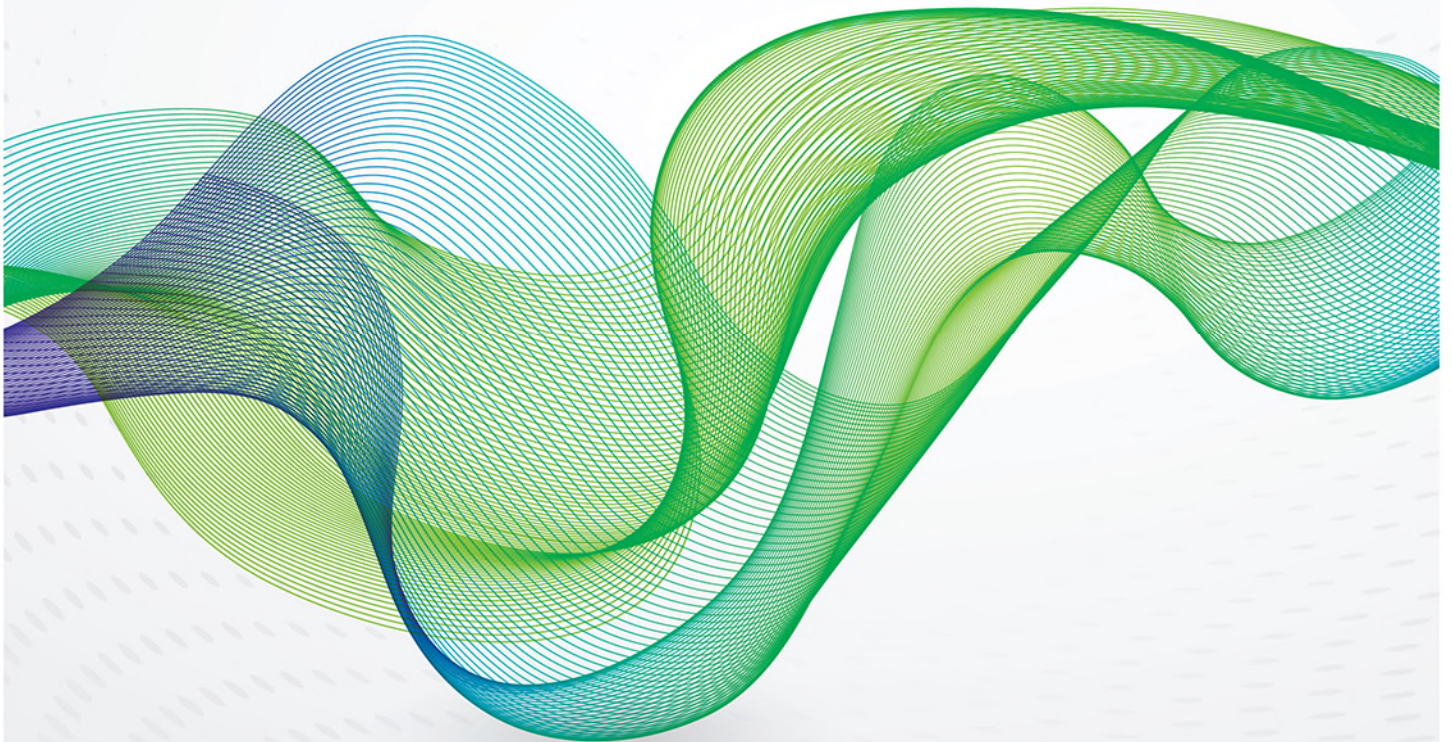




THE OXFORD
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China's 13th Five-Year Plan: Implications for Oil Markets



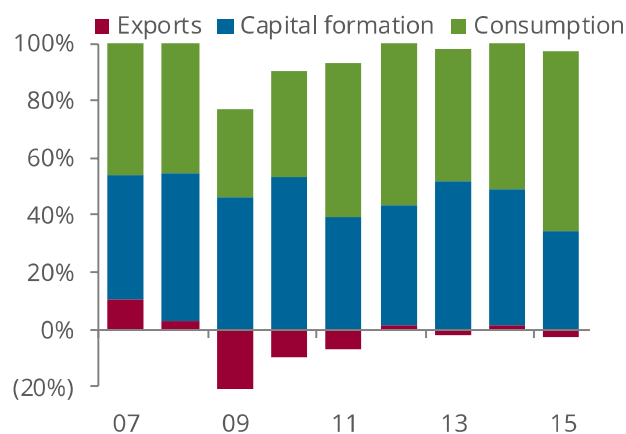
Introduction

China's transition from a statist to a market-guided economy, and from an export-oriented growth model toward a more consumer-driven development path, is well underway. The Chinese leadership has reiterated its commitment to pursuing these structural changes, even though Premier Li Keqiang has likened the process to 'taking a knife to one's own flesh'¹. It is undoubtedly a difficult and, at times, bumpy trajectory, as efforts to liberalise the stock and currency markets in the summer of 2015, and then again in early 2016, have shown. Furthermore, now that the Chinese economy accounts for almost 15% of global GDP, 13% of global trade, and around 30% of global oil demand growth, every bump on the way is felt well beyond China's borders. As China's economy is slowing and moving toward a less resource-intensive development path, many countries around the world, especially in Asia, need to adapt to China's changing growth patterns.

So, given the complexity of this transition, and the uncertainty of the outcome, all eyes are on Beijing. Pundits and China watchers have therefore been eagerly awaiting the publication of the 13th Five Year Plan (13FYP; 2016-2020) in order to gain insights into Beijing's policy priorities for the coming years. For oil markets, understanding the 13FYP is key on three levels. First, the perceived success (or failure) of China's economic transition drives sentiment, often regardless of the actual amount of oil that China consumes. In this respect, the 13FYP is unlikely to appease market jitters as the government will experiment with new market-driven mechanisms, but its half-hearted embrace of liberalisation will continue to breed volatility.

Second, even if the transformation will not be as complete as China's leaders envisage, the Chinese economy is rebalancing in earnest (Figure 1), which means product demand will come increasingly from transport and consumer goods, the lighter end of the barrel². Moreover, the rise of the Chinese consumer, especially in light of the government's emphasis on developing the Internet of Things and a vibrant e-commerce sector, will bolster demand for petrochemicals.

Figure 1: Share of GDP growth, %

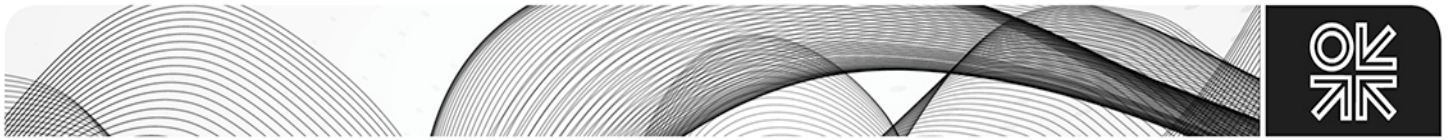


Source: Haver Analytics

Finally, the shift in thinking about energy, notably the rising importance of environmental protection compared to supply security, is apparent in the contours of the 13FYP. In the past, when Chinese oil demand was growing at 0.5 mb/d a year, and the economy was still expanding at double digit rates, the government's main priority was ensuring that the system would be amply supplied. This entailed securing supplies from a diverse number of sources, with a preference for crude that would then be

¹ 'China's Li Vows to Ensure Growth Amid Reforms That Cut Flesh', Bloomberg, March 15, 2015, at <http://www.bloomberg.com/news/articles/2015-03-15/china-s-li-vows-to-prop-up-growth-as-he-seeks-painful-reform>

² Michal Meidan, Amrita Sen, Robert Campbell, 'China – the 'new normal'', Oxford Energy Comment, February 2015, available at <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2015/02/China-the-new-normal.pdf>



processed domestically³. But now that demand growth is expected to average around 2-3% a year, China's supply sources are more diverse, its SPR filling at rapid rates, and its downstream is more sophisticated, the government is increasingly focusing on qualitative improvements. Beijing will therefore slow the pace of refining additions and focus instead on promoting the shift to higher fuel quality specifications, including the roll out of China V nationwide on 1 January 2017, and the subsequent move to China VI.

2. The 13th Five-Year Plan: Major Features

Five-year plans, are a legacy of the 1950s, when the Party-State touched on every aspect of economic life. Yet as China's economic structure has changed, plans have also evolved to become guiding documents instead of detailed directives. They are drafted over the course of several years in consultation with corporate stakeholders and ministries, and tend to intertwine with existing policies, regional plans, and strategic initiatives⁴. Ultimately, these plans constitute the Chinese government's vision for future reforms and communicate this to other parts of the bureaucracy, industry players, and citizens. Ministries and provincial authorities then publish sector-specific five year plans that draw on the goals articulated in the central document and offer more detailed guidance. As such, the five year plans are no longer master plans, but part of a continuous cycle of policy making.

The 13FYP is no exception. It does not deviate from previous policy guidelines as it reinforces the need to pursue China's economic transformation. Furthermore, the 13FYP aligns with the timeline for a number of key policy documents that were introduced in 2012-2013 and include targets through to 2020. These have already highlighted the need to deepen 'financial and fiscal reform' and to allow private firms to play a greater role in the economy. The 13FYP reaffirms these goals with intensified focus on innovation, opening up, and environmental protection⁵.

The 13FYP is, however, unique in two main respects. It is the first five year plan drafted under President Xi Jinping. And given the sweeping changes President Xi Jinping has made in Chinese political and economic governance since coming to power in 2012, it is no surprise that the Party's oversight on the process has been greater than in previous FYPs, when it was led by the National Development and Reform Commission (NDRC)⁶. It is therefore more closely aligned with the top leadership's priorities, but also raises questions about the bureaucracy's ability and willingness to enforce a vision that it does not necessarily share. The 13FYP also stands out as it marks an important period in China's economic transition to a high-income economy. For decades, Chinese leaders have been aiming to turn the country into a 'moderately prosperous' society by 2020, by doubling GDP and people's incomes compared to their 2010 levels. This deadline is fast approaching and it dovetails with the 100th anniversary of the Communist Party in 2021. As a result, the leadership in general, and President Xi Jinping in particular, attach great political importance to meeting its 'centennial goals' and hope to reinforce the Party's legitimacy by doing so⁷.

The 'centennial goals' are the fundamental reason that the 13FYP still includes a GDP growth target, although Beijing has for the first time set a floor for growth and avoided a fixed target. Moreover, the ways in which Beijing intends to spur growth are also changing. This is reflected in the five guiding principles that are highlighted in the 13FYP:

³ Gabriel Collins, Andrew Erickson, Lyle Goldstein, William Murray (eds.), *China's Energy Strategy: The Impact on Beijing's Maritime Policies*, Annapolis: Naval Institute Press, 2012

⁴ Command performance, *The Economist*, 24 October 2015

⁵ Scott Kennedy (ed.), 'State and Market in Contemporary China: Toward the 13th Five Year Plan', A Report of the CSIS Freeman Chair in China Studies, March 2016, https://www.law.yale.edu/system/files/china-law-documents/horsley_160303_kennedy_statemarketchina_web.pdf

⁶ Peter Martin, 'The Humbling of the NDRC: China's National Development and Reform Commission Searches for a New Role Amid Restructuring', *China Brief*, Volume 14 Issue 5, March 6, 2016

⁷ "China sets itself a lofty growth target", *The Economist*, 5 March 2016, <http://www.economist.com/news/china/21694208-omniscience-wonderful-thing-china-sets-itself-lofty-growth-target>



- **Innovation and high technology:** China's leaders hope that industrial innovation and higher end manufacturing will help drive the next stage of China's economic growth by developing the information technology (IT) and service sectors.
- **Coordination:** The 13FYP aims for more balanced regional growth across urban and rural areas as well as between coastal and inland provinces. To this end, Beijing will promote a number of regional integration programmes and aim to reach a 60% urbanisation rate by 2020, up from 55% in 2015.
- **Inclusive growth:** In line with Beijing's priority to 'put people first', the urbanisation process will increasingly focus on public services and building out the social welfare system, rather than on construction. Beijing hopes to thereby reduce its citizens' high levels of precautionary savings and free resources for consumption, the basis for economic growth in the years to come.
- **Openness:** As China seeks to rise up the industrial value chain, the leadership recognises the need for more private and foreign expertise and capital. At the same time, Beijing intends to promote more outbound investments through the 'Belt and Road Initiative' which will see many of China's overcapacity industries pursue investment opportunities overseas. Finally, under the 'openness' flag, Beijing aims to promote capital account liberalisation, financial services reform and to have a fully convertible RMB by 2020.
- **Green development:** The government's commitment to tackling air, water and soil pollution stands out as one of the 13FYP's top priorities.

The Environmental Agenda

The final priority highlights the rising importance of the environmental agenda. Indeed, 10 out of 25 numerical targets in the 13FYP are related to the environment, compared to eight out of 24 in the 12FYP (2010-2015). These include a pledge to cap energy consumption at 5 billion tonnes of standard coal equivalent by 2020, and to increase the share of non-fossil fuels in the energy mix to 15%, up from the target of 11.4% for 2015. Similarly, all 31 provincial governments have committed to reducing air pollution⁸. Furthermore, the government will provide financial and policy support to meet these goals, given that they also dovetail with industrial plans to develop 'new energy' and green technology. Additionally, the 13FYP calls for tougher penalties for polluters and sets out goals to evaluate local officials according to environmental criteria. Already in 2015, China shut down 20,000 plants and fined polluters for \$654 billion, a 34% increase compared to 2014⁹, and with the rising clout of China's Ministry of Environmental Protection (MEP), environmental enforcement is likely to become more stringent. The plan also reiterates President Xi Jinping's pledge to launch a national carbon emissions trading scheme, although it does not mention the 2017 timeframe that President Xi Jinping has previously outlined. Nonetheless, subsequent plans will likely provide further guidance on the emissions trading system.

⁸ The economic and social development of China, Outline of the 13th Five Year Plan.

⁹ "China Shut Down 20,000 Polluting Plants in 2015", *Xinhua*, 6 March 2015

Table 1: Key FYP targets

Target	12FYP target	2015 actual	13FYP target
Growth			
GDP (RMB trillion, end of period)	55.8	67.7	92.7
Real growth (average %)	7.0	7.8	6.5
Services (share)	47.0	50.5	56.0
Urban residents (share)	51.5	56.1	60.0
New urban jobs created (millions over period)	45.0	64.0	50.0
Disposable urban income (average %)	7.0	7.7	6.5
Disposable rural income (average %)	7.0	9.6	6.5
Energy and Environment			
Total energy consumption	4.2	4.3	5.0
Energy intensity (%)	(16.0)	18.2	15.0
Carbon intensity (%)	(17.0)	(10.0)	(15.0)
Non fossil fuels, share of the energy mix (%)	(11.4)	(12.0)	(18.0)
Sulfur Dioxide (%)	(8.0)	(18.0)	(15.0)
Nitrogen Oxides (%)	(8.0)	(18.6)	(15.0)
Ammonia Nitrogen (%)	(10.0)	(13.0)	(10.0)
Chemical Oxygen Demand (%)	(10.0)	(12.9)	(10.0)
Forest Coverage (%)	(21.7)	(21.6)	(23.0)

Source: Energy Aspects

The Growth Target

While the 6.5% bottom line that Beijing has set for growth is more realistic in China's current economic environment than a fixed growth target, it is also a purely political aspiration that will undermine market sentiment regarding China's commitment to its rebalancing process. As such, the 13FYP growth target—highly ambitious in light of the need to deleverage, restructure heavy industry, and promote a less carbon intensive growth path—places Beijing between a rock and a hard place: meeting the growth targets could cast additional doubts on the reliability of Chinese statistics, but failure to meet them would undermine the government's political credibility, which has suffered after the mismanaged stock market bailout in the summer of 2015.

Already, there is a growing sense that Beijing is running out of time and many of its problems are now coming to a head: one in every six provinces, according to Premier Li Keqiang, is nearing fiscal insolvency, and servicing the vast amounts of debt that the system has amassed is taking a growing toll on corporate profits and state coffers¹⁰. Beijing is looking to create alternative financing channels, including provincial government and corporate bond issuance as well as public-private-partnerships (PPP) to support infrastructure investment projects, instead of direct bank loans.

For 2016, the government seems to have decided on issuing higher levels of credit in order to reach headline economic goals. A major recipient of infrastructure spending will be the regional integration plans, such as the Yangtze River Economic Belt, and efforts to rejuvenate the three Northeastern Provinces (Liaoning, Jilin, Heilongjiang). At the unveiling of the 13FYP in March 2016, the NDRC introduced a three-year plan to fund 300 major transportation projects through 2018 valued at RMB 3.1 trillion (\$480 billion). These will include 20 major water projects, hydro and nuclear power plants,

¹⁰ Scott Kennedy (ed), 'State and Market in Contemporary China: Toward the 13th Five Year Plan', A Report of the CSIS Freeman Chair in China Studies, March 2016, https://www.law.yale.edu/system/files/china-law-documents/horsley_160303_kennedy_statemarketchina_web.pdf



as well as investments in urban rail transport, urban underground utility pipelines, renovating and upgrading the country's power grid, and support for environmental projects¹¹.

Going forward, favouring growth over a more sustainable approach to credit could become untenable. While sovereign support for the banking sector should limit any run on banks, expectations of a non-performing loan crunch would still cause volatility in financial flows and inhibit the functioning of the banking system. Indeed, Beijing has no good options: trimming excess capacity and restructuring unproductive state-owned enterprises—which the government has pledged to do—will slow economic growth as investment would probably decline and higher unemployment would subdue household spending. While the hope is still that the economic downside from proactively reforming the system will be limited compared to a drop in growth due to a banking crisis, the government still seems to be postponing the painful adjustments in favour of growth.

From the outset, the 13FYP looks inherently contradictory: it outlines a path forward that includes greater political centralisation as a backdrop for greater market mechanisms. Beijing has reiterated its pledge to allow markets to play a 'decisive' role in the economy but it has also highlighted the 'dominant role of the public ownership system' and the need to 'incessantly strengthen the vitality, control and influence of the state-owned economy'. In other words, if market forces are 'decisive', then state-owned enterprises (SOEs) cannot remain dominant and should be allowed to lose out to competition from private and foreign firms. And if the government wishes to maintain the strength of the state-owned economy, markets will inevitably be suppressed and cannot play a leading role.

In the Chinese political economy, however, the square can be circled, at least in theory. Unlike in advanced economies, where markets are the underlying principle organising economic activity, in China, the default setting is direct control by the party-state. The role of markets is only to organise economic activity where the state does not need to assume a large leadership role and increasingly, even in state-dominated sectors, the market is also viewed as a means to improving the economic efficiency of state owned assets by forcing them to maintain a reasonable degree of productivity¹². In other words, the market is a mechanism for setting prices but not reassigning control of assets. In the near term, this means that financial sector reform, including interest and exchange rate liberalisation will continue to make progress because they do not lead to changes in asset ownership. Similarly, changes to energy pricing mechanisms, which have gained momentum since 2013, will also continue. But this is also why SOE reform will move forward in fits and starts.

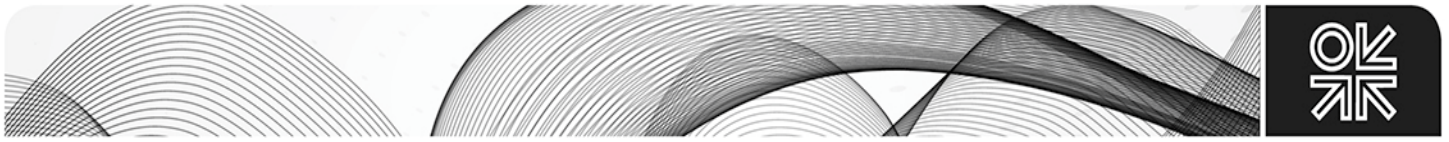
Meeting Beijing's 6.5% bottom line for growth is looking like a hollow undertaking. And the tensions that will emerge as the plan is implemented will provide ample opportunities for negative sentiment to build up and feed through to oil prices. In scenarios of policy mismanagement or a banking crisis that led to recession, even if a hard landing is averted, China's oil demand growth would slow from the 2-3% rate currently expected. Conversely, there is no upside for oil demand if governance becomes more effective and the 13FYP is successful. But there is an upside for the Chinese leadership as it means that China's state-capitalist authoritarianism will emerge as a leaner, stronger, and more competitive version of itself, not a liberal economic and political system.

3. Greener and Leaner Energy Consumption

A detailed 13FYP for oil and gas has yet to be published. But it will take its cues from the general framework highlighted in the central government's document and focus on environmental protection, energy efficiency, as well as innovation and technological upgrades in developing new supplies and managing demand. Given these trends are a continuation of the 12FYP, oil demand will continue down the 'rebalancing' path of a shift from middle distillates to light ends. This will be exacerbated by the 13FYP's focus on consumption due to the rise in car sales as well as the expansion internet networks, and the rise of e-commerce for plastics and packaging. Already, China's oil intensity—the

¹¹ China eyes \$724 billion of transport investment over next three years, Reuters, 11 May 2016

¹² Scott Kennedy (ed.), 'State and Market in Contemporary China: Toward the 13th Five Year Plan', A Report of the CSIS Freeman Chair in China Studies, March 2016, https://www.law.yale.edu/system/files/china-law-documents/horsley_160303_kennedy_statemarketchina_web.pdf

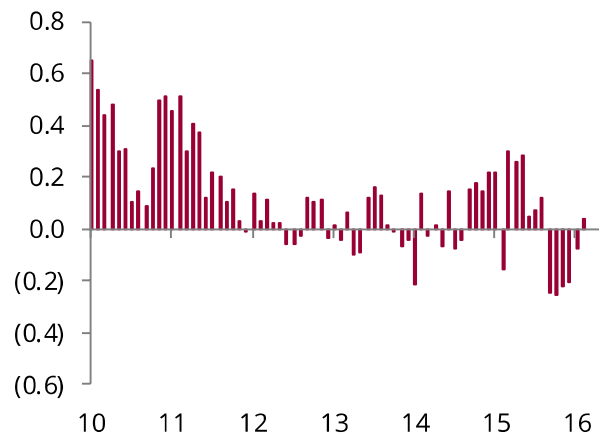


amount of crude oil required to generate a unit of real GDP growth—has declined at an annual rate of 3-6% over the past decade, and will continue to drop. In the 12FYP, Beijing aimed to reduce energy intensity by 16% compared to 2010 and overshot its target, reaching 18.2%. In the 13FYP, the goal is set at 15%, in recognition of the fact that additional efficiency gains will be more difficult over time.

Demand for Distillates

The structural shift in end product demand has become clear. For the better part of the last two decades, diesel use, which is closely correlated to heavy industry and coal demand in China, increased from 1.4 mb/d in 2000 to 3.5 mb/d in 2015, representing one third of Chinese oil demand. It has been predominant in road transport for freight—especially for moving coal from producer to consumer areas—as well as in rail and marine transportation. Yet after more than a decade of diesel demand growing at an average of 8%, it started slowing in 2011, and declined in 2013 for the first time (Figure 2). Industries such as construction, coal, ship-building, steel, and cement that boomed throughout the 2000s, started feeling the crunch of tighter credit and the correction in the real estate sector.¹³

Figure 2: Diesel demand, y/y change, mb/d



Source: NBS

In the 13FYP, changes to the government’s investment goals as outlined above, from transport infrastructure spending to internet networks and social welfare, combined with the political and economic incentives to downsize heavy industry, will further accelerate diesel’s decline. Industrial consolidation—which the government has placed among its main tasks for 2016—will weigh on diesel demand. Beijing’s ‘supply side’ focus for the year consists of reducing overcapacity in heavy industry and shutting down ‘zombie’ companies¹⁴. The National Energy Administration (NEA) has announced that it will not approve coal production projects between 2016 and 2019, and aims to shut down 60 Mt of coal production in 2016¹⁵. By 2020, the NEA plans to shutter 500 Mt of coal production capacity. The government has also pledged to reduce steel production capacity by 100-150 Mt over the next five years.¹⁶ In 2016, Hebei province—China’s largest steel producing region—plans to shutter 10 Mtpy of iron, 8 Mtpy of steel, and 1.5 Mtpy of cement capacity.

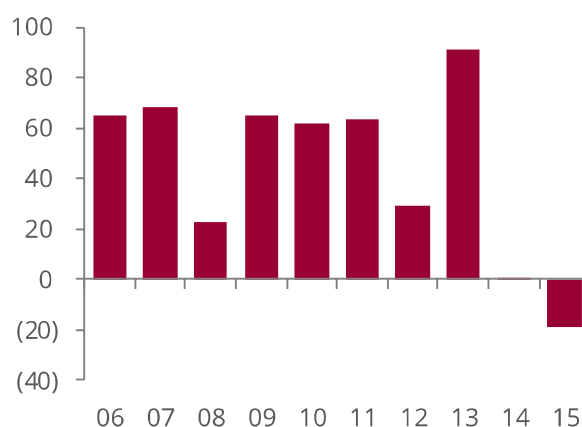
¹³ Michal Meidan, Amrita Sen, Robert Campbell, ‘China – the ‘new normal’, Oxford Energy Comment, February 2015, available at <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2015/02/China-the-new-normal.pdf>

¹⁴ ‘Backgrounder: What is China’s supply-side reform?’, *Xinhua*, 22 December 2015

¹⁵ ‘China to close more than 1,000 coal mines in 2016: energy bureau’, *Reuters*, 22 February, 2016

¹⁶ RPT-China to cut crude steel production by 100-150 mln tonnes –cabinet, *Reuters*, 24 January, 2016

Figure 3: Steel output, y/y change, Mt



Source: Haver Analytics

To be sure, Beijing will need to offset the downward pressure on growth in order to meet its GDP target, and infrastructure spending remains an integral part of its response. In the 2016 budget, the government set a steeper fiscal deficit target for 2016, at 3% compared to 2.3% in 2015. This will allow Beijing to channel financing into priority industries such as green technologies, energy saving, environmental protection, social welfare as well as infrastructure. Beijing has announced an impressive RMB 800 billion (\$123 billion) in railway spending and RMB1.65 trillion (\$253 billion) in highway spending in 2016 compared to RMB 772.9 billion (\$118 billion) and RMB 2.86 trillion (\$438 billion) in 2015, respectively¹⁷. Furthermore Beijing has downsized its public housing programme, pledging to complete 20 million units of public housing during the 13FYP, roughly half the number of units built over the course of the 12FYP, and is also emphasising renovation over new construction. Within that, 6 million units are expected to be completed in 2016, compared with 7.7 million in 2015. So the government's efforts to meet its growth targets will not lead to a surge of new diesel-intensive spending, but they will prevent diesel demand from falling off a cliff.

Even though government programmes aimed at shutting overcapacity have failed in the past, this time will likely be different. Political fiat combined with falling commodity prices and weaker demand from China's peaking real estate sector are already leading to a gradual reduction in coal and steel production. In 2015, the downturn in heavy industry provided a strong incentive to cut output, and now the political goals are further aligning behind additional cuts. Thus far, local governments have been finding ways to keep troubled firms operating at low prices and minimal profits, but their marching orders are now changing. And if the central government can help reduce the social impact from job losses—which it is pledging to do—then more excess capacity will be shut. The government estimates 1.8 million job losses over the next few years due to the overcapacity reduction targets and is therefore setting aside RMB 100 billion (\$15 billion) to help finance the resettlement of affected workers¹⁸.

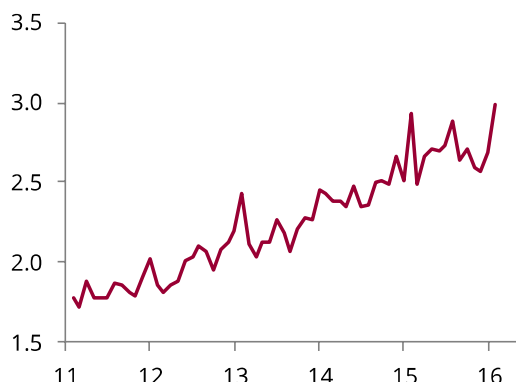
Light ends lead

The lighter end of the barrel, on the other hand, has been thriving. The rise of automobile sales has led to steady increases in gasoline consumption just as rising air travel is supportive of jet fuel demand. From 0.86 mb/d in 2000, gasoline use has almost tripled to an expected 2.7 mb/d in 2015 (Figure 4), and the government expects it will continue to catch up with diesel and even surpass it by 2020. Gasoline demand is intrinsically linked to driving, and with car sales continuing to grow strongly, after a bout of moderation in 2015, gasoline demand growth is expected to maintain its upward momentum.

¹⁷ 'Spending on Rail Lines, Trains to Hit 3.8 Tln Yuan over Next Five Years', *Caixin*, 1 April 2016

¹⁸ Ernan Cui, 'What to Make of Industrial Layoffs', *Gavekal Dragonomics*, 10 March 2016

Figure 4: Gasoline demand, mb/d



Source: NBS

The shift to a more consumption-driven model will also continue to drive petrochemical demand for plastics and packaging (Figure 5), especially as e-commerce takes off and the government encourages the localisation of automotive production. The government's 'Made in China 2025' programme, which aims to support Chinese industry to rise up the value chain, will include funding for R&D in a raft of industries, including 'new materials' such as carbon fibre and energy storage materials, rail equipment and energy saving vehicles. Similarly, local governments will promote innovation hubs throughout the country. Already in 2015, government linked venture capital funds raised RMB 1.5 trillion (\$240 billion) to invest in semiconductors and e-commerce, a trend that is now set to increase, which will boost demand for petrochemicals. Beijing's vision for a new type of urbanisation that focuses on public services, investments in healthcare and pharmaceuticals will further support the development of the Chinese petrochemical sector, as will a growing emphasis on quality control and the need for non-durable food packaging, in light of recurring food and product quality scandals that have raised consumer awareness. But the same rising environmental consciousness will also continue to slow paraxylene (PX) project developments. Sinopec has postponed three cracker projects with a combined ethylene capacity of 2.8 Mtpy in Qingdao, Hainan and Guangdong due to higher development costs and concerns over local opposition.¹⁹

Figure 5: Petchem demand, mb/d



Source: NBS

¹⁹ Demand growth for LPG, although still strong, is likely to moderate as construction of PDH plants also slows. Over the past several years, six PDH plants came onstream, with total processing capacity of around 4 Mtpy. For 2016, three additional plants are planned but only one has announced its intention to start its plant in H1 16. The others may get delayed given that existing plants are reportedly running at around 70%, and after Beijing cut natural gas prices in November 2015, LPG has lost some of its competitiveness compared to gas for industrial users.

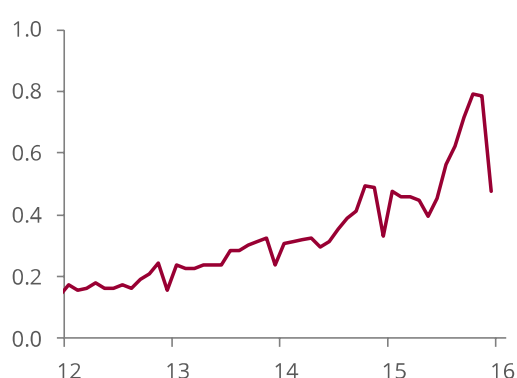
4. China's alternative energy vehicles push

Just like the oil and gas plan, the 13FYP for the automotive sector is currently being drafted, but statements by the Chinese Association of Automobile Manufacturers (CAAM) suggest that the plan will include targets for production capacity of 30 million vehicles per year by 2020, as well as annual production of 2 million plug-in hybrids electric vehicles and pure electric vehicles (EVs)²⁰. In 2015, according to CAAM, China produced 24.5 million vehicles, a weak 3.3% y/y increase compared to double digit growth rates seen since 2010. The saving grace for car sales was a tax cut that the government introduced in October 2015. With the new-car purchase tax halved to 5%, sales recovered in October and maintained stronger growth through to the end of the year, with small engine vehicles sales growing by 10.4% y/y. At the same time, lower oil prices and China's rising middle class contributed to the strength in demand for SUVs as sales grew by 52.4% y/y in 2015.

Figure 6: Car sales, engine <1.6 litre, million units



Figure 7: SUV sales, millions



Source: Haver Analytics

The tax cuts will remain in place in 2016, and CAAM therefore expects passenger vehicle sales to grow by 7.8% y/y. But after the tax cut is phased out in 2017, car sales will likely slow, as will, gradually, gasoline demand growth. This is because Beijing has set out ambitious targets for reducing average fuel consumption from 6.9 litre/100km in 2015 to 5.0 litre/100km in 2020²¹. So with more stringent standards and more forceful implementation—which is likely now that environmental protection is a top government priority—and ambitious plans to develop China's alternative energy-vehicle market, gasoline demand growth will moderate.

New Energy Vehicles

Like many other elements of the 13FYP, support for new energy vehicles (NEVs) is not new, but a combination of environmental and industrial imperatives suggest that NEV development will gain additional momentum in the next five year period. This is because NEVs—including plug-ins, EVs and gas-fired vehicles—could help the government meet its environmental goals and are also part of the 'Made in China 2025' programme, China's industrial upgrading plan²². NEVs have been gaining growing government support since 2012, when the Ministry of Finance provided subsidies ranging from RMB 30,000 to 60,000 (\$4,600-9,200) for passenger vehicles and subsidies of RMB 500-600,000 (\$77,000-92,000) for commercial vehicles, most of which are also matched by provincial governments. Sales tax and licence taxes have since also been waived for EVs. Indeed, several of China's major metropolitan areas control the growth of their vehicle population in order to limit traffic congestion by employing a licence lottery or auction system. EVs are generally excluded from these controls. In Beijing, EVs are also excluded from driving restrictions on work days. Finally, in

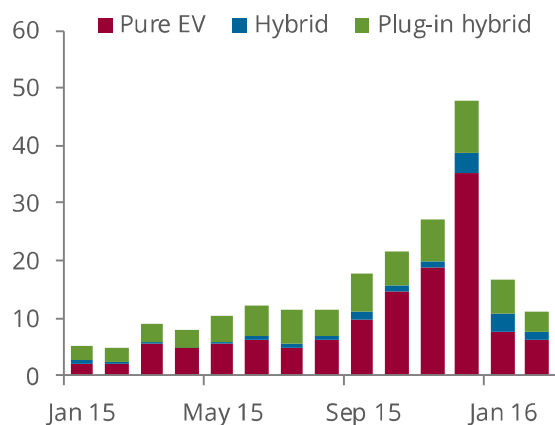
²⁰ China aims for 30 million annual auto production capacity by 2020: industry association, *Reuters*, 16 October 2015, <http://www.reuters.com/article/us-china-autos-plan-idUSKCN0SA0KX20151016>

²¹ The Chinese Automotive Fuel Economy Policy, UNEP, February 2016

²² 'Made in China 2025': Promoting energy saving vehicles and new energy vehicles, *MIIT*, May 2016 (Chinese)

September 2014, the government scrapped a purchase tax on locally produced NEVs²³. On the supply side, the government has introduced multiple R&D programmes to promote battery technology development, and has been encouraging charging infrastructure development²⁴. As a result, EV sales started picking up, reaching 74,800 units in 2014 and then rising almost threefold, to 220,000 in 2015. In total, by the end of 2015, 350,000 units had been sold within the country.

Figure 8: Car sales, NEVs, thousand units



Source: Haver Analytics

In the 13FYP, Beijing is looking to sustain the momentum behind EV development and sales with a renewed focus on developing technology by encouraging more companies (i.e. not carmakers) to enter the EV manufacturing segment. Chinese officials have claimed that traditional fossil-fuel carmakers were not proactive enough in developing EVs and the officials have therefore sought to create a more competitive environment to boost the industry's development. In December 2015, the government issued a plan to add 1,200 charging stations and 4.8 million distributed charging piles by 2020. At the end of 2014, China had 780 charging stations and 31,000 charging poles. Since then, a slew of micro targets have gradually been released by different ministries, highlighting that NEVs are a growing priority. Moreover, ministries are now aligned in thinking that China should focus first and foremost on EVs rather than hybrids, with a number of heavyweights with experience in the automotive industry leading the charge.

So while the headline goals have not changed, there is greater political impetus behind them. By 2020, Beijing plans to develop an EV production capacity of 2 million units, with roughly 1.5 million sales and in total, 5 million EVs on the road. Of the total EV population, 400,000 will be commercial vehicles (buses and public service vehicles) and 4.6 million units will be passenger car vehicles. The 'Made in China 2025' programme also reinforces these by focusing on supporting infrastructure development: subsidies for charging stations are likely to increase, while regulatory efforts will emphasise standard setting for batteries and charging infrastructure. The extent of government support has also generated enthusiasm among carmakers, Chinese and foreign alike.

But despite this, hurdles remain. For one, Chinese battery technology remains relatively weak and the driving range, despite significant improvements, was at around 150km in 2014 while charging times ranged from 6-8 hours. Lower speed EVs are perhaps attractive alternatives to e-bikes but less of a substitute for traditional combustion engine vehicles. Second, battery costs remain high and the fragmented nature of the Chinese automotive industry discourages economies of scale in R&D. The hefty subsidies currently in place reduce the urgency for carmakers to cut battery costs, but as the government begins to phase out subsidies, failure to trim expenses could impede EV penetration into the Chinese car fleet. Third, even though Beijing is focusing increasingly on infrastructure development, regulatory approvals for land acquisition or facility installation in residential compounds

²³ Yonghe Huang, 'China's New Energy Vehicle Market and Policy Analysis', China Automotive Technology and Research Center Briefing, 5 August 2015

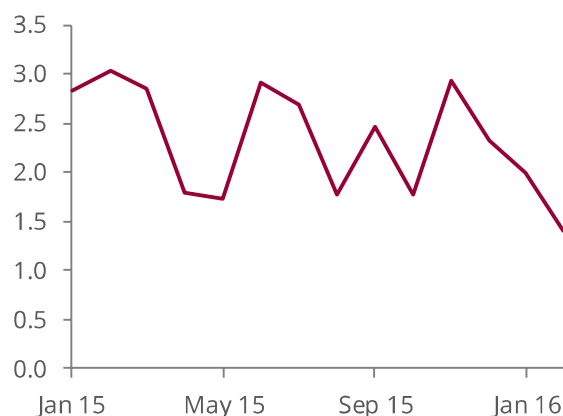
²⁴ An Zhimin, Bao Zhiming, 'Double Dips on the 'New Energy' Vehicle Ride', *Caixin*, 15 March 2016

could slow the infrastructure rollout and increase the costs associated with it. Finally, the government's emphasis on pure electric vehicles over hybrids, in part because it wants to enhance the industry's competitiveness, seems to be at odds with consumer's preference for hybrids. Nonetheless, even though the government may fail to reach its 5 million unit target in 2020, NEVs will become a larger component of the Chinese car fleet and will slow demand growth for gasoline. CNPC estimates that in 2015, NEVs shaved off roughly 80 thousand b/d of gasoline demand and according to government estimates, by 2020 NEVs will knock off 0.3-0.35 mb/d of gasoline demand.

Natural gas vehicles, at the margins

Beijing has equally ambitious targets for natural-gas vehicles (NGVs). The government is looking to increase the number of NGVs in China from almost 3 million units in 2013 to 5.2 million in 2015, and to 10.5 million units by 2020. Already, NGVs have been benefitting from government support including production subsidies as well as R&D funding for technology development. Highway tolls are also waived for NGVs.

Figure 9: Sales of NGVs, thousand units



Source: Haver Analytics

But there are a number of constraints to promoting NGVs more rapidly. First, natural gas supplies remain limited, especially for transport. Major gas producing regions such as Shandong, Xinjiang, and Sichuan, boast high levels of NGVs—the three provinces combined account for more than half of China's NGVs—but other potential consumer hubs, especially along China's coastal provinces where air pollution is at its most severe, are promoting gas use in industry and power generation and dealing with shortages during peak seasons²⁵. As a result, China's coastal provinces account for a little over 10% of China's NGV fleet. But increasingly, China's oil and gas majors are investing in refuelling capacity. And with improving gas grid connectivity, NGVs and gas stations are also spreading eastwards: In 2015, China had a total of 3,732 refuelling stations, unevenly spread between Shandong, which boasted 473 stations, followed by Xinjiang with 362 refuelling stations, and Sichuan, with 315 stations.

Pricing is also a key consideration. Not only are the costs of purchasing NGVs higher than traditional vehicles, but also average fuel costs in the coastal provinces are higher than gasoline prices. In 2015, on average, Shanghai retail prices of gasoline 93RON reached \$182 per barrel, while CNG was \$200 per barrel. In Xinjiang, however, CNG cost \$111 per barrel and in Sichuan \$142 per barrel, making gas more competitive than gasoline.

Going forward, much will depend on the price of oil but also on the domestic gas pricing mechanism, which is still very much state-determined.²⁶ Beijing has pledged to make all prices market-driven by

²⁵ 'China's natural gas vehicles, prospects and challenges', *CNPC News*, 31 May 2016 (Chinese)

²⁶ Michael Chen, 'The Development of Chinese Gas Pricing: Drivers, Challenges and Implications for Demand', OIES Paper, NG 89, July 2014, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2014/07/NG-89.pdf>



2020, but progress on liberalising gas prices has been slow and will likely move forward in small steps. Despite these hurdles, NGVs will also gradually slow the pace of gasoline demand growth.

5. The trials and tribulations of domestic oil price reform

As part of the government's pledge to allow markets to play a 'decisive role' in the economy, the 13FYP also states that Beijing will 'lift price controls in power, oil and natural gas and improve the pricing mechanism for refined oil products' by 2020. China's current product pricing mechanism is state-guided and even though it tracks global oil prices more closely than it did in the past, price adjustments are still made by the NDRC.²⁷

The next step in the reform process will likely be to allow the majors to adjust prices, based on a state-set formula. Even though pricing is a prerogative that the NDRC will not surrender easily, a number of anti-corruption campaigns have targeted the NDRC price departments, highlighting that the NDRC too must comply with the reform agenda. Nonetheless, Beijing is unlikely to relinquish all control over price setting, a tool it still sees as conducive to maintaining social stability, by keeping diesel costs for agriculture relatively low for example, and for managing inflationary expectations. As such, the 13FYP statement that Beijing will 'improve' refined product price-setting suggests that it will not fully liberalise pricing, even though it will experiment with different mechanisms, as it has been doing for several years.

The current oil product pricing mechanism dates back to January 2009, when Beijing first pegged domestic prices to international crude costs. The government replaced the state-set benchmark ex-factory prices by a ceiling retail price, below which retailers were free to set their own prices. These ceiling retail prices came under review every 22 working days, and were adjusted according to changes in international crude prices, for grades including imported crudes from Indonesia such as Cinta, Minas, and Duri. In reality however, adjustments of product prices were few and far between, and rarely reflected the full extent of changes in international costs.²⁸ This led to a surge in speculative trading while refiners' margins suffered. High global crude costs were not passed through to consumers and even troughs in the pricing cycle only seldom offered relief to margins.

In 2013, the government sought to reduce some of the speculative activities and support refining margins. The NDRC shortened the review period to 10 days and noted that the formula would be applicable when global oil costs ranged between \$80-130 per barrel. The formula was implemented more regularly, allowing refiners and traders to enjoy greater predictability—though technically the NDRC could intervene if inflation was rising or if it judged that global prices were too low or too high. Nonetheless, it continued to adjust domestic prices, even as global oil prices began falling in the summer of 2014. Yet in a bid to prevent a surge in consumption, the NDRC capped the pass through of lower prices, and raised consumption taxes. So while Brent fell by 65% from September 2014 to December 2015, domestic gasoline and diesel prices dropped by 28% and 34% respectively. Finally, in December 2015, when global prices fell below \$40 per barrel, the NDRC suspended adjustments of domestic product prices.

In early January 2016, the NDRC tweaked the pricing mechanism and lowered the floor to \$40 per barrel, to better reflect global oil prices. Prices are still reviewed every ten working days, but they are not adjusted when global oil prices fall below \$40 per barrel. By introducing the new floor to the pricing mechanism, the Chinese government has explicitly stated that it is looking to offset some of the majors' losses on their upstream production, and prevent shut-ins.

In addition, Beijing is looking to limit demand growth, given that the deteriorating air quality—which is in large part due to transportation emissions—is a growing source of public consternation. According to the new mechanism, when global oil prices are lower than \$40 per barrel, refiners will pay an

²⁷ See for instance, Fattouh, B., C. S. de Oliveira, A. Sen (2014) 'Gasoline and Diesel Pricing Reforms in BRIC Countries – A Comparison of Policy and Outcomes', Oxford: Oxford Institute for Energy Studies.

²⁸ Ibid.



additional tax—though the exact mechanisms for levying this remain unclear—that will be held in a special fund and used for emissions control and fuel quality upgrades.

The NDRC's latest tweak also announced that ex-refinery LPG prices will be liberalised. Up until now, ceiling prices for ex-refinery LPG were set by the government, but going forward, LPG prices will be determined directly by supply and demand. In the short term, this should not alter prices significantly, given that thus far ex-refinery LPG prices have rarely reached their ceiling prices.

The government's price reform agenda is informed by two additional considerations: its environmental protection efforts and its desire to open the sector to private actors. China's worsening air quality has led Beijing to adopt an ambitious environmental agenda that includes a carbon tax—although this is still under debate—and an accelerated timeline for introducing more stringent fuel quality standards. By allowing supply and demand dynamics to determine prices, the government is hoping to gradually raise the cost of oil products for end users and move away from subsidies. But the oil price crash of 2014 has complicated these efforts and Beijing has had to step in and guide markets in the right direction. The government capped the pass-through to domestic drivers and raised the consumption tax on oil products in a bid to prevent a sharp uptick in demand that would compromise its environmental efforts. Gradually, though, Beijing is looking to tweak the ways in which it manages prices, moving from subsidies to taxes for example, all the while maintaining the government's ability to intervene and shape prices if need be.

6. Restructuring of the NOCs

The government recognises that a more transparent and predictable pricing mechanism will facilitate another goal: encouraging private actors to enter the energy sector. The 13FYP emphasises the need to open up the economy to private investors and improve the efficiency of state-owned companies. While the problems associated with the state-owned enterprises (SOEs)—including poor returns on investment, rising debt and widespread corruption—are well understood, there are disagreements about how best to resolve these issues.

Political and public pressure has been building for an overhaul of China's national oil companies (NOCs).²⁹ CNPC and Sinopec are among the largest and most politically connected companies in China, and have benefitted from high ranking and powerful patrons. The political tide turned however, in 2013, with the ouster of the former chairman of CNPC, Zhou Yongkang who had accumulated too much power for Xi Jinping's liking and had bred deep rooted corruption in the industry, especially at CNPC.

The collapse in oil prices has also added to the NOCs woes. Their earnings have declined along with oil prices, when their balance sheets were already under strain from their overseas buying binge. And indeed, since Zhou was ousted, the NOCs' ability to inform national policies has been greatly reduced and a slew of changes—including the deregulation of natural-gas prices and challenges to the companies' monopoly over oil and gas imports—are testament to a change in mood.

The oil companies have also increasingly realised that they must toe the political line. The fuel specification changes are one example: In early 2013, the government set a timetable for introducing China IV but Sinopec and CNPC dragged their feet on fuel quality upgrades complaining that their weak refining margins were impeding their ability to invest in the upgrades. Since 2014 and the beginning of the corruption probes, Sinopec and CNPC have tried to outdo each other in meeting targets early.³⁰

²⁹ For detailed analysis, see M. Meidan (2016), *The structure of China's oil industry: Past trends and future prospects*, Oxford: Oxford Institute for Energy Studies.

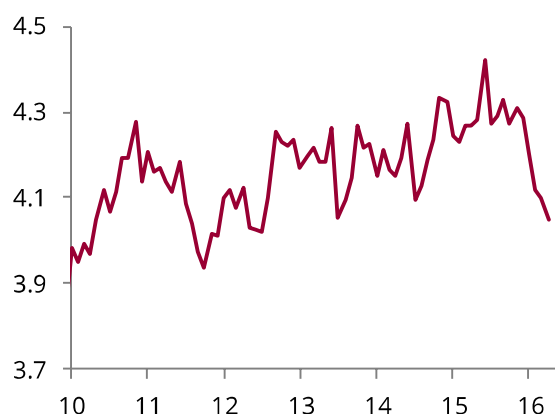
³⁰ Sinopec's experiment with 'mixed ownership' is another case in point. Sinopec sold a 29.99% stake in its retail fuels business, including over 23,000 gas stations in 2014. While it highlights the companies' willingness to fall in line with the political directives, it is also telling of the limits of these reforms: of the 25 new shareholders in Sinopec Sales, 16 are state-owned entities. While they own collectively 20% of Sinopec Sales, no individual investor controls more than 2.8%, and none of them are represented on Sinopec's board of directors.

Finally, the unprecedented liberalisation of oil import rights for independent refiners is also a significant achievement in this context.³¹ The government sees competition from them as a way to impose discipline on the NOCs. In point of fact, the initial stages of liberalisation look like anything but discipline: While the independent ‘teapots’ that now have access to crude as feedstock are raising runs, the state owned majors are also maintaining their refining throughput, and looking to expand their retail outlets to fend off competition from the ‘teapots’. Ultimately, market dynamics could force some mergers and consolidations amongst the ‘teapots’ as the smaller ones will find it costly to maintain high volumes of crude imports when the domestic market for oil products is looking increasingly oversupplied.

The NOCs, in response, will focus their limited Capex on more lucrative segments. And in line with the ‘mixed ownership’ rhetoric, they will likely spin off some of their pipeline assets and oilfield service subsidiaries. At the same time, the government will pursue its efforts to open the upstream to private investment. In July 2015 the Ministry of Land and Resources opened tenders for six oil and gas blocks in Xinjiang to private firms. The bidding was greeted with little enthusiasm and attracted domestic investors with limited upstream experience given the relatively poor quality of the assets, and even though it will not erode the NOC’s dominance, it is a step toward opening the oil industry further to private capital.

Even new investors in China’s upstream are unlikely to reverse China’s declining domestic output. While the 13FYP may include an objective to maintain or even increase domestic production from bases in Xinjiang or in the South China Sea, the reality of low oil prices is pointing toward a decline in output: Indeed, based on China’s oil and gas majors’ 2015 results, domestic production is set to fall by 0.17 mb/d (-4%) in 2016. Investment in production has been falling from a peak of \$54.4 billion in 2014 to \$39.4 billion (-27.6% y/y) in 2015 and now \$33.5 billion (-15.1%) this year. This is a significant change in thinking as maintaining high output from these flagship fields has been key to the government’s goal of limiting its dependence on imported oil. The government even set a target for crude oil imports to stay below 61% of total consumption in the 12FYP. Import dependence was far from this ceiling up to 2013, but started to rise in 2014 following the collapse in global oil prices and in 2015, the share of imported oil reached 65%.

Figure 10: Crude oil output, mb/d



Source: NBS

The NOCs go global, again

The NOCs are therefore adapting their strategies to these new commercial and political realities. In the past, China’s decision makers were reluctant to rely solely on markets to secure oil supplies. They supported the oil companies’ purchase of oil and gas assets abroad on the (untested) theory that, in

³¹ See M. Meidan (2016), *The structure of China’s oil industry: Past trends and future prospects*, Oxford: Oxford Institute for Energy Studies.

times of crisis, these resources could be shipped back to China. So the priority now is not to lock up assets that are no longer particularly scarce, but to obtain the best price on global markets. And indeed, the trading arms of PetroChina and Sinopec, ChinaOil and Unipec, have stepped up their presence in global trading platforms significantly, especially since 2014, when career traders were promoted to the top spots at both ChinaOil and Unipec, replacing corporate planning officials and refinery managers. While these are still early, and relatively experimental stages, the goal is to become more dominant in global benchmarks and impact global oil prices actively.

Alongside China's growing appetite for trading, the NOCs will gradually resume their outbound investments, joined no doubt by the newcomers to the sector. China's NOCs are setting their sights on assets that they hope will be cheaply valued, in Iran, Brazil, and Africa. Yet after having been on the sidelines of international M&A throughout the corruption storm, China's NOCs will be more cautious about their spending for three reasons. First, because even though they are cutting upstream Capex, their finances remain limited. Moreover, they remain, plagued by the uncertainty surrounding the trajectory of crude oil prices. Second, they remain in wait and see mode over the future of the SOE reform plan and corruption probes. The audit of Sinopec's \$10 billion investment in Angola from 2008 through mid-2015 is a case in point. Sinopec reportedly earned no returns on its investments while it seems to have exaggerated reserves, leading to the arrest of former Sinopec President Su Shulin for corruption last year. So now that China's NOCs are aware that unsuccessful overseas acquisitions are likely to attract the attention of Xi Jinping's anti-graft authorities, the companies are likely to be more selective shoppers. And finally, because the Chinese leadership is less anxious about supply security the companies will receive less support from the increasingly stretched state-owned funds. Political support will also be limited to Xi Jinping's key foreign policy priorities (namely, the 'Belt and Road Initiative'). Nonetheless, the view in Beijing remains that China should increasingly become a price maker in global oil markets, and this implies a greater presence across the global supply chain, though not exclusively in the upstream.

7. Conclusions

As the main blueprint for China's 'rebalancing', the 13th Five Year Plan (13FYP) will have a deep impact on economic growth and energy demand patterns. China's economic growth is slowing, and the economy is now clearly shifting from an export oriented growth path to a more consumer-driven development model. China is now looking to tackle the challenges of debt and industrial overcapacity but it is doing so, at times, in a haphazard manner. The 13FYP, by laying particular emphasis on innovation, urbanisation and environmental protection, will accelerate the shift in end product demand from middle distillates to light ends. Efforts to curb industrial overcapacity will further weigh on diesel demand, even though plans for regional interconnectivity will prevent it from falling sharply, while the push to develop alternative energy vehicles will slow gasoline demand growth rates from the double digit growth rates witnessed over the past decade. Finally, the government's efforts to open the domestic oil industry to private participants is testament to a change in its thinking about oil supply security, and of a greater willingness to allow Chinese companies to become active participants in global oil supply chains and price-making mechanisms. Reforms of the Chinese national oil companies (NOCs) are unlikely to lead to massive privatisations, but will force them to be more financially disciplined leading to cuts in upstream Capex and more cautious outbound investments.