



Joint IEA-IEF-OPEC Report

on the

Fourth Symposium on Energy Outlooks

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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 Fourth Symposium on Energy Outlooks at the IEF Secretariat in Riyadh on 22 January 2014. The Symposium, which involved the participation of nearly 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. Market dynamics at play in the petrochemical sector were also addressed, in the context of shifting investment and trade patterns.

Now in its fourth year, the joint Symposium on Energy Outlooks is one of the specific areas of the IEA-IEF-OPEC cooperation, in line with the endorsement from Energy Ministers at the 12th International Energy Forum (Cancún, March 2010) referenced in Attachment Two of the Cancun Declaration.

Session I

The first session of the Fourth IEA-IEF-OPEC Symposium on Energy Outlooks covered key findings from the Third joint Symposium convened in Riyadh in January 2013, and involved discussions on selected observations and conclusions from the latest IEA and OPEC outlooks. Participants in this session highlighted progress made to date in improving the comparability of IEA and OPEC outlooks, and stressed that the objective of such efforts is not to harmonise the findings of the outlooks, but instead to make them easier to compare and contrast.

Presentations focussed on the impact of recent energy market developments and updated economic growth forecasts on supply and demand balances and inventories. Discussants exchanged views on the implications on upstream investment of growth in non-OPEC oil supply and OPEC natural gas liquids (NGLs) exceeding projected demand growth in the short- to medium-term. Discussants also addressed the topics of spare capacity and storage and how they impact trade flows as well as oil, gas, and product price trends. Moreover, participants also exchanged views on how energy efficiency gains on the demand side and new renewable energy technologies on the supply side may affect energy balances.

Session II

In the second session, discussions shifted from the perspectives of international organisations' on energy outlooks to those of industry and academia. Conversations centred around recent trends and expectations related to oil market developments. Participants also discussed changing energy consumption patterns and structural shifts such as the growing role of environmental considerations in decision-making. The influence of technological advances on the global fuel mix and the rise of non-OECD economies were also addressed.

Discussants found that while outlooks differ, there was widespread consensus on the belief that fossil fuels are expected to remain the primary source of energy over the long-term.

Session III

During the third session, experts from the petrochemical and market monitoring industries presented their views and forward-looking perspectives regarding the impact of changing market dynamics on refining and the petrochemicals sector. Low cost refinery feedstocks in the Middle East and North Africa, as well as in Central and Eastern Europe, combined with strong product demand growth in Asia and surging resource availability in North America are reshaping value chains and trade flows. Investment in the petrochemical industry is shifting to more competitive regions and has become more integrated.

These structural shifts pose open questions to industry business models, as they alter energy and individual regional product trade flows for coal, liquefied petroleum gas (LPG), ethylene and propylene in response to changing regulations, environmental policies, and drivers of supply and demand. US investment in ethylene and propylene capacity stands to position it as a major exporter, while the European Union is becoming increasingly import dependent. Demand growth in Asia and Latin America is expected to absorb additional capacities, especially on the back of surging demand for polymers.

The rise of unconventional feedstock sources may inspire new regional oil and gas policies among established producers, and has been pressuring the European petrochemical sector to adapt. Aside from these changes in feedstock availability, trade flows and operational integration, human resource strategies to develop the

necessary skills and know-how likewise represent an important success factor.

Conclusion

In comparing and contrasting outlooks presented by the various speakers, differences in short- and medium-term outlooks for liquids demand and economic growth were relatively minor, while long-term demand scenarios yielded a range of options that reflect uncertainties in both the market and policy environment.

Through the discussions in the Fourth IEA-IEF-OPEC Symposium on Energy Outlooks, participants deepened their understanding of the assumptions and methodologies that underpin these projections, and expressed widespread consensus that as energy markets have become more interrelated and co-dependent, new emerging supply and demand factors are impacting trade and investment patterns. For this reason, experts agreed that sharing of analytical issues and insights has become more important, to ensure that the research that shapes these outlooks remains comprehensive and up-to-date with fast moving developments.

The Symposium concluded with a discussion on the trilateral programme of work on energy outlooks, including next steps to further build momentum for this constructive exchange of perspectives and viewpoints.

2. Introduction

The International Energy Agency (IEA) and the Organization of the Petroleum Exporting Countries (OPEC) each year publish energy market outlooks and short- to medium-term reviews, 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 derived 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 Fourth Symposium on Energy Outlooks at the IEF Secretariat in Riyadh on 22 January 2014. The Symposium gathered nearly 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 the petrochemicals sector. The Symposium was held under the Chatham House Rule to respect commercial disciplines and to ensure a constructive, open discussion.

The Fourth 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.

3. Key Findings from the Third IEA-IEF-OPEC Symposium on Energy Outlooks and Highlights from Recent IEA and OPEC outlooks

The IEF opened the session by recapping conclusions from the Third IEA-IEF-OPEC Symposium on Energy Outlooks. Featured takeaways from the Third Symposium included the importance of non-OECD inventory data, the need for a realistic assessment of the extent to which light tight oil may impact markets, the impact of energy and environmental policies on the future of energy supply and demand, and shared support for progress in facilitating the comparison of the IEA and OPEC outlooks.

Turning to recent progress made on the outlooks comparability front, a number of new developments were highlighted: the inclusion of non-commercial biomass in OPEC's 2013 World Oil Outlook (WOO2013) total biomass demand calculation, the inclusion of country-by-country biofuels production in the IEA's Oil Market Report (OMR), and an adjustment by OPEC in its medium-term outlook horizon from four to five years--so that now both the IEA and OPEC cover the same timeframe. Participants at the Fourth Symposium identified further opportunities related to variations of geographical definitions, differences in baseline data, the treatment of biofuels and bunker fuels, and categorisation methods of liquid supplies, as well as oil price assumptions and conversion factors.

3.1 Short-term Outlooks

Short-term outlooks focussed on macroeconomic trends and their impact on energy supply and demand balances, as well as storage levels. Discussants noted that economic recovery was taking hold in OECD economies, while non-OECD economies' growth rates were less stellar--creating a subtle but noteworthy short-term shift in macro-economic momentum. Other key short-term market drivers discussed include unconventional and conventional production growth in North America and Iraq, respectively. There was general consensus that with demand lagging behind supply, overall markets appeared well supplied in the short-term.

Regarding short-term supply, discussants noted that non-OPEC supply was expected to sustain its growth trend led by OECD Americas, while OPEC NGL supplies had shown strong cumulative growth as well. Notwithstanding a convergence of views on general supply growth trends, a 0.6 mb/d divergence between IEA and OPEC in projections for 2014 was noteworthy compared to more or less aligned short-term projections made in prior years.

Shifting to short-term demand, both the IEA and OPEC revised short-term world oil demand outlooks upward during the second half of 2013. While total oil demand growth continues to come from non-OECD countries, OECD oil demand has showed signs of contracting at a slower rate, evidence of a recovery in macroeconomic conditions.

3.2 Medium-term Outlooks

Discussions covering the medium-term focussed on macro-economic

developments driven by demographics and productivity trends. Participants discussed the shift in the global energy demand centre to developing Asia, with China and India poised to be a principle source of demand growth in the coming years.

Regarding medium-term supply, participants mentioned the impact of growing and more diverse energy supplies and related technological advancements. Discussions focussed on the impact of these developments on price stability on world oil markets and competitiveness among still largely regional gas markets. Discussants observed that price volatility had eased in oil markets, and generally expected prices to remain at current levels over the medium-term. In contrast, the picture of price developments in gas markets is less clear over the short- and medium-term, in part as a consequence of widely diverging market characteristics among North American, European and Asian gas markets. Participants noted that this has created a more uncertain environment that may test breakeven thresholds for both conventional and unconventional gas supplies in the coming years.

Turning to medium-term demand, Symposium participants noted that while the share of fossil fuels is expected to be distributed more evenly in the global energy mix, oil demand will initially remain the leading fuel--driven by the transport sector, where diesel demand is expected to rise. Discussions highlighted, however, that oil demand may well narrow in other market segments and in the OECD region--as a consequence of both policy and macro-economic trends. Gas demand is expected to rise and may eventually make significant inroads in the transport sector, though over the medium-term this may remain confined to selected markets such as the United States and China.

3.3 Long-term Outlooks

IEA and OPEC outlooks converged in that long--term demand growth will continue to be driven by developing Asia, wherein India and other South East Asian countries are expected to overtake demand growth momentum from China by 2020. Perspectives vary regarding how trends related to climate and environmental policy, demographics, productivity and energy intensity may impact Asian demand growth. Hydrocarbons, including crude oil, gas and coal, are expected to continue to dominate primary energy demand, with natural gas

showing the steepest growth.

With regard to long-term supply, participants highlighted variations in different scenarios as a function of macroeconomic growth forecasts, sustainability requirements, the potential for adoption of so-called unconventional production techniques worldwide, and the probability of new supplies for export coming on stream. Overall, discussants noted a marked shift of crude oil trade movements from the Middle East to Asian markets, which in addition to fuelling economic growth, may offset declining imports in OECD countries. Discussants focussed on the impact of possible technological advances, such as the pace at which second generation biofuels might come on line or the potential for natural gas and LNG increase penetration in the transport sector. Given the longer time horizon and the greater number of variables, the IEA and OPEC perspectives on supply showed more variation in long-term forecasts.

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

The Fourth IEA-IEF-OPEC Symposium on Energy Outlooks was the first in which industry representatives were invited to share their outlooks and to present on the key factors that shape them. Their contributions enriched discussions with observations on market realities and commercial perspectives regarding on-going short, medium and long-term developments in energy markets, framed within the broader context of macroeconomic and monetary 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 and other commodities, such as metals.

5. Perspectives on the Petrochemicals Sector

The Symposium identified the petrochemical sector as an area that required special attention, to deepen stakeholders' collective understanding of the recent market changes linked to some of the structural shifts discussed in prior sessions.

Low cost refinery feedstocks in the Middle East and North Africa, as well as Central and Eastern Europe, combined with strong product demand growth in Asia and surging resource availability in North America have been reshaping value chains and trade flows. Investment in petrochemical industries has shifted to

more competitive regions, with product flows to meet global demand adapting as a function of changing regulations, of newly available feedstock, and existing refining capacity levels. Another major development is that national oil companies are moving deeper into value chains by investing in petrochemical industries and refining capacity abroad, leading to more integration between petrochemical and refining industries with upstream stakeholders.

Panellists and Symposium participants discussed these structural shifts and the many open questions tied to them. Changes in individual product trade flows among regions, such as those of LPG, ethylene and propylene, increasingly challenge established business models and unlock opportunities for new market entrants. US investment in ethylene and propylene capacity will likely make it a major exporter, while the EU is becoming increasingly import dependent. Price differentials between the EU and US markets have sharpened and are impacting overall competitiveness. Independent oil and gas companies, such as Valero and Marathon, have re-invested in US refining capacity to process more light, tight oil--thereby enabling product exports as domestic demand falls on lower economic growth and renewable/CAFE fuel standards. While naphtha production from Eagle Ford and Bakken displaced around 1.6 mb/d of Brent and Bonny crudes in 2013 and is expected to produce up to 4 mb/d by 2020, olefin crackers have moved feedstock slates to ethane and LPG and mitigate naphtha length through increased gasoline exports.

Demand growth in Asia and Latin America is expected to absorb additional capacities, especially on the back of surging demand for polymers (plastics) and a strong reliance on naphtha/gasoil of crackers in Asia. In this respect, discussants drew attention to the ambitious targets China set in its 12th Five Year Plan for refining, fertilizers and petrochemical products. Petrochemical growth is also robust in Saudi Arabia, and capacity expansions in Gulf Corporation Council Countries such as Qatar and UAE were also noted. In addition to the oil exports, trade and investment links with China are strong and represent considerable growth potential in downstream industries beyond the petrochemical and refining sector alone.

The rise of unconventional sources may inspire new regional oil and gas policies among established producers and force the European petrochemical sector to

adapt by further downsizing while industries seek out new synergies and deploy to growth markets. Aside from these changes in feedstock availability, trade flows and operational integration, employment and human resource strategies to develop skills and know-how likewise remain critical factors to the sector.

6. Conclusion

The Fourth 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 and viewpoints shared 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.