

ENERGY SECURITY AS A GLOBAL PARTNERSHIP



 AN **INTERNATIONAL ENERGY FORUM** PUBLICATION

1 - 4 OCTOBER 2018

IEF BACKGROUND PAPER

MARRAKECH CITY, MOROCCO | 1 - 4 OCTOBER 2018

**AN IEF DIALOGUE INSIGHT PAPER FOR THE SECOND
MINISTERIAL AND HIGH LEVEL SESSION OF THE
11th ARAB ENERGY CONFERENCE (AEC)**

ENERGY SECURITY AS A GLOBAL PARTNERSHIP

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10 KEY POINTS

- 1. Energy security as a global partnership involves engaging proactively in dialogue and cooperation among countries,** the aim is to unlock the value of maintaining market stability in the face of crisis and benefit from secure and sustainable functioning of energy markets to serve interdependent interest over longer term time horizons.
- The terms and conditions that **balance these co-dependent producer-consumer interests in acquiring equitable rents and benefits** to fuel healthy economic growth is what gives meaning to the modern-day concept of energy security.
- 3. The establishment of the International Energy Forum (IEF) marks the turning point from the adversarial energy security relations of the past,** towards inclusive data driven dialogue among producer and consumers on global energy market stability, and orderly transformations to better inform policy and investment decisions.
- 4. Shifts on the supply and demand side have increased uncertainty overtime.** The variables that account for this range include policy implementation, investment and technological developments as well as long-term assumptions for regional economic and population growth. These variables are at the centre of the dialogue on energy security.
- 5. Energy security concepts and dialogue** among the more multifaceted perspectives taken by producers and consumers **has become more forward-looking and dynamic** with the impact of the shale oil and gas revolution, the advancement of renewables, and the imperative of fulfilling shared goals.
- 6. Hydrocarbons remain the dominant resource within the global energy mix until at least the 2050s.** Together with **advances in clean energy technologies they are an important factor to inclusive and sustainable growth,** considering energy access and affordability as well as climate change and clean air concerns.
- 7. New unconventional production and some renewable sources are driven by more short-term commercial considerations** and respond to different market and regulatory incentives and requirements when compared to production from conventional oil and gas fields.
8. Given that over the next decades non-OECD markets will drive economic growth and oil and gas demand, while import dependencies in the OECD region rise, **the importance of investment in conventional sources of supply is unchanged and remains as vital to global energy security** as before.
- 9. The burden on oil and gas producers to mobilise long-term investments in new conventional supply,** advance clean technologies, and efficiency gains has not eased, nor is the role of inventories and spare capacity as a stabilising force for short-term disturbances diminished.
- 10. As a unique neutral facilitator of ongoing informal, open, inclusive and well-informed data driven global energy dialogue, the IEF is well placed to uphold the global partnership on energy security and enable orderly industry transformations in a rapidly changing and ever more challenging world.**

1. INTRODUCTION

Global energy security is built on the interactions between the cyclical development of supply and demand fundamentals, and the evolution of policy, technology, and foreign economic and security relations. National market, and foreign economic and security considerations have shaped energy security throughout most of the 20th century. The establishment of the International Energy Forum (IEF) marks the turning point. Shared producer and consumer interests in oil and gas market stability and access to reliable data for well-informed policy and investment decisions have characterised dialogue on energy security and market outlooks in the globalised world of the 21st century. The IEF provides a unique and neutral platform to strengthen energy security through data-driven dialogue amongst producers and consumers on market, policy, and technology evolutions, enhancing energy market transparency and foresight in an informal partnership with interdependent stakeholders.

This IEF Dialogue Insight Paper describes producer and consumer country perspectives on energy security as a function of changes in market structure, investment and trade patterns, as well as related policy shifts, and technology advancements. It identifies certain key risks and opportunities of economic, environmental, technical and geopolitical nature that require strengthened cooperation for their successful management. The paper concludes by highlighting how enhanced producer-consumer dialogue on the IEF platform improves policy cohesion and boosts trade and investor confidence in the future of global energy security, by facilitating reliable energy sector transformations that achieve global goals in a cost effective and equitable manner.

2. THE CONCEPT OF ENERGY SECURITY; EVOLVING PRODUCER AND CONSUMER PERSPECTIVES

How energy security is defined depends on the perspective taken in the evolving context of strategic energy commodity markets, international relations and outlooks. At its core is the interdependency between producers and consumers of such commodities. Producers focus on security of demand and economies of scale to facilitate cost effective investment and optimal revenues from exports for social economic development, while consumers are concerned with security of supply through imports from competitive markets to fuel economic growth at affordable prices. The terms and conditions that balance these co-dependent producer-consumer interests in acquiring their fair share of rents and benefits to fuel healthy economic growth is what gives meaning to the modern-day concept of energy security. This is not a static formula, but rather a constantly evolving concept as market circumstances and energy commodity valuations as well as international relations change with outlooks overtime. Contemporary dialogue among consumers and producers is rooted in how policy and investment decisions influence co-dependent energy security interest over the long-term and not directly concerned with day to day market fluctuations.

FROM CONFRONTATION TO GLOBAL PARTNERSHIP ON THE IEF PLATFORM

Energy security was a zero-sum game almost entirely focused on oil in the post-World War II decolonialisation process. The transfer of ownership of natural resource rights from International Oil and Gas Companies (IOCs) of energy importing developed economies gathered in the Organisation for Economic Co-operation and Development, to the National Oil and Gas Companies (NOCs) of the major energy producing developing economies meant that energy security was viewed through the lens of competing national and foreign economic and security considerations. This led to the establishment of the Organization of the Petroleum Exporting Countries (OPEC) in 1960, the Organization of Arab Petroleum Exporting Countries (OAPEC) in 1968, and the International Energy Agency (IEA) as an autonomous organisation within the framework of the OECD in 1974. OPEC and the IEA emerged as the main proponents in the economic governance of separate producer and consumer country energy security concerns overtime. Energy supply and demand in the Soviet Union and Eastern Europe, as well as developing Asia including China, was largely internally balanced which meant they then still stood at the fringe of international energy security considerations. Though energy security was high on the international agenda of energy importing and exporting countries, in the context of the Cold War and Middle East conflicts global partnership on energy security were simply not on offer. Initiatives led by France to address energy security considerations in a more inclusive producer-consumer dialogue were held back by distrust and the 'comfort' of the then prevailing alliances.

The resolution of the Cold War that came with the emergence of the newly independent states in Eastern Europe and the Former Soviet Union, coincided with the successful collaboration between producer and consumer countries in the liberation of Kuwait in the early 90's. These momentous events substantially altered international relations and created new circumstances and condition precedents. On one hand, they enabled collaboration between OECD and non-OECD countries in economic transition towards open and globally integrated market economies. On the other hand, they illustrated that cooperation between producer and consumer countries on oil market stability was not only possible, but in future would become even more important for a rapidly globalising world economy that would continue to depend on investment and trade patterns of scarce natural resources. With strengthened confidence in the ability of producers and consumers to identify common energy security interests, the first meeting of the producer-consumer dialogue was hosted by France in 1991 in which market stability figured most prominently to the benefit of both producer and consumer countries. The era of the zero-sum

considerations that came to the fore in the 1960's, gave way to the win-win of dialogue on shared interests to reinforce global energy security to the benefit of ever more interdependent stakeholders in the early 1990s.

Over the past 28 years the producer-consumer dialogue has strengthened international engagement on energy security through global partnerships that the inclusive platform of the International Energy Forum provides to the world. 16 International Energy Forum Ministerial Meetings have been held in which producer and consumer perspectives on energy security as a global partnership have converged on several key collaborative initiatives, while the dialogue continues to evolve in response to new challenges.

This relates, foremost, to the comprehensive work programme that Ministers gathered at the 12th International Energy Forum in Cancun Mexico on 30-31 March 2010 (IEF12) established on the IEF platform with the IEA, OPEC and JODI Partner Organisations. The global financial crisis saw oil prices reach \$145 in July 2008 and fall to \$30 by December 2008 and then make a steady recovery to levels above \$100 in February 2011 (See Annex Figure 1: Oil Price and Volatility). Critical global market governance issues were addressed among the G20 leaders who met twice yearly between 2009 and 2011, and annually since. Reducing energy market volatility, and excessive oil price volatility in particular, served the energy security interests of both consumers and producers gathered at the biennial IEF ministerial meetings, and would help accelerate the wider global economic recovery. Saudi Arabia, cognisant of the importance of the producer-consumer dialogue, called for an ad-hoc meeting in Jeddah in June 2008. This in turn was followed by a series of further meetings in London, Riyadh, and Paris between 2008 and 2010 to address the architecture of the producer-consumer dialogue and energy market volatility.

Ministers gathered at IEF12 ultimately agreed to further enhance energy data transparency and deepen the collective understanding of energy outlooks, physical and financial market interactions as well as policy and regulatory impacts by improving the institutional architecture for global energy market governance through the IEF platform. Enhancing the interface for collaboration among international organisations, member state companies and government representatives thus added a more substantive and ongoing cooperation among experts to the producer-consumer dialogue. This was formalised in the IEF12 Cancun Ministerial Declaration containing recommendations and an implementation plan, as well as the agreed areas of cooperation between the IEA, IEF and OPEC. The establishment of the Trilateral Work Programme between the three organisations has helped to inform IEF Ministerial Meetings with robust analyses on future trends, aimed at limiting uncertainties and anchoring market expectations. Moreover, to safeguard the informal, inclusive nature of the IEF dialogue and reinforce the commitment of both producing and consuming countries to this unique global partnership, the IEF Charter was adopted at a special IEF Ministerial Meeting held on 22 February 2011 in Riyadh and circulated as an official document by the Secretary General of the United Nations.

THE QUEST FOR STABILITY IN AN ERA OF GLOBAL SHIFTS AND INDUSTRY TRANSFORMATIONS

The quest for stability continues to call for dialogue as energy market dynamics have become more complex and give rise to new energy security concerns. Widely shared perspectives on enduring natural resource scarcity amidst new geopolitical upheavals in the Middle East, North Africa, and the Former Soviet Union, as well as nuclear shut downs in Europe and Asia following the Tsunami that hit Japan in March 2011, provided support to a sustained period of elevated oil and indexed gas prices between 2010 and 2014, despite a steady rise of new hydrocarbon, renewable and nuclear energy technologies.

Oil prices hovered above \$100 from 2011 to 2014 and peaked at \$115 in June 2014 before commencing a downward slide that would see prices touch \$44 in January 2015 and \$26 in February 2016 (See Annex Figure 1: Oil Price and Volatility). A slow price recovery followed, enabled by stronger oil demand growth in response to lower prices, a brighter world economic outlook fuelled by monetary stimulus, macro-economic restructuring, and high-compliance with the voluntary output adjustments that OPEC agreed with key non-OPEC producing countries at their first Ministerial Meeting on 10 December 2016.

Sustained high oil prices and security of supply concerns advanced unconventional oil and gas drilling techniques. Their impact on the world energy markets coincided with a recovery in oil exports from the Middle East. The US shale oil and gas revolution comes with new risks and opportunities to global energy security as security of supply interests are supplanted by rising security of demand concerns in light of the lifting of the US Crude Oil Export Ban by the US Congress in 2015, and the search for new oil and gas export outlets by new entrants in an increasingly competitive energy market. This is influencing current market dynamics and will continue to reshape global oil and gas trade.

Following the oil market downturn in late 2014, unconventional US oil and gas production has become more resilient due to cost reductions and operator innovation. US oil production increased by over 5.5 mb/d over the past decade, covering for production declines that resulted from above-ground constraints elsewhere. Although shale production dipped in 2015, it has recovered since due to productivity improvements and higher prices. Nevertheless, both near-term global market balances and US exports will depend largely on global demand. US exports will be driven by commercial considerations since production is more short-term and must respond to market fluctuations and different regulatory requirements when compared to exports sourced from conventional fields in producing countries. As US oil and gas are not an overt policy vector, international trade opportunities and the ability to overcome hurdles related to cost and market access through innovation and new infrastructure will drive exports in the long term. This will contribute to an ongoing transformation of global oil and gas trade, along with frontier supplies in the Western Hemisphere, ranging from Canada to Argentina. US shale has made global supply more price responsive, but, while shale can temper long term price movement, it remains governed by market fundamentals. US shale will lend to greater long-term price stability, but the role of inventory and spare capacity as a stabilising force for short-term disturbances in the global market is not diminished.

Given that oil and gas demand will be largely driven by non-OECD markets for the next few decades, the importance of investment in traditional sources of supply is unchanged and remains as vital to global energy security as before. Here the burden on oil and gas producers to mobilise investment in new conventional supply in a volatile price environment has not eased. As before, the downward price pressures to which oil and gas markets have been exposed over the past four years have resulted in an unprecedented reduction in upstream investment. Producers will have to make up for the backlog and add new capacity to reliably respond to growing demand and rising import dependencies in both OECD and non-OECD countries. Global partnerships among producing and consuming economies will continue to depend on well-informed dialogue that addresses how market fundamentals and policy and technology trends affect their collective interest in global energy security.

BEYOND FUNDAMENTALS: NEW POLICY AND TECHNOLOGY DIMENSIONS

The greater variability in policy priorities and technology pathways to achieve sustainable development goals, including universal and affordable access to modern energy services and keeping average

global temperature to no more than 2°C by 2100, add important new dimensions to the producer-consumer dialogue. Energy security concepts and dialogue among the more multifaceted perspectives taken by producers and consumers has become more forward-looking and dynamic with the impact of the shale oil and gas revolution, the advancement of renewables, and the imperative of fulfilling shared goals. Though the dialogue on energy security focuses primarily on investment and trade patterns in supply and demand balances, equitable, secure, and healthy functioning markets are increasingly affected by these new vectors that have implications for ongoing efforts on improving energy market data transparency and deepening understanding of supply and demand balances in energy outlooks, and physical and financial energy market interactions with IEF partners. This includes the pace of integration of new technology options in both hydrocarbon and renewable energy industries, in which the growing role of tight oil, liquefied natural gas, and electrification are important new features. The manner in which these new directions interact with each other will affect investment cycles with far reaching consequences for market volatility and energy security as well.

AN ENHANCED ROLE FOR THE DIALOGUE: IEF MILESTONE MINISTERIAL MEETINGS

IEF Ministers took up the challenge to accommodate the structural energy market changes in both market and policy orientations by sharpening focus on the implications for global energy security and the global energy governance architecture. The 13th and 14th biennial International Energy Forum Ministerial Meetings held in Kuwait on 12-14 March 2012, and in Moscow on 15-16 May 2014, advanced dialogue on energy security and reducing excessive energy market volatility by consolidating global partnerships through the initiatives launched at IEF12 in the Cancun Ministerial Declaration. Ministers also followed up on their promise to include energy poverty alleviation as the ninth United Nations Millennium Development Goal, that later became the seventh UN Sustainable Development Goal, and placed emphasis on energy efficiency in hydrocarbon supply chains to deliver a sustainable energy future.

At the 25th anniversary of the producer-consumer dialogue, the 15th International Energy Forum Ministerial Meeting (IEF15) gathered under the theme “Global Energy Transition: An enhanced role for the dialogue” in Algiers on 26-28 September 2016. The successful adoption of the 2030 Agenda for Sustainable Development at the United Nations Sustainable Development Summit on 25 September 2015, and the landmark “Paris Agreement” concluded by the 21st Session of the Conference of Parties to the United Nations Framework Convention on Climate Change in December 2015 coincided with changes in energy demand and supply that made market prospects more uncertain and reduced investor confidence since the Russian Federation hosted the IEF14 Ministerial Meeting in Moscow in 2014. Moreover, the global energy governance architecture reflected a greater variety of stakeholder perspectives and changes in the composition of both existing and new organisations. An enhanced role for the producer-consumer dialogue to strengthen global partnership on energy security was therefore a vital requirement to maintain balance among a growing number of interdependent interests. A more vibrant and insightful dialogue through the IEF platform would further improve the interaction between all relevant stakeholders and corresponding bodies. IEF15 acknowledged that global energy transitions come with shifts at various levels, and that impacts on economies of interdependent producing and consuming countries differ. Recognising their shared interest in deepening understanding, building confidence and trust to make energy sector policies more cohesive, and establishing a more transparent and predictable market environment, the need for an enhanced producer-consumer dialogue among all energy sector stakeholders was evident. IEF15 Ministers therefore reaffirmed their commitment to the IEF and the producer-consumer dialogue, expressing their support to further enhance the neutral platform that the IEF uniquely provides, with the goal of strengthening global energy security and facilitating orderly global energy transitions. This included the launch of an IEF Energy Efficiency Knowledge Sharing Framework according to the

two additional mandates IEF was recently granted from the 6th Asian Energy Ministerial Roundtable early November 2015, and the G20 Energy Ministers Meeting in late June 2016.

When IEF energy ministers and industry leaders met alongside heads of international organisations at the 16th biennial International Energy Forum Ministerial Meeting (IEF16) in New Delhi on 10-12 April 2018 under the theme “The Future of Global Energy Security –Transition, Technology, Trade and Investment” they engaged in a more comprehensively structured dialogue to assess how global shifts, new policies and technologies, and investment and trade patterns influence energy market security, facilitate orderly transitions, and accelerate the achievement of shared goals. On one hand, world oil demand and supply patterns showed signs of re-balancing. An upswing in world economic performance and the subsequent recovery in energy demand growth in both the OECD and non-OECD regions accompanied high compliance with the voluntary output adjustments agreed upon by OPEC and non-OPEC producing countries at the OPEC Ministerial Meeting on 10 December 2016. On the other hand, uncertainties relating to how new policies and technologies would affect investment and trade of energy demand and supply balances, and fuel sustainable and inclusive growth in the wider world economy, continue to grow. IEF16 ministers acknowledged that global energy security is taking on new meanings that have just as much to do with adaptability as energy access, affordability, and inclusive and sustainable growth. They emphasised that through open dialogue, energy market stakeholders can move forward faster and farther when embracing shared value propositions that benefit all. Noting from contributions by both the IEA and OPEC that the fossil fuel sector shall continue to provide around three-quarters of energy demand in 2040, as projected in their main scenarios, IEF16 delegates focused dialogue on the mutual reinforcing role of fossil fuels and clean energy technologies, including renewables and called for:

- Reliable, and realistic transformations that all can afford, and
- Rational responses to the global energy challenges we face together.

3. MANAGING OPPORTUNITIES AND RISKS IN A CHANGING ENVIRONMENT

The successful management of opportunities and risks to global energy security in an environment in which interdependent markets and foreign relations will continue to evolve and energy policies and technologies change, depends on reliable data and inclusive dialogue.

The following observations can be made when comparing changes in past world primary energy demand fuels shares as recorded by IEA and OPEC against future projections of the IEA, OPEC, the US Energy Information Administration (US EIA) and the International Renewable Energy Agency (IRENA) (See Annex Figure 2: Fuel Shares in World Primary Energy Demand 1971-2050):

1. Fuel shares remain surprisingly similar in historical data and scenario projections over the years.
2. The rise of natural gas and nuclear led to an increase of their share in the global energy mix at the expense of oil over the past decades, yet their shares are projected to remain relatively stable in future. Despite reductions in coal demand in the OECD region the share of coal shows little change in future projections due to growing energy demand in the non-OECD.
3. Ambitious projections by the IEA and IRENA prepared for the G20 in 2017 on the rise of renewables and nuclear energy in joint Sustainable Development Scenarios to 2050, contrast with the historical record and main scenarios by IEA, OPEC and US. EIA.
4. Historical data and main scenario projections show that widely held expectations such as on the role of nuclear energy in the 1970s, the golden age of gas, or growth in renewables and electrification today, may not fully materialise, and increase demand for other fuels.

Though the debate on fuels shares is important for long-term investment in energy security and sustainability assessments, energy demand growth figures paint a more challenging picture still. The United Nations estimates the world population to grow from around 7.55 billion today to more than 11 billion by the end of this century, when Africa, accounting for more than 88% of this growth, shall equal Asia in population size. OPEC projects non-OECD energy demand will grow to 93.5 million barrels of oil equivalent per day (mboe/d) between 2015 and 2040, compared to 2 mboe/d in OECD countries. Led by India, China and Nigeria, the Asian and African regions' share in world energy demand growth combined will amount to 75% according to IEA data.

In most scenarios, fossil fuels are forecast to remain the dominant resource within the global energy mix until at least the 2050s. Together with advances in clean energy technologies they are an important factor to inclusive and sustainable growth, considering energy access and affordability as well as climate change and clean air concerns. Rising uncertainty over security of energy demand is a consequence of more varied regional policy choices and technology options that together give rise to the wider held assumption that change or a peak in demand for hydrocarbon molecules in favour of a surge in electrons is immanent. This negatively impacts investment decisions in the energy sector for the rational development of available natural resources and an efficient and sustainable functioning of global energy supply chains with readily available and scalable technologies. Future energy demand and supply levels are a function of demographics, market conditions, tax and regulatory incentives and national economic and environmental policies that Ministers craft for industry leaders to base investment strategies and build business models on. In comparing long-term scenarios that take account of both existing new and alternative policies in outlooks to 2035

published by the International Energy Agency (IEA) and the Organization of the Petroleum Exporting Countries (OPEC) in 2013, the range of liquids demand levels spanned from 90 million barrels per day (mb/d) for the current policy scenario, to 115 mb/d for the 450 particles per million (450-ppm) CO₂ equivalent scenario; the target for the atmosphere that the UN International Panel on Climate Change (IPCC) and the scientific community widely regard as synonymous with keeping average global temperature by 2100 to no more than 2°C above pre-industrial levels. This amounts to a long-term investment uncertainty of around 25mb/d that is predominantly a function of policy implementation and technology deployment.

When comparing the outlooks for long-term liquid demand that the IEA and OPEC published most recently in 2017, the range of liquid demand between the current policy scenario and the sustainable development scenario, replacing of the 450-ppm scenario, spans between 122 mb/d and 80 mb/d respectively. This amounts to an increase in investment uncertainty over the next five-year interval by around 17 mb/d when the differential between current trends and new policy and technology implementation in the current policy and sustainable development scenario's amounts to 42 mb/d (See Annex Figure 3: Liquid Fuel Demand Outlooks (2017)).

Shifts on the supply and demand side have increased uncertainty overtime. The variables that account for this range include policy implementation and technological developments as well as long-term assumptions for regional economic and population growth. These variables are at the centre of the dialogue on energy security therefore. The methodologies used to build energy outlooks warrant an on-going dialogue among policymakers, industry executives, and other stakeholders. The IEA-IEF-OPEC Symposia on Energy Outlooks are an important exercise in this regard and is already contributing towards a better understanding and comparability of energy outlooks while respecting different interests and points of view.

To balance the burdens and benefits of maintaining global energy security and orderly industry transformations more dialogue is therefore needed on how these variables interact and evolve in the economic, environmental, technology and geopolitical arenas:

3.1. ECONOMIC (SUPPLY-DEMAND BALANCES, TRADE AND INVESTMENT, AND MECHANISMS)

In the economic arena dialogue is focused on the evolution of energy demand and supply balances, including storage, energy trade and investment patterns, as well the cost and benefits of strategic reserves and spare capacity. Emphasis is placed on the risks that short cycle supply resilience poses to investment in longer term conventional resources and security of supply mechanisms.

3.2. ENVIRONMENTAL (SUSTAINABLE DEVELOPMENT AND CLIMATE)

Dialogue on energy security in the environmental arena is driven by the promise of new energy technologies and long-term policies on sustainable development, climate change, as well as short-term requirements for clean air in urban centres. Discussions focus on the interface between the hydrocarbon and renewable energy sector and finding mutually reinforcing solutions with the aid of new technologies, including decarbonised energy fuels.

3.3. TECHNICAL (INNOVATION AND DEPLOYMENT)

In respect of technology and innovation dialogue is focused on the role of new and existing technology in creating more efficient and resilient energy systems to meet growing demand in a cost effective and sustainable manner. Risk and opportunities related to market driven and government mandated technology choices feature prominently.

3.4. GEOPOLITICAL (GLOBAL AND REGIONAL)

The IEF was established as a neutral body for informal and open dialogue to depoliticise relations among interdependent energy market stakeholders after a period of confrontation. The knowledge networks and producer-consumer relations built upon the IEF platform have gained relevance to address risk and opportunities through informal dialogue in the current geopolitical environment.

4. THE ROLE OF INTERNATIONAL COOPERATION FOR THE FUTURE OF GLOBAL ENERGY SECURITY

Ministers, industry leaders and heads of international organisations have expressed their continued support for the role that IEF plays in improving energy security, facilitating orderly transitions, and sharpening focus on energy efficiency, access and affordability. As energy markets are governed by more complexity, enhanced dialogue on probable energy pathways will improve market transparency and accelerate the achievement of shared goals in an effective and equitable manner.

Building on the successful model of the trilateral work programme that energy ministers established at the IEF12 will help to further enhance dialogue and market transparency through concerted efforts to obtain deeper insight in future energy outlooks, accelerate energy efficiency gains and advance energy access.

Institutional cooperation has gone from strength to strength to make distinct outlook projections more comparable and raise the energy dialogue to a higher level. This includes the launch of a comparative analysis of IEA and OPEC short-term reports released on a monthly basis, in addition to the yearly in-depth comparative analysis of energy outlooks that the IEF publishes yearly in collaboration with IEF Knowledge Partners. More engagement among relevant international and national organisations through the IEF platform will further enhance global partnerships on energy security in a rapidly changing environment.

The macro-economic benefits of stable energy markets that allow the economy to continue to grow without fear of negative supply or demand shocks have been well documented overtime. Through dialogue and cooperation, countries' look to unlock the value of maintaining stability in the face of crisis and benefit society by attaining a secure and sustainable functioning of energy markets that serves the interdependent interest of producers and consumers over the longer term.

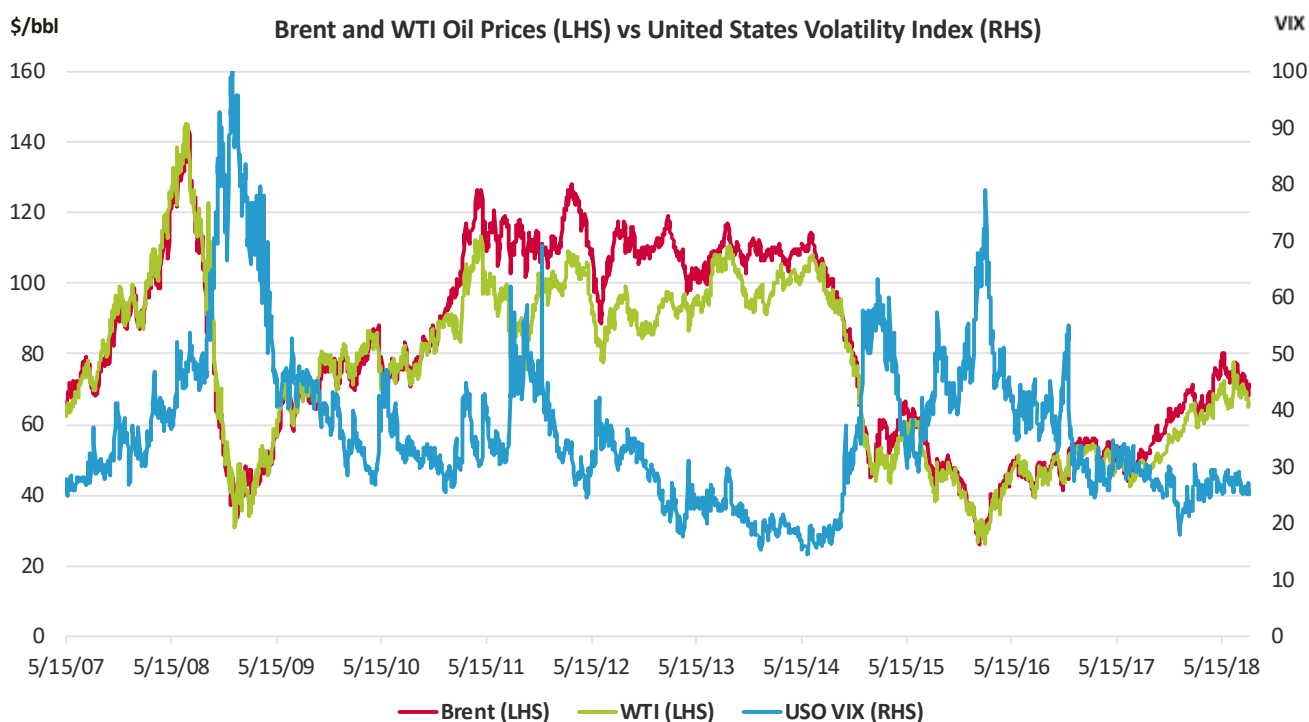
5. CONCLUSION

Ministers and industry leaders must constantly consider new energy policies and technologies across the entire spectrum of the global energy sector. This creates new investment and employment opportunities, but naturally also raises new questions in relation to supply and demand balances that underpin global energy security. Since policy pathways vary among regions and many new energy technologies have yet to prove their scalability in different settings, producer-consumer dialogue on how global shifts and industry transformations driven by more diverse policy and technology choices, affect global energy security remains essential. Misperceptions, missteps and missed investments affect producers and consumers and the successful attainment of global targets as well.

The global partnership on energy security that the IEF facilitates among an increasing number of interdependent stakeholders to ensure adequate and timely investment appropriate to evolving energy supply and demand patterns has never been more important. The deeply rooted historical origins of the producer-consumer dialogue from which the substantive IEF work programme and Charter has evolved continue to nurture vitally important goodwill and trust among governments and strengthen investor confidence among the industry stakeholders that the Forum serves. As a unique neutral facilitator of ongoing informal, open, inclusive and well-informed data driven global energy dialogue the IEF is well placed to uphold the global partnership on energy security and enable orderly industry transformations in a rapidly changing and ever more challenging environment.

Enhancing Transparency Enables Balance

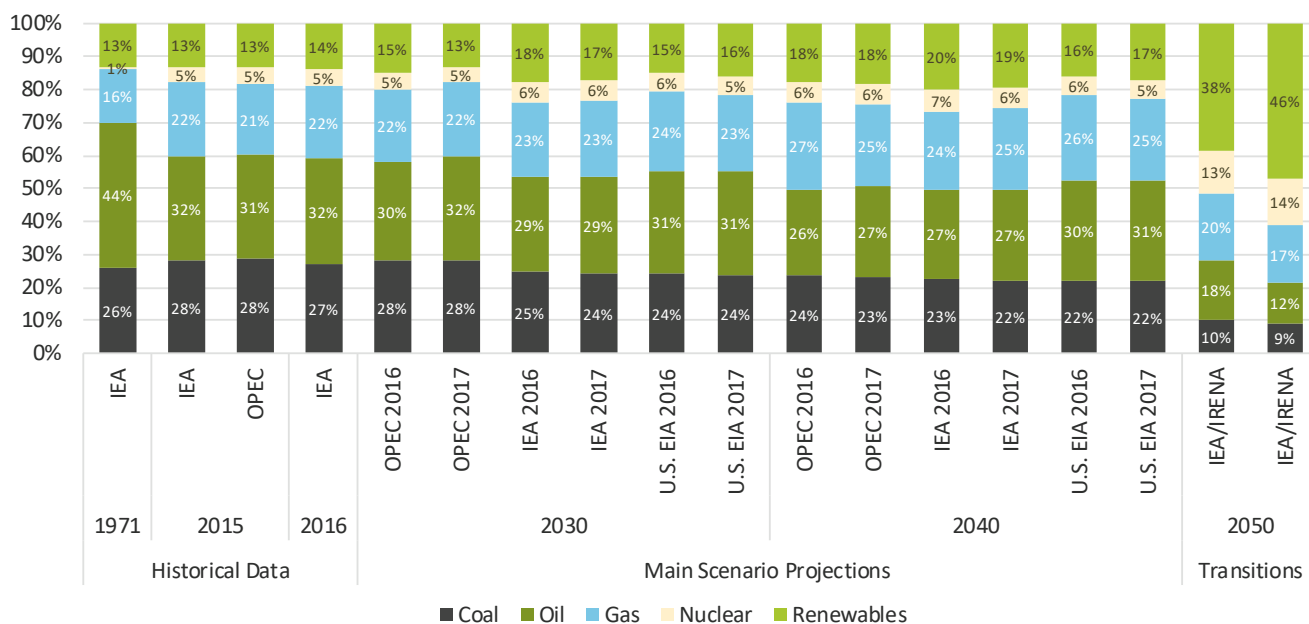
Dialogue and Data Visibility Reduce Volatility



Fuel Shares in World Primary Energy Demand

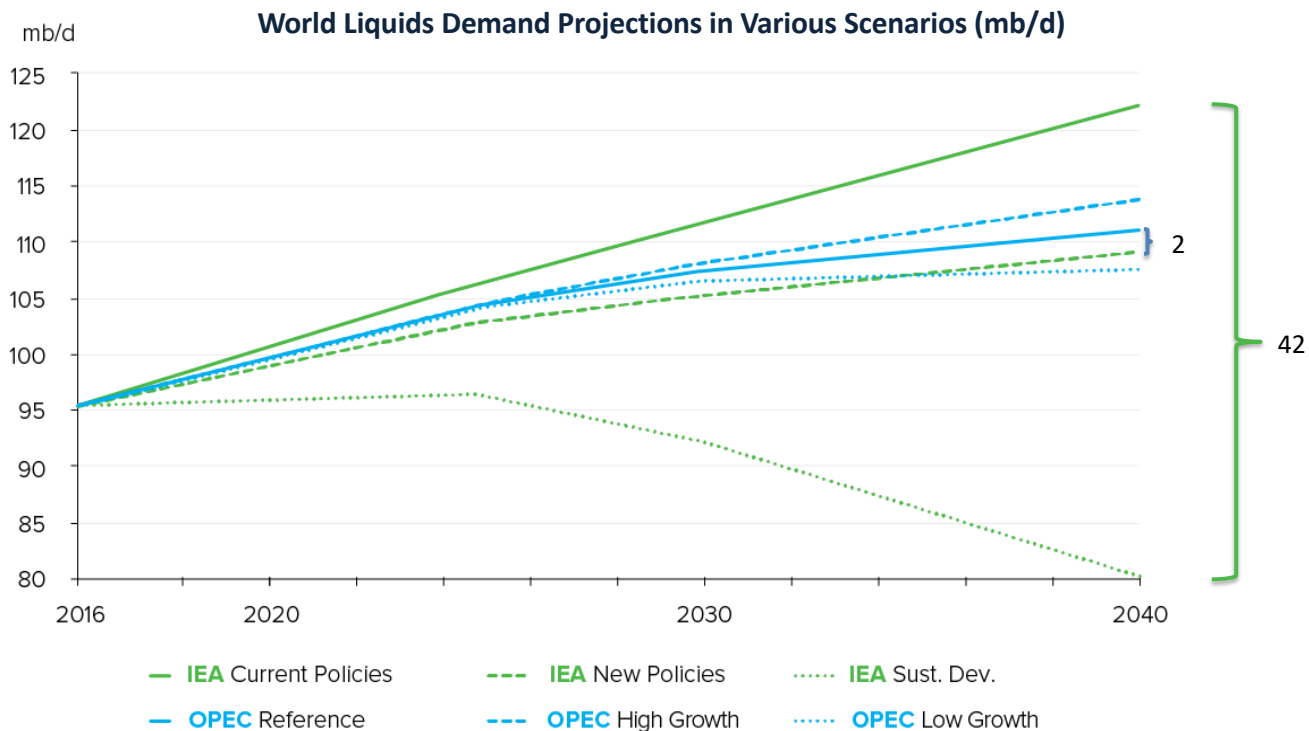
Remain surprisingly steady over the years and in main scenario projections

2016 and 2017 IEA and OPEC Outlooks to 2040 and IRENA-IEA Renewable Perspectives to 2050 on World Energy Demand against Historical Data



From Security of Supply to Security of Demand

IEA demand scenario projections vary by 42 mb/d in 2040



EIGHTH IEA IEF OPEC SYMPOSIUM ON ENERGY OUTLOOKS
 A COMPARISON OF RECENT IEA AND OPEC OUTLOOKS

