



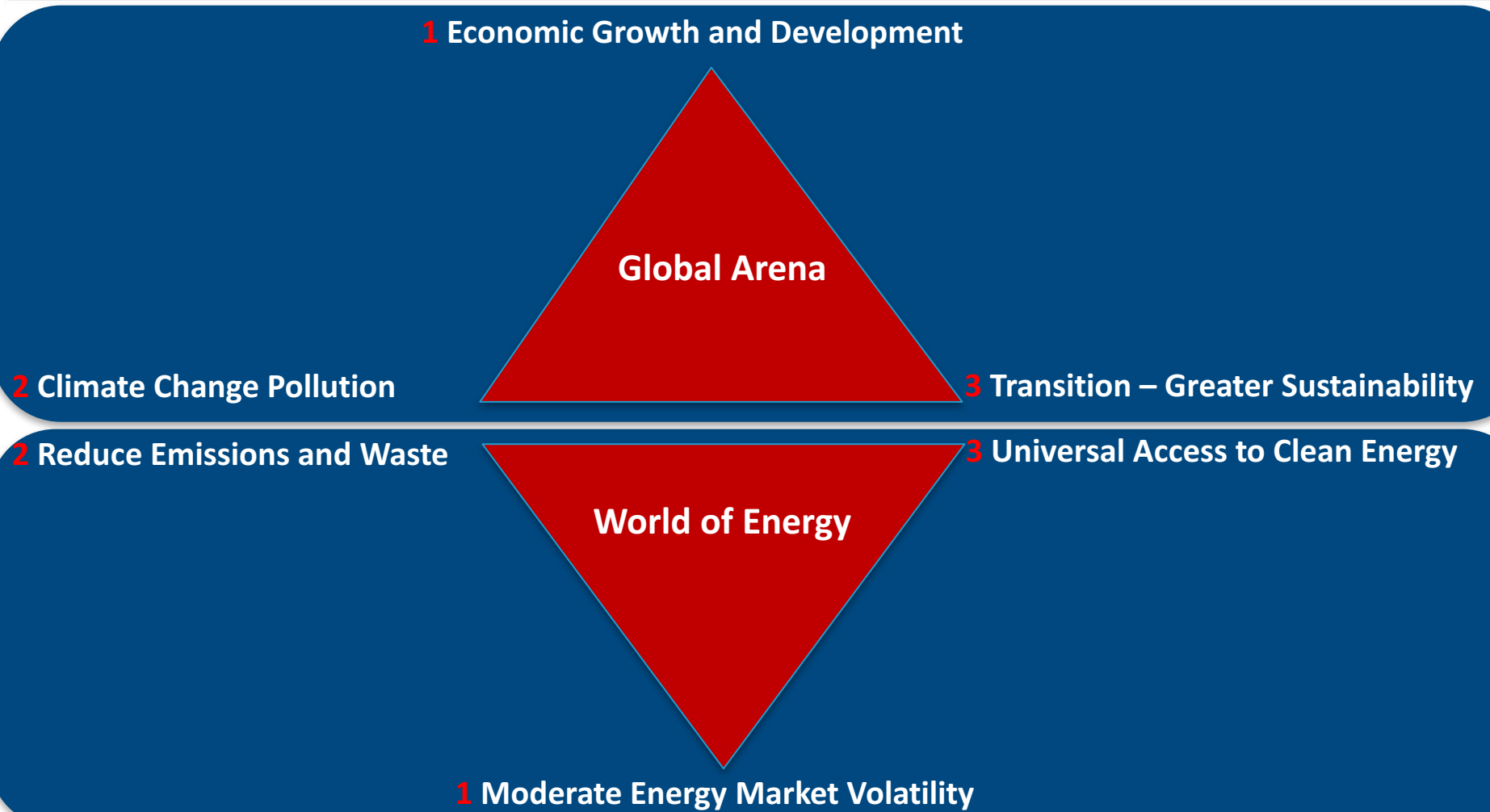
Energy Security, Transition, and Dialogue

Dr Sun Xiansheng
Secretary General, IEF Riyadh

Flow

1. Energy Security: Trends, Challenges, and Response
2. Transition: IEA, OPEC, and extra long-term outlooks
3. Dialogue: Ministerial Meetings

3+3 Challenges of IEF Dialogue on Energy Security



ENERGY SECURITY

OIL PRICES

PARIS AGREEMENT

GEOPOLITICS



2014

3 SURPLUSES

2 FALLS

2015

5 CONTROLS

4 GUARANTEES

2016

Trend



Low for longer

Certainties



Surplus supply



Lower demand

Uncertainties



Balance?



Technology?

2017

3 Impossibilities:

1. Oil prices will not



fly over \$100,
- per barrel

2. Oil prices will not



drop lower than \$20,
- per barrel

3. Investment will not



be as high as when
prices topped \$100



2017

Uncertainty

Oil prices, high or low,
depend

Oil price trends in the
second half of the year
depend



on OPEC-Non-OPEC deals



on OPEC deal extension,
and

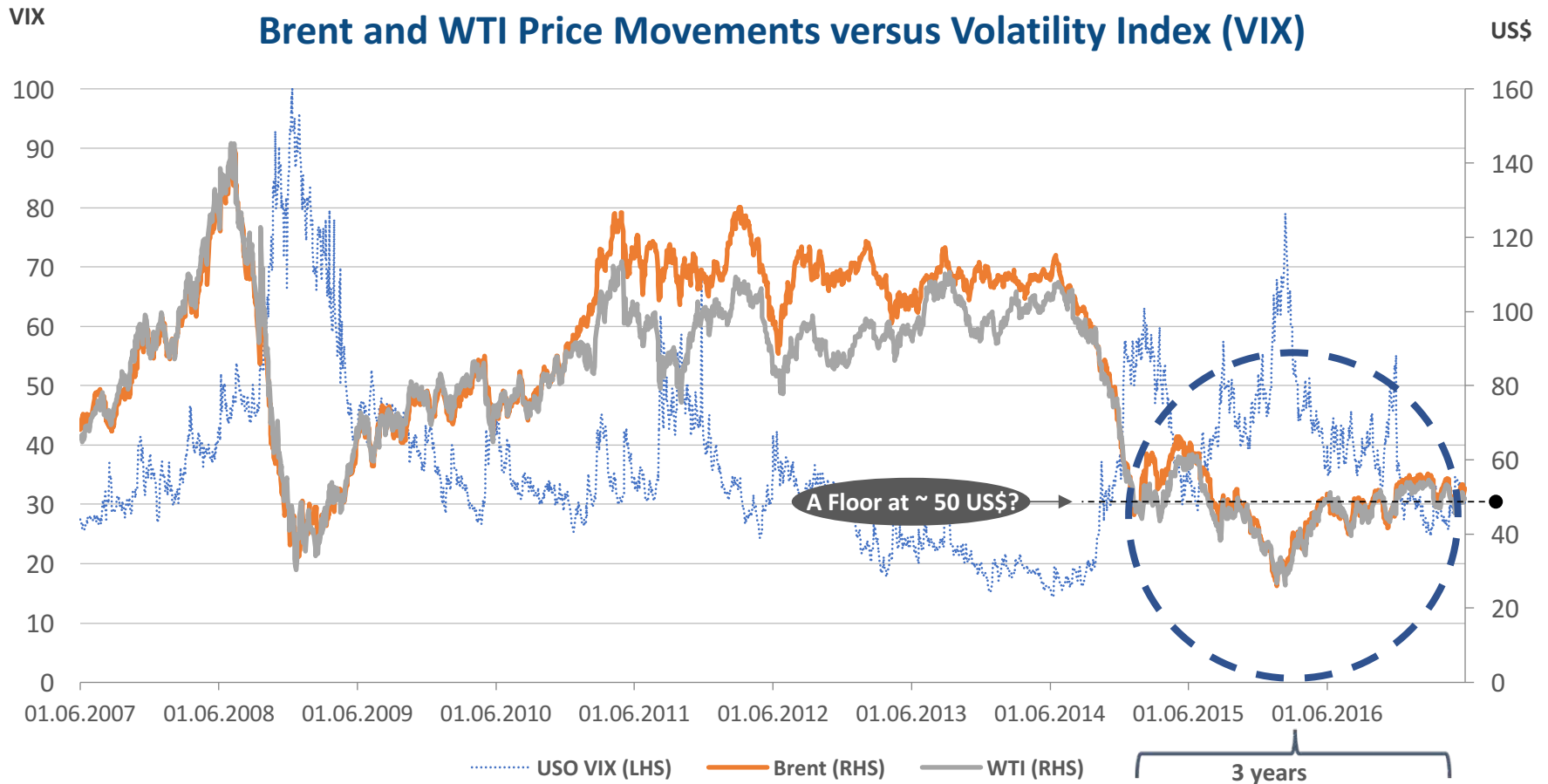


U.S. Shale Oil
and inventory levels



More settled markets may rekindle investment

Capex expenditure is estimated to rise by around 7% in 2017.



Sources: U.S. Federal Reserve Economic Data, Chicago Board Options Exchange



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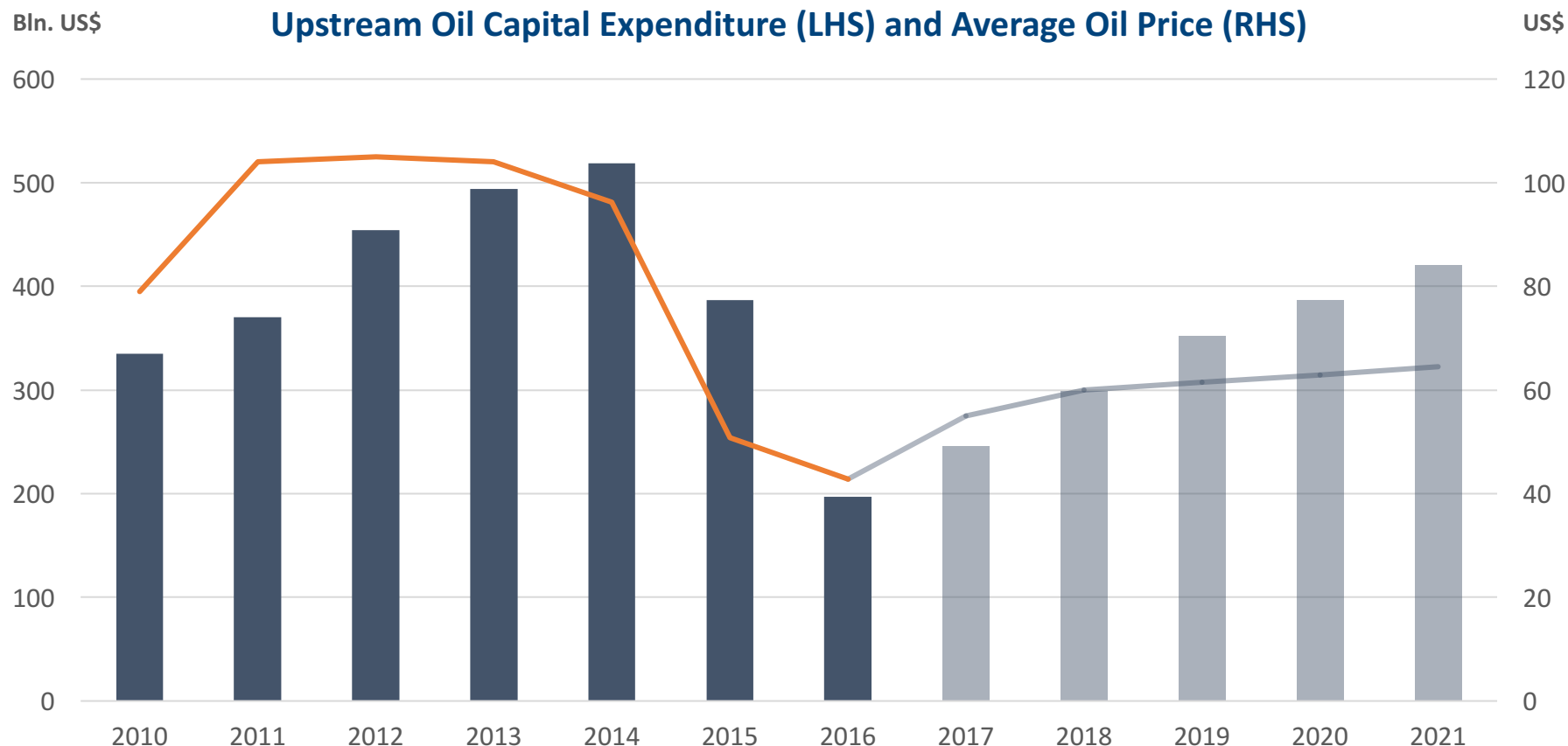
KNOWLEDGE
GENERATION
Through Dialogue

ENERGY
SECURITY
Through Dialogue

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TRANSITION
Through Dialogue

Investment may recover to capture growth

If price support holds, demand keeps pace, and costs are controlled.



Sources: World Bank, McKinsey Energy Insight's Global Liquids and North American Supply Models, Rystad Energy



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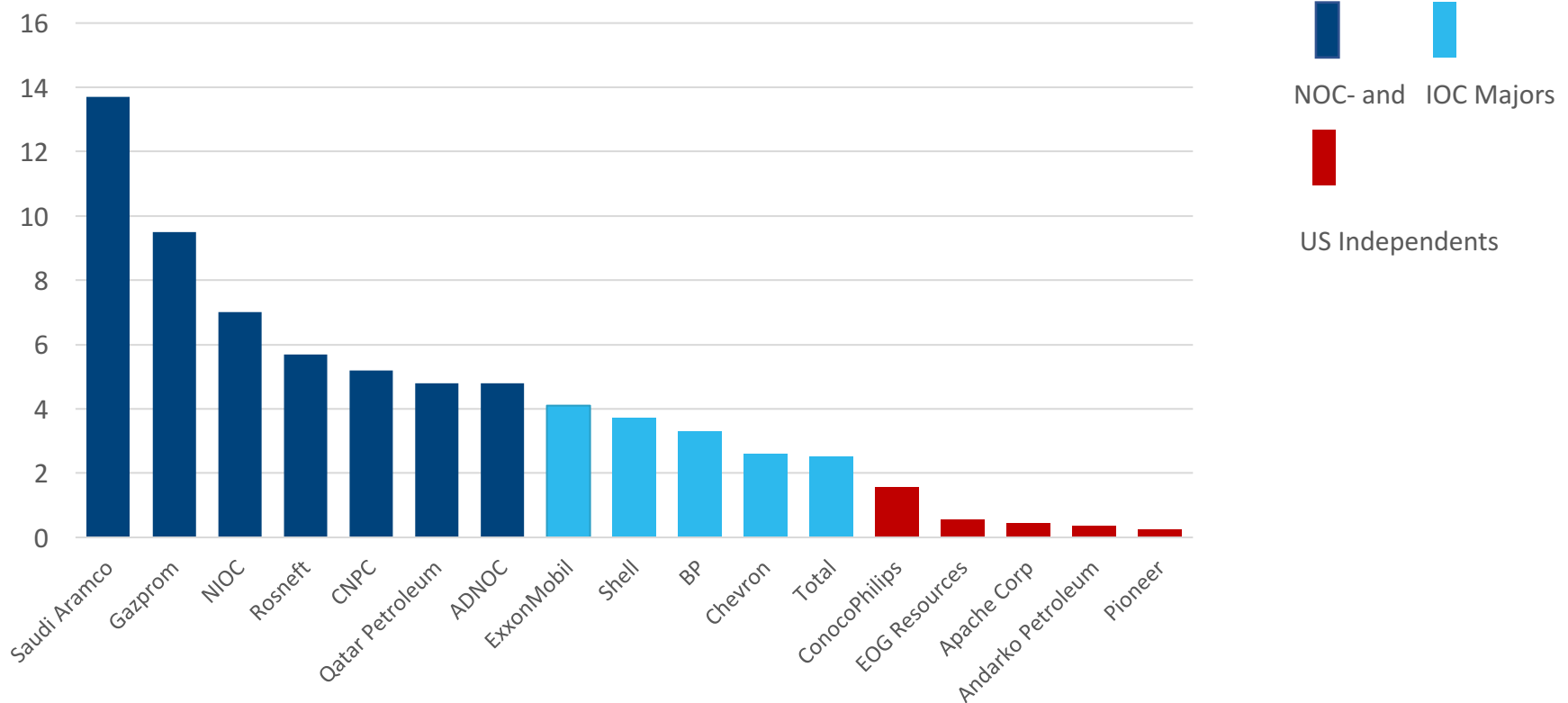
**ENERGY
TRANSITION**
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US independents sell the marginal barrel

But shale oil's resilience can not make up for majors supply deferrals.

Million barrels oil equivalent per day

Majors and Independent Oil Company Production



Sources: IEF assessments, Various Company Reports



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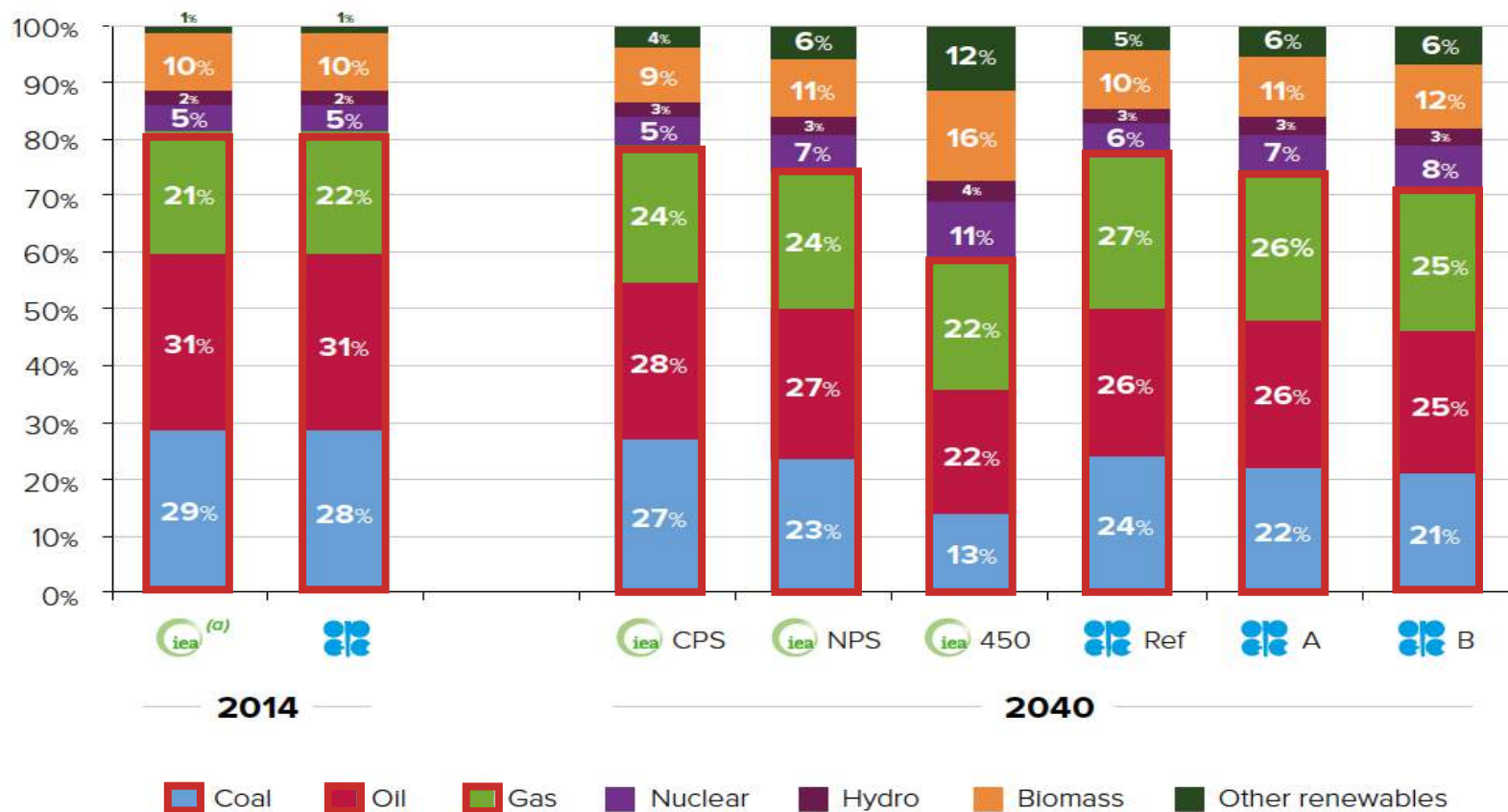
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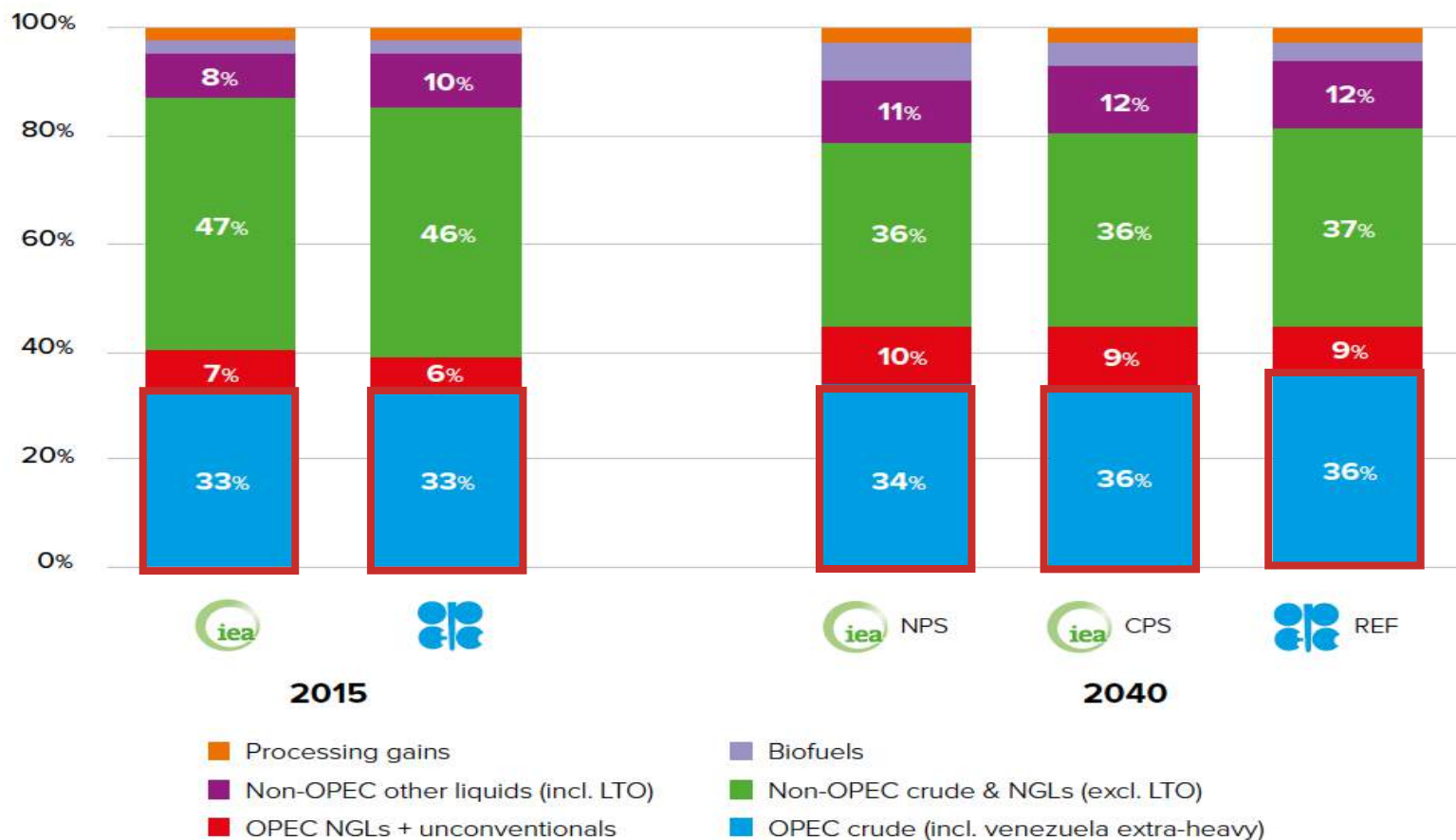
IEA and OPEC show fossil fuel shares still range between 57% and 79% in 2040

World Primary Energy Fuel Shares in 2014 and Outlook for 2040



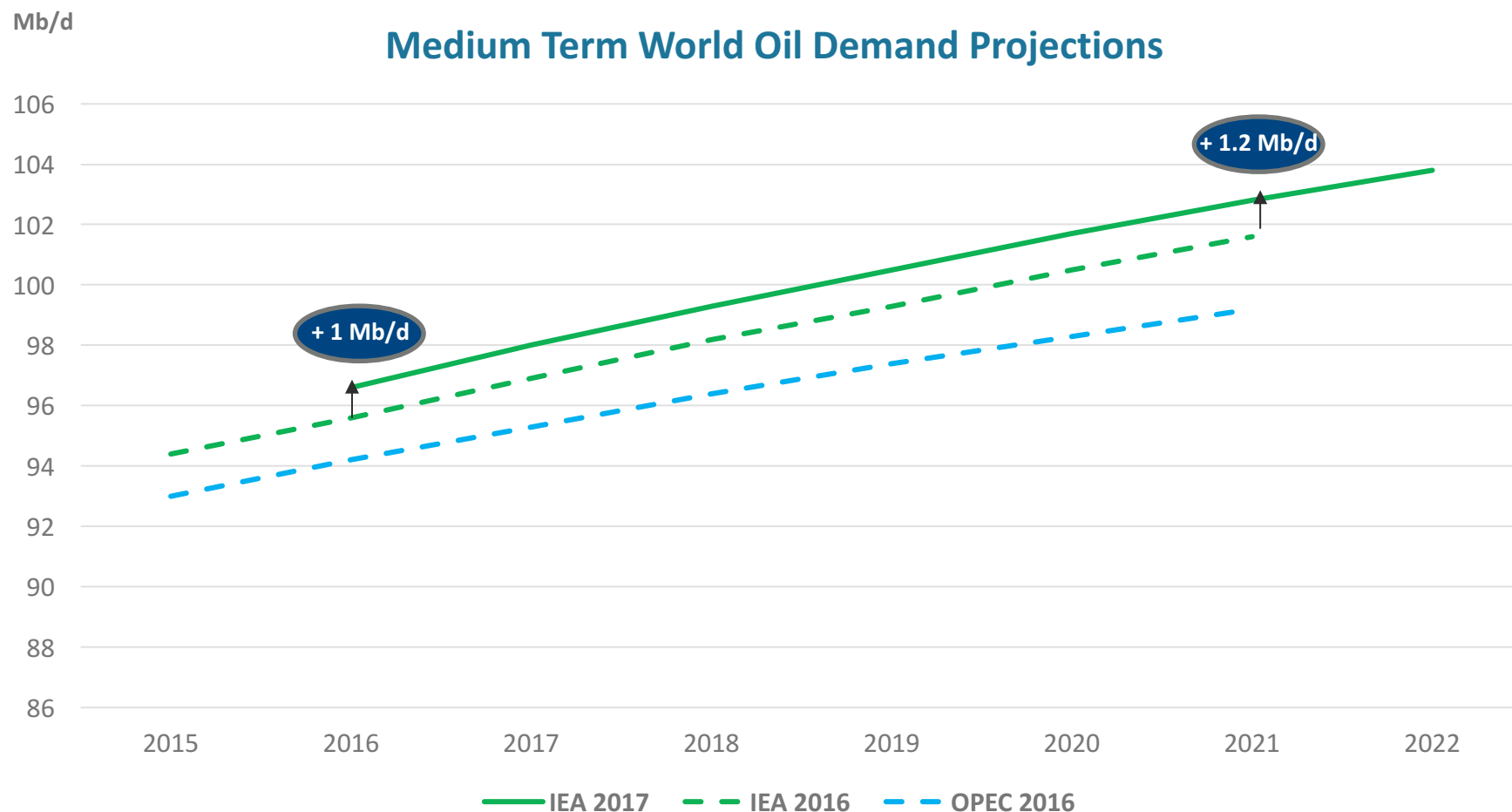
The share of OPEC crude grows in all scenarios

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



Transition Pathways

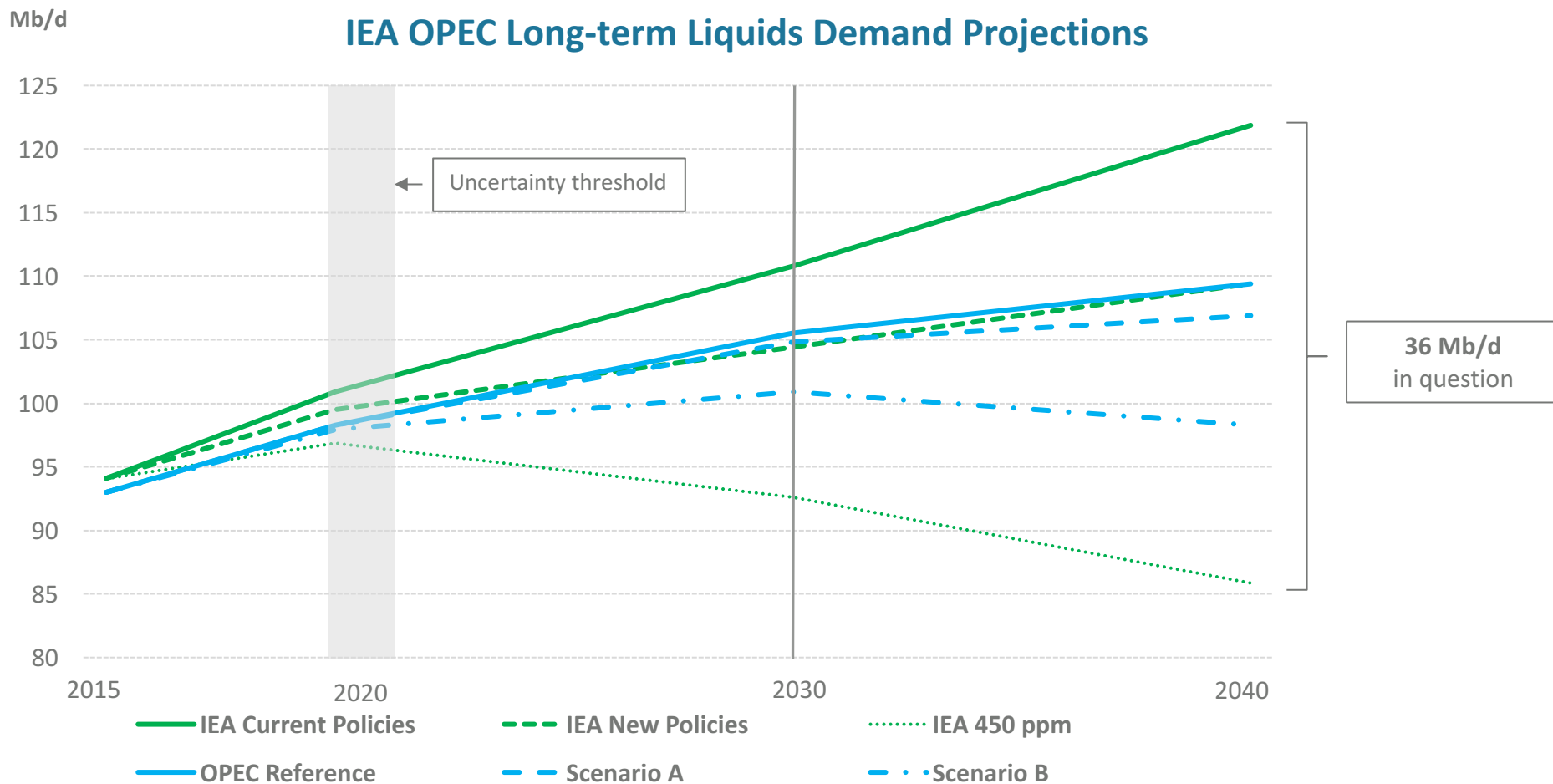
Medium-term oil demand picks up pace in lower price environment to 2020



Sources: IEA Oil 2017 Analysis and forecasts to 2022, IEA Medium Term Oil Market Report 2016, OPEC World Oil Outlook 2016

When is the turning point?

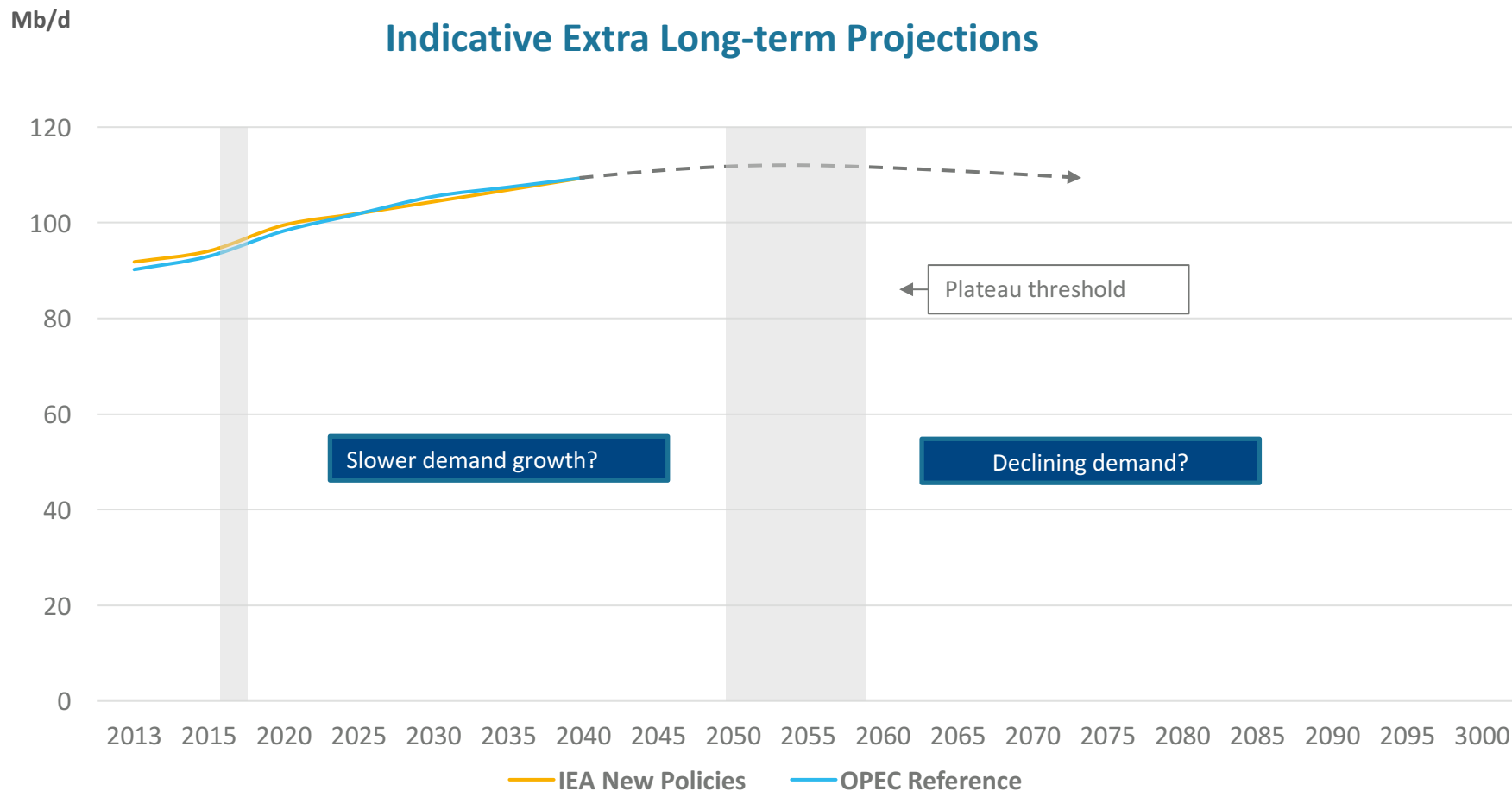
Demand, technology, and transition policy, increase uncertainty after 2020s



Sources: IEF-Resources for the Future Introductory Paper for the Sixth IEA-IEF-OPEC Symposium on Energy Outlooks February 2016

Slower demand growth looks certain...

Main pathways point at demand plateau in 2050s



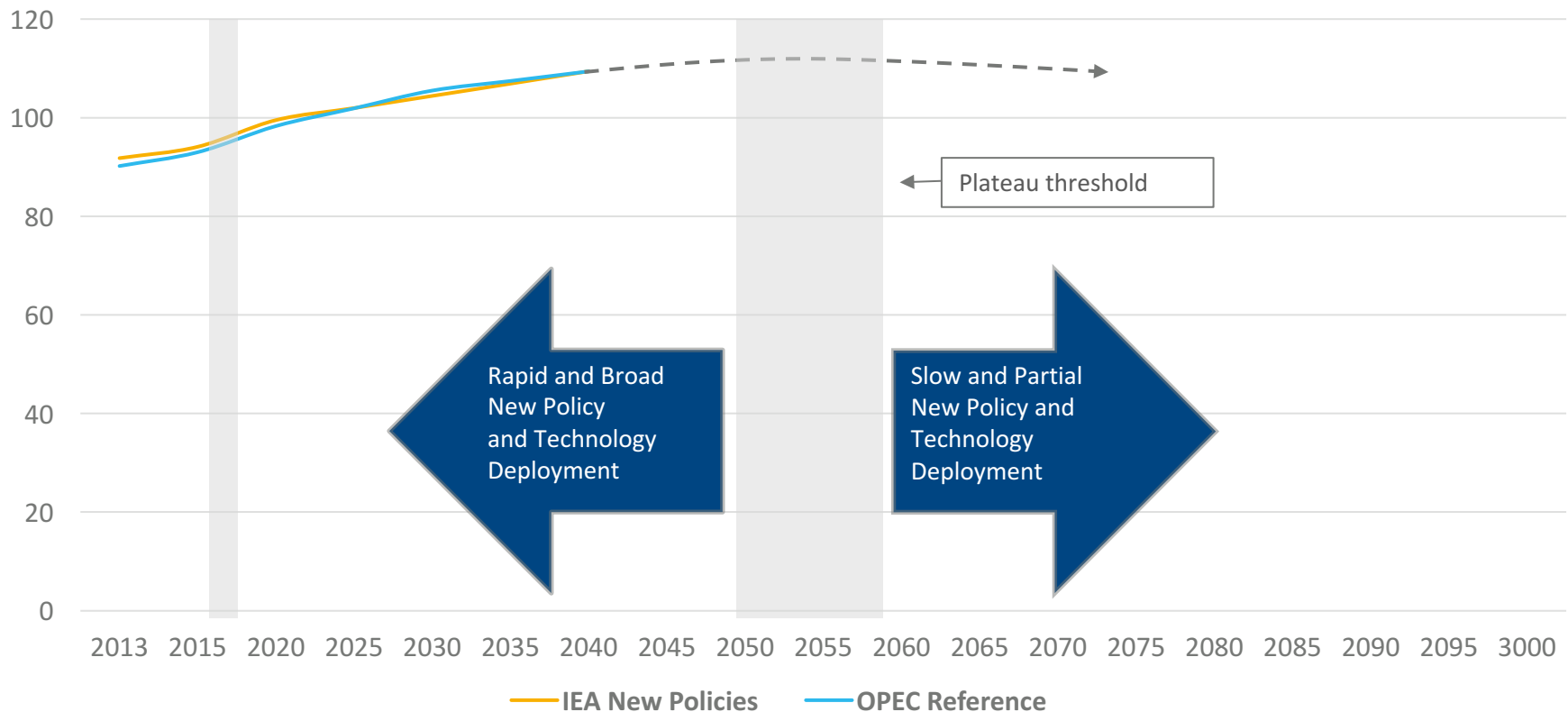
Based on extrapolation of 2016 IEA, OPEC and Russian Long Term Projections

Policy and Technology Cooperation

Depth and breath of new policy and technology deployment is key

Mb/d

Indicative Extra Long-term Projections



Based on extrapolation of 2016 IEA, OPEC and Russian Long Term Projections

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2017

Proposals:

Strengthen JODI



**Transparency
+ Information**

Full use of IEF Platform



**Dialogue
& Cooperation**

Action on new trend



**Green, Low Carbon,
Efficient, Sustainable**

3 Upcoming IEF Ministerial Initiatives

1. **1st Asian Energy Efficiency Conference and Exposition** 30 October-2 November 2017 | Riyadh, Saudi Arabia
2. **7th Asian Ministerial Energy Roundtable - Global Energy Markets in Transition: From Vision to Action** 1-3 November 2017 | Bangkok, Thailand
3. **16th IEF Ministerial Energy Forum** 10-12 April 2018 New Delhi, India





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