Global Energy Outlook: Opportunities and Challenges

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Abstract

In mid-November 2014 the Paris-based International Energy Agency issued its latest World Energy Outlook. The main theme of the report is that the global energy system is "in danger of failing short of the hopes and expectations placed upon it."[1] This study explores some of the main opportunities and challenges facing the global energy system. Specifically, the analysis focuses on energy security, both from consumers' and producers' perspectives, and the recent sharp drop in oil prices and the economic, environmental and strategic implications. The forces that have led to the recent decline in prices seem to differ from those that led to previous declines. It is likely that prices will remain low for a prolonged period of time. Major producers and consumers will have to re-adjust their economic policies and strategies to respond to these key changes in the global energy landscape.

Key Words

Energy security, oil prices, climate change, shale gas, diversification, renewable energy.

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Introduction

The broad Middle East and particularly Iran, Iraq and the six Arab States on the Persian Gulf (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates) enjoy several advantages as the world's major oil and natural gas producers. First, together Middle Eastern producers hold the world's largest proven oil and gas reserves. No region in the world holds as much proven reserves. The high level of production and low (though growing) level of consumption mean that a substantial proportion of the oil produced in this region is exported to the rest of the world. Meanwhile, the massive natural gas reserves and the relatively small volume of production mean that the region has the potential to play a leading role as a natural gas supplier, once gas deposits are developed.[2]

No wonder, the International Energy Agency projects that the region "remains at the center of the longer-term oil outlook". The Paris-based organization predicts that up to the mid-2020s non-OPEC rising output from the United States, Canada, Brazil and others will

reduce the share of Middle Eastern producers in the global production. However, this non-OPEC production, mostly tight, sands and deep-water oil, will decrease and the Middle East region will provide the bulk of production.[3]

Second, the cost of production in the Middle East is one of the lowest in the world. Unlike Russia, the Caspian Basin, the North Sea, and the Gulf of Mexico, most oil and gas fields are either onshore or in the shallow waters of the Persian Gulf and the Mediterranean Sea. This accessibility means that much of the oil and gas production in the Middle East is less environmentally challenging and cheaper to produce.

Unlike private international oil companies, which aim mainly at maximizing their profits, state-owned and state-managed national oil companies are driven by both strategic concerns and commercial interests.

Third, the Middle East region has been producing and exporting oil and gas for decades. Generally the energy infrastructure is well developed. Extensive pipeline networks connect the oil and gas fields to marine export terminals and loading platforms on the Persian Gulf and the Mediterranean Sea. From there the region has easy access to the high seas and global markets in Asia, North America and Europe. Unlike other producing regions, shipping ports in the Middle East do not experience major storms or freezing.[4]

Finally, traditionally most of the world's spare capacity of oil is concentrated in the Persian Gulf, particularly Saudi Arabia. This spare capacity serves as an insurance policy against any unexpected interruption of supplies due to natural or political reasons.[5] This concentration of spare capacity can be explained by the fact that oil and gas production is dominated by state-owned national companies. Unlike private international oil companies, which aim mainly at maximizing their profits, these state-owned and state-managed national oil companies are driven by both strategic concerns and commercial interests. Saudi Arabia and other Gulf producers maintain spare capacity to ensure short- and long-term stability of global markets.

Given these advantages and despite rising production in Russia, the Caspian Basin, Africa and, more recently, North America, the bulk of the increase in world oil output is projected to come from the Middle East. The oil and gas resources of the Middle East will continue to be critical in meeting the world's growing appetite for energy.

In short, history and geology put Middle East oil and gas producers in

the driver's seat. The region has been producing and exporting crude and natural gas for decades and is certain to maintain this policy and status in the future. The projected rise of the Middle East's share in meeting global demand means that major consumers (i.e. China, India, Japan, South Korea and Europe) are likely to grow more dependent on energy supplies from the Middle East.[6] The smooth continuation of this mutual dependence between Middle Eastern producers and major consumers require close cooperation in addressing several strategic and commercial challenges. Some of these challenges are domestic while others are regional and international.

Equally important, international sanctions, wars, ethnic and sectarian strives, terrorism, and overall regional instability have negatively impacted the full utilization of the Middle East's hydrocarbon resources.

Most of the Middle East governments have achieved a modest success in initiating and implementing economic and political reform. There is much to be desired in pursuing economic development and political liberalization. Equally important, international sanctions, wars, ethnic and sectarian strives, terrorism, and overall regional instability have negatively impacted the full utilization of the region's hydrocarbon resources.

These domestic, regional and international challenges have raised doubts about the reliability of oil and gas supplies from the Middle East. In the last few decades policymakers, media outlets and think-tanks in Washington, Brussels, Beijing and Tokyo have frequently called for reducing energy dependence on the Middle East. U.S. officials, more than their European and Asian counterparts, have repeatedly talked about "energy independence" and stopping or reducing the nation's "addiction to oil."

This study argues that such calls are useful for political rhetoric and gaining votes. As an energy analyst asserts, "Presidents may declare an urgent need to cut imports and boost energy independence - no one ever lost political support by seeing evil and blaming foreigners."[7] In reality and based on projections by US, European and Asian governments as well as by major international organizations, the world will grow more dependent on oil and natural gas supplies from the Middle East. Furthermore, the region's long history of producing and exporting hydrocarbon fuels suggests that concerns over interruption of supplies from the Middle East are exaggerated. A close scrutiny indicates that, with a few exceptions, the region has proven a reliable producer and exporter of oil and natural gas.

Shortly after the 1973 Arab-Israeli war Arab oil producing countries cut production and imposed an oil embargo on the United States and a few other countries for their support to the Jewish state.

In the following sections I briefly discuss the concept of "energy security" and some of the major socio-economic and political challenges threatening the energy sector in the Middle East. The analysis underscores the multi-dimensional nature and complexity of energy security and policy. This will be followed by an analysis of the recent sharp drop in oil prices and the economic, environmental and strategic implications.

Energy Security

For long time the world relied on fossil fuels to meet most of its energy needs. Not only were the prices affordable, but equally important, interruption of supplies triggered by political disputes was not an issue. The creation of the Organization of Petroleum Exporting Countries (OPEC) in 1960 as a cartel representing the interests of major oil-producing countries served as a sign that a key change was about to take place. The so-called oil embargo (1973-74) that followed the 1973 Arab-Israeli war represented a turning point in the decades-long perception of energy security. Since then the supplies of oil and natural gas have at times been interrupted due to political crises. These geo-strategic disputes have also contributed to intense price fluctuations and volatility.

Against this background the interest in alternative energy has emerged and evolved since the mid-1970s. Problems related to safety, reliability, and affordability have slowed down the maturation of nuclear and renewable power. In recent years technological advances and lower costs have convinced many countries to take a fresh look at these alternative energy resources. Furthermore growing environmental concerns have made energy security inseparable from the transition to a low-carbon economy.[8] These developments have broadened the perceptions and understandings of energy security. In 2011 the International Energy Agency (IEA) adopted a comprehensive approach that includes availability (geological), accessibility (geopolitical), affordability (economic), and acceptability (environmental and social).[9] Finally, the availability of reliable supplies at affordable prices with little environmental impact represents only half of the energy equation. The other half is efficient demand. Stated differently, energy security has supply-side and demand-side components.[10]

Recent Drop in Oil Prices: Economic and Strategic Implications

Shortly after the 1973 Arab-Israeli war Arab oil producing countries cut production and imposed an oil embargo on the United States and a few other countries for their support to the Jewish state. This led to what came to be known as the first oil shock (a surge in oil prices in a short period of time). Since then oil prices have fluctuated responding to changes in supply and demand as well as political developments. In 2008 oil prices reached their peak, around US$147 and for the following years stayed above US$100. The last few months, however, have witnessed a steady drop of oil prices. In early November a barrel of oil is sold for a little more than US$80.

The forces that have led to the recent decline in prices (more production and less consumption) seem to differ from those that led previous declines. It is likely that prices will remain low for a prolonged period of time. Major producers and consumers will have to re-adjust their economic policies and strategies to respond to these key changes in the global energy landscape.

Renewable energy is any form of energy that is replenished by natural processes at a rate that equals or exceeds its rate of use.

Reasons for Declining Oil Prices

Oil prices, like the prices of any other commodity, reflect and respond to changes in supply and demand. For decades major consuming countries, led by the United States, have felt vulnerable to economic and political upheavals in producing countries. Since the Nixon administration in the early 1970s U.S. officials have talked about reducing dependency on the Middle East and ending the nation's addiction to oil. In pursuing these objectives consuming countries have adopted a three-fold strategy: increase oil and gas production, diversify the energy mix, and reduce consumption.

Increase oil and gas production

Oil companies have invested heavily in new exploration techniques. In recent years drilling in deep water has substantially contributed to an increase in both production and reserves. Equally impressive, the so called shale revolution (a combination of horizontal drilling and hydraulic fracturing or "fracking") has added millions of barrels in US production (and billions of cubic meters of gas).[11] This technology has transformed the U.S. from a major importer to a rising exporter. The United States has taken the lead in producing shale gas and shale/tight oil, but proven

reserves have been reported in many other countries in Europe, Russia, China and others.[12] In other words the promise of a shale revolution is not limited to the United States. Finally, the technology is not static. Oil companies are investing in improving the technology and overcoming environmental challenges.[13]

Diversification

In addition to the rise in oil and gas production, consuming countries have sought to diversify their energy mix-reducing the share of fossil fuels and increasing the share of alternative energy, particularly renewable sources. These efforts are driven mainly by concerns over energy security and climate change. Renewable energy is any form of energy that is replenished by natural processes at a rate that equals or exceeds its rate of use.[14] Renewable energy is obtained from the continuing or repetitive flow of energy occurring in the natural environment and includes resources such as biomass, solar energy, geothermal heat, hydropower, tide and waves, ocean thermal energy, and wind energy.[15] Some renewable energy resources such as hydropower are technically mature and have been deployed on a significant scale. Others, such as wind, solar, and geothermal, are in a nascent phase of technical maturity and commercial production and deployment. Unlike fossil fuels, almost all countries have access to some forms of renewable energy. For example, solar and ocean energy are widely distributed. Still, the contribution of renewable energy to the overall energy mix varies substantially from one country to another. In recent years renewable energy has been expanding rapidly. The International Energy Agency (IEA) projects that renewable energy will account for nearly half of the increase in global power generation to 2035, with wind and solar making up 45% of the expansion.

Energy efficiency

The energy equation has two sides: supply and demand. The increase in oil supplies has been accompanied by aggressive efforts to reduce consumption. The IEA estimates that investment in energy efficiency markets worldwide in 2012 was between US$ 310 billion and US$ 360 billion. The Agency estimates that final consumption in the IEA countries is 60% lower today because of energy efficiency improvements over the past four decades. European countries and the United States are taking the lead in global energy efficiency. The European Union (EU) has set itself ambitious energy and climate goals. By 2020, Europe should achieve a 20% decrease in energy consumption, a 20% share in renewables in the EU energy mix, and a 20% decrease in energy consumption. In its Energy Efficiency Communication,

released in late July this year the EU proposed a new energy efficiency target of 30% for 2030.[16] Indeed, most of the increase in consumption in the coming decades will come from South Asia and the Middle East.

Economic and Strategic Implications

The rise in oil and gas production, diversification of energy mix, and decline in consumption have fundamentally altered the global energy landscape. Almost all countries in the world have contributed to these new dynamics, albeit at different degrees. The potentially prolonged period of low oil and gas prices is likely to have significant and wide-spread implications.

Environmental impact

Since the early 2000s, global natural gas production has substantially increased. In addition to well-established players such as Russia, Iran, and Qatar, several new producers have emerged as well-established exporters. These include Turkmenistan, Australia, and the United States. Cheap gas has replaced coal in generating electricity in many countries. Given that coal is more polluting than gas, this replacement is considered a positive development in the efforts to contain pollution. However, cheap gas has also reduced incentives to invest in renewable energy, which is less polluting than gas. In other words, cheap gas is considered a mixed blessing with regard to environment protection and climate change.

In the last few decades most Middle Eastern producers have achieved a very modest success in their efforts to reduce their heavy dependency on oil and gas revenues.

Economic impact

Consuming countries will benefit from cheap oil and gas while producing countries are likely to lose (at least in the short term). Lower prices mean that the billions of dollars the United States and Europe would have transferred to producing countries would, instead, be spent and/or invested in the local economies. These "saved funds" can be used to stimulate the economy and generate jobs. On the other hand, low prices might negatively impact (slow or even undermine) the shale revolution, as shale/tight oil along with production from the North Sea are expensive.

Production costs in the Middle East are the cheapest. Middle Eastern producers can make profit even at US$70 per barrel. However, such a low price would not be enough to balance their budgets.

In the last few decades most Middle Eastern producers have achieved a very modest success in their efforts to reduce their heavy dependency on oil and gas revenues. They need high prices to maintain and support the high standard of living they enjoy. Several Middle Eastern producers have created sovereign wealth funds (oil funds) to invest their oil revenues. These funds (such as the United Arab Emirates' Mubadala, Qatar Investment Authority and Kuwait Fund) are among the richest in the world. Their massive financial assets can help overcome the declining oil revenues. Less wealthy oil producers such as Iran will have to be more aggressive in reforming their economies and creating other sources of revenues.

Strategic impact

Oil is not only an economic commodity, it is a strategic one as well. The key changes in oil markets are likely to have a significant impact on the political and security relations between producers and consumers. In its Energy Outlook report, British Petroleum concludes that the United States is on a path to achieve energy self-sufficiency, while import dependence in Europe, China and India will increase. Asia will become the dominant energy importing region. Russia will remain the leading energy exporter, and Africa will become an increasingly important supplier.[17] While it will remain a key energy player, the Middle East is likely to see relatively static exports. These projections are likely to shape geopolitical relations between producers and consumers.

Middle Eastern producers, led by Saudi Arabia would provide un-interrupted oil supplies to Europe and the United States at "reasonable" prices and, in return, Western powers would guarantee their security.

Since the 1940s many analysts have argued that Western, particularly American, relations with the Middle East were largely driven by the "oil for security" bargain. In other words, Middle Eastern producers, led by Saudi Arabia would provide un-interrupted oil supplies to Europe and the United States at "reasonable" prices and, in return, Western powers would guarantee their security.[18] In recent years the fundamentals of this bargain have changed. The United States is becoming less dependent on foreign supplies from the Middle East and elsewhere. Currently the bulk of US imports come from the Western Hemisphere. Meanwhile, Asian big economies (i.e. China, India, Japan and South Korea) are growing more dependent on Middle Eastern oil. In the last two decades the

broader economic and trade ties between the Middle East and South Asia have grown much faster and deeper than those between the former and Western powers. These expanding volumes of trade and investment suggest that sooner or later Asian powers (particularly China) are likely to assume responsibility in protecting sea lanes and oil shipments from the Gulf to South Asia.[19]

Middle Eastern producers have reacted to the sharp decline in oil prices in multiple ways. Instead of cutting production, Saudi Arabia, the United Arab Emirates, and Iran (among others) have reduced the price. The UAE has recently allowed the expiration of some longstanding concessions to major western oil companies and is considering replacing some of them with partners from Asia. The Qatar Investment Authority announced plans to invest US$15 billion across Asia in partnership with China's CITIC Group.

These recent reactions by oil producers should not be over-estimated. Oil funds will not turn their backs on Europe. The continent still is the major destination of investments from the Persian Gulf and elsewhere. Western oil companies have the most advanced technology in oil exploration and development and will continue playing a major role in the energy sector in the Middle East. The bottom line is that the oil market is a global one, where disruption anywhere impacts prices everywhere. The long-standing close economic and strategic cooperation between Western powers and Middle Eastern producers is likely to survive the recent drop in oil prices.

Endnotes

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