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China's Independent Refiners: A New Force Shaping Global Oil Markets

1. China's 'teapot refiners': Evolution and Features

China's independent refiners sprang to global attention after they first received quotas to process imported crude oil in July 2015. Since that time, Chinese crude buying has surged—even though end product demand growth is slowing—with the teapots accounting for the vast majority of China's incremental purchases. They have tapped into a wide variety of suppliers, impacted regional pricing dynamics and crude flows to China.

China's 121 independent refiners account for an estimated 4.3 mb/d, or just under a quarter, of the country's overall downstream capacity¹. Located for the most part in Shandong province, they have traditionally been small (20 thousand b/d to 0.1 mb/d capacity), inefficient and unsophisticated—earning them their nickname 'teapots'². They sprang up around Shengli oilfield and managed to secure feedstock from the field. Yet many of the Shandong refiners have grown in scale and sophistication over time, and while they are still dubbed teapots, some of them are among the country's most complex petrochemical facilities. Other independent refiners are located in Guangdong province—China's southern manufacturing and export hub—and scattered throughout the country, in areas including Shanxi and Liaoning, usually close to major oilfields and heavily focused on asphalt production.

Unlike their state-owned peers, teapot refineries have had very limited options for feedstock. Back in the 1990s and 2000s, the right to import crude oil was tightly controlled by the government and awarded to five state-owned traders (ChinaOil, Unipecc, Sinochem, CNOOC and Zhuhai Zhenrong). After China joined the WTO in 2001, the Ministry of Commerce (MOFCOM) began awarding crude import licences under the 'non-state' trading system³. But the allowances, which were extremely limited, were granted for the most part to locally owned companies on the condition that the imported oil had to be sold to a state-owned refinery.

As such, the teapots could not access crude oil and instead relied on more expensive imported fuel oil as feedstock, including 180-CST low-sulphur fuel oil from Asian markets, 380-CST fuel oil from Venezuela, or M-100 fuel oil from Russia. They processed it into off-spec diesel for use by farm machinery, only gradually expanding to additional uses. Their refining units were unsophisticated and produced low quality products, and the use of expensive fuel oil combined with domestic oil product

¹ According to Energy Aspects' proprietary database of independent refiners

² "Analysis of the competitiveness of the Shandong refining sector", *China Petroleum News* (Chinese), 25 May 2016, <http://news.cnpc.com.cn/system/2016/05/25/001594038.shtml>

³ Inside China's teakettle refineries, Argus special report, 2012

price controls imposed by the government, depressed their profits. Their utilisation rates therefore hovered at 35% to 40%⁴ (See Figure 1), much lower than state-owned refiners' utilisation of around 85%⁵.

Figure 1: Independent refiner's utilisation rates %



Source: Company Reports

Despite these barriers, the teapots have managed to survive and evolve considerably. Their numbers have decreased by roughly a third following several government consolidation campaigns, but at the same time, many have managed to avoid shutting down whilst increasing their capacity and sophistication in the meantime. In 2010, Beijing mandated that teapots with capacity of under 20 thousand b/d should be shuttered by the end of 2011 and that refineries with crude distillation capacity of under 40 thousand b/d should be mothballed by the end of 2013⁶. Yet two years later, refiners opted to expand and upgrade the units that were earmarked for closures in order to stay open⁷.

As a result, even though there are fewer teapots, their capacity in Shandong has grown dramatically, from 1.12 mb/d in 2009, to 2.1 mb/d in 2012⁸. During that period, the teapots also grew in sophistication. In 2012, catalytic cracking capacity reached 0.88 mb/d, a 57.3% increase from 2009, while coking capacity surged by 84% to 0.80 mb/d. Hydrogenation capacity more than doubled to 0.93 mb/d over the same period, while reforming capacity rose by 92% to 96 thousand b/d⁹. By 2014, Shandong teapots' crude refining capacity reached 2.49 mb/d with catalytic cracking capacity at 1.14 mb/d and coking capacity of 1 mb/d, as well as 1.33 mb/d of gasoline and diesel hydrogenation capacity¹⁰.

The teapots' output has also diversified, although it has remained more limited than the product slate of state-owned refiners. Production is still dominated heavily by diesel and gasoline, with respective outputs of 55% and 34%. Fuel oil accounts for less than 4%, while LPG represents 5.7% (See Figure 2). Teapots' production of off-specification naphtha is extremely limited and they do not produce jet/kerosene. Shandong's independent refiners account for the bulk of this output. In November 2015,

⁴ Shandong's independent refineries face winter with only a 30% utilization rate; some firms apply for bankruptcy, (Chinese) 21st Century Business Herald, January 21, 2015, <http://finance.sina.com.cn/chanjing/cywxw/20150121/013221346190.shtml>

⁵ "China's Independent Oil Refineries: An Inside Look - Surviving Amid Mounting Challenges", *Platts special report*, 16 December 2014

⁶ Henry K. H. Wang, *Energy Markets in Emerging Economies: Strategies for Growth*, New York: Routledge, 2017

⁷ "China's teapot refiners expand aggressively to stay operational", *Platts*, 1 November 2013, <https://staging1.platts.com/latest-news/oil/singapore/chinas-teapot-refiners-expand-aggressively-to-27587532>

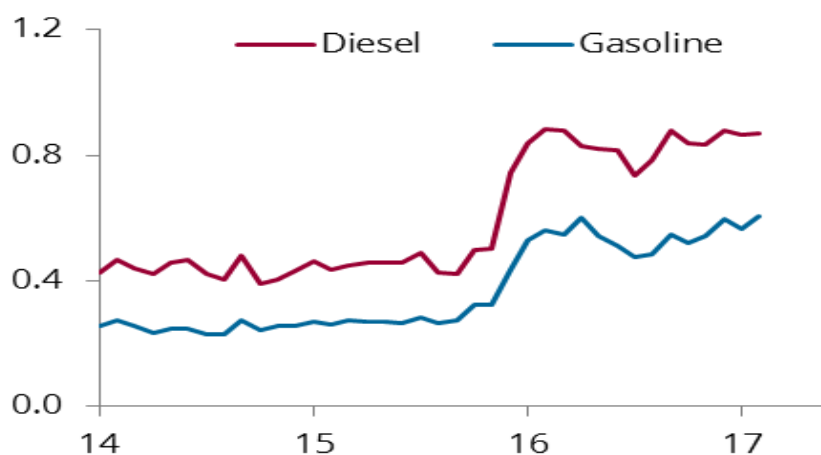
⁸ According to SCI99

⁹ "China's teapot refiners expand aggressively to stay operational", *Platts*, 1 November 2013, <https://staging1.platts.com/latest-news/oil/singapore/chinas-teapot-refiners-expand-aggressively-to-27587532>; SCI99

¹⁰ Energy Aspects database

they produced 0.32 mb/d of diesel/gasoil, 0.2 mb/d of gasoline, 50 thousand b/d of LPG and 29 thousand b/d of fuel oil. Their peers in Guangdong and Shaanxi provinces produced a combined 0.15 mb/d of diesel/gasoil, 0.12 mb/d of gasoline, 24 thousand b/d of LPG and 1 thousand b/d of fuel oil¹¹.

Figure 2: Teapot diesel and gasoline output, mb/d



Source: Company Reports

2. Survival of the fittest?

The teapots' ability to survive stems from a number of factors. First, their contribution to the local economy has acted as a shield from central government decrees. Oil is one of Shandong province's most important industries—the petrochemical industry accounts for 19% of the province's industrial revenue¹². And unlike their state-owned peers, which pay tax revenues to the central government, local teapots' fiscal contributions stay within their locality. As such, teapots have received strong support in the form of tax breaks and cheap access to land. Local authorities have even offered teapots refunds on the consumption tax—on blending components for gasoline—or have not been collecting it from the teapots at all¹³.

Second, despite attempts by state-owned refiners PetroChina and Sinopec to squeeze them out of the domestic downstream, they survived by becoming important swing suppliers throughout the 2000s, when China's oil demand growth was surging and refining capacity could not keep up. In the fuel shortages of 2007-2008 and then again 2010, teapot refiners ramped up their output and eased supply shortages in eastern and central China, highlighting their contribution to supply security¹⁴.

Yet, from 2010, as China's oil demand growth began to slow and the government looked to introduce higher quality fuels, the teapots had to find new ways of maintaining profitability. They have upgraded capacity in order to meet China IV standards for the most part, but at the same time, continued to target China's hinterland where there is still a market for off-spec fuels. While the transition to China IV and China V standard fuels is being enforced quite stringently in the larger cities to the east and south of the country—where drivers can also bare the cost burden with greater ease—in the less affluent regions

¹¹ Ibid

¹² According to the Shandong petrochemical industry association, www.sdchem.gov.cn

¹³ "Teapots exploit loopholes in China's massive tax web", *Platts Oilgram News*, 19 December 2014

¹⁴ Inside China's teakettle refineries, Argus special report, 2012



of central and western China, consumers continue to favour cheaper gasoline and diesel, even if these are less environmentally friendly.

Third, many of the teapots have been developing partnerships with the state-owned companies. Initially, CNOOC and Sinochem viewed the teapots as a means to establishing a better foothold in the domestic downstream, to rival Sinopec and PetroChina. Given that CNOOC is a latecomer to the Chinese downstream, it has formed alliances with a number of teapot refiners—taking stakes in three Shandong teapot refineries with combined processing capacity of 0.15 mb/d, supplying them with its offshore crude¹⁵. Sinopec for its part has been increasing sales from the Shengli oilfield (which is also located in Shandong province) to refiners with which it has secured contractual arrangements. The government's decision to impose a consumption tax on fuel oil in 2006 increased the teapot's desire to work with state-owned producers and gain access to crude¹⁶. The following year, PetroChina formed an alliance with Dongming, Shandong's biggest independent refiner, supplying it with imported crude as well as a mix of onshore grades such as Zhongyuan, Changqing and Tuha. In 2008, PetroChina also began supplying heavy Venezuelan Merey crude to Shandong from the companies' output in the Orinoco Belt.

Finally, as Beijing raised the consumption tax on fuel oil eight-fold in 2009, fuel oil was rapidly losing its lustre and the teapots' transition toward crude intensified¹⁷. As a result, from an overwhelming reliance on fuel oil in the early 2000s, the share of fuel oil in teapot's feedstock fell to 24% in 2014, with the remaining 76% crude. With crude oil becoming a significant feedstock, independent refiners sought approval to import it independently and avoid the fees associated with the state-owned middlemen¹⁸.

The teapots' attempts to lobby the government for crude oil import rights took a long time to materialise. In 2013, state-owned ChemChina was awarded a 0.2 mb/d 'non-state' crude oil import licence. This was an important step because despite the fact that ChemChina is a state-owned chemicals producer, it was the first to receive 'non-state' quotas with which it sought to supply crude oil to teapot refiners¹⁹. In 2014, the independent trading company Xinjiang Guanghui received approval to import 4 thousand b/d, though the bulk of this was intended to come from the company's upstream investments in Kazakhstan²⁰. In February 2015, the National Development and Reform Commission (NDRC) issued guidelines allowing independent refiners to apply for quotas to use imported crude oil. In order to qualify, refiners would need to get rid of small primary processing units and meet local fuel quality standards. Once granted, the quotas would allow teapots to use imported crude, even though one of the five state-owned traders would still need to import on the refiners' behalf²¹. The NDRC's regulations were therefore a carrot for independent refiners to consolidate and upgrade to higher fuel standards. Much to the refiners' surprise, within five months of announcing the new guidelines, the NDRC issued 0.7 mb/d of crude import quotas to independent refineries, equivalent to more than 10% of China's crude oil imports. It came as an even greater surprise when in August 2015, MOFCOM granted two teapots approval to forego the state-owned middle man and import crude oil directly²².

The sudden progress and rapid opening of the sector is due to a number of reasons. First, in the context of Beijing's energy sector reform, the government has pledged countless times to open the oil and gas sector to non-state actors and generate competition that will force the state monopolies to become more efficient. Over the years this goal has met with considerable resistance from the state-owned companies. But following the corruption investigations launched by Xi Jinping into CNPC and Sinopec—

¹⁵ "CNOOC plans expansion of newly-bought refinery", *Reuters*, 18 September 2008; "Two more independent refiners in Shandong may buy offshore crude", *C1 Energy*, 8 July 2014, <http://www.c1energy.com/common/5276767,0,0,0,2.htm>

¹⁶ Jim Bai, Chen Aizhu, "China's 'teapot' refiners say able to ease diesel shortages", *Reuters*, 25 November 2011

¹⁷ Vandana Hari, "Beijing Tightens the Noose", *Platts*, October 2014

¹⁸ Changing feedstock of Chinese teapots, *Platts Oilgram News*, 18 December 2014

¹⁹ "ChemChina obtains crude import quota, relies less on fuel oil", *RIM Intelligence*, 9 August 2013

²⁰ Fayen Wong, Chen Aizhu, "China private energy firm wins rare crude oil import permit", *Reuters*, 28 August 2014

²¹ National Development and Reform Commission, "Notice on questions related to the use of imported crude oil", Document No. 253 (2015), http://yxj.ndrc.gov.cn/zftp/dflvgl/201502/t20150216_738641.html

²² Ministry of Commerce, "Ministry of Commerce notice related to the criteria for crude processing enterprises applying for non-state import licenses" Document No. 407 (2015), <http://www.mofcom.gov.cn/article/b/e/201507/20150701056066.shtml>

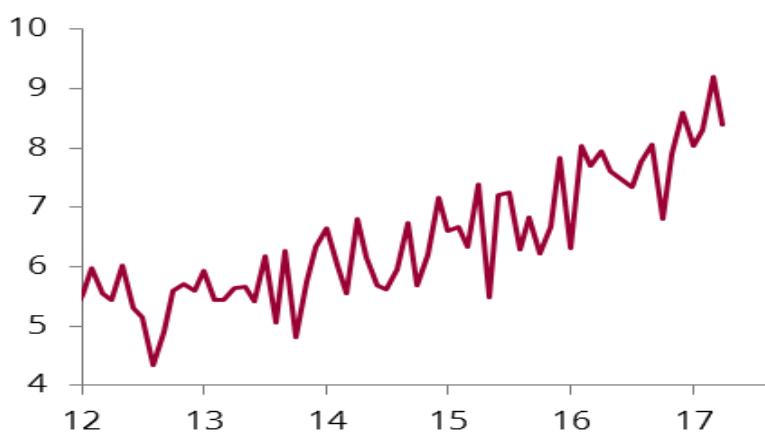
ongoing since 2013—the companies have been weakened politically and their ability to resist change has been greatly reduced²³.

Second, offering teapot refiners import licences in return for consolidation has become the most effective tool for getting Shandong provinces' unwieldy refiners to shutter small CDUs. For years, teapot refiners paid lip service to Beijing's consolidation targets while continuing to expand²⁴. Yet following the NDRC's notice regarding crude oil quotas, an estimated 0.71 mb/d of capacity was mothballed in 2015 with an additional 0.44 mb/d earmarked over the course of 2016²⁵. Import quotas have also become an effective tool for shifting from fuel oil towards crude as a feedstock, assisting the government's efforts to upgrade fuel quality standards from China III to China IV and the impending transition to China V. This will help alleviate China's air pollution woes, now a top priority for Beijing.

Third, as the government is looking to launch an oil futures exchange in Shanghai, it must increase liquidity in the domestic market. It must also increase transparency and liberalise pricing, but allowing a greater number of actors to trade is an initial step in the right direction²⁶.

Additional import quotas have come in quick succession. By the end of 2016, the NDRC granted 19 refiners approval to process 1.46 mb/d of imported crude²⁷. It is important to note that these refiners now have crude import 'quotas', which refers to the maximum volume of imported crude oil that they are allowed to process in a given year, but only ten refiners have secured crude import 'licences' from MOFCOM. These licences allow them to import directly from the international market without having to go through a state-owned company. In 2016, thirteen refiners secured licences to import 1 mb/d, with the rest importing through state owned and private traders (See Table 1). But with the floodgates opened, crude imports by independent refiners increased by 0.75-0.80 mb/d y/y in 2016, accounting for the bulk of China's incremental crude buying (see Figure 3).

Figure 3: China crude oil imports, mb/d



Source: China Customs

²³ Michal Meidan, The structure of China's oil industry: Past trends and future prospects, OIES Paper, WPM 66, May 2016, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2016/05/The-structure-of-Chinas-oil-industry-past-trends-and-future-prospects-WPM-66.pdf>

²⁴ China's teapot refiners expand aggressively to stay operational, *Platts*, 1 November 2013

²⁵ Author's calculation

²⁶ Chen Aizhu, "China's new oil import policy positive for quality, prices- governor", 7 March 2015

²⁷ For a list of quotas and phased out capacity as of January 2017, see "FACTBOX-China's new crude importers - Reuters News", Reuters, 4 January 2017

Table 1: Independent refiners import quotas, Mt

Refinery	End 2016 quotas	2017 quotas
Dongming Petrochemical	7.5	6.6
Panjin Beifang Asphalt Fuel	7.0	5.7
Sinochem Hongrun Petrochemical	5.3	5.1
Kenli Petrochemical	2.5	2.2
Lijin Petrochemical	3.5	3.1
Dongying Yatong Petrochemical	3.4	2.0
Ningxia Baota Petrochemical	6.2	0.5
Wonfull (Huifeng) Petrochemical	4.2	1.7
Tianhong Chemical Co	4.4	3.8
Shouguang Luqing Petrochemical	2.6	2.2
Chambroad (Jngbo) Petrochemical	3.3	0.8
Dongying Qirun Chemical Company	2.2	2.1
Haiyou Group	3.2	0.4
Shandong Qingyuan petrochemical	4.0	2.0
Shandong Hengyuan petrochemical	3.5	1.8
Wudi Xinyue Ranhua	2.4	1.2
Shaanxi Yanchang	3.6	0.0
Shenchi Huagong	2.5	1.3
Landbridge port	1.8	1.8
Xinhai Chemical Group	0.0	1.9
Jncheng petrochemical	0.0	1.5
Zhonghai Shandong	0.0	1.9
Henan Fengli	0.0	2.2
Haike Rulin	0.0	2.1
Dongfang Hualong	0.0	3.0
Qicheng Chemical	0.0	1.6
Shengxing Chemical	0.0	2.2
Total	73.1	60.4

Source: Energy Aspects

3. Erratic buying patterns and Logistical Constraints

While teapots have typically preferred to run heavy sour grades, in 2016, they experimented with a variety of crudes, prioritising price and ease of delivery over assays. So even though a handful of suppliers including Russia, Venezuela and Angola became the dominant sources of feedstock, volumes varied substantially on a monthly basis²⁸.

These erratic buying patterns were driven by a number of factors. First, when the teapots received their initial crude quotas, they had limited financial resources and so opted for crudes from Russia and Asia Pacific that would be delivered within weeks rather than months. Second, given the limited port infrastructure in Shandong province, the teapots preferred to source crude in smaller parcels that could

²⁸ Chinese Customs data

be delivered to nearby ports. So teapots opted for grades that could accommodate these infrastructure limitations, leading to higher imports of Malaysian and Indonesian crudes for example, and to demand for Russian ESPO, that can be delivered via rail²⁹. Third, as the independent refiners received crude import quotas, they rapidly built up their trading teams and for the most part hired from the established state-owned traders, Chinaoil, Unipet and Sinochem. As a result, the newly created trading units relied on old connections and contacts, sourcing crude from Venezuela and Brazil, for example, for ex-Chinaoil traders, or Angolan grades for Sinochem or Unipet, as well as Russian crudes for Sinochem and Chinaoil³⁰.

The surge in imports into Shandong has also created a number of logistical headaches for both refiners and suppliers. In April and May, when imports into the Qingdao customs area peaked at 2.33 mb/d and 2.50 mb/d respectively³¹, the port authorities found themselves incapable of handling the surge. Tankers were floating off the Chinese coast for over 30 days, waiting for the crude to be discharged and processed through customs. Even though the crude on board was acquired when prices were around \$30 per barrel, the demurrage costs were piling up³². In addition, the teapots needed to bring the crude from the ports to the refineries, leading to congestion on the main pipelines and trucking routes, raising costs even more. Yet the rising demand for logistics companies and the overall support to the region's economic growth have made local officials eager to support the Shandong refiners and ensure that they are able to develop their business.

Similarly, the infrastructure and storage businesses have also been booming in Shandong as a result of the teapots' rise—an additional VLCC berth at the port of Yantai and a 0.30 mb/d crude pipeline from Yantai to Zibo (which will connect Chambroad, Jincheng, Huifeng, and Tianhong to the port) are expected to come online in Q4 16. The port of Qingdao is hoping to build a 0.40 mb/d pipeline from Dongjiakou to supply various Shandong refineries, while Hongrun is also planning an additional 0.20 mb/d pipeline from Dongjiakou to Weifang³³. With the exception of the Yantai-Zibo pipeline, these new routes are unlikely to come online before 2018, and even then, several refiners will not be able to use them, opting instead to develop their truck fleets or invest in rail connections. Huifeng (Wonfull), for example, has four rail lines for crude and two for products linking the refinery to the ports in Shandong and in Nanjing (Jiangsu province)³⁴.

But roughly two-thirds of the independent refiners still rely on trucks for transportation. Even though the costs are roughly three times higher than by pipeline, some refiners have preferred to build up their trucking fleet and avoid the costs of laying down heavy infrastructure. Finally, a fleet of trucks allows them to market their products in distant provinces in China³⁵, with some reportedly trucking products as far as Yunnan, over 2000 Km from Shandong, even though transportation costs are very high, estimated at over \$10 per barrel³⁶.

²⁹ "Independent refiners alter China's crude oil import patterns", (Chinese) *Xinhua*, 24 September 2016, http://news.xinhuanet.com/fortune/2016-09/24/c_1119617923.htm

³⁰ Author's interviews, Beijing, May 2016

³¹ According to Chinese Customs data

³² Libby George, Keith Wallis, China teapot refiner oil buying spree creates tanker jam at Qingdao, 7 April 2016, <http://uk.reuters.com/article/us-china-oil-tanker-traffic-idUSKCN0X419L>; "Independent refiners erode the 'Two Barrels of Oil' market share", (Chinese), *Jiemian*, 7 December 2016, <http://www.jiemian.com/article/1000869.html>

³³ China's independent refiners plan to build large tanker terminal, (Chinese), *Jiemian*, 7 March 2017, <http://finance.sina.com.cn/chanjing/gsnews/2017-03-07/doc-ifycaafm5487074.shtml>; "Approval granted to build the 'Dong-Dong' pipeline offering Shandong refiners access to the port", (Chinese) 21st Century Economic Herald, <http://port.zhoushan.gov.cn/news/20160627081205703.html>

³⁴ Independent refiners set to benefit from the 13th Five Year Plan (Chinese), ICIS, <http://e.icis-china.com/news/detail?id=1019&typeid=15>

³⁵ Meng Meng, Chen Aizhu, "From hinterland to wonderland: China's 'teapot' refinery boomtowns", Reuters, 25 May 2016

³⁶ "An analysis of the independent refiners situation in 2016 and outlook" (Chinese), Sohu, <http://business.sohu.com/20161017/n470452687.shtml>



4. Playing cat and mouse with the taxman

With numerous suppliers seeking to enter the teapot market, in 2016 the teapots processed 0.65 mb/d more feedstock y/y and even managed to maintain profitable margins³⁷, in large part due to their ability to avoid taxation. This, in turn, allowed them to sell their output at a discount of up to \$15 per barrel relative to the state-owned oil companies.

While domestic product prices now track international crude costs more closely, there is still a 10-working day lag between price changes, allowing refiners to process crude bought at a lower price and sell the products once higher domestic prices kick in. Yet even in the inverse situation, the teapots have managed to maintain profitable margins, mainly due to their ability to avoid taxation. Typically, refiners import crude for which they pay VAT and import duties, and then when selling the product, pay a consumption tax of \$37 per barrel for gasoline and \$28 per barrel for diesel, which is then calculated in their wholesale selling price and passed on to consumers. In addition to the consumption tax, refiners need to factor in a number of other taxes, such as construction tax and education fees, which, when combined, amount to as much as 50% of the retail price³⁸.

One way teapots have been reducing costs is by taking advantage of tolling arrangements, or ‘third-party processing’, whereby a refiner is exempt from import duties if the crude is processed with the aim of exporting products³⁹. This can provide cost savings of \$10 and at times \$20 per barrel—an effective uplift to margins.

When refiners process fuel oil, however, they are exempt from paying the consumption tax on products because they paid it when buying their feedstock and can provide the tax authorities with their fuel oil purchase invoice to recoup the tax. This has become one of the most important loopholes that the teapots exploit, and they have in some cases managed to avoid paying tax altogether, even now that they are processing crude oil, by buying fake receipts and passing off their crude oil procurement for fuel oil. Furthermore, the fuel oil does not show up in the official statistics because the invoices are provided by a swath of small companies. Official customs statistics still take into account the crude and fuel oil volumes that actually enter the country. It is only after that point that a lot of the crude gets passed on as fuel oil to the teapots, so the actual import volumes of fuel oil do not increase, nor does the fuel oil show up as teapot feedstock⁴⁰.

While this is supposedly the most common tax avoidance method, teapots can also mark their diesel and gasoline as petrochemical products, which are also exempt from consumption tax, or as other products that carry a lower tax. Finally, the teapots are infamously the country’s largest blenders. They sometimes purchase naphtha for petrochemicals (which is once again exempt from consumption tax) but then blend it into the gasoline pool, or import mixed aromatics and blend them into the gasoline pool⁴¹.

Though the consumption tax is eventually passed on to the consumer, eluding the tax allows the refiners to mark down the price of the product and sell at a discount—at times of up to \$15 per barrel—to their retail outlets or to the majors, which have increasingly been buying teapot products instead of their own refineries’ output, yet given the limited uptick in domestic product demand, the majors have been marketing these discounted products and exporting more of their own output.

³⁷ Energy Aspects database

³⁸ “With higher consumption tax on oil products, the tax level will soon breach 50%”, (Chinese), Gucheng, 26 January 2016, <https://m.gucheng.com/news/164.shtml>

³⁹ “Export tax rebate to stimulate oil product exports” (Chinese), Economic Information Daily, 22 November 2016

⁴⁰ Author interviews, Beijing, September 2016

⁴¹ Author interviews, Shandong, May 2016

5. The teapots hit Asian product markets

As a result, rise of China's independent refiners is also being felt in regional markets. First, the appetite of Shandong refineries for fuel oil has been replaced with demand for various crude grades, leading China's fuel oil demand to fall by 13.8% y/y in 2015 and by another 7% y/y in 2016.⁴² Second, the surge in independent refiners' crude buying has generated greater competition for Russian and Middle Eastern grades, leading Japanese and Korean refiners, for example, to seek alternative crude sources. Indeed, demand for Venezuelan Merey—which PetroChina has been supplying independent refiners also slowed—while imports of Russian ESPO, as well as Vietnamese and Indonesian crude have all increased. Finally, with independent refiners raising run to use up their crude allowances but state-owned majors only marginally reducing their throughput, the oversupply of products in China has led to a surge in exports (see Figure 4). In 2015, diesel exports surged to average 0.15 mb/d, an 80% rise y/y, while jet fuel, fuel oil and gasoline exports were also extremely strong compared to 2014. In 2016, diesel exports doubled to 0.32 mb/d⁴³.

Figure 4: Chinese product exports, mb/d



Source: China Customs

As such, the battle for market share between the independent refiners and the majors has gradually shifted from the domestic market to regional product markets: In November 2015 state-owned Sinochem won product export quotas, becoming the first refiner outside of the big three (PetroChina, Sinopec and CNOOC) to export products. In late December 2015, independent refiner Dongming was awarded a 205 b/d export quota for Q4 15, followed, in January 2016 by export quotas to two more independent refineries—Lijin Petrochemical and Yatong Petrochemical in Shandong, as well as to Huajin, a subsidiary of state-owned Norinco, located in northeastern Liaoning province⁴⁴.

But, the overall amount of product exports awarded to independents remained limited⁴⁵ as only the larger independent refiners were able to finance the infrastructure needed to get the products to market. Combined with the fact that few of these refiners are close to a port, the high cost of land freight has led teapots to opt for small export volumes on a trial basis. Moreover, with tighter scrutiny over port facilities—including pipelines and storage, following recurring explosions and rising concern with industrial safety—licensing processes remain lengthy, further deterring the smaller teapots from investing in export infrastructure. Furthermore, the initial export quotas were only valid until the end of 2016 at which point the government would decide whether to extend the quotas to 2017. But since the

⁴² Energy Aspects database

⁴³ China Customs

⁴⁴ "Four barrels of oil" account for 90% of product exports, independent refiners account for 5%", (Chinese) Chem99, <http://www.chem99.com/news/24111168.html>

⁴⁵ Ibid

independent refiners only exported small volumes, by May 2017, the government had not renewed their export quotas. At the same time, the state owned companies were actively lobbying the central government to limit the teapots' crude import quotas and clamp down on the illegal practices that had become rampant in Shandong. In late 2016, Beijing finally began investigating the Shandong teapots, looking for ways to close some of the tax loopholes they have been adept at exploiting and fuelling speculation that the teapots' crude import and product exports quotas will not be renewed⁴⁶.

6. The teapots come to home roost in 2017

As a result, 2017 got off to an uncertain start for the teapots, as the government was slow to approve their crude import quotas and did not award the independent refiners product export quotas. While crude quotas were ultimately awarded, the government opted to grant them in batches, with the first one likely covering H1 17. Yet by May 2017, the government had not yet indicated if and when it would be awarding additional crude quotas, even though the first batch was roughly equivalent to the volumes that teapots had actually imported in 2017.

The rush to secure crude led to a buying binge in Q1 17, with March 2017 imports reaching an all-time record high of 9.2 mb/d, following which, many independent refiners likely have exhausted their crude import allowances. The uncertainty surrounding the crude import quotas has been compounded by a number of other factors that suggest that teapot buying and output may have peaked in 2016.

Several factors will lead to a squeeze on teapot margins in 2017: First, rising crude costs, combined with tighter government scrutiny on teapot buying and taxation practices will make creative tax practices more challenging.

Second, higher fuel quality standards—as the country moves to higher fuel specifications in 2017⁴⁷—as well as more stringent oversight of product output in light of the recurring smog will require additional investments in upgrading their capacity to meet higher fuel specs.

Finally, the biggest risk for the teapots remains a change in the political mood in Beijing and locally. The promotion of Shandong governor Guo Shuqing to head the Chinese securities watchdog⁴⁸ back in Beijing represents a blow for the teapots. Guo had lobbied to liberalise trade and grant teapots crude import quotas. He had also worked to facilitate credit for them. Given the teapots' contribution to the local economy, a sharp about-face is unlikely, but without strong support, approvals and licensing could slow and financing for the myriad infrastructure projects could tighten. In addition, there are signs of a shift in Beijing's attitude toward the majors—which now seem to be currying favour with the government once again after several years of being side lined during anti-corruption investigations. Thus far, the majors' efforts to lobby the government against the teapots fell on deaf ears, but the concern is that things could start to change.

The most significant risk for the teapots is a change to the consumption tax that would see it levied at the retail segment rather than at the wholesale level. This would make it more difficult to avoid paying consumption tax, which has allowed the teapots to discount their products and would lead teapot margins to compress quite significantly, especially in a rising crude price environment. Talk of changing the consumption tax is not new, but the government feels more confident currently in its ability to levy it in the retail sector thanks to the rising use of electronic banking for payments that could allow the government to monitor implementation better than in the past. Beijing is also mulling a deeper reform of the tax system. So while pinpointing the timing of a tax reform is difficult—and more likely after the Party Congress in the autumn—it represents one of the biggest risks to the teapots. Any counter

⁴⁶ Chen Aizhu, Meng Meng, "China targets teapot oil refineries in tax crackdown – sources", *Reuters*, 23 August 2016

⁴⁷ Du Xiaoying, "China accelerates upgrade of emissions standards", *China Daily*, 15 February 2016

⁴⁸ Keith Bradsher, "China Names Guo Shuqing, a Rapid-Fire Regulator, to Oversee Troubled Banks", *New York Times*, 24 February 2017

measures to ease the tax burden (by exempting them from VAT or other local fees for example) would require a very supportive local leadership.

Even in the worst case scenario, however, with tighter margins and more limited access to credit, the teapot story is unlikely to end in 2017. Already the independent refiners are diversifying their activities, integrating petchem facilities to capture strong margins, and investing in fine chemicals as well as in midstream and downstream infrastructure⁴⁹. It is also important to remember that until the crude quotas were granted, teapots ran at an average 30-40% of capacity and stayed alive with negative margins by running their petchem facilities and other side businesses. Their situation has improved considerably, with better access to credit and better human resources.

In addition, the consolidation trend is picking up pace: a Guangdong-based real estate firm acquired an 80% stake in Qixiang Tengda, which is about to start up a mixed feed dehydrogenation plant and alkylation unit later this year; a Beijing based private company is acquiring Zhuhai Baota, which has been struggling with heavy debt levels for the past two years. In addition, Shtar Science and Technology as well as Tianhong New Energy also have new Chinese investors, while private firm CEFC, which recently won a 4% stake in ADCO, is looking to acquire Shandong-based assets. The company owns upstream and downstream assets overseas and has recently signed an agreement with Dongming to build a crude terminal and storage facility at the port of Rizhao in Shandong⁵⁰.

So even though the economic and political environment in Shandong is changing, the teapots, for now, are adapting along with it. Clearly, smaller refiners will either shut down or get taken over by larger teapots, while Chinese traders will increasingly gain market share. The landscape in 2018, however, is already looking quite different.

But the teapot story is not over yet. To be sure, these government efforts to crackdown on quota trading and tax evasion are coinciding with a change in teapot operating patterns and altering their refining economics. The government has warned the irregularities in crude buying or taxation uncovered during the investigations will lead to penalties and even to import licences being revoked. And the teapots are likely to become more cautious about their choice of middlemen in crude purchases and buy fewer fuel oil invoices, which they have been using to deduct consumption tax from their products. But teapots are notoriously skilful at using the tax system to their advantage. And given their contribution to the economy in Shandong, local authorities will be keen to protect them.

⁴⁹ Chen Aizhu, "Diversify or die: China's independent oil refiners adapt to new challenges", *Reuters*, 11 April 2017

⁵⁰ "Takeover time for China's independent refiners", *Argus*, 24 March 2017