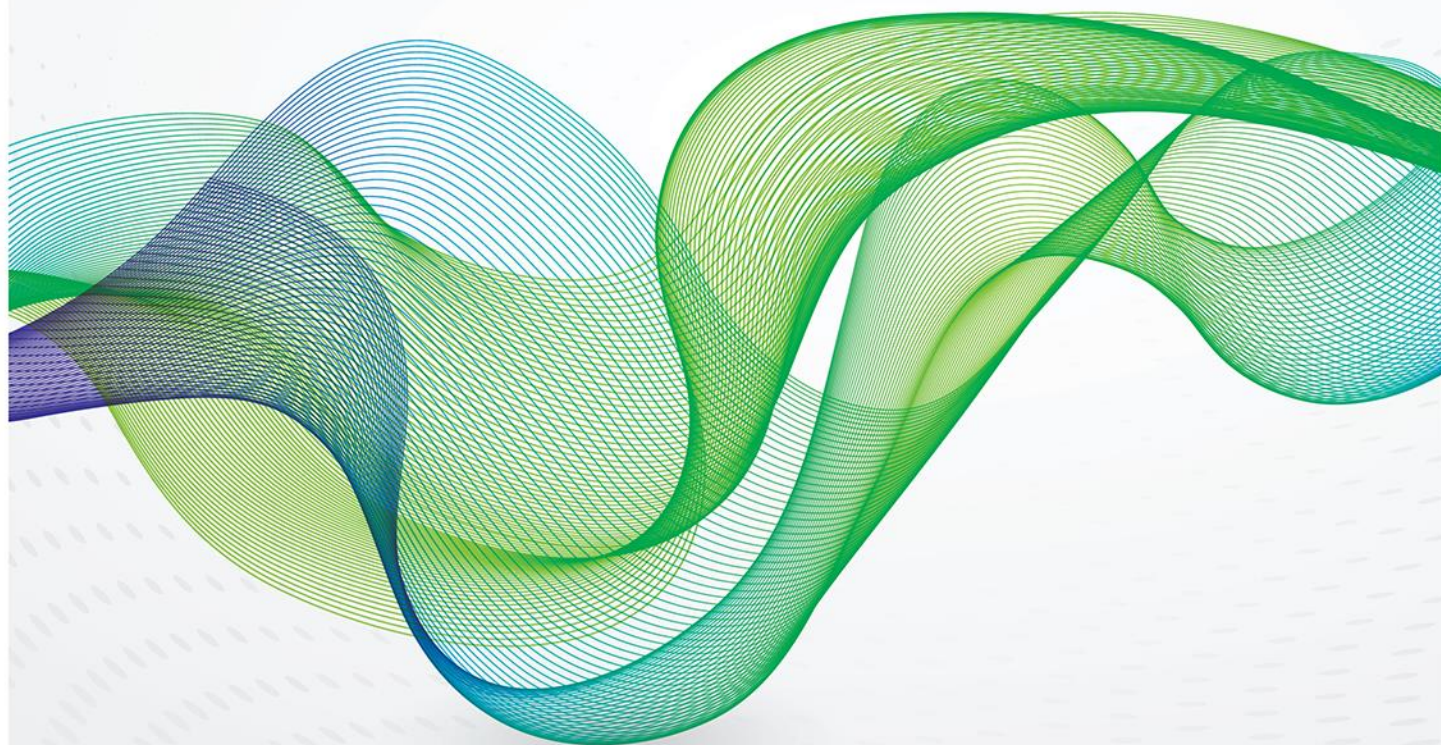


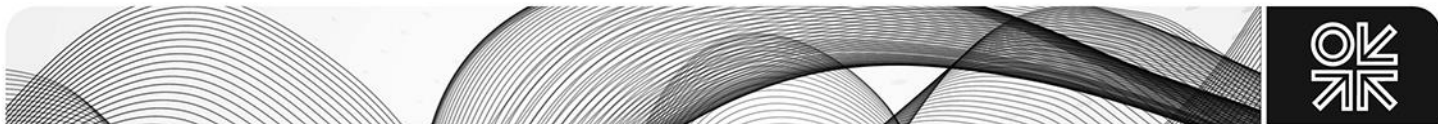


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SEPTEMBER 2020

China's oil demand in the wake of COVID-19





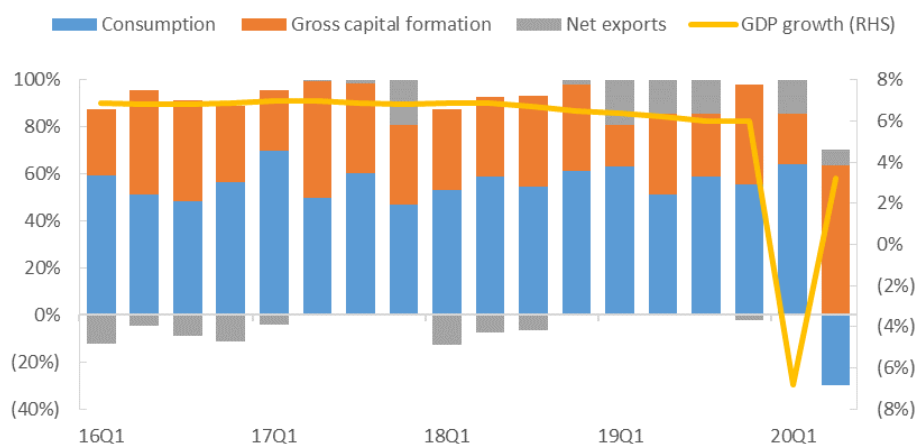
China's oil demand has almost tripled over the past two decades, accounting on average for one-third of global oil demand growth every year. China is set to dominate future growth as well, as it will overtake the US as the world's largest economy. But the pace of the country's oil consumption is slowing while the product makeup is shifting, in line with the restructuring of the Chinese economy and policy efforts to curb local air pollution. Over the past two decades, China's oil consumption has grown by over 9 million barrels per day (mb/d), according to BP, from 4.7 mb/d in 2000 to 14.1 mb/d in 2019. Yet over the next two decades, its oil use is expected to grow by 3–4 mb/d, reaching 17–18 mb/d in 2040. While China's oil use has a strong growth potential—given that China's per capita oil use is currently around one-third of OECD levels—future growth rates will be tempered by efforts to tackle air pollution.

Whether China's oil demand will increase by closer to 3 or 4 mb/d over the next two decades is extremely significant for global markets, especially in the context of the global energy transition and concerns about peak oil demand. Even a small adjustment in the outlook for a country that consumed 14 mb/d of oil in 2019 has huge ramifications for suppliers, refiners, and traders worldwide. This comment will assess whether China's pandemic recovery efforts and support policies offer any clues as to its future oil demand growth. It will argue that even though the strong recovery in crude buying and refining throughputs in Q2 20 suggests an accelerated growth trajectory going forward, the government's recovery package and its focus on electrification will in fact weigh on oil demand in the medium term. On the supply side, a closer look at China's current refined product output points to a gradual shift to chemicals. Indeed, even though China's oil demand growth is set slow, refiners are still pursuing large capacity additions with a view, however, of cutting product output and shifting to petrochemicals. COVID-19 seems to be fast-tracking that process, too.

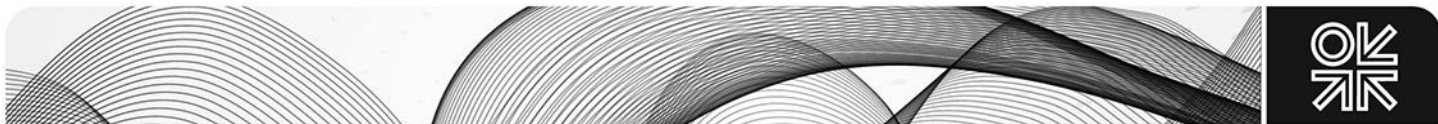
China's economy comes bouncing back: how strong is oil demand?

As China gradually emerges from the COVID-19-induced economic shock, the government's fiscal support measures and monetary easing seem to be paying off: China's Q2 2020 GDP pointed to a very strong recovery, at 3.2 per cent year on year (y/y, Figure 1), following the steep 6.8 per cent y/y decline in Q1. Fixed asset investments have been a key driver of growth, increasing by 8.3 per cent y/y in July, after growing by 5.6 per cent y/y in June, a faster clip than the average pace in 2019. Industrial output increased by 4.8 per cent y/y, supported by an acceleration in manufacturing, mainly in the auto sector. Various business resumption indices highlight that China's economic activity is already at 80–90% of pre-COVID 19 levels, but they have been stuck there since May. Still, global metals markets have received a boost from Chinese buying as new investments in railways, ultra-high voltage power lines and electric vehicle charging points are poised to support demand for metals and industrial fuels.

Figure 1: GDP growth and sectoral contribution to growth %



Source: NBS



But for China to return to pre-COVID-19 levels, the industrial sector needs consumer demand to pick up, a process that is proving slow. Retail sales remained subdued in July, falling y/y by 1.1%, although this was an improvement from the 1.8% y/y drop in June. Moreover, the recovery is slowed by localised outbreaks, as was seen in Beijing and neighbouring provinces in June, which led to school closures and another round of travel restrictions. Concerns about incomes and employment will also weigh on consumer spending, especially among China's 400-million strong migrant worker force, roughly half of whom are employed in trade. The near term outlook is something of a mixed bag, with a rapid recovery in industrial activity and a slower uptick in consumer demand. Still, even though the government has refrained from issuing a GDP growth target for the year, it will want to deliver on its pledges to eradicate poverty and double the size of the economy from 2010 levels, suggesting efforts to deliver a solid economic recovery.

Crude still going strong

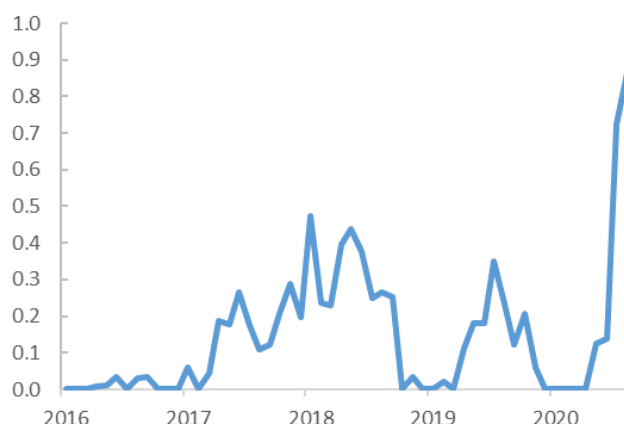
The macroeconomic backdrop, of a strong recovery in supplies waiting for consumer demand to catch up, is also mirrored in oil demand. China's crude imports have been exceptionally strong, with arrivals reaching a record 13 mb/d in June. In the first half of the year, crude imports averaged 10.9 mb/d, higher y/y by over 1 mb/d (10 per cent) and exceeding last years' growth of 0.80 mb/d (Figure 2). Yet over the same period, China's refining throughputs averaged 12.8 mb/d, a more modest y/y increase of 0.17 mb/d, or 1.4 per cent.

The strength in buying is due to a number of reasons: First, refiners are purchasing more US crude ahead of the scheduled review of the 'phase one' deal, with imports from the US reaching record highs of 0.7-0.8 mb/d in July and August (Figure 3). Second, the government's focus on stockpiling for energy security purposes means that tank space is being added, and filled, rapidly. In August alone, roughly 40 mb of new tank space started up and over 100 mb of storage tanks is expected to come online later this year. The government is also mulling a new policy that will require independent refiners to hold 35 days of forward cover, up from the 15-day mandate currently, which will further support crude imports into China. In the year-to-date, China is estimated to have filled over 200 mb of inventories but can still fill more storage before hitting tank tops. Third, Beijing has front loaded import licences for independent refiners, allowing them to increase their purchases. Since 2015, Beijing has been giving private refiners licences to import crude directly from international markets, but since 2016, it has been spreading out the purchase volumes over the year. This year, the government front loaded its licencing process to allow independents to capitalise on \$20 and \$30 oil. Private buyers are therefore stocking up but logistical constraints, mainly at ports in Shandong province, have led to congestion offshore.

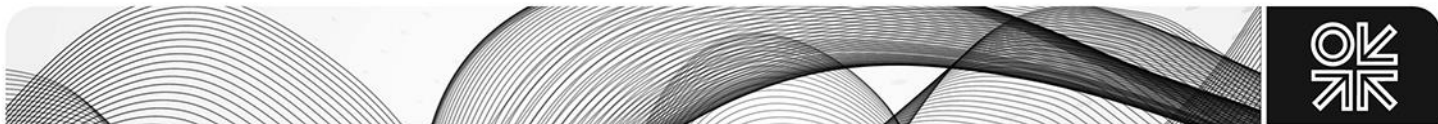
Figure 2: China crude imports, y/y change, mb/d



Figure 3: Crude imports from the US, mb/d



Source: China Customs, Kpler



Finally, despite the economic slowdown, and evidence of slower demand growth—with the NDRC estimating that oil demand in H1 20 had fallen y/y by 6 per cent¹—refiners are still adding new capacity: In July, Sinopec's brought online its 0.2 mb/d Zhongke refinery. Sinochem's 60 thousand b/d Quanzhou expansion is also expected for September 2020 while mega-refiner Rongsheng is proceeding with its 0.40 mb/d expansion, which is set to start trial operations in Q4 20.

Demand is picking up, but not as fast as supplies

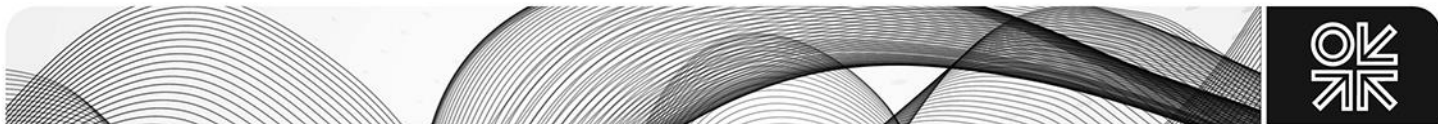
With the strength in crude imports, refinery runs have also come bouncing back since April (Figure 4). In Q2 20, runs averaged 13.6 mb/d, higher y/y by close to 1 mb/d, offsetting the Q1 20 weakness, bringing throughputs in the first six months of the year to H1 19 levels, which begs the question: is oil product demand fundamentally strong? The rapid increase in runs in Q2 20 was first and foremost due to a combination of low crude prices and the domestic product pricing mechanism, which guarantees refining margins by effectively putting a floor on retail prices at \$40 per barrel of crude. Throughputs in Shandong increased in April-May and the teapots postponed maintenance in order to capture these strong margins, mainly for diesel which is also their main output—in anticipation also of a looming infrastructure stimulus. Their runs have since slowed somewhat as heavy floods in China over the summer months, combined with the annual fishing ban—which limits the use of diesel-powered fishing vessels—weighed on industrial demand for diesel. In H1 20, implied diesel demand was still lower y/y by 0.3 mb/d, or 7 per cent. In the next few months, diesel use is expected to strengthen again due to an uptick in infrastructure work and industrial activities and as the fishing ban is lifted. Sales of commercial vehicles, mainly diesel-powered trucks, soared in June, higher y/y by over 60 per cent on the back of industrial demand. As a result, refiners will be able to clear some of the stocks that have reportedly accumulated, but with supplies from both independents and majors having increased, alongside more output from blenders who have been importing cheap feedstocks such as light cycle oil, any large increase in refining throughputs will also likely lead to higher exports.

Gasoline demand is also improving, but not as rapidly as supplies. In the first four months of the year, due to the lockdowns and travel restrictions, gasoline demand fell y/y by close to 20 per cent (0.65 mb/d), but starting in May, it has been recovering rapidly (see Figure 5). In China's major cities, traffic congestion is back to pre-COVID levels—except for Beijing where a second outbreak in June has weighed on travel—and even higher as people prefer private transport for their commutes. At the same time, highway passenger traffic is still limited as people are less willing to travel for leisure. According to China's Ministry of Transport, highway passenger turnover in June was still less than half compared to the average over the past five years.

Nonetheless, with growing confidence in China that the leadership is effectively managing to suppress the virus, gasoline demand should continue to grow through the summer driving season and the September-October holiday seasons. The domestic car market has also received a boost from local officials, trying to support their economies, with easing licence plate restrictions for internal-combustion-engine vehicles and new 'cash for clunker' trade-in deals. The central government has delayed the roll-out of stricter motor emissions standards, alleviating some of the pressure on domestic ICE sales. Indeed, in June, ICE vehicle sales rose by 12 per cent y/y, although in the first half of the year, they were still lower y/y by 17 per cent and the China Association of Automobile Manufacturers expects sales to decline by 10 per cent y/y in 2020, assuming a strong increase in sales later this year.

The domestic demand outlook is by no means bearish, with demand for gasoline, diesel, jet fuel and fuel oil already inching up from 2019 levels in May. But it is also far from the stellar recovery that crude buying or refinery runs would imply. Domestic clean product stocks are reportedly rising while the state-owned refiners are increasing exports and even applying for approval from the head office to increase outflows—despite weak export margins—in order to clear the overhang. Refining yields are also telling

¹ Overview of oil products in the first half of 2020, NDRC (Chinese), https://www.ndrc.gov.cn/tgsi/tjsi/jjyx/mdyqy/202007/t20200731_1235110.html



a more cautionary tell as gasoline, diesel and jet yields have been falling since the beginning of the year.

Figure 4: China refinery runs, mb/d

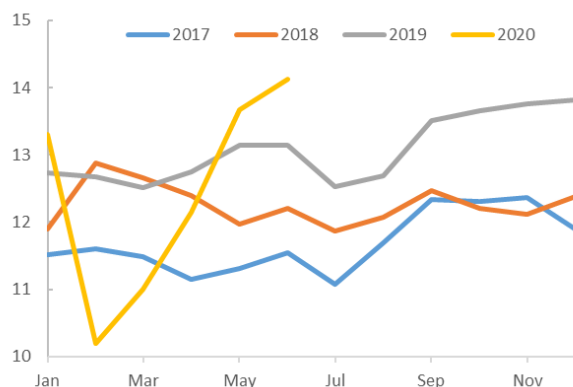
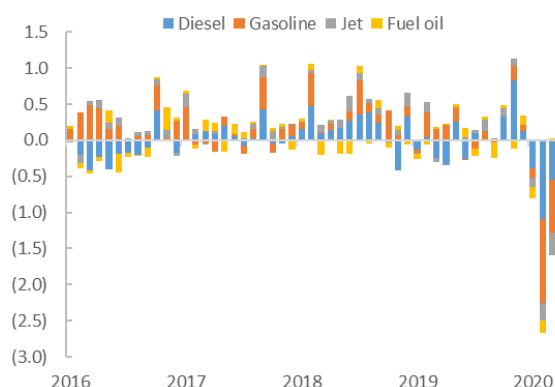


Figure 5: Implied product demand, mb/d



Source: NBS, Customs, OIES

Electric dreams will weigh on oil demand

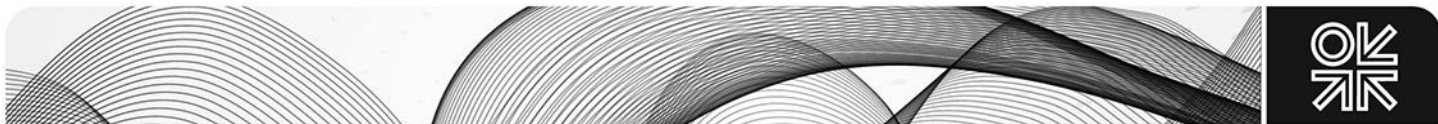
The strength in oil buying and throughputs is giving the market a false sense of security and a hope that China's infrastructure boom will once again mop up excess supplies globally. But as described above, low crude prices and the domestic pricing mechanisms have incentivised imports and runs. Even with demand coming back, stocks are building up suggesting that China's crude buying will slow, and product exports will rise.

More importantly, despite the short-term strength in implied product demand, the government's recovery package should not be confused for the 2008-2009 stimulus. Indeed, the government is now increasingly shifting to a more prudent approach to growth support, as it wants to avoid the wasteful spending that resulted from the 2008-2009 stimulus. Beijing in August stated that liquidity will be maintained at 'reasonable and sufficient' levels, largely in order to support small firms, and that there will be no 'flood irrigation' in monetary policy, stressing that China must work to contain financial risks. While the government's messaging suggests that it is relatively confident in the overall direction of the domestic recovery, the state of the global economy and escalating tensions with the US are a growing concern. President Xi Jinping has articulated a new concept, the 'dual circulation' strategy which seeks to make the economy less vulnerable to external shocks by becoming self-reliant in key technologies. While China won't shut foreign companies out of its economic system, as that would undermine economic efficiency, policymakers will continue to try and develop domestic capabilities in key technologies.

This focus on technological self-reliance, which was noted already in the government work report in May 2020², points to a faster electrification of Chinese cities and energy end-use. The government's New Infrastructure plan, which lies at the heart of its short-term recovery and its long-term development, focuses on seven specific fields: 5G networks, data centres, artificial intelligence, the industrial Internet of Things, ultra-high voltage power transmission, high-speed rail, and electric vehicle charging infrastructure.³ To be sure, many of these promises reiterate existing policy priorities, but there is now greater urgency to fulfil them.

² Michal Meidan, "COVID-19 and the electrification of the Chinese economy", OIES Commentary, June 2020, <https://www.oxfordenergy.org/publications/covid-19-and-the-electrification-of-the-chinese-economy/>

³ White Paper on the Development of 'New Infrastructure' (in Chinese), CCID Research Institute for Information Technology, <http://www.miithinktank.org.cn/aatta/20200324225821366/1-2003231F017.pdf>.



So while China's medium-term economic growth prospects still look solid, underpinning the ongoing urbanization process and demand for transport fuels, electrification will weigh on demand growth rates. The government's focus on infrastructure to support its growing electric fleet (for both private and public travel) will weigh on both gasoline and diesel demand growth.

Indeed, despite the strength in ICE vehicle sales, the government has also stepped in to support new energy vehicle (NEV) sales – which were slowing before the pandemic due to lower subsidies and the economic downturn – by extending subsidies until 2022. In March, China's top economic planning body, the National Development and Reform Commission, announced that it will accelerate the country's transition to NEVs. To be sure, even though Beijing is changing tactics on its support measures for NEVs, it remains determined to grow the sector. Already last year the government signalled that it was lowering the level of cash subsidies and switching to a credit accumulation scheme, in force since 2017, under which domestic car manufacturers are awarded higher scores based on the more electric and hybrid vehicles they sell. The credit scheme is expressed in percentage terms, but functions as a points system, with points awarded using a formula based on production levels and taking into account factors such as energy efficiency and driving range. In June 2020, the government updated its credit scheme, requiring that NEVs account for 14 per cent of carmakers' total production in 2021, 16 per cent in 2022, and 18 per cent in 2023, compared to the current 12 per cent. The goal is for NEVs to account for one fifth of annual car sales by 2025⁴. There have been some concerns that the revised policy weakens the government's push to promote NEVs as it lowers the NEV credit per vehicle by adjusting coefficients. Yet this was likely an attempt to prevent a credit glut, brought about by rapid acceleration in driving range over the years and avoid a drop in the value of the credits. Moreover, even though the credit system is mainly aimed at encouraging the uptake of NEVs, it also seeks to ensure lower fuel consumption in ICE vehicles, with a view to meeting the government's goal of lowering average fuel consumption from 5.5 liters/100 km in 2019 to 4 liters/100 km by 2025⁵.

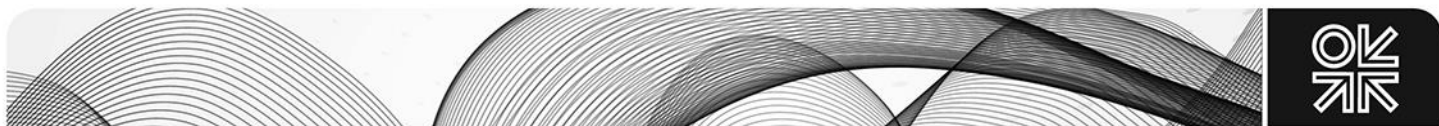
Moreover, in response to the lull in NEV sales, the government in July launched a campaign to spur NEV purchases in rural areas through road shows and discounts. At the same time, carmakers are offering affordable entry-level models and free charging point installation services, targeting first time buyers and rural consumers who have lower driving range requirements but also access to space for charging facilities. Local governments in Shanghai, Guangzhou, and Sichuan, for example, are also offering additional subsidies for NEV sales that are set to expire at the end of the year while initiatives to increase electric mobility penetration remain unchanged. A number of localities are on track to meeting their pledges that by 2020, 8 per cent of new urban fleets – including buses, sanitation trucks, postal vehicles, taxis, and commuting coaches – will be powered by electricity. The Beijing municipality still plans to convert 20,000 taxis to electric vehicles by the end of this year and the switching of bus fleets to electric vehicles in Shenzhen and other cities – still hold.

In a post-COVID-19 recovery, however, efforts to add charging infrastructure and create a robust digital and technological ecosystem for electric fleets could accelerate the uptake of electric mobility. Already, greater use of artificial intelligence and big data technologies has led to a surge in the use of e-bike and e-scooter sharing platforms in Chinese cities in the aftermath of the COVID-19 outbreak. According to data from bike-sharing companies, before the pandemic, riders looked to bike sharing for short distances (the 'first' or 'last' mile from their home or office to the train stop); but now, they are shunning public transport and preferring to take the whole journey by bike. The addition of e-bike and e-scooter sharing platforms makes longer journeys more convenient.⁶ Even before COVID-19, electric two-wheelers and low-speed electric vehicles were blossoming in smaller Chinese cities, as they do not

⁴ China issues NEV credit scheme for 2021-23, Argus Media, 22 June 2020, <https://www.argusmedia.com/en/news/2116465-china-issues-nev-credit-scheme-for-202123>

⁵ Decision regarding amendments to China's Corporate Average Fuel Consumption and New Energy Vehicle credit program, (Chinese), MIIT, 15 June 2020, <http://www.miit.gov.cn/n1146295/n1652858/n1652930/n3757018/c7981973/content.html>

⁶ Winston Ma Wenyan, 'Here are 4 major bike-sharing trends from China after lockdown', *World Economic Forum*, <https://www.weforum.org/agenda/2020/07/4-big-bike-sharing-trends-from-china-that-could-outlast-covid-19/>.



require a driver's licence and sell for as little as \$1,000. With a faster roll-out of sharing platforms and more charging infrastructure, more new drivers may now be on an electric mobility trajectory.

A shift from road to rail

The electrification trend will also impact diesel demand for freight, given the potential for a faster shift from trucks to rail. The government has sought to reduce commodity trucking because diesel-powered freight trucks are responsible for 60 per cent of the nitrogen oxides and 85 per cent of the particulate-matter pollution released on China's roads, despite making up only 8 per cent of all vehicles. Shifting the transport of goods and commodities from roads to designated rail lines and rivers is likely to be a key part of the 14th five-year plan⁷ while the expansion of rail lines, as part of the country's stimulus programme, could accelerate this change. In August 2020, China Railway Corp released its long-term investment plan, including a 41 per cent increase in total new mileage and a doubling in high-speed mileage through 2035. The plan aims for all cities with a population of over 200,000 to be covered by the railway network before 2035, and those with a population of more than 500,000 to be connected to high-speed tracks⁸.

To be sure, moving goods by road is still cheaper and more effective, especially for short distances and the government's efforts to ban trucking has met with resistance from industry players concerned with the cost of cleaner alternatives. In 2017, as part of the government's efforts to tackle air pollution, it issued a ban on all truck-based transport of minerals, steel, coking coal and bulk commodities in a number of areas including Beijing and Hebei province, the Yangtze Delta sea and river ports around Shanghai and coastal Jiangsu and Zhejiang provinces. But the following year, the government softened its requirements and instead of banning diesel-freight, it stated that bulk commodities should 'in principle' be transported primarily by rail and waterways, adding waterways as an option to the previous version that mandated a shift to rail⁹. Rail transport was estimated to be 60-80 per cent more expensive than trucks, leading to concerns that rising costs from producers and users of coal, iron ore and other bulk commodities would negatively impact their margins. Additional rail infrastructure, alongside market reforms of rail freight prices¹⁰, could help the competitiveness of rail transport.

Finally, new high-speed rail lines, which are part of the New Infrastructure plan, could dent the anticipated surge in air travel, and therefore jet fuel consumption, going forward. The competition between high-speed rail and air travel is not new,¹¹ but a concerted push to develop high-speed rail lines, alongside consumer reluctance to fly after COVID-19, could dent China's extremely strong potential for jet demand growth.

Chemical reaction

At the same time, despite China's current refining overcapacity, there is plenty of appetite for new additions, with over 2 mb/d of new refining additions planned through 2025. For now, the government shows no sign of slowing the pace of refining starts, in part because new plants are being built by private companies – as part of the government's effort to open the sector to non-state actors – and because they are integrated petrochemical plants, which support the government's goal of self-sufficiency in chemicals. This switch to petrochemical output has been in the making for several years, with the state-

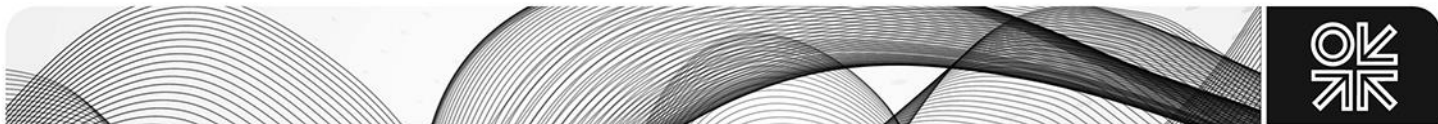
⁷ Ministry of Ecology and Environment, *Vehicle Environmental Management Annual Report* (in Chinese), 2019, http://www.gov.cn/xinwen/2019-09/05/content_5427449.htm.

⁸ "China plans to expand railway network to 200,000 km before 2035", Reuters, 13 August 2020, <https://www.reuters.com/article/us-china-economy-infrastructure-railways/china-plans-to-expand-railway-network-to-200000-km-before-2035-idUSKCN2590M4>

⁹ Fan Ruohong, Han Wei, "Railways on Track to Gain as Northern China Puts Brakes on Coal-Carrying Trucks", Caixin, 20 April 2017; Sun Lizhao, Yang Ge, "China Taps Brakes on Coal-Hauling Truck Ban", Caixin, 5 July 2018

¹⁰ As noted in the government's 2018-2020 plan for restructuring the transport sector (in Chinese) here: http://www.gov.cn/zhengce/content/2018-10/09/content_5328817.htm

¹¹ Hongchang Li, Jack Strauss, and Liu Lu, 'The impact of high-speed rail on civil aviation in China', *Transport Policy*, 74 (February 2019).



owned refiners also looking to value-added products to help them compete in the global market and maximize profitability. Indeed, Chinese refiners have been investing heavily in olefins and aromatics capacity as they seek to reduce the share of refined products and expand further downstream over time.

Sinopec, China's largest refiner, has been increasing its chemicals capex over the last five years, and before COVID-19 hit, the company was planning to increase it by 44 per cent y/y to RMB 32 billion yuan (\$4.6 billion) in 2020, accounting for 22 per cent of total capex (in addition to spending in the category earmarked 'Refining and Chemicals', see Figure 6). While the capex spending may be scaled back this year due to the oil demand shock and falling prices, chemical conversion projects continue. Sinopec reportedly started work in May to re-orient its 0.18 mb/d Anqing refinery in Anhui province towards petrochemical production, with plans to add around 2 million tonnes per year of olefins and aromatics capacity. The end goal is cutting and cut refined product output by a third. PetroChina's annual guidance also points to increased investments in chemical transformation and upgrading capacity. In 2019, the company upgraded its 0.20 mb/d Liaoyang refinery in Liaoning province, added 0.80 million tonnes per year of paraxylene (PX) capacity, and earmarked funds for its Guangdong petrochemical refining and chemical integration project, as well as the Daqing petrochemical upgrade project. China is already the world's largest chemical producing country, a position that will be strengthened as it continues to invest in olefins and aromatics chains, but it currently relies on petrochemical imports for much of its feedstock. But with a surge of new capacity additions, in 2020, it is estimated to account for half of global ethylene capacity additions, and three-quarters of propylene capacity. Given that these new additions are for the most part integrated (refineries and chemical plants), they are benefitting from competitively priced naphtha and LPG—their main feedstock—and in turn are able to produce PX that is often cheaper than imports. Not only does this help support jobs further downstream, but it also reduces petrochemical imports. PX imports in 2020, for example, could fall to just 9 Mt, from 15 Mt in 2019¹².

Figure 6: Sinopec capex, RMB billion

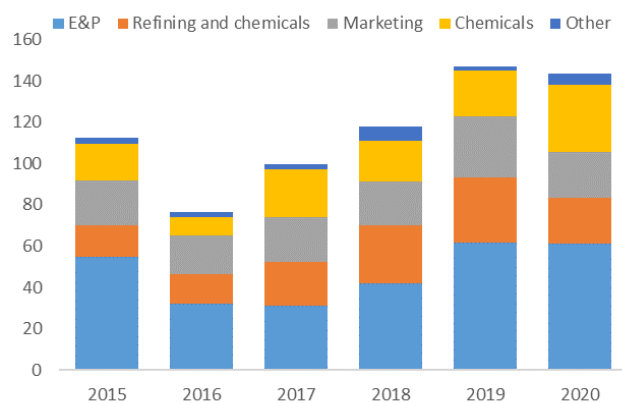
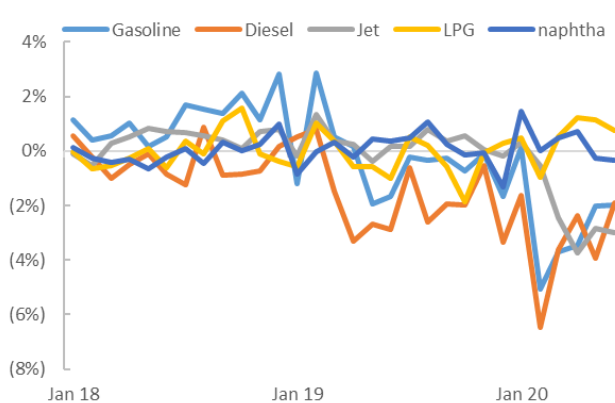


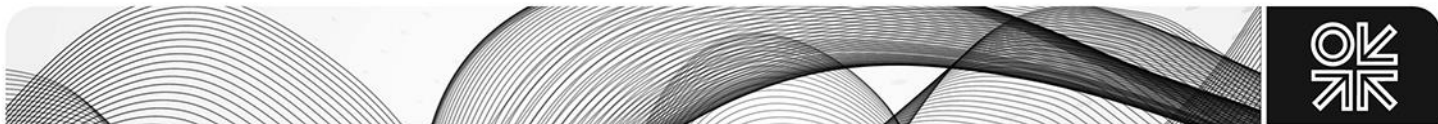
Figure 7: Refinery yields, %



Source: NBS, Company reports, OIES

If trends in China's oil market in the first half of 2020 are anything to go by, the shift may be happening faster than previously expected. Refinery yields for gasoline, diesel, and jet fuel have been falling since the beginning of the year. This is unsurprising for Q1 2020, when refinery runs and economic activity collapsed. In Q2, however, this remained unchanged, despite the strong increase in refinery runs. Between January and June gasoline yields were still lower y/y by close to 3 percentage points (ppts),

¹² John Richardson, "Paraxylene demand collapses as higher China production threatens 6m tonne fall in imports", ICIS Asian chemical connections blog, June 2020, <https://www.icis.com/asian-chemical-connections/2020/06/paraxylene-demand-collapses-as-higher-china-production-threatens-6m-tonne-fall-in-imports/>



jet yields fell by 2 ppts and diesel yields shrank by 3 ppts. At the same time, LPG and naphtha yields have been rising consistently due to the increased output of chemicals (figure 7).

An altered outlook

As the Chinese economy continues to recover from the COVID-19 shock, oil demand is set to return to 2019 levels by 2021, rebounding strongly next year. And the longer-term outlook for rapid urbanization and a rising middle class remains unchanged, with growth rates tempered by the government's commitment to curbing pollution. But small changes to mobility trends, and even gradual shifts from road freight and air travel to rail, will weigh on China's demand growth through 2040, bringing China's consumption higher by closer to 3 mb/d than to 4 mb/d. Refiners, in light of the excess product supply domestically, are aligning themselves with the government's ambition to shift towards specialty-chemical growth, reflecting the increasing sophistication of consumer demand and China's industrial output.

COVID-19 seems to have exacerbated the product oversupply and accelerated the shift to chemicals. Going forward, the government's twin focus on economic recovery and accelerated electrification of energy end-uses could soften the outlook for oil demand. Electrification will be supported by efforts to add charging infrastructure and the creation of a robust digital and technological ecosystem, which in turn could support shared e-mobility. At the same time, the addition of rail lines could displace diesel freight and weigh on future jet fuel demand for air travel. Already in the first half of 2020, as refiners have grappled with the product oversupply while stocking up on cheap feedstock, they seem to have focused on shifting to chemicals. As such, COVID-19 might be offering a glimpse of China's future oil demand and supply system.