


November 2020



## The Chinese majors' responses to the collapse in global oil prices and the COVID-19 pandemic: an upstream perspective

The year 2020 is pivotal for China's upstream sector, having been intended to witness the ushering in of a new era of strong production increases. This final year of the 13th Five Year Plan (2016–2020) is also the second year in the oil companies' 'Seven-Year Exploration and Production Increase Action Plans', and the inaugural year of domestic upstream liberalization plans, all of which were designed to bolster China's upstream development. But the ambitious development plans of both government and oil companies have been marred by the fallout from COVID-19 and the subsequent collapse in global oil prices.

During the last oil price crash, between 2014 and 2016, the Chinese majors (CNPC, Sinopec, and CNOOC) followed their international peers in slashing Capex; this led to a contraction in oil output, which fell by 6.9 per cent y/y in 2016. This time, however, they hope to chart a different course. While the Chinese majors are set to cut Capex, they hope that a number of strategies – such as cost reductions throughout the supply chain, mainly through effective management of service company costs, as well as reduced activity overseas – will allow them to direct more capital toward domestic exploration and production. Moreover, by opening the upstream to private and foreign companies, the Chinese majors hope to unlock new sources of financing and expertise to expand natural gas production and stabilize oil output.

The Chinese majors' insistence on maintaining domestic production, at a time of abundant global supplies, stems from rising concerns about energy security and the surge in dependence on imported oil and gas. Indeed, back in 2016, imported oil accounted for 60 per cent of total consumption (increasing to 72 per cent in 2019), while natural gas imports represented 32 per cent of demand (43 per cent in 2019). In addition, the gas supply shortages seen in the winter of 2017/2018, just as domestic demand surged, told a cautionary tale as prices surged and pipeline supplies fell short of expectations. At the same time, the majors can afford to focus on the costlier domestic upstream because their largest shareholder, the state, does not expect them to prioritize profits and revenues at a time of national crisis. On the contrary, enhancement of their domestic activities is a way in which growth and employment in China can be supported.

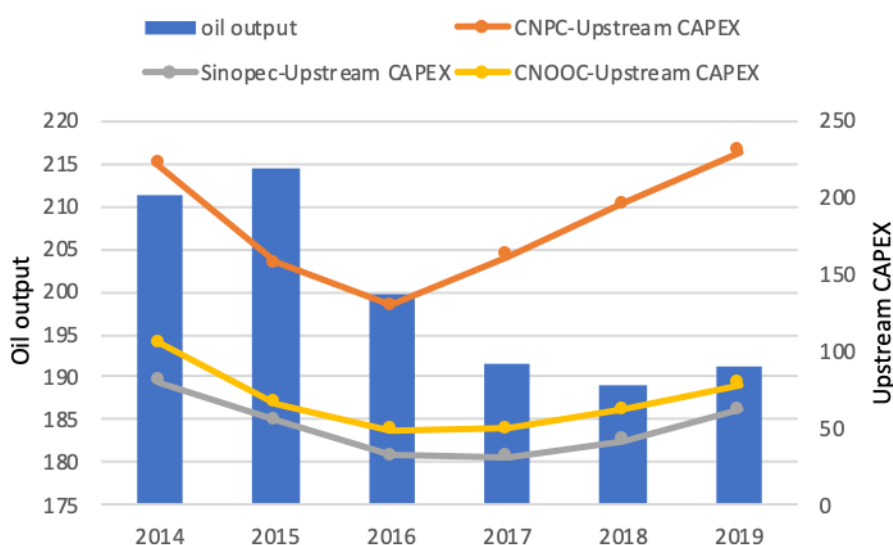
But can these strategies deliver oil and gas production growth? While an increase in 2020 production is highly likely, due to the large Capex investments in 2019, the expected cuts in Capex in 2020 could start weighing on production growth from 2021–2022. It remains unclear to what extent the current cost-cutting efforts will be sufficient to drive growth through 2025, at a time when Capex budgets are being cut. And while the majors' decision to focus on production in mature fields and delay investments in strategic reserves could help maintain production in the near term, output growth post 2025 might be jeopardized.

## China's majors stick to their production targets

At the beginning of 2020, before the double challenge of the supply glut and the coronavirus-induced demand destruction hit oil prices, China's state-owned oil and gas majors were planning to increase their investments in domestic oil and gas production, in line with their 'Seven-Year Exploration and Production Increase Action Plans' (Seven-Year Action Plans), which they had issued at the beginning of 2019. However, following the oil price crash, the majors' commitment to their original plans has been questioned. Industry observers both in China and overseas have been assuming that after rebounding last year, China's oil output will decline again in 2020, much like it did during the last price crash of 2014–2016.<sup>1</sup>

Indeed, back then, the three majors reduced their investment in the upstream sector substantially. For example, in 2015, CNPC, Sinopec, and CNOOC cut their E&P Capex by 28.7 per cent, 32 per cent, and 37 per cent respectively as they prioritized profits, focusing on portfolio optimization, management reform, and tight cost control. This resulted, among other things, in three consecutive years of production declines between 2016 and 2018 (Figure 1).

**Figure 1: Domestic oil production, million tons (LHS), upstream Capex, billion RMB (RHS)**



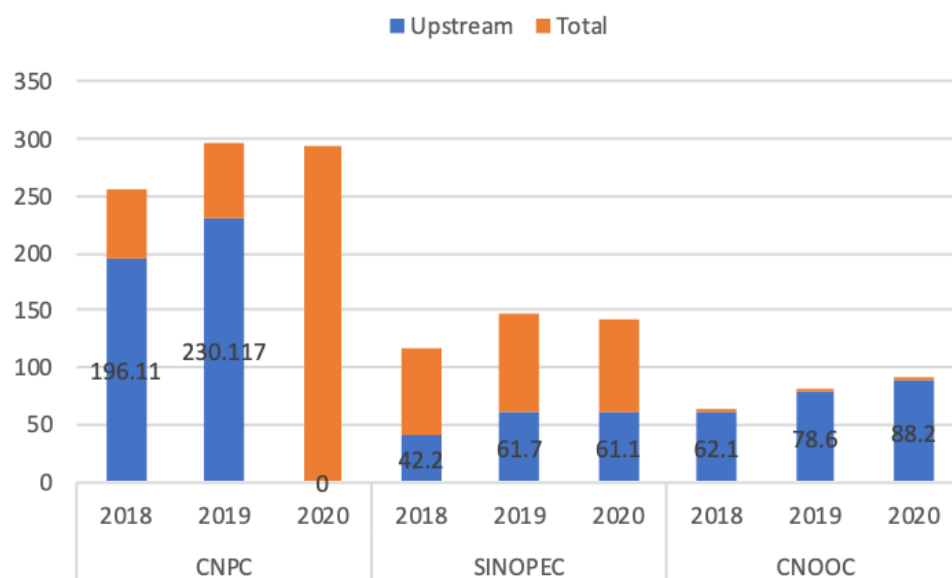
Source: NBS, majors' Annual Reports.

But back in 2016, China's oil import dependency was at 60 per cent and that of gas was at 32 per cent. Three years later, in 2019, oil import dependency had surged to 72 per cent and natural gas to 43 per cent. As a result, China's National Energy Administration (NEA) initiated dialogues with the country's three major oil companies (CNPC, Sinopec, and CNOOC) to discuss the potential for bolstering their upstream activities. At the beginning of 2019, with output of 189 million tons (3.8 mb/d) oil and 173 billion cubic metres gas, the majors successively issued their Seven-Year Action Plans, aiming to boost the domestic level of oil production to 200 mt (4 mb/d) and gas production to 200 bcm before 2025. As a result, (Figure 2), CNPC, Sinopec, and CNOOC increased their upstream investment in 2019 by 17

<sup>1</sup> 'China's Oil Dream Dims as State Giants Cut Capex by \$19 Billion', Bloomberg News, 29 April 2020, <https://www.bloomberg.com/news/articles/2020-04-29/china-s-oil-drilling-dream-dimmed-as-state-major-cuts-spending>; Erica Downs, Antoine Halff, David Sandalow, Erin Blanton, 'China and the Oil Price War: A Mixed Blessing', Center on Global Energy Policy Commentary, 25 March 2020, <https://www.energypolicy.columbia.edu/research/commentary/china-and-oil-price-war-mixed-blessing>.

per cent, 46 per cent, and 26 per cent respectively y/y, with the majority of investments going into conventional oil and gas fields, which need longer periods of payback than shale.

**Figure 2: Three majors' Capex breakdown in 2018, 2019, and pre-crisis 2020 strategy, billion RMB**



Source: 2018, 2019 Annual Reports, 2020 Strategy Review.

Note: CNPC published its 2020 total Capex without details on the upstream.

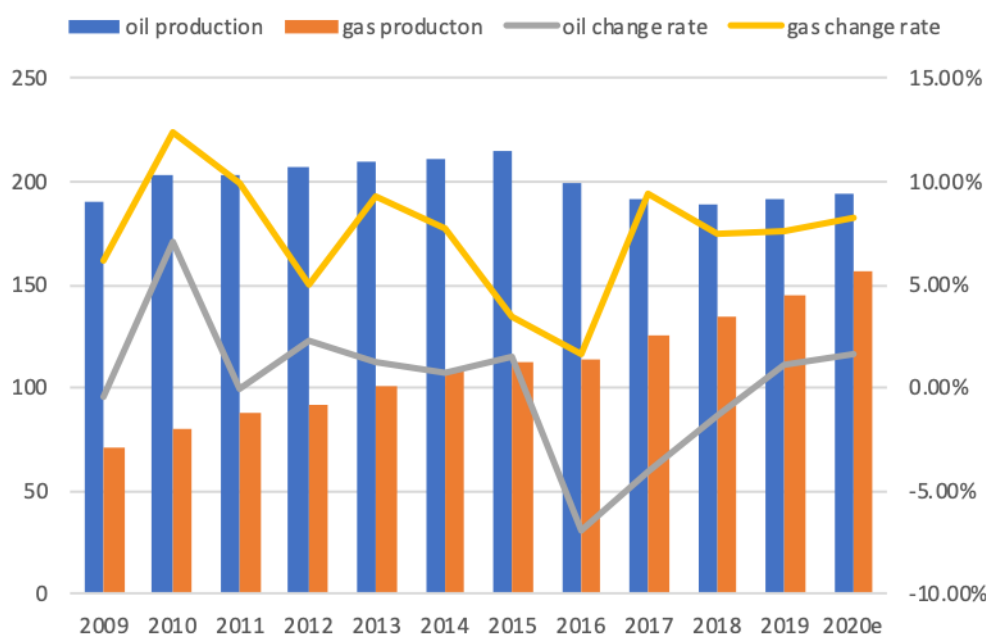
Owing to these larger investments, China's total crude output in 2019 increased by 1.2 per cent y/y to 191 million tons, reversing the three previous years of declines (Figure 3). This improved performance was also exhibited in the gas sector, with production in 2019 reaching 173.3 bcm, a growth rate of 9.6 per cent y/y. Moreover, data released by the National Bureau of Statistics of China (NBS) suggested that there was still strong momentum in Q1 20, pointing to a 2.4 per cent y/y increase in crude production and a 9.1 per cent y/y rise in gas output.

China was one of the first countries to start rolling out an economic recovery plan. Though early, the scale of the stimulus package was modest at an estimated 7 per cent of annual GDP; much smaller than those of some OECD nations that exceed 10 per cent and the country's response to the 2008 global financial crisis that reached 12 per cent.<sup>2</sup> Two sets of slogans underpinned the government's approach to the 2020 recovery plan: the "Six Stabilities" announced in March 2020 and the "Six Guarantees" announced in April 2020 (Table 1).<sup>3</sup> The slogan "Six Stabilities" has underpinned national economic policy since 2018, whilst the "Six Guarantees" reflect the need to address the challenges posed by the COVID-19 pandemic. Environmental protection and climate change mitigation are not among these priorities.

<sup>2</sup> Wong C. Uncovering China's fiscal stimulus policies in the budget report, <https://research.nus.edu.sg/eai/wp-content/uploads/sites/2/2020/07/EAIC-16-20200706.pdf>; 6 July 2020 [accessed 20 July 2020]; Alberola E, Arslan Y, Cheng G, Moessner R. The fiscal response to the Covid-19 crisis in advanced and emerging economies. Bank of International Settlements, BIS Bulletin 23, 17 June 2020.

<sup>3</sup> People's Daily Overseas Edition. Xi Jinping: Do a solid job in ensuring "six stabilities" and fully implement the task of "six guarantees", [http://paper.people.com.cn/rmrhwb/html/2020-04/24/content\\_1983578.htm](http://paper.people.com.cn/rmrhwb/html/2020-04/24/content_1983578.htm); 24 April 2020 (in Chinese) [accessed 3 August 2020].

**Figure 3: Domestic oil and gas production, million tons (LHS), y/y change, % (RHS)**



Source: NBS, ETRI

### Boosting domestic production is a political and social necessity

Indeed, despite the recent collapse in oil and gas prices, the rationale behind the Seven-Year Action Plan still holds today. The plan was born from a perceived need to ensure domestic supplies in order to mitigate the effect of price increases—as China's external vulnerabilities and concerns about energy security increased over the course of the 13th FYP—while also opening the upstream market to create more space for diverse participants. In particular, the rapid increase in the country's natural gas import dependency, and the sudden reduction in Turkmen exports to China (which in turn led to a surge in the cost of LNG imports), contributed to Beijing's sense of insecurity and concerns about the prospects for supply disruptions.

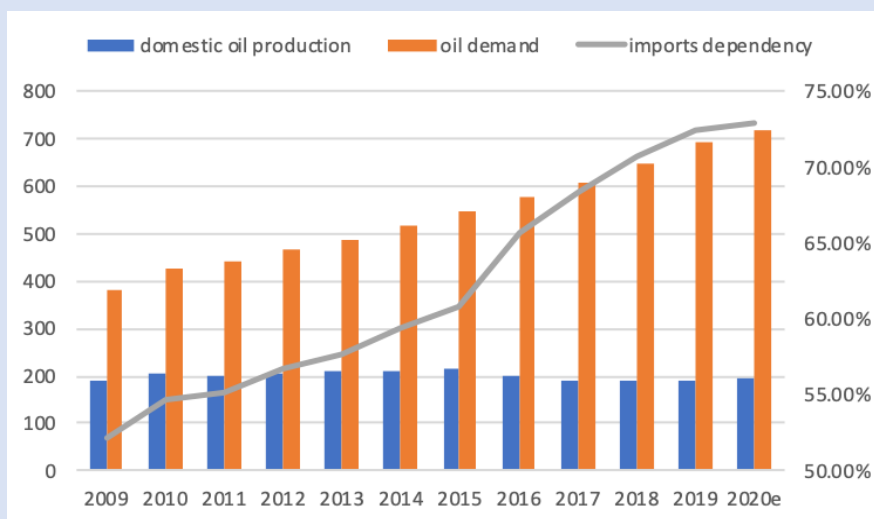
Given that China's three oil majors govern the majority of China's oil and gas business, they are expected to guarantee energy security (see box below for more on energy security and import dependency). At the same time, when considering the massive value and annual revenue of the three oil companies, their responsibilities extend well beyond the energy sector. Following the outbreak of COVID-19, China's majors have also been expected to assume social responsibilities and assist the central government in restoring normality. In early February 2020, the majors became the first enterprises to resume operations gradually. By taking advantage of their integrated industrial chain and access to raw materials, the majors purchased face mask production lines, enabling mask output to reach more than 3 million per day. In addition, China's three oil companies announced in March that they would enlarge recruitment by more than 8,000 people in total. As such, the majors' various social responsibilities inform their need to adhere to production increases, particularly when confronting a national crisis. Even though output from some of the older and more marginal fields will be uneconomic, their closure could turn out to be even costlier when considering the majors' production obligations, employment issues, and the cost of recovery.



### Are imports a bane or a boon for energy security?

Given China's surging energy needs in recent years, its import dependency has surpassed more than 72 per cent in oil and 43 per cent in gas. This has been seen by some as a threat to national energy security. When reviewing the curve of oil import dependency over the past 5 years, although the absolute import volumes have increased, the dependency growth has slowed, even before COVID-19 (Figure 4) and when considering the majors' strong resolve to increase domestic output, China's import dependency could remain flat in 2020.

**Fig 4: China's oil demand, domestic oil production, million tons, and imports dependency, %**



Source: NBS, ETRI

Note: 2020 data are based on estimates from ETRI, from its pre-virus scenario

That said, Chinese buyers are taking advantage of low crude costs to fill up commercial and strategic stocks. But stockpiling has been limited by storage capacity: According to Wood Mackenzie, in January and February 2020, the utilization rate of China's crude reserve (including both national and commercial tanks) averaged 83 per cent against last year's 72 Per cent. While the government issued plans in the early 2000s to establish a strategic petroleum reserves equivalent to 100 days of net oil imports by 2020, the country is still falling short of this target. To date, China has built nine national oil reserve bases, and alongside commercial and private oil storage tanks, stocks are estimated to account for around 50 days of cover, far lower than the safety standard of 90 days set by International Energy Agency. To a certain degree, the slowing growth in import dependency, seen in recent years, results from slowing increases in oil demand as well as the limitations of storage capacity. Thus, to try to keep the size of domestic oil reserves commensurate with the total amount of consumption, the state has released related policies to encourage social capital to participate in the construction and operation of oil reserve facilities.

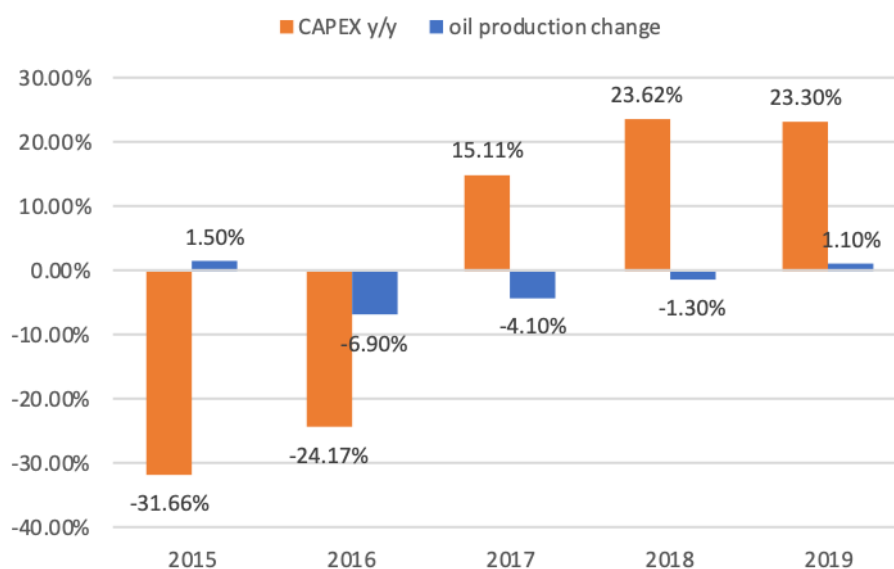
Cheap crude has led to a dramatic surge in imports. But should additional imports caused by the price crash and by stockpiling be regarded as a threat to energy security? Arguably, energy security consists of factors beyond import dependency, including the diversity of energy sources, the stability of supply chains, the sustainable development of demand, as well as ensuring the robustness of the major player's financial situation. In this respect, China's NOCs, who are vertically integrated, can leverage low oil prices to purchase larger volumes of crude, thereby improving their trading profits and offsetting losses from their upstream. As such, even if the domestic upstream weighs on their cash flow, the entire value chain can still be cash flow positive. So, importing oil during a low price period is not only conducive for China's long term strategic security needs, but also offers the oil companies greater flexibility and a way to cut costs.

Financially, China's majors can afford to prioritize their social responsibilities given that, as state-owned entities, they have a relatively robust cash flow and a lower level of corporate debt, as measured by gearing ratios—net debt (net debt /total equity). For example, the gearing ratios of CNPC, Sinopec, and CNOOC were 24.4 per cent, 29.1 per cent, and 26 per cent respectively in 2019. (Their international peers' gearing ratios for the same year, according to their Annual Reports, were 31.1 per cent, 29.3 per cent, and 18 per cent respectively for BP, Shell, and TOTAL.) Furthermore, the Chinese majors have also highlighted the fact that they hope to seize the opportunity of the current oil price crash to test their operational limits, further strengthening the resilience and competence of their professional teams. The experiences accumulated during the last crisis, in 2014–2016, helped formulate a systematic crisis response mechanism, which the majors hope to apply this time too.

### Production in 2020 will benefit from pre-COVID Capex increases, but what happens after 2021?

In their first quarter results, published in late April, China's majors announced plans to slash expenditures by a combined \$19 billion. Indeed, the majors' financial results, released by NBS in Q1 20, highlighted that as a result of slumping demand, the total revenue and profit of China's majors had declined dramatically by 11.7 per cent and 59.7 per cent respectively. However, revenues in March increased by 48.4 per cent against February, and recovered to 88 per cent of their 2019 levels. Nonetheless, PetroChina has stated that it will maintain oil production stable and increase its gas output by 5 per cent this year. This may well be achievable given that, historically, there is a correlation between the upstream Capex and output levels (Figure 5) with a lag of around one year. Indeed, the Capex cuts in 2015 and 2016 resulted in two years of production declines in 2016 and 2017. It was only after the 2017 Capex increase that this reduction in output started to slow, in 2018. Finally, the massive growth in 2018 upstream Capex enabled a reversal in the 2019 production profile. As a result, domestic production in 2020 is estimated to be growing, following the high figure for 2019 Capex.

**Figure 5: Domestic oil production; upstream Capex (three majors combined), y/y change, %**



Source: Calculations based on NBS, majors' Annual Reports.

But will Capex cuts this year, and potentially next, lead to a decline in oil production and slowing gas output growth in 2021 and beyond?

It is important to note in this context that the time lag between investment and output is one indicative factor, but this offers only limited insight into the correlation between a change in Capex and the extent



of any swing in production. Within their E&P Capex, the majors have shifted the emphasis between oil and gas over the years. A glimpse of this can be seen in the brief descriptions in their Annual Reports. For example, in Sinopec's 2016 report, the company stated that it would invest its E&P Capex mainly in the Fuling shales gas and other gas fields in Sichuan and Xinjiang. So, while the 24.17 per cent y/y decline in Capex spending led to a fall in oil production in 2017, domestic gas output still rose by 9.7 per cent y/y. In this vein, in 2017, the E&P Capex shifted toward oil rather than gas, leading to a slower decrease in oil production as well as a slower increase in gas output the following year. In 2016–2017, the majors focused on gas production in light of the supply shortages, but as gas supply sources diversified and crude import dependency increased rapidly, along with the price recovery from 2018, the majors refocused their attention on oil.

The three majors' 2019 annual results, published in March 2020, suggested some caution in their strategies as they did not give production targets for 2020, unlike reports in previous years. Like many other oil and gas companies, China's majors are looking to keep some flexibility in their strategies, to adapt in this period of heightened uncertainty; however, unlike the IOCs, they need to balance their profitability and their pledges to boost E&P, especially in the context of their domestic social responsibilities. Sinopec intends to:

'keep a stable production volume of crude oil and realise a positive growth for natural gas'.

For example, Sinopec highlighted that in the coming year it will focus on:

'capacity building of Shunbei Oilfield, Tahe Oilfield, and the Oilfield at the western margin of the Junggar Basin [and strengthen] profit-oriented development of mature fields'.

The outlook for natural gas development is vague, with a pledge to:

'accelerate capacity construction of key projects, and promote integration of production, supply, storage and marketing so as to maximize the value of the business chain'.

## The appeal of mature fields

From the previous price downturn, the majors have gained a rough sense of how much they can cut upstream Capex without leading to declines in output. Before the current oil price crash, CNPC and Sinopec had been planning to reduce their 2020 upstream Capex by around 1 per cent from 2019 levels, while CNOOC was set to increase its upstream investment by 10 per cent. However, given the fall in global prices, the majors are finding different ways to adapt. One of CNPC's major subsidiaries, Changqing Oil Field, whose oil and gas output accounts for the largest share of CNPC's upstream portfolio and of total domestic production, has decided to cut 2.5 billion RMB from its non-operational expenditure budgets. Sinopec will adopt a slightly different strategy, given that its advantage lies in the mid- and downstream sector. Moreover, as Sinopec's upstream acreage is harder to develop than that of CNPC and CNOOC, it needs more upstream Capex to develop the same amount of resources. As a result, Sinopec is looking to maximize the advantages of its integrated business model through the allocation of resources – including procurement, transportation, production, storage, and marketing – to the upstream in order to keep crude oil production volumes stable and increase natural gas output. At CNOOC, the only major to post a net profit in 2019, earnings from other parts of its business will also be used to help offset any potential losses in the upstream. CNOOC has announced plans to cut its Capex by between 10 and 15 per cent, all of which will come from overseas assets. Nevertheless, CNOOC is sticking to its domestic production plans and looking to adjust its LNG import portfolio by controlling costs and trying to revise down the cost of its long-term contracts. If it fails to do so it will have to limit spot LNG purchases, as the company is looking to cap its LNG import budget.

In their 2020 interim reports, CNPC, Sinopec and CNOOC announced their intention to cut total Capex by 21 per cent, 10 per cent and 11 per cent, respectively, relative to their pre-pandemic plans. It is important to note that the Chinese majors have more flexibility than the IOCs in deciding when and by how much to cut. IOCs tend to relate their Capex decisions, among other factors, to oil and gas prices, but China's majors also take into account political and social priorities. The majors' decision on the level

of Capex adjustment is also strongly influenced by the demand side: if they expect a relatively stable demand uptick, the majors will plan their Capex accordingly. This year, however, based on H1 20 statistics released by NBS, domestic demand for oil products has declined by 6 per cent y/y to 153.86 mt, suggesting that the pandemic has weighed on demand more heavily and for longer than the majors had expected. While a softer demand outlook gives the majors some room for slower output growth, the energy security imperative continues to drive a strong commitment to upstream production.

Already, the majors seem to be reviewing the focus of their upstream operations. Typically, upstream Capex is executed on a value-driven basis, prioritizing the following:

- Exploring mid-to-large size discoveries and reserve growth in favourable regions.
- Strengthening emerging areas (the most productive parts of each discovery's history) and frontiers (the first commercial discoveries) such as potential hydrocarbon-rich sags.

The lowest priority has been given to expanding activity in mature basins where discoveries have been declining. However, this year, following the price collapse, the majors' near-term exploration strategy will focus on mature areas as they have shorter production cycles and quicker capital return. Breakthroughs in strategic fields (in frontier and emerging areas) will need further analysis because even though their discoveries are assumed to be 10 times larger than those in the mature areas (on average), they are also much costlier.

Within these mature fields, the majors are also looking to reduce drilling costs by reviewing and reducing contractors' fees. Typically, in mature fields, the majors seek to optimize infill drilling programmes to slow declines, but this time around, they will also seek to accelerate projects in order to bring them on stream ahead of schedule. As the oil majors are looking to keep their domestic production growth target, in theory, the proportion of associated working drilling rigs will remain at the level they initially forecast, but they will reduce the rigs' fixed operating times (which they have already cut by an estimated 10 per cent). This can be done by using different contractual models – using daily rates rather than monthly rates as well, and also by taking into account the nature of the wells, which was previously not the case. In short, the majors are looking to better classify well types and optimize contractual methods accordingly, with the aim of cutting costs and increasing efficiencies. As part of this process, they are also likely to outsource some of the lowest performing wells (from both an economic and technical point of view) to private and foreign service companies.

## A changing focus in international upstream

In terms of overseas business, in 2019 the majors' equity production from overseas oil and gas increased by 3.6 per cent y/y to 210 mt, achieving their fourth consecutive year of growth. But this growth streak is likely to be broken by the current price turmoil, as all the majors are now planning to slash expenditures on overseas exploration and production activities. CNOOC, in its Q1 20 Review, announced that it would revise down its 2020 production target by 15 million/boe, with all the cuts from overseas assets.

This is driven by a number of factors:

- First, 60 per cent of the majors' overseas assets are in high-risk countries (this 'high-risk' assessment includes political, economic, and operational risk factors, each of which is assessed differently by the majors). The output from these countries accounts for an estimated 68 per cent of total overseas E&P.
- Second, the majors' current overseas assets are seen as marginal compared to their domestic asset base, as they require a higher investment in terms of operating costs and human capital per unit. Indeed, hefty overseas investments resulting in financial losses have become a controversial issue domestically.

When oil prices are high, diverse overseas portfolios are conducive to improving the company's competence and potential value. But in the current price environment, the majors will likely reduce the



number of workers on global projects, especially for projects whose profits have been below the breakeven point for a long time – such as CNOOC's oil sands project<sup>4</sup> and Sinopec's assets in the UK and Argentina. On the other hand, the low-price environment offers the majors the opportunity to divest from non-core and less profitable assets while also acquiring more competitive assets. Based on their robust cash flow, China's majors have also claimed that they will seek acquisitions of high-quality blocks in exploration hot spots, such as deepwater blocks in Brazil and South Africa, and keep their commitments to 'One Belt One Road' countries.

When assessing the quality of overseas assets, the majors will consider several factors that include the economic benefit of the project through its reserve volume, the favourability of developing conditions and steadiness of E&P facilities, and the contract models, among others. At the same time, their investment assessment is based on broader economic considerations; in addition to breakeven costs, the majors also consider whether an investment will facilitate the promotion of domestic exports in fields such as engineering, services, goods, and materials. Moreover, they also expect to create more market opportunities for bilateral EPCs, dockyards, and manufacturers.

### **Tight control of operating expenses through diverse measures**

Besides reassessing their Capex plans and breakdowns, the majors may need to tighten their operating expenses, increase investments in R&D, and enhance their efficiency while also opening the upstream to international actors, all in a bid to achieve both higher production and profits.

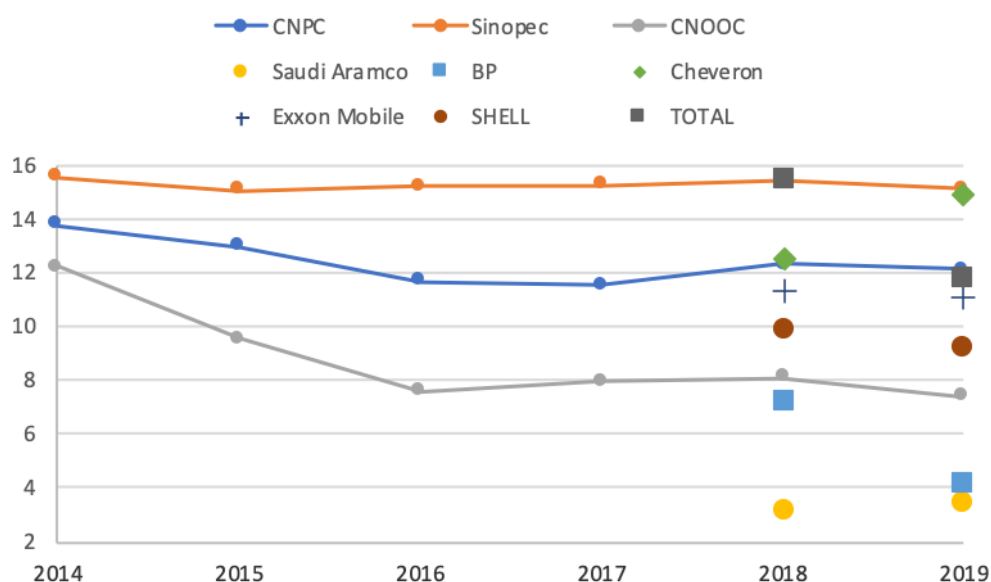
In the context of low prices, all-in costs/boe are considered as an appraisal metric of a company's survival level. Although CNPC and Sinopec haven't unveiled details of their all-in costs in their 2019 Annual Reports (only CNOOC has released a breakdown of its all-in costs), we can infer some related trends from the publicized statistics of Opex (one of the key components of all-in costs) from the past five years (Figure 6).

The Opex of CNPC, Sinopec, and CNOOC in 2019 was \$12.11, \$15.3, and \$7.39/boe, respectively, having fallen by 1.6 per cent, 1.8 per cent, and 8.42 per cent from 2018. Industry estimates suggest that the actual all-in costs<sup>5</sup> were between \$29 and \$50/boe, with Sinopec at the low end, followed by CNPC, and CNOOC at the higher end of the range. This suggests that the E&P costs of China's majors stand among the middle of the global upstream. In fact, given that mature and highly depleted reservoirs account for a large proportion of the majors' domestic assets, their high water content and relatively low recovery ratio dampen the long-term prospects of production growth, both from a technical and a cost perspective. However, lessons learned from the last low-price cycle in 2014–2016 suggest that there is room for the majors to squeeze their operating expenses, depending on the degree of difficulty of production and the physical nature of their resources. Technically speaking, though, closing an active field and reopening it in the future may incur higher costs than keeping it operational.

<sup>4</sup> 'China's CNOOC cuts 2020 oil, gas output target by 3%, capex target by 11%', S&P Global Platts, 30 April 2020, <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/043020-chinas-cnooc-cuts-2020-oil-gas-output-target-by-3-capex-target-by-11>.

<sup>5</sup> All-in costs include: Opex; depreciation, depletion, and amortization (DD&A); dismantlement; selling, general and administrative expenses (SG&A); taxes other than income tax.

**Figure 6: Opex of three majors and IOCs, \$/boe**



Source: Majors' Annual Reports, equity research of RBC Capital Markets.

Considering the majors' current inclination to maintain domestic production, in addition to making cuts in Capex, they will likely need to look at ways of saving Opex as well. Some typical strategies of reducing operating expenses include:

- Cutting oil service company costs by reducing the idle time of drilling rigs, intensifying the frequency of supervision on dynamic developing wells, and tightly controlling the recession rate of old and marginal fields.
- Diversifying procurement access via broader public tender bids, while strengthening supervision on such factors as expenses and scheduling of ongoing subcontracts, outsourcing, raw material supplies, and resource-leasing companies. Typically, in domestic projects, the majors use their own service subsidiaries and will only rely on external companies in some unconventional fields or other large-scale or urgent projects. However, subsidiaries are allowed to further subcontract out parts of their work to external service companies if this allows them to save time or money, or to make up for their technical limitations. In the current low-price environment, the focus will move more consistently to profitability.
- Implement 'lean management'. For example, subdivide each item of costs on a daily basis, enhance work efficiency by resorting to digital solutions, revise the salary allocation mechanism, or cut employment ratios in overseas branches. The majors have declared that they aim to reduce their management expenses by at least 10 per cent y/y.

## Nascent opportunities for China's majors

Finally, there are a number of other opportunities for China's majors such as increasing their investment in R&D, and introducing more cooperation, through the opening up of the upstream market.

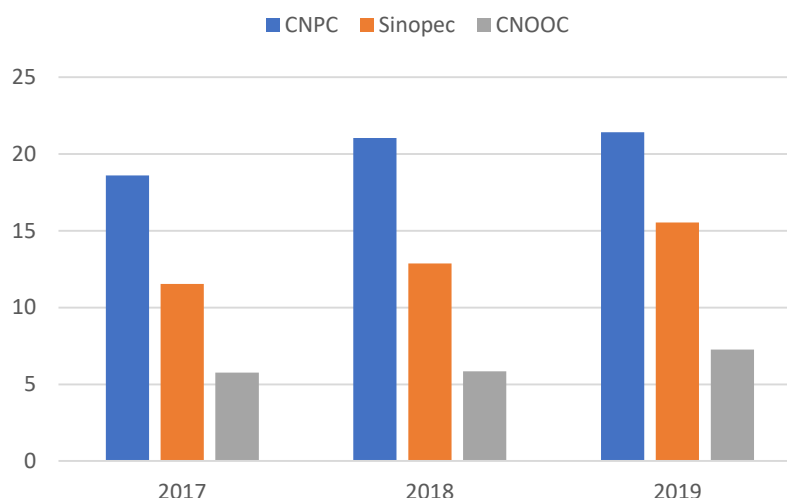
Unlike previous price crashes, this price cycle coincides with an emphasis on raising domestic oil and gas output (in the context of the Seven-Year Action Plan), which in turn is increasing the importance of innovation. As we see in Figure 7, the three majors have all been raising their R&D expenditures over the past three years. In the past, the majors' innovation efforts focused on meeting growing energy

demands and responding to the need for environmental protection, but currently their strategy will emphasize the boosting of innovative methods to be applied in their operations.<sup>6</sup>

Indeed, this is not unique to China's majors; the worsening macro-industrial environment will urge global oil players to seek cost savings, but it remains to be seen how much each player will still be able to devote to R&D.

Apart from resorting to innovative methods, the liberalization of the domestic upstream could also help China's oil players to tackle the price conundrum. In January, the Chinese Ministry of Natural Resources declared that from 1 May 2020, various market entities, including foreign capital, private enterprises, and other social capital registered in China with net assets valued at 300 million RMB or more, will have access to E&P activities. Meanwhile, prospecting rights permits can potentially be prolonged for a further five years after the five-year validity period at the initial registration. Currently, upstream investments are monopolized by state-owned companies. By opening the upstream, the government hopes to bolster this industry, boosting domestic energy supplies and reducing the country's import dependence. Moreover, the central government also aims to use this policy to accelerate the marketization of gas, reducing the gas price in the long run.

**Figure 7: R&D investment of three majors, billion RMB**



Source: Majors' Annual Reports.

Before the outbreak of the pandemic, general commentaries within the industry argued that the majors, who own mining rights spanning over 3 million square kilometres, will be reluctant to release blocks with rich natural resources. In reality, the three majors have stated that they are keen to engage in multilateral cooperation to invigorate the upstream market. To date, China's majors have been working with the local governments of areas in which the assets are located, but this has meant working with a small number of partners, and limited opportunities to share costs and responsibilities. Following the government's decision to open up the upstream, the majors have also stated that they welcome foreign partnerships, which they hope will also promote greater efficiency and accuracy in risk identification and evaluation. However, the key challenge is whether investors, be they domestic private companies

<sup>6</sup> For instance, the NOCs will introduce more digital solutions into conventional operations to improve efficiency. CNOOC is working on a database to improve the integration of data collection, to realize remote monitoring in a bid to enhance the quality of its decision making in both production and operations. CNPC has also established what it calls the 'three clouds': digital application for daily management, e-commerce procurement platform, and scientific computing, providing efficient services for technological research and development, as well as for the accuracy of engineering design. In the upstream, Sinopec has reportedly made headway in research into gas-enrichment theory and exploration technologies in marine phase medium and large gas fields in Sichuan Basin; meanwhile, its proprietary rotary steering drilling system has been successfully applied in its Shengli oilfield, leading to breakthrough in reserve and drilling efficiency.

or IOCs, will have the appetite to invest in China's upstream sector due to its long pay-back period, not to mention the long-term uncertainty of oil demand as well as technology issues around gas E&P, particularly for unconventional gas. Indeed, the majority of China's oil fields are in decline after decades of exploration, while its gas reservoirs are scattered, limiting the ability for large-scale exploration.

## Conclusion

The year 2020 was designed to be a strong year for China's oil and gas production, following the launch of a 'Seven Year Action Plan' in 2019. But these ambitious development plans have been marred by fallout from COVID-19 and the subsequent collapse in global oil prices.

Yet even though China's majors are cutting their Capex, they plan to keep domestic oil production stable while increasing gas output, by using several strategies such as cost reductions throughout the supply chain, mainly through effective management of service company costs, as well as reduced activity overseas. This should allow them to direct more capital toward domestic exploration and production. Moreover, by opening the upstream to private and foreign companies, the Chinese majors hope to unlock new sources of financing and expertise to drive natural gas production and stabilize oil output. That said, foreign investors' appetite to enter China's domestic upstream may be limited by the maturity of the fields and complexity of the geology, especially as many foreign IOCs reconsider their asset base in light of the energy transition.

But can these strategies deliver production growth? While an increase in 2020 production is highly likely due to the large Capex investments in 2019 and the lag between investment and output, the 2020 Capex cuts could start weighing on production growth in 2021–2022. But it remains to be seen if the current cost-cutting efforts will be enough to ensure production growth through 2025. The majors' decision to focus on mature fields, while delaying investments in strategic reserves, could help maintain production in the near term, but this could negatively impact output post 2025.