INTERNATIONAL ENERGY FORUM

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Global Energy Transition

Risk and Opportunities

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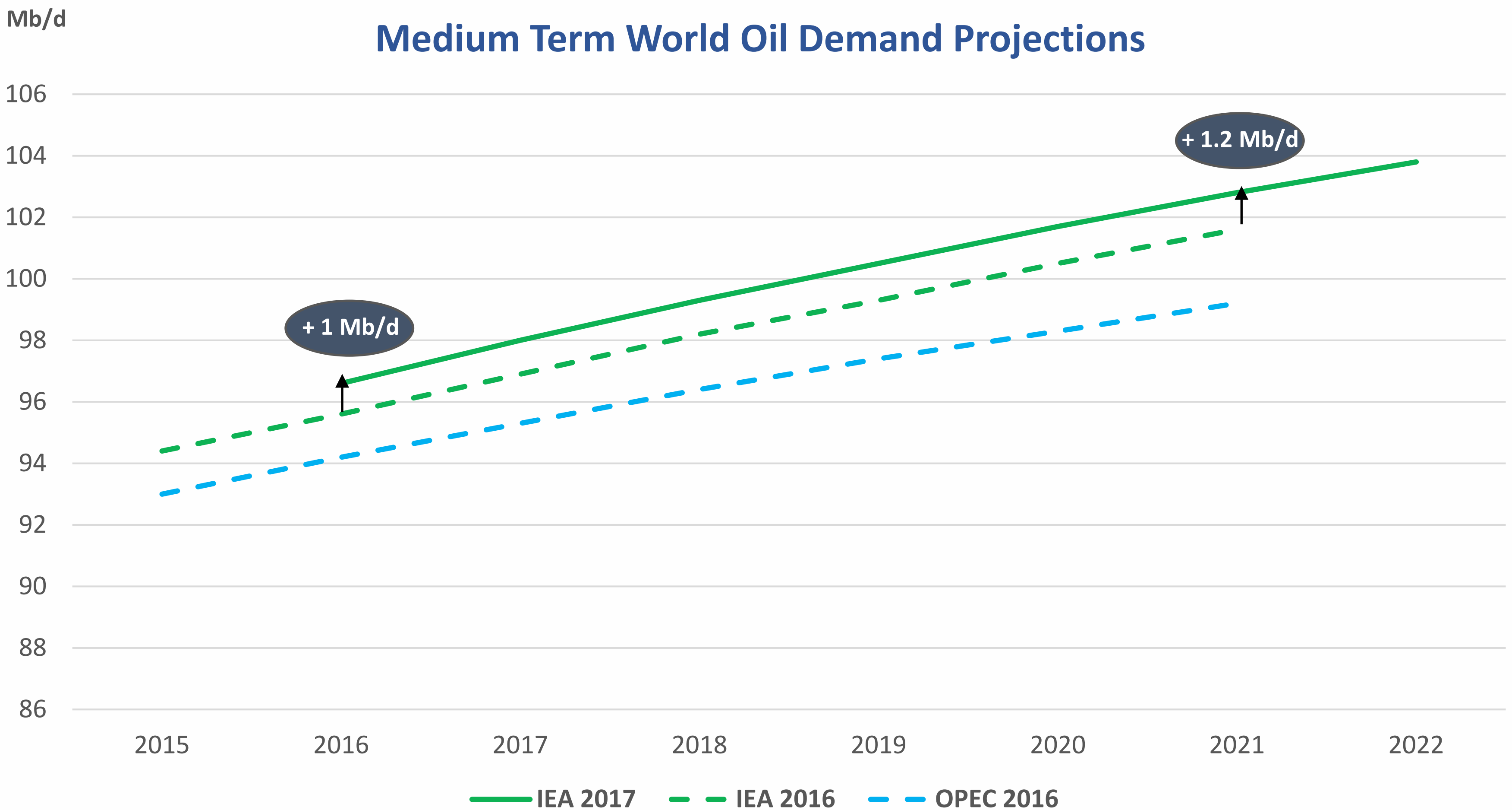
Flow

1. Where are we on the transition pathway?
2. What are the risks and opportunities?
3. Russia’s role in transition?
4. Key IEF Initiatives

Transition Pathways

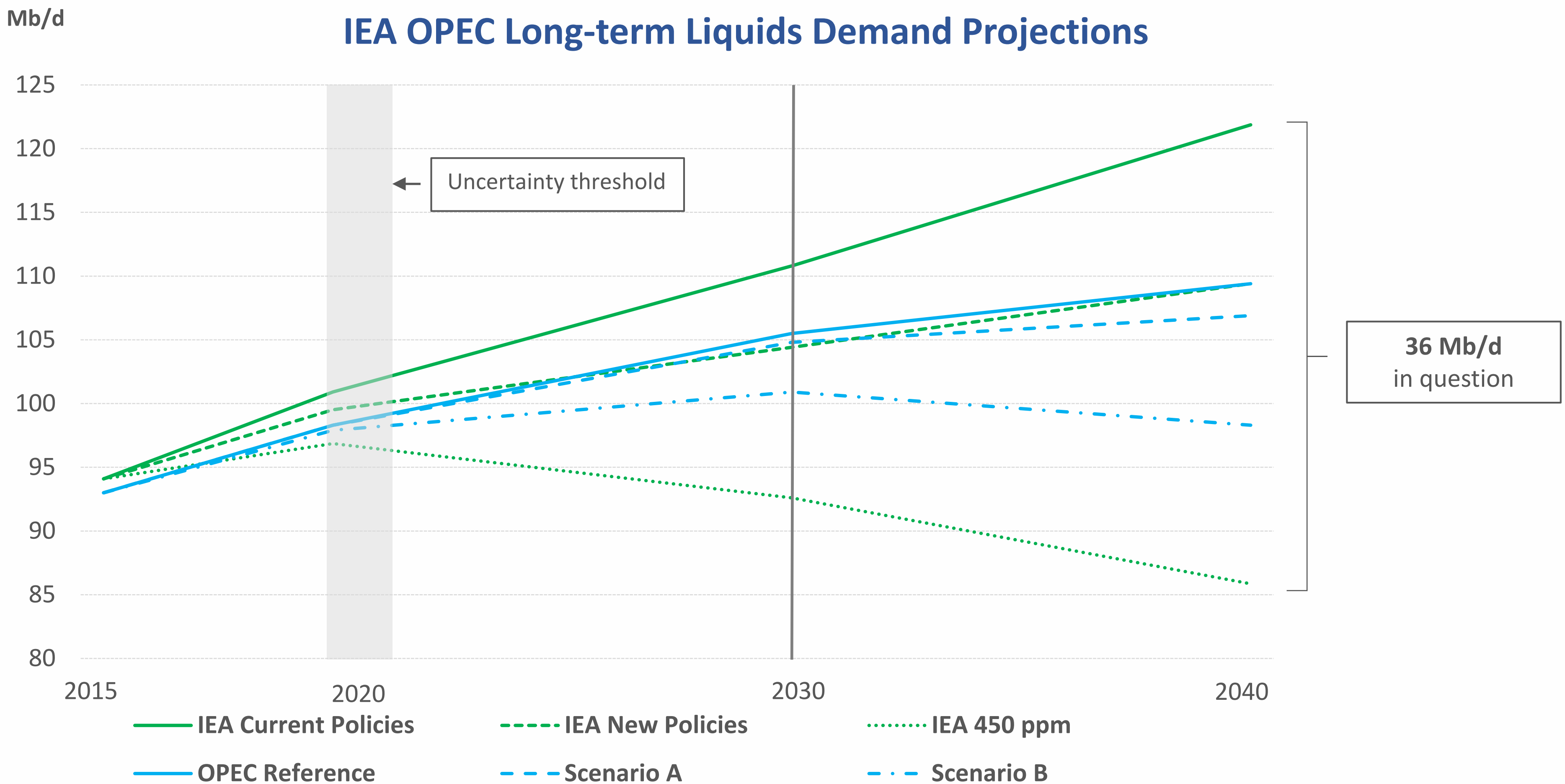
Medium-term oil demand growth picks up in lower price environment to 2020



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?

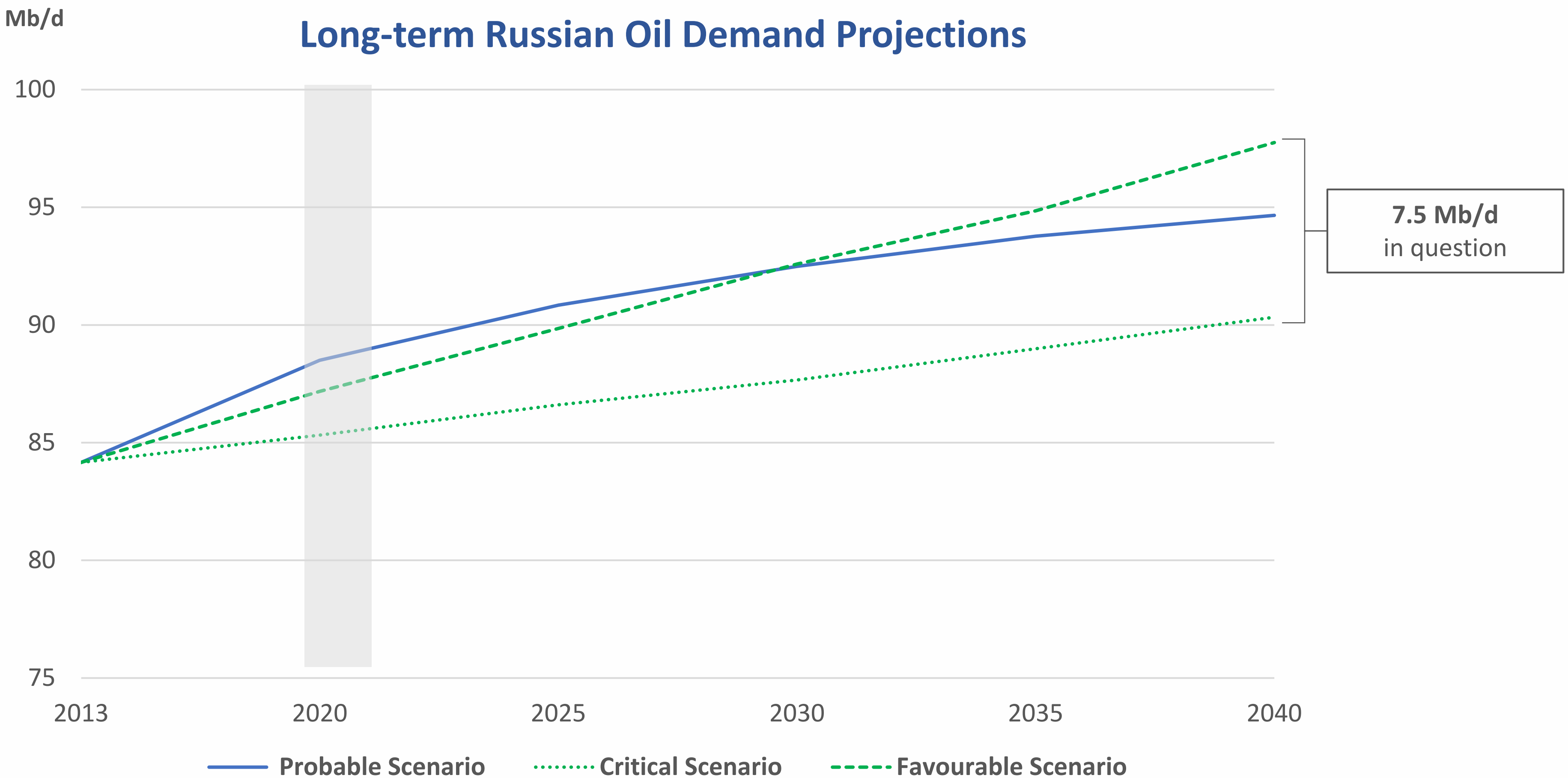
Demand, technology, and transition policy, increase uncertainty after 2020s



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

Russian outlooks show less variation

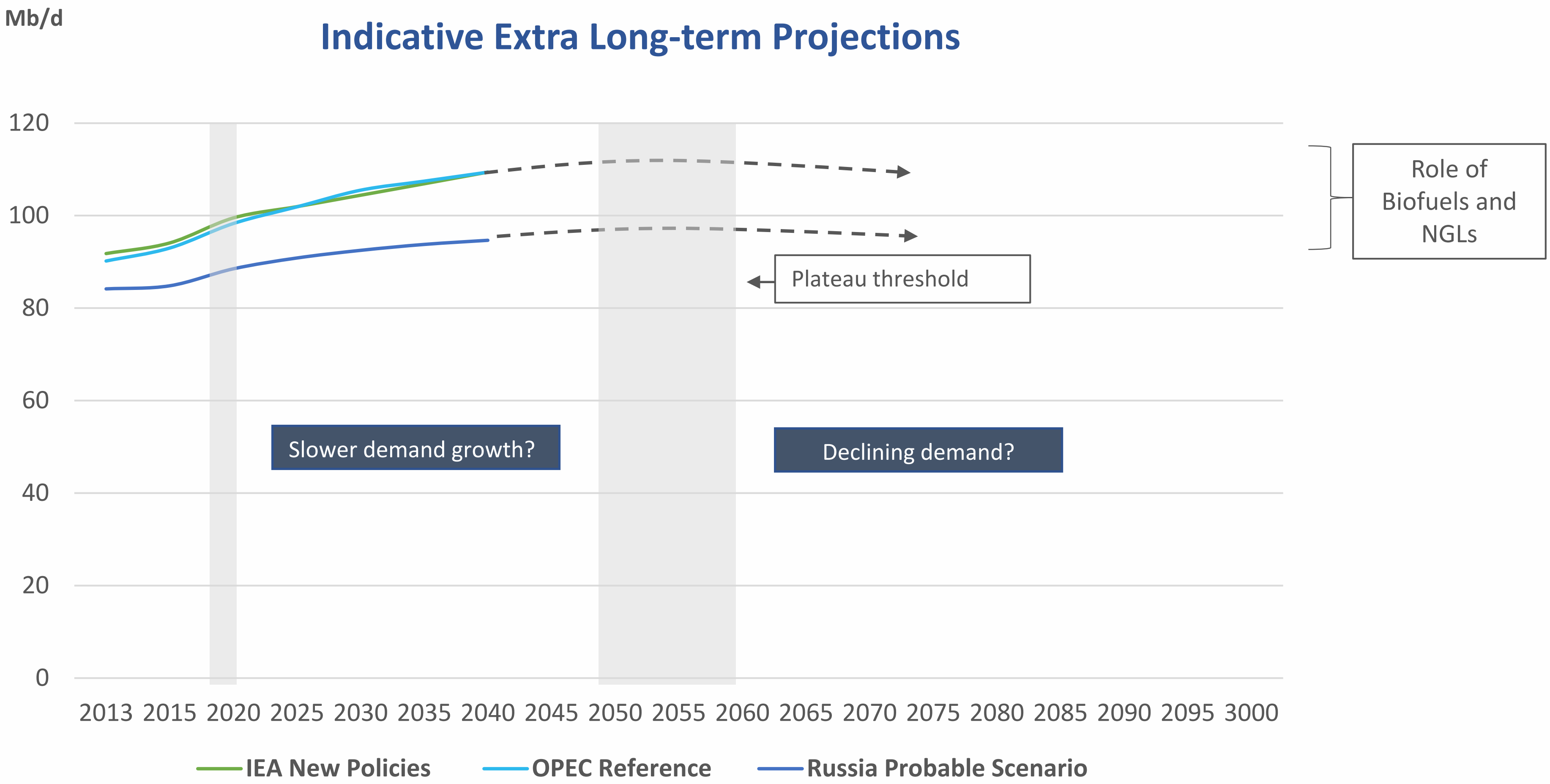
Russian energy outlooks see less uncertainty in oil demand growth



Sources: Energy Research Institute of the Russian Academy of Sciences and The Analytical Center for the Government of the Russian Federation; Global and Russian Energy Outlook 2016

Slower demand growth looks certain...

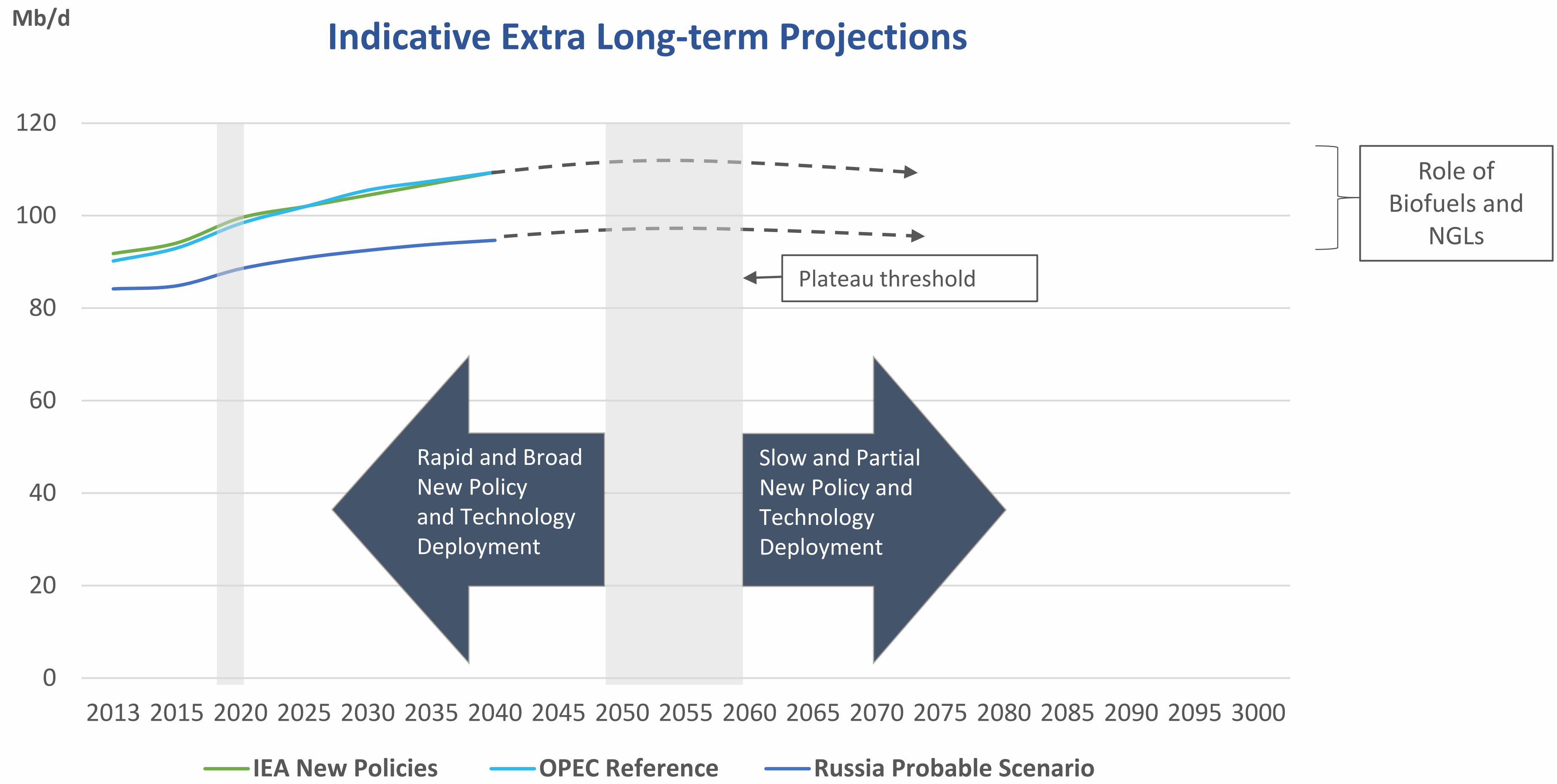
Main pathways point at demand plateau in 2050s



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



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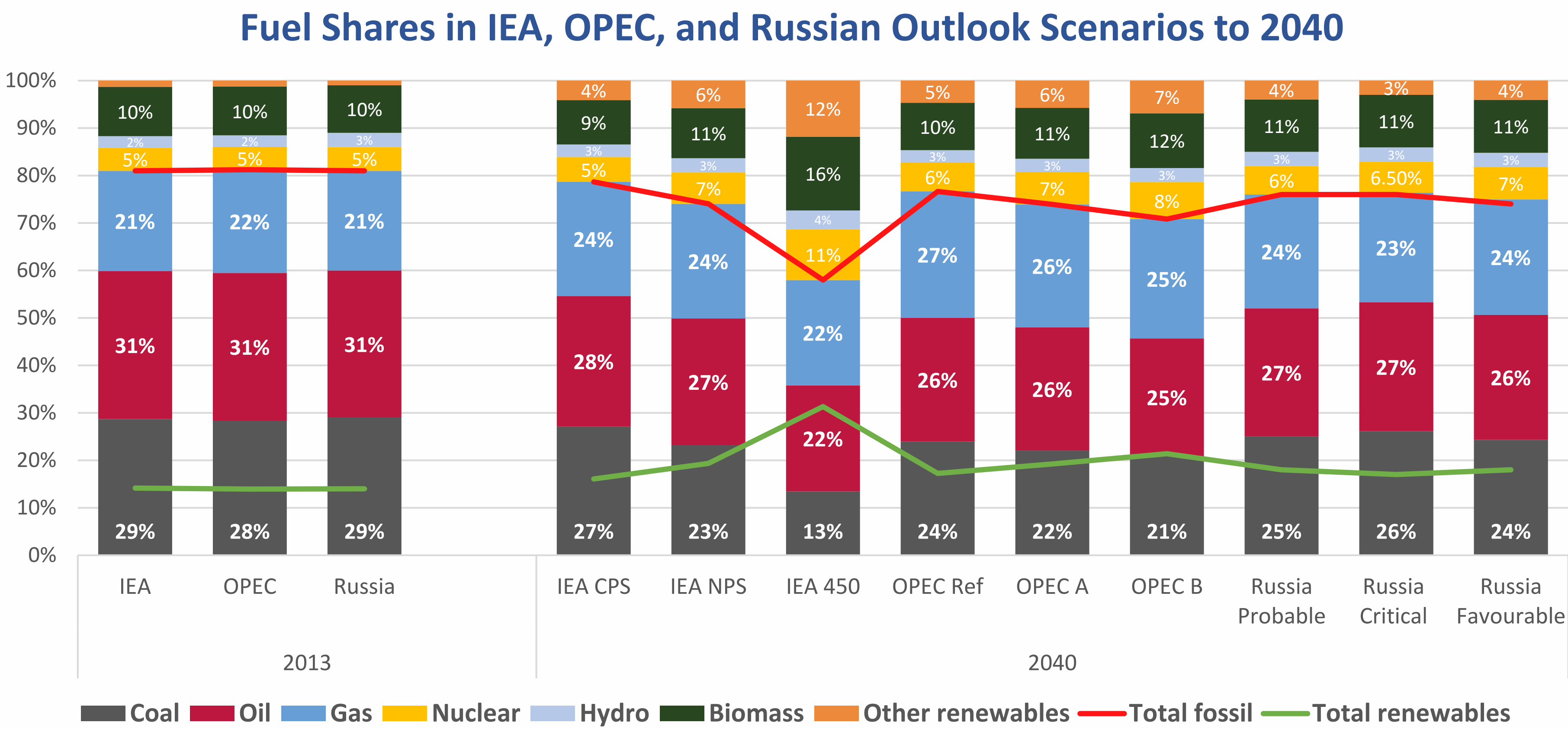
Energy Security Rests on Fossil

Fossils amount to 74%, 77% and 76% in key 2040 scenarios, and to 57%, 71% and 74% in alternative 2040 scenarios of IEA, OPEC, and Russia



Sources: Energy Research Institute of the Russian Academy of Sciences and The Analytical Center for the Government of the Russian Federation; Global and Russian Energy Outlook 2016, IEF-RFF Comparative Analysis of IEA World Energy Outlook 2016 and OPEC World Oil Outlook 2016

Risk and opportunities of the down cycle

Global Oil and Gas Market Security

Risk	Opportunities
Upstream investment deferrals	**Flexibility and new business models**
• 3 year crunch amounts to ~5mb/d loss • Impacts market stability and jobs • Strands resources	• Consolidation and new partnerships • Diversification to gas and renewables • Better access to resources
Market volatility	**Resilience through enhanced performance**
• Alternating swing suppliers (US/KSA) • Risk of shortfalls/spikes in 2020s? • Role of inventory data transparency	• Efficiency gains cost reductions • Standardisation across industry • Digitisation and Big Data

Risk and opportunities of the down cycle

Global Oil and Gas Market Security

Risk	Opportunities
Dependence on major producers • Role of NOCs grows • Reduced market influence • Geopolitical risk increase	**New technologies and market segments** • Carbon Capture Use and Storage • Highly Efficient Low Emissions Generation • Storage, Transport, and Petrochemicals
Energy transition uncertainty • Leadership • Finance • Technology	**Improved price signals** • Inefficient subsidy reform • Carbon pricing mechanisms • Level inter-fuel competition

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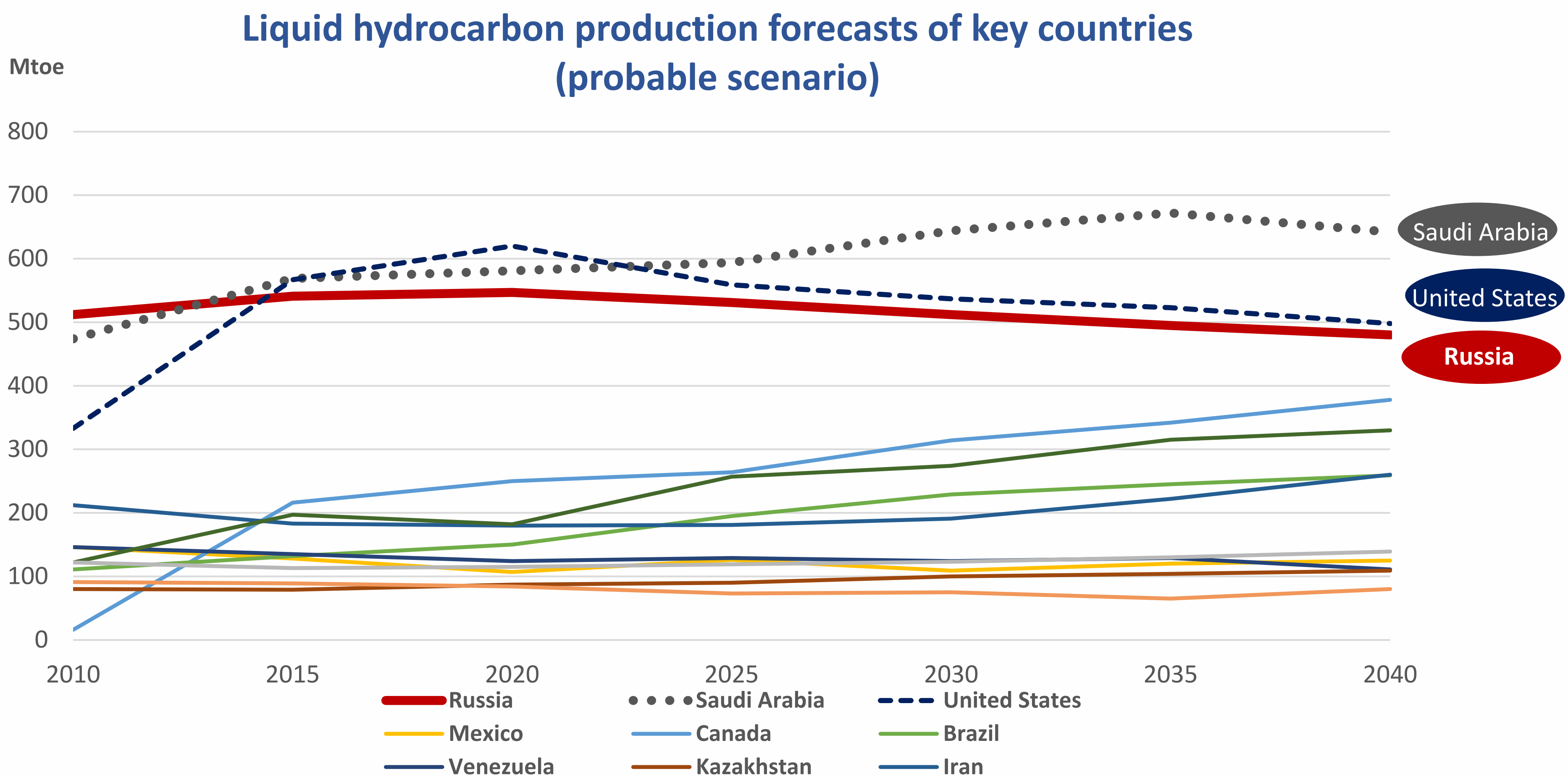
Russia is the 3rd largest liquid producer

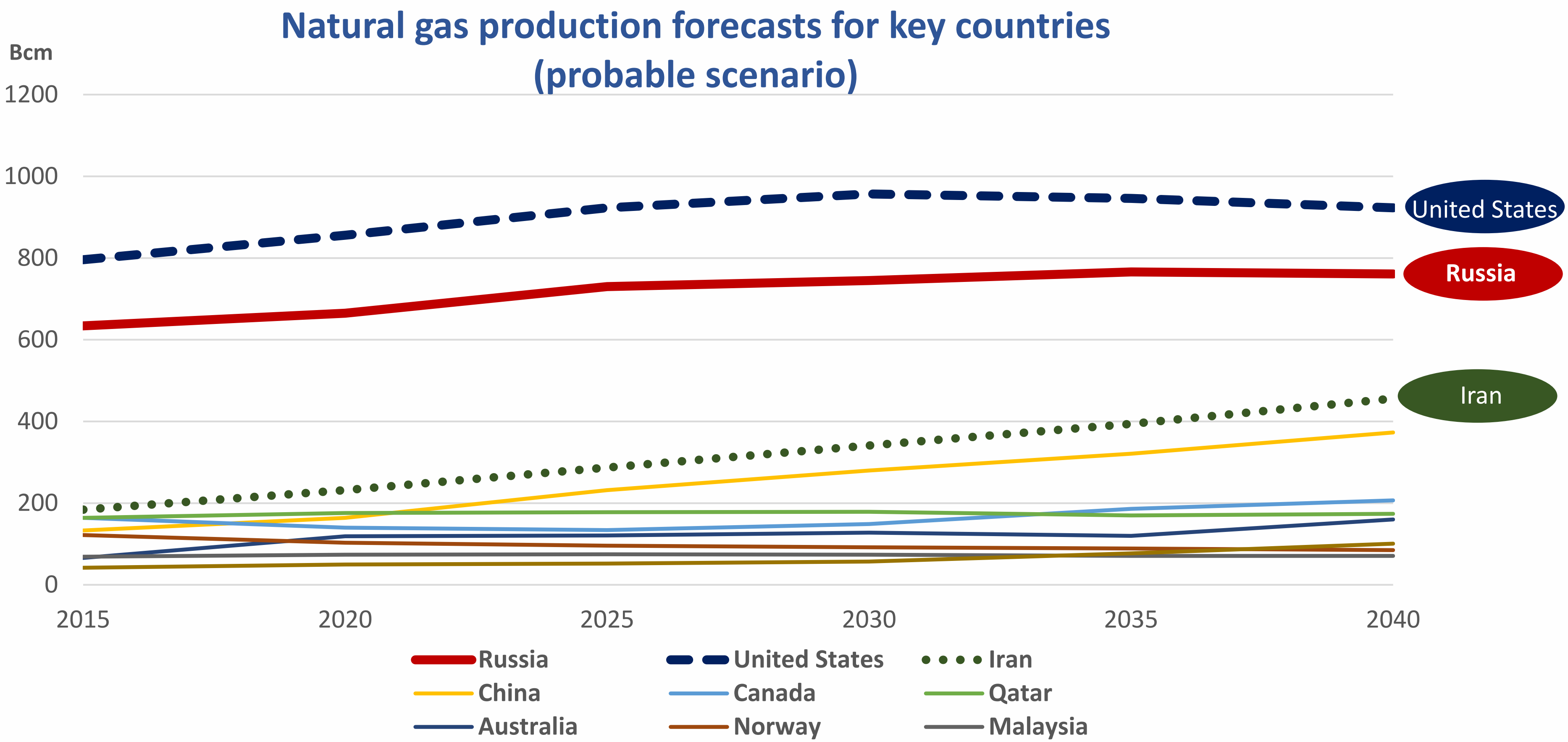
Sharing responsibility with other key producers for global energy security



Sources: Energy Research Institute of the Russian Academy of Sciences and The Analytical Center for the Government of the Russian Federation; Global and Russian Energy Outlook 2016

Russia is the 2nd largest gas producer

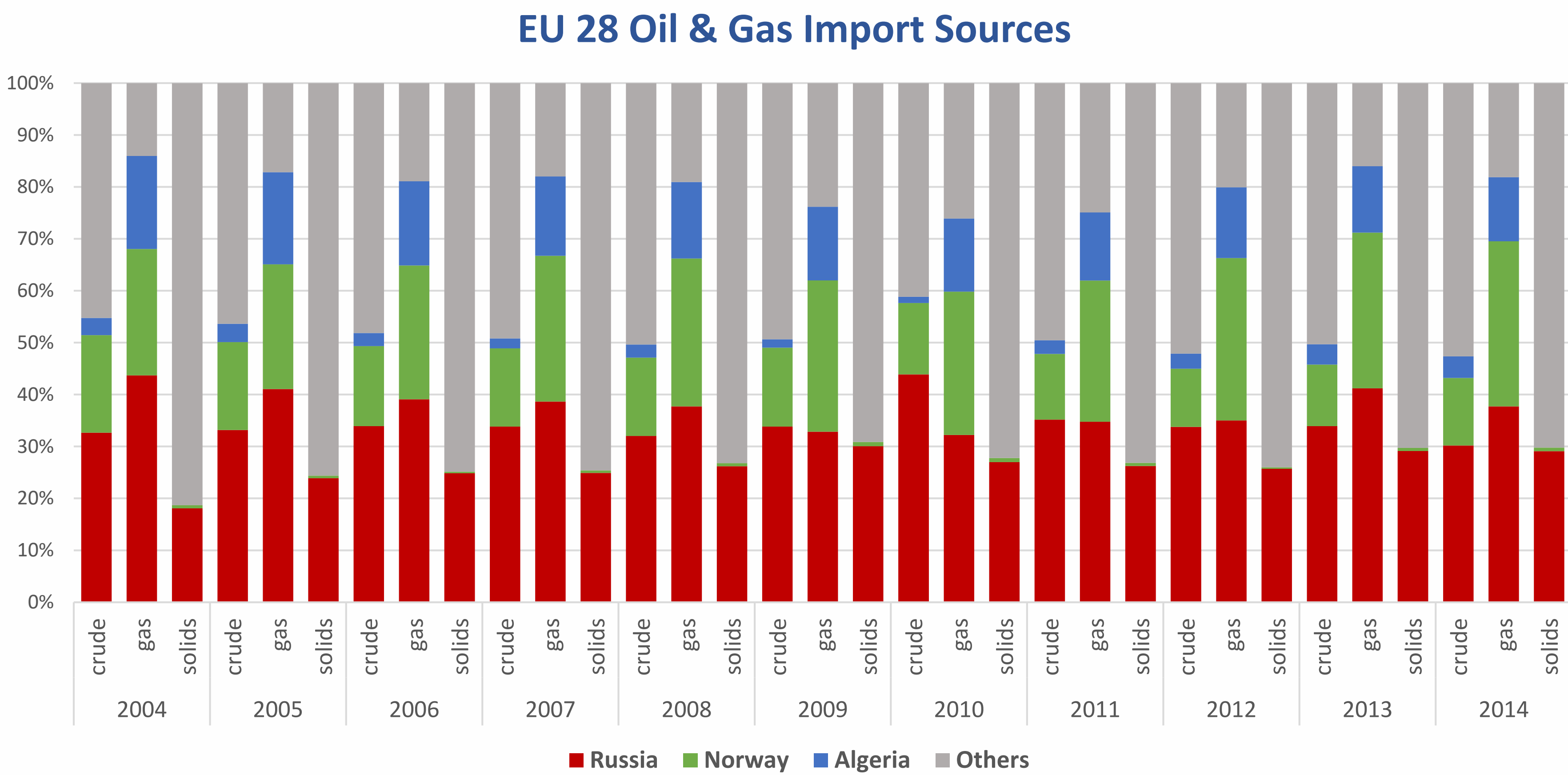
Strategically placed between European and Asian demand growth centers



Sources: Energy Research Institute of the Russian Academy of Sciences and The Analytical Center for the Government of the Russian Federation; Global and Russian Energy Outlook 2016

EU imports most oil, gas, and solids from Russia

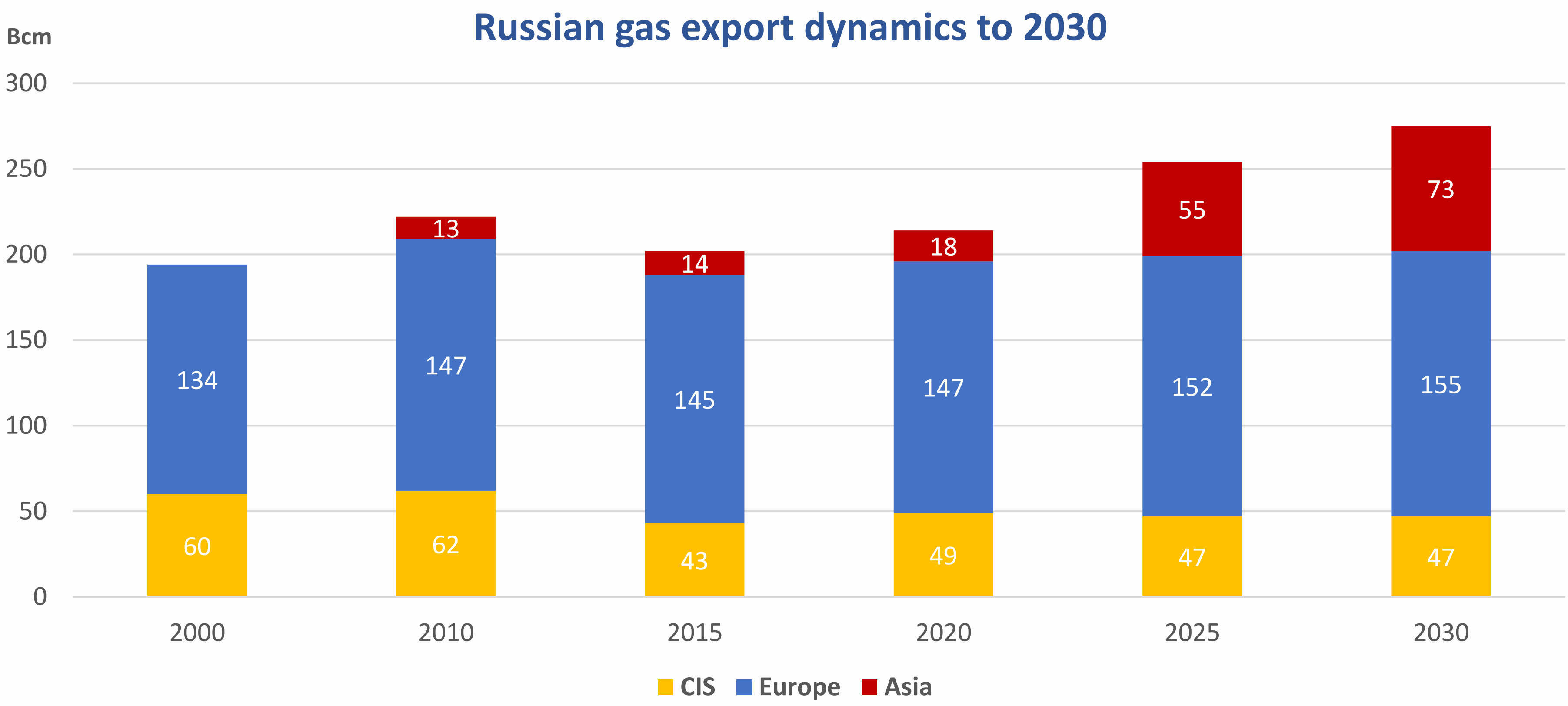
Russia is the largest import source for hydrocarbons in Europe



Source: Eurostat 2016

Russia gas export diversification enables transition

Both in Europe and in Asia



Source: Tatiana Mitrova, Energy Research Institute, Russian Academy of Sciences, Cedigaz

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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

Opportunities for Dialogue

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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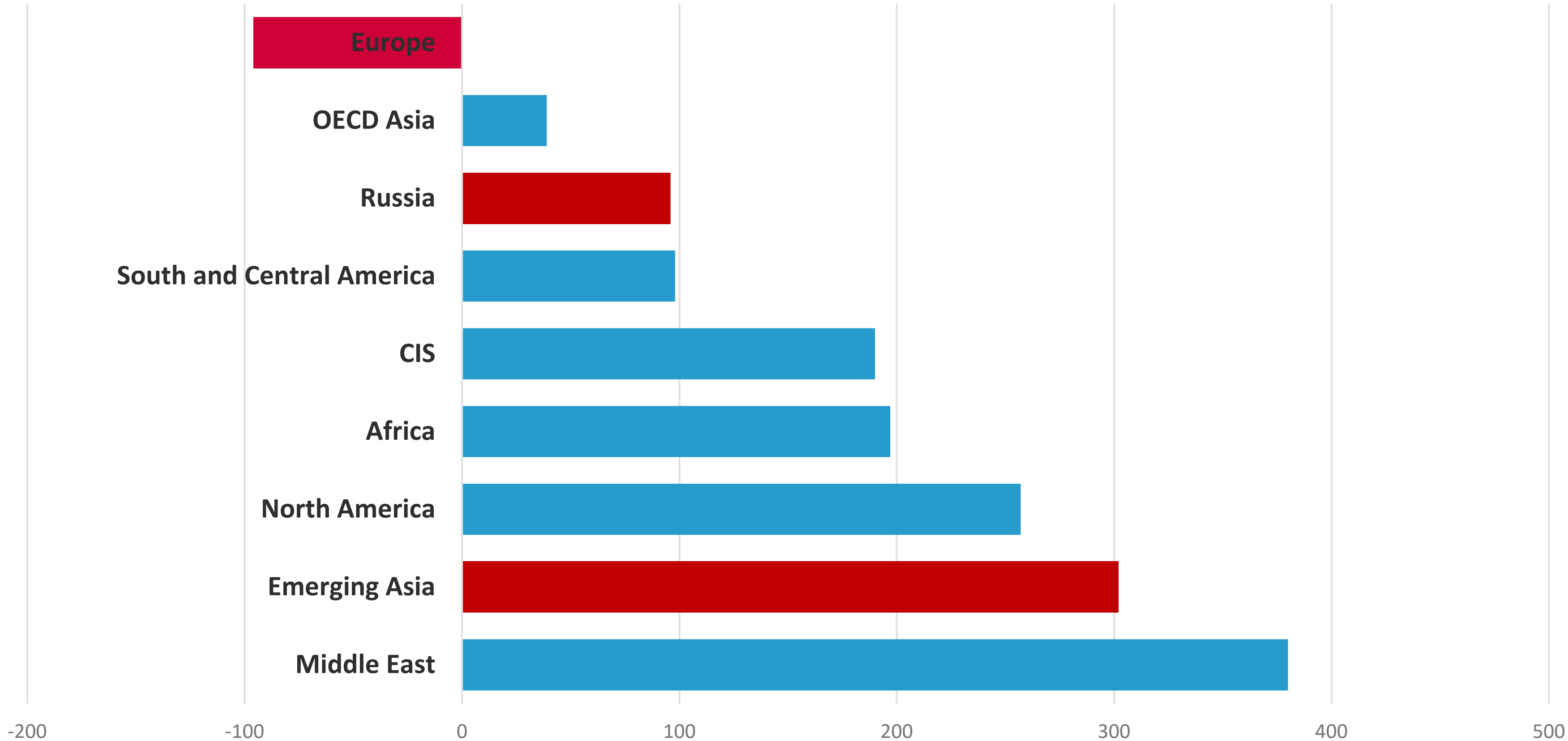
- SPARE SLIDES -

Natural Gas helps reliable transitions

Russia is well placed when gas and innovation can play a larger role for longer

Gas Production Growth by Key Regions and Russia 2015/40



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