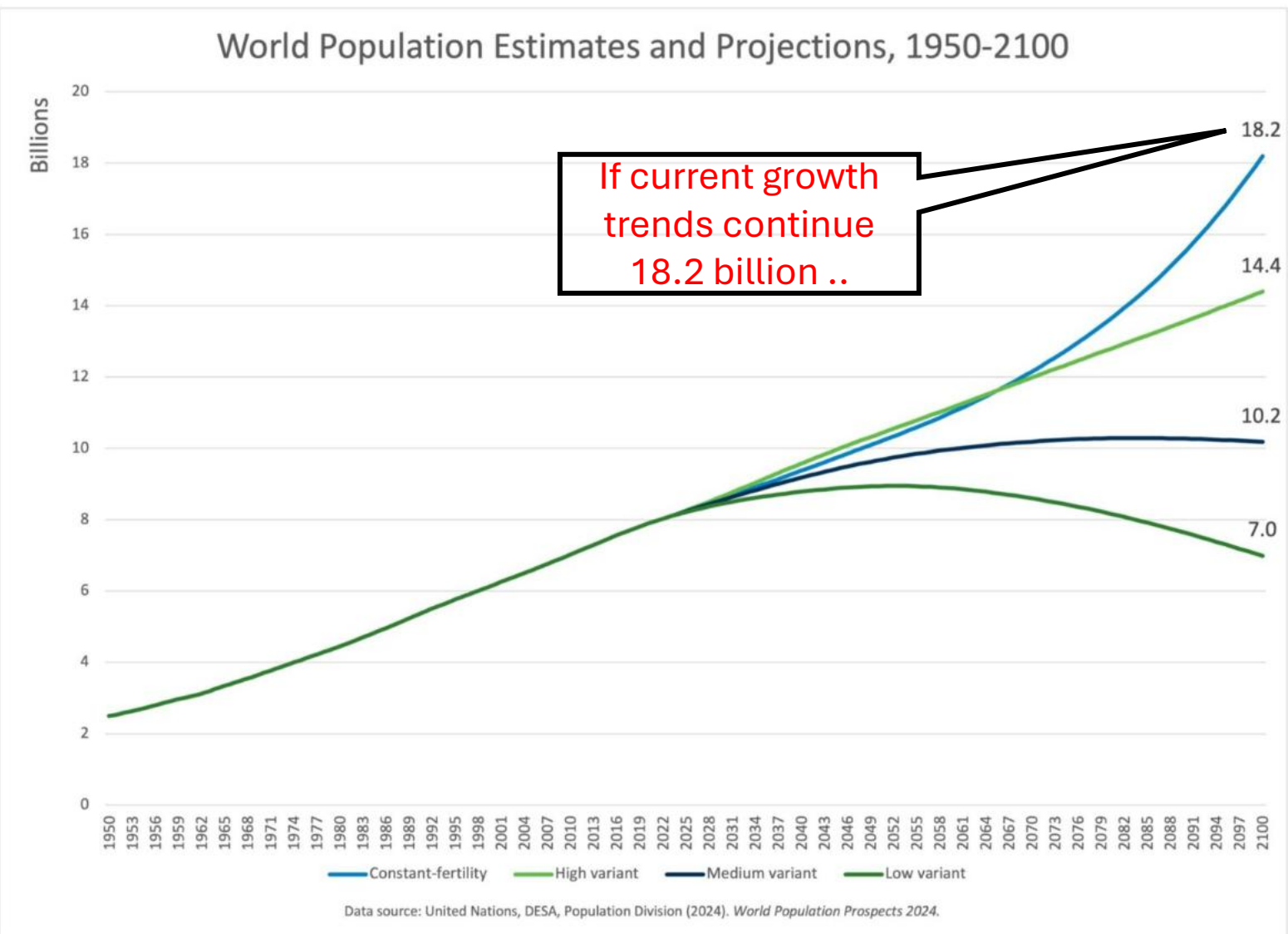


World Population Milestones Throughout History

Year	Milestone	Years since previous milestone
1804	1 billion	All of human history
1927	2 billion	123
1959	3 billion	32
1974	4 billion	15
1986	5 billion	12
1997	6 billion	11
2009	7 billion	12
2021	8 billion	12
2036 (projected)	9 billion	15 (projected)
2060 (projected)	10 billion	24 (projected)

United Nations, DESA, Population Division (2024). *World Population Prospects 2024*.

Forecasted population growth to 2100



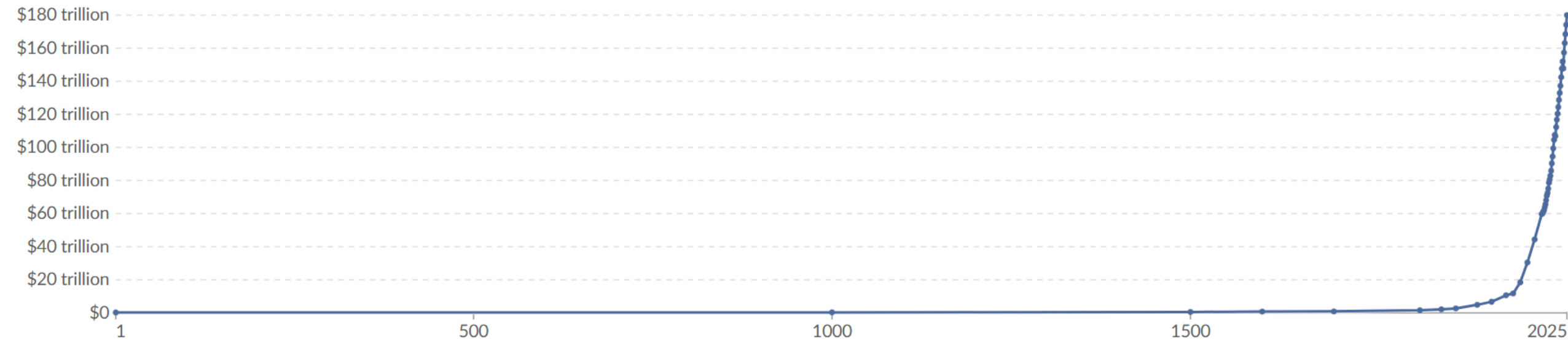
Fact - Current trends: GDP Continues to grow ...

2025: USD 180 Trillion

Global GDP over the long run

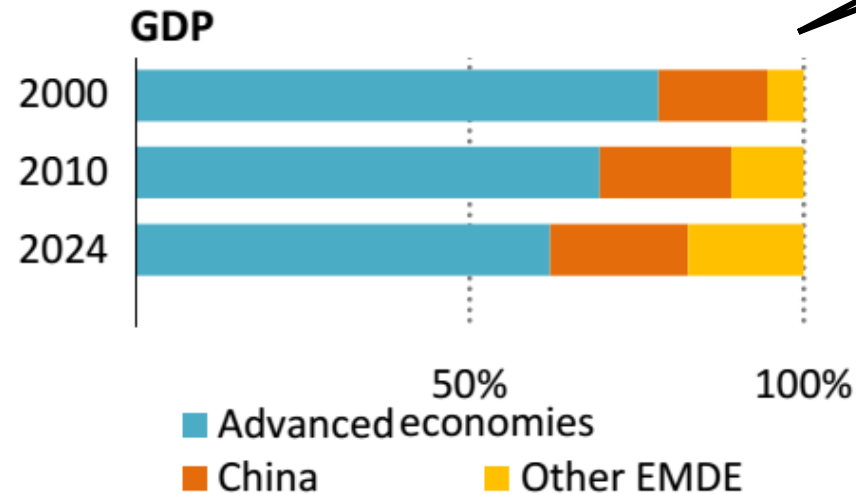
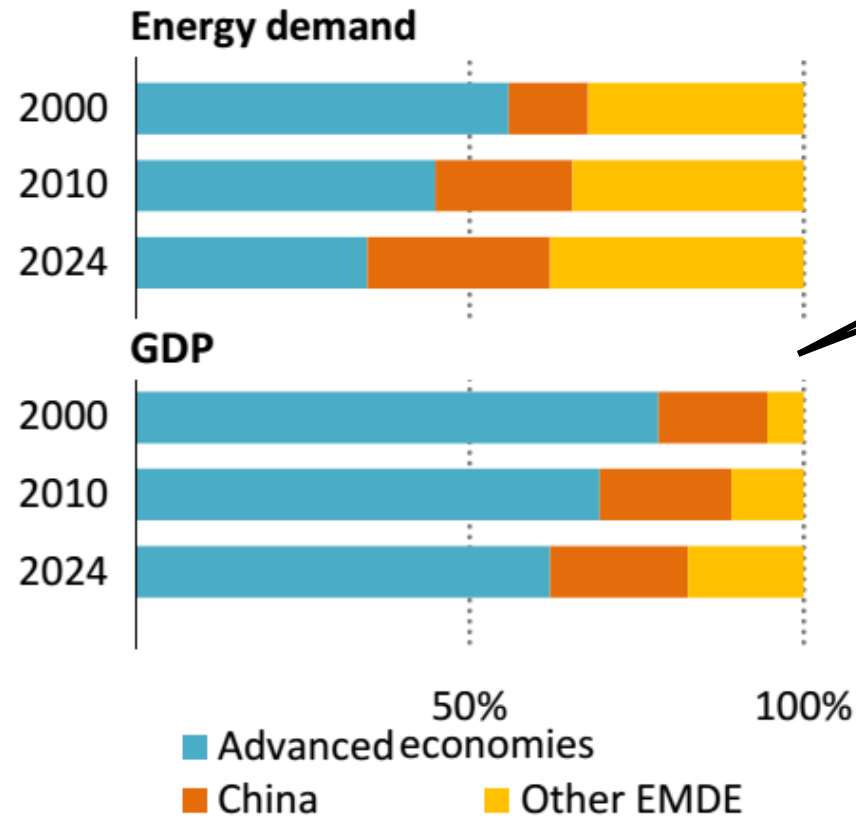
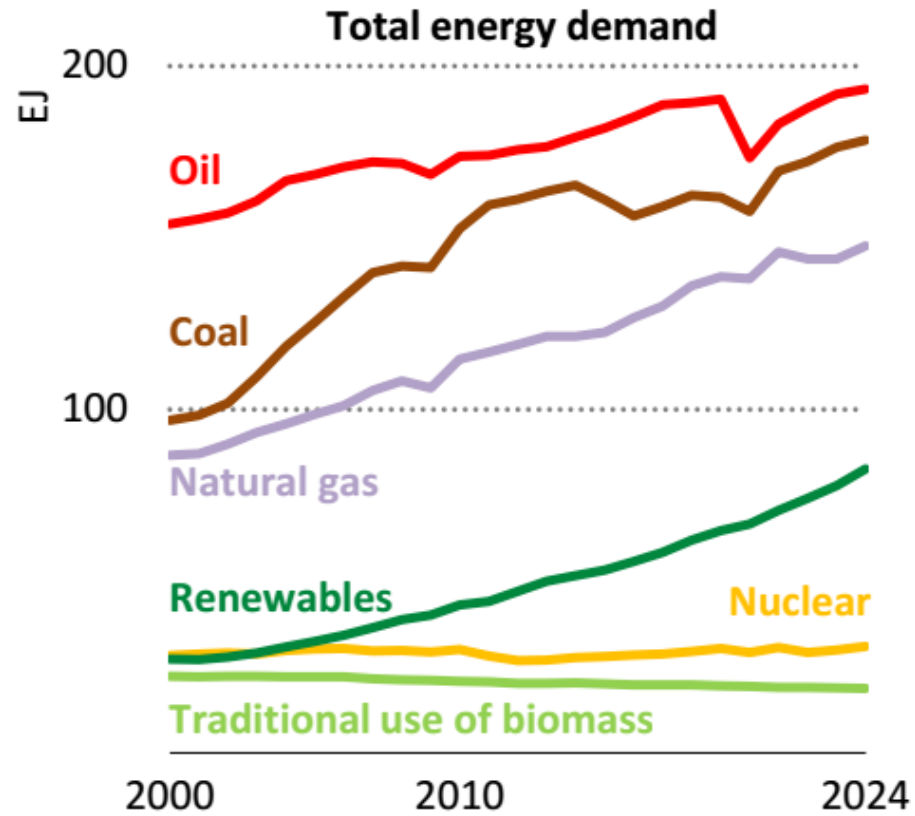
[Our World in Data](#)

Total output of the world economy. These historical estimates of GDP are adjusted for inflation. We combine three sources to create this time series: the Maddison Database (before 1820), the Maddison Project Database (1820–1989), and the World Bank (1990 onward).

[Table](#)[Line](#)[Settings](#)

Fact – Global energy demand continues to grow ...

2000 – 2024 by region



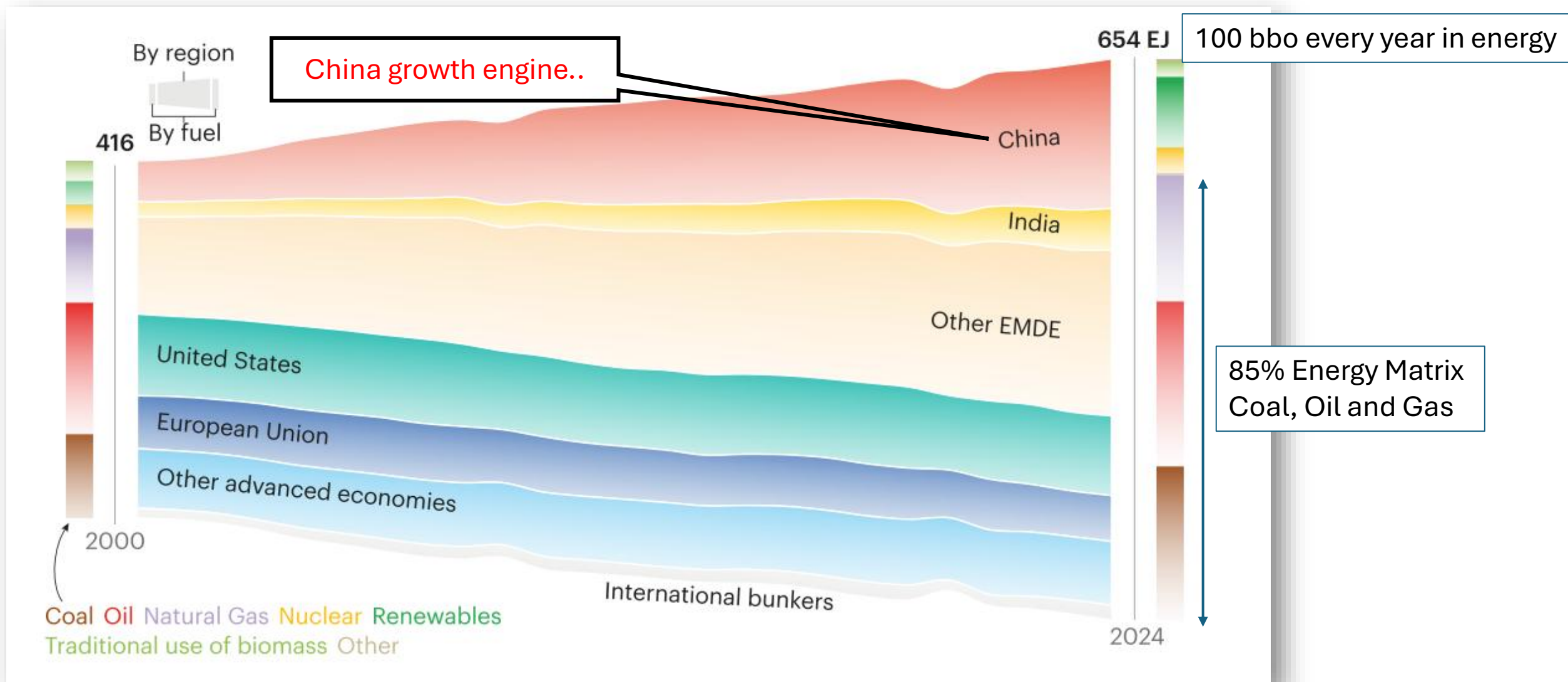
China and EMDE growth ..

*Global energy demand has increased 20% since 2010,
with all the increase taking place in emerging market and developing economies*

IEA. CC BY 4.0.

Fact – Global energy demand continues to grow ...

2000 – 2024 by region – 60% growth since 2000 in Emerging Markets

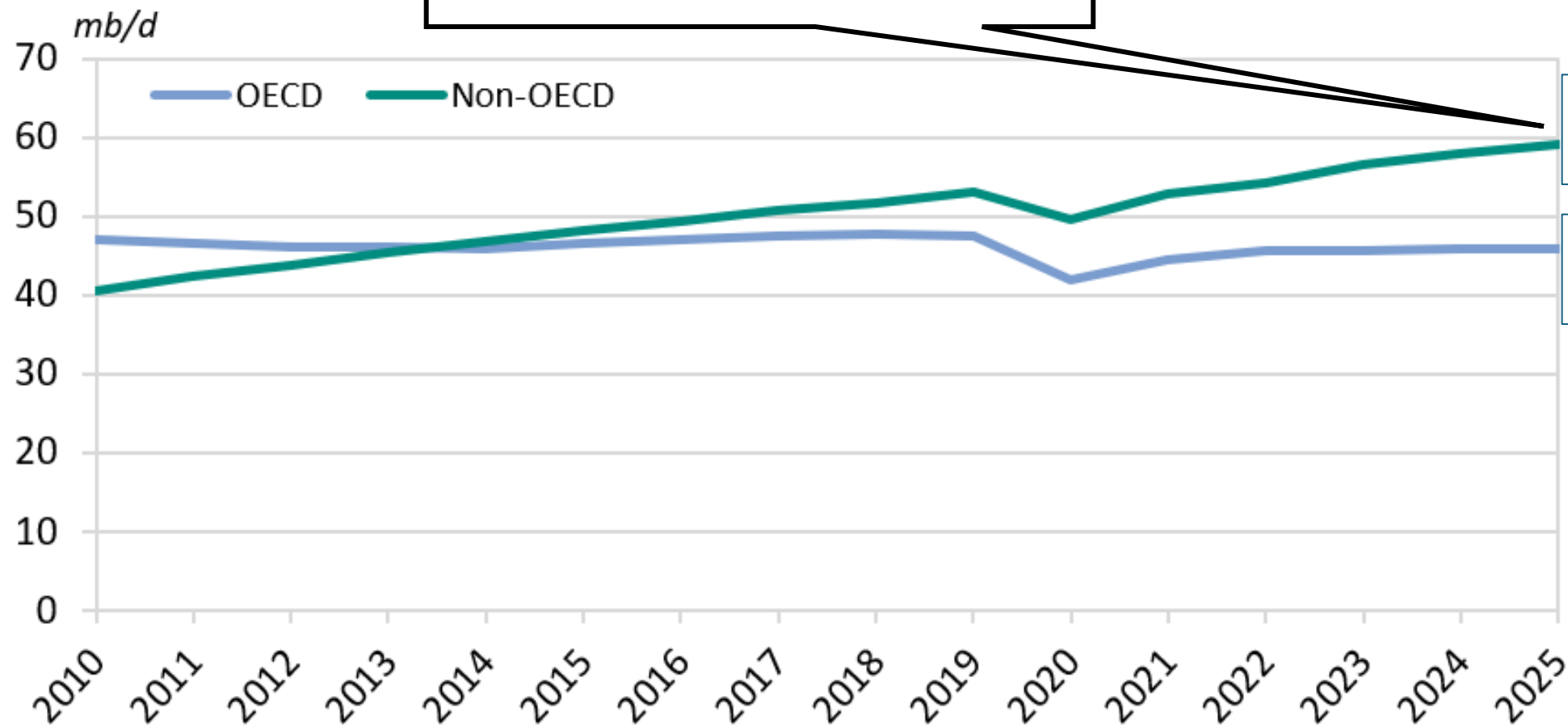


Fact: Current oil demand by region - 2010–2025

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World 2025 oil demand **105 mbod ..**

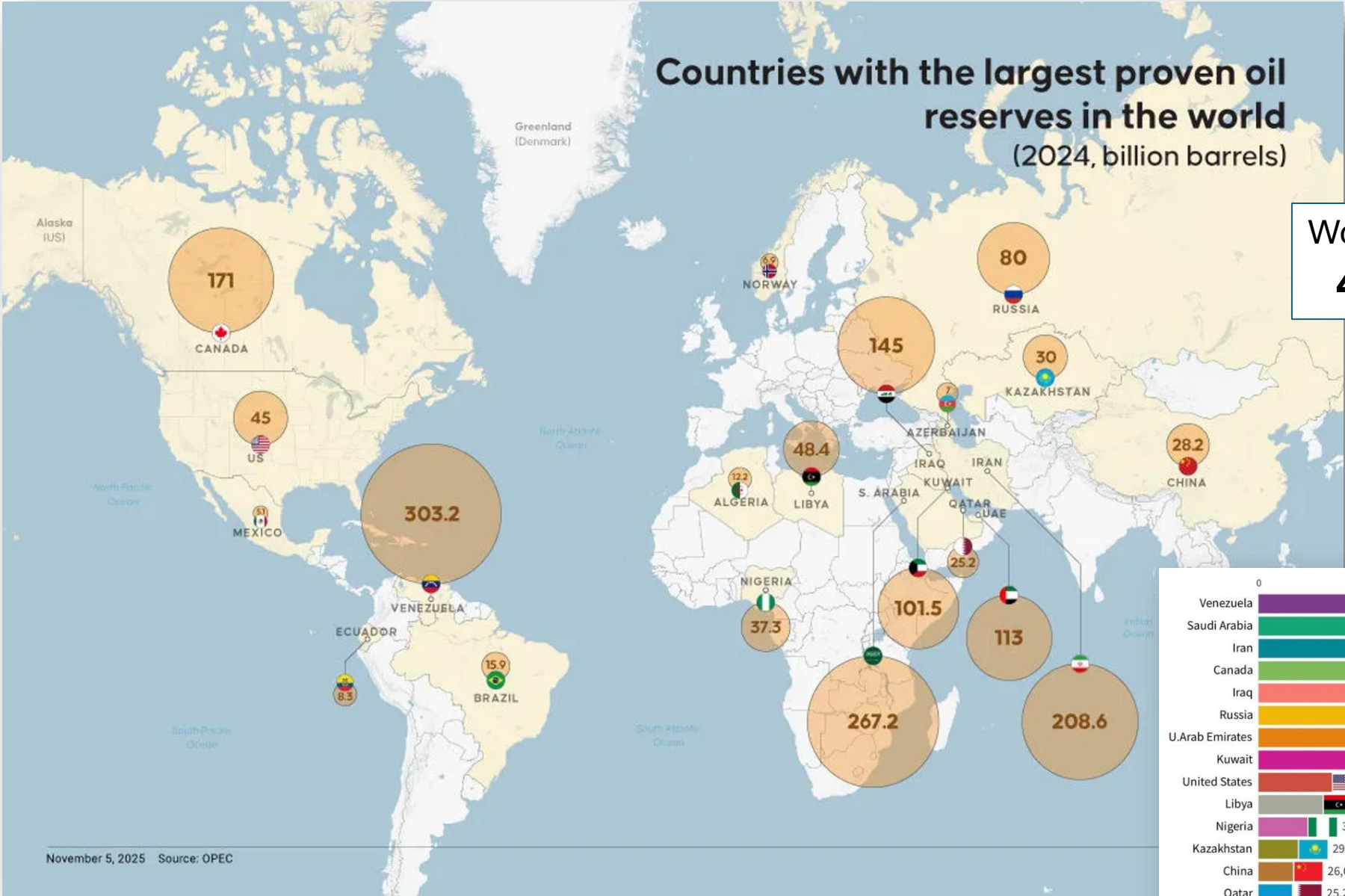


Growth 15 yrs : 20 mb/d
Non-OECD **50% Growth**

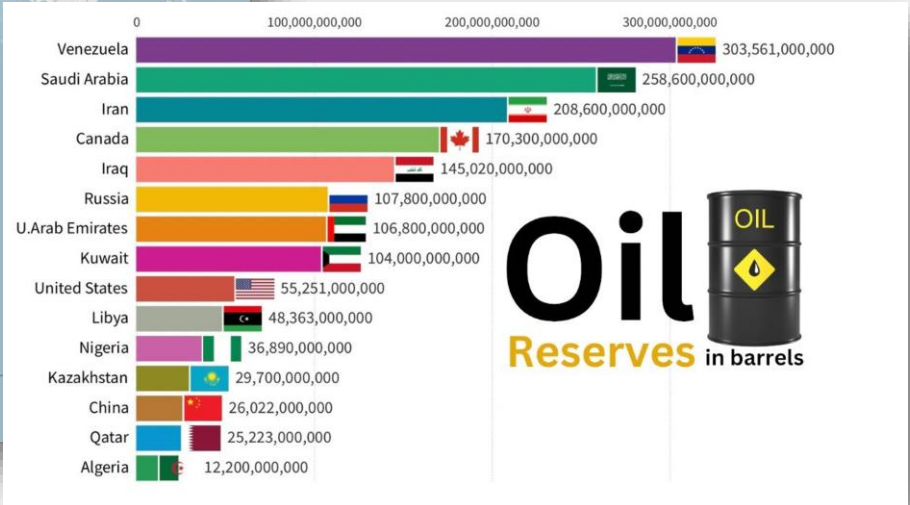
Growth 15 yrs : - 2 mb/d
OECD **0% Growth**

Near 40 BBO per year demand!

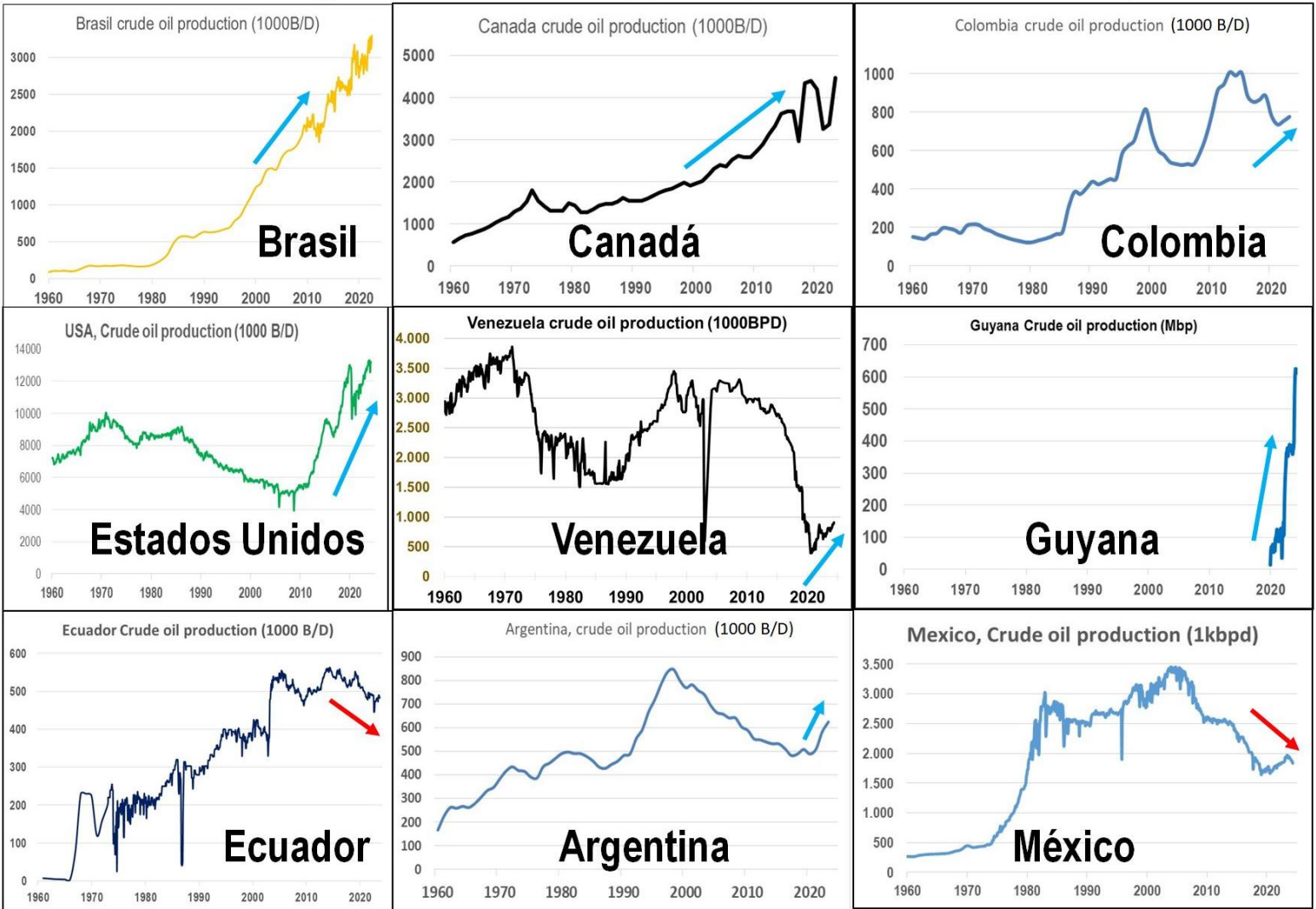
Fact: Proven oil reserves of the world (1.7 Trillion bbls)



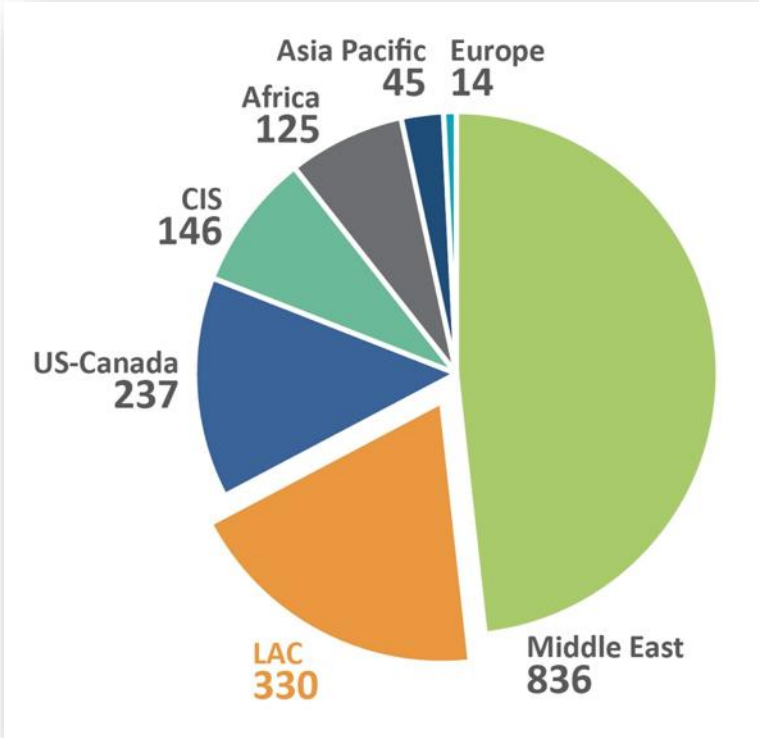
World Total : 1.7 Trillion BO
42 years at this rate



Fact: Latin America main producers' tendencies



Global Proved Oil Reserves:
1,732 Bbo
LAC: 19%

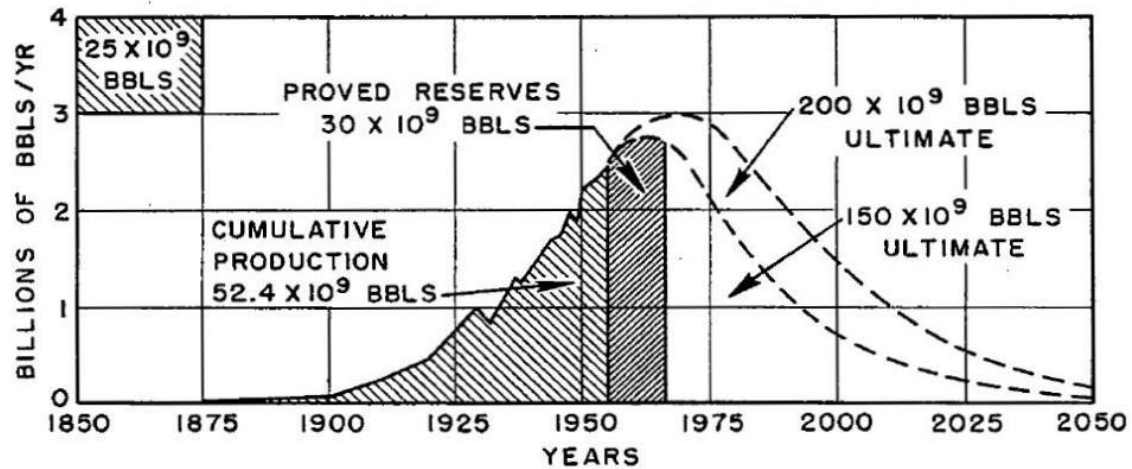


Predicting the future: Hubbert Peak Oil (1958) in 1970

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Hubbert's Peak



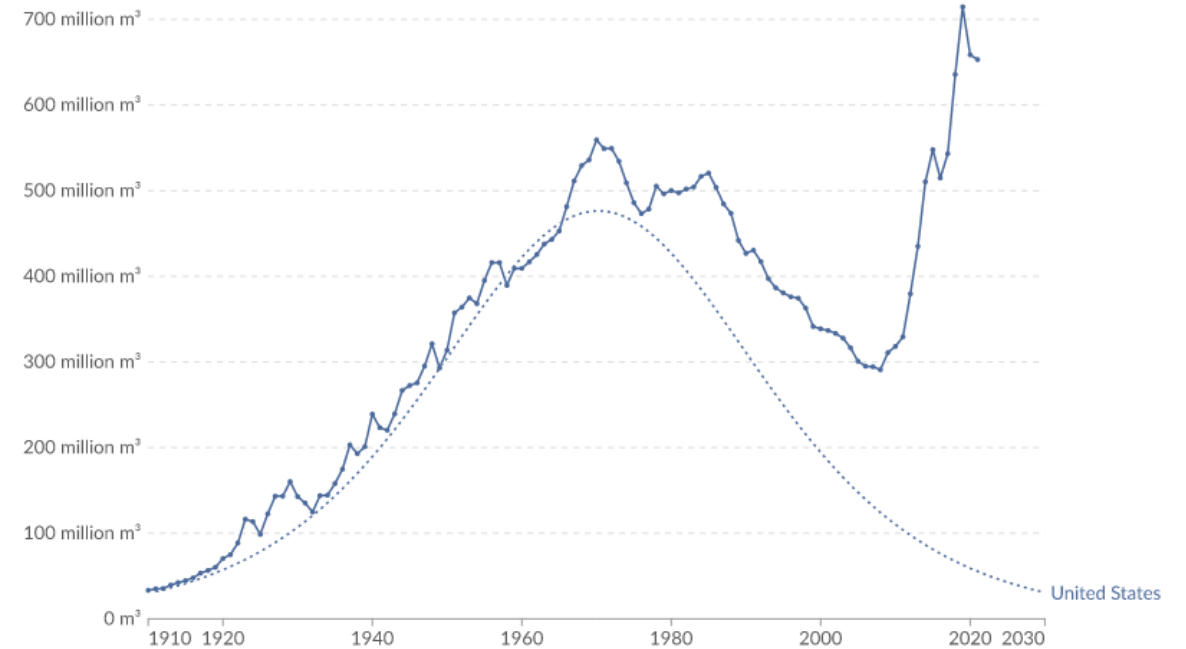
- From the 1956 article
- Hubbert drew the graph by hand and integrated the areas by counting the little squares
- He opted for the higher estimate culminating in the 1970s

19

Hubbert's peak prediction vs. actual oil production in the United States

Hubbert's hypothesis of peak oil production in the United States, alongside actual oil production trends in the United States, both measured in cubic meters per year.

Our World
in Data



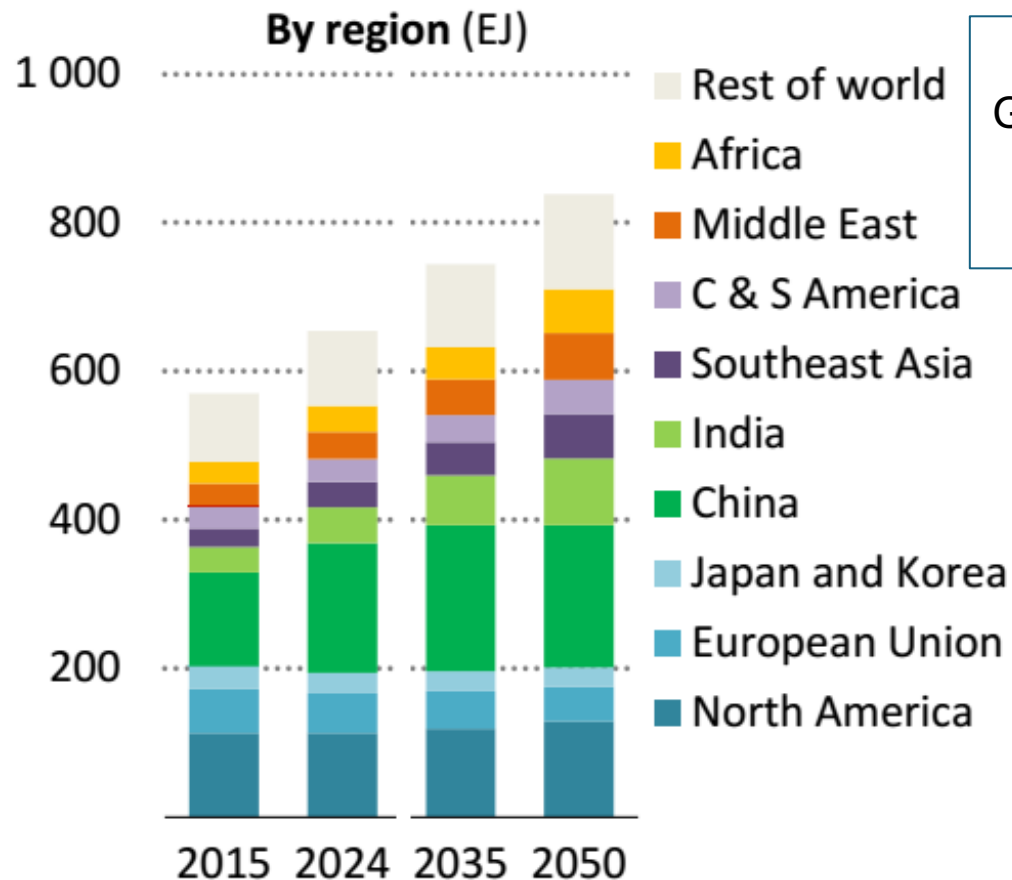
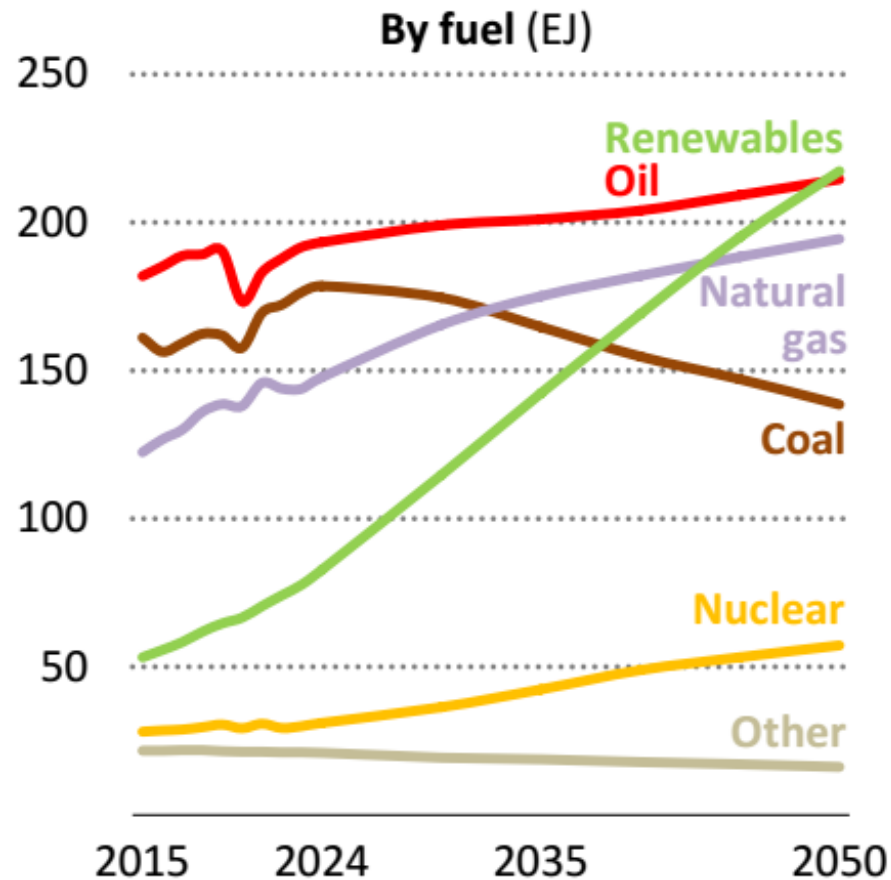
Data source: Cavallo (2004) & EIA

OurWorldinData.org/energy | CC BY

Global total energy demand in 2015 – 2050 by scenario (IEA)

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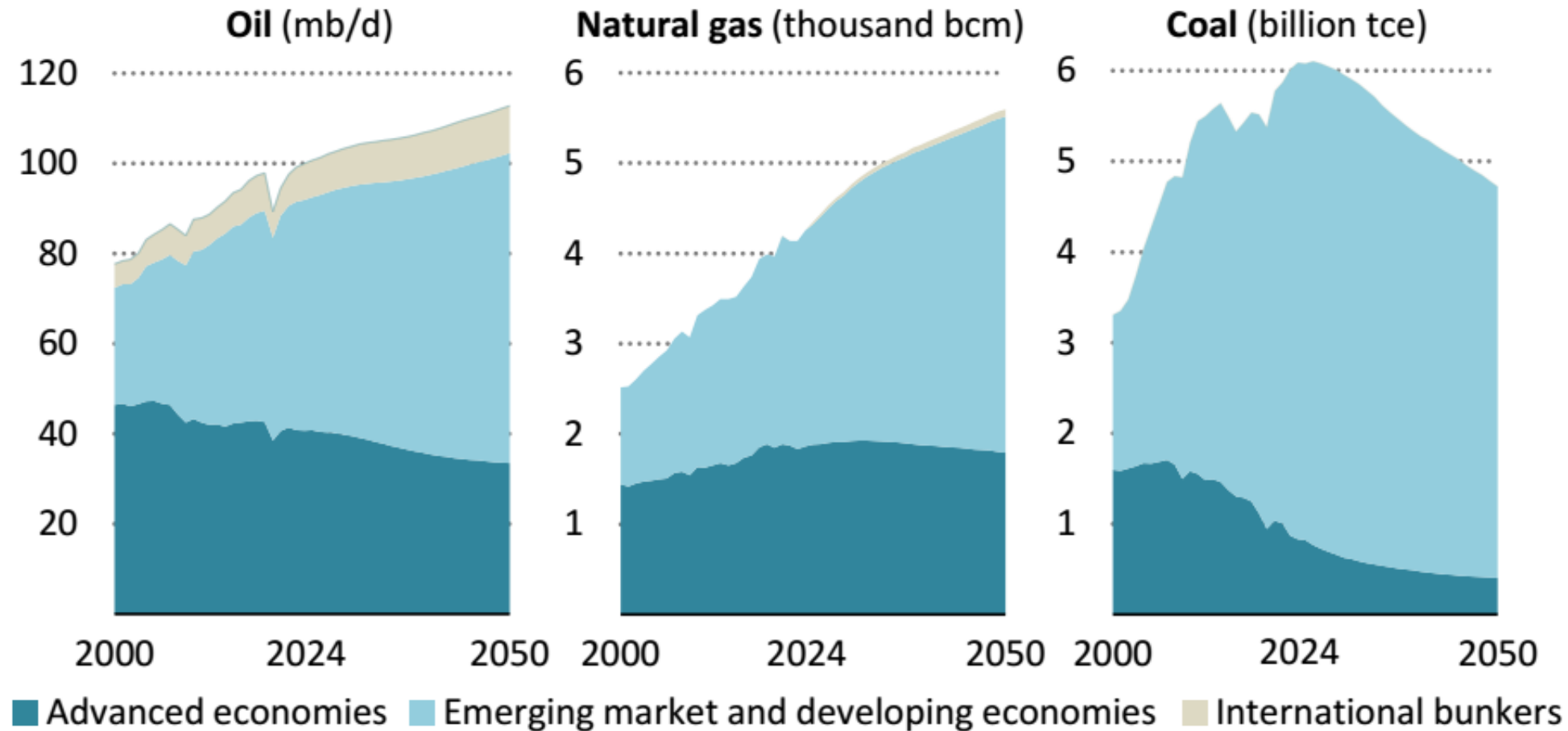
CPS Total Energy
Growth 35 yrs : Near 200 EJ
Near **40% Growth**
90% from EM

IEA. CC BY 4.0.

Fossil fuel demand 2050 CPS Case (IEA)

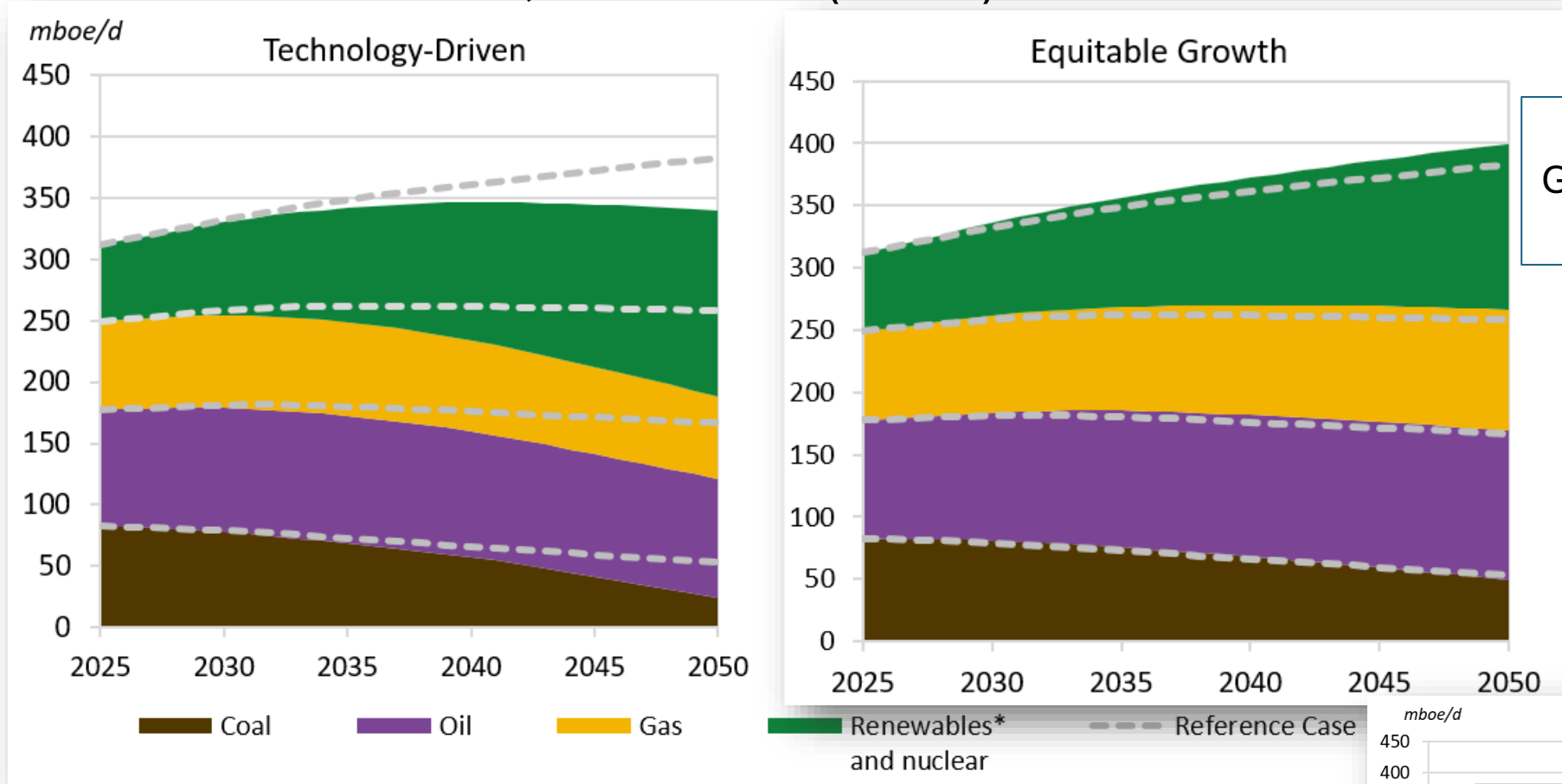
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IEA. CC BY 4.0.

Global primary energy demand in the Reference Case and in alternative scenarios, 2025–2050 (OPEC)

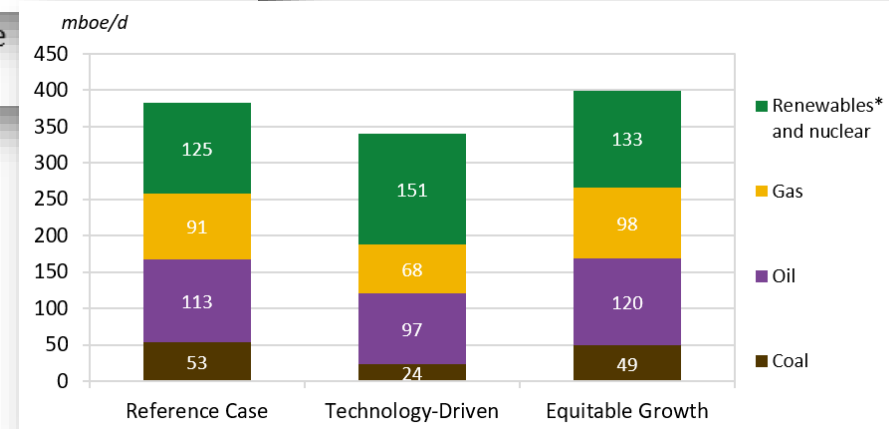


Reference Case

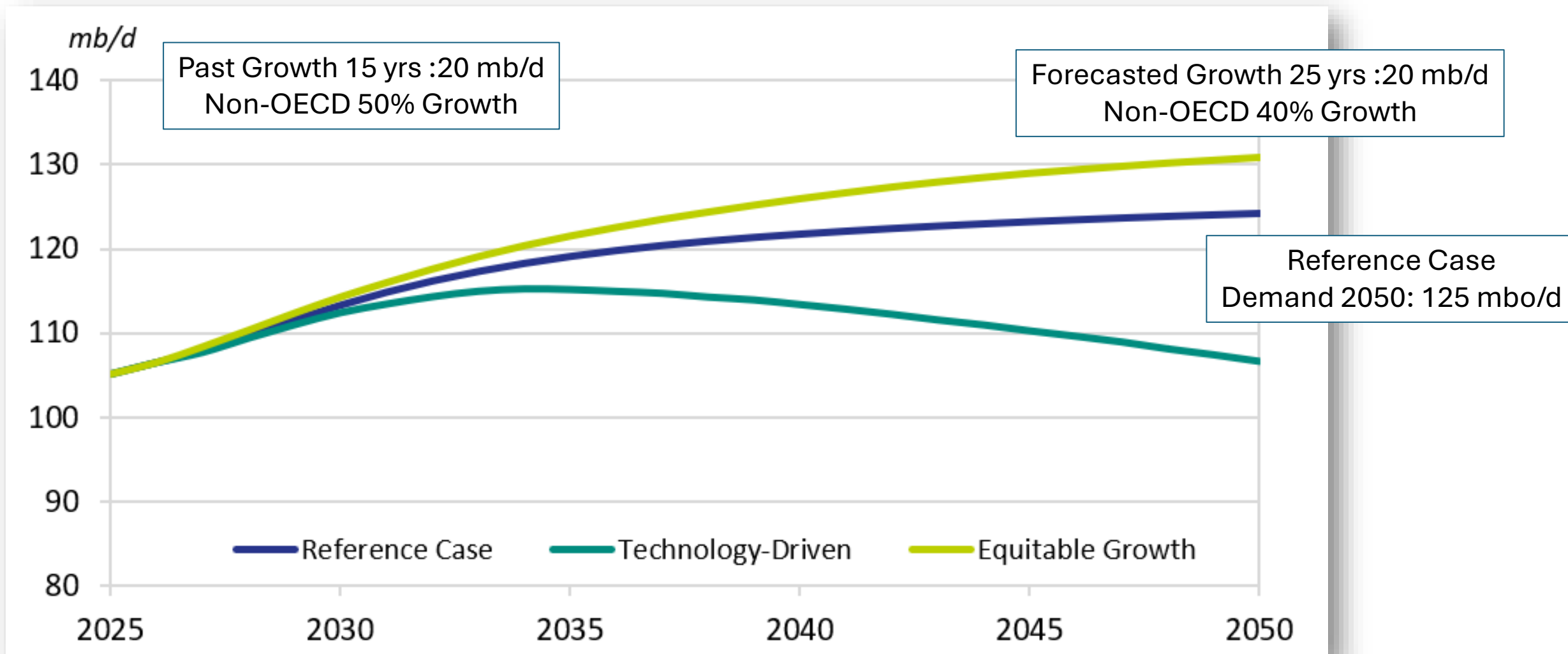
Growth 25 yrs : Near 100 mbe/d

Near **30% Growth**

Global primary energy demand in the Reference Case and in alternative scenarios, 2050



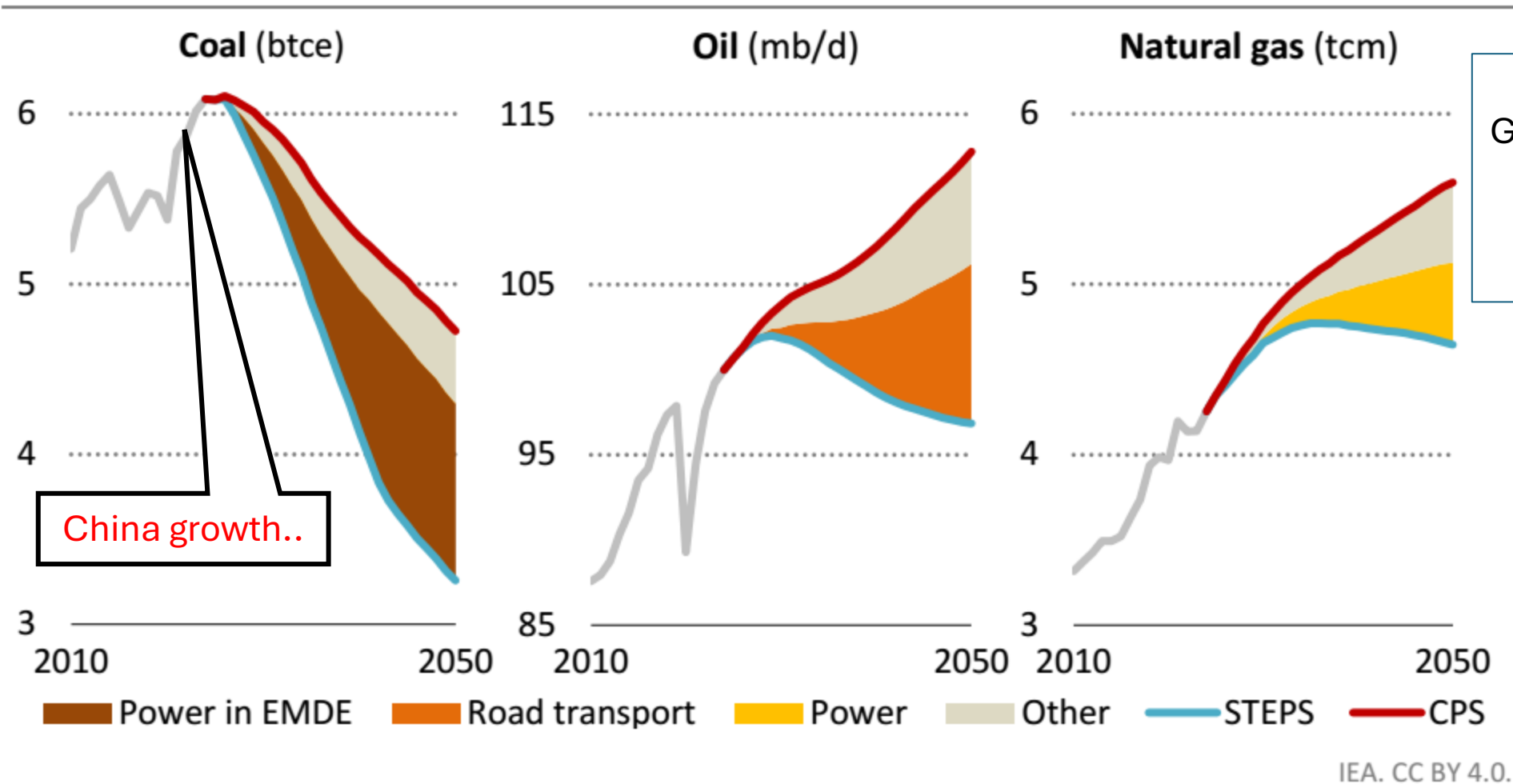
Global liquids demand in the Reference Case and in alternative scenarios, 2025–2050 (Opec)



Global primary energy demand in 2010 – 2050 by scenario (IEA)

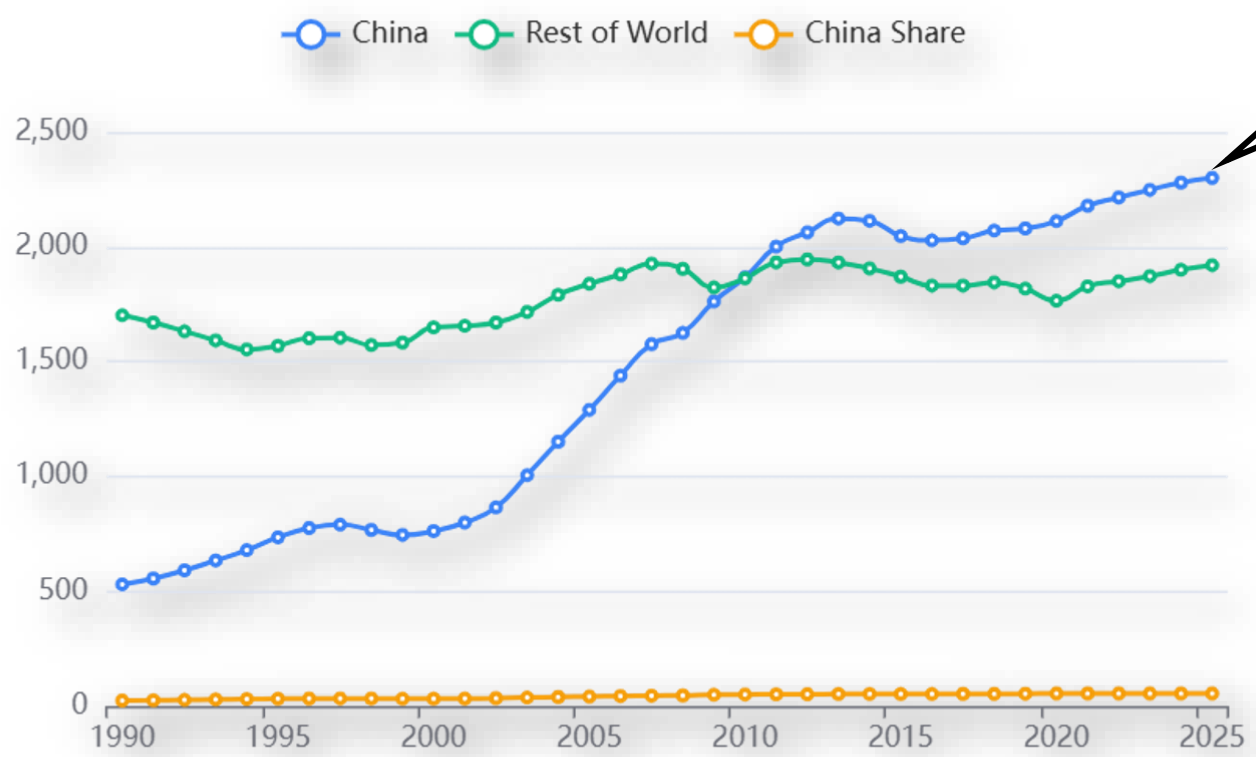
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CPS Case
Growth 25 yrs : Near mbe/d
Near % Growth
Coal and oil peak 2030?
Green Politics?

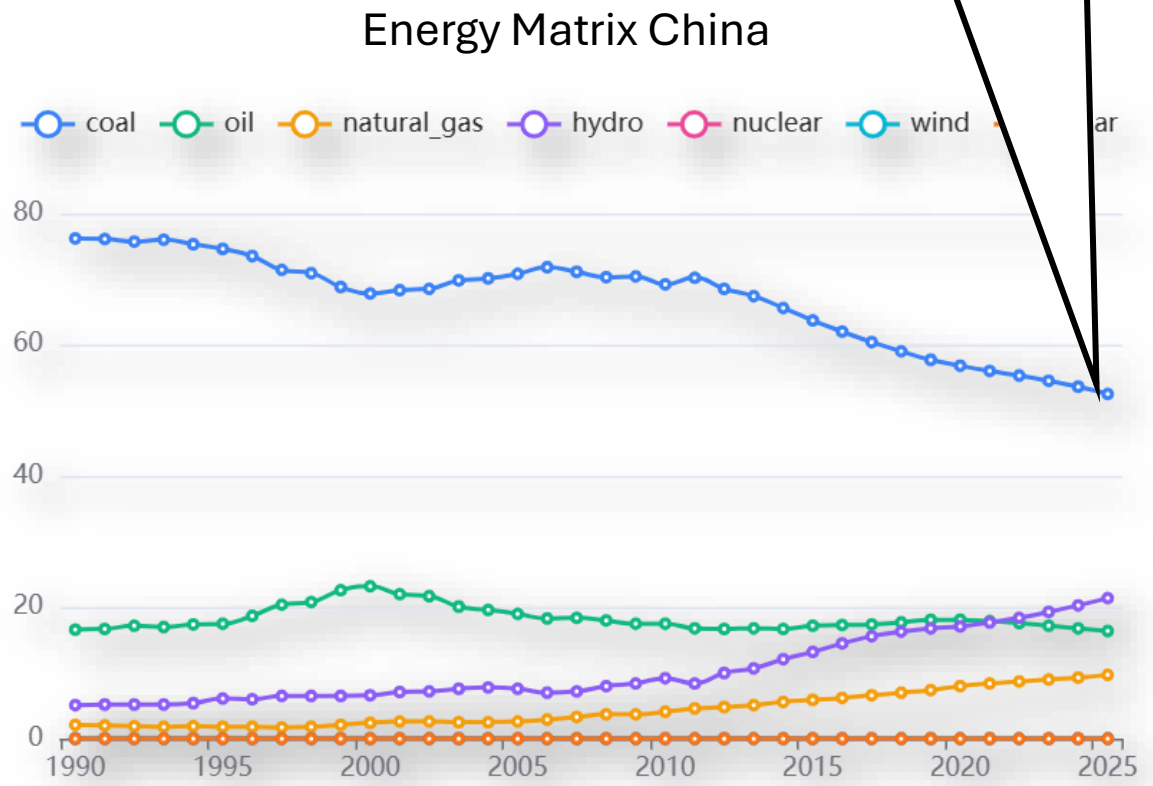
China coal case – Forecasted to peak in 2030 and drop...



Coal China growth 500%

China consumed 2,300 Mtoe of coal in 2025, 54.5% of global consumption

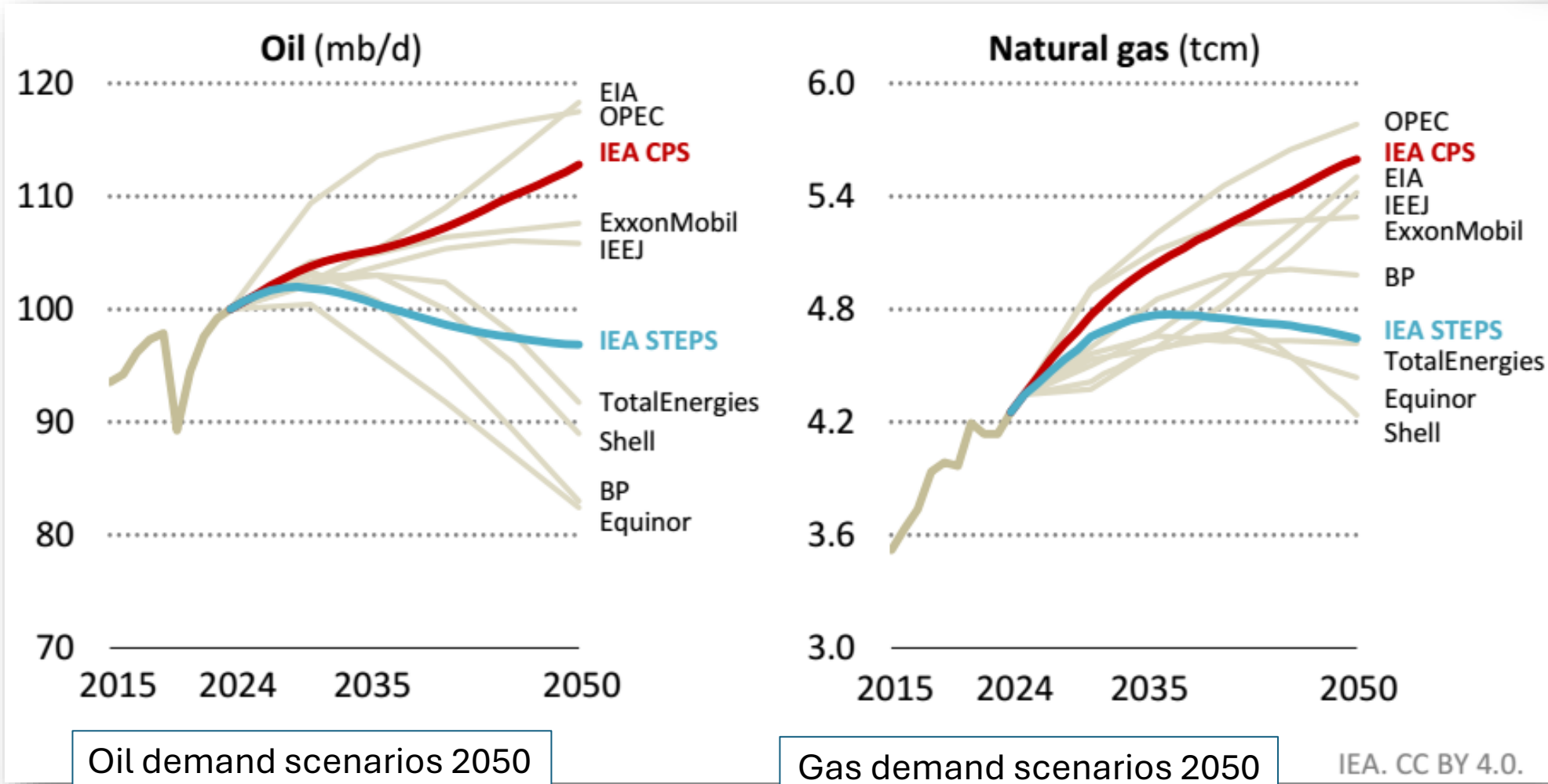
Coal 50% energy matrix



Comparative global oil and gas demand scenarios to 2050 (IEA)

Large spread of forecasted demand... complex capital decisions

...



Oil demand scenarios 2050
Range from **82 – 120 mb/d**
38 mb/d range
13 bbo/ year

Gas demand scenarios 2050
Range from **4.2 – 5.8 Tcm**
1.6 Tcm range

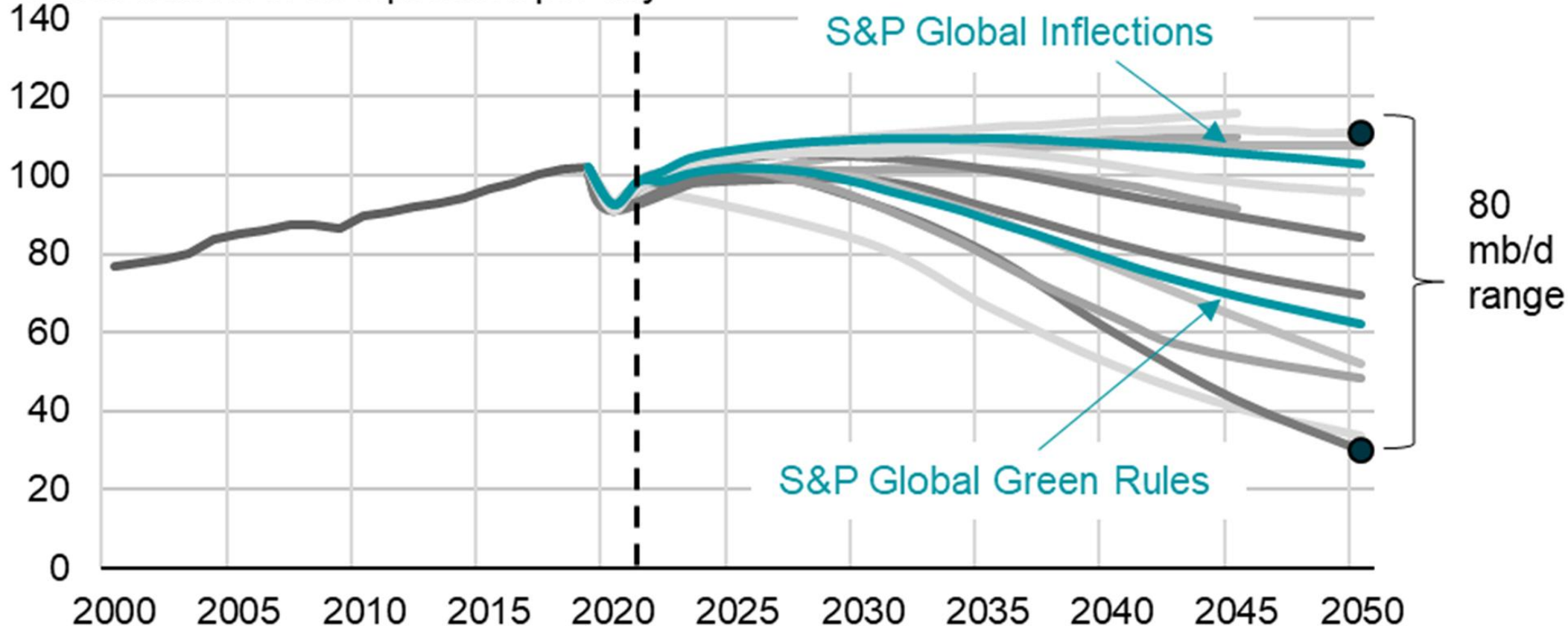
Comparative global oil demand scenarios to 2050 (SP Global)

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Liquids Demand Scenarios Through 2050

Million barrels of oil equivalent per day



Source: IEF, S&P Global Commodity Insights, IEA, OPEC, BP, BNEF

Source: SP Global 2023

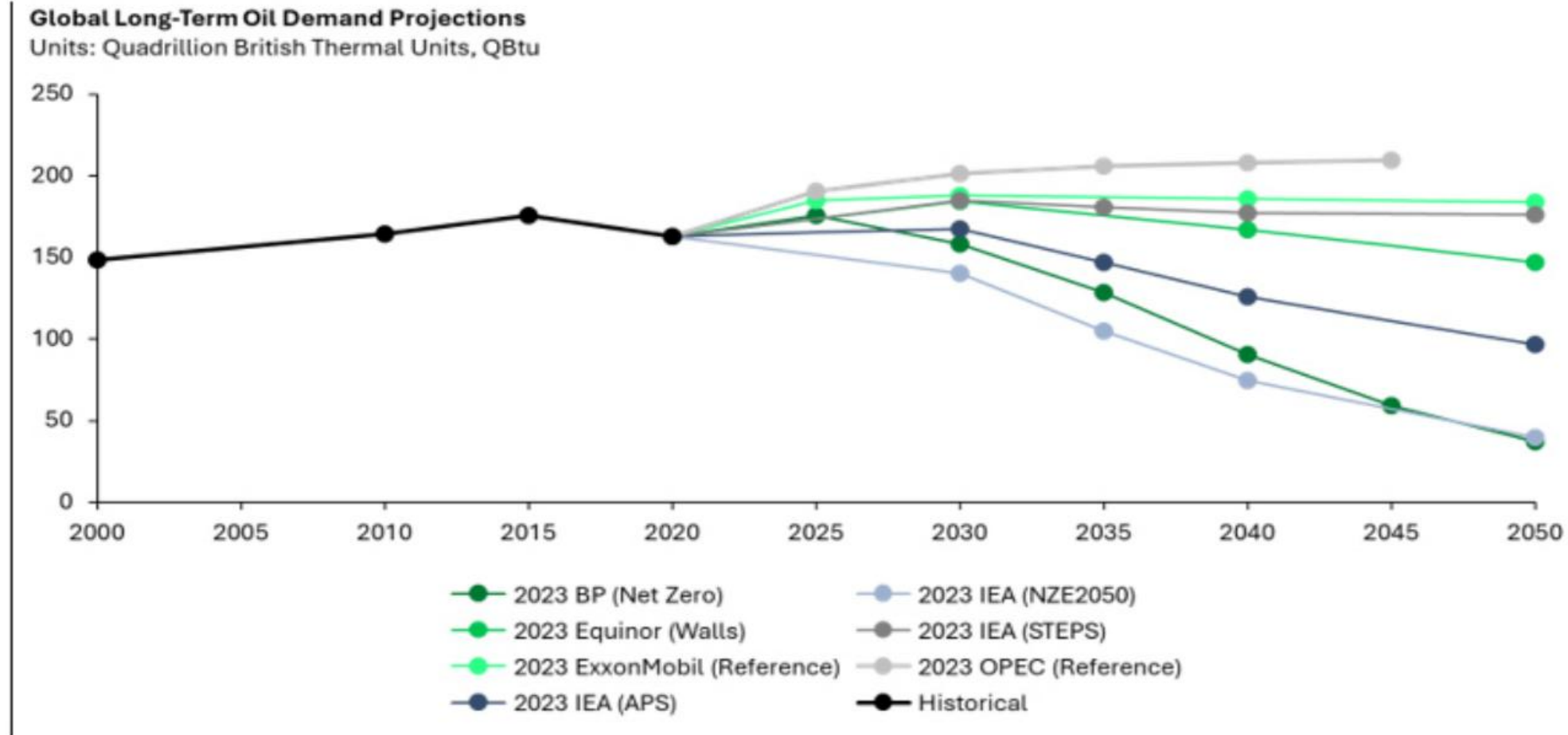
Comparative global oil demand scenarios to 2050 (Al Attiyah Found)

Notable divergence: Today: IEA and OPEC **2 mbo/d** difference

In 2030 : **7 mbo/d**, in 2045 : **45 mbo/d** = volatile = uncertainty

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2030 demand forecast diverging and changing opinions ...

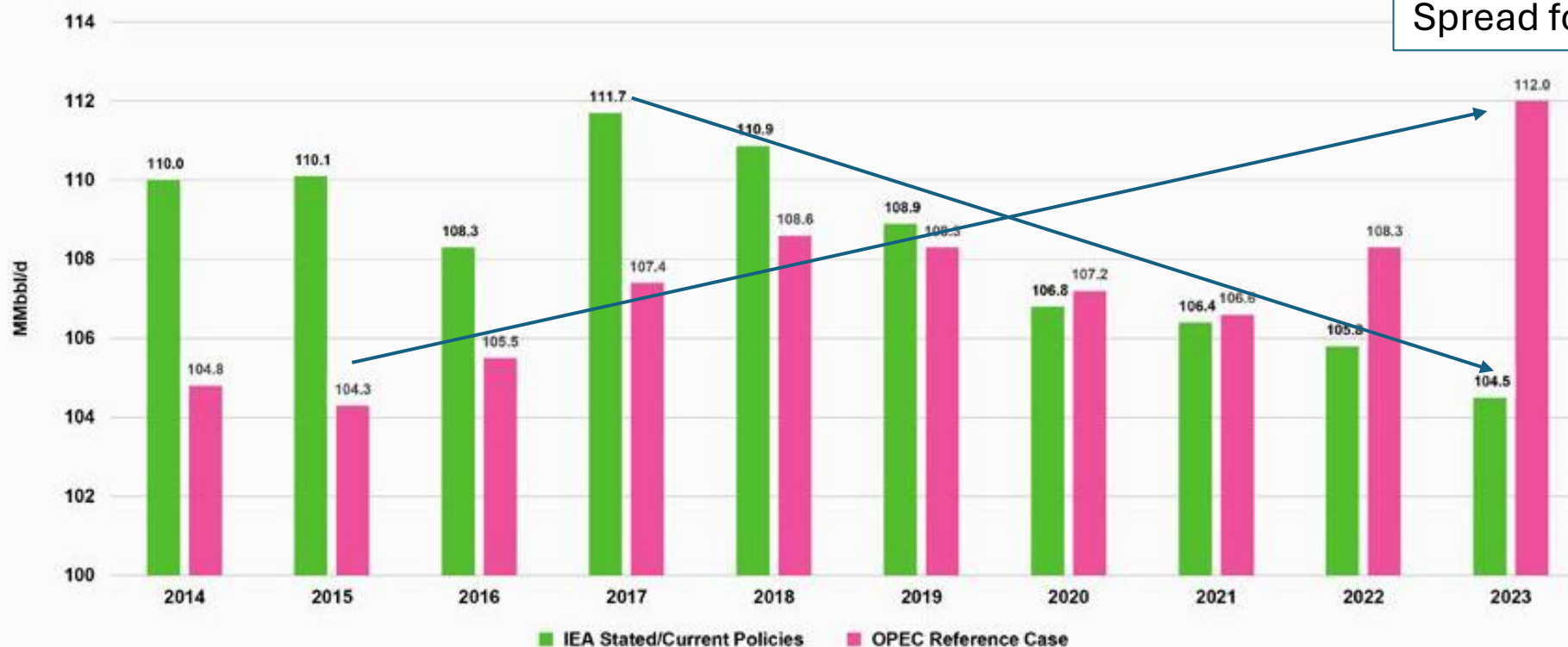
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IEA/OPEC 2030 Global Oil Demand

2030 Estimate by Report Vintage: Diverging Trends

ENVERUS INTELLIGENCE® | RESEARCH



Source | Enverus Intelligence® Research, IEA, OPEC

ENVERUS EVOLVE
CONFERENCE

Global Oil Outlook | Testing Peak Oil | 1

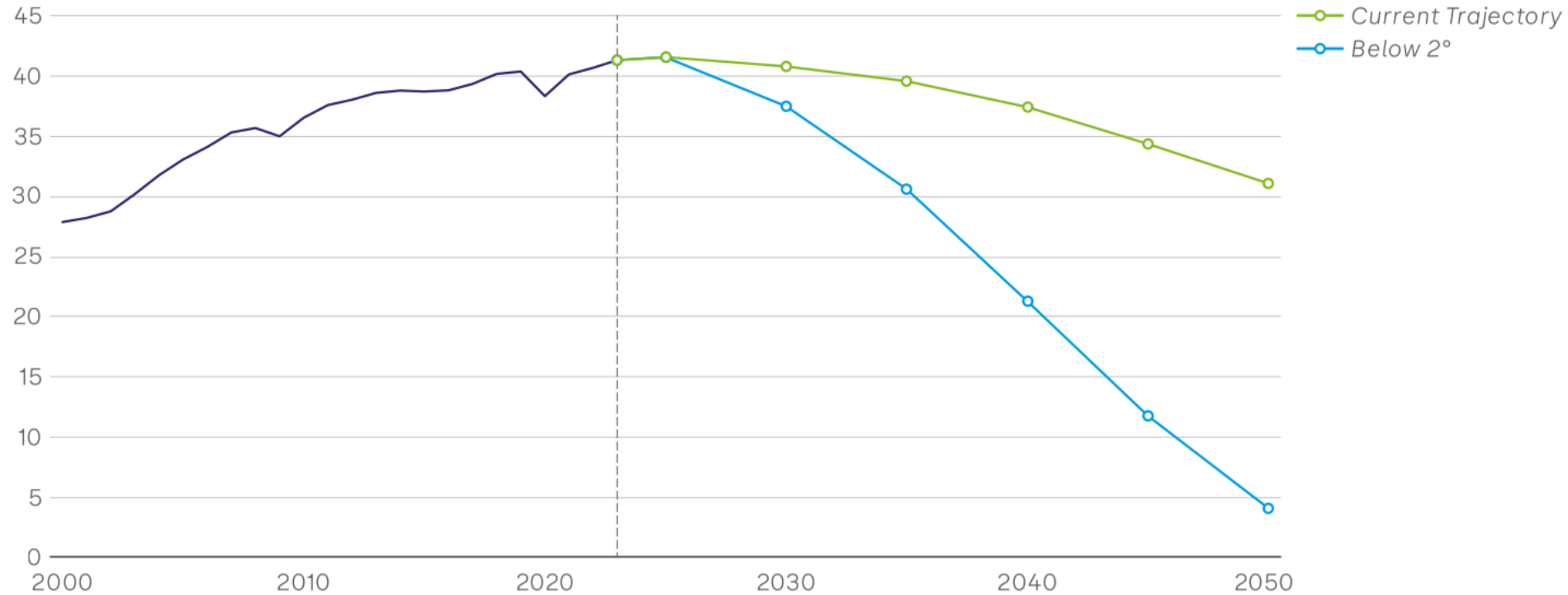
Explaining the spread: Carbon emissions assumptions cases (BP)

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Carbon emissions

Gt of CO₂e



Source:

bp Energy Outlook

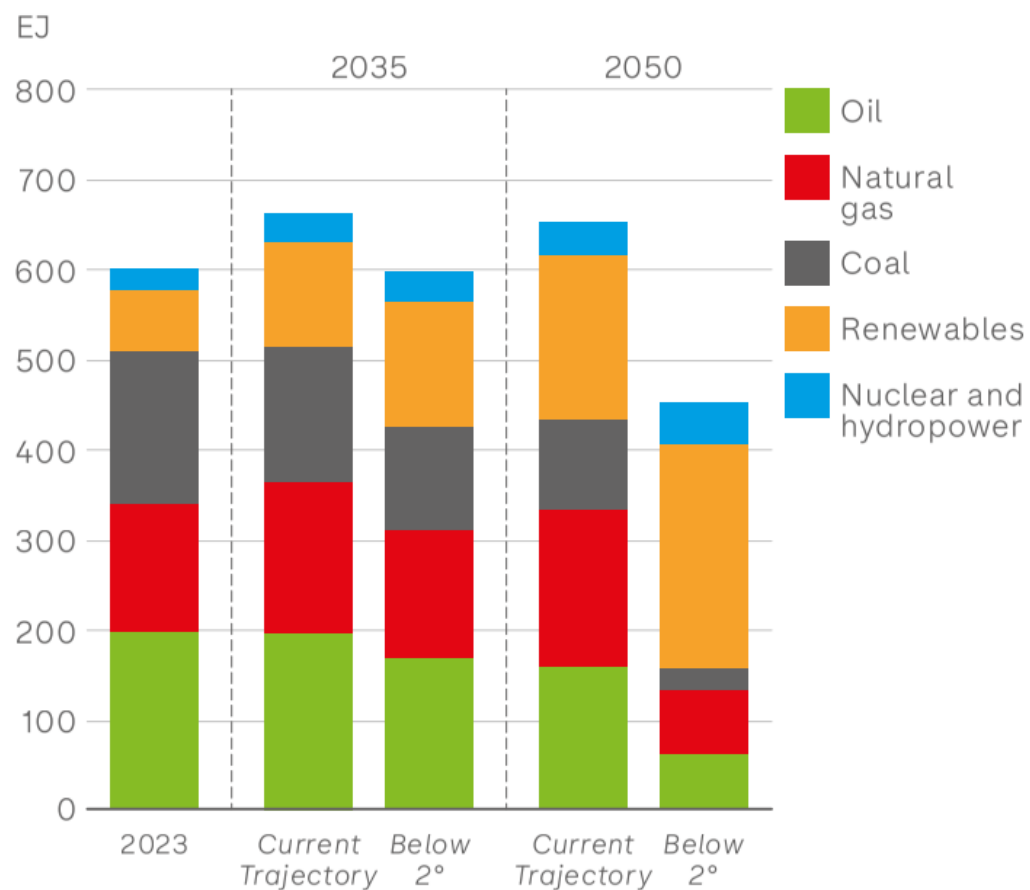
2025 edition

Primary energy by 2050 Current Cases (BP)

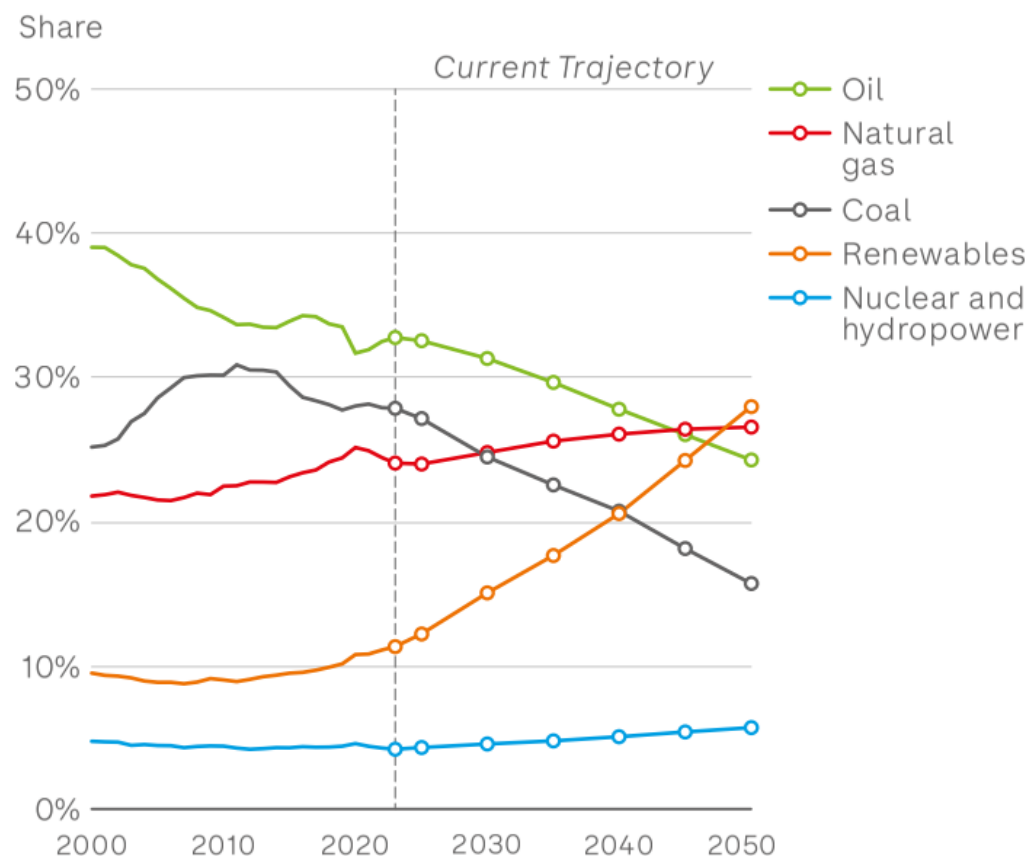
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Primary energy by energy type



Primary energy fuel mix



Source:

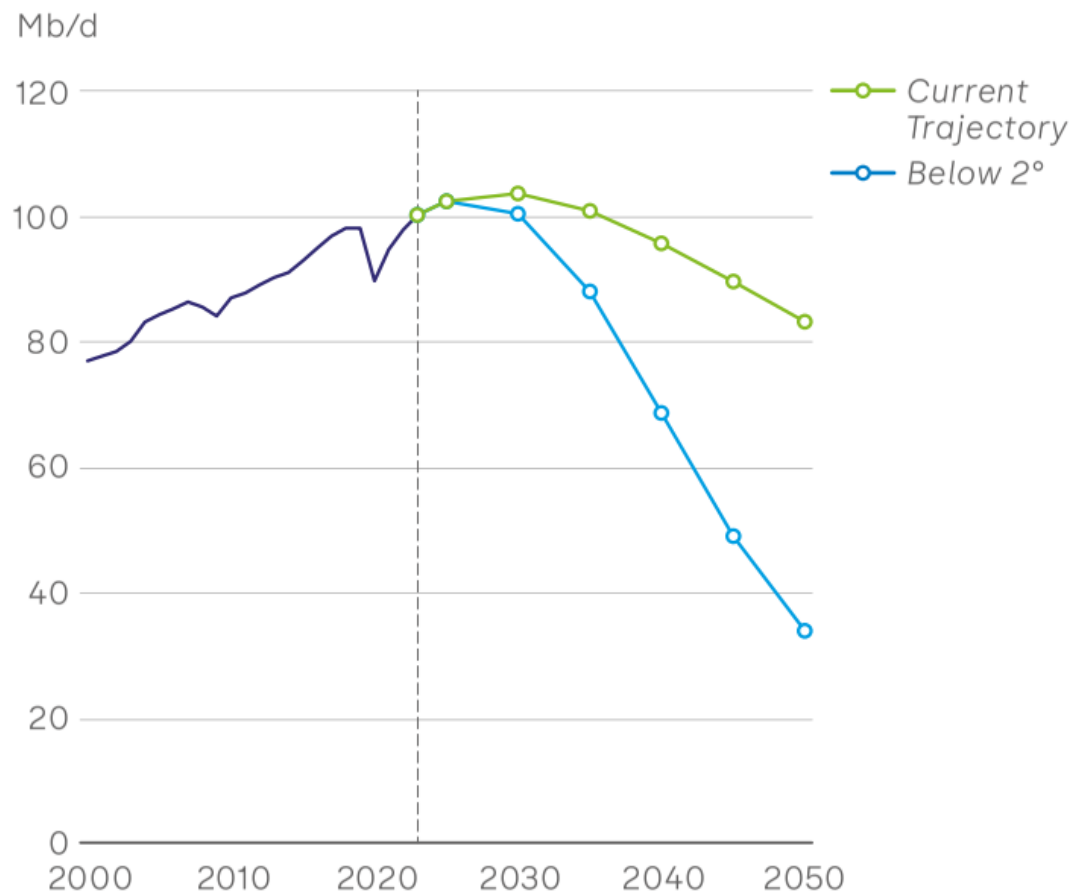
bp Energy Outlook
2025 edition

Oil demand 2050 Current and Below 2 Cases (BP)

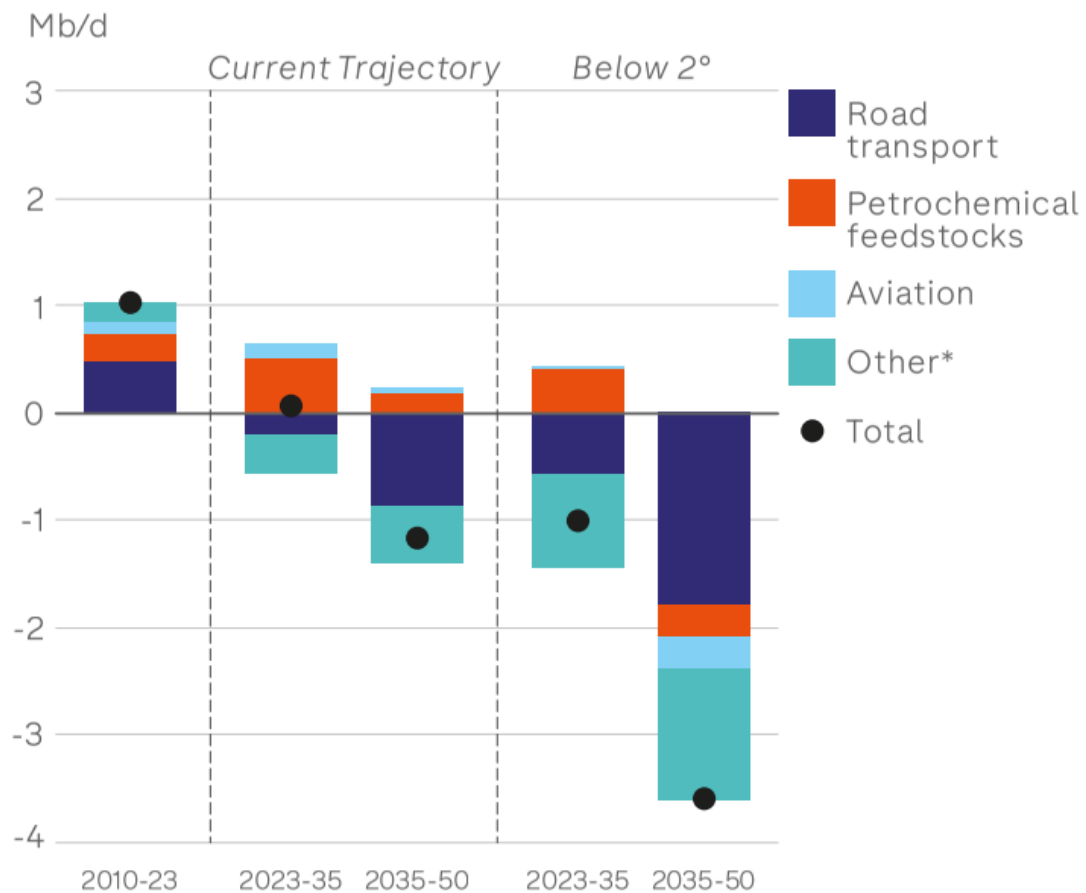
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Oil demand

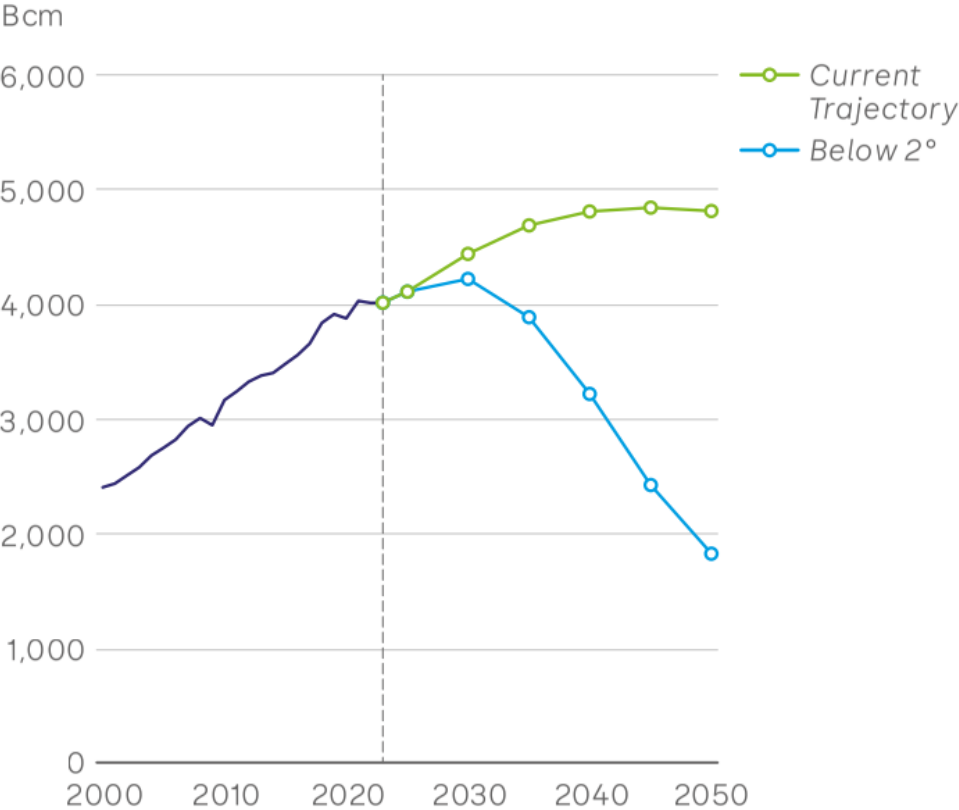


Average annual oil demand growth by sector

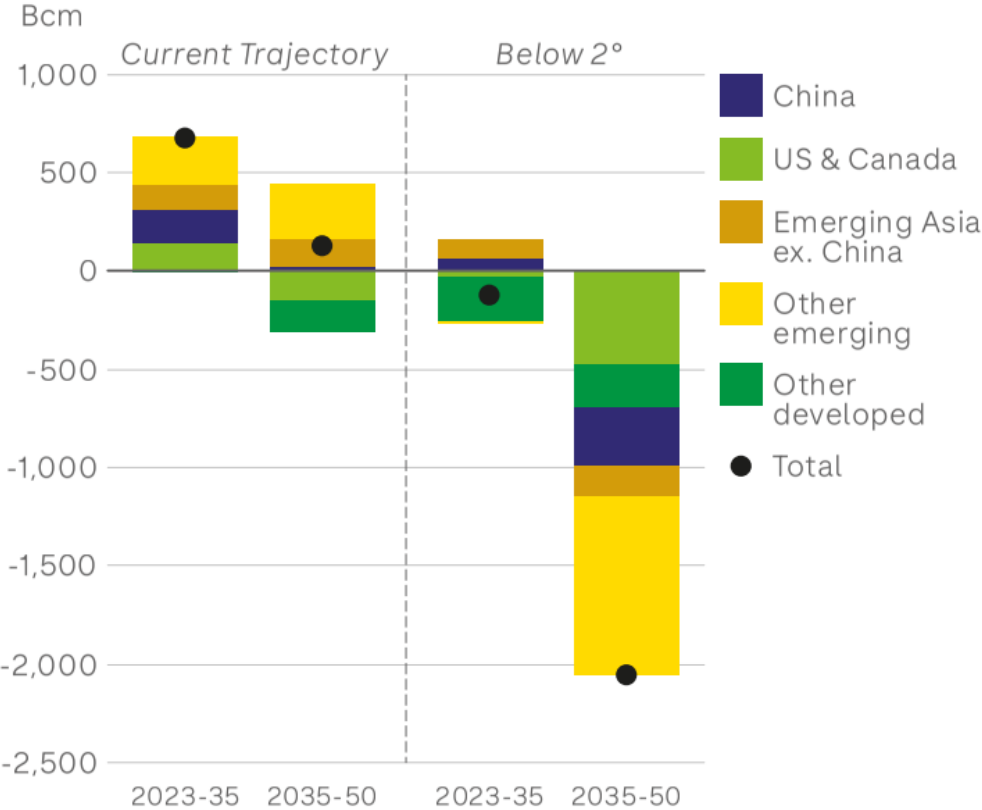


Gas demand 2050 Current and Below 2 Cases (BP)

Natural gas demand



Change in natural gas demand by region



Source:

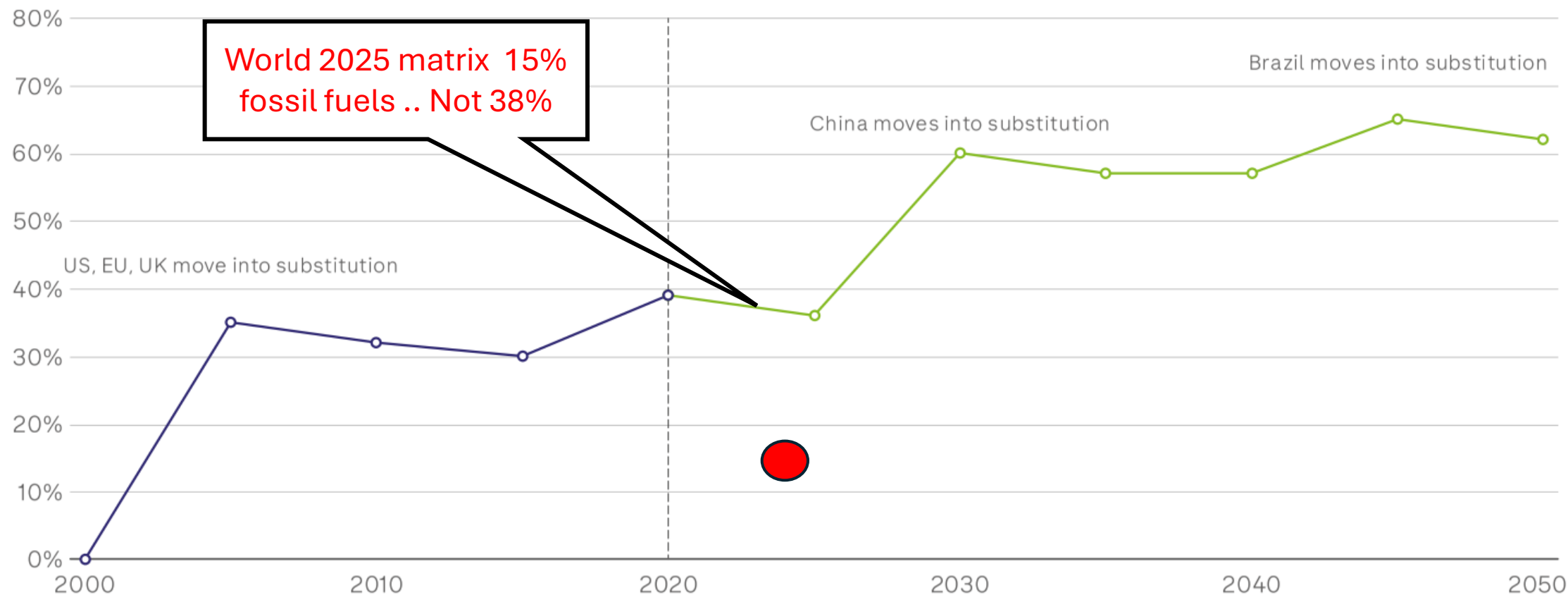
Energy substitutions assumptions in Current Case (BP)

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Primary energy of countries in 'energy substitution' in Current Trajectory

Share of global primary energy



World 2025 matrix 15%
fossil fuels .. Not 38%

China moves into substitution

Brazil moves into substitution

US, EU, UK move into substitution

bp Energy Outlook

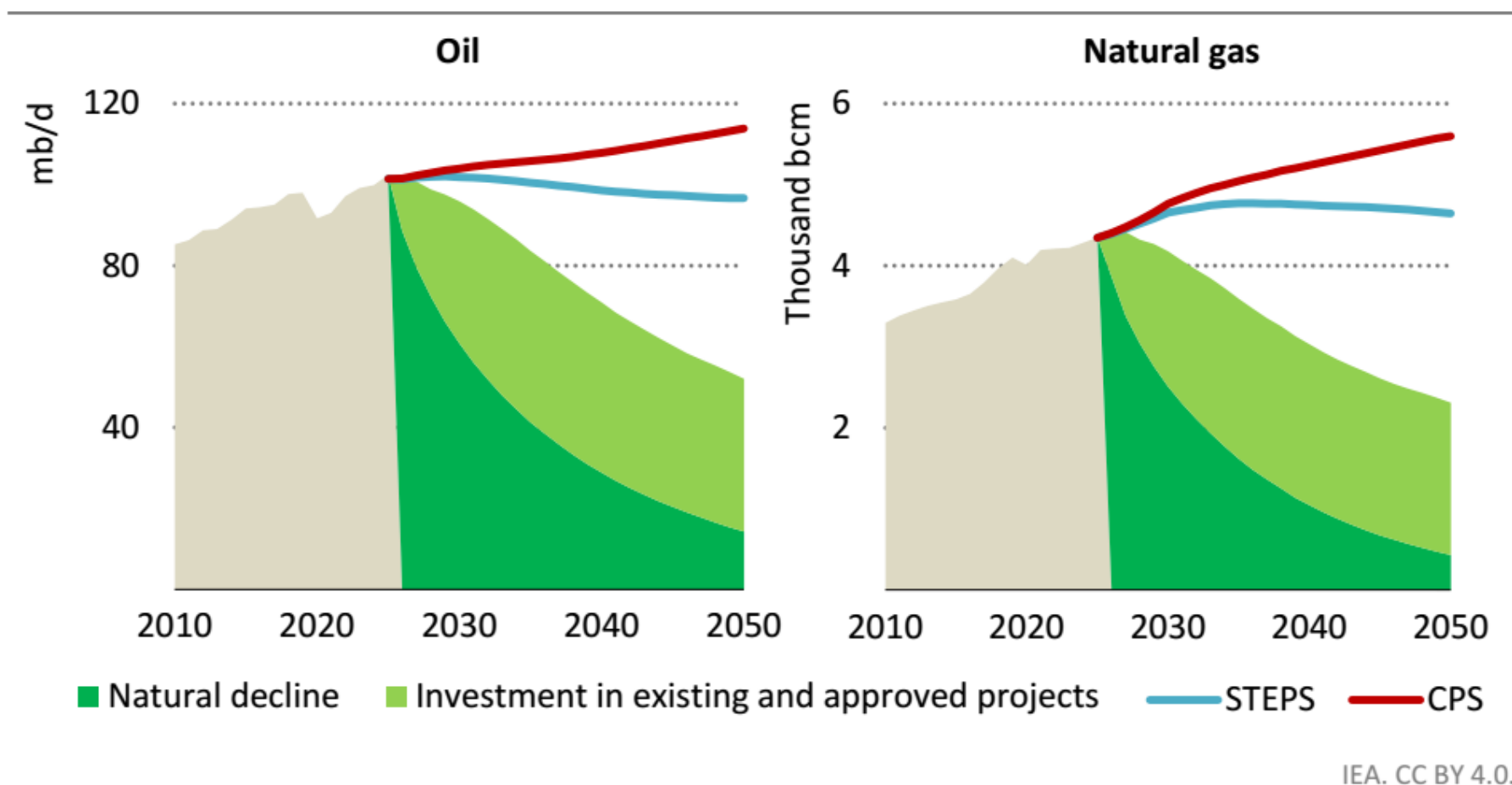
2025 edition

Source:

Oil and gas supply forecast vs investment in sanctioned projects

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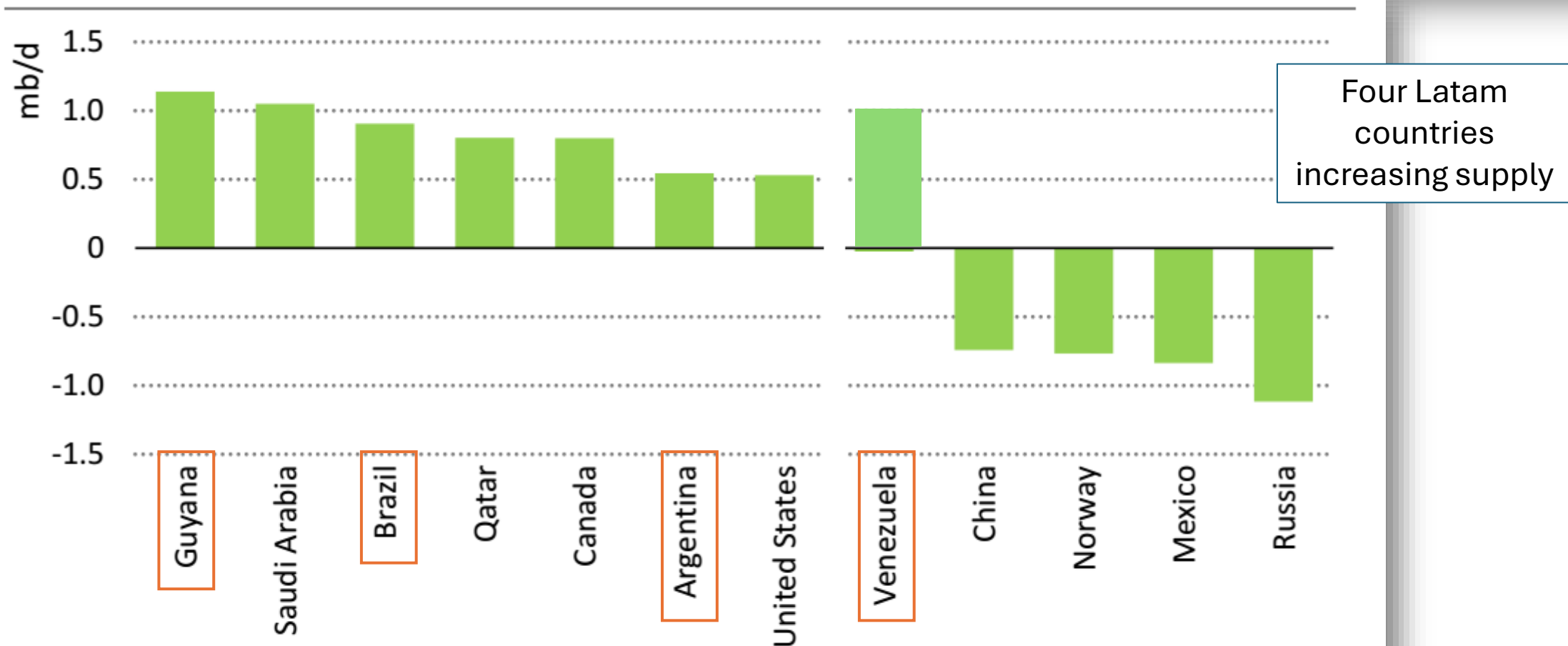
Not enough sanctioned projects to keep up with demand

Oil and gas natural declined offset by existing investments but more investment to meet current forecasted demand

Oil and gas change in supply by 2035 in selected countries (IEA)

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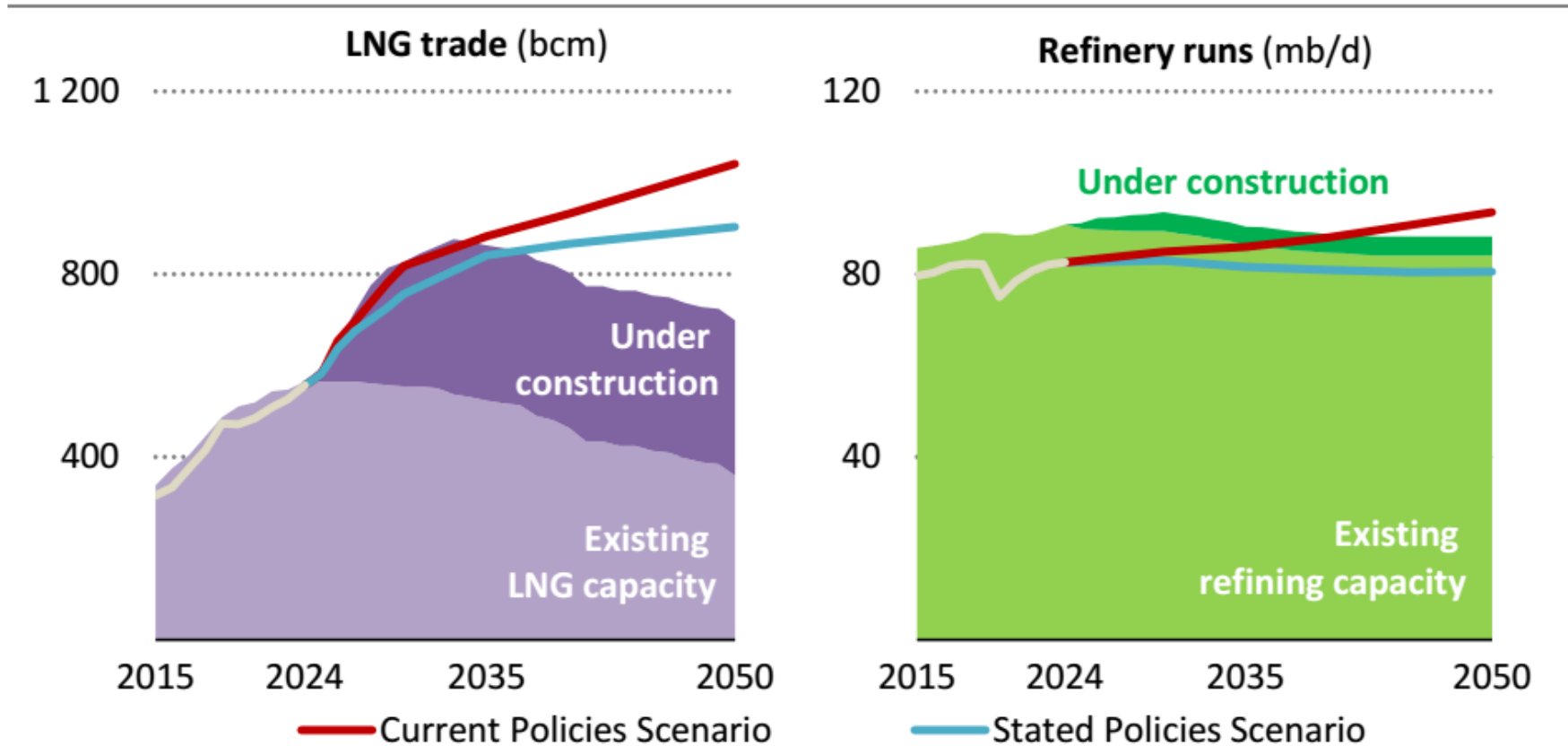


IEA. CC BY 4.0.

Supply increases to 2035 come mainly from countries in the Americas and the Middle East, and falls from mature producers

LNG trade and refining volumes relative to existing investments by 2050 (IEA)

Under investments scenarios...



IEA. CC BY 4.0.

LNG projects can meet STEPS demand until the late 2030s and CPS demand until the early 2030s; refining capacity is sufficient in the STEPS, but an additional 5 mb/d is needed in CPS

Oil and gas supply and existing investments by 2030

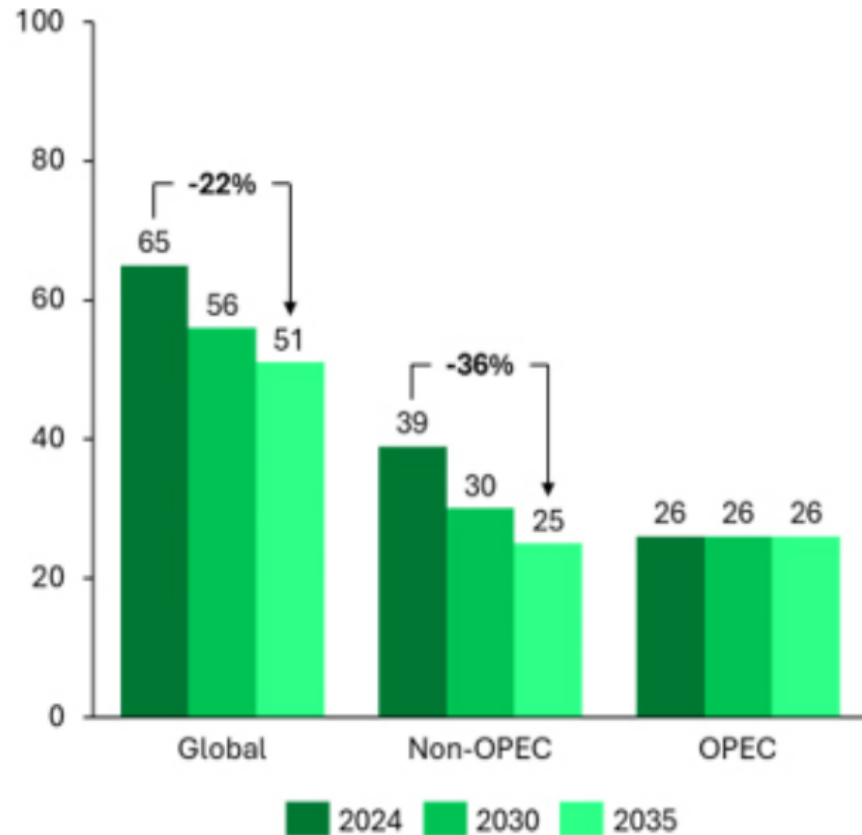
Under investments scenarios...

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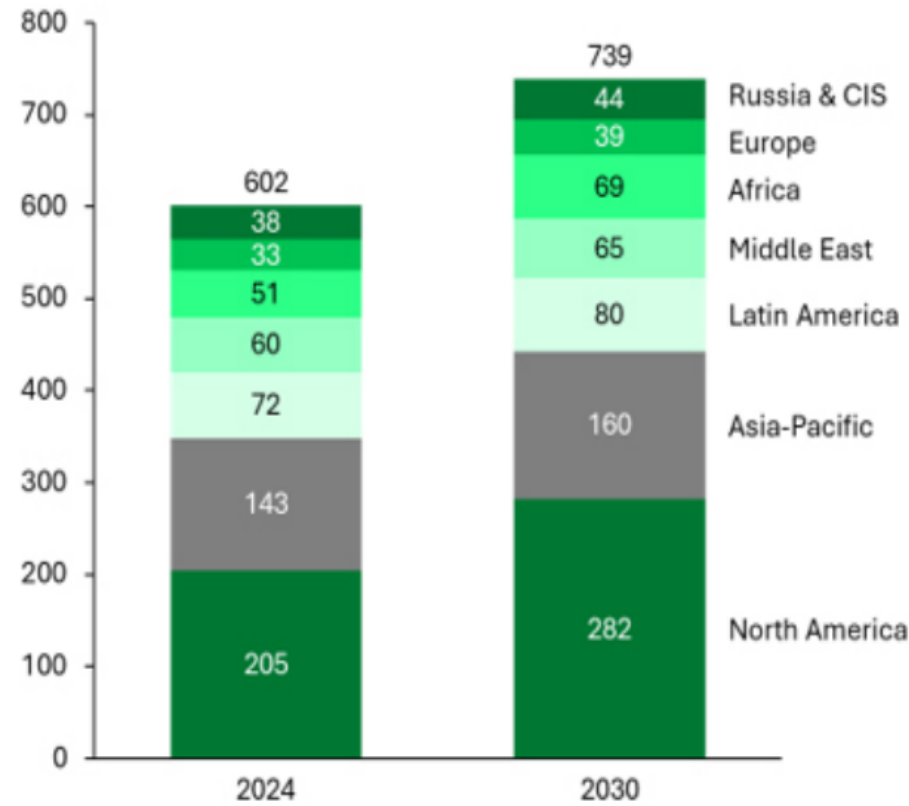
Decline in OPEC and Non-OPEC Conventional Oil Production between 2024 – 2035

Units: million barrels / day, mb / day



Upstream CAPEX by Region

Units: US\$ billions



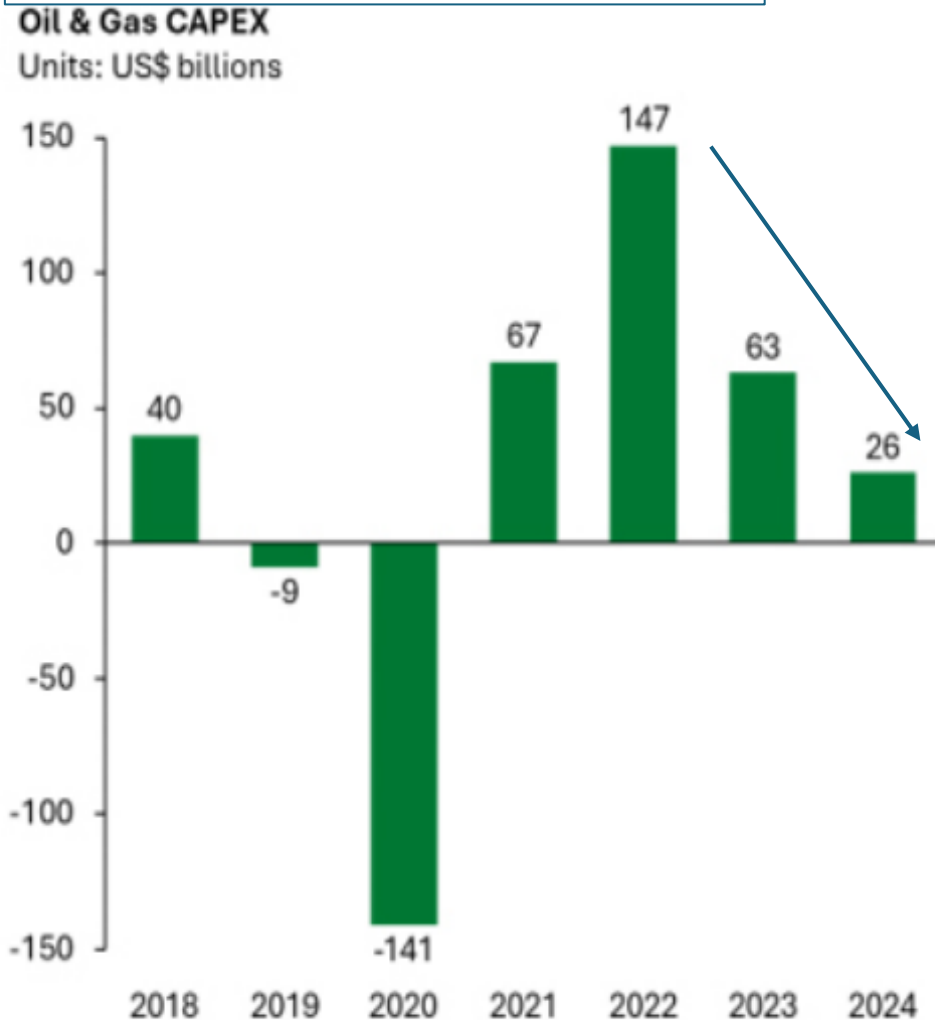
Upstream Capex 2025: **\$600 billion**
Upstream Capex 2030: **\$738 billion**
Need to increase : **\$135 billions**

Current change in existing investments (Al Attiyah Found) Under investments scenarios...

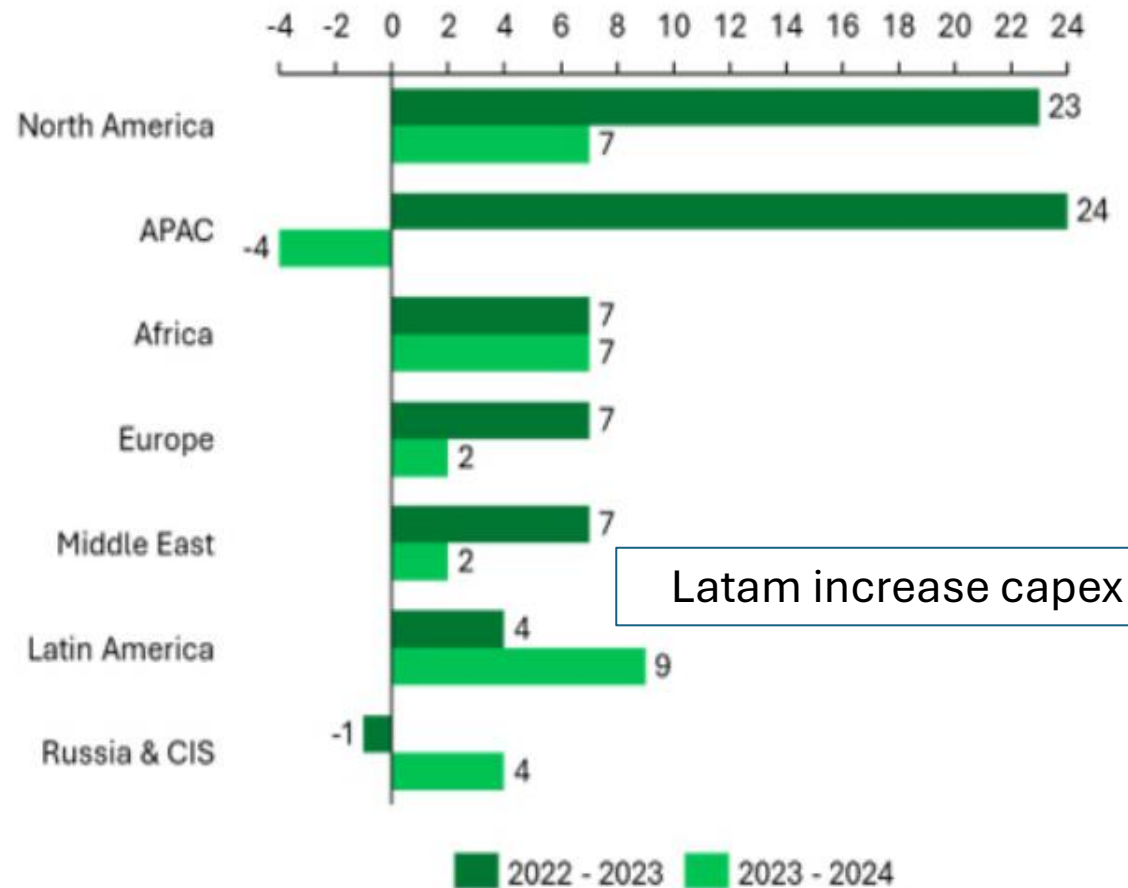
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Change in Upstream capex by year



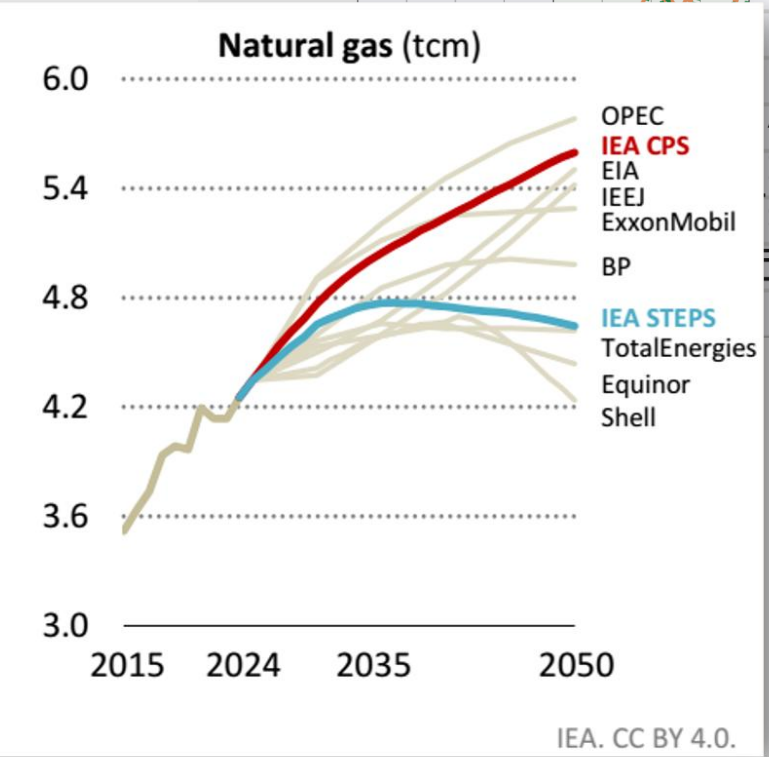
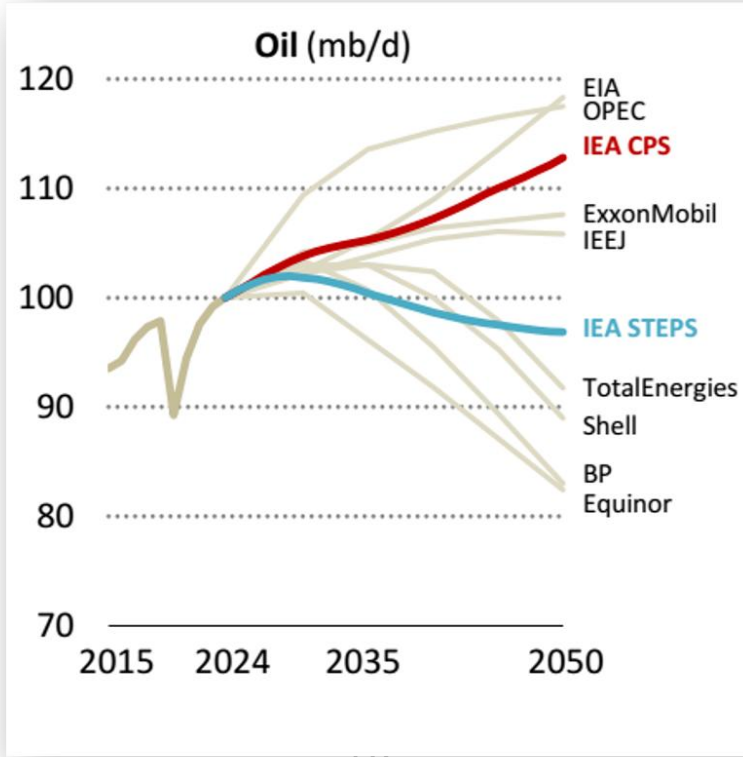
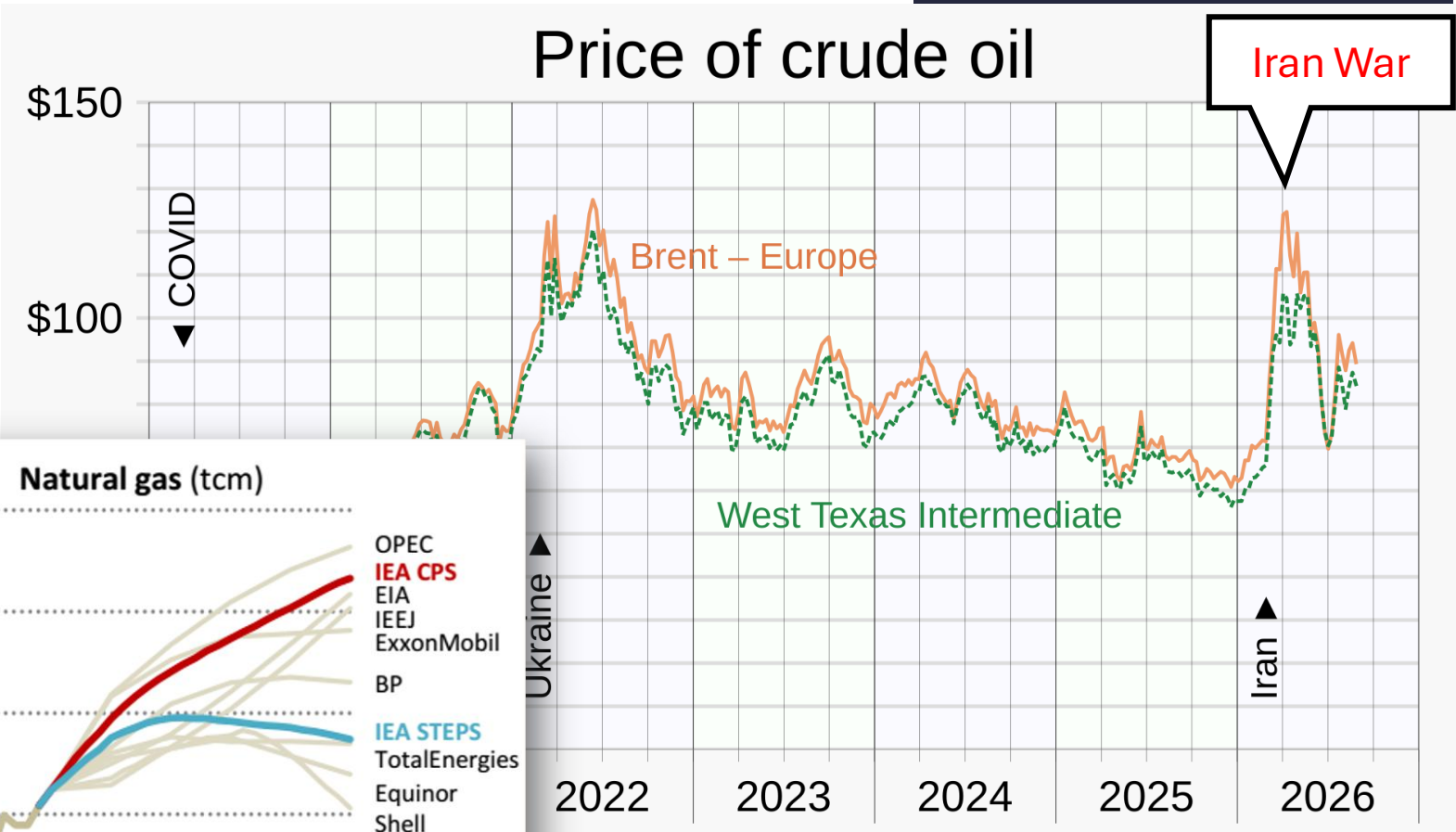
Change in Upstream capex by region



Latam increase capex O&G

Iran war price sensitivity to losing near 30% of supply

100% price increase



Concluding facts and remarks

- Exponential population growth. **18 billion** in 2100?
- Combustion oil, gas and coal. Fossil fuel civilization. **USD 180 trillion** worth.
- At this rate **42 years** of oil left. 1.7 trillion barrels.
- Supply in next 25 years depends in critical decisions taken today
- Large spread for demand scenarios. 80 mbo/d in 2050
- Upstream projects underinvestment current scenarios for expected demand
- Uncertainty to deploy capital in upstream in the 30 years
- Oil price sensitivity to supply is extreme. Iran war : price +usd 60 /bl (100%)

Questions and thoughts

The fossil fuel culture is compromised ... and our ability to grow

- Without energy we don't exist as a society and the future as we know it is compromised
- Why do we see this large distortion in predictive scenarios?
- Why as a society don't recognize the extreme value of the fossil fuel resources?
- Extreme misinformation (i.e fracking issue) in our society
- Targeting energy is weakening our ability to make critical decisions
- In conventional warfare energy is a primary target. In unconventional wars is too.
- Western oil and gas industry is a target of misinformation and propaganda

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THANK YOU!
GRACIAS!

“Prediction is very difficult, especially if its about the future”

Niels Bohr