Joint IEA-IEF-OPEC Report

On the

Fifth Symposium on Energy Outlooks

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Contents

1. Executive Summary

The International Energy Agency (IEA), the International Energy Forum (IEF), and the Organization of the Petroleum Exporting Countries (OPEC) jointly hosted the Fifth Symposium on Energy Outlooks at the IEF Secretariat in Riyadh on 23 March 2015. The Symposium, which involved the participation of more than 100 experts from industry, government and academia, facilitated an exchange of views and expert opinions on energy market trends and short-, medium-, and long-term energy outlooks. The Symposium also focussed on investment decisions in the context of recent oil market developments that have created new risks and opportunities for energy security.

Now in its fifth year, the joint Symposium on Energy Outlooks is one of the specific areas for cooperation between the IEA-IEF-OPEC, in line with the endorsement from Energy Ministers at the 12^{th} International Energy Forum (Cancún, March 2010) referenced in Attachment Two of the Cancun Declaration in addition to Joint IEA-IEF-OPEC Symposia and High-Level Workshops on Gas and Coal Market Outlooks and Physical and Financial Energy Market Interactions.

Session I

The first session of the Fifth IEA-IEF-OPEC Symposium on Energy Outlooks covered key findings from the Fourth joint Symposium convened in Riyadh in January 2014, and involved discussions on selected observations and conclusions from the latest IEA and OPEC outlooks.

Presentations focussed on the impact of recent energy market developments, including significantly lower oil prices and updated economic growth forecasts on supply and demand balances and inventories. Discussants exchanged views on inter-fuel competition and on how oil markets would find new balances as upstream investment growth in non-OPEC oil supplies would likely slow down. Discussants also addressed changes in the responsiveness of oil supply and demand to market developments and how these would impact investment and trade flows as well as oil, gas and product price trends. Moreover, participants also exchanged views on how environmental climate policy and new supply side technology advancements - including new renewable energy technologies and energy efficiency gains on the demand side - may affect energy balances.

Participants in this session highlighted progress made to date in improving the comparability of IEA and OPEC outlooks, and stressed that differences in historical baseline data should be clarified in order to make outlooks easier to compare and contrast both in terms of demand and supply outlooks and the underlying assumptions of various scenarios.

Session II

In the second session, discussions shifted from the perspectives of international organisations' on energy outlooks to those of industry and government. Conversations centred on the impact of lower and more volatile oil prices on supply and demand, market structure and investment incentives in a period of divergent economic growth, cash flow constraints and rising costs. Participants also discussed the changing dynamics of OPEC and non-OPEC supplies to meet future demand in relation to spare capacity and storage requirements, and touched on the impact of financial markets and monetary policy on oil market volatility. Discussions focused on changing consumption patterns and structural shifts in the Asian market, where fuel efficiency and environmental considerations have become more crucial to shaping energy policies that could impact the pace of growth in primary energy demand. The influence of technological advances on the global fuel mix and the rise of nuclear, renewables, natural gas and demand for transport fuels in non-OECD Asia were also addressed. Finally discussions focussed on the impact of these developments on crude oil and product trade among major demand and supply regions.

Discussants found that while coal, oil and gas are expected to remain the primary sources of energy over the long-term, a major risk for the energy industry will be to secure adequate and timely investments.

Session III

During the third session, expert discussions focussed on how to handle this risk and how it affects investment decisions in the context of short-, medium- and long-term supply and demand outlooks. The discussion focussed on how investment in oil production would adjust to low prices and volatility. In this respect, the potential for improved efficiency and cost reduction in the oil industry was highlighted. Discussants also questioned whether tight oil production would show the same resiliency as shale gas markets and whether it could be replicated outside North American markets. Participants also discussed the incentives for OPEC to maintain spare capacity and invest in new supplies over the short- to medium-term. Discussants argued that producers would need to find new balances between flexibility and long-term commitments in the new market environment as investment incentives and the ability to attract long-term financing appeared to have weakened. Examples were drawn from other sectors on how the energy industry could enhance its performance and lower break-even thresholds.

Discussants found that current downward pressure on oil prices and uncertainty over price direction, recalled the cyclical nature of the markets.

Conclusion

In comparing and contrasting outlooks presented by the various speakers, differences in short- and medium-term outlooks for oil demand and supply were discussed, including in historical baseline data. Long-term demand scenarios yielded a range of options that reflect growing uncertainties in both the market and policy environment. They emphasized the importance of a better understanding of the factors behind these differences to improve comparability.

The discussions in the Fifth IEA-IEF-OPEC Symposium on Energy Outlooks, contributed further to a better understanding of the assumptions and methodologies that underpin these projections, and participants expressed widespread consensus that energy markets have become more interrelated and co-dependent. Major supply and demand factors, including demand-side technology advancements and energy policies are impacting investment and trade patterns. Experts agreed that clarifying methodological issues and sharing analytical insights have become more important. To better inform policy and investment decisions, IEA and OPEC outlooks are important contributions to reflect upon fast moving developments and valuable references for debate among senior energy experts.

2. Introduction

The International Energy Agency (IEA) and the Organization of the Petroleum Exporting Countries (OPEC) each year publish energy market outlooks based on the rigorous analysis of available statistical data, market fundamentals, macroeconomic developments, policy trends and assumptions. In addition, on the occasion of the biennial International Energy Forum (IEF) Ministerial meetings, both organisations present focussed findings that they derive from their analysis and outlooks.

As part of on-going, shared efforts to enhance dialogue among related market actors, the IEA, IEF and OPEC jointly hosted the Fifth Symposium on Energy Outlooks at the IEF Secretariat in Riyadh on 23 March 2015. The Symposium gathered more than 100 experts from industry, government and academia, wherein senior experts presented their perspectives and shared insights in an open exchange of views on recent developments in energy markets. In addition to discussing short-, medium-, and long-term IEA and OPEC outlooks, the Symposium featured presentations from industry on selected topics and devoted special attention to energy sector investment challenges. The Symposium was held under the Chatham House Rule to respect commercial disciplines and to ensure a constructive, open discussion.

The Fifth Symposium is part of a wider trilateral work programme undertaken by the IEA, IEF and OPEC that was endorsed by Energy Ministers at the 12th IEF Ministerial Meeting as referenced in Attachment Two of the Cancún Declaration in addition to Joint IEA-IEF-OPEC Symposia and High-Level Workshops on Gas and Coal Market Outlooks and Physical and Financial Energy Market Interactions.

3. Key highlights and advances in the comparative analysis of recent IEA and OPEC Outlooks

The IEF opened the session noting that this year's Joint Symposium took place against the background of a more turbulent oil market and highlighted the importance of on-going senior expert discussion as well as the achievements and opportunities in advancing the comparability of energy outlooks. Participants noted that to better understand the differences more debate between IEA, IEF and OPEC is necessary on statistical baseline data and key assumptions for short-, medium-, and long-term outlook projections. This would, while improving the comparability, enable senior experts to focus discussions on the key uncertainties in future energy market developments. The comparative analysis of IEA and OPEC outlooks further found that the main differences concerned assessments on non-OECD and non-OPEC demand and supply projections. Other key differences concerned OECD Americas and FSU supply potential and the composition of the fuel mix over the long-term outlook in baseline and other scenario's.

Turning to recent progress made in advancing the comparability of outlooks, a number of new improvements were highlighted. These included more comparable projection timeframes and disaggregated biofuel, Tight Oil and unconventional NGLs data by region. Participants at the Fifth Symposium also took note of differences in historical baseline data, variations of geographical definitions, the treatment of bunker fuels, as well as differences in oil price- and economic growth assumptions and conversion factors. To enhance the comparability of scenario's and Symposium discussions the Reference Scenario of OPEC will in future be compared to both the Current Policy and New Policy Scenario of IEA.

3.1 Short-term Outlooks

Short-term outlooks focussed on macroeconomic trends and recent price developments and their impact on oil supply and demand balances. Discussants noted that economic recovery had continued in OECD economies, while non-OECD economies' growth rates continued to face headwinds with only few exceptions. Imbalanced fundamentals, high oil inventories, and an appreciating US dollar have contributed to the recent decline in crude oil prices. There was general consensus that the short-term price volatility is expected to continue alongside the rebalancing of the market. Discussants also observed that technology advances meant that oil supplies had become more price-elastic, in contrast to demand mainly due to the effect of subsidies and taxes. On key fundamentals, non-OPEC supply was expected to slowdown. Total demand was forecast to perform better due to the combined effect of substantially lower oil prices and improved economic growth prospects, particularly in the OECD area.

3.2 Medium-term Outlooks

Discussions covering the medium-term focussed on macroeconomic developments driven by assumptions on trends in oil prices, production cost, economic recovery, productivity and demographics. The eastward pull of global oil trade was expected to continue, reflecting the region's steady and largest contribution to oil demand growth. As a consequence, new refineries in mainly the non-OECD Asia region and the Middle East are expected to lead a significant build in capacity by 2020.

Discussions on the impact of lower oil prices on oil supply and investments evolved around the resilience of US tight oil over the medium-term and oil supply prospects in North American, Brazil, and Russia. Discussants observed that price volatility had increased. Participants noted that this created a more uncertain environment that may test breakeven price thresholds for both conventional and unconventional supplies in the coming years.

There was consensus among Symposium participants that recent price trends would stimulate demand, though taxes and the removal of subsidies will dampen their effect on the medium-term. The impact of policy, regulation and stricter energy efficiency standards across economic sectors are likely to further moderate demand though developing countries will remain the key driver of demand growth and have already overtaken OECD oil demand in absolute terms.

3.3 Long-term Outlooks

IEA and OPEC main long-term outlook scenarios shared a consistent view that the share of fossil fuels shall continue to dominate the future energy-mix. While gas use is expected to rise strongest, the shares of coal, oil and gas shall start to converge in the longer-term. Since main assumptions have not changed drastically, and differences in historical baseline data have only a marginal impact on long-term demand and supply projections, long-term outlooks have not substantially changed. However, discussants did note that new price dynamics were likely to have an impact on long-term supply and demand projections and the composition of the fossil fuel-mix in relation to other energy sources such as renewables and nuclear. Participants further exchanged views on the role of gas and storage capacity that some believed merited more attention and debate.

With regard to long-term supply and demand, participants highlighted variations in different scenarios in light of the potential of advances in technology and policy dynamics most notably in relation to carbon emissions and energy efficiency requirements. There was consensus that these will likely play a more important role in long-term forecast, their deployment however remains difficult to assess in advance. This complicates factoring in technology and strong policy adjustments into long-term forecasts.

4. Views on Short-, Medium- and Long-term Energy Outlooks from Industry and Academia

The Fifth IEA-IEF-OPEC Symposium on Energy Outlooks invited high-level energy industry practitioners and senior representatives to share their outlooks and give their perspectives on the key factors that will shape energy markets in future. Their participation enriched discussions with observations on outlooks in relation to evolving market realities and commercial perspectives regarding short-, medium- and long-term energy and financial market developments. Related discussions provided additional dimensions to the exchanges, as they explored topics such as the impact of monetary and fiscal policy on oil prices and the relation between oil prices, cash flow and debt, trade opportunities and storage.

Discussants exchanged perspectives on the impact of lower and more volatile oil prices on supply and demand patterns, market structure, and investments incentives in a period of slow economic growth where companies to varying degrees are exposed to cash flow constraints and rising cost. Participants also discussed the resiliency and changing dynamics of OPEC- and non-OPEC supplies to meet future demand in relation to spare capacity and storage requirements and touched on the risk and opportunities that higher oil market volatility presents. Discussants highlighted that major companies are significantly reducing their upstream capital expenditures. However, even when capital is deployed to most productive wells and projects, short-term production may increase. On one hand some discussants had strong confidence in the resiliency of unconventional oil production that could surprise on the upside on the medium-, and long-term. On the other hand, a slow down in investment in conventional production, spare capacity and unconventional production outside North America, would lead to supply constraints by the end of the medium-term. There was consensus that oil price recovery will be driven by the supply side. Discussants noted that international trading companies and the banking sector could benefit from a period of increased volatility, while the services industry would be negatively affected. A protracted period of low oil prices would ultimately provide the incentive for cost deflation and industry restructuring.

Discussions also focused on the changing energy consumption patterns and structural shifts occurring in Asian markets. Symposium participants focussed on recent developments in Japanese and Chinese markets in respect of energy demand trends and the interrelation between fossil and non-fossil energy sources. Discussants noted that after increased oil and LNG imports had compensated for the shut down of nuclear, oil demand would likely decrease in Japan in line with other OECD economies. In Asian non-OECD economies oil demand would continue to increase as a consequence of increased demand in the transport sector, notwithstanding improving fuel efficiency and increased competition from natural gas vehicles. Symposium participants found that the role of fuel efficiency and environmental considerations has grown in energy policies and primary energy demand growth will slow as heavy industry decreases its share in GDP. The influence of technological and policy advances on the rise of coal-, nuclear-, renewable- and natural gas demand in non-OECD Asia were also addressed. Discussants noted that while coal remained the dominant source in the energy mix of Asian non-OECD economies its share would decrease and may peak in the late 2020s in China. Finally discussions addressed the impact of these developments on crude oil and product trade among major demand and supply regions. While Asian economies would continue to mainly draw on supplies from Middle East producers, changes in production and demand balances in North America have shifted global trade flows and increased competition with other producing regions.

Discussants found that that while coal oil and gas are expected to remain the primary source of energy over the long-term, uncertainties for the energy industry to secure adequate supplies have increased due to rising cash flow constraints and policy developments.

5. Perspectives on Investment

During the third session expert discussions focussed on how to accommodate new uncertainties, how these affect investment decisions, and short-, medium- and long-term supply and demand outlooks. The discussion focussed on how investment in oil production would adjust to low prices and volatility. Experts found that major conventional oil producers would have to continue to reduce upstream capital expenditures to mitigate the impact of abundant supplies and weakened demand on oil prices. Unconventional oil production was likely to be more inert to price signals as a consequence of optimised production and available debt financing. Breakeven thresholds however vary largely among shale oil producers. Since unconventional oil production is still a relative new industry discussants found it difficult to give informed and definite assessments. Discussants questioned whether tight oil production would show the same resiliency as shale gas markets had. Under present market realities, participants found that shale oil production was not likely to be replicated outside North American markets. Participants also discussed the incentives for OPEC to maintain spare capacity and invest in new supplies that would otherwise remain flat over the short-, to medium-term. Discussants noted that a growing demand for OPEC crude oil supplies would not necessarily translate into new supplies. Outside the US and Canada, new supply growth will come from high-cost conventional production. In this respect the success of energy sector reform and investment in Mexico and other energy producing regions was raised as an important variable along side geopolitical factors. Discussants found that producers would need to find new balances between flexibility and long-term commitments in the new market environment. Here investment incentives and the ability to attract long-term financing have weakened, not only because of low oil prices but reduced returns on capital. Examples were drawn from other sectors on how the energy industry could enhance its performance and lower break-even thresholds in this new environment. Discussions also highlighted the contribution that more rationale consumption patterns and improvements in the investment climate could make to strengthen long-term investment incentives. When discussing the impact of lower oil prices on production in Canada, Symposium participants noted that due to the long-term nature of investments oil sands production would be less affected by the new market environment.

Discussants found that current downward pressure on oil prices reminded of the cyclical nature of the oil market and has implications for both energy sector investment and energy outlooks.

6. Conclusion

The Fifth IEA-IEF-OPEC Symposium on Energy Outlooks served as a unique platform to deepen collective understanding of increasingly complex and interrelated market dynamics between consuming and producing countries. In the discussion on the energy outlooks by IEA and OPEC professionals, Symposium participants deepened their insight of underlying assumptions and methodologies. There was broad consensus that as energy markets have become more interrelated and co-dependent; new emerging supply and demand factors are changing trade and investment patterns. For this reason, experts agreed that sharing of analytical issues and insights has become all the more important to ensure that the research underlying these projections remains comprehensive and up-to-date with fast moving developments.