



**Joint IEA-IEF-OPEC Report**

**On the**

**Eighth Symposium on Energy Outlooks**

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## 1. Introduction

This summary reflects on the main outcomes of the 8th IEA-IEF-OPEC Symposium on Energy Outlooks that the International Energy Forum (IEF) organized in collaboration with the International Energy Agency (IEA), and the Organization of the Petroleum Exporting Countries (OPEC) at the IEF Secretariat in Riyadh on 14 February 2018. The symposium was held under the Chatham House rule and gathered more than 150 participants from industry, government and academia, including ministers and other high-level industry and government representatives alongside world-renowned experts with a diverse range of backgrounds. Discussions focussed on the IEA's and OPEC's flagship outlook publications and were informed by the comparative analysis of insights on energy demand and supply trends in the Introductory Paper prepared by the IEF and Resources for the Future, in consultation with the International Energy Agency and the Organization of the Petroleum Exporting Countries.

The Joint Symposium on Energy Outlooks is one of three joint high-level expert meetings that the IEA, IEF and OPEC undertake under the trilateral workprogramme of the producer consumer dialogue to enhance the understanding of energy market and policy developments. The trilateral work programme was agreed upon by the three organizations under the Cancun Declaration, which was endorsed by energy ministers at the 12th IEF Ministerial Meeting, held in Cancun, Mexico, in March 2010, as referenced in Attachment Two of the Cancún Declaration. In addition to the Joint IEA-IEF-OPEC Symposia on Energy Outlooks, the trilateral collaboration involves workshops on Physical and Financial Energy Market Interactions and Gas and Coal Market Outlooks.

Substantial progress was made over the course of the seven IEA-IEF-OPEC Symposia on Energy Outlooks to enhance collective understanding of energy market outlooks through

in depth dialogue and advancing the comparability of IEA's and OPEC's energy outlooks. Thereto IEF facilitated collaboration between IEA and OPEC experts in a series of technical meetings including the Eighth IEA-IEF-OPEC Technical Meeting on Advancing the Comparability of Energy Outlooks which was held in advance of the Eighth IEA-IEF-OPEC Symposium on Energy Outlooks on 13 February 2018.

IEF and G20 Ministers welcomed the joint collaboration of IEA, IEF and OPEC to further understand energy market dynamics and encouraged the organisations to continue their fruitful dialogue on how energy policy and markets may evolve to enhance energy market transparency and inform policy and investment decisions in both producing and consuming countries.

The symposium was structured around three substantive sessions including presentations and roundtable discussions on:

1. The IEA's and OPEC's short-, medium-, and long-term outlook projections released in 2017 and the IEF-RFF comparative analysis
2. Perspectives offered by industry on evolving energy policy and market trends.
3. Investment trends in unconventional and conventional oil and gas production

Key highlights from the three sessions and main findings from both organizations' outlooks are presented in the next sections. Full presentations and IEF documents can be accessed on IEF's website at [www.ief.org](http://www.ief.org).

## **2. Key Findings from the Eighth IEA-IEF-OPEC Symposium on Energy Outlooks and Highlights from Recent IEA and OPEC Outlooks**

Over the past years, IEF cemented its role as a leading platform for inclusive dialogue on energy market trends and established its flagship event, the Joint IEA-IEF-OPEC Symposium on Energy Outlooks as a standard for producer-consumer dialogue on energy

outlooks. Rising uncertainty about how energy demand and supply balances will evolve on policy, technology, and demographic trends that show growing variability over short-, medium-, and long-, term projection periods, has increased the interest in improving collective understanding of future energy market dynamics. To overcome market turbulence and other hurdles to investment, reduce unwarranted market imbalances and ensure secure and sustainable energy market functioning the need for enhancing market predictability and transparency collectively has grown.

Welcoming more than 150 senior government and industry representatives from energy producing and consuming countries to IEF's Secretariat, Dr Sun Xiansheng, Secretary General of the IEF, noted that this year's high-level attendance, which included the energy ministers of Saudi Arabia, Russia and Sudan highlights the importance of inclusive dialogue on global energy security and energy data transparency for a shared global energy future. HE Khalid al-Falih, Minister of Energy, Industry, and Mineral Resources of Saudi Arabia, highlighted in his introductory remarks the "tremendous opportunity [...] for the IEA, the IEF and OPEC to collaborate in promoting a rational view of future energy policy that will promote energy security, encourage environmental protection, meet and mitigate the challenges of climate change, and help to fuel economic prosperity not just in the developed world, but the developing world as well". Similarly, the Minister of Energy of Russia, HE Alexander Novak stated that "[...] to create a predictable environment for policy and investment decisions we strongly believe that the process of modelling the future, through an inclusive comparative analysis of Energy Outlooks, must become universal and global." OPEC's Secretary General, HE Mohammed Barkindo and IEA's Director of Energy Markets and Security, Mr. Keisuke Sadamori, noted the importance of the symposium as "a further bridge to enhancing a common understanding between IEF, the IEA and OPEC" and its significant contribution to facilitate the "process of transition to more sustainable and secure energy systems.

Reflecting on the key outcomes of the 2018 Outlook Symposium, the heads of IEA, IEF

and OPEC found that comparing outlooks has become easier over successive meetings; dialogue on varied producer and consumer perspectives has become better informed and this year's comparative analysis of the IEA's and OPEC's short-, medium-, and long-term projections was facilitated by more closely aligned baseline data. An on-going challenge in the comparison of energy outlooks concerns the different use each organisation makes of historical data, definitions, and geographical classifications. The introductory paper of the Eighth Symposium identified opportunities to further harmonise several variables such as differences in world liquids demand and supply baselines, publications dates and consistency in the classification of countries and liquid fuels at both regional and global level.

IEA, IEF and OPEC remain committed to further strengthen joint engagement in enhancing comparability of their energy outlooks. Continued collaboration and an open dialogue are critical prerequisites to achieve greater data consistency and to improve data harmonization. Agreement on baselines and projection periods, as well as definitions and classifications remain essential to make IEA and OPEC forecasts more comparable. Senior experts from both organizations agreed to share baseline data and projection time frames for Outlooks published in 2018. Also, agreement upon joint specialist workshops to further explore underlying assumptions in base case scenarios will further help to bridge projection differences between the two organizations. Nevertheless, continued dialogue at the expert level on assumptions and methodologies to deepen understanding of the impact that different price assumptions and different views on the evolution of policy, technology and economic growth have on oil supply and demand balances, also remains important to understand differences in outlooks.

## 2.1 Short-term Outlooks

### Liquids

### Demand

Both OPEC and the IEA estimate world liquids demand baselines in close proximity at 95.4 mb/d and 96.3 mb/d, respectively; a difference of 0.9 mb/d. The OPEC production agreement is a significant consideration for both organizations although there is some difference in compliance projections, most notably for Russian production. OECD demand projections were modestly increased from January to December due to increased economic activity. Both the IEA and OPEC project robust world liquids demand growth of 1.3 mb/d and 1.5 mb/d, respectively, for 2018. This similarity at the global level masks differences in regional growth assessments. While the IEA is more bullish about demand growth in non-OECD Asia, the Middle East, and Africa, OPEC estimates stronger demand growth in OECD Americas and OECD Asia Pacific.

### Liquids Supply

From a supply perspective, OPEC and the IEA estimate 2016 world liquids supply baseline data at 95.8 mb/d and 97.0 mb/d respectively; a difference of 1.3 mb/d. OPEC and the IEA estimate 2016 world liquids supply baseline data at 95.8 mb/d and 97.0 mb/d respectively; a difference of 1.3 mb/d, slightly lower than last year's report, with differences again primarily due to non-OECD data divergences on OPEC supplies (0.9 mb/d) and the FSU (0.4 mb/d). For 2018, IEA and OPEC forecast world liquids supply at 98.5 mb/d and 99.1 mb/d respectively; differing in their assessment by just 0.6 mb/d, well below last year's difference of 2 mb/d for 2017. Growth of OECD unconventional (i.e. US shale) led the IEA and OPEC to substantially revise their projections upward for OECD supplies during the first half of 2017. Like previous years, the largest difference in IEA and OPEC projections of non-OPEC liquids supply is for the FSU region, amounting to 0.4 mb/d for 2017 and 0.5 mb/d for 2018.

## 2.2 Medium-term Outlooks

### Liquids Demand

The IEA and OPEC expect 2022 world liquids demand to reach 103.8 mb/d and 102.3 mb/d respectively. Both the IEA and OPEC forecast robust liquids demand growth but OPEC projects a slightly lower annual growth rate of world liquids demand of 1.15 mb/d, compared to the annual growth rate of 1.20 mb/d forecast by the IEA through to 2022. The IEA projects non-OECD liquids demand to be 2.8 mb/d higher than OPEC in 2022, partly due to a higher baseline demand estimate that differs by 1.2 mb/d. Conversely, OPEC projects liquids demand from OECD nations to be 1.3 mb/d higher than the IEA in 2022. This difference is driven by more optimistic projections of demand in OPEC's outlook, as baseline estimates differ by only 0.1 mb/d. However, OPEC and IEA agree that little to no growth in OECD liquids demand will occur. OPEC projects modest growth followed by a decline, with 2016 demand equal to 2022 (46.8 mb/d). The IEA projects annual average declines of 0.2 mb/d, reaching 45.5 mb/d in 2022. Both the IEA and OPEC note that the overall driver for liquids demand growth remains transportation, followed by petrochemicals and industrial demand. However, growth projections are dampened by the impact of fuel efficiency standards, notably in the OECD, and slowing demand growth in China due to structural shifts towards a services and consumption-oriented economy.

### Liquids Supply

OPEC and the IEA project world liquids supply to reach 102.5 mb/d and 103.8 mb/d by 2022 respectively, differing in their medium term liquid supply assessment by 1.2 mb/d. OPEC and IEA non-OPEC supply projections differ through 2022, with more bullish projections coming from the IEA through 2018, followed by higher projections by OPEC for non-OPEC supplies in later years, with a difference in 2022 of 1.1 mb/d. Both



projections agree that most non-OPEC supply growth will come from OECD Americas, followed by more modest growth from Latin America. They also agree that supplies from non-OECD Asia are likely to decline through 2022. In sum, the IEA and OPEC forecast total non-OPEC supplies to reach 60.9 mb/d and 62.0 mb/d in 2022 respectively; a 1.1 mb/d difference. The IEA and OPEC projections imply supplies from OPEC member countries of 42.9 mb/d and 40.5 in 2022 respectively, a difference of 2.4 mb/d. This difference stems largely from IEA's 2022 world liquids supply projections being 1.2 mb/d higher than OPEC's projection, along with OPEC's projection of more robust supplies from OECD Americas.

## 2.3 Long-term Outlooks

### Primary Energy Demand

OPEC and the IEA both project that fossil fuels will continue to dominate the primary energy mix with oil, gas and coal maintaining a 75% to 79% share of total primary energy demand in 2040 with the exception of the IEA's Sustainable Development Scenario, where fossil fuels supply 61% of primary energy demand in 2040. However, the IEA and OPEC differ on the shares of coal, oil, and natural gas in total primary energy demand in 2040. The IEA's Current Policies Scenario projects coal and oil consumption to be 16 mboe/d and 10 mboe/d higher, respectively, than OPEC's Reference Case. The IEA's New Policies Scenario projects lower consumption of all fossil fuels than OPEC's Reference Case with differences in coal (-7 mboe/d), natural gas (-5 mboe/d), and oil (-3 mboe/d).

### Energy Supply Mix

The IEA's New Policies and Current Policies Scenarios, along with OPEC's Reference Case, project that oil will maintain its position as the leading fuel in 2040, though its share in the energy mix shrinks from more than 30% in 2015 to 27- 28% under these three

scenarios. Unlike either of the last two years, OPEC's Reference Case does not project natural gas emerging as the leading primary energy source by 2040. However, natural gas is set to grow the fastest among fossil fuels (in percentage and absolute terms), with an increasing share in the fuel mix in every IEA scenario examined here, including the IEA Sustainable Development Scenario. Both the IEA and OPEC project that the share of renewables, led by growth in wind and solar, will increase in all scenarios from 14% in 2015 to 16% under the IEA's Current Policies Scenario, 18% in OPEC's Reference Case, 20% under the IEA's New Policies Scenario, and to 29% under the IEA's Sustainable Development Scenario by 2040.

### **Liquids Demand**

The share of oil in the world primary energy portfolio is expected to decrease, but the level of oil demand still enjoys robust growth under central scenarios. In OPEC's Reference Case and the IEA's New Policies Scenario, world liquids demand respectively reaches 111 mb/d and 109 mb/d by 2040. In the IEA's Current Policies Scenario, world liquids demand grows to 122 mb/d, falling only under the Sustainable Development Scenario to 80 mb/d by 2040. The IEA's New Policies Scenario shows India overtaking China as the leading centre of demand growth in absolute terms, while both the IEA's Current Policies Scenario and OPEC project that absolute growth in liquids consumption in China and India will be roughly equal.

### **Liquids Supply**

OPEC's Reference Case forecasts global supply in 2040 of 111 mb/d, slightly more than the 109 mb/d under the IEA's New Policies Scenario, and well below the IEA's Current Policies Scenario which projects 122 mb/d of supply in 2040. OPEC is substantially more bullish on production from non-OECD Europe and Eurasia, projecting 2040 production to be 2.8 mb/d and 0.8 mb/d higher than the IEA New Policies and Current Policies Scenarios,

respectively. OPEC projects that OPEC member nations will provide 46% of global supply in 2040, equal to its 2016 estimate. The IEA projects OPEC supplies of 43% under both the IEA's New Policies and Current Policies Scenarios, compared with 45% and 46% respectively under last year's IEA outlook. Like last year, IEA's Current- and New Policies Scenarios are more bullish on supplies from the OECD, as the OECD Americas region supplies 2.0 mb/d and 4.0 mb/d more than OPEC's Reference Case under the IEA's New Policies and Current Policies Scenarios, respectively. Compared with OPEC's Reference Case, IEA's Current-, and New Policies Scenarios project tight crude peaking at higher levels and in later years. In the New Policies Scenario, non-OPEC tight oil grows through 2035, reaching 9.5 mb/d before falling to 9.2 mb/d in 2040, more than 2 mb/d higher than last year's projections.

### **3.Views on Short-, Medium- and Long-term Energy Outlooks from Industry and Academia**

Symposium participants elaborated on the main themes laid out in the preceding session informed by in depth presentations on short-, medium-, and long-term energy outlooks from senior industry and academic experts. Discussants focused on key market shifts and those policy and technology developments that are likely to have a significant impact on the evolution of energy demand and supply balances.

Economic expansion and population growth will continue to boost global oil demand, with the majority of growth contributed by non-OECD nations, particularly non-OECD Asia and Africa. Unless policies or technologies change significantly more than currently known, oil in 2040 – along with other fossil fuels – is currently on a path to maintain a central position in the global fuel mix. However, as major emerging economies mature, new and more efficient technologies are deployed, and environmental efforts pledged under the Paris Agreement come into effect, global oil demand growth rates will likely be tempered.

Looking to 2018, markets will continue to be influenced by the decisions taken by OPEC and non-OPEC nations regarding the potential extension of production adjustments. Other key areas of interest will include the growth rate of U.S. tight oil supplies, economic development in key oil-producing nations, and global economic growth rates. The key questions for long-term oil supply are which nations and what types of oil production are likely to supplant production declines from existing conventional projects and support demand growth. After declining in 2016, non-OPEC supply from unconventional plays has rebounded rapidly, driven by U.S. tight oil. The industry has made efficiency gains to cope with lower oil prices, though it is unclear how sustained low prices will affect capacity and what price levels would be sufficient to support faster growth rates. In addition, it is unclear to what extent declining investment in higher cost conventional projects will reduce supply in the coming years. Nonetheless, to meet long-term demand, OPEC member countries will likely continue to play a central, if not increasing role in global oil supply as high cost non-OPEC supplies remain under pressure from market volatility, moderate growth in prices, and shifting consumer preferences. Consumer behaviour, economic recovery, demographic growth and urbanisation foretell that demand for oil will remain robust, notwithstanding a shift towards renewables and new transport modes.

### **Session perspective: Investment in unconventional and conventional oil and gas production**

Participants reflected on investment conditions for unconventional and conventional oil and gas production and interactions between production profiles related to their impact on market volatility and security of supply. Discussants noted that the disruptive effect of new technologies and innovative business models employed by new entrants to global energy markets naturally impact investment in hydrocarbon resources and influence oil market volatility.

Present day oil and gas market abundance and downward pressure on prices have caused oil and gas sector investment to contract significantly over the past three years. It remains unclear to what extent U.S. shale oil's resilience and OPEC-led efforts to adjust production will provide swing and spare capacity to the market overtime. While shale and tight oil producers have become more capable of operating profitably in low price environments, shale oil is still at a relatively early stage of its industry life cycle, where the scope for steep learning curves but also pitfalls is substantial discussants found. From an investment perspective, shale oil will lead to shorter and more limited oil-price cycles causing shallower price rotations based on production changes. In addition, further risk of disruption stems from persistently high stock levels which not only present a challenge to OPEC's efforts to rebalance the market, but also to the investment needs of conventional resource plays. On the side of conventional resources, the shortfall of investment in greenfield projects over the recent years will have consequences for secure and stable market functioning in the mid-term. Moreover, the above shifts in energy balances also affect to different and varying degrees the revenues, economic policy and growth prospects of both producer and consumer countries, as well as the profitability and long-term viability of companies throughout an increasingly diverse energy supply chain.

Despite decreasing investment in recent years, oil and gas still represent the largest single category of global energy investment. With greater optimism returning to the market, investment in both conventional and unconventional production may well experience positive growth in the near future. The recovery from historic drop-off in investments in 2015 and 2016 has started and although investment was flat in 2017, early data suggests a rise for 2018. Session participants broadly agreed that recent price swings highlight a new era of uncertainty as the world's oil markets continue to adjust to shifting realities. Oil is seeking a new equilibrium and the rebalancing of supply and demand is bringing a new global energy security order with it. As oil is expected to remain a dominant

component of the global energy system, new oil development and production remains essential to secure reliable and affordable energy supply for the future.

## 5. Conclusions

The IEA-IEF-OPEC Symposia on Energy Outlooks continue to provide a unique opportunity to share perspectives on energy market developments and deepen collective understanding of future energy outlooks. Against the background of major energy policy and market shifts, the Eighth IEA-IEF-OPEC Symposium enabled senior government stakeholders and industry experts to compare various assumptions and exchange views on their energy supply and demand projections. The Symposium continues to offer a timely and unique opportunity to further strengthen the producer-consumer dialogue with new perspectives from new demand and supply centers, now energy markets are at a critical juncture. Though current market developments adversely affects long cycle investment and lead to a rebound in market volatility on the short-, to medium term, long-term market outlook remain largely unchanged. Despite these rising uncertainties energy markets are expected to align with the evolving policy requirements of producer and consumer countries. The rapid rise of renewables and natural gas will create new challenges and opportunities for energy security, investment and trade flows, as well as system resiliency. New energy technology deployment in transport, and other key sector, as well as changing producer-, and consumer preferences, point at the importance of dialogue and energy data transparency to improve understanding and help address stakeholder concerns collectively.