Innovation in the GCC Petrochemicals Industry

Covid-19 Recovery Roadmap

In collaboration with

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The combined GDP of the six GCC countries – Saudi Arabia, the UAE, Qatar, Kuwait, Oman and Bahrain – totalled around $1.6trn in 2019, according to the World Bank. Saudi Arabia contributed approximately half of this figure, while the UAE accounted for one-quarter. The remainder was divided between Qatar (11.8%), Kuwait (8.3%), Oman (4.7%) and Bahrain (2.4%). The chemicals industry, which includes petrochemicals, has been an important contributor to the region’s economy: in 2018 the segment accounted for 4.9% – or $81.6bn – of the GCC’s GDP, up from 3.1% the previous year. Saudi Arabia was the top producer by value, responsible for 56.3% of the region’s output ($46bn), followed by Qatar (14.1%) and the UAE (13.3%). This trend has continued, with Saudi Arabia accounting for 74.6% of GCC chemical production in 2020, while Qatar and the UAE were responsible for 10.5% and 8.1%, respectively. The region’s collective capacity for chemicals production stood at 150m tonnes per year in 2020, with a compound annual growth rate (CAGR) of 5.9% between 2012 and 2020. This expansion was led by the UAE, which had a CAGR of 9.3% over that period, followed by Saudi Arabia (7.5%).

In addition to being a main driver of growth, the petrochemicals industry is a key source of employment. In 2018 it supported nearly 613,000 jobs, accounting for around 2.4% of the GCC’s workforce. In line with its economic contribution, Saudi Arabia was home to 66% of this figure, while the UAE and Qatar accounted for 17.5% and 5.4% of the total, respectively. According to the Gulf Petrochemicals and Chemicals Association (GPCA), the industry invested an estimated $438m in research and development (R&D) that year, supporting 7100 jobs and $71m in economic activity for the region.

GCC countries have been increasingly focused on diversifying their economies away from hydrocarbons since the 2014-16 fall in international oil prices, fuelled by a rise in supply from the US starting in 2014-15 and lower demand in 2015-16. This accompanied an accelerated push worldwide to transition towards more sustainable sources of energy. The petrochemicals segment is an integral part of this shift, embodied in the region’s long-term development strategies. One example of this is Saudi Arabia’s Vision 2030: the roadmap aims to reduce the country’s dependence on oil and diversify its economy; develop public services such as health, education and infrastructure; and create growth in segments such as recreation, ICT and tourism.

Pre-pandemic Performance

Petrochemicals contribution to GDP, 2018 ($bn)

<table>
<thead>
<tr>
<th>Country</th>
<th>Contribution to GDP ($bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>46</td>
</tr>
<tr>
<td>Qatar</td>
<td>11.5</td>
</tr>
<tr>
<td>UAE</td>
<td>10.9</td>
</tr>
<tr>
<td>Oman</td>
<td>7.5</td>
</tr>
<tr>
<td>Kuwait</td>
<td>7.5</td>
</tr>
<tr>
<td>Bahrain</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>GCC total:</strong></td>
<td><strong>81.7</strong></td>
</tr>
</tbody>
</table>

GCC total: 612,885

Petrochemicals workforce, 2018 (no. of employees)

<table>
<thead>
<tr>
<th>Country</th>
<th>no. of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabia</td>
<td>5917</td>
</tr>
<tr>
<td>UAE</td>
<td>32,057</td>
</tr>
<tr>
<td>Kuwait</td>
<td>32,912</td>
</tr>
<tr>
<td>Qatar</td>
<td>107,315</td>
</tr>
<tr>
<td>Bahrain</td>
<td>404,417</td>
</tr>
</tbody>
</table>
Part 1: Resilience

Structure & Stakeholders

Key actors in the GCC petrochemicals & chemicals industry include:

<table>
<thead>
<tr>
<th>Country</th>
<th>Key Actors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain</td>
<td>Gulf Petrochemical Industries Company; BAPCO</td>
</tr>
<tr>
<td>Kuwait</td>
<td>Kuwait Petroleum Corporation; Kuwait National Petroleum Company; Kuwait Integrated Petroleum Industries Company</td>
</tr>
<tr>
<td>Oman</td>
<td>QO Chemicals; Petroleum Development Oman</td>
</tr>
<tr>
<td>Qatar</td>
<td>Qatar Energy; Qatar Petrochemical Company</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>Saudi Aramco; SABIC</td>
</tr>
<tr>
<td>UAE</td>
<td>Abu Dhabi National Oil Company; Bourage</td>
</tr>
</tbody>
</table>

The majority of stakeholders in the GCC's petrochemical segment are national companies and those with high levels of public sector participation. Shareholdings of public companies or joint ventures (JVs) with the private sector are also common in the industry.

Saudi Arabia is one of the world's biggest crude oil exporters and has worked to develop its petrochemicals segment to maximise potential. Saudi Aramco, the country’s integrated energy company, has business across the value chain, from exploration to petrochemicals. In December 2019, 1.5% of the company's shares were sold on the Saudi Stock Exchange, generating $26bn and valuing the company at $1.7trn. It represented the largest initial public offering in history.

Abu Dhabi’s Ruwais, a town 240 km west of Abu Dhabi City, is poised to experience petrochemicals-driven growth: Abu Dhabi National Oil Company (ADNOC) plans to expand the area’s existing 817,000-barrel-per-day (bpd) refining facility by an additional 200,000 bpd, and build a 400,000-bpd petrochemicals complex. ADNOC aims to have the expansion on-line by 2024 and the refinery by 2026. Once both facilities are complete, the country’s refining capacity will rise from 922,000 bpd, as of October 2021, to 1.5m bpd in 2026 – a 65% increase. In November 2021 ADNOC and Austrian firm Borealis announced they would invest $6.2bn in Borouge, a JV between the two firms. The financing will be used to expand the JV’s facility for polyolefins – including polyethylene and polypropylene – to support packaging, plastics and acrylics industries – to 6.4m tonnes per year by 2025. This would make Borouge the world’s largest single-site polyolefin complex.

Signalling the shift to an emphasis on more environmentally friendly sources of energy, in October 2021 Qatar Petroleum changed its brand identity to Qatar Energy. It is also involved in downstream activities: in June 2019 the company signed an agreement with Chevron Phillips Chemical to build a petrochemicals complex, which, once complete, will be the Middle East’s largest single-site ethane cracker. The facility will have an annual capacity of 1.9m tonnes by 2025, representing an 82% increase in Qatar’s polyethylene output capacity.

Another key stakeholder in the segment is Dubai-headquartered GPCA, which has represented the region’s downstream hydrocarbons industry since its establishment in 2006. With more than 250 member companies, the organisation accounts for over 95% of the Gulf’s chemicals output.
Part 1: Resilience

Petrochemicals & Diversification

The Gulf’s long-term economic diversification focus aims to cushion the region’s economies from challenges arising from oil price fluctuations, as well as boost value-added growth. The region’s oil rents underline the importance of this shift: a high proportion of national earnings derived from oil rents indicates the liquidation of a country’s capital stock. When economies use such rents to support consumption rather than invest to replace what is being depleted, they are missing an opportunity to invest in the future.

By 2013 – the year preceding the oil price drop – oil rents as a percentage of GDP reached 52.1% in Kuwait, 44.4% in Saudi Arabia and 41% in Oman, underscoring the importance of diversification. Governments in the region have implemented roadmaps to facilitate this economic shift, including Abu Dhabi Economic Vision 2030, Qatar National Vision 2030 and Bahrain’s Economic Vision 2030, all of which launched in 2008; Saudi Arabia’s Vision 2030, published in 2016; New Kuwait 2035, launched in 2017; and Oman Vision 2040, released in January 2021.

Petrochemicals can play a central role in economic diversification by expanding non-oil GDP through products derived from oil and gas. In 2017 petrochemicals and chemicals accounted for nearly one-third of the region’s manufacturing GDP. The contribution of the segment was particularly significant in Qatar and Oman, with both contributing around half of manufacturing GDP that year. By comparison, the segment accounted for 31% of manufacturing GDP in Saudi Arabia, 24% in Kuwait, 23% in the UAE and 15% in Bahrain in 2017. Manufacturing is crucial to GCC economies: the sector represented 10% of the region’s real GDP and 17% of non-oil GDP in 2017. That year only two sectors contributed more to GDP: crude petroleum and natural gas (40.9%); and finance, real estate and business services (12.3%).

Contribution of petrochemicals to manufacturing value added, 2010, 2016-17 (%)

- Qatar
- Oman
- Saudi Arabia
- Kuwait
- UAE
- Bahrain
- GCC

Graph source: ISSU/GPCA
New forms of innovation, continued investment in R&D, and the increasing agility of R&D teams have helped to lay the foundation for value-added growth in the Gulf chemicals and petrochemicals industries. Indeed, nurturing a knowledge-based economy, which includes R&D activities, is crucial for successful, long-term economic diversification. In recognition of this, the annual value of R&D investment in chemicals in the region rose from $293m in 2010 to $480m in 2019. This highlights the segment’s increasing focus on innovation, with its expansion outpacing the 42.5% increase seen globally over the same period.

The number of workers employed in R&D fell between 2010 and 2019, from 496 personnel to 397 as chemical industry players rationalised their teams in response to changing demands from end-user industries, according to the GPCA. This trend reflected the need to be adaptable and results-oriented as evolving technologies alter business operations. The organisation noted, however, that the numbers did not reflect the fact that non-R&D employees such as those in marketing and customer service are increasingly involved in innovation.

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Over the 2009-19 period, 5768 chemical patent applications were filed with the GCC Patent Office and 2461 patents were granted. Of the total applications in the region, chemical processes – also referred to as chemical synthesis – accounted for the bulk (1629). The GPCA attributes the popularity of this category to increasing demand for new methods of making commercially important compounds. The second-largest category of applications was catalysts (1053), or inventions related to the manufacturing method, use or regeneration of a catalyst; or to the chemical compound used as a catalyst.

Innovation in the chemicals industry has traditionally focused on the improvement of products and processes. By 2020 this had widened to include innovation in product application, company services and business models. That year the GPCA identified service innovation – including the launch of a separate business model to offer a new service such as chemicals distribution and new services related to an existing physical product – as especially important. Indeed, innovation in services is a key competitive advantage.
Part 1: Resilience

Domestic Sales & Exports

Substantial growth in the volume of chemicals and petrochemicals exports in the years leading up to 2019 helped the GCC expand the segment’s trade surplus despite a fall in oil prices. In 2018 over 80% of the GCC’s petrochemicals products were exported, while 20% were sold within the region. South-east Asia, East Asia and the Pacific accounted for the bulk of the exports, at 67%, and China and India alone accounted for 23.8% and 19.1%, respectively. This was followed by Europe and the Central Asia region (22%), led by Western Europe (9%).

Rising chemicals exports helped expand the segment’s trade surplus, which nearly doubled between 2009 and 2019, from 30.6m tonnes to 59m tonnes. By 2019 the volume of chemical imports was equal to approximately one-third of those exported, positioning the GCC as a net exporter. In a report published in 2021 the GPCA noted that it expected the region’s final 2020 trade balance to remain positive despite pandemic-related headwinds and export reductions, at 50m-56m tonnes.

Despite the GCC’s robust export volumes, export revenue fell from $63.7bn in 2018 to $57.2bn in 2019, attributed in part to a drop in the price of crude oil. Since oil is a raw material used in petrochemicals, the correlation between oil market prices and the industry is significant, although not always direct. Traditionally, an increase in oil prices causes a rise in petrochemicals production costs, which tends to lead to higher prices for downstream intermediate products.

However, market conditions including production capacity and demand may alter this correlation, as well as the margins of petrochemicals manufacturers. As such, the increase in export volumes in 2019 were not sufficient to compensate for the fall in oil prices, especially when combined with other factors that lowered export revenue.
Covid-19 Impact

After global headwinds in 2019, including trade disruptions and geopolitical challenges, 2020 saw the Covid-19 pandemic impact economic growth around the world. Widespread lockdowns mandated the closure of businesses and restricted the movement of people, which led to reduced demand for oil.

This saw the Organisation of the Petroleum Exporting Countries (OPEC) crude oil basket price – the weighted average price for oil produced by members – drop by 73% between January and April 2020. Indeed, the full-year OPEC basket price for 2020 was $41.47 – similar to the value in 2016, when the market was heavily oversupplied. To mitigate the risks of declining demand and prices, OPEC+, which includes Russia and nine other non-OPEC members, reduced supply by 9.7m barrels per day, equal to around one-fifth of production output, for two months starting from May 1, 2020.

In 2021 the global economy began to gradually recover. Increasing Covid-19 vaccination rates enabled the relaxation of pandemic-related restrictions on business and travel, which saw global demand for petroleum outpace supply. The OPEC basket price for 2021 climbed to $69.89, a 68.5% increase on the previous year. Mean OPEC oil prices in 2021 were higher than breakeven prices in three GCC countries – namely, Kuwait, Qatar and the UAE – according to IMF breakeven price estimates from October that year. Market prices are expected to exceed breakeven prices for all GCC members in 2022, however, owing to an expected increase in oil prices and a drop in breakeven prices.

Breakeven oil prices in the GCC – that is, the oil price needed to balance a country’s budget – exceeded 2020 market prices, posing a challenge to fiscal and export revenues. According to IMF calculations in April 2020 that took into consideration the early impact of the Covid-19 pandemic, only Qatar, Kuwait and the UAE were expected to retain breakeven oil prices lower than $70 per barrel for the year among the GCC countries – with forecasts of $39.90, $61.10 and $69.10, respectively.

The challenges of 2020-21 also impacted export activities. After healthy growth in most years from 2009 to 2019, GCC chemicals exports recorded a 20% drop in 2020 to 66m tonnes, equivalent to export volumes registered in 2014 and 2016. Similarly, GCC export revenue declined by 23.5% to $43.8bn in 2020, almost matching the total of $42.3bn seen in 2016.

From a long-term perspective, however, chemicals export volumes from the GCC have recorded positive scores across the globe. Annual export volumes to Asia, the council’s largest export destination by region, more than tripled, from 17m tonnes in 2006 to 56.2m tonnes in 2020, representing a compound annual growth rate (CAGR) of 8.9%. Intraregional chemicals trade, meanwhile, expanded by a CAGR of 5.5% over the same period, from 2.5m tonnes to 5.2m tonnes.

The twin challenges of the Covid-19 pandemic and the decline in global oil prices resulted in a reduction in GCC chemicals exports in 2020 in terms of both volume and revenue. However, the demand-driven uptick in oil prices during 2021 and early 2022 indicates a path to recovery for the segment.
GCC countries implemented swift and decisive policy responses to cushion their economies and populations from Covid-19 and the drop in oil prices. On March 15, 2020 the Central Bank of the UAE launched the Dh100bn Targeted Economic Support Scheme for retail and corporate customers affected by the pandemic. In October 2021 the government approved the Emirates Development Bank Strategy to offer Dh30bn of funding to priority industrial sectors in 2021-25.

On March 16, 2020 Qatar launched a QR75bn package to reduce the virus’ impact on the private sector. The central bank lowered the lending rate by 100 basis points to 2.5% to help facilitate access to finance for industrial players. The regulator also launched a special repo window at zero interest, equal to 9.3% of GDP, to offer liquidity to banks for the postponement of customer loan installments and the dissemination of new loans. This helped widen access to finance for businesses, including for chemicals and petrochemicals players, while boosting liquidity.

Relief measures announced in Oman on March 19, 2020 included the three-month halting of rent payments for companies in industrial zones, and exemptions from municipal taxes and some government fees until the end of August 2020. On April 1, 2020 the authorities announced a package of measures including the waiving of fines and penalties for late disclosures and the payment of taxes in smaller instalments.

On March 17, 2020 Bahrain announced a BD4.3bn economic stimulus support package, equal to 29.6% of GDP. Under the package, the central bank temporarily widened zero-interest lending to banks – to a maximum of BD3.7bn – to enable the deferral of loan repayments and the disbursement of additional credit.

The government of Kuwait approved KD500m in financial support on March 16, 2020 for Covid-19 pandemic relief measures. This included a six-month postponement of social security contributions for private companies; the lifting of government fees in selected sectors, including manufacturing; and the provision of concessional, long-term loans to vulnerable small and medium-sized enterprises.

On March 20, 2020 the GCC’s largest economy, Saudi Arabia, announced an SR70bn private sector support package, equal to 2.7% of GDP, which included the suspension of tax payments to facilitate liquidity in the private sector. The following month temporary electricity subsidies amounting to a total of SR900m were introduced for the commercial, industrial and agricultural sectors.

Petrochemicals companies, meanwhile, activated crisis management plans in collaboration with major stakeholders. The streamlining of costs was key to business resilience, and effective and regular communication helped to overcome supply chain disruptions. This included action by the public sector, which worked to enable industrial business continuity.
Case Study

Founded in 2005, Advanced Petrochemical Company is a joint stock company listed on Tadawul, the Saudi Stock Exchange, since 2007. The company operates in the chemicals and petrochemicals industry, and primarily produces polypropylene (PP). It aims to be a producer of a diverse array of petrochemical products.

The main industries driving demand for its output are automotive, health care, packaging, textiles and consumer products. With headquarters and production facilities located in Jubail, in Saudi Arabia’s Eastern Province, the company has long-term offtake agreements with Mitsubishi in Japan, Vinmar International and Tricon Chemical in the US, and DOMO Chemicals in Belgium. It also owns two manufacturing joint ventures in South Korea, managed in partnership with local firm SK gas.

The Covid-19 pandemic posed significant operational challenges to petrochemical companies – especially in the early months in terms of staffing as countries imposed lockdown measures. In this context, Advanced Petrochemical activated its crisis management plan, which includes a clear executive structure and leadership, and regularly engaged with authorities, suppliers, clients and stakeholders to help them adapt as the situation evolved. In order to maintain business continuity, work shifts were rearranged and replacement teams were put on standby in case Covid-19 outbreaks occurred. In the first half of 2021 the company had previously scheduled maintenance on two of its facilities. This required their complete shutdown for a month, adding complexity to the already challenging environment. Despite these difficulties, Advanced Petrochemical managed to maintain consistent levels of output.

The year 2020 was challenging for the petrochemical segment, with industry players around the world experiencing a hit to their bottom lines. In Advanced Petrochemical’s case, net income dropped by 21.6%. However, the company’s crisis response plan, robust internal systems and efforts to streamline costs, along with the stability derived from the company’s focus on long-term commercial relations, led to a 57.2% rise in net profit in the first nine months of 2021. This was despite a 195% increase in offshore logistics costs, which reflected the downward pressure of international logistics disruptions.

Advanced Petrochemical Company leveraged cooperation mechanisms such as the Kingdom’s Petrochemicals Manufacturing Committee in order to mitigate the impact of logistics bottlenecks.
"It is difficult to predict when the current disarray in supply chains will subside, but we can deploy mitigation strategies, including options to arrange a more stable co-location of containers at outbound points," Fahad Al Matrafi, CEO and president of Advanced Petrochemical, told OBG. The concentration of inputs and supplies in Jubail should facilitate this end, which would be particularly beneficial for producers with average output volumes.

The pandemic underlined the importance of achieving deep levels of engagement with offtakers to limit uncertainty. On the one hand, by pursuing long-term commercial partnerships the firm has been able to tie its capital investments to predictable demand, in turn shortening amortisation times while increasing customer satisfaction by allocating manufacturing capacity to specific clients. This is the rationale behind the company’s new Jubail-based joint venture, Advanced Polyolefins Industry Company (APOC), owned by subsidiaries of Advanced Petroleum and SK gas. APOC is building a dehydrogenation plant – set to open in 2024 – with a nameplate capacity of 843,000 tonnes of propylene and 800,000 tonnes of PP a year. On the other hand, the demand for petrochemicals is traditionally characterised by a considerable level of fragmentation in applications, which forces manufacturers capable of producing a wide range of semi-finished or finished goods to quickly adapt to shifting demands. As such, access to an adaptable feedstock is a competitive advantage. In order to deliver such feedstock, APOC is investing in innovative technologies, and leveraging its connections with offtakers and petrochemical technology licensors to anticipate solutions to the industry’s changing needs.

Looking to the future, sustainability will be one of the main focus areas as the company evolves. In terms of daily operations, Advanced Petrochemical is working with external advisors to integrate sustainability across its systems, with a view to releasing the company’s first sustainability report in the third quarter of 2022. The drive for sustainability can spur product innovation, according to Al Matrafi, who is also a member of the sustainability committee at the Royal Commission of Jubail and Yanbu. The firm is exploring circular economy technologies – with licensors and a potential new partner in Jubail – to derive a value-added chemical from one of the firm’s hydrocarbon waste streams. "Those at the top of the organisation see sustainability as a path to help Saudi Arabia achieve its environmental targets and improve our business performance, as well as potentially open up new streams of revenue," Al Matrafi explained.
Part 2: Response

Short-term Prospects

According to the January 2022 edition of the “World Economic Outlook” from the IMF, the global economy is poised for an expansion of 4.4% in 2022 and 3.8% in 2023, following a 3.1% contraction in 2020 and 5.9% growth in 2021. Some suppliers expect global petrochemicals demand to increase in 2022 as economic recovery continues worldwide. Nevertheless, petrochemicals players will likely still face challenges in the first half of the year, particularly if new Covid-19 variants emerge or if the conflict in Ukraine becomes protracted, which would impact supply chains and economic activity more generally.

The GCC was expected to return to growth of 2.2% in 2021, sustained by the global recovery and an uptick in oil demand and prices, according to the World Bank’s August 2021 “Gulf Economic Update”. Against this backdrop the GCC chemicals and petrochemicals industry was poised to expand across all key indicators, including sales revenue, production volume and international trade, according to the Gulf Petrochemicals and Chemicals Association (GPCA) in November 2021.

On February 16, 2022 the OPEC crude oil basket price rose to $95.32 per barrel – the highest level since October 2018. This raised expectations for growth in the price of petrochemicals products. Moreover, the GCC's chemicals capacity utilisation rate of 93.3% in 2020 was not only above the global average of 78.6%, but remained in line with its annual average rate of 93% for 2009-19. These circumstances, in combination with strong economic and manufacturing activity in China – the GCC’s largest chemicals export market – have prompted a healthy outlook for GCC chemicals and petrochemicals exports in 2022.

The GCC was expected to have maintained a chemicals trade surplus of 50m-56m tonnes in 2020, according to GPCA estimates in 2021. This represents a drop in volume from 59m tonnes in 2019 and a 17.9% decline in value from $32.9bn to $27bn. The contraction has been partly attributed to the 35.2% drop in oil prices for the year.

Of a total production output of 150m tonnes in 2020, 28.9% comprised basic chemicals, 22.9% fertilisers and 17% commodity polymers. Inorganic chemicals registered the highest CAGR between 2012 and 2020, at 38% – significantly outpacing the overall GCC chemicals industry CAGR of 5.9%. Even during the pandemic, the GCC petrochemicals segment proved capable of maintaining fairly stable production levels and export volume.

Despite some concerns, expansion is projected for the global economy in 2022: this will support growth of the GCC petrochemicals industry. Positive signs in the opening months of the year included rising oil prices, the economic recovery of China, and a consistent rate of productivity in the segment despite the challenges endured throughout 2020 and 2021.
Part 3: Reinvention

Investment Outlook

Capital investment in the GCC petrochemicals industry has increased significantly in recent years. With mean annual investment of around $2.8bn, the value of petrochemical mega-projects in the GCC increased nearly 10-fold between 2017 and 2020, from $1bn to $9.5bn. Petrochemicals producers in the region demonstrated resilience during the pandemic, investing $2.7bn – roughly equal to the mean of the preceding years and reflecting continued confidence in the segment. Although progress on some projects has been temporarily halted in response to pandemic-related challenges, the construction pipeline remains robust.

A combined $71bn in investment is planned or committed in MENA for 2020-24, according to estimates by the Gulf Petrochemicals and Chemicals Association (GPCA) in 2021. Egypt accounts for around half of this total, with Oman and Saudi Arabia coming in second and third, respectively, with roughly $20bn each.

Among Oman’s largest developments in the segment is the $9bn Duqm Petrochemicals Project (DPP), undertaken by the Duqm Refinery and Petrochemical Industries Company, a 50:50 joint venture between Oman-based global energy supplier OQ Group and Kuwait Petroleum International. While the GPCA noted in late 2021 that the DPP was on hold due to pandemic-related challenges, appetite in the city has continued to grow; in December 2021 OQ and SABIC signed a memorandum of understanding to explore the development of a new petrochemicals project, including a steam cracker plant and units to produce olefin derivatives, in the Special Economic Zone of Duqm.

Meanwhile, in Saudi Arabia, one of the most substantial undertakings is the Amiral project, a $5bn petrochemical complex being built near Jubail by Saudi Aramco and France’s TotalEnergies. When it becomes operational in 2024, the facility will have the first mixed-feed cracker integrated with a refinery in the Gulf, with 1.5m tonnes per annum of ethylene capacity and production units for other high-value petrochemicals.

The UAE and Kuwait both expect to receive close to $10bn of investment between 2020 and 2024. In the UAE, Borouge’s expansion initiative in Ruwais worth $6.2bn is among the largest projects under way, while in Kuwait, the $5bn Al Zour petrochemical complex being developed by Kuwait Integrated Petroleum Industries is in the pipeline. However, the GPCA noted that Al Zour was on hold in late 2021; as of February 2022 an announcement had yet to be made on resuming development.

Qatar’s petrochemicals industry, for its part, is expected to receive around $5bn over the 2020-24 period. This will primarily be channelled towards the construction of a new petrochemicals complex in the industrial city of Ras Laffan, carried out by Qatar Energy and Chevron Phillips Chemical. While the project was temporarily halted during the pandemic, construction resumed in November 2021.

Although pandemic-related headwinds and weak oil prices led some Gulf petrochemicals players to delay development decisions or pause projects, the subsequent rebound in oil prices and gradual economic recovery have since made it easier for many capital investment projects to stay on track with, or even without, modifications. This should pave the way for growth in GCC chemicals activity in the years beyond 2022.
In a 2020 survey from Boston Consulting Group (BCG), 58% of executives in the Middle East identified innovation supported by substantial funding as a top priority – a rate surpassed only by China, at 59%. BCG identified Saudi Aramco as the most innovative firm in MENA, with SABIC ranking third – underscoring the petrochemicals segment’s innovative potential.

An analysis of the main technical categories of registered GCC petrochemicals patents, based on 2020 data from Derwent Innovation, points to emerging innovation trends. Within chemical processes – the top category by number of registered patents – commonly registered processes included polymerisation, petroleum, hydrocracking and hydrotreating. The popularity of this category largely stems from the laboratories of industrial corporations, with just 4% of patents originating from academia. This signals scope for increased collaboration between private industrial laboratories and other stakeholders to unlock the benefits of open innovation and incorporate more external ideas.

As the second-largest category, catalysts are important for both the energy and environmental sectors – particularly amid mounting global pressure to adopt solutions that pose less environmental risk. Cracking – or the process by which complex hydrocarbons are broken into lighter molecules by means of hydro, catalytic, steam and thermal processes – accounted for the third-largest technical category by innovation. As with the other top categories, this is a mature technology primarily developed in company laboratories and therefore presents another opportunity to enhance competitiveness along the value chain.

Moving forwards, big data will play a fundamental role in enabling GCC chemicals companies to predict, rather than merely react to, changing market conditions. These technologies not only help boost time and cost efficiency in bringing a new product to market, but also facilitate business model innovation and increase competitiveness.

Within the chemicals and petrochemicals segment, big data and analytics can enable the integration of information from suppliers, production plants, internal departments such as sales and marketing, and third-party logistics providers. Analytics tools, meanwhile, can accelerate the innovation process, augment product quality, strengthen supply chain resilience and enhance customer service.

Innovation in the GCC’s chemicals industry has a vital role to play, both for the growth of the segment itself, and for the region’s economic expansion more broadly. Increased investment in chemicals research and innovation will be pivotal to drive product differentiation, increase process efficiencies and secure cost advantages – ultimately helping the region’s chemicals players become more competitive in the global arena.
Part 3: Reinvention

Consolidation & Growth

The total value of mergers and acquisitions (M&A) set a new record in 2021. Global M&A value across pending and completed deals was $3.60trn year to date in August 2021, according to Refinitiv, a global provider of financial markets data – exceeding the full-year total of $3.59trn in 2020.

By industry, the high-technology sector accounted for the lion’s share, at $799bn, followed by financial services, with $442bn. Industrials, including chemicals and petrochemicals, was close behind, with $438bn. This pattern was similar to that of previous years, signalling the continued weight of the industrial sector in global investment and consolidation trends.

Although the Covid-19 health crisis led to a drop in both the number and value of M&A deals in 2020, the pandemic also indirectly encouraged greater investment activity. By increasing underlying market volatility, Covid-19 substantially altered the economic conditions needed to achieve organic corporate growth. This, in turn, increased receptiveness to M&A and, with it, opportunities for inorganic growth – that is, growth derived from M&A rather than an increase in a given company’s business activity.

MENA attracted $75bn worth of M&A deals in 2021, according to Lebanon-headquartered investment management firm Broadgate Advisers, with Saudi Arabia responsible for $44bn of the total. The Kingdom’s largest deals were related to energy and petrochemicals, including the $12.4bn acquisition of a 49% share in Saudi Aramco’s oil pipeline company by an international consortium led by US investment firm EIG Global Energy Partners. In another important development, Saudi Industrial Investment Group signed a non-binding agreement to purchase the remaining 50% stake in Saudi National Petrochemical Company, which would give it full ownership. The deal would create an $11.2bn company with a simplified ownership structure and an increased focus on growth expenditure.

The consolidation of the chemicals and petrochemicals industry through M&A deals could help to mitigate oversupply risks. Global chemicals production capacity exceeded demand by some 21% in 2017, with a gap of 30m tonnes for the year, according to an April 2020 analysis by Strategy&. Incorporating the early impact of Covid-19, the firm expected the gap would widen to 24%, or 38m tonnes, in 2020, largely due to demand declines across construction, automotive and consumer goods. The analysis forecasts this gap to grow to 28%, or some 50m tonnes, by 2023. This consolidation in the chemicals and petrochemicals segment could allow for better coordination of production volume, promote the closure of high-cost assets and facilitate the absorption of excess production capacity. Combined with a gradual recovery in global chemicals and petrochemicals demand, this could help to increase the resilience of regional supply chains and boost value creation in the broader industry.

Graph source: Refinitiv

Global M&A value* by sector, August 2021

<table>
<thead>
<tr>
<th>Sector</th>
<th>YTD ($)</th>
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<tbody>
<tr>
<td>High technology</td>
<td>799</td>
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<tr>
<td>Financial services</td>
<td>442</td>
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<tr>
<td>Industrials (incl. chemicals &amp; petrochemicals)</td>
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<tr>
<td>Energy &amp; power</td>
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<tr>
<td>Health care</td>
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<td>Real estate</td>
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<td>Retail</td>
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<td>Media &amp; entertainment</td>
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<td>Materials</td>
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<td>Telecommunications</td>
<td>106</td>
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<td>Consumer staples</td>
<td>94</td>
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</table>

*pending & completed deals
Maersk is an integrated logistics company with operations in 130 countries. The company has been present in Saudi Arabia since 1956, and manages weekly containerised shipping to and from the main ports of Jeddah, Dammam and Jubail. In June 2021 the firm expanded its portfolio in the Kingdom through a partnership with King Abdullah Port, the country’s first privately owned and operated port. The project will establish the Maersk Integrated Logistics Hub, a non-bonded warehouse that caters to the specific needs of Saudi petrochemical exporters. The Maersk Integrated Logistics Hub is part of a move to boost the efficiency and competitiveness of Saudi Arabia’s logistics sector in line with Vision 2030, the Kingdom’s long-term development framework. Among other goals, Vision 2030 aims to position Saudi Arabia as a transport and logistics hub between Asia, Europe and Africa.

The complexity and fragmented nature of petrochemical supply chains made the industry particularly vulnerable to the widespread disruptions associated with the Covid-19 pandemic. With operational continuity and price stability as central concerns for the industry, efficient and resilient logistics have emerged as a competitive advantage.

This is particularly relevant because Vision 2030 identified petrochemicals – together with the mining sector – as a fundamental driver for growth and economic diversification away from hydrocarbons exports. The government has moved in recent years to make this a reality, for example by establishing the Ministry of Industry and Minerals as an entity separate from the Ministry of Energy in 2019. Moreover, in 2020 the government granted the former a mandate to oversee the petrochemicals industry.

Efforts have also been made on a corporate level to bolster petrochemicals. In 2020 Saudi Aramco acquired a 70% stake in SABIC, the Kingdom’s leading petrochemicals manufacturing company. This set the stage for the creation of a fully-fledged oil-to-chemicals ecosystem, with value added further downstream through the expanded participation of petrochemical small and medium-sized enterprises.

In March 2021 the government announced the Shareek programme, which aims to inject $1.3trn into diversification-driving investments by 2030 via public-private partnerships. The programme is managed by the Public Investment Fund, and around 60% of the investments will be allocated to Saudi Aramco and SABIC in order to facilitate their role as a catalyst of private sector growth in the petrochemicals industry.
Case Study

The government redoubled efforts to support the petrochemicals industry during the Covid-19 pandemic. Supply chain disruptions associated with the health crisis highlighted the need to strengthen export-related infrastructure and services in order to ensure reliable access to the global market. It was in this context that the company introduced the Maersk Integrated Logistics Hub at King Abdullah Port, its first sector-specific industrial hub. “We created the Maersk Integrated Logistics Hub as a direct response to the needs of our clients in the domestic petrochemicals industry,” Mohammad Shihab, managing director for Saudi Arabia and the upper Gulf at Maersk, told OBG. “They emphasised the importance of speed and flexibility as success factors.” Cooperation with the relevant government agencies is vital in this regard. “The Saudi authorities have engaged with operators to improve the country’s logistics performance,” Shihab said. “This has not only been crucial in safeguarding the continuity of vital imports during the pandemic, but it has also allowed Maersk to contribute to the positive evolution of export-related regulations to guarantee they match the scale of the Kingdom’s ambitions.” The Maersk Integrated Logistics Hub will serve as a mid-point link in outbound petrochemical logistics, with annual throughput set to reach 1m tonnes by the third year of operations. An initial area of 100,000 sq metres has been set aside for warehousing space within 2 km of King Abdullah Port’s terminal yard, which is adjacent to the Customs inspection zone. This arrangement will facilitate the storage of export cargo, and enable pallet handling, stuffing and shuttling operations. By routing deliveries through the Maersk Integrated Logistics Hub, it is expected that processing time – from booking to loading onto the vessels – will fall in some cases from the current 14 to 18 days, to six to eight days. This should, in turn, lead to a 30% reduction in overall supply chain costs and shrink operations’ carbon footprint by approximately 27% as a result of fewer trucking trips from customers’ plants to the hub.

The facility is one step towards meeting Maersk’s wider goal of achieving deeper integration in its logistics and services offerings. In order to do so, the firm will leverage three factors: its expertise in third-party logistics and associated digital solutions; its consolidated land and sea transport networks; and its growing market knowledge. “As a tailor-made concept, the Maersk Integrated Logistics Hub corresponds with both Maersk’s capability to combine its services and processes in a modular manner, and the strategy to reshape the company by 2023 based on customer-centric infrastructure investment,” Shihab told OBG.
Part 3: Reinvention

ESG Trends

As the GCC continues its focus on developing the chemicals and petrochemicals segment, the environmental imprint of the energy fuelling these industrial processes in an important consideration. The region is already seeing rising investment in renewable energy, although measuring emissions along the industrial value chain remains a challenge.

Key petrochemicals stakeholders have an important role to play in the industry’s green revolution. For example, in November 2020 SABIC announced plans to install 4 GW of clean energy in the Kingdom by 2025, and 12 GW by 2030. The corporation’s 300-MW Yanbu Solar Photovoltaic (PV) Park has been designed to provide enough energy to power local operations during daylight hours. SABIC also plans to expand its green operations to Cartagena, Spain, where a 100-MW solar PV plant scheduled to open in 2024 will help the company achieve the world’s first large-scale petrochemicals production site to run completely on renewable energy.

Emissions along the industrial supply chain, including final product distribution, are among the most significant contributors to greenhouse gas emissions in the broader chemicals and petrochemicals industry. However, accurately measuring and calculating these so-called scope-3 emissions – those that are neither direct corporate emissions, nor indirect emissions associated with the purchase of electricity, steam, heat or cooling from third-party suppliers – presents a challenge for the segment.

“Calculating scope-3 emissions for a petrochemicals trading company is rather complicated, as it involves looking not only at the final products being shipped, but also at everything else in the supply chain – including the ships themselves,” Gina Fyffe, the CEO of petrochemicals trading company Integra, told OBG. “Ships are getting older, and it is very difficult to make decisions on replacing ageing ships without knowing which energy source will be environmentally acceptable for the next 25 years. The result is that fleets are getting smaller, which could push up freight rates further. This challenge needs to be faced without delay.”

The strategic position of the GCC offers some advantages for firms looking to reduce scope-3 emissions globally. “If you are a company that wants to diversify its petrochemicals supply chain, it makes sense to add the Middle East to the mix, as you can expect to receive the products within a few weeks, and generate fewer emissions from long-distance shipping in the process. Middle Eastern producers are also trying very hard to think creatively when it comes to transition planning, so they can establish an early-mover advantage in sustainability,” Fyffe said.

Sustainable development in the GCC’s chemicals and petrochemicals industry – including expanding the use of renewable energy and ongoing efforts to minimise harmful greenhouse gas emissions – looks set to boost the segment’s contribution to non-oil GDP revenue from 2022 onwards. This should ultimately increase the region’s resilience to external headwinds, drive value-added production and present wide-ranging investment opportunities over the coming years.

ESG-related trends in the GCC petrochemicals industry

- **Renewable energy**
  - Adoption of solar, wind and green hydrogen energy solutions to power petrochemical plants

- **Circular economy**
  - Usage of recycled and renewable feedstock in the petrochemical production process

- **Local employment**
  - Contribution of petrochemicals industry to local employment targets, such as Saudisation
As the world returns to growth post-Covid-19, the future is bright for GCC chemicals and petrochemicals. Key indicators include sustained production in the face of challenges; robust export demand forecasts as global activity resumes; and prospects for innovation-led transformation. With diversification high on the region’s long-term policy agenda, the industry looks set to offer wide-ranging opportunities in 2022 and beyond.

Among the sustainability challenges facing the industry is the difficulty measuring emissions along the supply chain. With this in mind, the strategic location of the Middle East not only offers benefits in terms of time, but also incurs lower emissions than longer-distance alternatives. At the same time, M&A may help better coordinate production volumes, boost the resilience of regional supply chains and protect the industry from future risks.

A knowledge-based economy is crucial to diversification. While the GCC lags behind global peers in R&D investment, analysis suggests that its commitment to innovation is robust. With innovation-led transformation pivotal to the next wave of economic and industrial development, greater investment in chemicals research and innovation would drive product and service differentiation, increase efficiency and enhance global competitiveness.

Growth in regional chemicals production in 2020 underlines the industry’s resilience, with the measures taken to support activity during the pandemic reflecting the public sector’s commitment to value-added manufacturing. Diversification remains a key pillar of the region’s long-term plans, and the launch of industrial strategies like the UAE’s Operation 300bn could be another growth driver.

The GCC’s focus on long-term economic diversification aims to cushion the region’s economies from global headwinds, including oil price fluctuations, and support value-added growth. The chemicals and petrochemicals industry can boost non-oil GDP through products derived from oil and gas. The segment accounted for 4.9% of regional GDP and 2.4% of the Gulf’s workforce in 2018.

An uptick in pre-pandemic chemicals exports from the Gulf drove the segment’s trade surplus despite lower oil prices. South-east Asia and the Pacific accounted for around two-thirds of export volume in 2018, with China comprising roughly one-quarter of the total. China’s post-pandemic rebound in economic activity, as well as the recovery in oil prices, are among the positive indicators for 2022.

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In collaboration with

Gulf Petrochemicals & Chemicals Association

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Integra

MAERSK
The Gulf Petrochemicals and Chemicals Association (GPCA) was established in 2006 with the mission to represent the downstream hydrocarbons industry across the Gulf. The association now pursues the common interests of more than 250 member companies from the chemicals and allied industries, which collectively account for more than 95% of the combined chemicals output of the GCC. The industry represents the second-largest manufacturing segment in the region and produces over $108bn worth of products every year.

The GPCA supports the petrochemicals and chemicals industry in the Gulf through advocacy, networking and thought-leadership initiatives aimed at helping member companies connect, share and advance knowledge; contribute to international dialogue; and shape the future of the global petrochemicals industry. In an effort to provide a regional platform for stakeholders from around the world, the GPCA manages six working committees – Plastics, Supply Chain, Fertilisers, International Trade, Research and Innovation, and Responsible Care – and organises six high-profile events each year. In addition, the association publishes an annual report, regular newsletters, and a variety of industry reports for use by both members and non-members.

As the industry emerges from the disruption of the Covid-19 pandemic, the association sees opportunities for regional companies to contribute to economic diversification and resilience. “We are at a turning point, shifting from commodity suppliers to speciality chemicals producers,” Abdulawahab Al Sadoun, secretary-general of the GPCA, told OBG. “We can increase our contribution to economic diversification through technology acquisition, research and development, joint ventures, mergers, industrial cluster developments and an increased emphasis on service, with greater support from governments in the region,” Al Sadoun added.

For more information, visit www.gpca.org.ae.