

Global Agenda Council on the Future of Oil & Gas

Future of Oil & Gas

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Introduction

The enormous economic contribution of the oil and gas industry to many national economies makes its future of critical importance to the global community. The purpose of this paper is to consider the future of the oil and gas industry and the profound challenges that it is facing. Although oil and gas are likely to be major sources of energy for decades to come, policy-makers and the public worldwide are re-evaluating the central role they play in modern life. With rising concerns for future demand, climate change, the cost of project development, governance and deteriorating community-level relationships, the industry finds itself in a delicate situation. Only by recognizing the true scope of these ongoing challenges and addressing their implications by offering leadership on solutions can the industry continue to prosper in an increasingly complex world.

Future Demand Trends

Since the Industrial Revolution, oil and natural gas have played an instrumental role in economic transformation and mobility in everyday life for the majority of the world's population. Oil was so fundamental to the development of modern society in the industrialized world that the 20th century is often referred to as the Age of Oil. Today, oil and natural gas play a pivotal role in the current global energy system. Approximately 31% of primary energy used globally is met by oil-based fuels while natural gas represents a further 21% of total world energy supply.

Since the 1980s, many oil-producing countries and oil companies operated from the assumption that the industrialized world would progressively use up its easy to access oil resources and become increasingly dependent on oil controlled by OPEC (the Organization of Petroleum Exporting Countries), and in particular the vast reserves of the Middle East. Under this long-prevailing world view, which lasted from the 1980s until recently, OPEC's petro-power would increase over time and therefore all the oil cartel really needed to do was wait it out for that day to come. Through the 2000s and up until last year, OPEC took a revenues-oriented strategy, believing that this oil-constrained world had arrived and its oil was more valuable under the ground than on the market. Oil companies, too, responded to this world view by pursuing a business model that maximized adding as many reserves as possible to balance sheets and warehousing expensive assets.

The shale boom in the United States and the Paris climate accords, however, have changed the industry's outlook for the future of oil and gas. With the prospect that major economies like the US, China and Europe will actively try to shift away from oil at a time when the costs for producing oil from shale and other kinds of source rock as well as from conventional sources is declining through technological innovation, producers are coming to realize that oil under the ground might someday be less valuable than oil produced and sold in the coming years. In effect, perceptions have changed from believing a peak in

supplies was possible to believing a peak in demand for oil is possible over the next several decades. Some investors have also become concerned that oil and gas company shares may be overvalued, if warehoused high-cost oil and gas assets become stranded.

This dramatic shift in expectations is changing the operating environment for the future of oil and gas. Moreover, policy-makers, investors and scientists gathering in Paris last December at the UNFCCC COP21 concluded that new efforts are needed if the planet is to avoid catastrophic climate change driven by the accumulation of greenhouse gases in the atmosphere. Under a scenario where fossil fuel use is restricted to limit global warming to 2°C, oil use may still be relatively stable, but certainly not expand to the same extent as in existing business-as-usual expectations.

The World Economic Forum's Global Agenda Council on the Future of Oil & Gas considers strategies that can be deemed to be robust for the oil and gas industry in a future 2°C world towards 2040 as well as most alternative futures. The council is not advocating or opining on the "realism" or likelihood of any given scenario, but considers what would be a robust strategy either in a business-as-usual outcome or if a low-demand growth circumstance indeed emerges.

According to the central New Policies Scenario of the International Energy Agency (IEA), the need for oil and gas to fuel global economic well-being for an expanding middle class in the developing world will increase oil and gas demand significantly over the next three decades, despite significant improvements in energy efficiency. Given the natural decline that comes in operating the world's current inventory of producing oil and gas fields, industry believes it can sustain its current business models. In its New Policies Scenario, the IEA projects that oil demand will rise by 14% from the 2014 demand of 90.6 million b/d to 103.5 million b/d by 2040. Overall, the global system will still be dependent on oil and natural gas for the majority of the energy required to fuel economic activity, with fossil fuels generally representing roughly 75% of total primary energy use in 2040. But this forecast is looking more questionable in light of changing global economic conditions, technology innovation and shifting demographic trends.

Under a scenario where fossil fuel use is restricted to limit global warming to 2°C, oil use would be significantly more limited. The IEA's 450 Scenario (consistent with a 50% probability for less than 2°C global warming) projects global oil demand to rise slightly to 93.7 million b/d in 2020 but thereafter fall to 74.1 million b/d by 2040. By comparison, coal consumption would fall 38% over that period and natural gas demand would rise 16%.¹ According to Norwegian oil firm Statoil's 2°C Renewal scenario, and assuming accelerated clean technology transitions, for instance, oil use would be about 15% lower than today at

¹ International Energy Agency, *World Energy Outlook*, 2015.

below 80 million b/d by 2040 and coal use would drop precipitously to only 14% of primary world energy demand. Under the Statoil scenario, natural gas would rise to 24% of primary energy, up from 21% today.²

A similar scenario study by the University of California, Davis, suggested that several emerging factors – efficiency technologies for advanced vehicles, logistics planning and freight, changes in urban transport patterns that cap personal vehicle ownership and congestion, and slower than expected economic growth in key Asian economies – could bring a temporary peak of oil demand in transport in the next decade or so. Population growth and expanding wealth effects, without strong policy interventions, will eventually overwhelm these improvements, allowing oil demand in the transport sector to reach 55 to 60 million b/d by the 2040s, compared to 52 million b/d in 2015. This outlook contrasts with the IEA Current Policies Scenario of 75 million b/d for transport oil demand by 2040 (based on today's policies only) and ExxonMobil's 2015 base forecast of about 69 million b/d by 2040.

Shifting Strategies

If industry and markets become more confident in a peaking, or at least a flattening, of oil demand growth, a change in investment and production strategies is likely to emerge, both among private companies and within OPEC itself. That means even if oil markets tighten in the next year or two, players will have to think twice about delaying the development and production of reserves, lest they disadvantage themselves over the longer term. Only parties that have no choice (lack of finance, geopolitical barriers, inability to organize investment due to bureaucratic failures, etc.) will be left out of the calculation whether to consider the remaining “carbon budget” for global oil production in deciding how much, and when, to invest to monetize existing reserve holdings. Companies will also have to consider when it no longer makes sense to continue exploration for new resources in high-cost, long lead-time environments as countries with large, low-cost reserves more aggressively pursue a market share-oriented strategy for their remaining oil and gas assets.

In this possible environment, to continue to attract investors and capital, the oil and gas industry as a whole must develop a value proposition that is consistent with its core production not growing as overall production growth may not be possible for all players. To deliver bottom-line value growth with stable top-line production, standardization, repetition, low-cost solutions and manufacturing processes will probably play a key role in reducing costs and increasing margins. This will partly be driven by consolidation in the industry and partly by competitive pressures and cooperation between the industry and its suppliers. This is a fundamental change for an industry geared towards tailor-made solutions to seek competitive advantage.

To balance cost challenges against the possible need for new reserves, a leaner and more efficient industry is required both in execution and operation. Companies will need to be prepared to deliver significant volumes of oil and gas at competitive returns, even if prices remain low and carbon externalities are priced more accurately. The industry will undergo a new technical revolution, with significantly higher levels of artificial intelligence and automation and remote operation and management. The new leaner environment will impact the supplier industry, including local content in host nations, and adversely affect national revenues achievable from the oil sector.

Trust Challenges

To demonstrate that it can maintain the value creation proposition for investors in the face of growing uncertainties, the oil and gas industry will need to embrace strategies that can create value in any scenario, including shortening project cycle times, minimizing product losses (including methane leakage), and increasing recycling and reuse of inputs such as water, heat and steel. Such strategies align industry more closely with technical solutions that will be attractive to society as a whole.

But fundamentally, in order for the oil and gas industry to be seen as a partner in energy solutions and economic prosperity – rather than a source of environmental damage and driver of sectarian conflict – the industry will need to address the serious trust challenges created by the failures of its worst ranks. A 2013 Gallop poll, for example, ranked the oil and gas industry as the least trusted industry, tied for last place with the tobacco industry, despite the pivotal importance of energy in daily life. This loss of trust has been amplified by the industry's linkages to controversial lobbying and law suits against climate change policies and other environmental and safety regulations. The industry tends to see the solution as better communication of technical issues. However, the public is seeking both measurable improvement in performance and greater transparency and disclosure.

The more challenging environment for oil and gas investment increases the stakes for addressing above-ground risks that prevent or delay resource development. Even with more stringent climate policies, oil will remain the dominant fuel for transport for the next two to three decades. And yet, oil and gas industries often meet sharp resistance around the world in many communities that have experienced negative environmental, social and geopolitical consequences from oil and gas exploration and development. Oil and gas companies have set expectations among their stakeholders that they can operate without negative environmental impacts, but, in many cases, actual performance has fallen short of these expectations.

Many operators work to high standards and go beyond reasonable efforts to clean up spills and restore the environment to its previous condition. However, highly visible lapses in environmental performance have undermined the confidence of an influential segment of society of the willingness of oil and gas companies to

² See Statoil's Renewal scenario presented in Energy Perspectives 2015. Click [here](#).

deliver fuel without undue costs on society that exceed the social benefits received.

The oil and gas industry is also plagued by incidents and accusations of corrupt practices. The idea of a corrupt oil and gas industry is deeply ingrained in public perceptions in many parts of the world and remains in the news with major events like the Petrobras and Nigerian government scandals. This lack of public trust in the industry complicates project development and jeopardizes government approval for major infrastructure projects. However, corruption matters beyond public trust. It is an enormously costly problem that creates operational and supply chain inefficiencies, can result in huge fines and compliance costs in the aftermath of a scandal, and has a negative impact on the distribution of wealth in certain societies, linking economic damage and political instability to the oil industry itself. Mistrust, strained relations and conflicts with local communities remain a problem in many locations. A private Goldman Sachs study indicated that nearly half of the risks facing projects were non-technical, with stakeholder-related risks being the single biggest issue.

The negative image of the oil and gas industry makes it challenging for the industry to recruit the most talented candidates in some locations as well as its ability to raise capital from institutional investors who can often find the business highly speculative and risky. Consumers are also questioning whether oil and gas will remain a reliable fuel source and desire a transition to cleaner sources of energy. Companies that ignore these challenges run the risk that it will be their balance sheet assets, and not competing oil reserve assets, that are stranded in the long run. By addressing these risks systematically, the industry would be able to ensure that markets value and finance oil and gas in an orderly transition to reflect changing demand outlooks.

Addressing Trust Challenges and Regulatory Uncertainty

Other industries such as the US nuclear industry and international airline carriers have created independent industry-wide reporting standards and verification/auditing methods and have established successful transparent, voluntary systems for measuring and rewarding best-in-class standards. Mutualizing risks has proven successful in other industries and pooling arrangements have proven useful already in oil and gas, notable examples being the tanker pools and the Canadian Oil Sands Innovation Alliance. Partnering with institutions like the Extractive Industries Transparency Initiative (EITI) and Sustainability Accounting Standards Board (SASB) can also enhance trust and assist companies in promoting standards industry-wide. These same standards can be applied to ethical lobbying practices and arm's length relations with regulators. Pooling arrangements that improve cooperation in industry during times of supply emergencies such as fuel loans and swaps can also reduce price volatility and give consumers improved service and performance.

Generating employment, investment and sales of energy products is no longer sufficient to ensure stakeholder satisfaction of oil and gas in light of breakdown of public trust in the industry's capabilities and motives. To address emerging threats to the industry's licence to operate will take a concerted effort in accountability, transparency and improved stewardship and performance across the whole industry. Relying on regulators and the courts to hold "bad actors" to account have not served the interests of the wider industry whose reputation is tainted by the same broad brush. Rather, an institutional framework that provided an agreed upon gauge for good practice would benefit both industry and society. Such a framework could enhance transparency and thereby provide confidence to investors and the public that industry can mitigate the circumstances of the necessary reliance on oil and gas as the energy system transitions over the coming decades. For oil and gas leadership, failure to address above-ground risks will run higher competitive risks as delays will be critical to resource development, while demand is stable and robust.

Eventually, players who remain competitive in the oil and gas industry will have to consider whether it can be more profitable to shareholders to develop profitable, low-carbon sources of energy as supplements and ultimately replacements for oil and gas revenue sources, especially to maintain market share in the electricity sector. This will require a change in the oil and gas industry investors' mindset. To develop this second leg of the oil and gas industry's activities, the industry may find new opportunities by addressing the technological challenges associated with the different parts of the renewable space, as well as how to develop efficient combinations of large-scale energy storage and transport solutions in a world with a lot of variable renewable electricity.

Furthermore, it is necessary to engage in a dialogue with regulators on efficient framework conditions for stable and reliable electricity supply. Capacity payments, cost-sharing mechanisms, revenue modulations to compensate for periods with zero or negative electricity prices, etc., are issues to consider as well as business partnerships for flex-fuel technologies to ease infrastructure transitions.

Finally, to improve resiliency to rising carbon pricing, the oil and gas industry may want to partner with vehicle manufacturers and other equipment manufacturers to improve the carbon efficiency of end-use energy to allow for lower emissions even when using fossil energy.

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