

Commentary

Implications of the 2021 Iran-China Deal for the Oil Market

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Executive Summary

In late March 2021, China and Iran signed a cooperation pact to stimulate investments in Iran's oil, gas and petrochemical infrastructure. We refer to this pact as the 'Iran-China deal' throughout this manuscript. This deal attracted substantial attention for its effects on global oil markets and the geopolitics of the region. Reports suggest that China may invest as much as \$400 billion in Iran's infrastructure and oil sector over 25 years owing to the deal. In exchange, Iran will supply oil to China at below-market prices (Fassihi and Myers 2021).

When this deal was signed, Iran was still facing numerous economic sanctions by the United States (U.S.), which were expanded in November 2018. In November 2019, the Trump Administration's 'maximum pressure' policy led to the U.S. unilaterally withdrawing from the Joint Comprehensive Plan of Action (JCPOA). Talks between the U.S., Iran and five other countries (including China) to reinstate the JCPOA have begun recently. The aim of these talks is to reach agreements on removing sanctions and renewing oversight of the Iranian nuclear program, among other controversial topics.

Additionally, the Iran-China deal was signed as the coronavirus was buffeting the global economy and oil market demand. The repercussions of the COVID-19 pandemic have wrought uncertainty in the oil market. Both public and private oil companies have therefore been compelled to curtail their capital expenditures on upstream operations. These budget cuts may reduce the supply of oil in the coming years, causing market volatility and higher prices. They may also slow down the global economic recovery and jeopardize energy access and security. China's pledge to invest in Iran's oil infrastructure may stave off these issues. Saudi Arabia has also announced its intention to increase its maximum sustainable capacity to 13 million barrels of oil per day in the coming years.

The Iran-China deal may hinder the efforts of OPEC and its allies (i.e., OPEC+) to balance oil supply and demand in the medium term. The interventions of OPEC+ have been vital in balancing the market in 2020 and 2021. Monthly Joint Ministerial Monitoring Committee meetings included the implementation of a compensation regime to further promote high compliance. This regime has sent strong and credible signals to the market. Without the collective action of OPEC+ and a high rate of compliance, the oil market would have been more volatile. Moreover, the rebalancing process would have been longer. In light of the Iran-China deal, however, Iran may abruptly increase its oil production and available supply despite being a member of OPEC. The precedent exists, as Iran increased production after the agreement on the JCPOA.

The Iran-China deal may have implications for several different industrial sectors, including the gas and petrochemical sectors. However, this commentary focusses on crude oil production. We highlight three implications of the deal for global oil markets in the short and long terms.

- **Iran's global oil exports will change negligibly in the short term.** We do not expect Iran's oil exports to immediately increase, for two reasons. First, Iran has already been supplying Asian markets via various means of tacit oil movement,¹ especially ship-to-ship transfers. Second, Iran's ability to ramp up oil production is limited owing to years of underinvestment in oil infrastructure. The long-term outlook is different. Chinese enterprises directly investing in Iran's oil infrastructure and trading its oil may allow Iran to upgrade its infrastructure and attain pre-revolution production levels. Sustainable oil production will require not only capital expenditures but also technical expertise. Iran will need access to technologies that are developed and commercialized by Western oil field service companies. Without these technologies, oil production offtakes will occur, but the peaks will not plateau, as oil fields' production will decline.
- **A novel blueprint is moving oil trade beyond the global financial system's reach.** The Iran-China deal may constitute an alternative blueprint for oil trade that is less vulnerable to sanctions. Under the deal, trade will be carried out using yuan-denominated gold contracts (Evans 2017) or other forms of non-dollar payment mechanisms (Bhadrakumar 2021). Thus, the deal may bolster the ongoing trend of de-dollarizing the oil trade. The Iran-China deal may also serve as a blueprint for other developing or sanctioned countries. Such countries may be willing to commit long-term oil exports to a single customer in exchange for immediate investments. This blueprint may therefore diminish Western countries' leverage over oil markets through the global financial system.
- **OPEC's power to counter the global oil market's cyclicity may decline if its individual members make bilateral commitments to third parties.** China's international diplomacy tactics tend to rely on fostering bilateral ties rather than operating in a multilateral environment. The Iran-China deal is a typical example of this approach. News of China's purchase of a 1% stake in the Saudi Arabian Oil Co. has also recently surfaced (Wu, Lawler and Arnold 2021). Such bilateral approaches may come at the expense of oil producers' multilateral framework (namely, OPEC). In turn, these approaches may reduce oil producers' ability to counter the cyclicity of the global oil market.

Iran: The Evolution of a Major Oil Producer under Long-standing Sanctions

Iran's oil production peaked before the revolution in 1978, reaching six million barrels of oil per day (Mb/d). However, it declined sharply as major foreign oil companies operating in Iran left when Iran nationalized its oil and gas sector.² Many of the sanctions following the Iranian revolution targeted Iran's oil production and infrastructure. Moreover, the war between Iran and Iraq that persisted from 1980 to 1988 acutely harmed Iran's oil facilities and distribution networks. Iran's oil production ranged from 1.5 Mb/d to 2.5 Mb/d during this time, and its production suffered from a lack of investment. When Iraq invaded Kuwait in 1990, Iran ramped up oil production, taking advantage of sanctions targeting Iraqi oil exports. It managed to repair its aging oil infrastructure

independently despite deteriorating human and financial capital stock. However, the relationship between the Iranian government and foreign oil firms remained hostile during this period. Iran's post-revolution oil production reached a ceiling of 3.7 Mb/d in early 1994, as Figure 1 indicates. This ceiling was largely unrelated to the OPEC quota system, which was reinstated in 1998. Instead, Iran's oil sector required substantial capital investments and knowledge to break this ceiling.

Figure 1. Historical crude oil and condensate production in Iran.



Source: U.S. Energy Information Administration.

Before the mid-1990s, the economic sanctions on Iran were primarily aimed at Iran's financial and banking sectors and did not derail its oil production growth. However, the Iran Sanctions Act, imposed by the U.S. in 1996, was different. This act directly aimed to bar investments in Iran's petroleum industry, forbidding major oil companies from providing services and equipment to Iran's oil industry. These companies' technologies and knowledge were crucial for the exploration, development and production of Iranian hydrocarbons. Therefore, these sanctions played a critical role in the emergence of the ceiling on Iran oil production in the 1990s.

Iran's oil production plateaued around 4 Mb/d (Figure 1) between 2004 and 2012. As a result, Iran invited foreign oil firms to reconstruct, develop and modernize its oil infrastructure. U.S.-based service oil companies were not permitted to operate while the Iran Sanctions Act was still in effect. However, major European oil companies, such as Total and Eni, entered

provisional agreements with the National Iranian Oil Company (NIOC) known as buyback contracts.³ These agreements allowed these companies to exploit and develop Iran's hydrocarbon resources (Curtis and Hooglund 2008). However, the terms and conditions of these contracts were not attractive, as they were short-term contracts with low rates of return. Moreover, the operators bore all of the risk if a project fell short of the agreed return on investment, regardless of the circumstances. In other words, operators bore the risk of both insufficient volumes produced and low oil sale prices (Ebrahimi and Khouzani 2003). The contracts also required these firms to increase the use of local content and employ Iranian nationals to transfer technology and knowledge (Ebrahimi and Khouzani 2003).

Iran's Nuclear Endeavor Reshapes the Political Context

In 2011, Iran further harmed its relationship with the West by commissioning its first nuclear power plant, with a nameplate capacity of 915 megawatts. Both Europe and the U.S. responded with severe sanctions, forcing international oil operators to leave Iran once again. Subsequently, Iran's oil production dropped to 3.2 Mb/d. However, JCPOA was adopted in late 2015 after several rounds of negotiations. This agreement, which lasted for three years, increased Iran's oil production to 4.5 Mb/d at maximum sustainable capacity.

In late 2016, the Iranian government again invited foreign oil companies to codevelop oil and gas fields with the NIOC. This time, the buyback contract terms offered many attractive features for foreign investors. For example, they included prolonged periods during which operators were rewarded with higher shares and extended contractual periods (Soleimani and Tavakolian 2017). Investments poured in, strengthening Iran's determination to approach or even match its pre-revolution oil production levels, although it did not disclose any official targets. Iran needed to secure sustained Western support to achieve this goal, as investments in oil take several years to translate into production.

New Sanctions in 2018

In November 2018, the U.S. officially pulled out of the JCPOA. It reinstated prior sanctions and added numerous new sanctions under what former President Donald Trump's administration termed its 'maximum pressure' policy. To soften the adverse reactions of its global partners, the U.S. granted waivers to eight countries. These countries were permitted to continue importing Iranian crude oil until May 2019, at which point they would also be subject to the sanctions (Manson 2018). After May 2019, no country was permitted to trade with Iran, and those engaged in tacit oil trading were sanctioned by the U.S. Treasury. Consequently, international oil operators and service providers left Iran for the third time.

This latest round of U.S. sanctions has adversely impacted Iran's economy and trade. Iran's gross domestic product contracted by 7.6% between April and December 2019, largely owing to a 37% decline in oil revenues in 2019 (World Bank 2020). Intensified domestic social and economic unrest heightened the pressure on Iran and the urgency for its government to create revenue streams.



Lockdowns and curfews to control the spread of COVID-19 also hurt Iran's economy. Consequently, Iran's estimated oil production dropped from 4.5 Mb/d in 2018 to an average of 2.7 Mb/d in 2019 and 2020. However, these estimates are difficult to validate, as Iran stopped reporting crude oil and condensate production figures in August 2018. During this time, the Iranian government has engaged in tacit oil trade with many countries, including Venezuela, Syria and China.

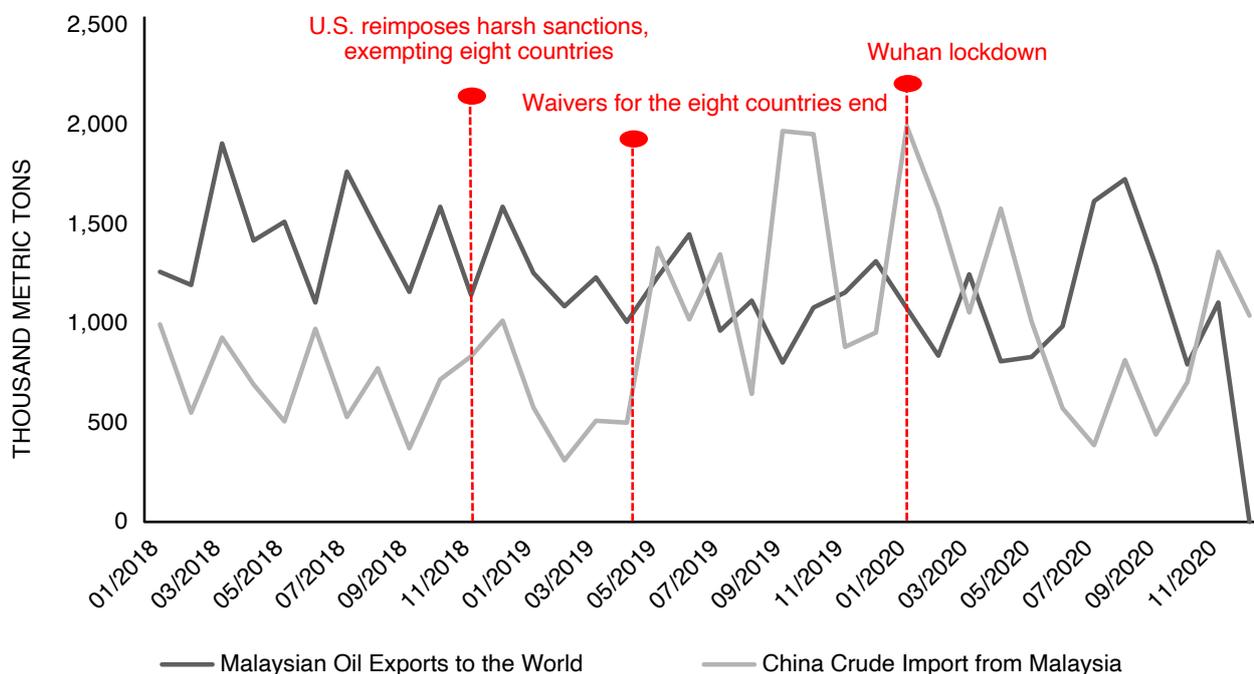
China has not been able to overtly buy Iranian crude oil amid its trade war with the U.S. In particular, U.S. sanctions have targeted numerous Chinese state-owned companies involved in the oil trade with Iran (Beaumont 2019). For example, China COSCO Shipping Corporation Limited was targeted with a designation in September 2019 (Bourse and Bazaar 2020). Ship-to-ship (STS) transfers of oil around the Straits of Malacca have emerged as a popular way to circumvent these sanctions. Private Chinese buyers have been able to use smaller tankers to conduct trade, mitigating the risk associated with possible U.S. sanctions on major shipping firms. These intermediaries switch off their transponders when conducting STS transfers with Iranian vessels. The Chinese buyers then forge their documents by disguising their oil cargos' origins to avoid implicating the end buyers of the cargos, especially state-owned firms.

Tacit Oil Movement Reflected in International Crude Trade Statistics: An Illustration

Various reports suggest that much of Iran's tacit oil destined for China has been rebranded via STS in various third-party countries, including Malaysia (Bloomberg News 2021; Hong 2021; Verma and Zhang 2021). We briefly examine Malaysian crude exports to China before and after the sanctions on Iran. This analysis suggests that a sizeable amount of Iranian oil has reached Chinese markets via such STS transfers.

The statistics for Malaysia reported in the Joint Organisations Data Initiative (JODI) database exhibit certain inconsistencies. However, a report by Chinese customs shows that crude oil imports from Malaysia have substantially increased since April 2019, when the waivers for eight countries ended. On the contrary, Malaysia's total crude oil exports, including those to China, have reportedly declined. Figure 2 shows that in 2019, total oil imports from Malaysia reported by Chinese customs exceeded Malaysia's total global oil exports. A few months after the COVID-19 lockdown in Wuhan, Chinese crude oil imports finally fell below Malaysia's total global crude oil exports. Thus, it is speculated that intermediaries now disguise all Iranian oil as Malaysian, even though these shipments may come from other countries, such as Indonesia. Earlier this year, Indonesian authorities detained an Iranian and a Chinese oil tanker for conducting an STS transfer in Indonesian territorial waters (Maritime Executive 2021).

Figure 2. Chinese oil imports from Malaysia and total global oil exports from Malaysia.



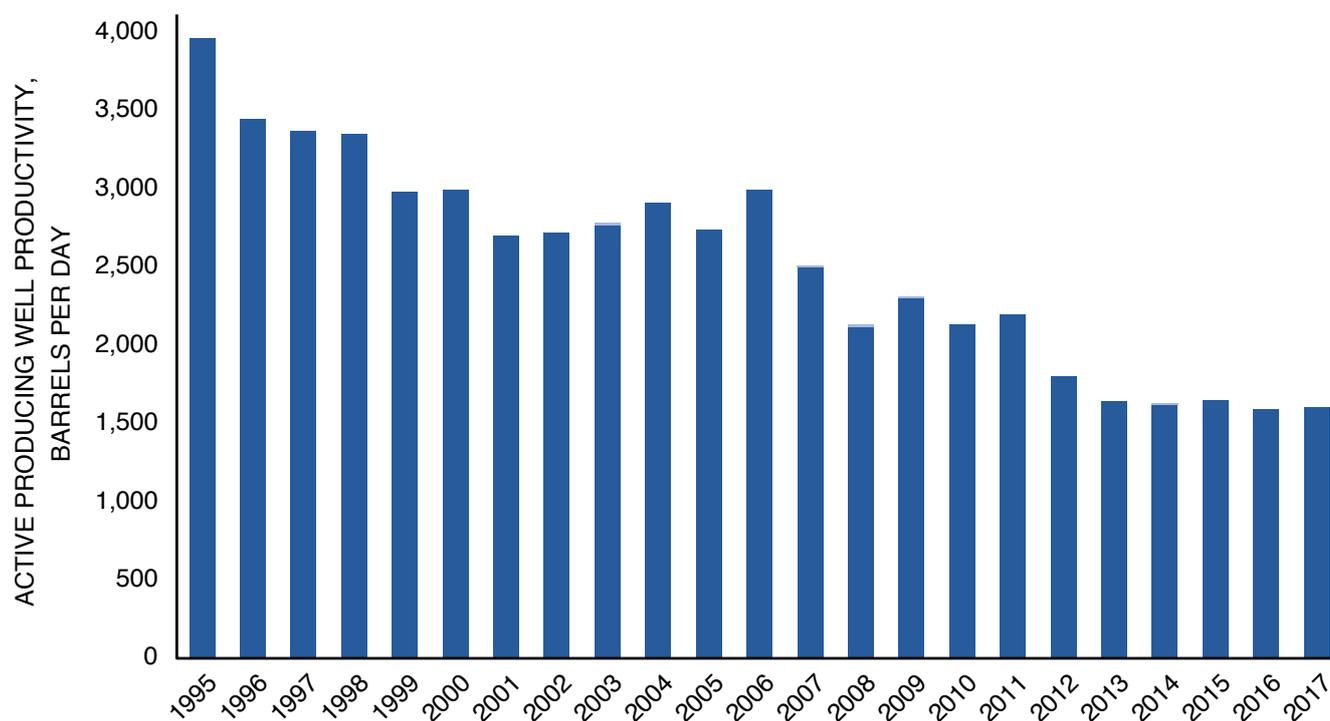
Source: JODI and China’s General Administration of Customs.

From these findings, we can establish a minimum baseline of Iran’s oil production and exports since August 2018 when sanctions were imposed and Iran ceased to disclose figures at JODI database. Specifically, we can aggregate Iranian oil exports to China, oil smuggled via STS transfers disguised as Malaysian oil, and Iran’s domestic consumption. In doing so, we estimate that Iran was able to produce 2.7 Mb/d on average since May 2019, as reported by the U.S. Energy Information Administration.

Current State of Iran’s Oil Industry

Historically, average annual production per producing well in Iran has been declining, especially after 2006, as Figure 3 shows. In 1997, an active oil-producing well produced an average of 3,370 barrels per day (b/d). A decade later, average well production had dropped by 50% to 1,600 b/d. We believe that the extended strategic partnership agreement between Iran and China will allow Iran’s oil industry to flourish in the longer term. Iran may even exceed its historical threshold of 4 million barrels through the development of green oil fields. Iran has already initiated the South Azadegan oil field, which will have a nameplate capacity of 320,000 b/d once the facilities and wells are commissioned (NS Energy 2020).

Figure 3. Average oil-producing well performance in Iran.

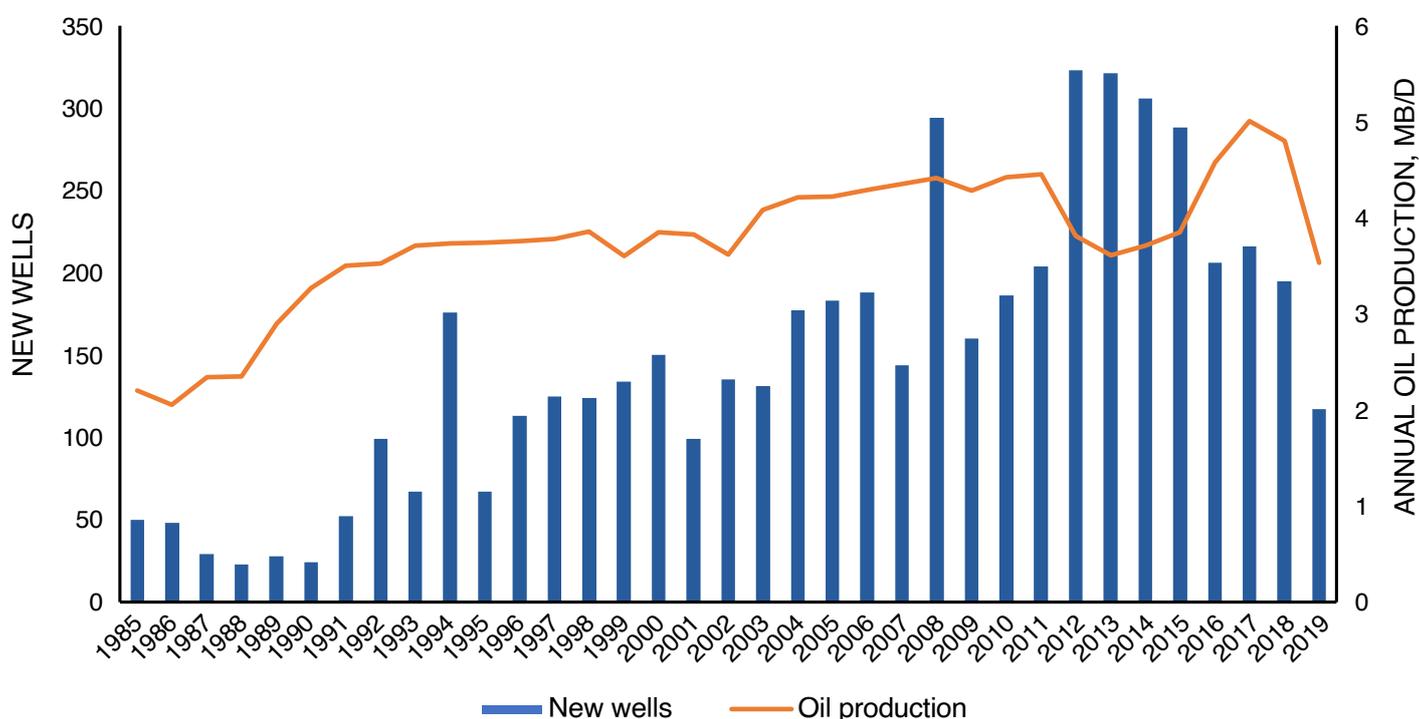


Source: KAPSARC analysis based on OPEC Statistical Bulletin Reports.

The decline in Iran's average well productivity is mostly attributed to the decline in reservoir pressures and asset maturity. Thus, Iran's oil infrastructure direly requires investments to restore production from its mature brownfields. Until 2006, buyback contracts helped to temporarily flatten overall well productivity. However, because of these contracts' high risk levels and short terms, the decline in Iran's well productivity was inevitable. Iran's strategy for offsetting the production decline has been to drill more wells and place them on-stream, as Figure 4 shows. However, this strategy has had negative repercussions, as it has accelerated depletion. The ultimate recovery of oil will be lower if no investments are made to arrest the decline through waterflooding and enhanced oil recovery applications.

Further, investments alone are not sufficient to sustain Iran's production output, as certain technologies are offered primarily by U.S.-based service oil companies. These companies have succeeded in safeguarding their intellectual property and have sustained competitive technological advantages in the oil industry. Many Chinese companies have achieved major technological breakthroughs in seismic operations and enhanced oil recovery technologies. However, they are still lagging in upstream frontiers, such as advanced well completions and artificial lift technologies. These advancements are essential to bolster Iran's oil field production and enhance production from wells. Achieving and sustaining incremental production volumes will depend on the U.S. and Iran reaching a deal enabling oil field service providers to enter Iran's oil sector.

Figure 4. New wells and oil production.



Source: BP Statistical Review and OPEC Statistical Bulletin.

The China-Iran Oil Trade: Potential to Disrupt Global Oil Markets

China surpassed the U.S. in gross crude oil imports in 2017, and it is now the world’s largest net oil importer as well. The deal with Iran gives China more power to dictate prices of the crude oil used by its refineries and petrochemical industries. In the long run, oil prices will fall, forcing fringe producers to comply or sell their crude oil elsewhere. Despite the shrinking profit margins, we expect major industry players, including Saudi Arabia and Russia, to retain their market shares in China.

Saudi Arabia’s market share in China is expected to remain stable. Over the past decade, the Saudi Arabian Oil Co. (Saudi Aramco) has invested in integrated refining and petrochemical joint ventures with China. It is also exploring cooperation on strategic oil storage and reserves (Saudi Aramco 2016). More recently, news that China has expressed an interest in purchasing a 1% stake in Saudi Aramco was released (Wu, Lawler and Arnold 2021). China considers Saudi Arabia a partner of choice, and Saudi crude oil is seen as an integral component of China’s national energy security.

China has become the preeminent buyer of Iranian crude oil since the U.S. reinstated its economic sanctions on Iran. Reports suggest that the Iranian crude oil sold to China is “heavily discounted” (Fassihi and Myers 2021). By selling below market prices, Iran guarantees large purchases of its oil over the long term if the JCPOA is not reinstated. In turn, Chinese



buyers are taking advantage of these discounted prices but are factoring in the risk of penalties by the U.S. Treasury. The terms of the deal if sanctions are lifted and Iran is permitted to trade its oil worldwide are unclear.

Iran's current spare capacity is estimated to be between 1.5 Mb/d and 2 Mb/d. Following the Iran-China deal, these volumes are likely to be made available to Chinese buyers. In return, China provides legal cover for circumventing sanctions. These imports of Iranian oil are displacing imports or decreasing purchases from other oil producers, including Gulf producers. For example, oil tankers from Brazil, Angola and Russia are now diverting shipments to India and Europe (Aizhu, Zhang and Valle 2021).

Iran can achieve its pre-sanction level of oil production. However, it cannot sustain this production level for a long time without investments and, more importantly, access to technologies. Our analysis of historical capital investment flows and oil production suggests that it takes four to five years for capital expenditures to significantly impact supply.⁴ This finding corresponds with industry standards, which suggest that incremental projects take three to five years on average to come on-stream and impact supply.

For Iran's production to reach 6 Mb/d in 2026, investment must be at least three times 2021 levels and investments should be maintained at this new level every year. The Chinese government has pledged substantial and continuous investments over 25 years. This long-term contract may prohibit the entry of many oil operators who previously accepted short-term buyback contracts. In exchange, Iran may phase out the buyback contract framework and replace it with production sharing or joint ventures with Chinese enterprises. In other words, Iran is expected to amend its Petroleum Act of 1974 to exclude Chinese enterprises.

A Blueprint for Evading Sanctions?

Western states have repeatedly placed economic sanctions on various oil producers, such as Iran, Russia, Iraq, Libya and Venezuela. Earlier sanctions mostly focussed on physically embargoing the flow of oil. In contrast, later sanctions have increasingly relied on controlling financial flows to and from sanctioned countries to coerce policy changes in these states. Financial sanctions are an especially effective tool for controlling the oil trade; the U.S. government can monitor most registered transactions using U.S. dollars. For instance, all transactions using the Society for Worldwide Interbank Financial Telecommunication system are monitored by the U.S. State Department. Such transactions are subject to U.S. law regardless of the originator and recipient of the transfer. For the U.S., monitoring such financial transfers and halting them if necessary is much more effective than physically preventing the exchange of traded goods.

Reports indicate that the Iran-China deal will rely on other currencies or contracts backed by gold. Thus, the deal may constitute an alternative blueprint for the oil trade that is less vulnerable to sanctions. Oil markets have been undergoing de-dollarization efforts for the last several years. Rosneft, for instance, decided to switch to euros in settling its exports to China in 2019. In December 2018, the European Commission expressed a

strong interest in paying Europe's energy import bills in euros. Its aim was to reduce the risk of a "disruption of energy supplies as a result of actions by third parties" (European Commission 2018, 2). Because China offers a wide range of goods and services, its clients can conduct additional imports and exports in a non-U.S. currency. Developing deeper relations with China and using Chinese yuan to trade may be preferable for countries facing severe sanctions or those in earlier stages of development.

The replication of this effort in other countries may also have considerable geopolitical consequences. The Iran-China deal mostly evades international financial channels, which also serves to reduce the West's ability to weaponize its control of global financial flows (Farrell and Newman 2019). The U.S. downplayed the deal, declaring that it "in some cases" has rather narrow areas of tactical alignment. State Department spokesperson Ned Price noted that the U.S. has "a shared interest with Beijing in curbing Iran's nuclear program." However, he also stated, "[c]ompetition, as you know, does define our relationship with China" (Rev 2021).

China's investment in sanctioned or otherwise neglected countries may create a lock-in effect whereby these countries become increasingly reliant on China as their economies develop. This economic interdependence will grant China more extensive basing rights worldwide and will create a preference for Chinese military equipment. These issues have already emerged as points of contention with China's promotion of its Belt and Road Initiative (Andersen 2019; Russel and Berger 2020).

Implications for OPEC and the Global Governance of Oil

Beyond its short-term impact on the global oil supply, the Iran-China deal has implications for the understanding of the global governance of oil. Contracting large amounts of oil in exchange for long-term investments further strengthens the movement to de-dollarize the oil trade. This movement has the potential to create alternative trading blocs. Whereas the existing system roughly corresponds with supplier and consumer clusters, these blocs would form along competing value chains from well to wheel.

Oil-producing countries ideally aim to price oil at a premium to realize a higher rate of return. The Iran-China deal, however, demonstrates that a steady stream of revenue from discounted oil may be preferable under specific geopolitical and domestic conditions. If enough suppliers opt to tie up their oil production under similar circumstances, OPEC's negotiating power will change. The discounts on oil in these contracts, along with their long-term nature, will reduce OPEC's ability to counter the cyclical nature of global markets. Oil producers may especially prefer a guaranteed revenue stream, albeit at a discounted price, as oil market volatility increases in the wake of the pandemic. Such a shift among OPEC countries may create more pressure on Saudi Arabia as the ultimate balancer of global oil markets, especially as oil becomes less fungible.

The Iran-China deal also has implications for the multilateral nature of global oil governance. In its diplomacy, China tends to foster bilateral ties rather than operating in a multilateral environment. China's approach to oil producers in the Gulf region (e.g., the aforementioned news that China was

interested in acquiring a 1% stake in Saudi Aramco) follows this pattern. These bilateral approaches may come at the expense of the multilateral understanding among oil producers. Their joint ability to counter the global oil market's cyclicity may suffer as a result.

An Unexpected Consequence: Will Iran's Government Become Culpable in the Iranian Public's Eye?

Finally, we highlight the possibility of an unexpected outcome of this deal. Iran's government may become more culpable for the country's economic performance if it cannot rely on sanctions as an excuse. The Iranian government has employed various fiscal and monetary measures to keep Iran's financial markets functioning. These include extensive controls on capital mobility and brief closures of banks to prevent consumer panic. Nevertheless, most Iranians currently regard the country's faltering economy and unemployment as its main problems.

Although the Iranian public does not solely blame sanctions for Iran's poor economic performance, many recognize the adverse consequences of sanctions on Iran's economy. A December 2018 survey conducted by IranPoll found that 71% of respondents thought that the economy was performing badly. However, only 36% ascribed this economic mismanagement to sanctions (Farmanesh 2019). The majority of respondents (59%) said that Iran's economic woes were due to the government's mismanagement of the domestic economy. However, the public also views the ineffectiveness of the JCPOA and the U.S. as obstacles to peace and prosperity. A January 2018 poll conducted in Iran by the University of Maryland showed that many Iranians were disillusioned by the JCPOA. This disillusionment arose because "benefits [were] not accruing to Iran's economy following this agreement" (Mohseni, Gallagher and Ramsey 2018).

These perceptions have allowed the Iranian authorities to divert attention from the underperformance of Iran's economy. The Iran-China deal may provide the authorities in Tehran with further macroeconomic room to maneuver. However, the circumvention of existing sanctions via the Iran-China deal may also put the domestic spotlight back on Iran's government. In other words, it may also further link Iran's economic performance with its government's competence in the view of the Iranian public.

Concluding Note

The Iran-China deal will not significantly impact the global oil market in the short term. However, this novel means of bilateral exchange between major oil producers and consumers may structurally shift the long-term geopolitics and global governance of oil. More specifically, the Iran-China deal offers a blueprint for circumventing global financial controls on sanctioned oil producers. This bilateral framework allows black knights, such as China, to invest in oil-producing states. In doing so, they can construct long-term oil trade relations with less concern about repercussions from Western countries.

Accordingly, oil markets should watch closely to determine whether China will prefer to use this mode of interchange with other oil-exporting states. The increasing levels of tacit oil trade between Venezuela and China following U.S. sanctions suggest that they may reach a similar deal in the future (Parraga, Sagdiev and Hafezi 2020). Notably, a large portion of Venezuela's debt to China is denominated in crude oil (Jenner 2019).

If the Iran-China deal operates over the longer term, China's technology transfers and infrastructure investments may enable Iran to reach its pre-revolution production levels. Iran may be able to achieve these levels within five to seven years. However, these levels are not sustainable without access to proprietary technologies developed by Western service oil companies.

Endnotes

¹ Tacit oil movement refers to any international, financially meaningful trade or movement of crude, condensate and oil products beyond legally recognized means. This movement can occur at any part of the oil value chain from wellhead to end consumers.

² Iran's Petroleum Act of 1974 mandated the nationalization of petroleum resources. It stipulates that exploration, development and production activities must be exclusively carried out by the National Iranian Oil Company (NIOC). The act does not authorize the government to engage in production-sharing agreements. However, it allows NIOC to utilize the services of foreign oil companies without having equity stakes in hydrocarbon projects (Ebrahimi and Khouzani 2003).

³ Under a buyback contract, a foreign oil firm provides capital investments and technical services to develop an asset. If the project is economically feasible, the firm's capital expenditures are considered a loan to the state. The state compensates the developers through annual payments. These payments may begin when production starts or when a production target is met for a specific duration, depending on the contract (Parshall 2016).

⁴ In this analysis, we minimize the Akaike information criterion for an autoregressive distributed lag regression model with five lag years. Please see the appendix for more details on the effects of Iran's capital expenditures on oil infrastructure.

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Appendix – Iran’s Oil Infrastructure Capital Expenditures

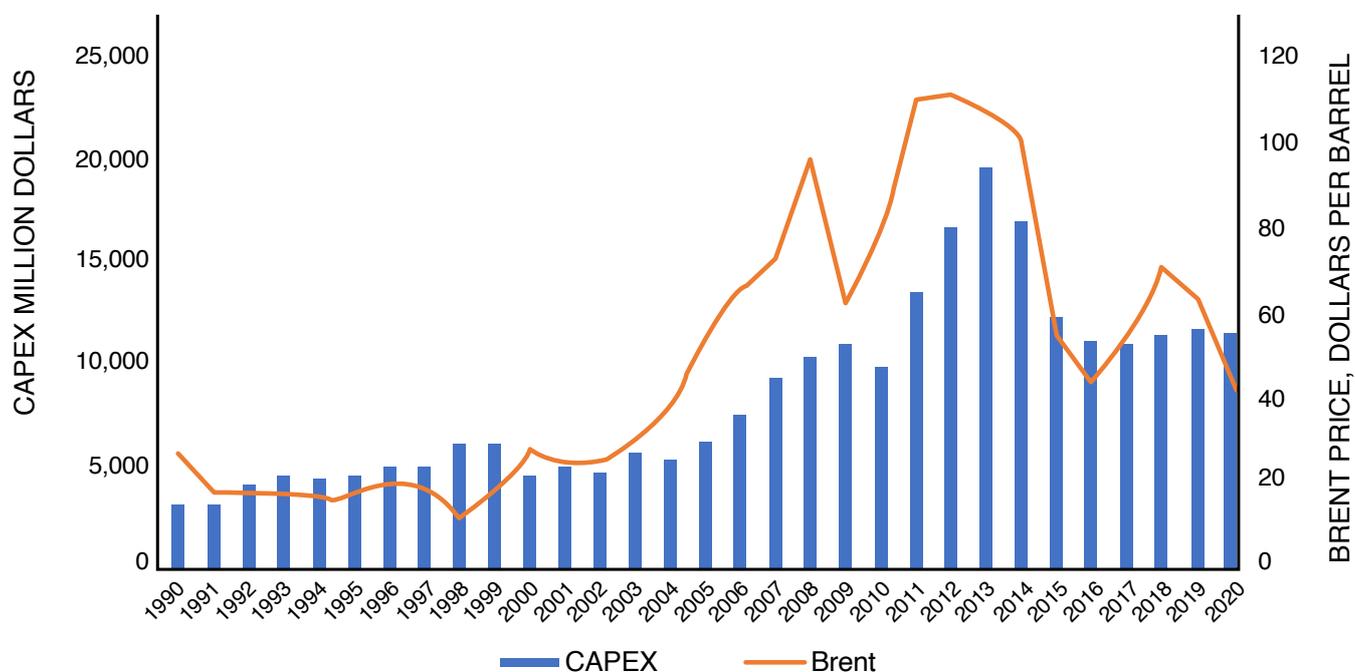
Five-year Lag

Sample (adjusted): 1996-2020

Included observations after adjustments: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob. (95%)
CAPEX (t-5)	3,719.43	224.77	16.55	0.00
$\Delta \log \text{CAPEX} [-5]$	922.76	511.55	1.80	0.09
$\Delta \log (\text{Brent})$	685.53	295.12	2.32	0.03
Time series trend	-4.05	11.39	-0.36	0.73
R^2	0.37	Akaike info criterion		14.94
Adj R^2	0.28	Schwarz		15.14
F-statistic	4.08	Hannan-Quinn		15.00
Prob(F)	0.00	Durbin-Watson		1.05

Figure A1. Annual capital expenditures in Iran and Brent crude prices.



Source: Rystad Energy and U.S. Energy Information Administration.



About this Project

The Energy and Geopolitics project investigates how international events shape energy markets, and vice versa. This project particularly focuses on the interactions of global energy markets with economic sanctions, international trade agreements, international organizations and geopolitical tensions.

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