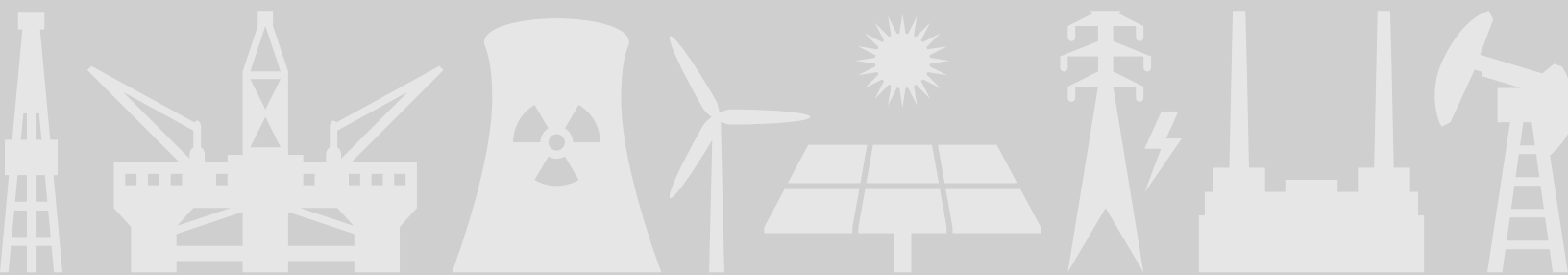


THE RISE OF CHINA'S INDEPENDENT REFINERIES

By Erica Downs

SEPTEMBER 2017



ABOUT THE CENTER ON GLOBAL ENERGY POLICY

The Center on Global Energy Policy provides independent, balanced, data-driven analysis to help policymakers navigate the complex world of energy. We approach energy as an economic, security, and environmental concern. And we draw on the resources of a world-class institution, faculty with real-world experience, and a location in the world's finance and media capital. Visit us at energypolicy.columbia.edu



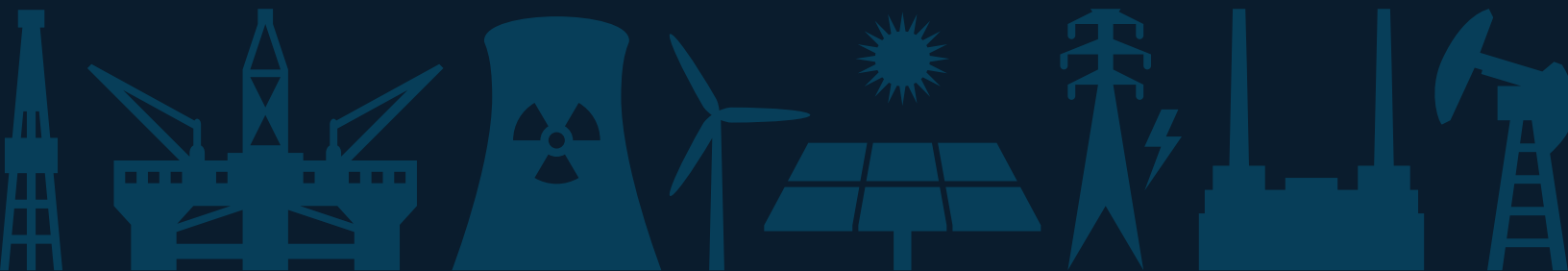
[facebook.com/ColumbiaUEnergy](https://www.facebook.com/ColumbiaUEnergy)



twitter.com/ColumbiaUEnergy

ABOUT THE SCHOOL OF INTERNATIONAL AND PUBLIC AFFAIRS

SIPA's mission is to empower people to serve the global public interest. Our goal is to foster economic growth, sustainable development, social progress, and democratic governance by educating public policy professionals, producing policy-related research, and conveying the results to the world. Based in New York City, with a student body that is 50 percent international and educational partners in cities around the world, SIPA is the most global of public policy schools. For more information, please visit www.sipa.columbia.edu





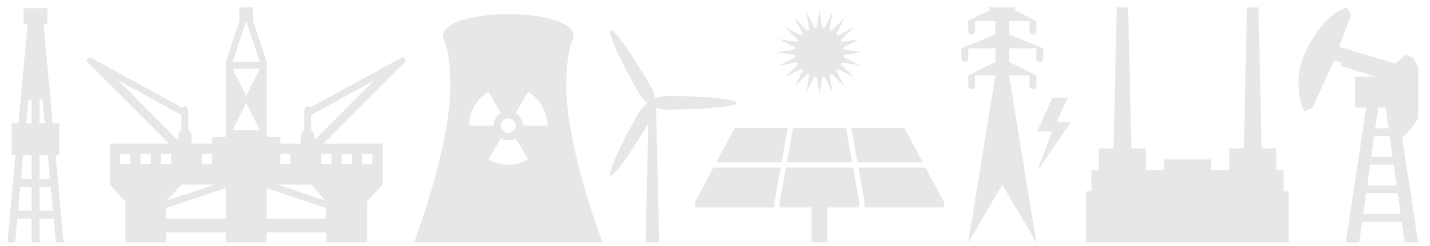
THE RISE OF CHINA'S INDEPENDENT REFINERIES

By Erica Downs*

SEPTEMBER 2017

***Dr. Erica Downs** is a non-resident Fellow at the Center on Global Energy Policy. In her full-time capacity, she is a senior research scientist in the China Studies division of the CNA Corporation, a non-profit research and analysis organization located in Arlington, VA. She previously worked as a senior analyst in the Asia practice at Eurasia Group, a fellow in the John L. Thornton China Center at the Brookings Institution, an energy analyst at the Central Intelligence Agency and a lecturer at the Foreign Affairs College in Beijing, China.

COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK



ACKNOWLEDGMENTS

The author would like to thank David Fridley, Antoine Half, Michal Meidan and two anonymous reviewers for their comments on previous drafts. This policy paper represents the research and views of the author. It does not necessarily represent the views of the Center on Global Energy Policy. The paper may be subject to further revision.

TABLE OF CONTENTS

| | |
|---|----|
| Acknowledgments | 2 |
| Executive Summary | 4 |
| Introduction | 5 |
| Meet the Independents | 7 |
| Beijing's Campaign Against the Independent Refiners | 10 |
| Starved of Crude | 10 |
| Targeted for Closure | 11 |
| Shielded by Local Governments | 11 |
| Tax Evasion for Survival..... | 12 |
| Beijing's About Face | 13 |
| Xi's Reform Agenda | 13 |
| Anticorruption Campaign Weakens NOCs' Resistance | 14 |
| The Aftermath: Boom Times and Beyond | 15 |
| International Implications | 19 |
| Surging Crude Imports | 19 |
| Increasing Product Exports | 20 |
| Reshaping the Competition for Shares of China's Crude Oil Imports | 21 |
| Conclusion | 26 |
| Notes | 27 |

EXECUTIVE SUMMARY

Beijing's decision in 2015 to allow China's small, independent "teapot" refineries to import crude oil through a system of import quotas and licenses has proved a major development for oil markets. The move marked a turning point for the refiners, which had suffered from poor margins and utilization rates for years and relied in part on tax loopholes and the support of local governments to survive. The Chinese government awarded its first crude import quota under the new program in July 2015. By the end of 2016, 19 independent refineries had been granted quotas totaling 1.48 million barrels per day (bpd)—representing more than the net crude oil imports of Spain. At the same time, China's product supplies surged, leading to an increase in exports to other Asian markets.

Indeed, after the government spent nearly two decades trying to shut down the small plants to boost the downstream presence of the national oil companies (NOCs) by restricting the independents' access to crude oil, the move signaled a new approach. With the quotas came an agreement that the teapot refineries take technical and environmental measures, including retiring outdated capacity, building LNG and CNG storage facilities, and producing refined products that meet government standards. The goal was to consolidate the independent refining sector and force the NOCs to become more competitive. This paper examines the history of China's independent refining sector, its transformation over the past three years, the impact it has had on the domestic and international energy markets, and the outlook for the future of the teapot plants. In short, the paper finds the following:

- Beijing is likely to continue to use crude import quotas and licenses as a tool to spur consolidation of the independent refining sector into the hands of a smaller number of larger plants with higher utilization rates. The surviving independent refineries will put more pressure on the NOCs to become more efficient without creating an existential threat to the NOCs' dominance of China's oil industry. Still, the independent refineries with direct access to imported crude are facing near-term headwinds, including a lack of product export quotas, reduced crude import quotas in 2017 (for plants that had them in 2016), pressure from NOCs unhappy with losing market share, and a central government that is paying much more attention to them than in years past to ensure that they honor the commitments they made to receive import quotas and licenses.
- Over the next decade, the number of independent refineries is likely to shrink as the larger, more sophisticated refineries with greater access to imported crude thrive and many of the smaller plants with lesser or no access end up being acquired by stronger firms. This process has begun. Already there have been at least three mergers involving independent refineries in the first half of 2017.
- China's independent refineries are influencing the competition for shares of China's crude oil imports. Purchases of Russian crudes by the independents enabled Russia to displace Saudi Arabia as China's largest supplier of crude imports on an annual basis in 2016, a position Russia has maintained through the first half of 2017. The independent refineries are also helping Angola and Brazil gain market share. Other suppliers favored by the independents include Venezuela, Malaysia and Oman.
- However, the independent refineries are likely to remain highly opportunistic crude buyers as higher crude prices and greater government scrutiny of their tax payments put pressure on the independent refineries' margins.

INTRODUCTION

The Chinese government essentially created a new country's worth of oil imports in 2015 when it granted the country's independent refiners—often referred to as “teapots”—direct access to imported crude oil, a privilege that only a handful of state-owned oil companies had previously enjoyed. Specifically, Beijing announced that qualified refineries would be granted crude oil import quotas and corresponding crude oil import licenses. The government awarded its first import quota to an independent refinery under the new oil trading regime in July 2015. By the end of 2016, Beijing had handed out quotas to 19 refineries totaling 1.48 million barrels per day (bpd), an amount greater than the net crude imports of Spain (1.22 million bpd) in 2014, when it was the world's seventh largest importer.¹

Beijing's move to open up the oil trading business to a much larger number of participants marked a reversal of fortune for China's independent refineries. They historically suffered from low margins and utilization rates due in part to limited access to crude oil. Starving the independents of crude and targeting them for closure were the two main prongs of the central government's long-standing—and largely unsuccessful—effort to consolidate the country's independent refining industry by forcing the smallest, least efficient players out of the market. The independent refineries survived and thrived by virtue of their own entrepreneurship, exploitation of tax loopholes, and protection from local governments, which value the independents as sources of employment and tax revenue.

For the independent refineries, Beijing's decision to allow them direct access to crude oil could hardly have come at a better time. Not only were crude oil prices falling but the government also implemented a \$40 per barrel floor for domestic diesel and gasoline prices in January 2016 to protect the upstream operations of China's national oil companies (NOCs). (When crudes trade below \$40 per barrel, the government stops adjusting domestic diesel and gasoline prices in line with fluctuations in global crude prices).² As a result, the independent refineries profited handsomely, especially in early 2016.

The independent refineries used their crude import quotas and licenses to catapult themselves from the sidelines of China's oil industry, which is dominated by the NOCs, to the center of the world oil market. In 2016 the independent refineries drove China's 14 percent growth in crude oil imports and contributed to the increase in China's oil product exports, which are depressing refining margins elsewhere in Asia. They are also playing a key role in determining how oil exporters fare in the competition for shares of China's crude oil imports; their appetite for Russian crudes helped Russia displace Saudi Arabia as China's top crude supplier on an annual basis, a position the Saudis had held every year since 2001 except for 2007.³

However, by the second half of 2016, it appeared that the independent refineries good fortune might be short lived. In August Beijing warned that independent refineries that evaded taxes or failed to meet the environmental and technical criteria they agreed to satisfy in order to receive their crude import quotas would have their quotas suspended or revoked. In November Beijing dispatched inspectors to all independent refineries with crude import quotas to check on their progress on paying taxes, retiring outdated capacity, and building liquefied natural gas (LNG) and compressed natural gas (CNG) storage. These moves prompted concerns among oil industry analysts that Beijing would reduce the purchasing power of the independent refineries and thus limit their ability to help absorb the glut of oil on the world market and put upward pressure on oil prices.⁴

The main argument of this paper is that it is unlikely that the independent refiners' days as global oil traders are limited. First, Beijing is likely to discover that carrots (providing the independent refineries with the direct access to imported crude in return for meeting the central government's criteria) are a more effective tool than sticks (trying

to force small, polluting firms out of the market by threat of closure) for facilitating the consolidation of China's independent refining sector. The logic is that those refineries that secure crude oil import quotas and licenses will survive and thrive, while those without access to imported crude will eventually be acquired or closed of their own accord, which will result in a smaller number of independent refineries with higher utilization rates.

Second, granting the independent refiners the right to import crude oil and process it is part of President Xi Jinping's effort to increase the efficiency of China's NOCs by exposing them to more competition. Although Xi apparently has no intention of eroding the dominant role of the NOCs in China's oil industry, he does want their financial performance to improve. While the NOCs, which rank among China's most politically powerful firms, have a track record of rebuffing government initiatives, Xi's ongoing anticorruption campaign likely reduced the willingness of China's oil majors to hinder the implementation of Xi's reform agenda, especially when they were a focal point of Xi's antigraft authorities. It is not a coincidence that Beijing's decision to open up the oil trading business to the independents coincided with its crackdown on the NOCs for corruption.

More broadly, this paper provides a comprehensive account of the rise of the independent refiners to global prominence. To be sure, English and Chinese language publications (both general news outlets and industry press) have chronicled the trials and travails of the independent refineries in great detail. ICIS and JLC (formerly JYD) also supply data that offers valuable insights into this diverse group of companies for which complete information about issues, including capacity and utilization rates, is difficult to come by. This paper weaves all of these sources together to provide a "one-stop shop" that explains who the independent refineries are, why Beijing finally decided to grant them their long-sought direct access to imported crude, and what the international implications are of the emergence of this new group of global oil traders.

The paper is divided into four sections. The first section introduces the independent refiners and their role in China's oil industry. The second section explains why Beijing spent nearly two decades trying to shut down many of China's independent refineries and how they survived. The third section explains why Beijing reversed course and granted the independent refiners crude oil import quotas and licenses. The fourth section examines international implications of the independent refiner's emergence as global oil traders, including their impact on China's crude oil imports, refined product exports, and the competition among oil exporters for market share in China.

MEET THE INDEPENDENTS

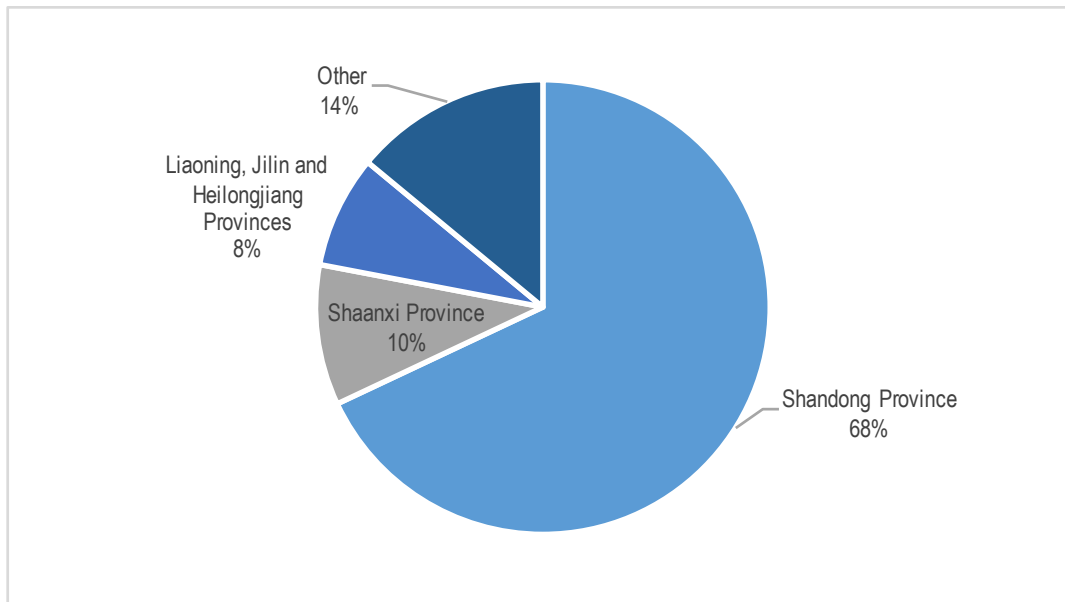
China's independent refineries are refineries that are not wholly owned by the "big three" NOCs: Sinopec, China National Petroleum Corporation (CNPC) and China National Offshore Oil Corporation (CNOOC). They are often referred to as "teapots" by observers outside of China because they were generally smaller and had more basic equipment than the NOCs' refineries. The earliest independent refineries were not full-range refineries. Instead, they originated as asphalt, lube, and fuel oil refineries.⁵ Although the independent refineries have become more complex across the board, they tend to be less efficient than those of the NOCs because they were built in a piecemeal fashion, whereas the NOCs developed their refineries as integrated projects.⁶

The independents are a diverse group of players that vary in ownership and size. In terms of ownership, roughly two-thirds of China's independent refining capacity is in the hands of private firms, which are the focus of this paper. The rest is held by central and provincial state-owned enterprises, including ChemChina, Sinochem, NORINCO, and Yanchang Petroleum. In terms of size, the average capacity of the independents is 70,000 bpd.⁸ Some are as small as 20,000 bpd, while others rival some of the plants owned by the NOCs. Shandong Dongming Petrochemical Group, the largest private refinery, can process 240,000 bpd between its refinery in Heze (180,000 bpd), in Shandong province, and its refinery in Lianyungang (60,000 bpd), in Jiangsu province.⁹ For comparison, Sinopec's refineries range in size from 160,000 bpd to 470,000 bpd.¹⁰

Nearly 70 percent of the capacity of the independent refiners is concentrated in the eastern province of Shandong, where Shengli, China's second largest oil field, is located¹¹ (see Figure 1). Shandong's independent refineries developed along with Shengli in the 1960s. The central government permitted local governments to collect oil that leaked from Shengli's pipelines and build refineries to process it as a way to ease local resistance to the development of Shengli, which involved local governments giving up land, an important source of tax revenue.¹² The fact that Shengli is spread out over a much larger geographic area than China's other oil fields also supported the growth of independent refineries in Shandong since it was difficult for the Ministry of Petroleum (and later the NOCs) to tightly control Shengli's production, some of which flowed to the independent refineries on a regular basis.¹³ Moreover, Shengli is an asphaltic crude, which made it an ideal feedstock for the simple refineries that sprung up around the oil field in the 1960s and 1970s.¹⁴

Other independent refineries are scattered across the country, often located near other oil fields or ports. The second largest concentration of independent refining capacity (10 percent) is in Shaanxi province, the home of China's oldest oil company, Yanchang Petroleum, which operates three refineries.¹⁵ Similarly, independent refineries sprouted up around oil shale deposits in the provinces of Guangdong and Liaoning and were geared toward the production of asphalt and fuel oil. Most of these refineries went into operation in the 1950s and lasted until the 1990s.¹⁶

Figure 1: Geographic distribution of independent refining capacity in 2015



Source: Sohu Finance.

China's independent refiners account for around one third of China's total refining capacity. Between 2005 and 2015, the independents' refining capacity had quintupled from 832,000 bpd to 4,175,000 bpd. As a result, their share of China's total refining capacity jumped from 13 percent to 29 percent. Most of the rest of the country's capacity is controlled by China's NOCs¹⁷(see Table 1).

Table 1: China's refining capacity in 2005 and 2015 controlled by China's NOCs

| Firm | 2005 | | | 2015 | | |
|-------------------------|------------------------|----------------|----------------|------------------------|----------------|----------------|
| | Capacity (10,000 tons) | Capacity (bpd) | Share of total | Capacity (10,000 tons) | Capacity (bpd) | Share of total |
| Sinopec | 16,350 | 3,270,000 | 50.39% | 26,620 | 5,324,000 | 37.83% |
| PetroChina | 11,935 | 2,387,000 | 36.79% | 18,870 | 3,774,000 | 26.57% |
| CNOOC | - | - | | 3,450 | 690,000 | 4.86% |
| Independent Refineries* | 4,160 | 832,000 | 12.82% | 20,876 | 4,175,200 | 29.04% |
| Coal-to-oil firms | - | - | | 380 | 76,000 | 0.54% |
| Foreign invested firms | - | - | | 824 | 164,800 | 1.16% |
| Total | 32,445 | 6,489,000 | | 71,020 | 14,204,000 | |

Source: International Petroleum Economics. * Includes refineries owned by ChemChina and Sinochem.

The independent refineries historically had low utilization rates due to their limited access to crude, averaging 40 percent or less.¹⁸ They have seen substantial improvement since Beijing began awarding them crude oil import quotas in mid-2015. Their utilization rates increased from 30 to 40 percent before 2015 to nearly 60 percent in 2016 and 62 percent in the first half (1H) of 2017.¹⁹ However, they use much less capacity than those of the refineries belonging to Sinopec and PetroChina, which operated at 80 percent and 75 percent of capacity, respectively, in 2016.²⁰

China's independent refiners and NOCs have a love-hate relationship with each other.²¹ On the one hand, the NOCs buy a sizeable portion of their refined products from the independents (recent estimates range from 30 to 70 percent) at a discount because the independents are "captive buyers."²² (Independent refiners control few marketing and retail outlets, and most lack the infrastructure for exports, so selling to the NOCs is often their only option.) Sinopec's marketing arm, for example, has preferred to purchase fuels from the independent refineries instead of Sinopec's refineries because of the lower prices it can obtain from the independents.²³ The NOCs have also sold the independent refineries unwanted crude and fuel oil supplies. On the other hand, the NOCs resent the independent refineries for constraining the growth of their market share, especially in Shandong, where Sinopec would stand to gain considerably if the province's independent refineries shut their doors. Meanwhile, the independents value the NOCs as crude suppliers and refined product customers but dislike their long-standing efforts, spearheaded by Sinopec, to squeeze them out of the market, an objective long shared by the central government.

BEIJING'S CAMPAIGN AGAINST THE INDEPENDENT REFINERS

Beijing spent nearly two decades trying to shut down many of China's independent refineries in a bid to concentrate the country's refining industry in the hands of its two most powerful national oil companies, Sinopec and CNPC. In 1998 the central government orchestrated an asset swap between the two firms to transform them into vertically integrated companies. CNPC, which had been China's onshore upstream company, transferred some of its oil fields to Sinopec. In return, Sinopec, which had been China's downstream company, handed some of its refineries to CNPC. Sinopec and CNPC subsequently put their best assets, including refineries, into subsidiaries—PetroChina and Sinopec Corp., respectively—for listing on international stock exchanges. The goal was to create globally competitive firms not only in exploration and production and but also in refining and petrochemicals.²⁴

In May 1999 the State Council made clear that it intended to strengthen the state-owned oil duopoly at the expense of the independent refineries, with the publication of Document No. 38.²⁵ The circular strengthened the NOCs' control over crude oil, including imports. It stated that even if private companies had secured licenses from the government to import crude, they would have to obtain a certificate from CNPC or Sinopec to get the crude through customs and onto rail cars and then sell the oil to the two NOCs. Document No. 38 also called for the closure of small refineries and gave CNPC and Sinopec the right to integrate local refineries into their operations.

Many of the independent refineries, which had numbered more than 200 in 1995, were casualties of Beijing's quest for national champions. CNPC and Sinopec absorbed most of the refineries with a capacity of 1 million tons (20,000 bpd) or more. This left 82 smaller refineries outside the hands of China's oil oligopoly.²⁶

The surviving refineries soon found themselves in Beijing's crosshairs. The central government wielded two big sticks to force independent refiners out of the market. One was controlling their access to crude oil. The other was the repeated targeting of small refineries for closure. While neither was entirely successful, the former proved to be more effective in inflicting hardship.

Starved of Crude

Beijing tightly controlled the independent refiners' access to crude oil in an effort to reinforce their dominance of China's refining sector. One statistic often cited in the Chinese media to demonstrate how the central government and the NOCs sought to strangle the independents is the fact that the volume of crude annually allocated to the independent refineries from the Shengli and Zhongyuan oil fields in Shandong (initially by Beijing and subsequently by Sinopec after it received the two fields as part of its asset swap with CNPC) remained unchanged after 1998 at a maximum of 38,500 bpd despite substantial growth in the independent refineries' capacity.²⁷

To be sure, the NOCs have made more crude available to the independents when it served their interests. For example, CNOOC, which pumps more crude than its refineries can process, sells them crude from its domestic offshore operations.²⁸ Sinopec has sought to offload unwanted fuel oil by stipulating that the independents had to purchase three cargoes of fuel oil for every cargo of crude.²⁹ Meanwhile, CNPC markets Venezuela's Merey crude to the independents. The company receives Merey from PDVSA as repayment for China Development Bank's oil-backed loans to Venezuela (the first of which was extended in 2008) and does not process the crude in its own refineries.³⁰

Due to limited access to crude, the independents' refineries historically used imported fuel oil (such as Russian

M100 and Venezuelan 380 CST) as their primary feedstock, which put them at a competitive disadvantage vis-à-vis the NOCs and contributed to their low utilization rates. Fuel oil yields fewer higher-value products—such as diesel, gasoline, and jet fuel—than crude. Moreover, Beijing's taxation and pricing policies periodically exacerbated the financial difficulties of the independents' reliance on fuel oil. The central government's decision to implement an eight-fold increase in the consumption tax for fuel oil (from \$15 to \$120 per ton) on 1 January 2009, for example, prompted independent refineries in Shandong and Guangdong to drop their utilization rates to 15 percent in the first quarter due to the combination of higher processing costs for fuel oil and insufficient crude feedstock.³¹ Similarly, in 2014, the year before they gained direct access to imported crude, the utilization rates of Shandong's independent refineries dropped below 40 percent due to a combination of high procurement costs for fuel oil, repeated cuts to state-set prices for diesel and gasoline, and weak domestic demand.³²

Targeted for Closure

The central government also attempted to consolidate China's independent refining sector by targeting small plants for closure. In March 2009, Zhang Guobao, then the head of the National Energy Administration, warned that Beijing intended to thin the ranks of the independent refineries, a move that would aid the NOCs in their bid to increase their market share. "China will consolidate its refining sector as small refineries will either be eliminated or be taken over by major oil refiners," he said.³³

To this end, Beijing issued multiple regulations calling for the shuttering of small refineries. In 2009, for example, the National Development and Reform Commission (NDRC) stipulated that by 2011 refineries with capacity less than 20,000 bpd should be closed and that refineries with capacity of 20,000–40,000 bpd should be merged or upgraded.³⁴ Two years later the central government intensified its efforts. In 2011 the NDRC earmarked 80 percent of China's small refineries for closure with its announcement that all crude distillation units that process 40,000 bpd or less would be shuttered by 2013.³⁵

However, the independent refineries responded to Beijing's plans for consolidation by making themselves too big to close. One refiner in Dongming City, Shandong, said the company had no choice but expand, even at the risk of overcapacity and idled units, to avoid being shut down.³⁶ Indeed, many refineries with capacity less than 40,000 bpd expanded their capacity above this threshold. For example, Shandong Tianhong New Energy Petrochemical increased its crude processing capacity from 30,000 bpd to 100,000 bpd.³⁷

As a result the capacity of the independent refiners increased substantially. According to information provider JLC, the crude distillation capacity of the independent refiners in eastern Shandong, where most of the facilities are located, doubled from 56 million tons (1.1 million bpd) in 2009 to 112 million tons (2.2 million bpd) in late 2013. Over the same period, the independents' catalytic cracking capacity increased by 57.3 percent, coking capacity by 92 percent, and hydrogenation capacity by 92 percent.³⁸ The near doubling of hydrogenation capacity was necessary for the independent refineries to meet the government's quality specifications for gasoline and diesel.³⁹

Shielded by Local Governments

The independent refineries' success at circumventing Beijing's repeated attempts to shut them down is also due to strong support from local governments. Many independents are important sources of jobs and tax revenue for the cities in which they are located. A case in point is Changyi Petrochemical, which was contributing 70 percent of the revenue collected by Shandong's Kenli County as of 2008. One official from Changyi City explained the imperative to support Changyi Petrochemical and its chairman, Deng Guide, in the following way: "We must protect Old Deng and make sure he's healthy and strong. If he sneezes, then our economy will not be able to hold up."⁴⁰

Local governments have actively worked to keep these backbones of their economies afloat. In 2014 Tianhong New

Energy, a major taxpayer in Shandong's Boxing County, found itself on the brink of collapse with reported debt of RMB 7 billion (\$1.1 billion) and assets of only RMB 3 billion (\$488 million). The firm, which had borrowed heavily from local banks, used short-term loans to finance refinery expansion and participated in oil swaps abroad before the banks pulled their loans. Fortunately for Tianhong, Boxing County deemed the refiner "too big to fail." The country established a bankruptcy restructuring committee and persuaded a local expressway company to invest in Tianhong's trading arm.⁴¹

Tax Evasion for Survival

Independent refineries have also routinely exploited loopholes in the tax system created by different import duties and consumption tax rates for different oil products. The refiners' tactics have varied over time in response to changes in the tax system. For example, when Beijing provided a tax rebate for using fuel oil as a feedstock to produce diesel and gasoline, some independent refiners would buy crude oil or asphalt as a feedstock but submit a fake VAT invoice for the purchase of fuel oil to the State Administration of Taxation to claim a refund to which they were not entitled.⁴² Some independents have intentionally mislabeled oil products with higher consumption tax rates, such as gasoline, as products with lower consumption tax rates, such as MTBE and aromatics, to ease their tax burdens.⁴³

The independents have also bolstered their bottom lines by taking advantage of the fact that Beijing currently charges a consumption tax on fuel oil but not on crude oil. Refineries that use fuel oil to produce diesel and gasoline do not need to pay the full consumption tax on these products because they paid the consumption tax on the fuel oil at the time of purchase. However, refineries that use crude oil as a feedstock are required to pay the consumption tax on the diesel and gasoline they produce because they did not pay any consumption tax on the crude purchased as feedstock. This tax structure has spurred many independent refineries to import crude without paying any taxes and then use fake invoices to pass off their crude oil purchases as fuel oil.⁴⁴

Local governments have also helped the independent refineries evade the oil consumption tax, which is remitted to the central government and thus does not contribute to local government coffers. In November 2012 the State Administration of Taxation announced that it would subject refined products made from crude oil and "other feedstocks" to an oil consumption tax as of January 1, 2013.⁴⁵ Shandong's independent refineries, fearful that the expansion of the consumption tax would force them out of the market, lobbied the provincial government for assistance.⁴⁶

The Shandong government sprang into action. On December 31, 2012, the provincial tax authority issued a circular in which it interpreted the central government's use of the term "other feedstocks" to exclude certain materials, notably aromatics and MBTE, which Shandong's independent refineries blended with the gasoline they produced to meet national fuel standards.⁴⁷ (The central government responded in September 2013 by more precisely defining "other feedstocks," but these changes to the consumption tax were never strictly enforced.⁴⁸)

BEIJING'S ABOUT FACE

In 2015 the central government reversed course. It ended its practice of only using sticks to bend China's independent refiners to its will and dangled a rather large carrot in front of them—greater access to imported crude. On February 15 the NDRC announced that it would award crude oil import quotas to independent refineries that meet certain technical and environmental criteria. These requirements include shuttering crude distillation units (CDUs) with a capacity of 40,000 bpd or less, building LNG or CNG storage, and making oil products that meet national fuel standards.⁴⁹ As a result refineries with import quotas would be allowed to process imported crude but not to purchase the volumes directly.

On July 23 the Ministry of Commerce further relaxed the restrictions on the independent refineries' access to imported crude when it announced that it would award crude oil import licenses to refineries that met certain requirements. License holders would be able to directly import crude oil instead of relying on one of the five state-owned companies authorized to act as agents on behalf of companies with crude import quotas (PetroChina, Sinopec, CNOOC, Sinochem, and Zhuhai Zhenrong).⁵⁰ The requirements for obtaining a license included processing capacity of at least 40,000 bpd, oil storage capacity of 300,000 tons, a credit line of \$1 billion, and a team of five experienced traders. The Ministry also abolished a previous requirement that applicants have at least two years' experience in importing oil, which would have prevented many independent refineries from qualifying for crude import licenses.⁵¹

Beijing's about face does not mean it is abandoning its goal of building a more efficient refining industry that is concentrated in the hands of state. Instead, it reflects a recognition that this objective will probably be easier to achieve if the government rewards independent refiners for complying with its directives instead of punishing them for failure to do so. The logic is that the independent refineries that meet the criteria for crude import quotas and licenses will find it easier to survive and thrive than those who do not. This division between the "haves" and "have nots" will probably result in many of the smaller, less efficient refineries shutting down or being acquired by their larger, more efficient, and more profitable peers.

The central government's decision to throw an economic lifeline to those independent refineries willing and able to shutter small CDUs, produce cleaner fuels, and build LNG or CNG storage mirrors its approach to consolidating China's coal and steel industries, both of which are also suffering from overcapacity but have many more small, inefficient, and heavily polluting producers. For example, in April 2016 China's central bank and three financial regulators called for banks to ease the burden of coal and steel companies. Their circular states that different firms should be treated differently with the implication that large firms should be the primary beneficiaries. Provincial governments have certainly gotten the message. In September 2016 the government of Shanxi, China's largest coal producer, asked local banks to offer lower interest rates on loans to the province's seven largest coal producers and to suspend financing for firms with outdated coal production capacity.⁵²

Xi's Reform Agenda

The Xi administration's decision to allow independent refiners greater access to crude oil is not only a way to spur consolidation of the independent refining sector but also part of a broader attempt to improve the performance of China's NOCs by exposing them to more competition from private firms.⁵³ The financial performance of the NOCs has dramatically deteriorated since the global financial crisis due to China's economic slowdown, the collapse in crude oil prices, and poor investment decisions made from the mid-2000s through the early 2010s, when the companies prioritized getting bigger at home and abroad over generating returns.⁵⁴ PetroChina is a case and point. The company's quarterly debt-to-equity ratio increased from 10 percent on December 31, 2007, to 43 percent on December 31, 2016.⁵⁵ Similarly, its quarterly profit margin declined from 15 percent to 1.31 percent over the same period.⁵⁶

Xi clearly wants to reverse the lackluster performance of China's NOCs and the rest of the state sector based on the myriad of plans for SOE reform his administration has released and various warnings that SOE bosses will be held accountable for investments gone south.⁵⁷ However, he has no plans to relinquish the state's ownership of the NOCs or the Communist Party's power to appoint their top executives. To the contrary, Xi is tightening the party's grip over the NOCs and other central SOEs.⁵⁸ His goal is to preserve its ability to pressure the companies to pursue objectives that run counter to maximizing returns, such as shedding large numbers of redundant workers. (Indeed, in March 2015 PetroChina's chairman, Wang Yilin, stated that his company was not like the international oil companies because PetroChina would not undertake large-scale layoffs in response to low oil prices.⁵⁹) While Xi's bid to strengthen party control over the NOCs will limit the extent to which the NOCs' performance can be improved, he appears to have calculated that he can nonetheless bring about some efficiency gains by gradually exposing the NOCs to greater—albeit still limited—competition.

To this end, the Xi administration is permitting private companies and state-owned firms from other sectors to play a small but growing role in China's oil industry. For example, Beijing has given two private companies, ENN and Guanghui Energy, the green light to build LNG receiving terminals, which will allow them to enter the LNG import business, once the exclusive domain of the NOCs.⁶⁰ Similarly, the central government invited private domestic firms to bid for six oil and natural gas blocks in Xinjiang, marking the first time private players were allowed to participate in an upstream tender.⁶¹

The most dramatic opening of the oil sector, however, has occurred in oil trading. Even before Beijing granted the independent refiners direct access to imported crude, it had signaled its intent to weaken the stranglehold of Sinopec and PetroChina (and, to a lesser extent, the other state-owned firms allowed to import crude) on the crude import business.⁶² In November 2012, in the waning days of the administration of President Hu Jintao and Premier Wen Jiabao, the NDRC granted a crude oil import quota of 200,000 bpd to ChemChina, a central SOE that operates nine refineries, including six in Shandong.⁶³ In August 2014 the NDRC awarded Guanghui Energy, based in Xinjiang, the right to import 4,000 bpd of crude per year to enable the firm to supply oil from its operations in Kazakhstan to refineries in China.⁶⁴

Guo Shuqing, the reform-minded governor of Shandong province, who was named chairman of the China Banking Regulatory Commission in February 2017, probably played a role in convincing Beijing to extend direct crude import access to the independent refineries. He had lobbied the State Council for crude import quotas for Shandong's refineries on multiple occasions while the central government was mulling its change in policy.⁶⁵ Guo probably cast the granting of crude oil import quotas to independent refineries as a way to further Xi's reform agenda; after Beijing's policy reversal, he told reporters that allowing independent refineries access to imported crude "may help improve fuel quality, clean up the air and lower the fuel prices consumers pay."⁶⁶

Anticorruption Campaign Weakens NOCs' Resistance

Meanwhile, the Xi administration's ongoing anticorruption campaign undoubtedly aided its efforts to increase the efficiency of the oil industry through the introduction of new participants. The NOCs quickly found themselves in the crosshairs of Xi's antigraft authorities. CNPC had been a power base for former Politburo Standing Committee member Zhou Yongkang, the highest-ranking leader to be arrested in Xi's crackdown on corruption and a career oil man who was general manager of CNPC in the mid-1990s. Moreover, the NOCs had become bêtes noires of the Chinese public and parts of the government for dragging their feet on upgrading their refineries to produce lower sulfur fuels to combat air pollution and for their lavish spending on everything from extravagant chandeliers to expensive liquor.⁶⁷

The fact that NOCs have been hard hit by the anticorruption drive probably diminished their appetite for actively opposing Xi's reform agenda, including allowing independent refiners direct access to crude. Four of the top 12 SOE executives (those with vice-ministerial rank) found guilty of corruption by the end of 2016 had come from the NOCs⁶⁸ (see Table 2). Meanwhile, dozens of other senior managers, mostly from PetroChina, were also arrested.⁶⁹ The targeting of so many oil executives has undoubtedly provided their successors with an incentive to present themselves as proponents of reform to reduce their chances of becoming the subjects of corruption inquiries themselves.

Table 2: Top oil executives arrested for corruption

| Name | Title | Company | Date announced |
|---------------|------------------------|----------|----------------|
| Wang Yongchun | Deputy General Manager | CNPC | Aug-13 |
| Liao Yongyuan | President | CNPC | Mar-15 |
| Wang Tianpu | President | Sinopec | Apr-15 |
| Cai Xiyou | General Manager | Sinochem | Feb-16 |

Source: Central Commission for Discipline Inspection of the Communist Party of China

The NOCs were able to thwart the attempts of the independent refineries to gain greater access to imported crude through the early days of the anticorruption campaign. Indeed, in late 2013, just months after Xi's antigraft authorities had detained a quartet of CNPC/PetroChina executives (including two with vice-ministerial rank) and a former general manager of CNPC and president of PetroChina (Jiang Jiemin), the NOCs helped derail a plan supported by several central government agencies to give the independent refineries crude import quotas.⁷⁰ On October 14, 2013, the National Energy Administration (NEA) released for public comment a proposal to allocate independent refineries 200,000 bpd of imported crude per year. The plan had the support of the Ministry of Finance and the Ministry of Taxation. However, the NOCs fiercely opposed the plan, along with some officials at the NDRC, who may have been uneasy about letting private firms play a larger role in a strategic industry. As a result, the crude import quotas, which some industry analysts had expected to be awarded as early as November 2013, failed to materialize.⁷¹

A little more than year later, the NOCs' willingness to undermine Xi's policy agenda had apparently weakened. By February 2015, the month in which NDRC announced that it would allow independent refineries to apply for crude import quotas, the anticorruption campaign had wreaked considerable havoc in China's oil patch. In addition to arresting NOC executives, mostly at CNPC and its subsidiary, PetroChina, Xi's antigraft authorities were also scrutinizing the companies' overall operations. Anticorruption inspectors visited Sinopec in late 2014 as part of a routine inspection tour and revealed in early February 2015 that (unsurprisingly) they had uncovered evidence of graft and abuses of power.⁷² A few days later, Xi's anticorruption watchdog announced that both CNPC and CNOOC would be visited as part of the first round of inspections in 2015.⁷³ Consequently, NOC executives sought to avoid actions—such as undermining Beijing's oil industry reform agenda—that might call unwanted attention to themselves.

The Aftermath: Boom Times and Beyond

Finally allowed to feast after years of famine, independent refineries rushed to apply for crude oil import quotas and licenses. In July 2015 the NDRC granted its first crude oil import quota to a private firm (Shandong Dongming) according to the criteria it had released in February 2015. By the end of 2016, the agency had awarded 19 refineries annual crude import quotas totaling 1.48 million bpd, and the Ministry of Commerce had granted 13 of the 19 refineries crude import licenses totaling 1.1 million bpd.⁷⁴

The crude import quotas and licenses could hardly have come at a better time for the independent refineries given falling oil prices and Beijing's decision to put a floor under domestic diesel and gasoline prices. The decline in crude prices (the Brent futures average fell from \$99 in 2014 to \$54 in 2015) prompted the central government in December 2015 to suspend its practice of adjusting diesel and gasoline prices every ten working days in line with fluctuations in global crude prices.⁷⁵ The following month, Beijing announced that no changes to diesel and gasoline prices will be made when crude trades below \$40. The objective was to limit the upstream losses of the NOCs, whose production costs are slightly above \$40 per barrel, according to the NDRC.⁷⁶ However, the independent refineries also benefitted from the oil prices floor even though they do not have upstream operations.

Greater access to imported crude combined with the oil price floor spurred a reversal of fortune for the independent refineries, especially in early 2016, when crude prices were less than \$40. The utilization rates for independent refineries in Shandong, where 15 out of the 19 firms with crude oil import quotas are located, had been around 30 percent in 2014. By the end of 2016, their utilization rates had increased dramatically. According to ICIS, the utilization rate of Shandong's independent refineries was nearly 60 percent in December.⁷⁷ (The independent refineries profited not only from stronger margins but also from selling imported crude to other refineries, presumably those without crude import quotas. Some independents reportedly made more money in early 2016 selling imported crude than processing it themselves.⁷⁸)

The independent refineries' higher run rates and alleged tax dodging enabled them to further expand their share of China's refined product market at the expense of the NOCs.⁷⁹ Internal monthly reports from Sinopec and PetroChina indicate that as of October 2016, the independents' market share had increased by 8 percent, while Sinopec's had decreased by more than 4 percent and PetroChina's by more than 3 percent.⁸⁰ The general managers of two PetroChina refineries told a prominent Chinese business publication in July 2016 that competition from the independent refineries was the largest threat they faced. One of the general managers implied that tax evasion by the independents was to blame, stating that "a plant of five million tons of annual capacity pays less than half that of a state-owned refinery."⁸¹

Sinopec and PetroChina cried foul. The NOCs' complained to the central government that the independents were not paying their fair share of taxes. They found sympathetic ears at the NDRC and the State Administration of Taxation. The two agencies dispatched investigators to visit several independent refiners in Shandong to look into the allegations of tax fraud and other illegal practices, such as selling imported crude to independent refineries not authorized to purchase it.⁸²

The central government agencies did not like what they found during their visit to Shandong. On August 23 the NDRC fired a warning shot across the bow of the independent refineries with the release of a circular calling for greater regulation of them. The document states that all applications for crude oil import quotas must meet the central government's criteria, must not contain false information, and that refineries that do not shutter the

capacity they pledged to close in order to receive their import quotas will have their quotas reduced or suspended. The circular also warns that any refiner found to be evading taxes will be put on a black list. First offenders will have their crude import quotas suspended for 6–12 months, and repeat offenders will have theirs cancelled.⁸³

Beijing subsequently made clear that the August 23 circular was no idle threat. On October 20 the NDRC and five other central government agencies announced that the central government would inspect the 16 independent refineries holding crude oil import quotas at that time at the end of November. Beijing would dispatch five teams to check on issues including tax payments, progress on shutting small crude distillation units (40,000 bpd or less), and improving oil product quality.⁸⁴

That said, the details of the inspections indicate that the central government's objective was not to force leading independent refineries out of the market but rather to pressure the independents to comply with China's tax code and the criteria for crude oil import quotas as part of Beijing's efforts to consolidate independent refining capacity in the hands of a smaller group of firms able to meet the government's criteria for survival. First, Beijing announced the inspections one month in advance instead of relying on surprise to determine whether refineries are dodging taxes or dragging their feet on meeting the criteria for crude import quotas. This advance notice stands in contrast to the government inspection teams that have shown up unannounced at steel mills and coal mines to check on progress on eliminating excess production capacity and whether the 276-day operating limit for coal mines that was in effect April to November 2016 was being implemented.⁸⁵ Second, the NDRC ordered the independent refineries to conduct self-inspections and share the results with the NDRC before the central government launched its own investigation.

These two features of the inspections indicate that Beijing did not want the inspection teams to uncover any major problems that would merit harsh punishments, such as the suspension of import quotas. Indeed, although nearly all of the independent refineries inspected were fined up to \$145 million for infractions (tax evasion, reselling crude to refineries without import quotas and slow progress on eliminating small CDUs and building CNG and LNG storage), they did not lose their import quotas.⁸⁶ Moreover, the fact that the central government continued to award new crude import quotas after it announced the inspections indicated Beijing was not ready to renounce its bargain with the independent refineries: permitting direct access to crude oil imports in return for greater scrutiny of the independents' behavior.

However, the November 2016 inspections were an early sign that the boom times were coming to an end for the independent refineries. First, even though Beijing has awarded more crude import quotas in 2017 than 2016, the government reduced the volume of quotas granted to the 19 refineries that also received quotas in 2016 by 17 percent. The overall growth in quotas in 2017 was the result of Beijing's decision to award 11 additional refineries quotas totaling 21.9 million tons (160 million barrels)⁸⁷ (see Table 3). Second, the NDRC announced in May 2017 that it was no longer accepting new applications for crude import quotas.⁸⁸ Third, the central government has not awarded any refined product export quotas to independent refineries in 2017 after awarding quotas for small volumes in 2016.

Table 3: Independent refineries' crude import quotas
(Unit: 10,000 tons)

| Refinery | 2016 Quota | 2017 First Batch Quota | 2017 Second Batch Quota | 2017 total |
|---|-------------|------------------------|-------------------------|------------|
| Dongming Petrochemical | 750 | 657 | 71 | 728 |
| Panjin Beifang Asphalt Fuel | 700 | 567 | 107 | 674 |
| Baota Petrochemical | 616 | 46 | 13 | 59 |
| Yatong Petrochemical | 276 | 201 | 63 | 264 |
| Sinochem Hongrun Petrochemical | 530 | 509 | 9 | 518 |
| Shandong Kenli Petrochemical | 252 | 224 | 19 | 243 |
| Lijin Petrochemical | 350 | 312 | 11 | 323 |
| Shandong Wonfull (Huifeng) Petrochemical | 416 | 167 | 96 | 263 |
| Shandong Tianhong Chemical | 440 | 375 | 31 | 406 |
| Shandong Shouguang Luqing Petrochemical | 258 | 208 | 16 | 224 |
| Shandong Chambroad (Jingbo) Petrochemical | 331 | 75 | 110 | 185 |
| Dongying Qirun Petrochemical | 220 | 208 | 1 | 209 |
| Shandong Haiyou Petrochemical | 320 | 43 | 71 | 114 |
| Wudi Xinyue Fuel | 240 | 120 | 120 | 240 |
| Hengyuan Petrochemical | 350 | 175 | 175 | 350 |
| Shandong Qingyuan Petrochemical | 404 | 202 | 202 | 404 |
| Shandong Shenchi Chemical | 252 | 126 | 126 | 252 |
| Hebei Xinhai Chemical | 372 | 186 | 186 | 372 |
| Shandong Jincheng Petrochemical | 300 | 150 | 150 | 300 |
| Dongying Haike Ruilin Petrochemical | 0 | 105 | | |
| Shandong Zhonghai Fine Chemical | 0 | 186 | | |
| Henan Fengli Petrochemical | 0 | 222 | | |
| Shaanxi Yanchang Petroleum | 0 | 360 | | |
| Jinao Keji (Hebei) Chemical | 0 | 230 | | |
| Gangqiao Gangkou Petrochemical | 0 | 180 | | |
| Shandong Dongfang Hualong | 0 | 300 | | |
| Shandong Shenxing Chemical | 0 | 220 | | |
| Shandong Qicheng Petrochemical | 0 | 160 | | |
| Dalian Jinyuan Petrochemical | 0 | 80 | | |
| Shandong Baoxing Shengshi Chemical | 0 | 144 | | |
| Total | 7377 | 6738 | 1577 | |

Source: ICIS.

These moves by the central government to rein in the independent refineries are probably due to the fact that the combination of the big drop in crude oil prices in 2015–2016 and Beijing's decision to keep prices at the pump artificially high to compensate the NOCs for their upstream losses almost certainly enabled the independent refineries to have a much larger impact on the China's oil market than Beijing originally intended in terms of taking market share from the NOCs and contributing to the glut of refined products. As one industry analyst noted, this free-riding of the independents on the diesel and gasoline price floor implemented to support the NOCs was never part of Beijing's plan.⁸⁹ As a result, the government's moves to limit the role of the independents as oil traders is a course correction that is consistent with Beijing's incremental approach to reforming China's oil industry.

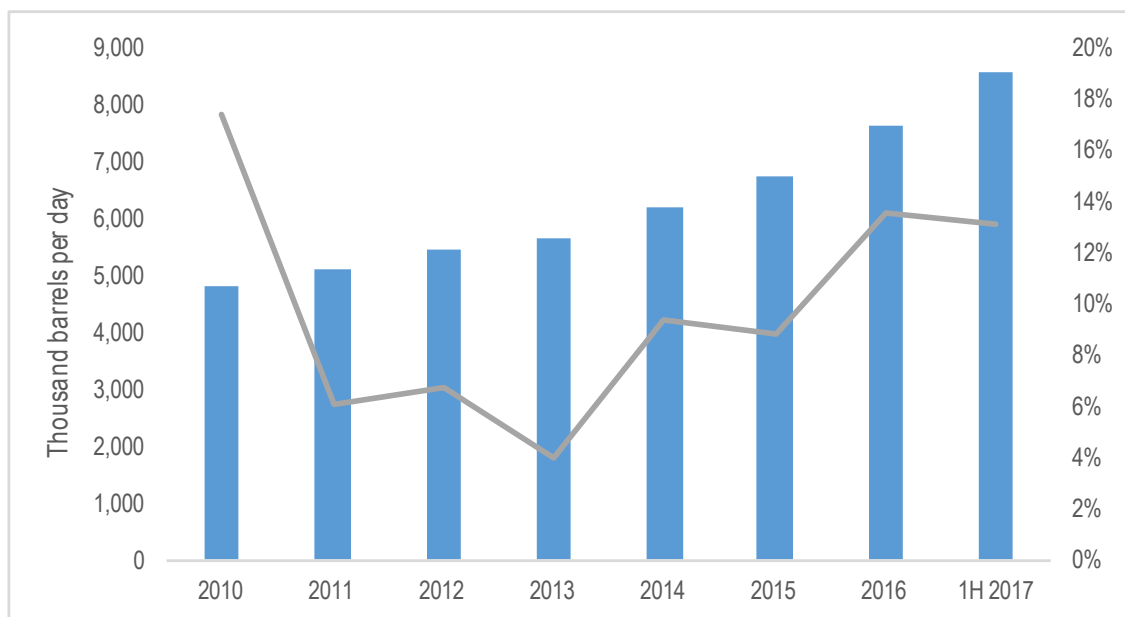
International Implications

China's independent refiners have made a splash on the world oil market. Beijing created a new country's worth of oil imports when it granted them the right to directly access imported crude. The independent refineries were the primary source of China's fastest growth in crude oil import demand in six years in 2016. Their crude purchases are contributing to the growth of Chinese refined product exports that have been depressing refining margins elsewhere in Asia and reshaping the global competition for shares of China's crude oil imports.

Surging Crude Imports

Although the independent refineries did not exhaust their import quotas for 2016, they did purchase enough crude to be the main driver of China's 14 percent growth in crude imports in 2016, the highest level since 2010.⁹⁰ The independent refineries accounted for more than 90 percent of this increase.⁹¹ (Other factors supporting China's crude import growth in 2016 include the 6.9 percent drop in domestic oil production and filling strategic and commercial stocks.⁹²) The independents remained the primary driver of China's 13.8 percent growth in crude oil imports in the first half of 2017 over the same period in 2016. From January to June 2017, the independents imported 2 million bpd, double the amount of incremental growth in China's crude oil demand over this period.⁹³ first half of 2017 over the same period in 2016 (see Figure 2).

Figure 2: China's crude oil imports



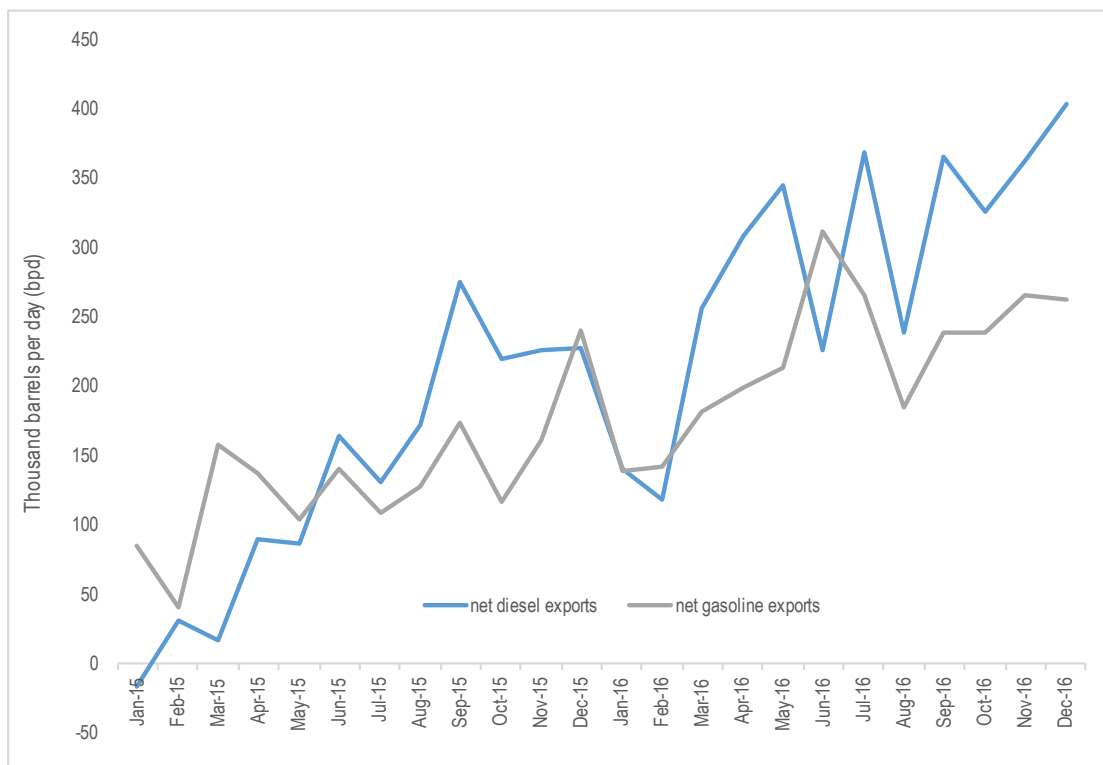
Source: General Administration of Customs.

The independent refineries are likely to support crude imports for the rest of 2017, but the volumes they import in the second half of the year will probably be lower than in the first half. First, Beijing awarded two-thirds of the quotas issued in 2017 in January (and the remaining one-third in June), and the independents had used the majority of their January quotas by the end of May.⁹⁴ Second, Beijing stopped accepting applications for crude oil import quotas in May.

Increasing Product Exports

The independents' greater access to crude oil has contributed to the dramatic growth in China's exports of refined products, especially diesel. Higher utilization rates for China's independent refiners helped increase overall Chinese refinery runs by 19 million tons (380,000 bpd) in 2016.⁹⁵ As a result, China ramped up its refined product exports. In 2016, China's diesel exports increased by 115 percent (226,000 bpd) and its gasoline exports grew by 64 percent (314,000 bpd).⁹⁶ China's diesel and gasoline exports continued to grow in the first half of 2017 as refiners sold more excess products to consumers elsewhere in Asia. Exports of diesel increased by 20.9 percent and gasoline by 18.8 percent from January to June 2017 over the same period in 2016.⁹⁷

Figure 3: China's net diesel and gasoline exports



Source: General Administration of Customs.

China is exporting more diesel than gasoline because of the changes in the composition of the country's oil demand that reflect changes in the composition of China's economy. As the drivers of China's economic growth shift from fixed asset investment and exports to consumption and services, the drivers of China's oil demand growth are shifting from diesel (primarily used to fuel heavy equipment and trucks that transport construction materials) toward gasoline (primarily used to fuel automobiles). Consequently, diesel demand has stagnated, while gasoline demand remains fairly robust. According to the CNPC Economics and Technology Research Institute, China's apparent consumption of diesel declined by 5.6 percent while that of gasoline increased by 3.1 percent in 2016.⁹⁸

Although gasoline is now the primary driver of China's oil demand growth, the country's refineries—especially the independent refiners—are configured to maximize diesel production. As China produces more gasoline to meet increasing domestic demand, it also produces more diesel than it needs to supply the domestic market. As a result, Chinese refiners are exporting these surplus barrels of diesel, primarily to other destinations in Asia. The top five destinations in 2016 in descending order were Singapore, Hong Kong, the Philippines, Bangladesh, and Australia.⁹⁹ The top four remained the same in 1H 2017, with South Korea occupying the number five slot.¹⁰⁰

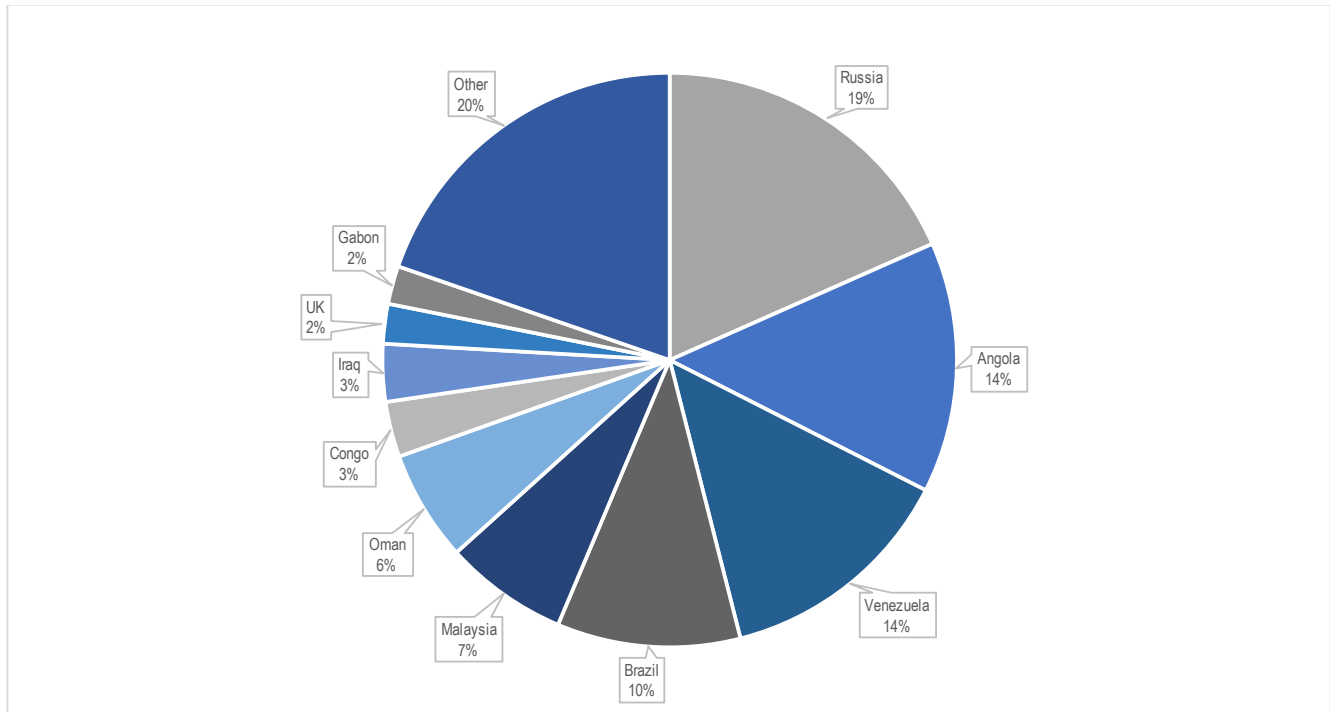
The growth in China's exports of diesel and other refined products has exacerbated the oversupplied global market and depressed refining margins elsewhere in Asia. Refiners in Japan and South Korea are worried not only about the quantity of China's product exports but also the quality. Chinese refiners are improving the quality of their diesel and gasoline to meet Beijing's stricter standards for low-sulfur fuels.¹⁰¹ As a result, some Chinese refiners are now able to meet Australia's requirements for high quality fuels. In June 2016 CNOOC exported China's first cargo of diesel to Australia, a sign that Japanese and South Korean refiners will face competition from their Chinese peers for shares of the Australian refined product market.¹⁰² Australia's import requirements have increased as the country has shuttered aging refineries.¹⁰³

Reshaping the Competition for Shares of China's Crude Oil Imports

The independent refineries are opportunistic crude buyers. They generally prioritize price over assay.¹⁰⁴ As a result they have bought dozens of crudes, and there is considerable variation in the crudes that comprise their monthly imports. Every month ICIS publishes a list of the top ten crudes imported by Shandong's independent refineries, and the crudes that populate these lists, especially the bottom halves, tend to change from month to month.¹⁰⁵

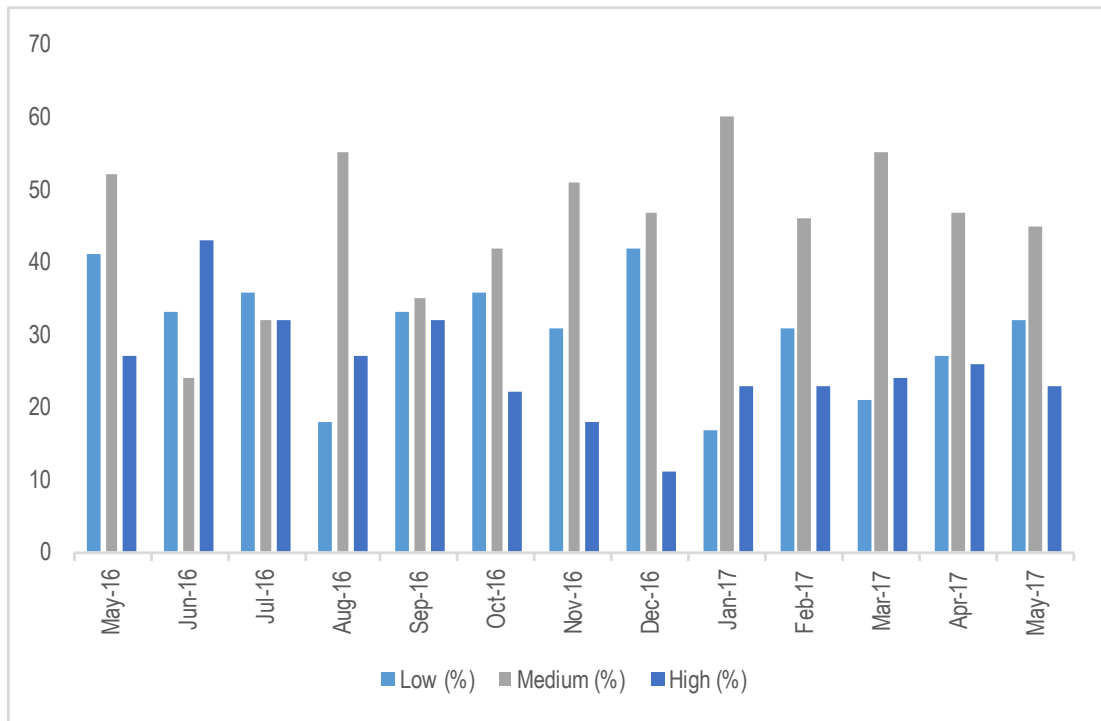
That said, the independent refineries import most of their crudes from a small number of suppliers. Six countries accounted for more than two-thirds of the independent refineries' crude imports from January to June 2017¹⁰⁶ (see Figure 4). Some of these purchases are the result of the independents' familiarity with the suppliers' feedstocks. Shandong Dongming, for example, received both Merey and Oman crudes from PetroChina through a pipeline in Shandong built and operated as a joint venture between the two firms.¹⁰⁷ Other purchases reflect certain countries, notably Angola and Malaysia, blending crudes to meet the independents' specifications.¹⁰⁸ (Malaysia's Nemina crude is one such blend.) In addition, both Angola and Brazil produce the medium density, medium sulfur crudes that are a good fit for the independents' units (see Figures 5 and 6).

Figure 4: Independent refineries' top crude suppliers



Source: "China Data: Independent refiners' Jun crude imports from Venezuela up 40% on month," Platts Commodity News, July 4 2017.

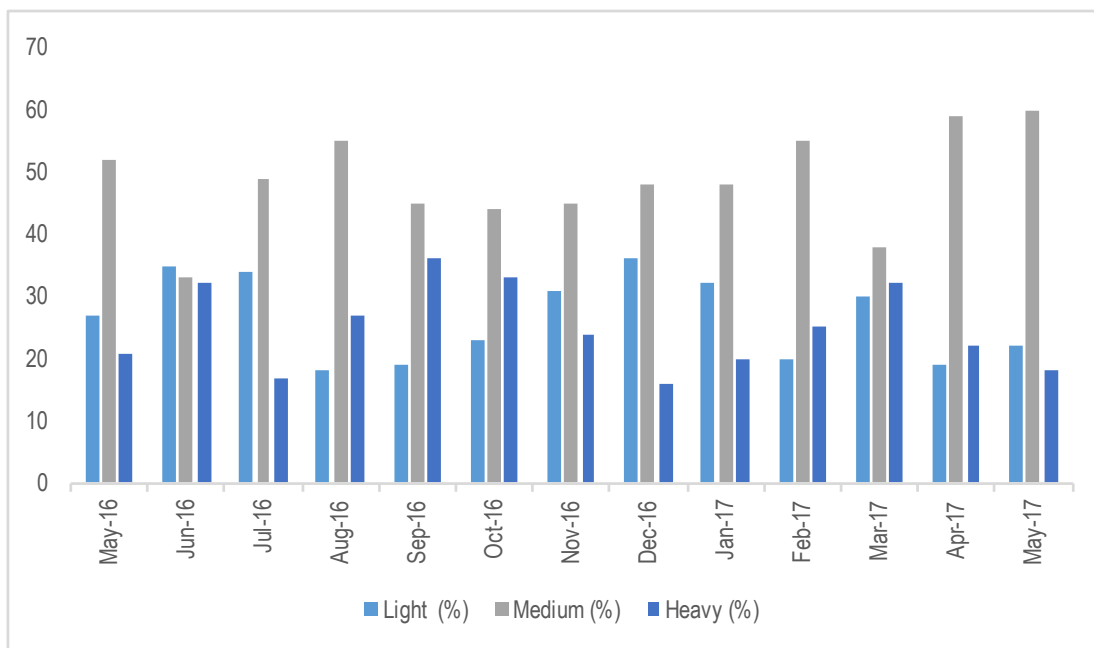
Figure 5: Sulfur content of independent refineries' crude imports



Source: ICIS.

Meanwhile, Russian crudes also appeal to the independent refineries for logistical and financial reasons. It takes less than four days for crudes shipped from the port of Kozmino in Russia's Far East to reach Shandong province, compared to 10–15 days for crudes from Southeast Asia, 20 days from Angola, and up 30 days for crudes from the Persian Gulf.¹⁰⁹ The shorter transit distance makes the smaller cargoes preferred by many independent refiners (due to domestic infrastructure constraints) economical.¹¹⁰ Moreover, Russian suppliers accept payment in Renminbi, which lowers the transaction costs because there is no need to pay currency conversion fees.¹¹¹

Figure 6: Density of independent refineries' crude imports



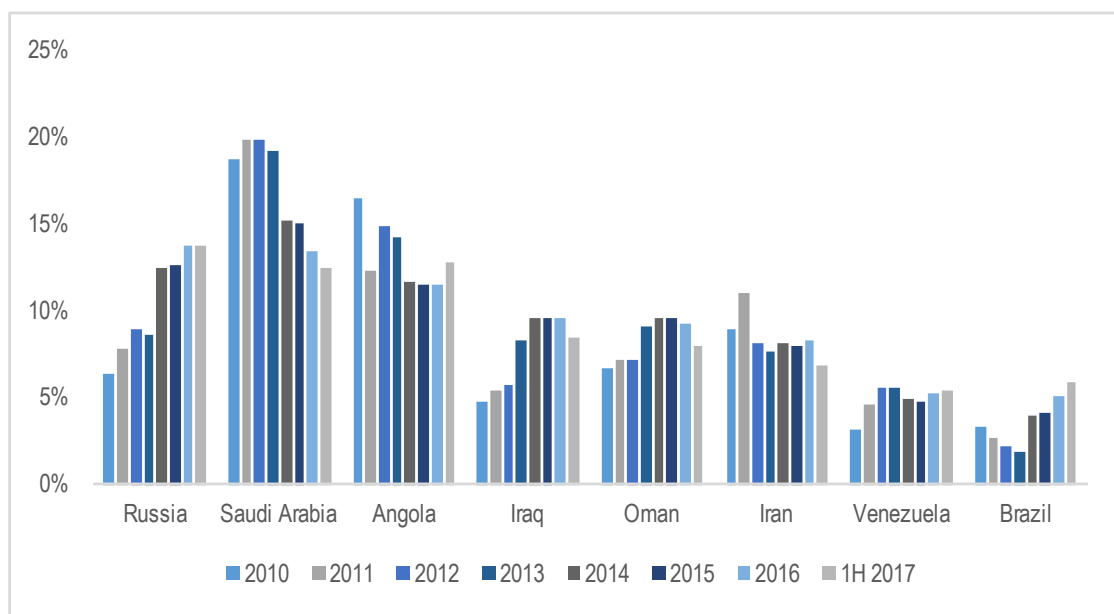
Source: ICIS.

The independent refineries are influencing the competition among exporters for shares of China's crude oil imports, especially among the country's top suppliers. The independents' crude purchases have helped Russia gain market share at the expense of Saudi Arabia, accelerating the two exporters' diverging fortunes in China. Between 2010 and 2015, Saudi Arabia's share of China's crude oil imports declined from 18.6 percent to 15.1 percent, while Russia's nearly doubled from 6.4 percent to 12.6.¹¹² In 2016 Saudi Arabia's share further declined to 13.4 percent.¹¹³ In contrast, Russia's share expanded to the 13.8 percent, due in large part to buying by the independent refineries, whose purchases of ESPO accounted for 92 percent of the growth in Russian crude deliveries to China over this period.¹¹⁴ This increase in Russian crude shipments helped Russia displace Saudi Arabia as China's top crude supplier in 2016, a position it has maintained from January to June 2017 (see Figure 7).

Angola is also benefitting from the rise of the independent refineries as oil traders, who are helping Angola regain lost market share. The country saw its share of China's crude oil imports decline from 16.5 percent in 2010 to 11.5 percent in 2015 as a result of increased competition from other suppliers, notably Russia.¹¹⁵ However, the independent refineries' appetite for a variety of Angolan crudes helped stem a further decline in Angola's share of China's crude oil imports in 2016. They also boosted Angola's market share to 12.8 percent from January to June 2017, making Angola China's second largest crude supplier after Russia during this period.¹¹⁶

Brazil is also gaining a larger share of China's crude oil imports thanks to the independent refineries. Their purchases helped Brazil secure its largest market share in China to date—5 percent of the country's crude imports in 2016.¹¹⁷ Buying by the independents also accounted for all of the growth in Brazil's crude deliveries to China in 1H 2017, which increased Brazil's market share to 5.9 percent for this period.¹¹⁸ Moreover, China Development Bank's extension of a second \$10 billion oil-backed line of credit with a ten-year term to Petrobras in 2016 and growing Brazilian oil production in excess of domestic demand indicate the Brazil is likely to maintain, if not expand, its market share in China.

Figure 7: Shares of China's crude oil imports



Source: General Administration of Customs.

Saudi Arabia, like some other major Middle East exporters, was slow to take advantage of the independent refineries' emergence of a new source of crude oil demand. The reasons are probably threefold. First, the kingdom sells virtually all of its oil through contracts of a year or longer, whereas the majority of the independent refineries' crude imports are smaller volumes purchased on the spot market due to credit constraints and inadequate access to ports.¹¹⁹ Second, Saudi Aramco is not as nimble as some of the other sellers vying to strike deals with the independents, notably the Russians. According to Zhang Liucheng, vice president for trading and marketing at Shandong Dongming, Middle Eastern suppliers, such as Saudi Arabia and Iran, were much more expensive and inflexible on pricing.¹²⁰ Third, Saudi Aramco has a low appetite for risk and may have some reservations about doing business with the independents due to concerns about their credit worthiness. Several independent refiners had some early crude import deals fall apart because of credit problems.¹²¹

That said, the rise of China's independent refiners as oil traders will likely prompt Saudi Arabia to adapt a more flexible marketing strategy. The kingdom is undoubtedly aware that the independents represent an opportunity to regain some of the market share it has lost since the beginning of the decade. To this end, Saudi Aramco sold a rare spot cargo of 730,000 barrels of Arab heavy crude from its storage facilities in Okinawa to Shandong Chambroad Petrochemical in April 2016 to "test the waters" of doing business with China's independent refineries.¹²² Moreover, the governments of Saudi Arabia and Japan agreed in the fall of 2016 to expand Okinawa's storage by 30 percent to 8.18 million barrels, which will better position Aramco to compete against Russia to supply refineries in China.¹²³ In February 2017 Saudi Aramco expanded its business with the independents by signing a contract to supply Arab extra light to North Huajin Chemical Industries Group Corp., a subsidiary of NORINCO, which operates a crude refinery and petrochemical plant in Liaoning province.¹²⁴

CONCLUSION

The Xi administration is unlikely to reverse its decision to allow the independent refineries to participate in global oil trading because of its reform agenda. Crude oil import quotas are likely to be an effective tool for facilitating the consolidation of the independent refining sector in the hands of the strongest firms that Beijing has long sought. The refineries that are able to meet Beijing's technical and environmental criteria for direct access to imported crude rank among the country's largest, most efficient, and environmentally friendly refineries not owned by the NOCs. These champions of the independent refining industry will be able to better compete against China's NOCs, although they will not displace them as the dominant players in China's oil patch.

However, the independent refineries with direct access to imported crude are now in a more challenging operating environment than they were in 2016. Not only is crude oil trading above \$40 (depriving the independents of the opportunity to profit from the gap between global crude prices and domestic diesel and gasoline prices) but the independents are facing a number of headwinds, including no product export quotas, reduced crude import quotas in 2017 (for those refineries that had them in 2016), pressure from NOCs unhappy with losing market share, and a central government that is paying much more attention to them than in years past.

What comes next for China's independent refineries? There are several developments to watch for:

More government oversight: Beijing will continue to scrutinize the activities of the independent refineries with crude oil import quotas to ensure that they are living up to their end of the bargain. The quotas themselves will make it easier for the central government to figure out whether independent refineries are dodging taxes, because China's customs authorities record every barrel of crude oil that is imported into China. As Platts has noted, a refining expert can use the customs data to roughly estimate a refinery's output and assess whether the product slate looks realistic.¹²⁵

Beijing is also likely to monitor the independents to make sure they are producing diesel and gasoline that meet the China V standard (similar to the Euro V standard), which took effect in January 2017 to help reduce air pollution from vehicle emissions.¹²⁶ While some of the larger independent refineries have the technology to produce fuels that meet the government's limit for sulfur content, many of the smaller ones do not. Moreover, the upgrades necessary to meet the China V fuel standard will probably be prohibitively expensive for some of these smaller plants. Refineries unable to produce higher-quality fuels are likely to be acquired by other companies.¹²⁷

More mergers and acquisitions: Over the next decade, the number of independent refineries is likely to shrink as the larger, more sophisticated refineries with greater access to imported crude thrive and many of the smaller plants with lesser or no access end up being acquired by stronger firms. Indeed, there have been at least three mergers involving independent refineries in the first half of 2017.¹²⁸ For example, Zhonggu Qilong, a Beijing-based company that markets and stores grains, purchased Zhuhai Baota Petrochemical, a Guangdong province independent refinery that had not been operating on a regular basis.¹²⁹ Meanwhile, private firms, including Shandong Dongming, are also considering buying smaller independent refineries.¹³⁰

More opportunistic buying: The independent refineries are likely to remain highly opportunistic crude buyers. Higher crude prices, greater government scrutiny of tax payments, and Sinopec's move to centralize its refined oil product purchases (which is likely to increase its bargaining power vis-à-vis the independents) are putting pressure on the independent refineries' margins.¹³¹ The independents' greater price sensitivity combined with the fact that they have used up the majority of their 2017 crude import quotas will probably prompt them to double down on shopping around for attractively priced crudes. As a result, which crudes they buy and in what volumes are likely to continue to vary on a monthly basis.

NOTES

- 1 “Zhongguo difang lianchang yue bao” (“Monthly Report on Independent Refineries”), ICIS, December 2016, 4; and International Energy Agency, “Key World Energy Statistics 2016” (International Energy Agency, 2016), 11, <https://www.iea.org/publications/freepublications/publication/KeyWorld2016.pdf>.
- 2 National Development and Reform Commission, “Fagaiwei jiu jinyibu wanshan chengpinyou jiage jizhi youguan wenti hui jizhe wen” (“The NDRC Responds to Questions from Reporters about the Further Improvement of China’s Oil Product Pricing Mechanism”), January 13, 2016, http://www.sdpc.gov.cn/zcfb/jd/201601/t20160113_771313.html. See also Brian Spegele, “China Tightens Hold over Energy Prices,” *Wall Street Journal*, January 13, 2016, <https://www.wsj.com/articles/china-tightens-hold-over-prices-for-gasoline-diesel-1452690523>
- 3 Data from China’s General Administration of Customs reported by Dow Jones, Reuters, and *Guoji shiyou jingji (International Petroleum Economics)*.
- 4 See, for example, Serene Chong, Alfred Cang, and Javier Blas, “World’s Hottest Oil Market Gets a Jolt from China’s Taxman,” Bloomberg, September 5, 2016, <https://www.bloomberg.com/news/articles/2016-09-05/world-s-hottest-oil-market-gets-a-jolt-from-china-s-taxman>.
- 5 E-mail from David Fridley, February 13, 2017.
- 6 Oceana Zhou, Daisy Xu, and Cindy Liang, “China’s Independent Refiners Step onto Global Stage,” *Platts Oil Special Report*, July 2016, 11.
- 7 Henry Liu, “How Will Independent Refiners Reshape China’s Oil Market?” *IHS Energy Insight*, August 15, 2016, 6.
- 8 “Factbox: China’s Independent Refiners,” *Platts*, June 6, 2016, <http://www.platts.com/latest-news/oil/singapore/factbox-chinas-independent-refiners-27600864>.
- 9 “Meet the Chinese Newcomers Staking a Claim to Global Oil Trading,” Bloomberg, January 12, 2016, <https://www.bloomberg.com/news/articles/2016-01-12/meet-the-chinese-newcomers-staking-a-claim-to-global-oil-trading>
- 10 Sinopec Corp., Form 20-F for the Period Ending December 31, 2015, 27, http://english.sinopec.com/download_center/reports/2015/20160425/download/2016042502.PDF.
- 11 “2016 difang lianchang de xianzhuang yu fazhan pouxi” (“Analysis of the Current Situation and Development of Local Refineries in 2016”), *Sobu Caijing (Sobu Finance and Economics)*, October 21, 2016, <http://center.cnpc.com.cn/bk/system/2016/10/20/001616707.shtml>.
- 12 “Zhao Mengyao, “Dilian chengchang lu” (“The Local refineries’ Path to Growth”), *Zhongguo Shibua (China Petrochemical)*, no. 4 (2016); and Yu Hong and Li Hong, “Guanyu Shandong defang lianhua qiye de diaoyan baogao” (“Research Report on Shandong’s Petrochemical Enterprises”), *Huagong Guanli (Chemical Enterprise Management)*, no. 28 (2015), <https://www.chinacem.net/info.asp?id=579>.
- 13 Wang Haibin, “Infighting about Clean Refined Products in China and Its Political Implications,” unpublished paper.
- 14 E-mail from David Fridley, February 13, 2017.
- 15 “Analysis of the Current Situation and Development of Local Refineries in 2016.”

- 16 E-mail from David Fridley, February 13, 2017. See also James G. Speight, *Shale Oil Production Processes* (Gulf Professional Publishing, 2012), 47–48.
- 17 Jin Yun and Zhu He, “Tiaozheng jigou, huajie guosheng, tizhi zengxiao renzhong daoyuan” (“A Long Way to Go in Adjusting Structure, Resolving Excess Capacity, Upgrading Quality and Improving Efficiency—Review of China’s Refining Industry in 2015 and Outlook for the 13th Five-Year Plan”), *Guoji shiyou jingji* (*International Petroleum Economics*) 24, no. 5 (2016), 38.
- 18 Zhou, Xu, and Liang, “China’s Independent Refiners Step onto Global Stage,” 4.
- 19 “China Data: Shandong Refineries Raise June Run Rates to 63% from 58% in May,” *Platts Commodity News*, July 12, 2017; Oceana Zhou, “China’s Independent Refiners Could Get Regulated Away: Fuel for Thought,” *Platts*, February 13, 2017, <http://blogs.platts.com/2017/02/13/china-independent-refiners-get-regulated-away/>.
- 20 Oceana Zhou, “China’s 2017 Product Exports May Rise Further,” *Platts Oilgram Price Report*, November 23, 2016.
- 21 Michal Meidan, quoted in “China: The Rise of the Teapots,” *Energy Compass*, June 10, 2016.
- 22 “China: The Rise of the Teapots,” *Energy Compass*, June 10, 2016; and Daisy Xu and Oceana Zhou, “Analysis: Chinese Independent Refiners Step Up Gasoil, Gasoline Production,” *Platts*, February 18, 2016, <http://www.platts.com/latest-news/oil/singapore/analysis-chinese-independent-refiners-step-up-26372586>.
- 23 Xu and Zhou, “Analysis: Chinese Independent Refiners Step Up Gasoil, Gasoline production.”
- 24 For more on the restructuring of CNPC and Sinopec to create internationally competitive firms, see Jin Zhang, *Catch-up and Competitiveness in China: The Case of Large Firms in the Oil Industry* (Routledge, 2004).
- 25 State Council, “Guanyu qingli zhengdun xiao lianyouchang he guifan yuanyou chengpinyou liutong zhixu yijian de tongzhi” (“Opinion Concerning the Cleaning Up and Restructuring of Small Refineries and Standardizing the Circulation of Crude Oil and Refined Products”), Document No. 38, 1999, http://www.gov.cn/gongbao/content/2000/content_60202.htm.
- 26 Zhao, “The Local Refineries’ Path to Growth”; and Yu and Li, “Research Report on Shandong’s Petrochemical Enterprises.”
- 27 “Liang shiyou jutou longduan zhi men songdong dilian anzhan yuanyou jinkou pei’e” (“The Monopoly of the Two Oil Giants Loosens, Independent Refineries Are Running out of Time for Crude Import Quotas”), *Caijing*, January 9, 2014, <http://industry.caijing.com.cn/2014-01-09/113793441.html>.
- 28 Yen Ling Song, “China’s Teapot Refineries Are Not All Hot Steam,” *Platts*, September 23, 2015, <http://blogs.platts.com/2015/09/23/china-teapot-refiners-oil/>.
- 29 Song Yen Ling, Daisy Xu, and Oceana Zhou, “Changing Feedstock of Chinese Teapots,” *Platts Oilgram News*, December 18, 2014.
- 30 Daisy Xu, “China Seen Cutting Merey Crude Imports,” *Platts Oilgram Price Report*, November 18, 2015; e-mail from a representative of a foreign oil company based in Beijing, November 10, 2016.
- 31 Zhang Yi, “Q1 Operational Rate of Independent Refineries in Shandong and Guangdong Decline,” *Xinhua*, April 24, 2009; and “China Cools to Fuel Oil,” *International Oil Daily*, January 16, 2009.
- 32 Yin Yijie, “Shandong dilian kaigonglu jin 30% mianlin handing; bufen qiye shenqing pochan” (“Shandong’s Independent Refineries Face Winter with Only a 30% Utilization Rate; Some Firms Apply for Bankruptcy”), *21 shiji jingji baodao* (*21st Century Business Herald*), January 21, 2015, <http://business.sohu.com/20150121/n407947122.shtml>.

- 33 Lin Fanjing, “Reshuffle of China’s Local Refineries Approaching,” *Xinhua China Oil, Gas & Petrochemicals*, April 18, 2009.
- 34 National Development and Reform Commission, “Fazhan gaige wei: zai bao zengzhang kuo neixu zhong jiakuai taotai luohou channeng” (“NDRC: Accelerate the Elimination of Backward Production Capacity While Maintaining Growth and Expanding Domestic Demand”), May 3, 2009, http://www.gov.cn/gzdt/2009-05/03/content_1303018.htm.
- 35 “Chanye jigou tiaozheng zhidao mulu (2011) (“Guidance Catalog for the Structural Adjustment of Industry [2011]”), National Development and Reform Commission, April 26, 2011, 81–83, <http://www.gov.cn/gzdt/att/att/site1/20110426/001e3741a2cc0f20bacd01.pdf>.
- 36 Wang Xiujuan, “Dilian ‘beikuochang’ xupeng ‘guo handong’” (“Local Refineries Are ‘Forced to Expand,’ Puffing Up to ‘Make It through Winter’”), *Zhongguo shiyou shibua (China Petroleum and Petrochemical)*, February 1, 2013, 71.
- 37 “Teapot Refiner Plans Expansion to Meet Mandate,” *Platts Oilgram News*, January 3, 2014.
- 38 “China’s Teapot Refiners Expand Aggressively to Stay Operational,” *Platts*, November 1, 2013, <http://www.platts.com/latest-news/oil/singapore/chinas-teapot-refiners-expand-aggressively-to-27587532>.
- 39 I thank David Fridley for this point.
- 40 He Yinfan, “Shandong dilian: zuihou de Xiongnu?” (“Shandong’s Independent Refineries: The Last Huns?”), *Zhongguo qiyejia (China Entrepreneur)*, no. 6 (2008): 84.
- 41 “Dilian qiye xianru jiti konghuang tianhong xin nengyuan pochan nan chongzu” (“Independent Refining Companies Fall into a Collective Panic, Tianhong New Energy’s Bankruptcy Is Difficult to Restructure”), *Zhongguo jingying bao (China Business News)*, September 5, 2015, <http://money.163.com/15/0905/08/B2O4457L00253B0H.html>; and Song Yen Ling, Daisy Xu, and Oceana Zhou, “Teapots Face Deteriorating Financial Conditions,” *Platts Oilgram News*, December 17, 2014.
- 42 Vandana Hari with Xiao Yi Zhou, Cindy Liang, Daisy Xu, Sebastian Lewis, and Song Yen Ling, “Feature 2: As Beijing Tightens Oil Tax Noose, Will Wily Players Escape Again?” *Platts Commodity News*, August 14, 2014.
- 43 “Jinkou yuanyou shiyong quan shenpi jiansu, dilian jianguan you ‘fang’ zhuan ‘shou’” (“The Approval of Crude Oil Import Quotas Decelerates, Supervision of the Independent Refineries Shifts from ‘Looser’ To ‘Tighter’”), *Jingji daobao (Economic Review)*, August 26, 2016, <http://chuansong.me/n/571872752871>.
- 44 This paragraph is based on Liu, “How Will Independent Refiners Reshape China’s Oil Market?”
- 45 State Administration of Taxation, “Guanyu xiaofeishui youguan zhengce wenti de gonggao” (“Notice on Policy Issues Regarding the Oil Consumption Tax”), Document No. 47 (2012), <http://www.chinatax.gov.cn/n810341/n810765/n812151/n812386/c1082513/content.html>.
- 46 Yan Zhiqiang, “Shandong dilian mianlin ju’e xin shui” (“Shandong’s Independent Refineries Face Huge New Tax”), *Zhongguo nengyuan bao (China Energy News)*, December 31, 2012, http://paper.people.com.cn/zgnyb/html/2012-12/31/content_1167215.htm.
- 47 “Shandong sheng guojia shuiwu ju guanyu chengpinyou xiaofeishui guanli wenti de gonggao” (“Notice of the State Administration of Taxation of Shandong Province on Issues Regarding the Oil Consumption Tax”), Document No. 10 (December 31, 2012), http://www.sd-n-tax.gov.cn/art/2013/1/7/art_44604_17764.html.
- 48 Wang, “Infighting about Clean Refined Products.”

- 49 National Development and Reform Commission, “Guojia fazhan gaige wei guanyu jinkou yuanyou shiyong guanli youguan wenti de tongzhi” (“Notice of the National Development and Reform Commission on Issues Related to the Use of Imported Crude”), Document No. 253 (2015), http://www.sdpc.gov.cn/gzdt/201502/t20150216_664965.html; and “China’s NDRC Releases Rules for New Crude Oil Import Quotas,” *Platts*, February 16, 2015, <http://www.platts.com/latest-news/oil/singapore/chinas-ndrc-releases-rules-for-new-crude-oil-27129634>.
- 50 “ChemChina’s Crude Oil Import Stuck in Bureaucracy,” *Platts Oilgram News*, March 28, 2013.
- 51 Ministry of Commerce, “Shangwubu guanyu yuanyou jiagang qiye shenqing fei guoying maoyi jinkou zige youguan gongzuo de tongzhi” (“Notification of the Ministry of Commerce about Work Related to the Criteria for Crude Processing Enterprises Applying for Non-State Import Rights”), Document No. 407 (2015), <http://www.mofcom.gov.cn/article/b/e/201507/20150701056066.shtml>; and “Fitch: China’s New Oil Import Rules Have Minimal Impact on Status Quo,” Fitch Ratings, July 29, 2015, <https://www.fitchratings.com/site/pr/988662>; and Chen Aizhu, “China Grants Independent Refiners Licenses to Import Crude Oil,” Reuters, August 10, 2015, <http://www.reuters.com/article/us-china-oil-license-idUSKCN0QF1YC20150810>.
- 52 Erica Downs, Christopher Beddor, and Chucheng Feng, “Local Governments Will Pick Winners,” Eurasia Group Note, September 22, 2016.
- 53 For a brief overview of some of the steps the Xi administration is taking to improve the performance of the NOCs, see Chen Aizu and Meng Meng, “No Big Bang, but Quiet Reforms Reshaping China’s Oil and Gas Sector,” Reuters, May 11, 2016, <http://www.reuters.com/article/us-china-reform-energy-idUSKCN0Y22RH>.
- 54 Neil Beveridge, Lu Wang, and Kevin Lian, “Bernstein Energy: Big Is No Longer Beautiful. Can a Shift to Quality over Quantity Revive the Outlook for GEM Oil?” Bernstein Research, February 11, 2014, 4.
- 55 PetroChina Debt to Equity Ratio (Quarterly), https://ycharts.com/companies/PTR/debt_equity_ratio.
- 56 PetroChina Profit Margin (Quarterly), https://ycharts.com/companies/PTR/profit_margin.
- 57 Wu Xiaobo, “President Xi Urges Unswerving Efforts to Deepen SOE Reform,” *China Daily*, July 5, 2016, http://www.chinadaily.com.cn/business/2016-07/05/content_25973534.htm.
- 58 Emily Feng, “Xi Jinping Reminds China’s State Companies Who’s the Boss,” *New York Times*, October 13, 2016, https://www.nytimes.com/2016/10/14/world/asia/china-soe-state-owned-enterprises.html?_r=0; and Jude Blanchette, “Back to Basics: The CCP at 95,” The Conference Board, September 2016, 2.
- 59 “Zhongshiyou dongshi Wang Yilin: bu yin shiyou jia di gao ziben zhuyi shi caiyuan” (“PetroChina Chairman Wang Yilin: No Capitalist-Style Layoffs Because of Low Oil Prices”), *Jingji guancha bao (Economic Observer)*, March 10, 2016, http://www.guancha.cn/Industry/2016_03_10_353483.shtml.
- 60 “Private Players Gain Ground in China,” *Petroleum Intelligence Weekly*, August 3, 2015; and “China Oks First Privately Owned LNG Import Terminal,” *LNG Intelligence*, May 13, 2013.
- 61 “China Opens Onshore Round to Private Bidders,” *International Oil Daily*, July 8, 2015.
- 62 The six companies allowed to directly import crude into China were PetroChina, Sinopec, CNOOC, Sinochem, Zhuhai Zhenrong, and Zhenhua. The first five firms are also allowed to act as agents on behalf of firms that have crude import quotas. See “ChemChina’s Crude Oil Import Stuck in Bureaucracy,” *Platts Oilgram News*, March 28, 2013.
- 63 Chen Aizhu, “ChemChina Entry Markets Cosmetic Reform to China’s Oil Market,” *Reuters*, November 27, 2012.

- 64 Lucy Hornby, "China Issues Crude Import License to Non-State Firm," *Financial Times*, August 28, 2014.
- 65 Zhong Ang, "Shiyou longduan jian bing chu po dilian channeng guquan huan youquan" ("The Oil Monopoly Is Broken; Local Refining Capacity Swaps Equity Stakes for Crude Rights"), *Jingji guancha bao (Economic Observer)*, November 7, 2015; and Yin Yijie, "Shandong chutai dilian chanye zhuanxing shengji bufen qiye kuisun yanzhong tingchan" ("Shandong Introduces a Plan for Transforming and Upgrading the Independent Refining Industry, Some Firms Have Stopped Operation due to Serious Losses"), *21 shiji jingji daobao (21st Century Business Herald)*, November 21, 2014, <http://m.21jingji.com/article/20141121/63c74013bad35344a4cf013f541343b9.html>.
- 66 Chen Aizhu, "China's New Oil Import Policy Positive for Quality, Prices: Governor," Reuters, March 7, 2015, <http://www.reuters.com/article/us-china-shandong-oil-idUSKBN0M30EI20150307>.
- 67 Edward Wong, "As Air Pollution Worsens in China, Solutions Succumb to Infighting," *New York Times*, March 21, 2013, <http://www.nytimes.com/2013/03/22/world/asia/as-chinas-environmental-woes-worsen-infighting-emerges-as-biggest-obstacle.html>; Andrew Higgins, "China's Oil Giant Runs Up a Scandalous Booze Bill," *Washington Post*, May 8, 2011; and "Wangyou pu zhongshihua dalou zhuang 1200 wan tiange diaodeng" ("Netizens Expose the RMB 12 Million Chandelier in Sinopec's Building"), July 16, 2009, <http://news.163.com/09/0716/06/5EAS811A00011229.html>.
- 68 E-mail from expert on China's anticorruption campaign, December 27, 2016.
- 69 Matt Sheehan, "China Targets Big Oil in Wars on Corruption, Pollution," *Huffington Post*, March 17, 2015, http://www.huffingtonpost.com/2015/03/17/china-corruption-oil-coal-pollution-crackdown_n_6882690.html.
- 70 For more on the oil executives detained, see Song Shengxia, "Under Investigation," *Global Times*, September 11, 2013.
- 71 "Liang shiyou jutou zhimen songdong dilian anzhaoyuanyou jinkou pei'e" ("The Monopoly of the Two Oil Giants Loosens, Independent Refineries Are Running out of Time for Crude Import Quotas"), *Caijing*, January 9, 2014, <http://industry.caijing.com.cn/2014-01-09/113793441.html>.
- 72 "China Uncovers Abuses of Power, Nepotism at Sinopec," Reuters, February 7, 2015.
- 73 "China's Top Graft Buster Targets 26 Big State Firms for Inspection This Year," Reuters, February 12, 2015.
- 74 "Monthly Report on Independent Refineries," ICIS, December 2016, 4.
- 75 "Analysis: China's Price Move Signals Discomfort with Oil Plunge," *Platts*, December 17, 2015, <http://www.platts.com/latest-news/oil/singapore/analysis-chinas-price-move-signals-discomfort-27065752>.
- 76 "Crude Stopped Falling at \$40 a Barrel for Chinese Consumers," *Bloomberg*, January 18, 2016 <https://www.bloomberg.com/news/articles/2016-01-18/oil-prices-stopped-falling-at-40-a-barrel-for-chinese-consumers>.
- 77 ICIS, "Monthly Report on Independent Refineries," December 2016, 1.
- 78 He Qing, "Mingnian dilian jinkou pei'e xingui chulu zongliang bujian huopi buyi" ("New Rules Are out for the Independent Refineries Import Quotas Next Year, the Total Volume is Not Reduced and Approval Will Not Be Easy"), *21 shiji jingji daobao (21st Century Economic Herald)*, December 7, 2016, http://epaper.21jingji.com/html/2016-12/07/content_52059.htm.
- 79 He Qing, "Guojia fagaiwe jia ma jianguan, dilian mianlin 'zhuanzheng' zhi tong" ("The NDRC Increases Oversight, the Independent Refineries Face the Pain of Transformation"), *21 shiji jingji daobao (21st Century Business Herald)*, September 1, 2016, http://epaper.21jingji.com/html/2016-09/01/content_46020.htm.

- 80 “Dilian daliang ‘canshi’ liang tong you shichang liyi” (“Independent Refineries ‘Nibble’ the Market Share of the Two Barrels of Oil”), *Jiemian*, December 7, 2016, <http://www.jiemian.com/article/1000869.html>.
- 81 Qi Yu, “Gongheguo ‘zhangzi’ men de rongyao he weiji” (“The Glory and Crisis of the ‘Oldest Sons’ of the Republic”), *21 shiji jingji daobao* (21st Century Business Herald), July 25, 2016, http://epaper.21jingji.com/html/2016-07/25/content_43917.htm. See also Chen Aizhu and Meng Meng, “China Targets Teapot Oil Refineries in Tax Crackdown: Sources,” Reuters, August 23, 2016, <http://www.reuters.com/article/china-teapot-tax-idUSL3N1B0213>.
- 82 Chen and Meng, “China Targets Teapot Oil Refineries in Tax Crackdown: Sources.”
- 83 National Development and Reform Commission, “Guojia fazhan we bangongting guanyu jinyibu guifan yuanyou jiagong qiye shenbao shiyong jinkou yuanyou youguan gongzuo de tongzhi” (“Notification of the General Office of the National Development and Reform Commission on Further Regulating the Relevant Work for Crude Processing Enterprises Applying to Use Imported Crude”), Document No. 485 (2016), http://www.ndrc.gov.cn/zcfb/zcfbtz/201608/t20160823_815398.html.
- 84 “Guanyu kaizhan youguan yuanyou jiagong qiye shiyong jinkou yuanyou zhuangxiang ducha de tongzhi” (“Notification About Launching Special Investigations of Crude Processing Enterprises Using Imported Crude”), National Development and Reform Commission, Document No. 2212 (2016), http://www.sdpc.gov.cn/gzdt/201610/t20161020_823331.html.
- 85 “China to Probe Illegal Expansion in Coal, Steel Sectors,” Reuters, November 24, 2016, <http://www.reuters.com/article/us-china-steel-restructuring-idUSKBN13J11T>; interview, Beijing-based mining executive, Washington, DC, June 8, 2016.
- 86 Zhou, “China’s Independent Refiners Could Get Regulated Away: Fuel for Thought.”
- 87 “Zhongguo defang lianchang yue bao” (“Monthly Report on Independent Refineries”), ICIS, May 2017, 4; Oceana Zhou, “China awards second batch of import quotas for 2017 at 22.92 mil mt,” *Platts*, June 19, 2017, <https://www.platts.com/latest-news/oil/singapore/China-awards-second-batch-of-crude-oil-import-27655442>.
- 88 Meng Meng and Beijing Monitoring Desk, “Update 2 - China sets deadline for refiners to apply for oil import permits,” Reuters, April 27, 2017, <http://www.reuters.com/article/china-crude-teapot-idUSL4N1HZ3VD>.
- 89 E-mail from Beijing-based industry analyst, July 4, 2017.
- 90 “DJ Oil Data: Table of China December Oil, Oil Pdt, LNG Imports,” *Dow Jones Institutional News*, January 21, 2011.
- 91 Chen Aizhu and Jessica Jaganathan, “China to Scrap Fuel Export Quotas for ‘Teapot’ Refineries: Sources,” Reuters, December 16, 2016, <http://www.reuters.com/article/us-china-fuel-exports-idUSKBN1450ZB>.
- 92 “2016 nian 12 yuefen guimo yishang gongye zengjia zhi zhengzhang 6.0%” (Above-Scale Industrial Value-Added Increased by 6.0% in December 2016”), National Bureau of Statistics, January 20, 2017, http://www.stats.gov.cn/tjsj/zxfb/201701/t20170120_1455945.html.
- 93 “China Data: Independent Refiners’ Jun Crude Imports from Venezuela Up 40% on Month,” *Platts Commodity News*, July 4, 2017; “Table of China June Data on Oil, Oil Product, LNG Imports,” *Dow Jones Institutional News*, July 26, 2017; “Table of China June Data on Oil, Oil Product, LNG Imports,” *Dow Jones Institutional News*, June 21, 2016.
- 94 E-mail from Beijing-based industry analyst, July 4, 2017; “Analysis: Chinese Independent Refiners’ Crude Oil Imports Set to Slow on Quota Issues,” *Platts*, March 21, 2017, <https://www.platts.com/latest-news/oil/singapore/analysis-chinese-independent-refiners-crude-oil-27794639>.

- 95 “2016 nian 12 yuefen guimo yishang gongye zengjia zhi zhengzhang 6.0%” (Above-Scale Industrial Value-Added Increased by 6.0% in December 2016”), National Bureau of Statistics, January 20, 2017, http://www.stats.gov.cn/tjsj/zxfb/201701/t20170120_1455945.html; and “2015 nian 12 yuefen guimo yishang gongye zengjia zhi zhengzhang 6.0%” (Above-Scale Industrial Value-Added Increased by 6.0% in December 2015”), National Bureau of Statistics, January 19, 2016, http://www.stats.gov.cn/tjsj/zxfb/201601/t20160119_1306102.html.
- 96 “Table of China December Data on Oil, Oil Product, LNG Exports,” *Dow Jones Institutional News*, January 23, 2017; and “Table of China December Data on Oil, Oil Product, LNG Exports,” *Dow Jones Institutional News*, January 23, 2016.
- 97 “Table of China June Data on Oil, Oil Product, LNG Exports.” July 26, 2017.
- 98 “Woguo chengpinyou xiaofei shouci chuxian weisuo” (“China’s Oil Product Consumption Shrinks for the First Time), China Petroleum and Chemical Industry Association, January 16, 2017, <http://www.cpcia.org.cn/html/13/20171/160238.html>, citing CNPC Economics and Technology Research Institute, “2016 nian guoneiwai youqi hangye fazhan baogao” (“2016 Domestic and international Oil and Gas Industry Development Report”).
- 99 “Table of China December Data on Oil, Oil Product, LNG Exports,” January 23, 2017.
- 100 “Table of China June Data on Oil, Oil Product, LNG Exports,” July 26, 2017.
- 101 “Rival Exporters Fear China’s High-Grade Oil Products,” *Nikkei Asian Review*, October 14, 2016, <http://asia.nikkei.com/Markets/Commodities/Rival-exporters-fear-China-s-high-grade-oil-products>.
- 102 Henning Gloystein, “China CNOOC Exports First Australia-Spec Diesel Cargo,” Reuters, June 22, 2016, <http://www.reuters.com/article/us-china-diesel-exports-idUSKCN0Z80UK>.
- 103 Jessica Jaganathan, “Australia’s 2015 Oil Product Imports Set to Soar after Ageing Refinery Closures,” Reuters, April 13, 2015, <http://www.reuters.com/article/australia-oil-imports-idUSL3N0WY3QE20150413>.
- 104 Michal Meidan, “China’s Independent Refiners: A New Force Shaping Global Oil Markets,” The Oxford Institute for Energy Studies, May 2017, 6, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2017/05/Chinas-Independent-Refiners-A-New-Force-Shaping-Global-Oil-Markets-OIES-Energy-Insight.pdf>.
- 105 See “Zhongguo difang lianchang yue bao” (“Monthly Report on Independent Refineries”), ICIS, May 2016–May 2017.
- 106 “China Data: Independent Refiners’ Jun Crude Imports from Venezuela Up 40% on Month.”
- 107 “Shandong Dongming chengwei Zhongguo shou huo jinkou yuanyou shiyong quan de defang lianchang” (“Shandong Dongming Becomes China’s First Independent Refinery to Obtain the Right to Use Imported Crude”), *Jiemian*, May 29, 2015, <http://www.jiemian.com/article/293026.html>.
- 108 E-mail from Beijing-based industry analyst, July 2, 2017.
- 109 Gawoon Philip Vahn, Deborah Lee, and Dexter Wang, “Far East Russian Crudes Rally as China Shifts Focus to Low Sulfur Crudes,” *Platts*, October 25, 2016, <http://www.platts.com/latest-news/oil/singapore/far-east-russian-crudes-rally-as-china-shifts-27695519>.
- 110 Meng Meng and Chen Aizhu, “Russia Beats Saudi for Third Straight Month as China’s Top Crude Supplier,” Reuters, June 21, 2016, <http://www.reuters.com/article/us-china-crude-imports-idUSKCN0Z72DX>.

- 111 “Russia’s December Oil Exports to China Best Saudi Arabia Again.” *Sputnik News*, February 3, 2016, <https://sputniknews.com/world/201602031034148491-russia-china-saudi-oil-exports/>.
- 112 “Table of China December Data on Oil, Oil Product, LNG Imports,” *Dow Jones Institutional News*, January 26, 2016; and “DJ Oil: Table of China December Oil, Oil Pdt, LNG Imports,” January 21, 2011.
- 113 “Table of China December Data on Oil, Oil Product, LNG Imports,” January 23, 2017.
- 114 Ibid.; and “Monthly Report on Independent Refineries,” ICIS, December 2016, 3.
- 115 “Table of China December Data on Oil, Oil Product, LNG Imports,” January 23, 2017; and “DJ Oil: Table of China December Oil, Oil Pdt, LNG Imports,” January 21, 2011.
- 116 “Table of China June Data on Oil, Oil Product, LNG Imports,” July 26, 2017; and “China Data: Independent Refiners’ Jun Crude Imports from Venezuela Up 40% on month.”
- 117 “Table of China December Data on Oil, Oil Product, LNG Imports,” January 23, 2017.
- 118 “Table of China June Data on Oil, Oil Product, LNG Imports,” July 26, 2017; “Table of China June Data on Oil, Oil Product, LNG Imports,” *Dow Jones Institutional News*, July 21, 2016; and “China Data: Independent Refiners’ Jun Crude Imports from Venezuela Up 40% on Month.”
- 119 Amrita Sen and Michal Meidan, “Cracking China’s Teapots,” *Energy Aspects*, February 2, 2016, <https://www.energyaspects.com/publications/view/cracking-chinas-teapots>.
- 120 Brian Spegele, Jenny W. Hsu, and Dan Strumpf, “Oil Producers Tap Brewing Demand from China’s ‘Teapots,’” *Wall Street Journal*, September 26, 2016, <http://www.wsj.com/articles/oil-producers-tap-brewing-demand-from-chinas-teapots-1474789780>.
- 121 Chen Aizhu and Florence Tan, “Exclusive: China’s Opening Up of Oil Market under Scrutiny after Deals Sour,” Reuters, January 22, 2016, <http://www.reuters.com/article/us-china-refinery-financing-exclusive-idUSKCN0V00KP>.
- 122 Chen Aizhu, “Update 1—Aramco in First Spot Crude Sale to Chinese Teapot Refiner: Source,” Reuters, April 25, 2016, <http://af.reuters.com/article/commoditiesNews/idAFL3N17S2UT>.
- 123 Takeo Kumagai and Philip Yahn, “Okinawa storage expansion to give Saudis an edge,” *Platts Oilgram Price Report*, October 25, 2016.
- 124 Florence Tang and Meng Meng, “Udate 1—Saudi Aramco Inks First Oil Contract with China’s Huajin,” Reuters, February 13, 2017, <http://af.reuters.com/article/energyOilNews/idAFL4N1FY1UX?sp=true>.
- 125 Zhou, Xu, and Liang, “China’s Independent Refiners Step onto Global Stage,” 11.
- 126 “China Upgrades Fuel Quality Standards for Cleaner Air,” Xinhua, December 26, 2016, http://english.gov.cn/state_council/ministries/2016/12/26/content_281475525556294.htm. For more information on the China V diesel and gasoline standards, see David Vance Wagner and Zifei Feng, “China V Gasoline and diesel Fuel Quality Standards,” International Council on Clean Transportation, January 17, 2014, <http://www.theicct.org/china-v-gasoline-and-diesel-fuel-quality-standards>.
- 127 “Chengpinyou jiang an guo wu biaozhun quanmian kaizhan zhiliang choujian” (“The Quality Spot Check Mechanism for National V Standard for Refined Products Will Be Fully Implemented”), *Meiri jingji xinwen (Daily Economic News)*, June 22, 2017, <http://auto.sohu.com/20170622/n498069193.shtml>; and “Global Equities Roundup: Market Talk,” *Dow Jones Institutional News*, March 6, 2017.

- 128 “Yangqi pinfan chongzu shougou minying lianchang huo qiangzhan youqi gaige hongli” (“Central Enterprises Frequently Purchase Private Refineries, Perhaps to Seize the Oil and Gas Reform Dividend”), *Zhengquan Ribao (Securities Daily)*, May 16, 2017, <http://stock.qq.com/a/20170516/003731.htm>.
- 129 “1 News Brief AP,” *Platts Oilgram News*, January 30, 2017.
- 130 Oceana Zhou, “APPEC 2016: Dongming Eyes Acquisitions in China’s Changing Refining Landscape,” *Platts*, September 12, 2016, <http://www.platts.com/latest-news/oil/singapore/appec-2016-dongming-eyes-acquisitions-in-chinas-26542906>.
- 131 For more on Sinopec’s centralization of fuel purchases, see Chen Aizhu and Meng Meng, “Sinopec Overhauls Fuel Buying Policy in New Blow to Teapots,” *Reuters*, March 28, 2017, <http://www.reuters.com/article/us-china-sinopec-fuel-idUSKBN16Z0TQ>.

