



OPEC's Long-term Outlook

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Energy Industry Report

The Al-Attiyah Foundation



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INTRODUCTION

OPEC'S LONG-TERM OUTLOOK

The Organization of the Petroleum Exporting Countries (OPEC) was created in 1960 by five founding members, Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela, with the aim to coordinate and unify the petroleum policies and ensure the stabilization of oil markets in order to secure an efficient, economic and regular supply of petroleum to consumers, a steady income to producers and a fair return on capital.

Sixty years later, as the energy industry faces drastic changes, this report looks at what the longer-term role of OPEC and OPEC+ will be in the 21st century? How the organisation will cope with a changing oil market, and what role will it play in world climate policy?



Energy Industry Report

This research paper is part of a 12-month series published by The Al-Attiyah Foundation every year. Each in-depth research paper focuses on a prevalent energy topic that is of interest to The Foundation's members and partners. The 12 technical papers are distributed in hard copy to members, partners, and universities, as well as made available online to all Foundation members.



EXECUTIVE SUMMARY

- Over more than 60 years of its existence, OPEC had several leading aims, that have evolved and changed over time.
- It sometimes behaved as a classic cartel, by restricting supply, with periods of success as well as failures. But its limitation of long-term output growth has been more significant than short-term adjustments.
- Competition from non-OPEC producers has always been a factor, but US shale output has been particularly challenging, and will remain a factor.
- Saudi Arabia, with its GCC allies, has become even more dominant in the organisation because of the declining influence of some other states.
- The OPEC+ cooperation has been necessary for price defence, but marks a new and more complicated era for the organisation.



IMPLICATIONS FOR MAJOR OIL AND GAS PRODUCERS

- OPEC will not collapse or disappear. However, its role will need to change in a world of peak oil demand and climate targets.
- There will probably not be a radical change in membership, though some smaller producers may join or leave.
- The OPEC+ cooperation, will increasingly become important for future oil policy because of the strength of Russia.
- Quotas will need to be adjusted after the pandemic because of declining capacity in some states and plans for strong production growth in others. This will be controversial.
- OPEC could also assume a greater role on climate change, and help its members advocate for, and adapt to, changing policy and economic circumstances.



OPEC'S HISTORY

First OPEC conference, 10-14th September 1960, Baghdad^{xviii}



The early years 1960–71

OPEC is an intergovernmental organization that was established on 14th September, 1960 at the Baghdad Conference. Its founding members are Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela (Figure 1).

The group's formation came at a time of a changing global economic and political landscape: in the post-WWII economic boom, where countries such as the United States, the Soviet Union, United Kingdom, France, and Japan led the global economic recovery with full employment.

It was also a time of transformation in the political landscape characterised by extensive decolonisation and the establishment of new independent states across the developing world.

At the time of its inception, the global crude oil sector was dominated by the "Seven Sisters" (i.e. BP, Royal Dutch Shell, Standard Oil Company of California (SOCAL, now Chevron), Gulf Oil (bought by Chevron in 1985), Texaco (merged with Chevron in 2000), Standard Oil Company of New Jersey (later Exxon, now ExxonMobil), and Standard Oil Company of New York (Mobil, now part of ExxonMobil)). Sometimes France's Total (named CFP up to 1985) is included in the group instead of Gulf.

Through interlocking concessions in the major oil-producing states outside the USA and Soviet Union, these companies dominated global crude oil production, trade, refining and marketing. They divided global markets outside the USA to avoid excessive competition between them, based initially on the secret Achnacarry Agreement of 1928. They set the posted oil price, and paid taxes based on that price. Tax rates were typically set at 50% of profits, agreed as a principle between Aramco, the



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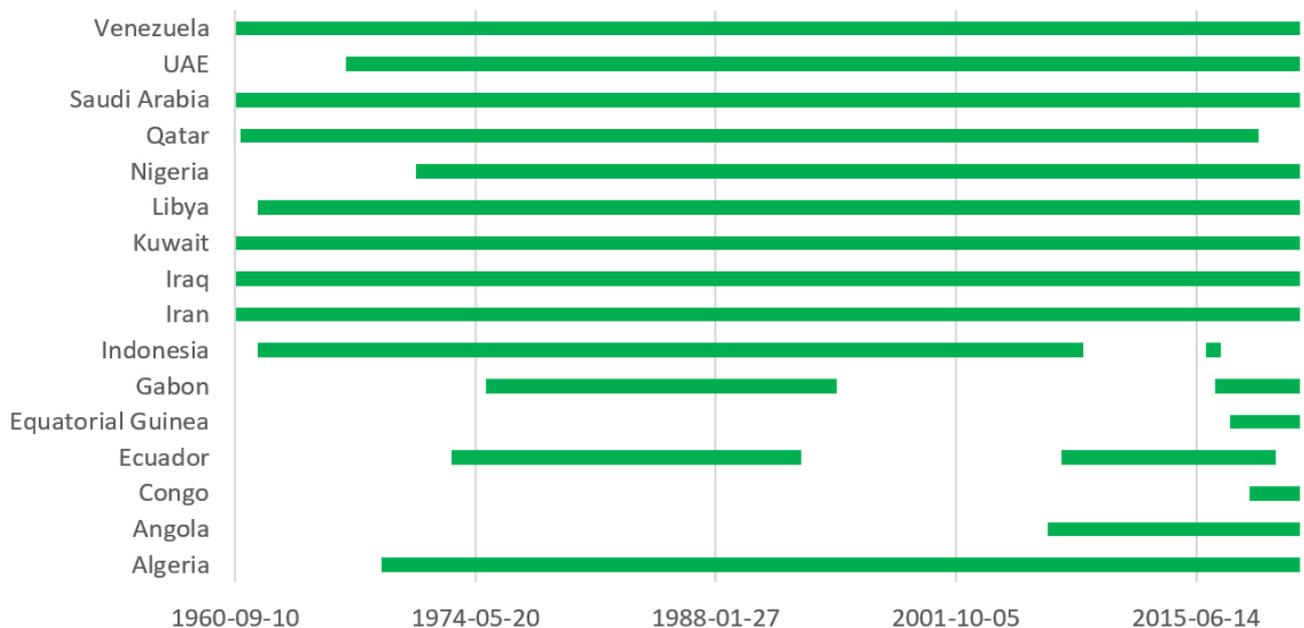
American concessionaire in Saudi Arabia, and King Abdulaziz in 1950, and adopted by other producing countries. Posted prices as well as market prices were very stable because of the careful scheduling by the majors and the regulating effect of the Texas Railroad Commission (TRC), which controlled production in the US's largest oil state. The TRC served as an initial inspiration for OPEC.

When Iran under Prime Minister Mohammad Mossadegh attempted to nationalise its oil in 1951, Anglo-Iranian (later BP) successfully organised a boycott which undermined the country's attempts to market its own oil, leading to a US-backed coup against Mossadegh in 1953 and the return of the Shah to full power.

In February 1959, BP and the other majors cut posted prices, and in August 1960, Exxon reduced its posted price for Middle Eastern crudes, with Saudi Arab Light at \$1.80 per barrel, the same level as 1949. This cut the



Figure 1 OPEC Membership¹



taxes due to the host governments, while the majors could absorb the discounts within their integrated refining and marketing operations.

the event immediately catalysed the formation of OPEC, though discussions between representatives of Venezuela and the Middle East producers had been underway for some years beforehand.

OPEC's first real success wasn't increasing prices, but resisting the price cuts being imposed by the super majors. Throughout the 1960s, OPEC tried to limit production to increase prices, but they did so without much success. Despite very rapid demand growth, the world market was oversupplied due to rising production in the United States, quotas on imports into the US, growth in Soviet exports, and strong expansion in the giant fields of the Middle East and North Africa.



The OPEC states continued to compete against each other for investment by the Seven Sisters and hence increased production and market share. Some countries were perceived as politically "difficult", notably Iraq after the revolutionary government of Abd Al Karim Qasim withdrew most of the Iraq Petroleum Company's concession in 1961. They received less investment and hence less production growth than more cooperative states including Saudi Arabia, Iran, and Libya until its 1969 coup.

During the Six-Day War between Israel and its Arab neighbours in 1967, the Arab states instituted an oil embargo but this was ineffective due to the oversupplied world market and incomplete compliance. In response, in January 1968, the Organisation of Arab Petroleum Exporting Countries (OAPEC), a separate body from OPEC, was formed by Kuwait, Libya and Saudi Arabia, and joined later by most Arab oil producers, including some which are not part of OPEC, namely Bahrain, Egypt, Syria and, for a period, Tunisiaⁱⁱ.

OPEC had wished to establish its secretariat in Geneva, Switzerland, but moved to Vienna, Austria in 1965. Two years later, the organization endorsed the "Declaratory Statement of Petroleum Policy in Member Countries", which allowed member countries to exercise permanent rights and sovereignty over their national development and crude oil resource. By 1969, five new members joined, Qatar in 1961, Indonesia in 1962, Libya in 1962, United Arab Emirates (represented initially by Abu Dhabi) in 1967, and Algeria in 1968. The main achievements of the organisation in these years were to create solidarity and mutual understanding,

improve the member countries' knowledge of their petroleum industries, and push for improved tax takes.

The oil crises 1971–1985

During the 1960s, the grip of the majors had begun to loosen because of the emergence of "independents" such as Getty Oil and Occidental Petroleum, and state-owned oil firms such as ENI of Italy and Japanese companies. These "independents" entered areas outside the Middle East concession system, including Libya, the Saudi-Kuwaiti Neutral Zone, and new, mostly offshore, blocks in Iran. Tax terms became increasingly competitive, and the 50:50 division of profits broke down. Japanese firms offered a 56% share of profits to Kuwait and Saudi Arabia for the offshore Neutral Zone concession in May 1958, just after Standard Oil of Indiana (which became Amoco in 1985 and bought by BP in 1998) offered 75% for an offshore concession in Iranⁱⁱⁱ.

Throughout the 1970s, OPEC's international profile began to grow. US oil production reached a peak in 1970 and began to decline, eliminating the role of the TRRC in regulating prices. Very rapid demand growth ate up spare production capacity, while rising inflation in the US and its departure from the gold standard in August 1971 removed a key pillar of currency and price stability.

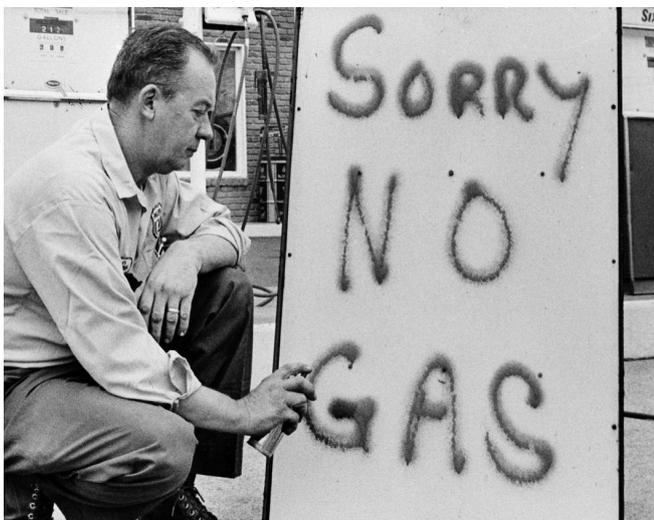
Libya became a major factor: it was run by a radical government led by Colonel Gaddafi and a US independent, Occidental, relied on Libya as its main source of crude oil. The Suez Canal was blocked from 1967 to 1975 because of war, making it harder to transport oil from Saudi Arabia and Iran to

the Mediterranean, and within the same time, an accident or sabotage on the Trans-Arabian Pipeline closed down another way to get oil to the Mediterranean. This raised the profile of the very light, sweet Libyan crude as a key supply for Europe.

At this point, Gaddafi demanded higher prices for Libya's oil, and Occidental, unlike the majors, had to agree. That demonstrated to other OPEC governments the power they held, leading to successive, successful increases in oil prices in the following years.



As a response to the October 1973 Yom Kippur War, OPEC members introduced an embargo targeting crude oil supplies to the United States, Canada, Japan, the Netherlands, and the United Kingdom, for extending their support to Israel. The embargo catalysed the first modern crude oil market shock, where prices increased dramatically from US\$ 2.90/bbl to US\$ 11.65/bbl.



This translated to a transfer of US\$ 100 B from Western consumers to Middle East and other oil producers. The "New Economic Order", became a buzzword at international conferences, and producers of other commodities, such as copper, formed their own organisations in an attempt to achieve similar price rises, control over their resources, and economic development. OPEC believed it could set prices at just below the production costs of expensive alternatives, such as synthetic crude from Oil shales or coal, to maintain its market share.

Some OPEC members, such as Saudi Arabia began to take a greater control of their national oil resources. In 1973, the Saudi state initially acquired a 25% working interest in ARAMCO, with an add-on of 35% in 1974, and eventually a full working interest by 1976. This further led to a complete nationalization of ARAMCO's assets in the 1980s. The concessions in Algeria were nationalised in 1971, Iraq in 1972, Kuwait in 1975, Venezuela by 1976, Qatar and the Kuwaiti share of the Neutral Zone by 1977, and Iran following the 1979 Revolution. International companies retained a partial interest in Abu Dhabi, Dubai, Nigeria, Libya and some operations in Qatar. The nationalisations

were generally consensual and compensation was paid, though the former partners felt this undervalued their stakes. But the shift in power and the collective action by OPEC meant that there was no attempt by the majors to form a united front to resist nationalisation or boycott the countries, as they did against Iran in 1951-53.

Another success by the cartel in the 1970s was the establishment of the "OPEC Fund for International Development" in 1976, which was mandated to support other developing countries, and thus, to gain OPEC some political goodwill at a time of record energy prices. Also, during the 1970s, OPEC's membership increased to thirteen with Nigeria joining in 1971, Ecuador in 1973, and Gabon in 1975.



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Three years down the line, OPEC was once again in the spotlight as a result of the "Second Oil Crisis", which resulted from the decrease in crude oil production in Iran following the Iranian Revolution in 1979, and then the outbreak of the Iran-Iraq War in 1980. At the peak of the crisis, crude oil prices tripled to US\$ 39 / bbl.

During the early parts of the 1980s, demand for energy and crude oil was impacted by the high prices and recession, forcing consumers to increasingly shift away from oil, in favour of gas, coal, nuclear power and more efficient equipment and vehicles. Consumption in the US dropped by 17% in the 1970s and 1980s and imports dropped by 50% while national income was growing by a third as consumers found substitutes for oil. Environmental issues began to emerge in the global energy discourse, primarily on air and water pollution.

The International Energy Agency (IEA), founded in November 1974 under the inspiration of Henry Kissinger, US Secretary of State, was intended initially as the industrialised Western countries' counterweight to OPEC. One of its key policies was formalising the coordinated holding and release of strategic oil stocks to avoid panics and meet unexpected disruptions^{iv}.

The high oil prices stimulated the exploration and development of remote areas, and as a result, Mexico, Alaska, the North Sea (mostly, the UK, Norway and Denmark) and West Siberia in the Soviet Union emerged as important oil exporters.

Because of nationalisation, the OPEC countries had mostly lost their direct access to the majors' vertically-integrated marketing outlets

in the industrialised countries. Crude trade and spot sales developed rapidly to fill the gap, with the North Sea Brent grade emerging as a key benchmark.

As a result, OPEC's share of the crude oil market and production decreased significantly. It also lost its ability to set prices, which were now increasingly determined by trading on exchanges in New York and London. Several OPEC countries, notably Nigeria, broke ranks on pricing to offer discounts to ensure they retained market share. In 1982, Saudi Arabia demanded the introduction of audited national production quotas for OPEC states to prop up prices, and deciding to unilaterally cut its own output. Saudi production fell from 10.27 Mbbbl/day in 1980 to just 3.6 Mbbbl/day in 1985, most of which was used domestically or sold in barter deals.



The oil slump 1986–2003

Because other OPEC members were taking advantage of the Saudis' willingness to cut production, in 1985, Saudi Arabia ended its policy of cutting output to defend prices. The kingdom introduced "netback pricing" where the price of its crude was determined by the value of the products that could be made from it, guaranteeing the refiner a margin. This made its crude highly attractive to buyers, the price of oil crashed from US\$ 25/bbl to US\$ 10/bbl, and the OPEC countries that had been "cheating" suddenly experienced big decreases in their revenues, leading them back to the bargaining table.

Thereafter, OPEC introduced a group-based, adjustment strategy with crude oil quotas divided among its members, and a Reference Basket for crude oil pricing. The group lost two smaller members, Ecuador late in 1992, and Gabon in 1995.

The 1990s were dominated by volatile but mostly low prices and restrained world demand growth. OPEC states believed that demand would recover and non-OPEC output would drop, but the period of oversupply was prolonged and it was difficult to gain adherence to quotas. Timely action from OPEC reduced the impact of the 1990–91 crisis, when Iraq invaded Kuwait, cutting off both countries' output temporarily and severely limiting Iraqi oil exports. The collapse of the Soviet Union in 1991 led to a sharp downturn in both its production and demand, but overall, its exports rose and post-Soviet states such as Azerbaijan and Kazakhstan became leading producers. Venezuela also re-opened to international investment with plans to boost production massively in defiance of its OPEC colleagues. The non-OPEC oil industry proved able to cut

costs and improve technology, including 3D seismic and horizontal drilling, to remain profitable despite low prices, and production expanded in the North Sea and Gulf of Mexico.

The Asian Financial Crisis of 1997 led to an economic downturn in Southeast and East Asia, and a mild winter in the Northern Hemisphere between 1998–1999 saw the oil market slump to price levels, as low as \$10 per barrel. However, a solid recovery followed in 1999, when the cartel agreed to cut crude oil production by 1.7 Mbbbl/day.

The oil boom 2003–2014

After the September 11th 2001 terrorist attacks in the US, prices rose briefly but then fell as recession took hold. OPEC cut production and even gained expressions of support from non-OPEC Russia, Mexico, Norway and Oman.

But prices rose steadily thereafter, primarily because of a surge in Chinese demand given its very strong economic growth, supported by limitations to production in various countries. Iraqi output recovered very slowly after the US-led invasion of 2003, the policies of Hugo Chávez in Venezuela and strikes against him limited production, Russian production expansion slowed under President Vladimir Putin after 2003, and there were various other political, security, technical and weather-related outages worldwide. Production of some OPEC members, notably Saudi Arabia and the UAE, increased steadily in this period, but otherwise OPEC's policy was quite passive in the face of the escalating prices, which restored budgetary surpluses and strong economic growth for most members. Angola joined the organisation in 2007, as its deepwater fields had made it a major producer, and Ecuador re-joined in the same year.

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Prices increased to a record US\$ 147 / bbl in Q2, 2008 but then collapsed to US\$ 35 / bbl in Q4 of the same year, as the global financial crisis intensified. Between Q3 – Q4, 2008 OPEC held three meetings where the cartel agreed to cut crude oil production by 4.2 Mbb/d to support prices while the global economy recovered. Indonesia suspended its membership in 2009, as it had become a net oil importer and felt that it no longer benefited from its position in the organisation.

The post-2009 period was much more volatile. The 2011 revolutions in several Arab states severely interrupted oil output, mostly in Libya. Between 2012-15, the Barack Obama administration imposed stringent sanctions on Iran over its nuclear programme, reducing its oil exports to below 1 million bbl/day. The result was another surge in oil prices, which averaged over \$100 per barrel during 2011-13. Key OPEC countries again increased output to cover for the losses, but most extra supply came from the US. American crude and condensate output which had fallen to a low of 5 million bbl/day in 2008, surged to 8.8 million bbl/day in 2014, with even stronger growth in NGLs.

The recent period 2014–2019

The key challenge for OPEC in this period was the increasing production of unconventional oil & gas from the United States (Figure 2), which continues to challenge OPEC's global market share. This was unlocked by the combination of hydraulic fracturing with horizontal drilling. As the chart shows, tight crude oil production rose from negligible in 2008 to an all-time high of 8.31 Mbb/d in November 2019. US tight oil alone was thus

comparable to the whole output of Saudi Arabia. Even a relatively minor shale player such as the Niobrara of Colorado-Wyoming was producing more than several OPEC member states including Ecuador, Gabon and Congo.

"Shale" or "tight" oil showed exceptionally rapid production growth, along with "short-cycle" characteristics as wells could be drilled and put on production within months, far faster than megaprojects in OPEC countries, Canadian oil sands, Siberia or deepwater, and other main option for production expansion. Shale reservoirs also show rapid decline rates, requiring continuous drilling to sustain output levels. This makes shale uniquely responsive to short-term oil prices. Prices crashed in late 2014 because of oversupply and, in 2016, global crude oil prices decreased to a low of US\$ 27 / bbl from a high of US\$ 115 / bbl in 2014.

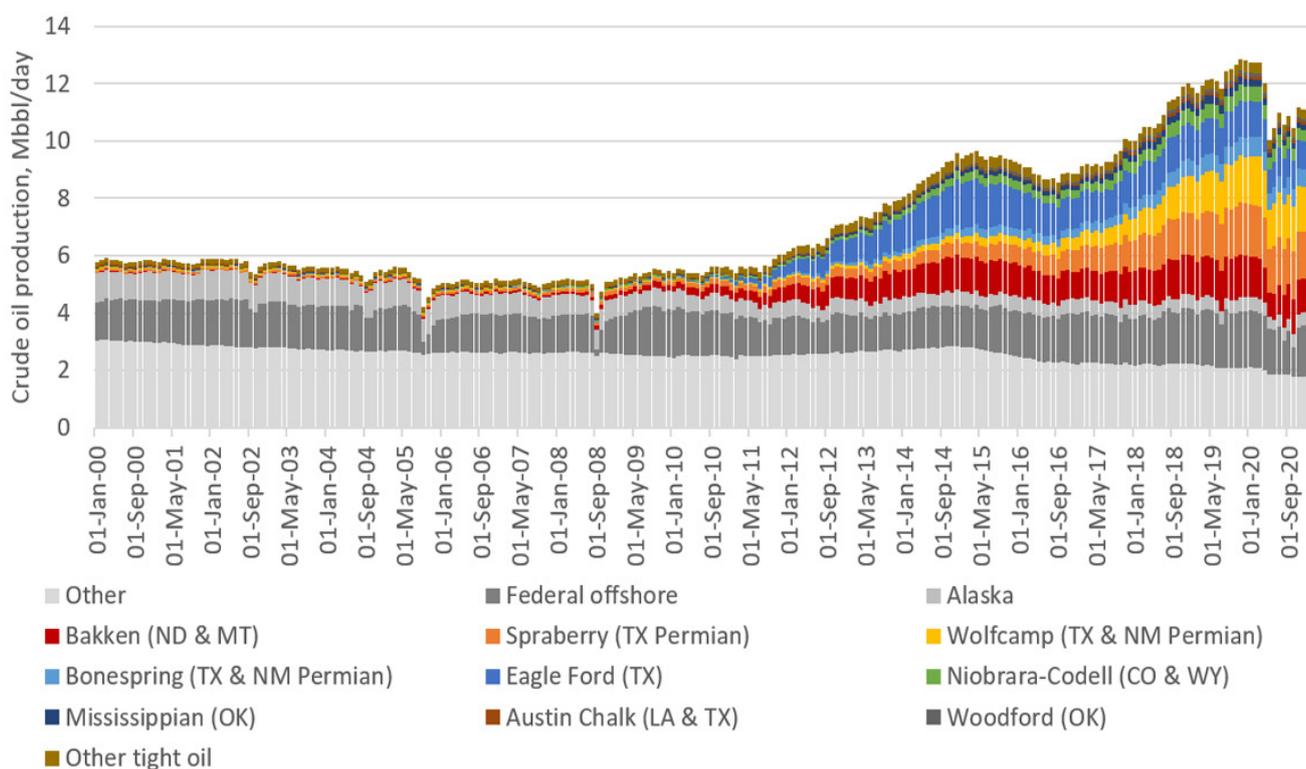


Initially, Saudi Arabia responded with a price war, increasing output and trying to drive some US shale producers out of business. American production did gradually decline, but the industry proved much more robust than OPEC had anticipated. With increasing pressure on public finances and budgets on its member countries, Saudi Arabia and Russia collaborated to create an informal alliance called OPEC+, which agreed to its first cut by 2016. Kazakhstan, Azerbaijan, Oman and several other non-OPEC exporters joined the alliance. This was the first time Russia seriously cooperated with OPEC in production cuts. It had become clear that, given the threat of losing market share to both the US and Russia, OPEC could no longer act alone. By 2020, OPEC+ increased its cuts to 2.1 Mbbbl/d with Saudi Arabia making the largest reductions. However, this move was risky, because US crude oil output, which had fallen

between March 2015 and September 2016, mounted a strong comeback to a new record in November 2019, some 4 million bbl/day above the previous high.

Gabon and Indonesia came back into the organisation in 2016, Equatorial Guinea in 2017 and the Republic of Congo in 2018, though Indonesia left again almost immediately. Qatar left from the start of 2019, stating that it wished to concentrate on its liquefied natural gas (LNG) business, but probably also influenced by the diplomatic breakdown with its neighbours, Saudi Arabia and the UAE.

Figure 2 US tight oil production 2000-present^v



RESPONSE TO THE COVID-19 PANDEMIC

In 2020 and 2021, the Covid-19 pandemic has led to an unprecedented disruption on almost every aspect of daily life. In its initial stages, it had detrimental impact on the global economy, the energy sector, and the global crude oil markets, as lockdowns cut most of 7.5 million bbl/day of jet fuel use as well as drastically reducing road traffic, especially in North America and Europe, but also in the Middle East and parts of Asia. The global crude oil market saw demand in freefall, and global storage capacity filling up quickly, combined with large-scale volatility.

The OPEC+ agreement briefly fell apart in March 2020, and Saudi Arabia and several other OPEC countries massively ramped up production, causing further price falls and threatening the over-filling of storage facilities. This led OPEC and OPEC+ members, as per the Declaration of Cooperation, to intensify their collaboration to restore stability, which effectively resulted in the largest voluntary production adjustments in the history of the crude oil industry.

Going forward, despite OPEC's efforts to manage crude oil production and maintain targeted price levels, the cartel is susceptible to global economic events, disruptions on the energy markets, and/or future volatility from the pandemic. Although its production cuts led to a strong recovery in prices to above \$60/bbl in November 2020, the group faces a difficult challenge in steadily regaining market share and drawing down excess inventories, avoiding another price slump, but not raising prices too high and facing demand declines or another sharp recovery in US shale output.



OPEC'S LONG-TERM STRATEGY

There has been much academic and policy debate over whether OPEC is a "cartel", that is a body systematically restricting output to keep prices high. While the organisation has certainly done this at times, it had shown classic illustration of some of the problems of running a cartel. The goal for any cartel is to act like a monopolist by looking at marginal cost and marginal revenue to find the optimal quantity and then price on the demand curve, which will usually be below the quantity that would be produced in a fully competitive market.

In practice however, OPEC's cartel was more complicated partly because there are quality differences in the crude, so there is no single price and the relative prices of grades varies with market conditions. More fundamentally, OPEC's market share has never been much above 50%, and more recently around 40%, giving plenty of space for competition. This compares to the De Beers diamond monopoly, which controlled 90% of the market in the 1980s. But even De Beers eventually faced growing competition and its market share dropped to less than 40% by 2012.

OPEC oil faces competition from other producers, but also from other energy sources. Since the first oil shock, oil has been squeezed out of more contestable markets such as power generation, but has maintained a near-monopoly in transport. With the growing sales of electric vehicles, that too may be changing. Oil demand is much more elastic in the longer term than the short term, as capital turns over and new technologies are introduced. Therefore, high prices that appear to be sustainable for a while can be misleading and followed by sharp crashes.

Further, political and socio-economic problems often make it difficult for OPEC to reach decisions. Some countries are high population and need immediate income (such as Nigeria and Algeria), some countries are engaged in conflicts and need cash, while others have relatively small populations, low production costs, and large per-capita hydrocarbon reserves and earnings, and large sovereign wealth holdings, such as Kuwait, the UAE and Qatar, while it was in OPEC. The wealthier states can take a longer-term view and have tended to prioritise market share over short-term prices. But rising populations and budgets and recent price falls have tended to blur this distinction.

Saudi Arabia has generally played a role similar to that of a "dominant firm" in a cartel of corporates, giving a lead on prices and volumes that other countries follow. In the early 1980s, it acted as a swing producer, cutting its output to match residual market demand, but this became untenable due to overproduction by others. The kingdom vowed not to repeat this experience, yet it did so in 2021 by making additional voluntary production cuts to help the group reach agreement.

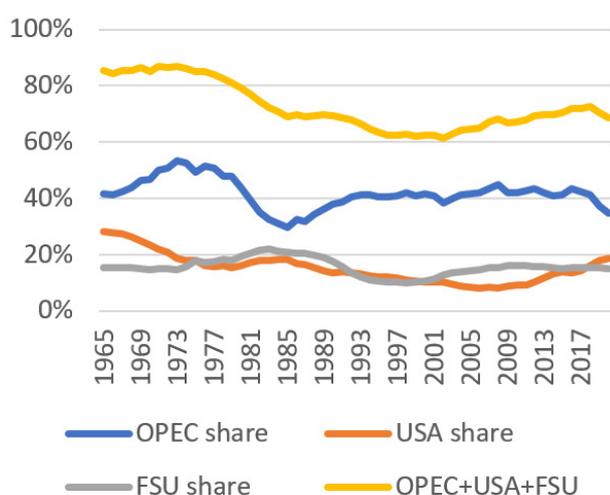
The problem is that the cartel price gives each country the opportunity to cheat on the agreement by producing more than they are officially allotted. The price of oil is significantly above the marginal cost of production, encouraging many countries in OPEC to increase their production beyond their allocations and as their production increased, prices fell. This was a particular problem in the early 1980s and again in the late 1990s. Compliance to the recent OPEC+ agreements, has so far been much better, but

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even here Iraq and Russia in particular have generally over-produced.

For most of the OPEC era, global oil production has been dominated by three "poles" – OPEC, the USA and the USSR/Former Soviet Union (Figure 3). Their collective market share of global production was about 85% up to the late 1970s, declined sharply to a low just above 60% in the early 2000s, then staged a recovery up to 2019. Note that this chart covers crude, condensate and natural gas liquids (NGLs). While OPEC quotas are set in terms of crude oil only, the NGLs have a high degree of substitutability. Also, the charted OPEC market share is adjusted for the entry and exit of members at various times.

Figure 3 Main producers' market shares over time^{vi}



Within this, OPEC's market share was only briefly above 50%, 1971-74 and 1976-77. It fell as low as 29.7% in 1985 due to Saudi Arabia's production cuts and the growth of competing supplies elsewhere. It then hovered around 40% before dropping again in 2019 and 2020 to below 35%, firstly because of OPEC quotas, the exit of Qatar, sanctions on Iran and political troubles in Venezuela and Libya, then because of the Covid-19 pandemic

in 2020 which necessitated sharp production cuts. This is the lowest market share OPEC has had since 1988.

The OPEC+ alliance, in force since 2016, is the first time OPEC has cooperated effectively with the second pole, the former Soviet Union – notably Russia but also Kazakhstan and Azerbaijan.

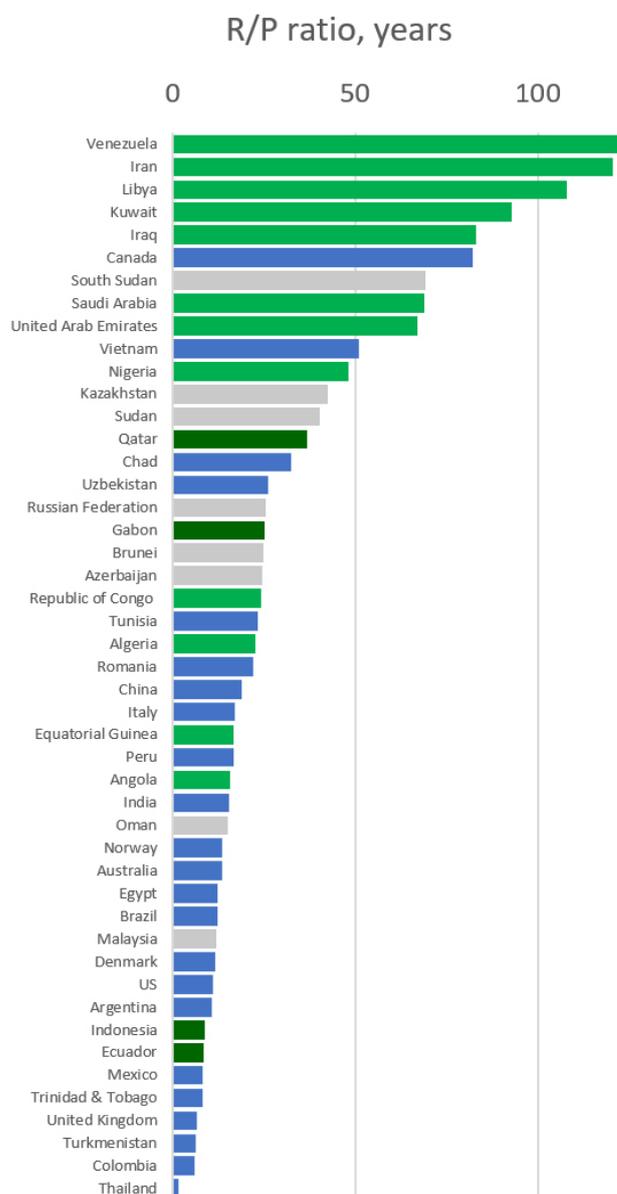
While officially, OPEC still strives to maintain market stability, it generally chooses not to speak in terms of price these days, because of anti-trust concerns. However, its historic behaviour suggests that it has generally aimed at maintaining higher prices, even when these were unsustainable and so detrimental to market stability, as in 1980-85 and again in 2011-14. It acts more quickly to cut production when prices fall, especially during crises. The need to gain consensus and to avoid breakdowns of quota discipline and "price wars" sometimes prevents the organisation from moving swiftly or optimally. This problem has probably diminished in recent years, because of the weakening of Algeria, Libya, Venezuela and Iran, and the financial and institutional shakiness of the second-biggest producer, Iraq, leaving Saudi Arabia as the clear de facto leader, usually supported by its Gulf allies Kuwait and the UAE.

OPEC's more important role in the market has probably been its long-term restraint of production rather than its short-term adjustments. As Figure 4 shows, the countries with the largest ratios of reserves to production, i.e. those that are producing their reserves at the slowest rate, are OPEC members. Venezuela is a special case because of its large extra-heavy oil resources and production collapse, Iran's output is of course

limited by sanctions and Libya's by civil war, but the pattern is clear, with stable and wealthy countries such as Kuwait, Saudi Arabia and the UAE also having very long reserves lives. It is probably not surprising that two ex-OPEC members, Indonesia and Ecuador, features with much lower R/P ratios. By preventing rapid exploitation of large, low-cost reserves over the past half-century, OPEC has kept prices on average much higher than they would have been in a fully competitive situation. OPEC+



Figure 4 Reserves/production ratio of major oil producers. Green: OPEC. Dark green: former OPEC. Grey: OPEC+. Blue: non-OPEC/OPEC+.



countries also now feature heavily in the longer reserves-life countries, and of course OPEC+ production cuts increase the R/P ratio, slow reserves depletion, and discourage investment in new production. Canada's reserves are mostly in the oil sands, so there is no country which is a holder of large, low-cost, long-life reserves that is not an OPEC+ member.

OPEC's relations with the developed countries are much better than in the 1970s. The IEA now engages with OPEC as a respected partner, and the International Energy Forum, based in Riyadh, was founded in 1991 as a bridge between the organisations. The Gas Exporting Countries Forum, headquartered in Doha, Qatar, was set up in 2001 as something of a counterpart to OPEC in the gas world, but it has never aspired to coordinate production or pricing policies.

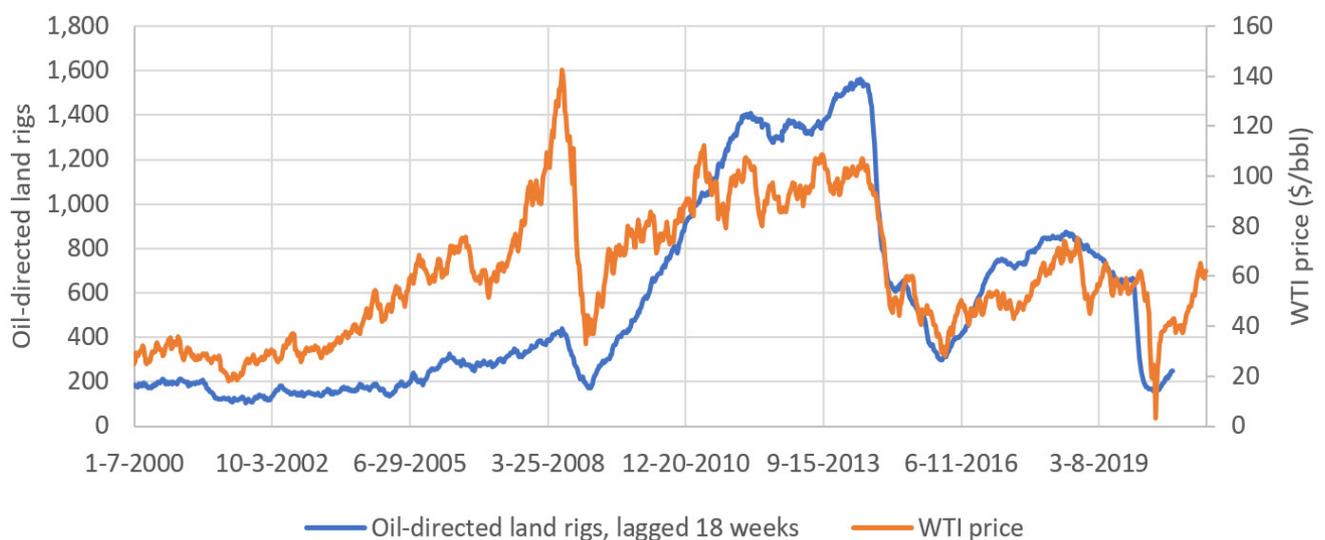
The primary external challenges to OPEC can be classified as follows.

Legal/political: OPEC has periodically faced anti-trust concerns in the US. Various versions of a "No OPEC" or "NOPEC" bill that would remove the organisation's sovereign immunity have been put before Congress at times including 2000, 2007-8, 2019 and 2021. These bills have never advanced very far due to lack of legislative priority and signals from the White House that it would veto any such bill, on US national security grounds, due to the damage it would do to relations with countries such as Saudi Arabia^{vii}.

A more fundamental challenge could be represented by political pressure on OPEC or individual states within it to take certain positions. During the 1973 crisis, Henry Kissinger even mooted the idea of invading an Arab oil producer to threaten the others^{viii}. This was rejected, because of the threat of Soviet intervention and wider Arab resistance. In April 2020, as prices crashed amid the Covid-19 pandemic, the then US President, Donald Trump, reportedly threatened Saudi Arabia with a withdrawal of US forces if it did not reach agreement with Russia to cut production^{ix}. In a more diplomatic and subtle manner, George H.W. Bush, as Vice President in 1986, reportedly pushed King Fahd to cut oil production^x.

Oil producer competition: OPEC has always faced the threat of other suppliers, as its policy, has generally tended to restrict its members' low-cost supply and hence keep prices above the strictly competitive level. At various times, the US, North Sea and Russia have been the prime competitors. Russia has been nullified through the OPEC+ framework and the North Sea through field depletion, but US shale remains a potent threat.

Figure 5 Correlation between lagged US land oil rigs and WTI price^{xi}



Due to poor financial returns, shale companies have promised to curb growth and return cash to shareholders, but it's likely that a period of high oil prices will still trigger a resurgence in drilling.

Other unconventional or frontier oil, including the oil sands in Canada, enhanced oil recovery, the Arctic, deepwater, and other shale basins such as those in western Canada, Argentina, West Siberia, Australia and elsewhere, would become economically viable if there is another prolonged period of high oil prices. This possibility is illustrated by the recent deepwater discoveries in Guyana and Suriname, which look likely to become significant non-OPEC producers, and Rosneft's planned Vostok Oil development in East Siberia with production rising to 1 million bbl/day by 2027.

Customer competition: In the 1970s even up to the 1990s, the US, Europe and Japan were the key markets. With the surge in the Chinese economy especially after 2003, and the growth in India, the big emerging Asian countries have become the most important customers. OPEC countries, Russia and the US compete fiercely for market share within these countries, and for inward investment from them.

Alternative energy competition: In the 1970s and 1980s, oil was challenged in power generation, industry and home heating by gas, coal and nuclear power, more efficient vehicles and appliances, and behavioural changes to conserve energy.

In the 2020s and beyond, the key challenger is electric vehicles, which are supported by government policy in Europe, China, California and elsewhere, with advances in improving costs and performance. Electric vehicles

accounted for 5% of all new car sales in 2020, a proportion set to rise to 7% in 2021. Growth is set to be particularly strong in the two/three-wheeler segment (motorcycles and rickshaws) in Asia, and city buses, due to ease of charging combined with improved urban air quality. Under the IEA's "Stated Policies" scenario, electric vehicles would displace 2 Mbbbl/day of oil demand by 2030; in the "Sustainable Development" scenario, this would rise to 3.4 Mbbbl/day. This shift will be accelerated by higher oil prices. Other areas of oil demand can also be affected by competition, such as:

- Light passenger vehicles: compressed natural gas (CNG), biofuels, public transport
- Trucking: LNG, rail, batteries
- Shipping: LNG, auxiliary on-board renewables, batteries (for short ranges), hydrogen/synthetic fuels
- Air: rail, batteries (for short ranges), biofuels, hydrogen/synthetic fuels
- Home heating: natural gas, biogas, hydrogen, electricity, solar thermal, geothermal, heat pumps
- Industrial heat: natural gas, electricity, solar thermal, geothermal, hydrogen
- Petrochemicals/plastics: natural gas, coal, biomaterials, synthetic materials/power-to-chemicals

However, OPEC has historically faced an alternative dilemma, in that, when oil prices are relatively low, consuming countries in Europe and Japan (though not the US) take the opportunity to raise petroleum taxation. The governments of the oil-importing states thus retain part of the rent and usually do

EXTERNAL CHALLENGES TO OPEC

not cut tax rates when oil prices rise again. This leads to the situation where 60-75% of the pump price in the UK, for example, is tax^{xii}. Fuel demand is then not very responsive to changes in crude prices. This taxation will likely increase due to the desire to limit greenhouse gas emissions.

Environmental: A number of alternative energy policies, such as biofuels and electric vehicles, are promoted for environmental reasons, particularly reducing greenhouse gas emissions. These policies are becoming increasingly stringent and, after considerable success in decarbonising the power sector in various countries such as the UK and France, transport is likely to be the next major sector to see stringent policy attention. Already various cities and countries have announced bans on the use or sale of new internal combustion engine vehicles, typically in the 2030s.

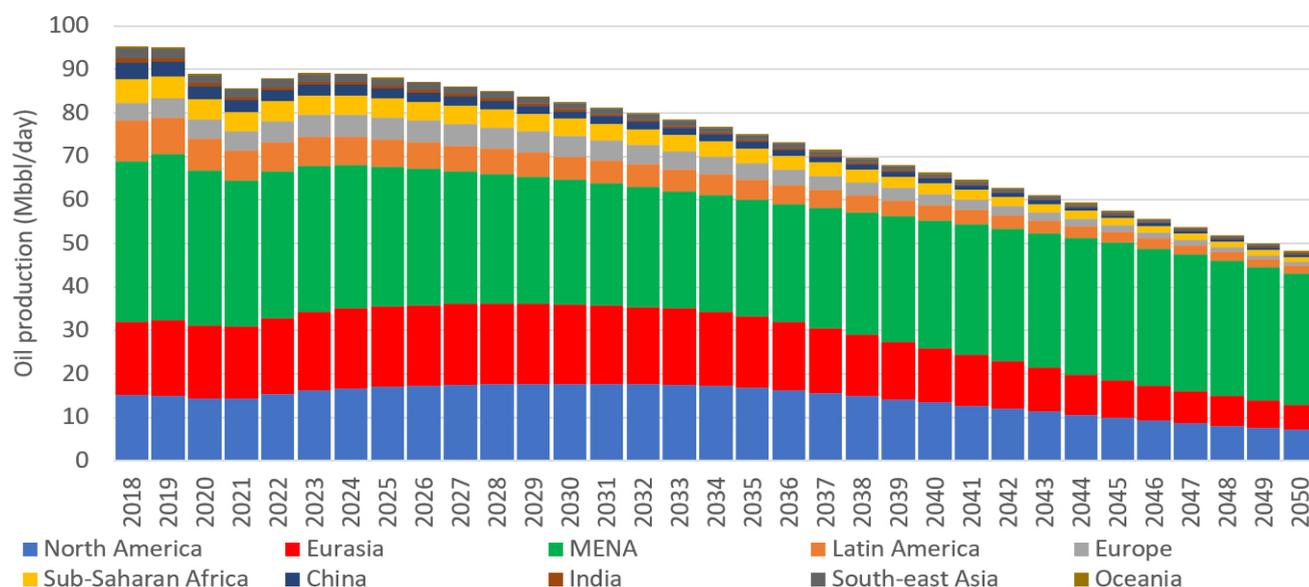
INTERNAL CHALLENGES TO OPEC

New members: Other countries have periodically raised the prospect of joining OPEC. They could include some of the smaller producers in the OPEC+ alliance, such as Sudan and South Sudan, or a new producer, Guyana^{xiii}. Brazil, which is not even in OPEC+, has also periodically raised the idea but it seems unlikely for now^{xiv}. Brazil seems to be the only plausible new member large enough in production to have a substantial impact. Russia is likely to value the freedom of action it gains from being within the OPEC+ framework but outside OPEC.

Potential departures: As discussed, Qatar and some other previous OPEC members have departed, some may return later and probably leave again. The UAE, currently OPEC's third-largest producer, and usually a close Saudi ally, reportedly raised in November 2020 the idea of leaving the organisation, as it was unhappy with its production allocation in the face of its plans to grow capacity. Given that some members' production is in long-term decline (Algeria, Angola, Venezuela) while others can grow strongly (Iraq, UAE, possibly a post-sanctions Iran, post-civil war Libya or Venezuela under a new regime), the current quotas will have to be significantly realigned in the medium term to shore up membership retention.

Competition for increased market share: OPEC, has at various times, faced some challenges from members making a dash for increased market share, as exemplified by the case of Venezuela in the late 1990s. At the moment, beyond some difficult discussions on new quotas as mentioned above, it is not obvious that any member has both the intent and ability to make sustained production gains on a level that would threaten the organisation.

However, if oil demand flattens and goes into decline because of the adoption of electric vehicles and other non-oil technologies, OPEC countries would face a difficult choice. They could continue restricting production to support prices, but this would result in oil demand's declining even faster, and they would lose some of the residual market to the US, Russia and other producers. Some could possibly have a large proportion of their abundant resources left unproduced.

Figure 6 Oil production by world region in “peak oil demand” scenario^{xv}

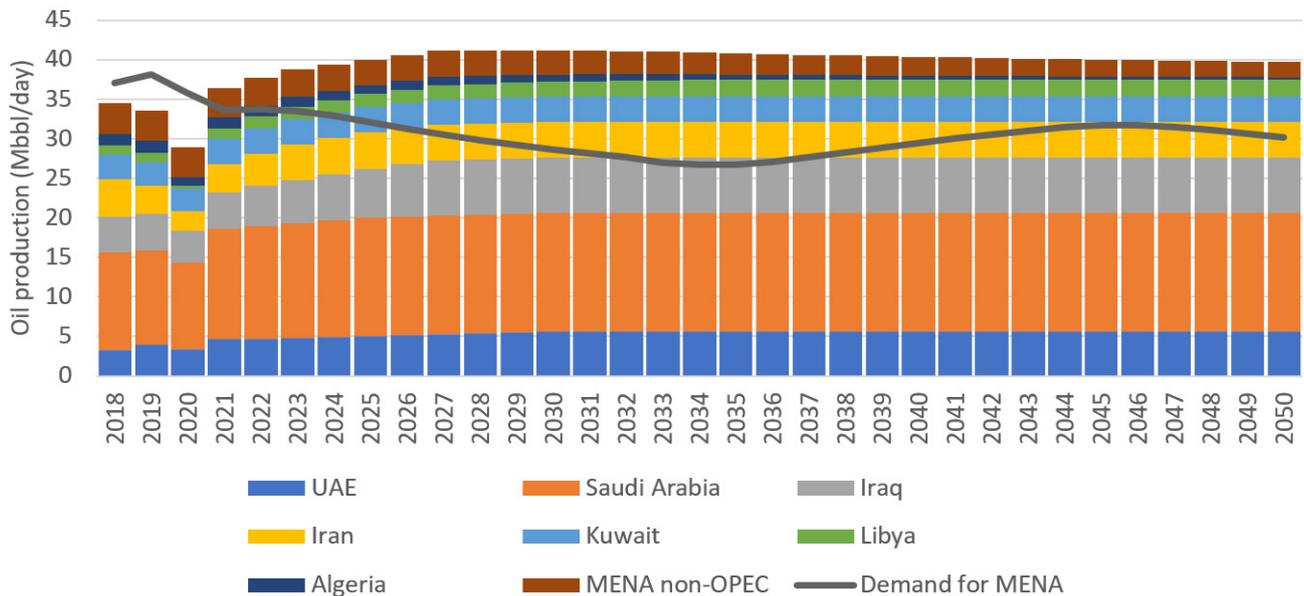
This case is illustrated in Figure 6. Although the projections here predate the pandemic, they show the impact of declining global oil demand, with North America and Eurasia (Russia and the rest of the former Soviet Union) gaining market share at the expense of MENA, up to the late 2020s, whereafter MENA is expected to gain more market share and overall production volumes. The other world regions decline throughout. MENA's market share, a rough proxy for OPEC's, given that the MENA OPEC countries dominate output, reaches 63% by 2050, a far stronger position than OPEC has ever enjoyed historically.

However, as noted, several MENA countries have plans for production capacity growth. When these are accounted for, along with appropriate declines in other countries, and assuming that all countries would produce at capacity, the revised approximate picture shown in Figure 7 emerges. The medium-term competition from North America and Eurasia substantially reduces the demand for MENA crude.

Assuming that non-MENA OPEC countries (mainly, Nigeria, Angola and Venezuela) contribute little in production cuts (and Venezuelan output may well increase with a change of government), the MENA OPEC countries would have the following options:

- Produce well below capacity for an extended period;
- Delay capacity expansion plans (but even then, production cuts would be required);
- Hope that some production growth plans (e.g. Iran, Iraq, Libya) do not materialise because of political, security and investment problems;
- Produce at higher levels with lower prices to squeeze out competition from North America and Eurasia.

The scenario in which the leading OPEC states accelerate production, as the world's low-cost producers, ensuring they take as large a share as possible of the remaining demand, has been proposed as a policy choice. It is also part of the supposed “green paradox” (that greenhouse gas emissions

Figure 7 MENA production and demand for MENA oil in a “peak oil demand” scenario^{xvi}

limits incentives for increases in short-term fossil fuel production). This policy would, of course, mean low prices. It is possible that the UAE's current production growth plans are at least partly inspired by this scenario. But higher-cost OPEC producers, such as Algeria, Venezuela, Ecuador, Angola, and those with high budgetary demands, could suffer badly.

THE OPEC+ ALLIANCE

As discussed, the OPEC+ alliance was formed by the Declaration of Cooperation in December 2016, to end the damaging price war fought since the collapse in oil prices, experienced in late 2014. OPEC had concluded that any attempt at coordinated production cuts, by the organisation alone, would merely result in loss of market share to the US and Russia, unless it could gain cooperation from several leading non-OPEC producers. The political influence of Vladimir Putin and his oil minister, Alexander Novak, was important in bringing in other states, particularly Azerbaijan and Kazakhstan.

However, the compliance of non-OPEC countries in OPEC+ to the group's production cuts has been lower than that of OPEC countries. Russia itself has been one of the least compliant. Several other countries have volunteered "cuts" that were the result of natural field declines. Nevertheless, the arrangement is the first time OPEC has received serious cooperation from outside the organisation. OPEC+ has succeeded in restricting non-OPEC output, as well as, allowing OPEC itself to make deeper and more sustained cuts.

Russia has often shown growing impatience with the continuation of production cuts and has repeated suggested easing them. This however, may be partly a negotiating tactic on the part of Russia. Moscow's position in the group is not just about its oil policy, but also a way of wielding greater geopolitical influence and building relations with historically American-aligned Middle East countries. It is rare for OPEC disagreements to be escalated outside the organisation, with the Iraqi invasion of Kuwait in 1990 being the main

exception. But as a global power, Russia has many more points of leverage on any of the other oil exporters, when compared with Saudi Arabia or other OPEC members.

OPEC+ has clearly been a short-term success, in relation to its own goals, but it is not clear whether it will continue to function, after the expected post-pandemic recovery of demand and production. The jury is still on regarding the future direction of OPEC+. Whether it will develop a formal mechanism and organisational nature alongside OPEC or even absorbing OPEC, or whether it will fall apart or become an informal grouping of limited influence, is up for debate.

OPEC AND CLIMATE CHANGE

As discussed, OPEC has been through a number of incarnations, and could enter a new phase in future:

1960–70: Raising oil taxation levels; sharing knowledge

1971–1981: Raising oil prices; nationalising the industry

1982–2015: Defending prices by quotas

2016–2021: Defending prices by quotas with the OPEC+ alliance

2022+: A climate organisation?

Member states have so far announced climate targets (their Nationally Determined Contributions, NDCs) under the Paris Agreement, and participated in international climate negotiations, on a national basis, as well as, a collective. OPEC and its leading members have been seen negatively by climate campaigners, as attempting to preserve a role for fossil fuels.

However, OPEC has the potential to play a more constructive role^{xvii}. Several OPEC members are too consumed by short-term problems to formulate a coherent plan for making their oil-dependent economies more resilient to global climate policy, for instance Iran, Iraq, Libya, Algeria, Nigeria and Venezuela. OPEC could coordinate on a cohesive production response to declining oil demand, in a way that avoids too-intense competition on the one hand and underinvestment on the other hand. It could help its members share key approaches to make oil use climate-compatible, including hydrogen, carbon capture and storage, direct air capture, bio-sequestration and offsets, and non-metallic hydrocarbon-based materials. The IEA and other international bodies would be ready to assist in such endeavours. Notably, in April 2021, the US brought Saudi Arabia, Qatar, Norway and Canada together to form the Net Zero Producers' Forum.



CONCLUSIONS

OPEC has sometimes behaved as a classic cartel, proving to be the most successful international commodity producers' organisation by far. However, it has had several other important goals that have evolved through time. In recent years, the organisation has survived the rise of Chinese demand, the global financial crisis, US shale and the Covid pandemic, in rather familiar shape and with nearly the same membership.

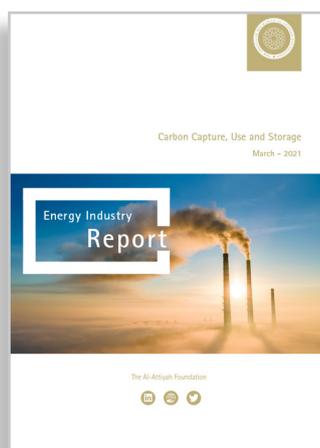
The OPEC+ alliance has significantly changed its decision-making and the weight of influence, with Saudi Arabia and Russia emerging as the clear leaders of the larger group. This has been facilitated by the collapsing power of Venezuela and Iran, formerly influential voices, because of external economic and political events.

OPEC faces a difficult path ahead, and this has been complicated by the coronavirus outbreak. Diverging interests and capabilities between its members will become increasingly apparent if and when peak oil demand is reached and climate policy begins to affect seriously, the long-term future of oil. Before then, post-pandemic recovery and underinvestment elsewhere could still cause a temporary spike in prices, which may obscure the best strategy that is needed. For now, OPEC has to make some tough choices about how quickly to bring back output, when and how to reallocate quotas, whether to pursue a strategy of higher market share and lower prices, and how to manage its relationship with Russia and the other players in OPEC+.



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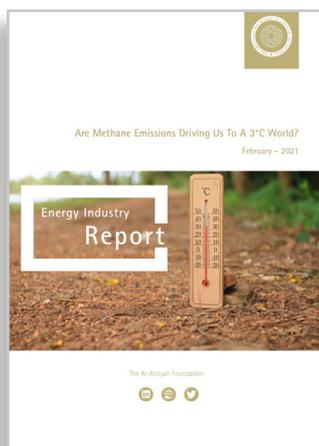
March – 2021

Carbon Capture, Use and Storage

CCUS refers to a range of technologies for capturing carbon dioxide (CO₂) from human-made sources including oil, gas and coal-fired power generation and industry, and using it to create useful products or storing it safely underground indefinitely.



(QR.CO.DE)



February – 2021

Are Methane Emissions Driving Us To A 3°C World?

The United Nations Environment Programme suggests that the world is on track for an average temperature rise of 3°C, with CoVid-19 likely to result in just a 0.01°C reduction in global warming by 2050. NASA announced that Earth's global average surface temperature in 2020 tied with 2016 as the warmest year on record.



(QR.CO.DE)



January – 2021

One Year On: The Impact Of The Coronavirus On Energy

The global energy sector endured a dramatic year in 2020, as the coronavirus (Covid-19) pandemic slashed demand and upended markets. Investor confidence slumped, with oil and gas one of the hardest-hit industries, as flights were grounded, fleets parked, factories and refineries closed, and work from home orders imposed.



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OUR PARTNERS

The Al-Attiyah Foundation collaborates with its partners on various projects and research within the themes of energy and sustainable development.





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