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**IRANIAN NATURAL GAS:
OPPORTUNITIES AND RISKS**

by

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IRANIAN NATURAL GAS: OPPORTUNITIES AND RISKS

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ABSTRACT

This thesis investigates the Islamic Republic of Iran's current natural gas sector and explores the opportunities to monetize its proved natural gas reserves. According to BP statistics, Iran owns the world's second-largest proved natural gas reserves, totaling 33.2 trillion cubic meters, or 17.2% of the world's total proved reserves. Iran's ability to expand its role in the natural gas market depends heavily on its ability to increase production, its capability to reach markets, and improved international relations with the West. The Joint Comprehensive Plan of Action (JCPOA) afforded sanctions relief for Iran to develop and resurrect its battered energy infrastructure with foreign investments. Though the United States withdrew from the JCPOA in May 2018, Iran is expected to increase its natural gas production to at least satisfy growing domestic demands. After analyzing Iran's natural gas capacity, susceptible markets, and infrastructure, this research explores three strategic political scenarios that explore how the United States could approach Iran's natural gas sector: cooperation, confrontation, and a hybrid approach. Iran desires to become a regional energy hub for exports, and U.S. policymakers must pursue a strategy that preserves U.S. interests while also promoting energy security for its allies and partners.

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LIST OF ACRONYMS AND ABBREVIATIONS

bcm	billion cubic meters
CESEC	Central and South-Eastern European Gas Connectivity
EIA	Energy Information Administration
FLNG	floating liquefied natural gas
GECF	Gas Exporting Countries Forum
IEA	International Energy Agency
IGAT I	Iran Gas Trunk Line I
IPI	Iran-Pakistan-India
JCPOA	Joint Comprehensive Plan of Action
LNG	liquefied natural gas
mcm	million cubic meters
NATO	North Atlantic Treaty Organization
NERD	Near East Regional Democracy
NIGC	National Iranian Gas Company
NIGEC	National Iranian Gas Export Company
NIOC	National Iranian Oil Company
TAPI	Turkmenistan-Afghanistan-Pakistan-India
TCM	trillion cubic meters

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I. INTRODUCTION

The role of natural gas in the global energy mix is growing significantly, presenting substantial economic and geopolitical implications for producers and consumers in the foreseeable future. The stability and viability of energy continue to be vital national interests for the United States and many other countries around the globe. The global energy mix is changing as countries seek to shift their dependence on oil and coal toward natural gas and renewables, which offer benefits such as lower cost, cleaner burning, and long-term sustainability.¹ According to the International Energy Agency, “natural gas supplies 22% of the energy used worldwide, and makes up nearly a quarter of electricity generation.”² Global natural gas consumption will continue to increase, surpassing coal as the second largest source of energy behind oil by 2025.³ Experts predict a looming natural gas shortage in the early to mid-2020s, prompting some of the top natural gas producers in North America, the Middle East, and Eurasia to posture themselves to improve their energy security, by increasing production in pursuit of economic opportunities and geopolitical standing.⁴

Scarce energy resources afford owners and producers economic benefits and strategic leverage in politics. In 2006, then-Secretary of State Condoleezza Rice cautioned that “[energy] has given extraordinary power to some states that are using that power in not very good ways for the international system, states that would otherwise have very little power. It is sending some states that are growing very rapidly in an all-out search for energy

¹ Daniel Yergin, *The Quest: Energy, Security, and the Remaking of the Modern World* (New York: Penguin Books, 2012), 4.

² “Natural Gas,” International Energy Agency, accessed 31 May 2018, <https://www.iea.org/topics/naturalgas/>. While oil, coal, and natural gas account for over 80% of the world’s energy, natural gas currently accounts for 22% of the world’s energy.

³ “Global Insights,” BP Global, accessed 20 July 2018, <https://www.bp.com/en/global/corporate/energy-economics/energy-outlook/country-and-regional-insights/global-insights.html>.

⁴ John Benny, “Chevron Expects LNG Supply Shortage by 2025,” Reuters, 06 March 2018, <https://www.reuters.com/article/us-chevron-lng/chevron-expects-lng-supply-shortage-by-2025-idUSKCN1GI2EH>; “LNG Supply Shortage Expected in Mid-2020s, Shell’s Outlook Says,” LNG World News, 26 February 2018, <https://www.lngworldnews.com/lng-supply-shortage-expected-in-mid-2020s-shells-outlook-says/>.

... and challenging our diplomacy.”⁵ Over the past decade, this reality has remained true for the United States’ efforts in the Middle East with Iran, which has asymmetrically challenged the balance of power in the region alongside growing natural gas markets.

The Middle East is one of the wealthiest regions of the world in terms of natural resources, and the potential for Iran to emerge as a major natural gas supplier will inevitably affect geopolitics as natural gas becomes more important for those seeking supplies. The Middle East possesses 41% of the world’s natural gas supply—79.1 trillion cubic meters (TCM)—and Iran controls almost half of that quantity.⁶ According to the 2018 *BP Statistical Review of World Energy*, Iran possesses the world’s second-largest proved natural gas reserves totaling 33.2 TCM, approximately 17.2% share of the world’s proved reserves.⁷ Iran produced 223.9 billion cubic meters (bcm) of natural gas in 2017, 6.1% share of the global production volume, earning the title of the third largest producer after the United States (20.0%) and Russia (17.3%).⁸ While major gas producers expand production to increase economic opportunities, major natural gas consumers in developing regions such as Europe and the Far East seek energy security by diversifying their supplies. For these reasons, Iran’s natural gas will be very relevant to the future global supply and demand calculus.

The United States, with the endorsement of the European Union and the permanent members of the United Nations Security Council, attempted to reintegrate Iran economically back into the international community in exchange for non-nuclear proliferation through the signing of the Joint Comprehensive Plan of Action (JCPOA) in 2015. On 08 May 2018, President Donald Trump unilaterally withdrew the United States

⁵ “U.S.-India Nuclear Cooperation Agreement,” C-SPAN video, 2:34, 05 April 2006, <https://www.c-span.org/video/?191941-1/us-india-nuclear-cooperation-agreement&start=2324>.

⁶ BP, *BP Statistical Review of World Energy 2018*, 67th ed. (London: BP, June 2018), 26, <https://www.bp.com/content/dam/bp/en/corporate/pdf/energy-economics/statistical-review/bp-stats-review-2018-full-report.pdf>.

⁷ BP, *BP Statistical Review of World Energy 2018*.

⁸ BP, *BP Statistical Review of World Energy 2018*, 28. Despite its production ranking, Iran’s natural gas has been primarily utilized to satisfy subsidized domestic demands and reinjection into underproducing oilfields to free up additional oil for exports. Iran will need to tame domestic consumption as it expands production in coming years.

from the JCPOA, as he believed it was “defective at its core” and “does nothing to constrain Iran’s destabilizing activities, including its support for terrorism.”⁹ Many experts believe the United States’ withdrawal from the agreement has several negative consequences, to include harming the country’s transatlantic relationship with allies and partners, as it places a bind on European countries who are doing business with Iran and, more importantly, damaging the United States’ legitimacy as a nation that is “unwilling to abide by its diplomatic agreements” established during previous administrations.¹⁰ Renewed economic sanctions on Iran will significantly hinder Iran’s ability to attract foreign investments necessary to monetize its vast natural gas reserves. Iran’s inability to produce and export natural gas will deny the global energy market, in particular, the European market, an additional source of energy for energy security and further entrench these countries into relying on Russia for energy at the cost of geopolitical leverage.

The prompting for this research is simple. The global demand for natural gas is increasing, a shortage is looming, and Iran has a significant claim in natural gas resources. This research proceeds with two main chapters that answer two central questions: (1) can Iran monetize its natural gas reserves?; and (2) assuming Iran can, what strategic policy scenarios exist for the United States? Under the circumstances of the United States’ recent withdrawal from the 2015 JCPOA, Iran’s ability to monetize its natural gas reserves in the short-term is substantially limited. However, Iran’s future monetization efforts depend on several factors we examine in this research, such as the expanding global market, attracting foreign investments, and defining a balanced and acceptable relationship with the United States.

In the first chapter, we discuss our central thesis question—Can Iran monetize its natural gas reserves? First, we review Iran’s energy policy to ensure that such efforts are likely. Second, we review Iran’s production and consumption data to determine the amount

⁹ White House, “Remarks by President Trump on the Joint Comprehensive Plan of Action,” 08 May 2018, <https://www.whitehouse.gov/briefings-statements/remarks-president-trump-joint-comprehensive-plan-action/>.

¹⁰ Michael Breen, “The True Consequences of America’s Withdrawal from the Iran Deal,” *The National Interest*, 13 March 2018, <https://nationalinterest.org/feature/the-true-consequences-americas-withdrawal-the-iran-deal-25796>.

of exportable gas the country may have to monetize. Third, we examine potential regional and global markets that Iran may supply. Last, assuming a surplus of natural gas is available to export and market demands, we review and discuss the available ways Iran can reach these markets with existing and future infrastructures.

In the second chapter, we compare two strategic policy scenarios, cooperation and confrontation, that frame historical engagements between the United States and Iran in terms of benefits, risks, and challenges. Then, we propose a third political scenario concerning Iran's natural gas ambitions. In recent decades, the United States has mostly chosen to confront Iran. A confrontational strategy aggressively counters Iran's malign activities with coercive economic sanctions while the United States preserves and promotes its interests in the Middle East. A cooperative strategy focuses on mutual collaboration to reduce conflict between the United States and Iran while actively promoting free-market trade, allowing international investments into the Iranian natural gas industry. This strategy invites an alternative source of natural gas for the global market and may help to increase global energy security. The third political scenario is a hybrid approach that focuses on rebuilding relations and investing in the Iranian youth population in hope of long-term regime change. This approach may prove to be more pragmatic as it combines the benefits of cooperation and confrontation to deter Iran's malign activities in the region and promote energy security for allies. Ultimately, the United States needs to pursue a strategy more likely to endure political cycles and hostilities in the short term, with the goal of cooperation in the long term.

Iran's aspiration to regain national prestige and its ability to emerge as a regional power depends on the success of its resource monetization efforts, and natural gas could become a strategic tool to this end. The combination of Iran's substantial natural gas reserves and the underdevelopment of its natural gas infrastructure provide the basis for the significant strategic opportunities and risks in the years ahead. Before seizing these economic opportunities, Iran will have to invest in its domestic infrastructure and improve geopolitical relationships.

The Islamic Revolution stemmed from a fundamentalist ideology and anti-Western sentiments; however, the Iranian government must balance its confrontation with the West

to optimize economic expansion and stay clear of sanctions targeting its energy sector. Iran's pursuit of its national interests to achieve regional hegemony over the Middle East counter U.S. and Western influences, which Iran believes have prevented the state's ascendance to establish itself as the vanguard for the expansion of the Islamic Revolution, and challenges many U.S. national interests. If Iran negotiates with the United States, then Iran could more effectively monetize its natural gas and reinvest in its battered energy infrastructure.

In an era of rising demands for natural gas and the probability of looming shortage in the next decade, the global economy could benefit from another source of the commodity. Iran has several emerging gas consumers in regional markets, a rapidly growing Far East market, and a European market, where several countries' consumption have grown by 11–22% since 2016 and states are seeking to diversify their dependence on Russian natural gas.¹¹ Iran's natural gas infrastructures, much like the rest of the world's, are still underdeveloped and require technological and monetary investments to fully realize their potential. Energy security is critical in today's international arena because of an increase in demand, the threat of disruption via terrorism, instability in exporting regions, geopolitical rivalries, and countries' need for energy to generate economic growth.¹² Therefore, natural gas has the potential to become a gateway to future cooperation.

Energy security is a matter of national strategy. It is imperative that the United States understand whether Iran can monetize its natural gas reserves to increase its relative bargaining position in international relations. Iran's ascendance in the region and share of the world's total natural gas reserves force energy stakeholders to reevaluate foreign relations with Iran, as sanctions relief could remove punitive repercussions for investors and afford Iran the opportunity to alter trade relations with the global market. Diversification is critical when it comes to energy security, as overdependence on a single

¹¹ BP, *BP Statistical Review of World Energy 2018*, 28.

¹² Daniel Yergin, "Ensuring Energy Security," *Foreign Affairs* 85, no. 2 (March/April 2006): 69, <https://www.foreignaffairs.com/articles/2006-03-01/ensuring-energy-security>.

source makes consumers susceptible to coercion through supply and pricing. With changing geopolitical relationships in the Middle East region, Iran could become the regional hub for oil and natural gas exports, as it desires, and energy exports could afford Iran both geopolitical power and economic wealth. However, the wrong U.S. policy could be detrimental to international relations and the overall viability and stability of the global energy market.

II. IRANIAN NATURAL GAS SECTOR

The energy sector represents an essential part of Iranian society, and poor relations with the West have arrested Iran's economic growth and development for the past several decades. Iran's underdeveloped natural gas sector is one of many industries that "has been battered by government policies, sanctions, war, and political risk" over the years and kept the country from producing excess natural gas to export and generate revenue.¹³ Downward spiraling relations with the West have repressed much-needed growth and development in Iran's energy sector, which needs both customers and investors to monetize its natural gas resources.

The themes of better monetization strategies, more profits, and less Western encroachment remain a consistent economic policy objective even after the 1979 Iranian Revolution. The 1951 Nationalization Act made the Iranian government the recipient of greater revenues through the nationalization of the Iranian energy sector. Iran's economy, much like other resource-rich states, depends on its energy sector for a significant share of its gross domestic product. In 2005, the energy sector contributed 20% of Iran's gross domestic production, 80% of its foreign exchange earnings, and 50% of its government revenue.¹⁴ Iran's economic survival rests on the Iranian welfare state's resiliency, which the success and failure of resource monetization efforts continue to play an important role. However, the United States and the international community have scrutinized Iran and applied wide-ranging sanctions as a result of Iran's regional activities and nuclear program.

International sanctions intended to rectify Iran's behavior have caused rippling effects against Iran's energy sector. During the Ahmadinejad presidency from 2005–2013, Iran's economy was put in a vise and barred from formal trades and investments. Multilateral sanctions targeting banking and energy sectors, from 2012 to 2015, prevented Iran from developing much-needed energy infrastructure. The 2015 Joint Comprehensive

¹³ Suzanne Maloney, *Iran's Political Economy Since the Revolution* (United Kingdom: Cambridge University Press, 2015), 368.

¹⁴ Kenneth Katzman, *Iran Sanctions*, CRS Report No. RS20871 (Washington, DC: Congressional Research Service, 2018), <https://fas.org/sgp/crs/mideast/RS20871.pdf>.

Plan of Action (JCPOA) was a landmark agreement for President Barack Obama, President Hasan Rouhani, and the Iranian reformist platform and it set out to restore diplomacy and end Iran's international isolationism that had been deeply rooted by Mahmoud Ahmadinejad. With the agreement's sanctions relief, Iran was afforded the opportunity to resurrect a battered energy sector, monetize its natural gas reserves, and increase its role in the global energy market. However, in May 2018, President Trump withdrew the United States from the JCPOA, sending a warning that sanctions will resume by the end of 2018.

This chapter serves to address our primary thesis question: Can Iran monetize its natural gas reserves? The short answer under the current political climate is "no"; however, the long answer is "it depends." This chapter is broken down into four main sections. First, we review Iran's historical pursuit of natural resource wealth and discuss Iran's most recent economic strategy for monetizing natural gas. Second, we assess the capacity of Iran's natural gas infrastructure to produce a surplus of natural gas for export. Third, we analyze the current and future demands of the global market and regional markets for natural gas. Last, we assess Iran's ability to reach these markets through both existing infrastructure and developing projects. An understanding of these critical subtopics assert that Iran's natural gas resources are creating a strategic opportunity that can serve as a driver for Iran's economic prosperity and enhance its geopolitical leverage in the 21st century.

A. BACKGROUND AND POLICY

The Islamic Republic of Iran's policies within its energy sector have created obstacles and left little incentive for investors over the years to stimulate monetization and development. Iran's resource nationalization efforts predated the 1979 Iranian Revolution, but constitutional provisions in the post-revolution architecture prevented international oil companies and investors from possessing controlling interests of their investment projects. Profit sharing and repayment arrangements no longer favored the oil companies, which were assuming the risks, leading to a lull in development. However, concerned moderate-Iranian leaders would soon realize that a degree of openness is required to achieve its energy goals.

The Nationalization Act in 1951 was Iran's blatant attempt to regain control of its resources and monetization process, but this effort sparked international rebuke. Before this legislation, Iran's energy sector was mostly privatized and relied on foreign investors to develop, market, and monetize natural resources, which resulted in Iran receiving a disproportionate amount of net profit from its natural resources while international oil companies benefitted greatly. Prime Minister Mohammad Mossadegh, who later became the subject of a covert operation, spearheaded resource nationalization efforts that created the National Iranian Oil Company (NIOC) to oversee the energy-related operations.¹⁵

After Reza Shah was reinstated in 1953, he set in motion export contracts and plans for infrastructure development targeting natural gas markets to demonstrate that Iran was still open for business despite its nationalization efforts. By 1970, Iran was moving toward the 50–50 profit-sharing standard that it coveted and Iran's oil industry began to see exponential growth in subsequent years.¹⁶ The inauguration of the Iran Gas Trunk Line I (IGAT I) in 1970 “represented the first major attempt to monetize Iran's gas resources that were previously wasted through flaring,” a process where gas burns off during oil recovery due to underdeveloped technology and the ability to capture it.¹⁷ IGAT I was originally built to export gas mainly to the Soviet Union through a large trade deal, but instead served as the “backbone of a massive domestic gas utilization system” that rebalanced Iran's domestic energy portfolio and allowed Iran to export more crude oil.¹⁸

The Shah's critics did not believe he was doing enough to protect Iran's energy sector and the Iranian Revolution set out to gain more control and rescinded energy export deals. Though monetization efforts had improved under the shah, this was still not enough for the revolutionaries, who had watched their Arab neighbors prosper and felt more wealth could be unlocked through internal reforms. The revolution set out to “reconfigure the role

¹⁵ In 1953, the United States and Great Britain jointly-participated in an Operation AJAX or TPAJAX, a covert operation to overthrow Prime Minister Mossadegh and reinstate the Shah Reza.

¹⁶ Maloney, *Iran's Political Economy*, 65–66.

¹⁷ Maloney, 372.

¹⁸ Maloney.

of energy in the post-revolutionary economy” and to increase profits.¹⁹ According to a 1982 *New York Times* article, Mohammad Gharazi, Iran’s oil minister at the time, asserted that the shah kept prices “artificially low” and disagreements on price with trade partners consequently prevented the Shah’s IGAT II trunk line from moving forward.²⁰ Though the nascent regime sought to economically fortify itself by reclaiming control and increasing profits, the newly established regime would face significant hurdles down the road.

The rescission of gas export deals following the Iranian Revolution had its consequences and Iran has had to overcome these breaches. Iran’s protectionist ideals did not attract investors. It was not until 1993 that Iran finally sought to revive pre-revolution export options by allowing Gaz de France to conduct feasibility studies on the various pipeline and liquefied natural gas (LNG) export options.²¹ Despite the policy decision to rescind export deals after the revolution, which caused a decline in overall energy production, Iran’s gas production has seen moderate increases in recent decades.²² Had the nascent regime continued or renegotiated deals instead of rescinding the export contracts, Iran’s share in the global energy sector would likely be far more significant today.

Until recently, the Iranian Constitution prohibited foreign and private ownership of natural resources but allowed foreign investments in exploration and development contracts through Iranian subsidiaries.²³ Following the 1979 Revolution, Iran established two key articles in its constitution: Article 81, which prohibits concessions to foreign companies in the energy sector, and Article 153, which forbids “any form of agreement resulting in foreign control over the natural resources, economy, army, or culture of the country.”²⁴ In other words, foreign and private investors can participate in the initial stages

¹⁹ Maloney, 369.

²⁰ “Iranians Challenge Oil Limits,” *New York Times*, 08 November 1982, <http://www.nytimes.com/1982/11/08/business/iranians-challenge-oil-limits.html>; Maloney, *Iran’s Political Economy*, 384.

²¹ Maloney, *Iran’s Political Economy*, 389.

²² BP, *BP Statistical Review of World Energy 2018*, 26.

²³ “Overview,” eia Beta, accessed 03 November 2017, <https://www.eia.gov/beta/international/analysis.php?iso=IRN>.

²⁴ Maloney, *Iran’s Political Economy*, 374.

of natural gas assessment and extraction but must return ownership to the NIOC and its subsidiary, National Iranian Gas Company (NIGC), once the field develops and production starts.²⁵ In return, the NIGC contractually uses revenue from sales to repay foreign and private investors at a rate of 12–17% over a period of five to seven years.²⁶ The NIGC’s current repayment plan to private and foreign investors diminishes Iran’s ability to monetize its natural gas reserves quickly or reinvest in its energy sector as a significant amount of its short-term revenue goes directly to repaying investors.

Iran’s shift toward reformist politics ushered in a wave of diplomatic negotiations, namely the JCPOA, to reintegrate itself back into the global economy. The international community denied Iran the ability to pursue economic prosperity from 2012–2015 as a result of the regime’s behavior. Without a doubt, multilateral sanctions hurt Iran, curtailing Iran’s efforts to utilize its oil and gas resources to create and maintain an economy that fulfills rentier-state obligations to its constituents. However, the JCPOA offered new strategic opportunities for foreign investment to resurrect and develop Iran’s natural gas infrastructure.

Since the JCPOA in 2015, President Rouhani and Ayatollah Khamenei have presented a largely united front, albeit with some differences of strategy, in establishing an economy that can resist the level of pressure the West imposed with sanctions in previous years. Ayatollah Khamenei seems to prefer more isolation from the West, while President Rouhani believes that “constructive engagement with the world” is the path toward a “resistance economy.”²⁷ According to the Council on Foreign Relations, Ayatollah Khamenei defines the term “resistance economy” as “an economy that weans itself off oil

²⁵ eia Beta, “Overview”; The National Iranian Oil Company (NIOC), National Iranian Gas Company (NIGC), and National Petrochemical Company (NPC) are the three major state-owned companies that govern numerous subsidiaries for upstream, extraction and production, and downstream, import and export, energy activities. The NIOC controls all upstream projects for natural gas and both upstream and downstream activities for oil in Iran. The NIGC governs all natural gas downstream activities, and one of their more significant subsidiaries National Iranian Gas Exporting Company (NIGEC) controls domestic distribution. Last, the NPC governs the production and distribution of Iran’s petrochemicals.

²⁶ eia Beta.

²⁷ Ray Takeyh, *Iran’s “Resistance Economy” Debate*, Council on Foreign Relations, 07 April 2016, <https://www.cfr.org/expert-brief/irans-resistance-economy-debate>

exports, seeks to safeguard domestic industries from foreign competition, eschews trade in favor of local markets, and keeps its money out of international banks.”²⁸ Iran’s economic grand strategy, therefore, is to create an economy that is resilient and durable to withstand a resurgence of sanctions, should the West reinstate them.²⁹

Following the JCPOA, Iran made necessary policy changes to better encourage investment in its battered energy sector. In a 2015 Chatham House article, Paul Stevens stated, “Iran’s decision to open to international investment reflected both its concern that the [energy] sector was falling behind technologically and an ideological shift towards greater private-sector involvement in the economy, along with a political effort to reduce the country’s isolation internationally.”³⁰ In 2015, as a result of sanctions relief afforded by the JCPOA, Iran unveiled its Sixth Five-Year Development Plan (2016–2021) to support their resistance economy initiative, which outlined growth and development goals in its natural gas sector to attract investors on the heels of sanctions relief.³¹ Iran has also made policy changes through the Iranian Petroleum Contract to allow joint ventures between international oil companies and the NIOC in both exploration and production.³² A recent Congressional Research Service report argues that this initiative gave investors more rights and better profit-sharing, making investments more attractive.³³ Iran’s economic survival and geopolitical prowess in the region depend on its ability to expand and entrench favorable political and economic alliances amid international sanctions on Iran’s banking and oil industries, and these policy efforts seem to be what Iran needed, but these efforts may prove to be fruitless if sanctions resume.

²⁸ Takeyh.

²⁹ Takeyh.

³⁰ Paul Stevens, “Prospects for Iran’s Oil and Gas Sector,” Chatham House, last modified 05 March 2015, <https://www.chathamhouse.org/publication/prospects-irans-oil-and-gas-sector>.

³¹ “Iran Plans For \$100BN Upstream Investment Over 5 Years,” Natural Gas World, 01 March 2016, <https://www.naturalgasworld.com/100bn-investment-planned-for-irans-upstream-over-next-5-years-28434>.

³² Natural Gas World.

³³ Katzman, *Iran Sanctions*.

Following Iran's resistance economy framework, the NIGC, NIOC's subsidiary, desires robust production growth and aims to expand regional energy trade. In April 2018, NIGC's distribution director, Saeid Momeni, highlighted Iran's goal of increasing natural gas exports by 8% by 2022 and explained that Iran's ability to boost natural gas exports to its neighbors would increase the country's national security.³⁴ Over the course of this new development, Iran hopes to more than double its 2017 recorded production by producing 1.3 billion cubic meters (bcm) per day by 2022, which equates to 474.5 bcm per year.³⁵ Although this was a noteworthy announcement that Iran's energy sector was open for business, it also demonstrates Iran's dire need to attract investors to resurrect and develop its battered infrastructure.

Iran recognizes that a degree of international cooperation is required to achieve its goals and founded the Gas Exporting Countries Forum (GECF) in 2001. Iran leads the cartel by providing detailed market analysis for the consortium. Gas giant Russia joined the forum in 2008, and as of 2016 the GECF members collectively controlled approximately 67% of the world's proved natural gas reserves.³⁶ Though the GECF does not have the ability to control prices, Iran's executive leadership in the organization certainly showcases geopolitical efforts concerning natural gas trading.

³⁴ "Gas Exports Can Be Vital in Ensuring National Security," National Iranian Gas Company, accessed 11 April 2018, <http://iraniangas.ir/Portal/Home/ShowPage.aspx?Object=NEWS&CategoryID=4cd46ada-b65f-4830-abd3-f972dc23f6ac&WebPartID=b05b729f-9999-48df-9b96-01d81b214d55&ID=c2d8c920-8aab-4841-8dc3-264d17cb74d5>.

³⁵ "Iran Eyes New Gas Ventures," *Financial Tribune*, 03 October 2017, <https://financialtribune.com/articles/energy/73439/iran-eyes-new-gas-ventures>.

³⁶ Gas Exporting Countries Forum, *GECF Global Gas Outlook 2017* (Doha, Qatar, December 2017), 72, https://www.gecf.org/_resources/files/events/gecf-global-gas-outlook-2040---2017-edition/gecf-2017-outlook-14122017.pdf; "GECF Global Gas Model," Gas Exporting Countries Forum, accessed 12 April 2018, <https://www.gecf.org/gas-data/gecf-global-gas-model.aspx>. "The GECF GGM is a specialized, energy/gas forecasting tool that reflects the dynamic changes taking place in the in gas markets at a specific time horizon. It can stimulate the impact of expected/potential/virtual changes on the global gas chain, it is a perfect tool for tackling the What-If questions related to future gas markets, and also enables a better understanding of key uncertainties and outlook on the medium and long term supply and demand of gas." The GECF and its Global Gas Model, developed between 2011–2015, is a practical example of Iran fulfilling a hegemonic role as a regional energy hub. The model has several main features to include: maps of energy demands and forecasts what will be needed; maps upstream projects, present and future, and their production; maps routes, corridors, and other exportation infrastructure, including LNG plants; and it "gives an idea on the long-term trends of the gas market export/import routes based on historical figures," its core feature.

At the national policy level, Iran's shift toward a more open-market approach through its Sixth Five-Year Plan and policy that better attracts joint ventures establishes several economic opportunities for Iran and international investors. The 2015 Iranian Petroleum Contract model lifted 35-year-old prohibitions outlined in the Islamic Republic's Constitution that allows for and encourages necessary joint ventures to kick-start development initiatives. Though Iran's policy has postured the country's natural gas sector for enormous growth in the coming years, resumed sanctions on Iran will inevitably change this calculus.

B. IRAN'S NATURAL GAS CAPACITY

The purpose of this section is to analyze Iran's natural gas capacity in terms of production and consumption to determine the amount of exportable gas Iran may have to monetize in the short term. Historically, Iran's production has been almost entirely domestically consumed. Recently, that trend has slowly improved, credited mainly to sanctions relief ushered by the JCPOA, which allowed for the reopening of Iran's energy sector in 2015. If Iran can address inefficient production methods and wasteful domestic consumption, while encouraging foreign investments, Iran would be able to increase natural gas supplies for export.

Iran's massive proved natural gas reserves afford it the potential to emerge as a dominant world supplier of natural gas, but investments are needed. Iran's largest natural gas field, South Pars, which it shares with Qatar, accounts for approximately 40% of Iran's proved natural gas reserves and 55% of Iran's total production.³⁷ The South Pars Field is undergoing a 24-phase development plan to increase production, fulfill domestic demands, and potentially increase export capacity upon completion in 2022 (see Figure 1).³⁸ Thus far, 18 phases have been completed, requiring \$71 billion, and the remaining six phases require an estimated \$20 billion in investments.³⁹ Due to economic stagnation, Iran cannot internally finance the project's final phases, but completion of the South Pars Field will

³⁷ eia Beta, "Overview."

³⁸ Maloney, *Iran's Political Economy*, 411.

³⁹ eia Beta, "Overview."

increase natural gas production by 74.6 bcm per year.⁴⁰ Since the JCPOA, Iran has gained investments primarily from Russia’s Gazprom and France’s Total in South Pars; however, due to the United States’ withdrawal from the JCPOA in May 2018, the threat of secondary sanctions have already caused France’s Total to back out of its planned project, despite Chinese financial backing.⁴¹

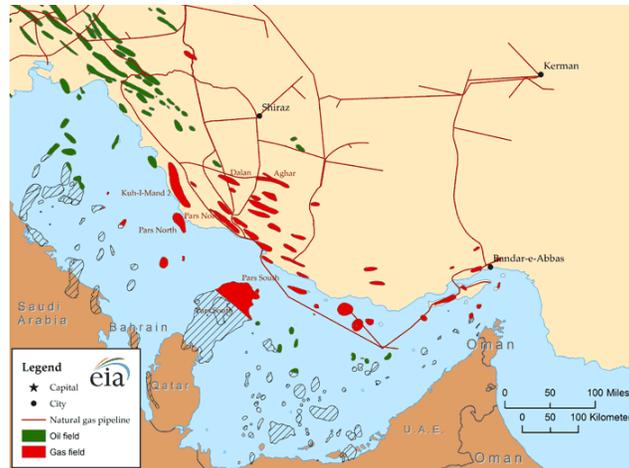


Figure 1. Iranian Gas Fields⁴²

Beyond South Pars, Iran has several sizeable natural gas fields pending development, demonstrating no shortage of opportunities for investors. Natural gas exploration in Iran remains relatively high, leading to gas field discoveries that include Kish (2 trillion cubic meters [TCM] of recoverable reserves), North Pars (1.4 TCM), Golshan (1.1 TCM), Lavan (1.8 TCM), Forouz B (700 bcm), Ferdowsi (308 bcm), and Khayyam (204 bcm)—which can provide Iran with a more significant share of the natural

⁴⁰ eia Beta; BMI Research, *Iran Oil & Gas Report Q4 2017: Includes 10-Year Forecasts to 2026* (London: BMI Research), 24.

⁴¹ François De Beaupuy, “Total Stops Iran Gas Project as Risk From Sanctions Too High,” Bloomberg, 16 May 2018, <https://www.bloomberg.com/news/articles/2018-05-16/total-stops-iran-investments-as-risk-from-sanctions-too-high>; “Gazprom to Submit Proposal for 3 Persian Gulf Gas Fields,” *Financial Tribune*, 16 December 2017, <https://financialtribune.com/articles/energy/77967/gazprom-to-submit-proposal-for-3-persian-gulf-gas-fields>

⁴² Source: eia Beta, “Overview.”

gas export market.⁴³ According to the National Iranian Oil Company's report, Iran has 184 fields consisting of 390 reservoirs, of which 171 fields are either developed or under development, and 209 undeveloped reservoirs.⁴⁴ According to the U.S Energy Information Administration (EIA), finding more gas to increase proved reserves is not a priority with so many opportunities on the table; however, with Iran's high rate of exploration success, its share of natural gas resources could be much higher than reported.⁴⁵

In recent years, Iran's natural gas production has continued to rise despite sanctions, mostly because of the need to satisfy its growing domestic demand. The sanctions on Iran's energy sector mostly affected its oil trade; however, production growth in natural gas did see a slight plateau in 2013 (see Figure 2). As depicted, natural gas production resumed the following year and continued to increase. In 2017, Iran produced 223.9 bcm of natural gas, up almost 21 bcm from the previous year, and earned the title of the third largest global producer with 6.1% share of the world's natural gas market after the United States (734.5 bcm) and Russia (635.6 bcm).⁴⁶ Despite Iran's natural gas production, its natural gas has been primarily utilized to satisfy domestic demands, which it subsidizes. Iran's overall domestic consumption in 2017 ranked fourth in the world, totaling 214.4 bcm (6.8% growth over the previous year and 5.8% of the world's market share).⁴⁷ Historically, Iran's production growth has been in tandem with consumption growth, limiting Iran's ability to export any sizeable volume.

⁴³ BMI Research, *Iran Oil & Gas Report Q4 2017*, 24; eia Beta, "Overview."

⁴⁴ "Home Page," National Iranian Oil Company, accessed 11 April 2018, <http://en.nioc.ir/Portal/Home/>.

⁴⁵ Source: EIA Beta, "Overview."

⁴⁶ BP, *BP Statistical Review of World Energy 2018*, 28.

⁴⁷ BP, *BP Statistical Review of World Energy 2018*, 29.

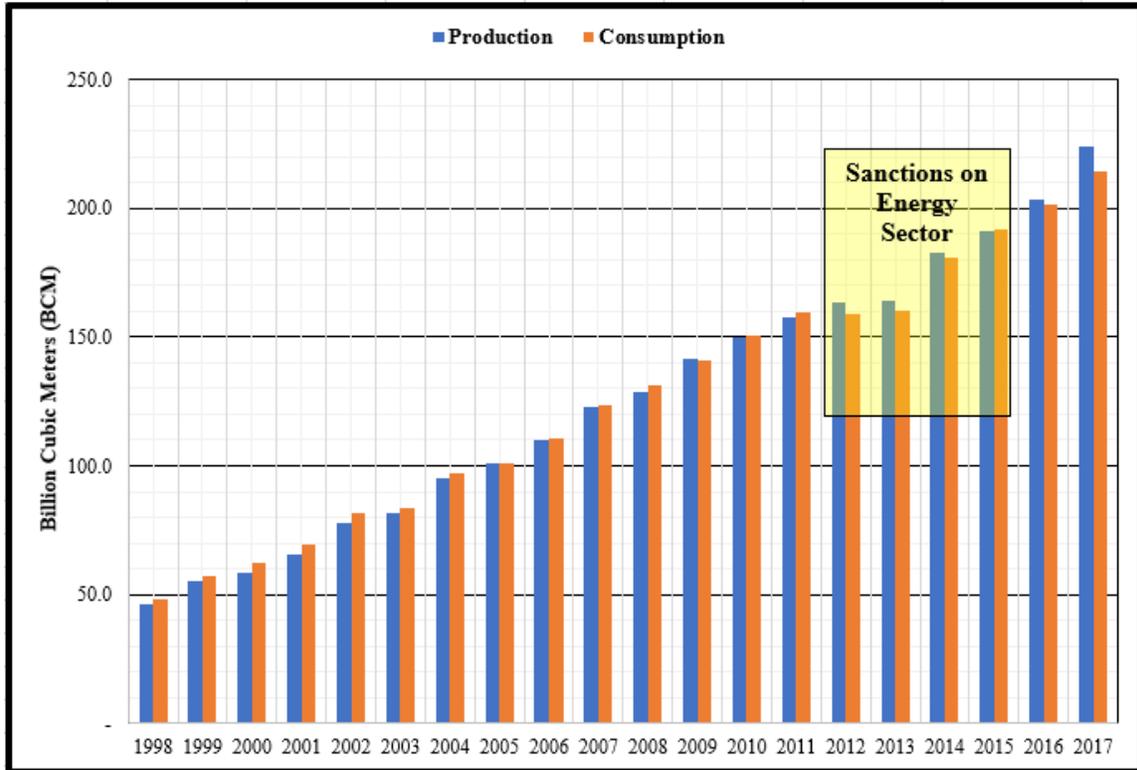


Figure 2. Iran’s Production and Consumption (1998–2017)⁴⁸

The Iranian government’s natural gas subsidies have limited the country’s ability to monetize the resource domestically and, therefore, impact the government’s ability to invest in its natural gas infrastructure. The U.S. Energy Information Administration (EIA) reports the subsidized cost of natural gas as approximately \$34,000 per million cubic meters (mcm) for domestic consumption in Iran, which is 90% lower than the approximated average residential natural gas price in the United States of \$355,000 per mcm.⁴⁹ Since President Rouhani’s victory in the 2013 election, he has set out to reduce

⁴⁸ Adapted from BP, *BP Statistical Review of World Energy 2018*, 28-29; *BP Statistical Review of World Energy 1965–2017*, accessed 7 August 2018, <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>.

⁴⁹ Pooya Azadi et al., “The Outlook for Natural Gas, Electricity, and Renewable Energy in Iran,” *Stanford Iran 2040 Project: An Academic Platform for Research on Iran’s Long-Term Sustainable Development*, Working Paper #3 (Stanford, CA: Stanford University, 2017), 10.

these subsidies and divert revenues back into productive investments.⁵⁰ Economic issues, as opposed to political issues, seem to be the motivator that explains the recent protests in Iran. Domestic protests suggest that attempts to increase profits off Iran’s domestic market through a reduction of subsidies will be a point of contention between the Iranian government and the Iranian people, who rely on subsidies to keep the cost of living down. If Iran chooses to cut subsidies to increase natural gas revenues for its investments in the void of willing foreign investors, it is likely that protests would break out again in Iran.

Iran has ambitious production growth projections under the JCPOA due to emerging foreign investments, but Iran continues to wrestle with its growing domestic demand. Iran is hopeful that total natural gas production from its gas fields will increase to 1.2–1.3 bcm per day or 438–474 bcm per year by 2022.⁵¹ Although the GECF did not cite Iran-specific production estimates beyond 2022, the GECF does forecast limited production growth for its members beyond 2025. We believe Iran will play a role in the consortium’s collective increase, while also crediting initiatives in Qatar, Oman, and Iraq’s natural gas sectors.⁵² The GECF forecasts Iran’s domestic consumption to rise over the next two decades, reaching 308 bcm per year by 2040 (see Figure 3).⁵³ If the GECF’s consumption estimates are correct and Iran achieves its production goals, Iran will have an estimated 205–241 bcm of exportable natural gas by 2022.⁵⁴

⁵⁰ Gareth Smyth, “Iran’s Protests: All About The Economy?,” Lobe Log, January 11, 2018, <https://lobelog.com/irans-protests-all-about-the-economy/>.

⁵¹ “The NIGC’s Strategic Objectives,” National Iranian Gas Company, accessed 11 April 2018, <http://www.iraniangas.ir/Portal/home/>; *Financial Tribune*, “Iran Eyes New Gas Ventures.” While *Financial Tribune* reported 1.3 bcm/day in late 2017, NIGC’s website establishes 1.2 bcm/day as the goal. Regardless, the projections are more than double their 2016 production numbers.

⁵² Gas Exporting Countries Forum, *GECF Global Gas Outlook 2017*, 74.

⁵³ Gas Exporting Countries Forum, 63.

⁵⁴ While Iran’s production goal is between 438–474 bcm, GECF forecasts consumption to be 219 bcm in 2019 and 247 bcm in 2025. By averaging the two consumption estimates, we determine 233 bcm is the target for 2022. By subtracting 233 bcm from the 438–474 bcm production goal, we arrive at 205–241 bcm of available gas for export. Gas Exporting Countries Forum, *GECF Global Gas Outlook 2017*.

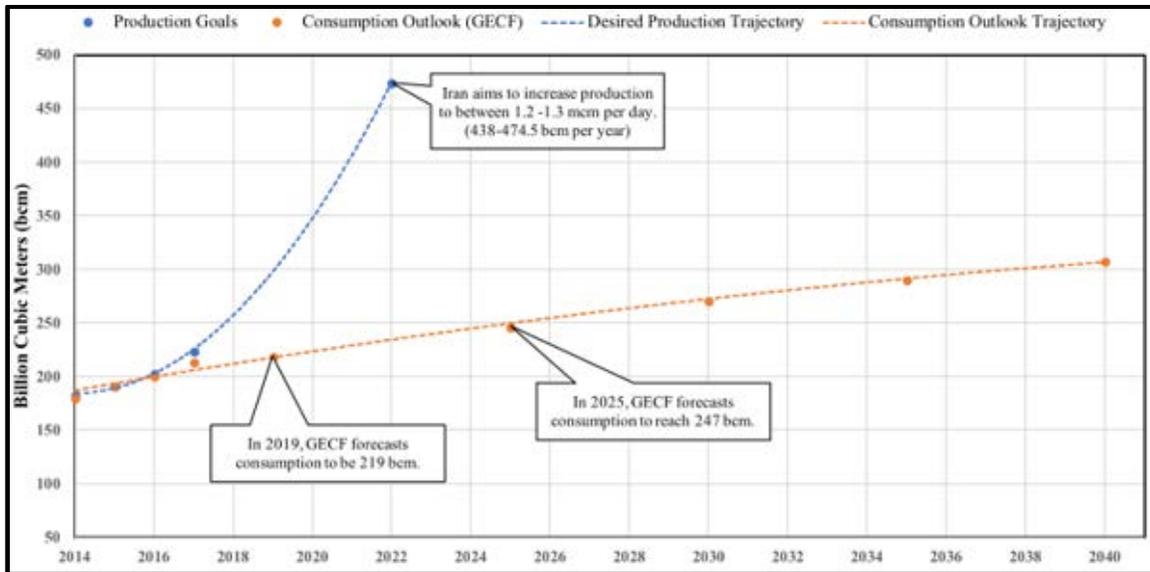


Figure 3. Iran’s Desired Natural Gas Production and Consumption⁵⁵

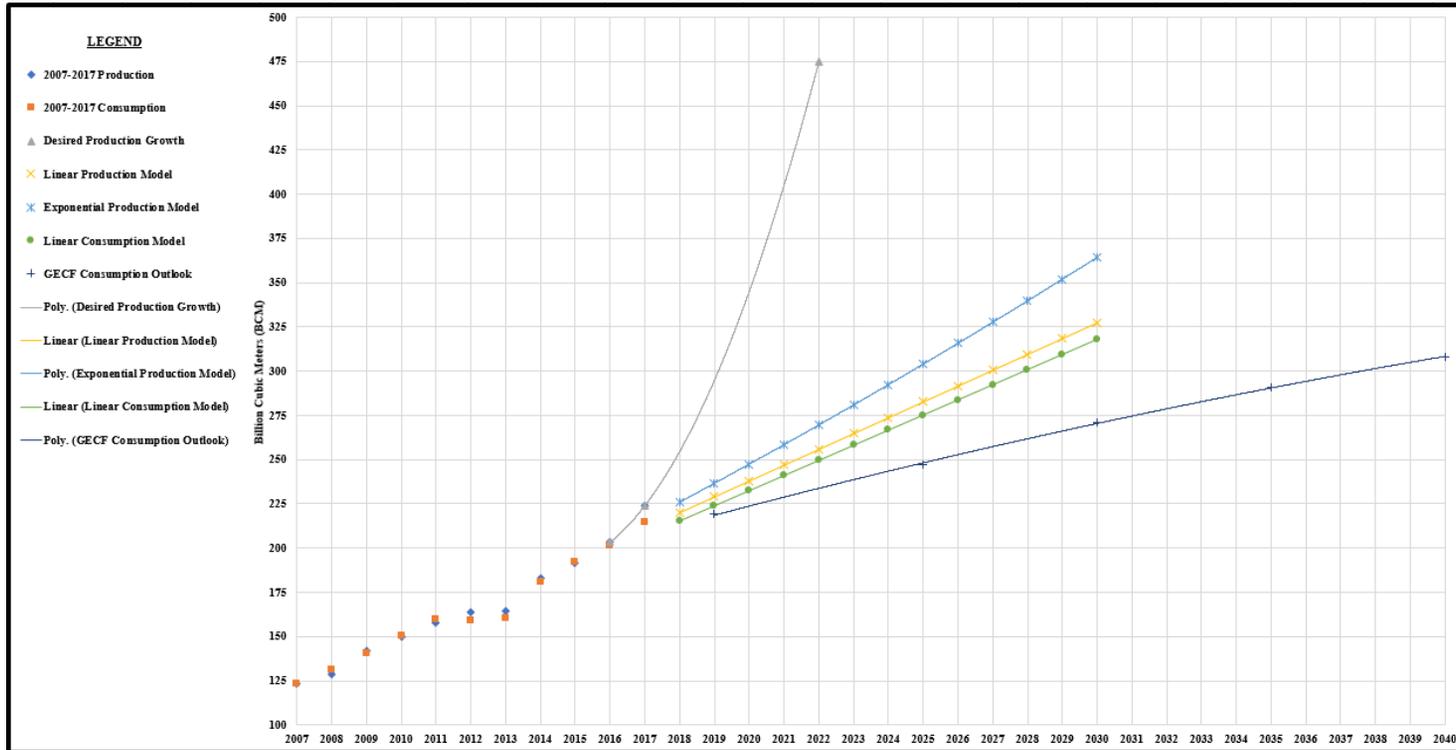
Although Iran projects robust production growth through 2022, Iran’s actual growth trend is more modest. While analyzing Iran’s annual recorded production and consumption data between 1998–2017, we generated three projections: production growth along linear growth trajectory, with a coefficient of determination that explains 99.24% of annual change in production; production growth along a slightly exponential growth trajectory, with a coefficient of determination that explains 99.44% of the annual change in production; and consumption growth along a linear growth trajectory with a coefficient of determination that explains 99.27% of the annual change in consumption. Not surprisingly, both production and consumption modeled linearly continued to rise in tandem with one another as Iran continues to produce sufficient natural gas to at least satisfy the country’s rising domestic demands (see Figure 4).

Iran has at least three alternate futures: robust growth, modest growth, or somewhere in between—regardless, we expect growth based on analysis to satisfy rising domestic consumption, as shown in Figure 4. Given the size of Iran’s domestic market, it

⁵⁵ Adapted from BP, *Statistical Review of World Energy 2018*, 28-29; Gas Exporting Countries Forum, *GECF Global Gas Outlook 2017*, 63; National Iranian Gas Company, “The NIGC’s Strategic Objectives.”

is reasonable to assume that domestic demand will be a driver of modest growth. Natural gas accounts for 70% of Iran’s energy mix for electricity generation, while oil contributes to 22% of the overall mix, and this is not likely to change.⁵⁶ For Iran to achieve robust growth, it will have to garner foreign investments at an unprecedented rate. As previously discussed, Iran’s deliberate efforts under the Iranian Petroleum Contract initiative make current investment opportunities more attractive. Iran must avoid sanctions targeting its energy sector to keep investors on their projects, which in today’s political climate is less likely with the United States’ withdrawal from the JCPOA. Iran’s future is somewhere in between and its ability to increase production beyond historically determined forecasts will be dependent on improving international relations with either the United States or by mustering support from those international partners that wish to remain in the JCPOA—though the latter will be difficult given the effects of secondary sanctions.

⁵⁶ Gas Exporting Countries Forum, *GECF Global Gas Outlook 2017*, 68–69.



Model data was derived from production and consumption data from 1998–2017.

Figure 4. Iranian Natural Gas Comprehensive Growth Projections⁵⁷

⁵⁷ Adapted from *BP Statistical Review of World Energy 2018*, 28–29; *BP Statistical Review of World Energy 1965-2017*; Gas Exporting Countries Forum, *GECF Global Gas Outlook 2017*, 63; National Iranian Gas Company, “The NIGC’s Strategic Objectives.”

In light of high domestic consumption, Iran’s natural gas industry requires technological modernization, processing improvements, and transportation infrastructure to optimize industrial production methods and increase exportable natural gas volume. According to the U.S. EIA, Iran’s inefficient methods of reinjecting natural gas “into oil wells to enhance oil recovery” and the lack of infrastructure “to capture and transport gas associated with oil production” causes Iran to lose a substantial amount of its gross production.⁵⁸ The *Stanford Iran 2040 Project* estimates Iran flares approximately 33 mcm of natural gas per day with the potential opportunity costs ranging from \$60,000 to \$80,000 per mcm (high-end total \$963.6 million a year).⁵⁹ If Iran can gain the means to modernize and improve its practices, it would most likely free up additional natural gas units to export to regional markets.

Iran has made recent efforts to address some of its flaring waste through joint ventures with foreign companies. In October 2017, the managing director of NIOC, Ali Kardor, announced the company’s contract with the Norwegian oil and gas company, Hemla Vantage, to build a floating liquefied natural gas (FLNG) station.⁶⁰ The 20-year joint project will capture and monetize approximately 1 bcm of natural gas from flaring in Iran’s South Pars Field each year for exports to the global market.⁶¹ Although 1 bcm of natural gas is relatively minuscule for Iran’s overall production volume, it serves as an example for future small project investors. As stated previously, Iran is currently losing approximately 11–12 bcm of natural gas each year through flaring, which could be captured and monetize to approximately \$2 billion a year.⁶²

⁵⁸ “Country Analysis Brief: Iran,” U.S. Energy Information Administration, 23, accessed 05 August 2018 <https://www.eia.gov/beta/international/analysis.php?iso=IRN>.

⁵⁹ Azadi et al., “The Outlook for Natural Gas,” 9–10. Flare intensity is defined as the ratio of flared gas to oil produced.

⁶⁰ “Iran, Norwegian Company to Sign FLNG Unit Deal,” *Financial Tribune*, 14 October 2017, <https://financialtribune.com/articles/energy/74122/iran-norwegian-company-to-sign-flng-unit-deal>.

⁶¹ Trend, “Iran Signs First FLNG Contract with Norway,” *Azer News*, 27 October 2017, <https://www.azernews.az/region/121184.html>.

⁶² Robin Mills, “Iran Oil and Sanctions,” *Columbia SIPA*, May 2018, 1. https://energypolicy.columbia.edu/sites/default/files/pictures/Iran%20Oil%20and%20Sanctions_CGEP_Mills.pdf.

Iran's sheer volume of natural gas reserves affords it great potential; however, Iran will need to manage international relationships better, affecting needed investments and determining which alternate future lies ahead. Although Iran's natural gas production is projected to rise, how much depends on investments, which become much harder to gain under a sanctioned regime. Based on Iran's projected growth in an open market, Iran could have between 205–241 bcm by 2022 available for export to the global market, which will be limited by market demand and its export infrastructure. However, historical analysis shows that modest growth, even under sanctions, in tandem with a rising consumption will likely occur if Iran's gas sector does not garner the needed investments. Iran's large domestic market can support this modest growth as it has shown in the past decades, but attempts to monetize natural gas in its domestic market through the reduction of subsidies may create socio-political unrest. For Iran to achieve robust growth, investments from foreign partners in an open market while avoiding U.S.-led sanctions will be paramount.

C. GLOBAL NATURAL GAS MARKETS

The global market offers Iran several regional markets for which to monetize its natural gas: Europe, the Far East, and the Middle East. Projections from various energy studies suggest an increase in the global demand for natural gas to facilitate economic growth, enable power generation, and satisfy the requirement for environmentally friendly energy consumption. From a policy standpoint, the Paris Climate Accord and other multinational agreements signal a more significant global demand for responsible energy consumption through the use of natural gas and renewable energy sources. The use of natural gas continues to increase in power-generation mixes as it offers an alternative source of energy to facilitate economic growth while providing long-term environmental benefits.

Global natural gas consumption will continue to rise, surpassing coal as the second-largest source of energy behind oil by 2025.⁶³ Aside from the United States' projected growth, China, India, Africa, and the Middle East are projected to increase their natural gas

⁶³ BP Global, "Global Insights."

consumption. The most significant projected annual growth of over 3.8% will occur in the Chinese, Indian, and African markets, whose growth will increase from 209 bcm, 50 bcm, and 138 bcm in 2016, to 616 bcm, 142 bcm, and 338 bcm, respectively by 2040 (see Figure 5).⁶⁴ According to the *GECF Global Gas Outlook 2017*, natural gas will remain the second most utilized source of energy in the mix until the late 2030s, when it overtakes coal and becomes the leading producer of electricity.⁶⁵

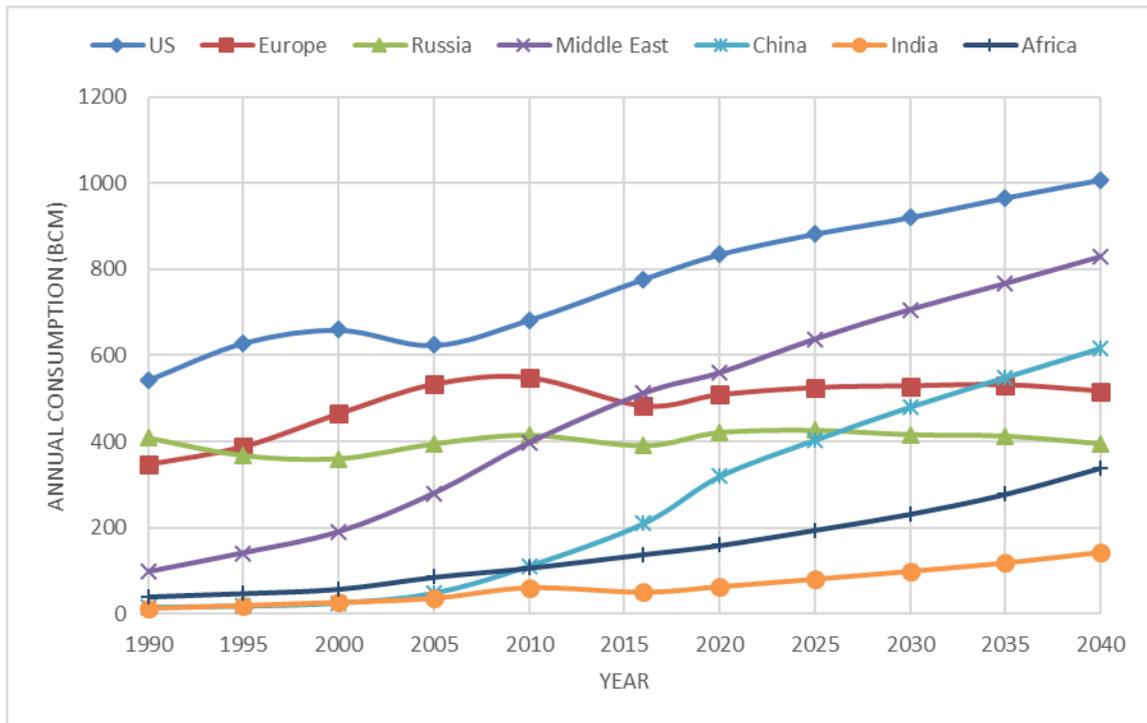


Figure 5. Natural Gas Consumption (Projection)⁶⁶

⁶⁴ Data was provided in billion cubic feet per day, which the authors converted into billion cubic meters per year to be consistent with other data utilized throughout the report. “Energy Outlook Downloads and Archive,” BP Global, accessed 20 July 2018, <https://www.bp.com/en/global/corporate/energy-economics/energy-outlook/energy-outlook-downloads.html>.

⁶⁵ Gas Exporting Countries Forum, *GECF Global Gas Outlook 2017*, 66.

⁶⁶ Adapted from BP Global, “Energy Outlook Downloads and Archive.”

According to the GECF, as the world's population is projected to increase from around seven billion people today to over nine billion in 2050, global energy demand will undoubtedly increase along with per capita gross domestic production.⁶⁷ Around the world, many countries and regional organizations are promoting reforms that endorse the role of natural gas in energy conversions due to its environmental benefits.⁶⁸ "Shell LNG Outlook 2018" reports an expected increase in global natural gas demand to average 2% a year between now and 2035, which is double the estimated growth rate for total global energy demand.⁶⁹

Iran's geographic location affords it export opportunities to the European and Far East energy markets, particularly China and India, which make up a third of the world's population. In March 2017, the NIGC presented its future goals for natural gas imports and exports, which suggest its intent to not only export to regional partners but also expand to the European and Far East markets.

1. European Market

The European market will have the most significant demand in the next decade for natural gas. European countries' desire for energy security stems from their overdependence on Russian energy. According to the *BP Statistical Review of World Energy 2018*, European countries imported over 489 bcm of natural gas and consumed over 531 bcm in 2017.⁷⁰ In further analysis, European countries imported 423.4 bcm of natural gas through regional pipelines, of which almost 190 bcm came from the Russian

⁶⁷ "Shell LNG Outlook 2018," Shell, accessed 20 July 2018, 5, https://www.shell.com/energy-and-innovation/natural-gas/liquefied-natural-gas-lng/lng-outlook/_jcr_content/par/textimage_864093748.stream/1519645795451/d44f97c4d4c4b8542875204a19c0b21297786b22a900ef8c644d07d74a2f6eae/shell-lng-outlook-2018-presentation-slides.pdf

⁶⁸ Shell, 7.

⁶⁹ "Shell LNG Outlook 2018: Factsheet," Shell, accessed 20 July 2018, 2, https://www.shell.com/energy-and-innovation/natural-gas/liquefied-natural-gas-lng/lng-outlook/_jcr_content/par/textimage_864093748.stream/1519880585608/f066fba0567e9e7ad3d260e48f09b008cc3a32983f7e875ee5927a9f675a21d0/shell-lng-outlook-2018-final-overview-factsheet.pdf.

⁷⁰ BP, *BP Statistical Review of World Energy 2018*, 29, 34.

Federation, 109.2 bcm came from Norway, and 43.3 bcm came from the Netherlands.⁷¹ Regarding supply by liquid natural gas (LNG), Europe received over 65.7 bcm of imports, to include 23.7 bcm from Qatar and 14.1 bcm from Algeria.⁷² In terms of consumption growth, European natural gas consumption grew by 5.5% (505.6 to 531.7 bcm) in 2017, which was significantly higher than its production growth of 1.7% (238.6 to 241.9 bcm).⁷³ Due to Europe's deliberate investments in renewables, its natural gas consumption will remain relatively constant with a projected demand of 554 bcm by 2040, an increase of 23 bcm.⁷⁴ If this trend continues, European nations will need to secure additional sources for natural gas or maintain its reliance on Russian energy, which comes with political coercion.

Russia's current stranglehold on Europe's natural gas market causes a substantial amount of anxiety due to the political leverage that Russia has over dependent countries and the European Union. European nations can recall when Russian-owned Gazprom cut natural gas exports into Ukraine, as a transit state in 2006 and 2009, which affected 18 European countries in the middle of winter.⁷⁵ Cory Welt, an analyst in European Affairs, reported in a recent Congressional Research Service report that in 2015, seven European Union countries and five non-European Union countries were 100% dependent on Russia for natural gas imports.⁷⁶ On March 20, 2015, a Memorandum of Understanding titled "Joint Approach to Address the Natural Gas Diversification and Security of Supply Challenges" was signed by the European Union and 16 non-European Union countries. This memorandum of understanding acknowledged Europe's overdependence on a single supplier (Russia) for natural gas and its susceptibility to political influence due to energy

⁷¹ BP, 34.

⁷² BP, 34.

⁷³ BP, 28–29.

⁷⁴ "Regional Insights—European Union," BP Global, accessed 20 July 2018, <https://www.bp.com/en/global/corporate/energy-economics/energy-outlook/country-and-regional-insights/european-union-insights.html>.

⁷⁵ Ildiko Benke, "Power and Energy: Geopolitical Aspects of the Transnational Natural Gas Pipelines from the Caspian Sea Basin to Europe" (master's thesis, Naval Postgraduate School, Monterey, CA, 2010), 1, <http://www.dtic.mil/docs/citations/ADA524510>.

⁷⁶ Cory Welt, *Russia: Background and U.S. Policy [August 21, 2017]*, CRS Report No. R44775 (Washington, DC: Congressional Research Service, <https://www.hsdl.org/?abstract&did=803908>, 18).

security, thus promoting the Central and South-Eastern European Gas Connectivity (CESEC) initiative to diversify natural gas imports by investing in LNG terminals and securing new suppliers.⁷⁷

The controversial Nord Stream 2 pipeline project promises to “enhance [the] security of supply, support climate goals and strengthen the internal energy market” by providing natural gas from Russia to the European Union.⁷⁸ Although it may sound promising, Nord Stream 2 does not diversify the source of the natural gas coming into Europe or increase the U.S. allies’ energy security. Nord Stream 2 essentially bypasses the contentious borders between Russia and Ukraine and further increases the European Union’s dependence on Russia for natural gas and solidifies Russia’s political-economic leverage over its consumers. The United States continues to contest the initiative for a variety of reasons to include the superficial energy security at the cost of geopolitical and economic instability.⁷⁹ In recent developments, European nations, in particular, Germany, have wavered in their support for the Nord Stream 2 project.⁸⁰

⁷⁷ “Memorandum of Understanding: A Joint Approach to Address the Natural Gas Diversification and Security of Supply Challenges as Part of the Central and South-Eastern European Gas Connectivity (CESEC) Initiative,” Europa, accessed November 3, 2017, https://ec.europa.eu/energy/sites/ener/files/documents/CESEC%20MoU_signed.pdf.

⁷⁸ “A New Pipeline for Europe’s Energy Future,” Nord Stream II, accessed 23 March 2018, <https://www.nord-stream2.com/project/rationale/>.

⁷⁹ Nick Snow, “Senators Want U.S. to Use All Options to Oppose Nord Stream 2 Pipeline,” *Oil and Gas Journal*, March 2018, <https://www.ogj.com/articles/2018/03/senators-want-us-to-use-all-options-to-oppose-nord-stream-2-pipeline.html>. In a letter of the United States Secretary of Treasury, Steven Mnuchin, and Deputy Secretary of State, John Sullivan, 39 bi-partisan Senators protested NORD STREAM 2 as a “step backward in Europe’s efforts to diversify its gas suppliers and make U.S. allies there more susceptible to Russia’s coercion and malign influence.” The letter goes on to recommend the United States actively support technological and financial investments to diversify Europe’s energy sources, suppliers, and routes to ensure our allies’ long-term economic independence.

⁸⁰ “Germany’s Support for Nord Stream 2 Wavers,” *Oil and Gas Journal*, 11 April 2018, https://www.ogj.com/articles/2018/04/germany-s-support-for-nord-stream-2-wavers.html?cmpid=enl_ogj_ogj_daily_update_2018-04-11&pwhid=591bd10ff6a6e0d25700bd9f523974d70a2e32c64b4ae241648e3ae54ee34a2a8b1e2f8776fc31cd222c3e0f5984e723162595ee1813686689429add8afa0f85&eid=414624756&bid=2064701. Germany has traditionally supported the construction of Nord Stream 2 as an additional source of natural gas into the country. Following Chancellor Angela Merkel’s meeting with Ukrainian President Petro Poroshenko in April 2018, Chancellor Merkel stated “this [Nord Stream 2] isn’t only an economic project, there are political factors to be considered.”

The European Union has also expressed an interest in a Southern Gas Corridor to diversify its natural gas routes and supply, which provides Iran an opportunity to enter the European market and monetize its natural gas. This route to Europe originates in the Caspian Sea, making Turkey the energy hub. Russia could still become a dominant supplier to Turkey through TurkStream, which is another Gazprom project. Upon completion of TurkStream, Russia will deepen its political-economic leverage over European states that are dependent on the Southern Gas Corridor for Russian natural gas. European countries are having a difficult time diverting away from Russian energy due to its proximity, established infrastructures, and relative cost. Iran could potentially find favor here, using existing trade agreements with Turkey, at least until 2026, to move additional volumes of gas to Turkey for input into the new corridor for the European market.⁸¹ From an energy security standpoint, the European market would likely prefer Iran as a viable alternative supplier if Iran can satisfactorily deliver natural gas. From an economic standpoint, the European Union's concern will be less about whose gas is in the pipeline and more about if it is priced competitively enough for diversification to be sensible. Iran will have to tread carefully with the European market to not undermine Russia's market share if the Iran–Russia security partnership remains of value.

2. Far East Market

Rising global energy demands are not exclusive to the European market; China and India's demands will continue to grow in the Far East. In 2017, China and India consumed 243.6 and 54.2 bcm of natural gas, respectively, while only producing half of their consumed amounts and relying on pipeline and LNG imports to fulfill the remainder.⁸² According to "Shell LNG Outlook 2018," China's demands for liquefied natural gas imports rank second worldwide behind only Japan, and its natural gas demand grew by 31 bcm in 2017, a 15% increase from 2016, due primarily to its substantial economic

⁸¹ Ole Gunnar Austvik and Gulmira Rzayeva, "Turkey in the Geopolitics of Natural Gas" (working paper, Harvard-Kennedy School, 2016), 7, https://www.hks.harvard.edu/sites/default/files/centers/mrcbg/files/66_final.pdf.

⁸² BP, *BP Statistical Review of World Energy 2018*, 29.

growth.⁸³ China's demand growth is forecasted to rise to 267 bcm per year by 2020 and add another 100 bcm to the demand every five years through 2040.⁸⁴ By 2040, China will consume 616 bcm of natural gas, approximately a quarter of the world's energy, as its demand growth contributes to 27% of the world's net increase.⁸⁵ China's energy mix will shift dependence from coal toward natural gas and renewables, where natural gas will increase from 6% to 13% of the country's energy mix.⁸⁶ According to the *GECF Global Gas Outlook 2017*, India's natural gas demand will increase at a slower rate to a projected total consumption of 139 bcm per year by 2040.⁸⁷ Renewables will mostly contribute to China and India's power generation mix, with natural gas in these markets playing a small role; however, their growing populations substantiate the Far East's requirement for natural gas and provide Iran with additional customers to monetize its natural resources.⁸⁸

3. Middle East Market

Iran's ability to boost natural gas exports to its neighbors would increase the country's national security; therefore, it will be Iran's priority.⁸⁹ The GECF estimates natural gas demands by Middle Eastern countries will increase from 479 bcm in 2016 to over 800 bcm by 2040.⁹⁰ Overall, the Middle East energy consumption will increase by 54% by 2040, with 60% of the growth represented by natural gas.⁹¹ In 2017, Middle East natural gas imports declined slightly, but consumption grew by 5.7%, with Iraq

⁸³ Shell, "Shell LNG Outlook 2018," 3.

⁸⁴ Gas Exporting Countries Forum, *GECF Global Gas Outlook 2017*, 54.

⁸⁵ BP Global, "Regional Insights—China," accessed 20 July 2018, <https://www.bp.com/en/global/corporate/energy-economics/energy-outlook/country-and-regional-in-sights/china-insights.html>.

⁸⁶ BP Global.

⁸⁷ Gas Exporting Countries Forum, *GECF Global Gas Outlook 2017*, 55.

⁸⁸ Gas Exporting Countries Forum, 66.

⁸⁹ National Iranian Gas Company, "Gas Exports Can Be Vital in Ensuring National Security."

⁹⁰ Gas Exporting Countries Forum, *GECF Global Gas Outlook 2017*, 55.

⁹¹ "Regional Insights—Middle East," BP Global, accessed 20 July 2018, <https://www.bp.com/en/global/corporate/energy-economics/energy-outlook/country-and-regional-insights/middle-east-insights.html>.

demonstrating the most significant growth at 21.2%.⁹² As Iran's natural gas production increases in the coming years, Iran will likely expand to regional states with a demand signal, notably Iraq (due to Iran's proximity), to develop deeper economic ties with neighboring states. As trade expands, Iran will gain more geopolitical influence in the region, increasing its national security.

In the Middle East, where natural gas is the leading source of energy in power generation, the demand for natural gas will continue to increase. Natural gas contributes over 60% of the Middle East's power generation mix. Since 2011, the demand for oil in power production has decreased, while the demand for natural gas has risen at a reciprocal rate (see Figure 6).⁹³ Iran is the largest gas consumer in the Middle East and its exportation of electricity to neighboring countries will continue to be a driving factor in its overall consumption, which accounts for 70% of Iran's energy mix for electricity generation, while oil contributed to 22% of the overall mix.⁹⁴

⁹² BP, *BP Statistical Review of World Energy 2018*, 29.

⁹³ Gas Exporting Countries Forum, *GECF Global Gas Outlook 2017*, 68.

⁹⁴ Gas Exporting Countries Forum, 68–69.

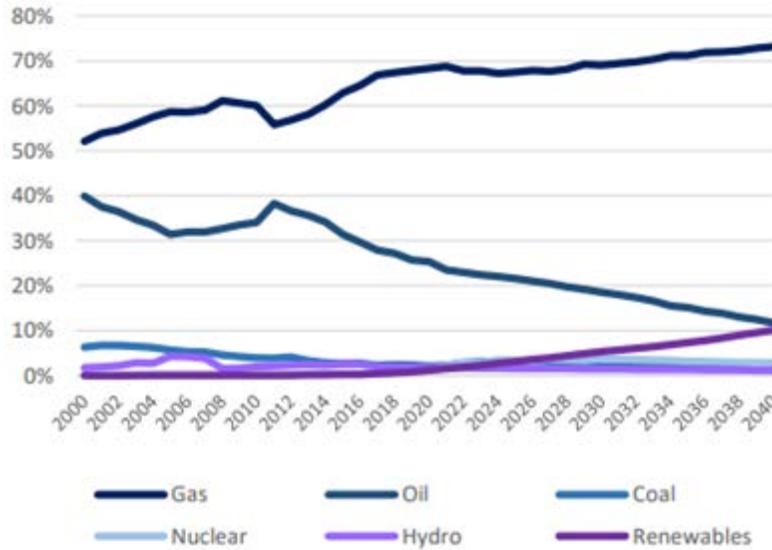


Figure 6. Middle East Power Generation Mix⁹⁵

To sum up, the European market is investing in renewable technology to lessen its dependence on imported energy and increase energy security. Faced with geopolitical pressures from its energy supplier, the European Union most actively seeks to increase energy security through investments in renewable sources of energy such as wind and solar power. Driven by the substantial growth of about 5% per year, wind will supply the European Union with 15% of its energy demands, while solar energy will account for 5% by 2040.⁹⁶ According to BP in 2018, renewables will increase its market share of the energy consumption mix from 4% to 14%, while oil and coal will decrease from 33% and 28% to 27% and 21%, respectively, of the global energy mix by 2040.⁹⁷ The global market’s projected reliance on cleaner sources of energy will cause a shortage in natural gas exports, in particular, LNG. “Shell LNG Outlook 2018” projects an approximate 45% shortage in LNG exports in 2035 (see Figure 7).⁹⁸

⁹⁵ Source: Gas Exporting Countries Forum.

⁹⁶ BP Global, “Regional Insights—European Union.”

⁹⁷ BP Global, “Regional Insights—Global,” 2.

⁹⁸ Shell, “Shell LNG Outlook 2018,” 24.

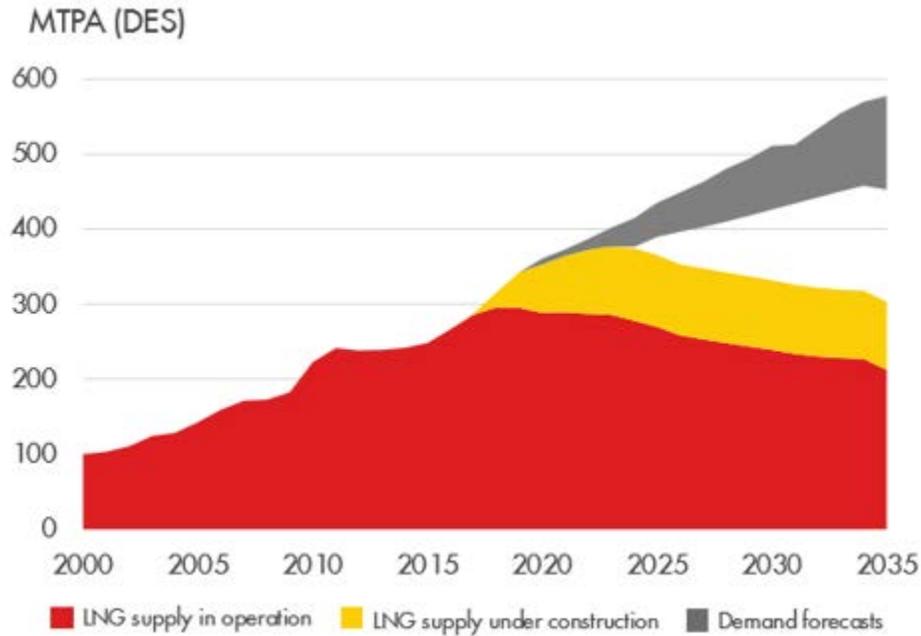


Figure 7. Shell LNG Outlook 2018: Emerging LNG Supply-Demand Gap⁹⁹

The Far East, to include the Chinese and Indian markets, signals the most significant future demand for natural gas due to its economic expansion and lack of natural resources. Iran should first secure the Middle East market due to the region’s growing demand for natural gas, which is expected to represent 60% of its total growth of energy consumption by 2040. While renewables will see the greatest growth, the global market’s demand for natural gas will increase at an average annual rate of 2%, while the demand for LNG will increase by an annual rate of 4% until 2035.¹⁰⁰ As natural gas is a commodity, Iran will be able to monetize its vast proved natural gas reserves if it is successful in producing and exporting the resource into regional or global markets through available infrastructures.

⁹⁹ Source: Shell.

¹⁰⁰ Shell, “Shell Outlook 2018: Factsheet,” 2.

D. IRAN'S NATURAL GAS INFRASTRUCTURE

Iran's natural gas exportation infrastructure is utterly underdeveloped to support its production and exportation goals. Even though Iran is the third-largest producer of natural gas, Iran has barely been a net exporter of that commodity. However, production is increasing to positively change this reality. Since the implementation of the JCPOA in 2015, sanctions relief has not only restored trade, but it has also opened the door for international investors to develop Iran's oil and gas infrastructure. Kenneth Katzman highlights an optimistic view in a Congressional Research Report, explaining "Iran might seek to finalize major regional economic projects that benefit the whole region, including ... gas pipeline linkages between Iran and Kuwait, Bahrain, and Oman; the Iran-Pakistan natural gas pipeline; the development of the Chabahar port; and transportation routes linking Central Asia to China."¹⁰¹ Katzman's prediction appears correct. Additional infrastructure to expand trading efforts will require further financial investments, and sanctions may have a limited effect on current pipeline projects.

Iran will require the infrastructure to move the commodity both regionally and globally; therefore, this subsection discusses Iran's existing and planned infrastructure projects, to include pipelines to reach regional partners and LNG to reach the global market. Iran's ability to export natural gas commodities to customers hinges on the capacity of its existing infrastructure and infrastructure under development. While pipelines can provide export capabilities to regional neighbors, Iran will need to invest in a long-term solution of LNG production sites and terminals to circumvent regional geopolitics and affect other global markets.

1. Current Infrastructure Capacity

Iran's current available distributive means consist of only pipelines to satisfy regional market demands. Iran does not have the capability to process or export liquefied LNG at this time. Currently, Iran has natural gas pipelines to support exports to Turkey (13 bcm capacity),

¹⁰¹ Kenneth Katzman, *Iran's Foreign and Defense Policies*, CRS Report No. 44017 (Washington, DC: Congressional Research Service, 2018), 58, <https://fas.org/sgp/crs/mideast/R44017.pdf>.

Iraq (9.1 bcm), Azerbaijan (10 bcm), and Armenia (2.3 bcm), a total of 34.4 bcm per year.¹⁰² While Turkmenistan has historically been an exporter to Iran at a maximum capacity of 12 bcm per year, this pipeline affords additional capacity.¹⁰³ The bulk of Iran’s natural gas infrastructure rests in the western and southern regions of the country, mostly due to terrain and population density (see Figure 8). Even though Iran has a maximum capacity to export just over 46.4 bcm per year, it only exported 12.5 bcm of natural gas to regional partners by pipeline, mostly Turkey, at a rate of 8.9 bcm in 2017.¹⁰⁴



Figure 8. Iranian Gas Infrastructure¹⁰⁵

¹⁰² **Turkey and Iraq:** BMI Research, *Iran Oil & Gas Report Q4 2017*; “BP, *BP Statistical Review of World Energy 2018*, 47; **Azerbaijan:** E. Ismayilov, “Azerbaijan and Iran Sign Memorandum on Gas Supplies,” *Trend*, accessed 19 March 2018, <https://en.trend.az/business/energy/1578227.html>; **Armenia:** Vladimir Socor, “Iran-Armenia Gas Pipeline: Far More Than Meets the Eye,” *The Jamestown Foundation*, 21 March 2007, <https://jamestown.org/program/iran-armenia-gas-pipeline-far-more-than-meets-the-eye/>.

¹⁰³ Masoud Mostajabi, “Iran, Turkey Key to Turkmenistan Realizing its Energy Potential,” *Atlantic Council*, 06 September 2017, <http://www.atlanticcouncil.org/blogs/new-atlanticist/iran-turkey-key-to-turkmenistan-realizing-its-energy-potential>.

¹⁰⁴ BMI Research, *Iran Oil & Gas Report Q4 2017*, 45; BP, *BP Statistical Review of World Energy 2018*, 34.

¹⁰⁵ Source: *Business Week Caucasus* “Iran’s Natural Gas Export: How? Where? and When?,” accessed 23 March 2018, cbw.ge/world/iran-gas.

2. Developing Infrastructure Capacities

Iran has three pipelines under construction with Pakistan, Oman, and Iraq that would more than double Iran's export capacity. As Iran expands its energy infrastructure and trade with neighboring states, this will likely increase the country's national security with expanded economic interests, as it has previously expressed.¹⁰⁶

First, the revival of the stalled Iran-Pakistan-India (IPI) pipeline project could expand to include China, affording Iran a major export corridor. The IPI natural gas project has been in negotiations since 1995, but geopolitical tensions between Pakistan and India, coupled with international sanctions on Iran, have stalled the initiative of a pipeline with an export capacity of roughly 40 bcm per year.¹⁰⁷ Prior to Iranian sanctions, Pakistan agreed to import up to 8 bcm of natural gas per year, but Pakistan halted construction and failed to build its segment of the project, leaving Iran's completed segment capped at the Baluchistan border.¹⁰⁸ China sees the potential natural gas pipeline from Iran as a way to satisfy its rising domestic demands. Chinese investments into Pakistan's natural gas infrastructure and Gwadar port have already exceeded \$45 billion, prompting India to develop the port of Chabahar to facilitate maritime trading, which would circumvent its rival, Pakistan.¹⁰⁹ As of June 2018, Pakistan and Iran have revived negotiations regarding the project, which could afford Iran a major outlet to the Far Eastern market.¹¹⁰

Second, Iran and India aim to complete a pipeline from Iran to Oman. Despite the threat of resumed sanctions at the end of 2018, India says this pipeline will remain in

¹⁰⁶ National Iranian Gas Company, "Gas Exports Can Be Vital in Ensuring National Security."

¹⁰⁷ BMI Research, *Iran Oil & Gas Report Q4 2017*, 73; "India Should Revive IPI Pipeline," *Economic Times*, last modified 19 March 2017, <https://economictimes.indiatimes.com/industry/energy/oil-gas/india-should-revive-ipi-pipeline-parliamentary-panel/articleshow/57716034.cms>; "Project Focus: Iran-Pakistan-India Gas Pipeline," *Gulf Oil and Gas*, accessed 20 July 2018, <http://www.gulfoilandgas.com/webpro1/projects/3dreport.asp?id=100730>.

¹⁰⁸ BMI Research, *Iran Oil & Gas Report Q4 2017*, 47.

¹⁰⁹ Golnar Motevalli and Iain Marlow, "India Slow to Develop Chabahar Port As China Races Ahead at Rival Hub," *Economic Times*, last modified October 5, 2016, <https://economictimes.indiatimes.com/industry/transportation/shipping/-/transport/india-slow-to-develop-chabahar-port-as-china-races-ahead-at-rival-hub/articleshow/54693856.cms>.

¹¹⁰ APP, "Iran-Pakistan Gas Pipeline: Govt Plans to Review Project," 02 June 2018, <https://tribune.com.pk/story/1725430/2-iran-pakistan-gas-pipeline-govt-plans-review-project/>.

development, which originates from Iran's Chabahar port that is strategically located outside of the Strait of Hormuz and extends to Oman's Qalhat LNG processing plant.¹¹¹ This pipeline will support up to 10.22 bcm per year of natural gas, in which Oman plans to process a third for LNG exports.¹¹² India, a major stakeholder in the development of Chabahar Port, intends to continue development of the strategic port to facilitate natural gas supplies to Oman. More importantly, India intends to utilize the port as a distribution center for agricultural products with Afghanistan and Central Asia, which the United States had assured support in early 2018.¹¹³

Lastly, in Iraq, Iran aims to expand existing trade with Baghdad by developing an additional pipeline to Basra in 2018. Frequent power outages, according to a 2018 article, "have turned into a persistent source of public discontented."¹¹⁴ This 9.1 bcm pipeline to Basra was quickly realized, and natural gas was expected to reach the city by March 2018, making Iraq the second largest customer for Iran's natural gas.¹¹⁵

China and India will inevitably play an increasing role. Without certainty, it is likely that these projects will add up to 59 bcm per year to Iran's natural gas export capacity, due to these project's proximity and their stakeholders' commitment to assume risk in the face of U.S. sanctions'. Regardless, these pipeline projects will require substantial geopolitical commitments and financial investments to complete.

¹¹¹ Charles Newberry, "Oman Natgas Pipeline with Iran on Track Despite U.S. Sanctions: Minister," S&P Global, 21 June 2018, <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/062118-oman-natgas-pipeline-with-iran-on-track-despite-us-sanctions-minister>; "Oman-Iran Gas Pipeline Cost to Rise Due to New Route," Reuters, 15 September 2016, <https://www.reuters.com/article/us-oman-iran-gas/oman-iran-gas-pipeline-cost-to-rise-due-to-new-route-source-idUSKCN11LONT>.

¹¹² BMI Research, *Iran Oil & Gas Report Q4 2017*, 73; Sofroniy Le Bon, "Iran & Oman Common Gas Export Pipeline Project Will Now Change Route in Order to Avoid UAE's Waters," *Eyes on Europe and Middle East*, 13 February 2017, <https://middleeastnewsservice.com/2017/02/13/iran-oman-common-gas-export-pipeline-project-will-now-change-route-in-order-to-avoid-uae/#comments>.

¹¹³ Dipanjan Roy Chaudhury, "Chabahar Port Project Likely to Stay Unaffected," 15 May 2018, <https://economictimes.indiatimes.com/news/politics-and-nation/chabahar-port-project-likely-to-stay-unaffected/articleshow/64168607.cms>.

¹¹⁴ "Baghdad Mulling More Import of Iranian Gas," *Financial Tribune*, 27 January 2018, <https://financialtribune.com/articles/energy/80779/baghdad-mulling-more-import-of-iranian-gas>.

¹¹⁵ "Baghdad Mulling More Import of Iranian Gas."

Although the Middle East and lucrative Far East markets offer the greatest investment potential and practicable routes for pipelines, Iran's lack of LNG capabilities will burden further monetization efforts. The Middle East market represents a cost-effective target for Iran to monetize its natural gas through existing pipelines, which are currently not operating at maximum capacity. Securing trade agreements with regional partners will enable Iran to project regional influence and solidify trade relationships with bordering countries. Iran's LNG capability has been under construction for years, and without it, Iran does not currently possess the means to export all of its surplus gas or affect the global market's growing demands beyond IPI on a large scale.

In the past, the NIOC has initiated several projects to construct LNG export terminals to reach global markets, but these initiatives have stalled due to the lack of financial and technological investments, stemming from international sanctions.¹¹⁶ In total, five Iranian LNG projects have stopped.¹¹⁷ According to the National Iranian Gas Export Company (NIGEC), Iran is 50% complete with two LNG projects located at the South Pars Field that commenced before international sanctions—Pars and Persian—and the completion of these projects remain contingent on foreign investment that could be stymied by resurging sanctions.¹¹⁸ Upon completion, these two LNG terminals could liquefy upward of 14.3 bcm of natural gas per year, further increasing Iran's export capacity, and affording Iran the means to bypass regional political and security concerns associated with pipelines.¹¹⁹

Iran is optimistic about its future LNG potential. While acknowledging that the United States and Australia's "LNG boom" from 2016 to 2020 will contribute the most to global LNG volumes, GECF identified a second wave of LNG development beginning in 2025, which Qatar and Iran will mostly contribute since global LNG capabilities, both

¹¹⁶ U.S. Energy Information Administration, "Country Analysis Brief: Iran," 28.

¹¹⁷ Shokri Kalehsar, "Iran-Azerbaijan Energy Relations in the Post-Sanctions Era," *Middle East Policy Council* XXIII (Spring 2016), www.mepec.org/journal/iran-azerbaijan-energy-relations-post-sanctions-era.

¹¹⁸ BMI Research, *Iran Oil & Gas Report Q4 2017*, 48.

¹¹⁹ Kalehsar, "Iran-Azerbaijan Energy Relations in the Post-Sanctions Era."

current and emerging, will not sufficiently satisfy future global demands.¹²⁰ This emerging infrastructure, in theory, will allow Iran additional export capacity to reach global markets; however, the likelihood is low if sanctions resume.

In the wake of low investor confidence in Iran, Russia has also signaled a willingness to invest in the emerging market. Russia has shown an inclination to underwrite some of the development of Iran's natural gas infrastructure while expanding its global influence and undermining the role of the United States in the Middle East. In a 2018 Chatham House research paper, Russia, through their state-owned subsidiary, Gazprom, "reaffirmed Russian interests in helping Iran's natural gas sector, both in the construction of an LNG plant and regional pipelines."¹²¹ Although Russia sees Iran as a competitor in the natural gas market, Russia is cooperating through financial investments to gain a share of Iran's future revenues or leverage Iranian intentions away from Russia's stronghold in the European market toward the Far East market.¹²²

China has demonstrated a willingness to invest in Iran's energy sector to support its expanding economy, but Iran risks becoming another pawn in China's grand strategy. China, according to a 2016 *Economic Times* article, "could cash in on the gradual re-opening of the Islamic Republic's \$400 billion economy" with their incorporation of Iran into the "One Belt, One Road" initiative.¹²³ In July 2017, China and France's Total were signatories in a landmark \$5 billion investment to develop natural gas fields in South Pars, which was the most significant deal since sanctions relief from the JCPOA.¹²⁴ However, Total has already backed out following the United States' withdrawal from the JCPOA in

¹²⁰ Gas Exporting Countries Forum, *GECF Global Gas Outlook 2017*, 1, 84; Shell, "Shell LNG Outlook 2018," 24.

¹²¹ Nikolay Kozhanov, "Russian Policy Across the Middle East: Motivations and Methods" (research paper, Chatham House, 2018), 21, <https://www.chathamhouse.org/sites/files/chathamhouse/publications/research/2018-02-21-russian-policy-middle-east-kozhanov.pdf>.

¹²² Kent Moors, "Iran vs Russia: The Next Natural Gas War," OilPrice.com, 06 March 2017, <https://oilprice.com/Energy/Natural-Gas/Iran-vs-Russia-The-Next-Natural-Gas-War.html>.

¹²³ Motevalli and Marlow, "India Slow to Develop Chabahar Port."

¹²⁴ Associated Press, "Iran Signs \$5-Billion Deal with France's Total and Chinese Oil Company to Develop Natural Gas Field," *Los Angeles Times*, 03 July 2017, <http://www.latimes.com/world/la-fg-iran-gas-deal-20170703-story.html>.

May 2018. A recent Foreign Policy article argued that “It is important to consider that often Belt and Road projects do not always serve economic but rather geo-strategic, grand motives.”¹²⁵ As Iran looks for investors, there exists the possibility of the country becoming debt-laden as many other countries throughout Central Asia and Africa have become.

Due to a decade of varying degrees of economic sanctions, Iran’s underdeveloped natural gas infrastructure is only capable of exporting 105.4 bcm through the pipeline and an additional 14.3 bcm through LNG, totaling 119.7 bcm, if all existing infrastructure and on-going projects export at maximum capacities. As of August 2018, Iran has the capacity to export 46.4 bcm per year through established regional pipelines to Turkey, Turkmenistan, Azerbaijan, Armenia, and Iraq. Iran has several regional pipelines under construction to Pakistan, Oman, and Iraq (Basra), totaling an additional capacity of 59 bcm a year.¹²⁶ Pakistani and Omani projects require financial and political commitments from partners to complete, especially in the midst of reemerging sanctions. On the other hand, with sanctions relief, Iran could attract additional investments to expand export capacities to other global markets through both pipeline and LNG. Although Iranian natural gas could reach the European market through expanded pipelines that transit Turkey and China through the IPI pipeline, the Far East market is a more likely target for Iran’s pipeline exports. “Shell LNG Outlook 2018” promotes the expansion of LNG because the method minimizes the possibility of pipeline disruption while providing flexibility for producers and consumers to change trade patterns based on emerging demands.¹²⁷ Iran could increase its export capacity by 14.3 bcm a year upon completion of its two LNG terminals, which leaves Iran greater opportunity for growth. Only through continued sanctions relief,

¹²⁵ Robert A. Manning and Bharath Gopaldaswamy, “Is Abdullad Yameen Handing Over the Maldives to China?” *Foreign Policy*, 21 March 2018, <https://foreignpolicy.com/2018/03/21/is-abdulla-yameen-handing-over-the-maldives-to-china/>.

¹²⁶ **Current capacity: Turkey and Iraq:** BMI Research, *Iran Oil & Gas Report Q4 2017*, 47, BP, *BP Statistical Review of World Energy, 2018*, 47; **Azerbaijan:** Ismayilov, “Azerbaijan and Iran Sign Memorandum on Gas Supplies,” **Armenia:** Socor, “Iran-Armenia Gas Pipeline,” Mostajabi, **Turkmenistan:** “Iran, Turkey Key to Turkmenistan Realizing Its Energy Potential.” **Future export capacity:** BMI Research, *Iran Oil & Gas Report Q4 2017*, 45–49, 73.

¹²⁷ Shell, “Shell LNG Outlook 2018,” 13.

led by the United States, can Iran attract sufficient foreign investments to expand export capabilities and capacities.

E. CONCLUSION

Iran's massive amount of proved natural gas reserves presents a strategic opportunity for it to capitalize on rising demands within the global market by expanding its natural gas sector. However, resumed sanctions burdens Iran's efforts to gain the necessary investments to expand its capabilities and capacities. In this chapter, we discussed Iran's natural gas sector by reviewing its historical pursuit of unlocking wealth from natural resources, Iran's capacity to produce a surplus of natural gas for export, the global and regional markets' demand for natural gas, and finally, Iran's ability to reach these markets through existing infrastructure and through pending developmental projects. In doing so, we determined that Iran cannot unilaterally monetize its natural gas reserves at this time to the extent it desires; however, modest growth will continue and allow Iran to fulfill its domestic demand, sustain trade with Turkey, and most likely expand natural gas trade with Iraq.

Energy projections indicate that the Middle East, Europe, and the Far East regions will continue to increase their demand for natural gas into at least 2040. Of the three, the Middle East is the most feasible region for Iran to monetize its natural gas due to proximity and existing/emerging pipeline infrastructures. Natural gas-fueled power generation is an essential segment for Middle East states, especially those seeking to profit from higher oil export prices. While the European market seeks energy security through diversification, lessening its overdependence on Russian energy, the European Union's interests in a Southern Gas Corridor, facilitated by Turkey, is a potential way for Iran to increase quantities of export gas. However, these means require significant investments for expansion of the infrastructure, making this market less vital to Iran's natural gas monetization efforts. The Far East market, including China and India, will continue to experience the highest demand increase due to population growth and the need for energy to propel its growing economies. Therefore, the Far East, including Pakistan, is more lucrative if Iran can finish ongoing projects under sanctions.

Iran currently has a limited capacity to reach foreign markets. Iran's current export pipeline capacity is 46.4 bcm a year to regional partners. Iran's potential LNG and pipeline capacities, as outlined in this chapter, will increase upon completion of several ongoing projects. These projects' completion heavily depends on political and financial commitments for their stakeholders. If Iran can maximize its export capabilities, its export capacity will increase to 119.7 bcm a year to the regional and global markets.

The United States must succinctly address Iran's natural gas sector and determine an approach. With a global shortage looming, Iran's large share of proved natural gas reserves could affect the shortage, provide energy security for U.S. allies, or provide a basis for future cooperation. For Iran, the strategic opportunity is there. For the United States, amidst escalating animus and political discourse between the countries, the strategic risk from a hostile and prosperous Iran will likely further undermine U.S. national interests, if ignored.

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III. U.S. STRATEGY SCENARIOS: RISKS AND OPPORTUNITIES

The previous chapter discussed the central question of this thesis—can Iran monetize its natural gas reserves? After analyzing Iran’s energy policy, projecting Iran’s future production and consumption, and examining the potential global demand for natural gas, we conclude that Iran cannot unilaterally monetize its natural gas resources as it ambitiously intends at this time. Though modest growth is likely to continue, for Iran to achieve robust growth, it will have to gain and maintain financial partners at historically high levels. With the pressure of sanctions on Iran and secondary sanctions on investors that wish to do business with Iran, this is unlikely. Limited by its current available means and regional pipeline infrastructures, Iran will need to improve its relationship with the West to further reach and expand beyond regional markets.

The United States has generally and historically sought a comprehensive strategy that addresses all of the Iranian regime’s malign behavior while promoting U.S. interests in the Middle East, but the U.S. government has been unable to obtain such a comprehensive strategy during the past four decades of animosity. At the national level, the United States and Iran have competing interests including Iran’s nuclear proliferation, the United States’ presence in the region, Iran’s support for regional militias and terrorism, and the United States’ support for Israel and Saudi Arabia.¹²⁸ In lieu of a comprehensive strategy, the United States chose to focus on the major threat to the balance of power in the Middle East: Iran’s nuclear program. Although the United States withdrew from the Joint Comprehensive Plan of Action (JCPOA), the landmark agreement that addressed this single issue, both countries should find a way to cooperate and restore political dialogue.

The global energy mix, which seeks to lessen dependence on oil in favor of natural gas and renewable sources of energy, and Iran’s possession of the world’s second largest proved natural gas reserves and desire to be a major exporter motivates this research. How should the United States proceed considering these energy facts and current geopolitical

¹²⁸ Afshon Ostovar, “Why Iran Remains a Challenge for U.S. Foreign Policy” (presentation, World Affairs Council of Monterey Bay Area, Carmel, CA, May 17, 2018).

realities? Iran’s ability to achieve the robust growth outlined in the previous chapter (see Figure 4) and increase its position in the natural gas market heavily depends on its ability to gain and maintain investors to develop the necessary domestic, regional, and global infrastructures.

In this chapter, we explore strategic political scenarios and discuss how the United States could address Iran’s natural gas potential. These scenarios present strategic growth opportunities for Iran and prospects for the global market to gain another supplier. The United States will wrestle with the strategic risk of allowing a country that continues to show animus toward U.S. national interests while the Iranian regime risks its legitimacy in negotiating a deal that balances its ideology with survival. Cooperation and confrontation are the most obvious, yet opposite, scenarios exemplified in the last decade before and after the JCPOA. Since both policy scenarios offer benefits and setbacks in achieving U.S. policy objectives, a hybrid approach could prove most pragmatic for strategists because it satisfies many of the U.S. national interests while investing in the Iranian youth for long-term regime change. We believe Iran’s massive proved natural gas reserves can serve as a gateway toward future cooperation, which will be the central focus of this chapter, which envisions broader U.S. goals and geo-strategic implications.

A. U.S. ENERGY GOALS

Economic prosperity and energy security continue to be at the forefront of the *U.S. National Security Strategy*. During the Obama administration, the United States became the leader in natural gas production.¹²⁹ In 2017, the Trump administration published its first *National Security Strategy*, taking energy production a step further with the aim of becoming an “energy dominant” nation by promoting energy exports and ensuring energy security as two of its priority actions in advancing American prosperity.¹³⁰ The United States’ critical role in the global energy system, “as the leading producer, consumer, and

¹²⁹ Barack H. Obama, *The National Security Strategy of the United States of America* (Washington, DC: The White House, February 2015), 16.

¹³⁰ Donald J. Trump, *The National Security Strategy of the United States of America* (Washington, DC: The White House, December 2017), 22–23.

innovator,” will not only “help [its] allies and partners become more resilient against those that use energy to coerce” but bring economic gains back to the United States.¹³¹

As a priority action, the United States will promote its energy exports, specifically natural gas. In a renewed push to address global energy security and trade, the Trump administration has set out to reduce trade deficits with Europe and the Far East by increasing American exports, including liquefied natural gas (LNG). The Trump administration plans to utilize the United States’ natural gas sector as an emerging means to exercise its strategic energy dominance as a “leading natural gas producer to transform transportation and manufacturing” to stimulate the United States economy.¹³² The United States seeks to provide markets, especially in Europe and China, alternative natural gas sourcing solutions for their demands to support diversification.

With the United States expanding its LNG export capabilities, the global market now has an option that was not previously available. As of 2018, the United States has two LNG terminals operational and multiple others in development to assert itself as a significant exporter of LNG by the early 2020s.¹³³ President Trump’s aggressive strategy to levy trade tariffs seem to be part of the calculus toward Europe and China, who have agreed to buy LNG from the United States in exchange for tariff relief.¹³⁴ The United States’ increased natural gas exports do not merely promote the “America First” rhetoric; rather, the effort seeks to provide energy to the global community to arrest Russia’s growing share of the markets that comes with additional political-economic leverage that could divide the United States and its allies.¹³⁵

¹³¹ Trump.

¹³² Trump, 4, 19, 22.

¹³³ Jude Clemente, “Cove Point Becomes 2nd U.S. Liquefied Natural Gas Export Terminal,” *Forbes*, 06 March 2018, <https://www.forbes.com/sites/judeclemente/2018/03/06/cove-point-becomes-2nd-u-s-liquefied-natural-gas-export-terminal/2/#378a171a6170>.

¹³⁴ “EU Agrees To Buy More U.S. Gas If Trump Scraps Tariffs— Report,” RT, 17 May 2018, <https://www.rt.com/business/426989-eu-gas-us-tariffs/>; LNG World News, “LNG Supply Shortage Expected in Mid-2020s.”

¹³⁵ “America First” is the slogan that President Trump tokened in the early months of his Presidency. Although it is critiqued as American protectionism, it is also a declaration of that America is ‘open for business.’ This also applies to renewed pushed for U.S. energy production and exportation.

Energy security is a vitally important aspect of international security, therefore, ensuring the viability of natural gas resources among other energy needs is another priority action. Due to rising global demands, the geopolitical leverage between suppliers and consumers, and risks in unstable exporting regions, energy security requires an international effort.¹³⁶ The Obama administration and its predecessors foresaw “seismic shifts in supply and demand” and understood the coercive power that energy affords around the world.¹³⁷ Furthering that understanding, the 2017 *National Security Strategy* draws attention to Russia and China’s recent actions, whose strategic investments seek to “expand [their] influence and gain competitive advantages against the United States.”¹³⁸ In particular, Russia “projects its influence economically, through the control of key energy and other infrastructure throughout parts of Europe and Central Asia.”¹³⁹ According to a study conducted on behalf of the European Parliament’s Committee on Foreign Affairs, Russia exports 87% of its natural gas to the European Union, which accounts for 37% of the European Union’s imported natural gas volume.¹⁴⁰ The United States recognizes Europe’s heavy dependence on Russian energy and views the Nord Stream 2 and TurkStream projects as symbolic of Russian expansionism, which it strongly opposes. China’s investments into the One Belt One Road initiative and Russia’s Nord Stream 2, TurkStream, and investments into Iranian gas projects continue to be of strategic concern for U.S. policymakers due to the shifts in trade relations and the strategic implications that could follow.

In order to safeguard U.S. interests abroad, the United States must proactively leverage strategic advantages within its energy sector to safeguard allies and partners from succumbing to geopolitical pressures of competing energy suppliers. The 2017 *National Security Strategy* illuminates the United States’ stance on energy security for European

¹³⁶ Yergin, “Ensuring Energy Security,” 69.

¹³⁷ Obama, *The National Security Strategy*, 16; C-SPAN, “US-India Cooperation Agreement.”

¹³⁸ Trump, *The National Security Strategy*, 38.

¹³⁹ Trump.

¹⁴⁰ Rem Korteweg, “Energy as a Tool of Foreign Policy of Authoritarian States, in Particular Russia” (study, EU Publications), <https://doi.org/10.2861/951739>.

allies by stating, “we will work with our allies and partners to diversify European energy sources to ensure the energy security of European countries” and compete for positive relationships around the world.¹⁴¹ U.S. LNG could be a stable option for China and Europe, but buying U.S. LNG will be more costly than importing from Russia due to the cost of processing and transporting the liquefied resource. In a move toward cooperation and open markets in the midst of trade wars, on July 25, 2018, the United States and the European Union agreed to increase exports, including vast amounts of U.S. LNG.¹⁴² As trade negotiations continue, the efficacy of U.S. LNG against cheaper Russian gas will become an undeniable reality, and it is unknown at this time as to how much U.S. LNG alone can affect the U.S.–European Union trade deficit.

The biggest challenge to global energy security in the near future will be a confrontation with Iran, as it continuously threatens to block energy exports. Iran has not only threatened to block Persian Gulf exports through the Strait of Hormuz but more recently through its proxies in Yemen, threatens the Bab al-Mandeb.¹⁴³ The effects of a major conflict could likely bring about a devastating energy crisis because the United States is not capable of filling the void and therefore will have to work with other producers outside of the region to mitigate the consequential effects of a supply disruption in the Middle East.

B. U.S. GOALS WITH REGARD TO IRAN

Over the last two decades, the United States’ two hard objectives with regard to Iran are to “deny the Iranian regime all paths to a nuclear weapon and neutralize malign Iranian influence” that seeks to challenge the balance of power in the Middle East and undermine U.S. national interests.¹⁴⁴ To confront the threat of nuclear proliferation, the

¹⁴¹ Trump, *The National Security Strategy*, 22, 38, 48.

¹⁴² Vera Eckert, Oleg Vukmanovic, and Sabrina Zawadzki, “Trump’s Plan for U.S. LNG in Europe to Face Reality Check,” Reuters, 26 July 2018, <https://www.reuters.com/article/us-lng-europe-trump/trumps-plan-for-u-s-lng-in-europe-to-face-reality-check-idUSKBN1KG275>.

¹⁴³ Parisa Hafezi, “Iran’s Special Forces Chief Warns Trump: ‘If You Begin the War, We Will End It,’” Reuters, 26 July 2018, <https://www.reuters.com/article/us-iran-usa-soleimani/iranian-special-forces-chief-tells-trump-to-threaten-him-not-rouhani-idUSKBN1KG106>.

¹⁴⁴ Trump, *The National Security Strategy*, 49.

United States imposed sanctions in 2009 against Iran, later targeting Iran's energy sector in 2012, among other entities, until the JCPOA relaxed most of these punitive measures. The international community joined the United States in these sanctions in 2010, which increased the pressure on Iran's economy. The sanctions aimed to coerce Iran into abandoning its nuclear proliferation, malign activities in the region, and human rights violations in exchange for economic relief. Despite comprehensive demands, the West prioritized Iran's nuclear enrichment above all else, leaving Iran's ballistic missile program, malign operations in the Middle East, and domestic issues unaddressed in the 2015 JCPOA. On 08 May 2018, President Donald Trump announced the United States' withdrawal from the JCPOA, stating that it "does nothing to constrain Iran's destabilizing activities, including its support for terrorism."¹⁴⁵ Later that month, Secretary Mike Pompeo avowed, "No more. No more wealth creation for Iranian kleptocrats. No more acceptance of missiles landing in Riyadh and in the Golan Heights. No more cost-free expansions of Iranian power. No more."¹⁴⁶

The JCPOA was not perfect, but it was the most substantial cooperative attempt to minimize escalating tensions around a nuclear program and reintegrate Iran into the global economy through the easing of economic sanctions. President Barack Obama, while receiving congressional criticism, reached an agreement with other permanent members of the UN Security Council with the JCPOA in 2015, also known as the Iran Nuclear Deal, as a method to test the prospect of a better relationship.¹⁴⁷ The JCPOA placed inspection provisions, with an agreement to address nuclear proliferation specifically, through 2030.¹⁴⁸ While delivering a political victory for the Iranian reformists by negotiating the

¹⁴⁵ White House, "Remarks by President Trump."

¹⁴⁶ "After the Deal: A New Iran Strategy," U.S. Department of State, 21 May 2018, <https://www.state.gov/secretary/remarks/2018/05/282301.htm>

¹⁴⁷ Thomas L. Friedman, "Obama Makes His Case on the Iran Nuclear Deal," *New York Times*, 14 July 2015, <https://mobile.nytimes.com/2015/07/15/opinion/thomas-friedman-obama-makes-his-case-on-iran-nuclear-deal.html>

¹⁴⁸ Ali Vaez, "The Iranian Nuclear Deal's Sunset Clauses: Why They Are Not a Path to a Bomb," 03 October 2017, <https://www.foreignaffairs.com/articles/iran/2017-10-03/iranian-nuclear-deals-sunset-clauses>.

deal, the JCPOA sought to informally address regime behavior around the periphery of the deal, which has been heavily critiqued as unabated by the Trump administration.¹⁴⁹

Immediately prior to President Trump's announcement of U.S. withdrawal from the JCPOA, he published a memorandum to the Executive Branch stating the U.S. policy that

Iran be denied a nuclear weapon and intercontinental ballistic missiles; that Iran's network and campaign of regional aggression be neutralized; to disrupt, degrade, and deny the Islamic Revolutionary Guards Corps and its surrogates access to the resources that sustain their destabilizing activities; and to counter Iran's aggressive development of missiles and other asymmetric and conventional weapons capabilities.¹⁵⁰

The United States' unilateral withdrawal from the JCPOA demonstrates the current administration's willingness to revoke agreements on singular issues and its intent to confront Iran's regime behavior in favor of a more comprehensive agreement.

For several decades, the United States has maintained a consistent narrative of regime change in Iran, but with varying nuances due to political changes in Iran. While the Iranian government is led by President Rouhani, who is a proponent for improving relations with Western nations, Ayatollah Khamenei, the Supreme Leader of Iran, leads the Iranian regime whose anti-Western ideology stems from the Iranian Revolution. The United States assumes that with the regime's anti-Western hardliners marginalized, relations with a moderate and reformist government would be more sensible, Shi'ite militia sponsorship curbed, and the advantages of subsequent economic prosperity would win over fence-sitters within Iran. In a supporting Iranian reform, the United States used the Near East Regional Democracy (NERD) Program to alter behavior from within Iran. The George W. Bush administration explained that the NERD Fund was appropriated to support pro-democracy activists in a bid to change Iranian regime behavior, not to overthrow the Iranian

¹⁴⁹ Trump, *The National Security Strategy*, 49.

¹⁵⁰ Donald Trump, *Ceasing U.S. Participation in the JCPOA and Taking Additional Action to Counter Iran's Malign Influence and deny Iran All Paths to a Nuclear Weapon* (Washington, DC: Government Printing Office), 2018.

government.¹⁵¹ Since 2004, the United States has appropriated nearly \$500 million into the NERD Program for “educational, humanitarian, and non-governmental organizations and individuals inside Iran to support the advancement of democracy and human rights.”¹⁵² Overall, this initiative aims to strengthen the relationship between Iran and the United States through greater access to unbiased information, awareness of human rights, good governance, anti-corruption efforts, academic opportunities, and cultural exchanges.¹⁵³

Regime change is an existential threat for the Iranian hardliners, and it is arguable that the Iranian regime views a nuclear deterrence and the consequence of mutually assured destruction as a necessary means to safeguard itself against such threats. Although a nuclear deterrent mechanism would entrench the Iranian regime and provide an additional layer to safeguard its national interests, the cost of overtly and unilaterally pursuing the capability would be catastrophic in the short term. Close ties with Russia, a nuclear power and permanent member in the United Nations Security Council with veto power, makes sense for Iran.

As the United States formulates a strategy for Iran that is more suitable and feasible to re-engage diplomatic negotiations, the United States will use political, economic, and military strength to coerce the acceptance of more terms than the JCPOA was able to encompass. U.S. economic prowess has seemingly cornered its allies, particularly in Europe, in choosing either to submit to the U.S. policy against Iran and withdrawing from the JCPOA or to stand up for their economic interests at the risk of suffering from secondary sanctions and further damaging the alliance against a surging Russia. Ultimately, the United States will need to balance its geopolitical influence in the Middle East to protect its national interests, promote energy security for its allies, and find ways to support a reform-minded Iranian population while curbing the Iranian regime’s subversive activities in the region.

¹⁵¹ Kenneth Katzman, *Iran: Politics, Human Rights, and U.S. Policies*, CRS Report No. RL32048 (Washington, DC: Congressional Research Service, 2018), 32, <https://fas.org/sgp/crs/mideast/RL32048.pdf>.

¹⁵² Katzman, 33.

¹⁵³ “Near East Regional Overview Program Overview,” U.S. Department of State, 30 August 2017, <https://www.state.gov/documents/organization/101442.pdf>.

C. STRATEGIC SCENARIOS

While understanding U.S. interests, we now discuss global energy security concerns with the United States' broader goals, debate strategic implications for both the cooperation and confrontation approaches, and explore a possible way forward under a hybrid approach, which introduces two competing projects to Iran and introduces an Iranian natural gas initiative as a gateway to cooperation and support reform. The challenge remains to define a feasible long-term solution resistant to political cycles, which prevents continuous oscillating behavior between the two states, and a solution that best safeguards U.S. interests abroad. The United States must acknowledge the interests of other global stakeholders to avoid isolation when navigating the Iran problem set. It is essential to understand all scenarios offer strategic opportunities and potential obstacles that entail strategic risks, which we discuss in subsequent sections. President Trump, President Rouhani, and Ayatollah Khamenei have a short window of opportunity to calm escalating tensions, detour from the path to war, and permit diplomacy to triumph, with natural gas serving as a gateway to cooperation.

1. Cooperation

While the United States prepares to levy “the strongest sanctions in history” in the next episode of confrontation with Iran, a strategy of cooperation seeks to promote an agreement that is beneficial for both states.¹⁵⁴ Cooperation actively promotes free-market trade and encourages international investments into the Iranian natural gas industry, which allows for and promotes an alternative source of natural gas for the global market to increase energy security. More broadly, cooperation uses the carrot as opposed to the stick. Cooperation is not merely a strategy; it ought to be the end goal in foreign policy, because a constant state of conflict often creates spiraling conditions that are less than optimal for all participants. While episodes of conflict may be necessary for states to achieve political ends, a cooperative strategy recognizes the long-term approach by seeking out and cultivating common ground to minimize conflict. For the United States, a cooperation

¹⁵⁴ U.S. Department of State, “After the Deal: A New Iran Strategy.”

strategy would only work if Iran agrees to negotiate along the Trump Administration's 12 demands ranging from nuclear enrichment and ballistic missiles to Iran's support for various groups across the region, which makes a strategy of cooperation dubious.¹⁵⁵

A cooperative approach with Iran and its natural gas indirectly ranks Russia as the greater geostrategic threat to the West. An open market offers a better chance for the United States to affect the growing Russian political-economic leverage over Europe. Hostile relations with both Russia and Iran have allowed a Russian–Iranian relationship to emerge. Military partnership in Syria and economic partnership through Russian state-owned Gazprom have fortified a marriage of convenience between Iran and Russia, which needs to be remedied. However, the Iranian regime's newfound favor with Russian state-owned Gazprom to fund its battered infrastructure will likely remain and possibly expand in an effort to stir Iran away from encroaching upon Russia's market share in Europe and to the Far East and China, which is “investing billions of dollars in infrastructure across the globe.”¹⁵⁶ Therefore, the United States can marginalize Russia's influence over its European allies and partners through a cooperative strategy with Iran by promoting the monetization of natural gas in an open market.

A cooperative approach with Iran, allowing them access to the market that Russia dominates and encouraging it, induces friction between the two that could be of strategic value. The United States' European problem is complex—it wrestles trade deficits, Russia's growing energy expansion, and North Atlantic Treaty Organization (NATO) members' financial commitments, to name a few. Russia's energy objectives with regard to Europe encompasses four lines of effort: (1) secure long-term demands from major markets; (2) foster strategic ties with influential states such as Germany, France, and Italy; (3) safeguard against potential competitors; and (4) maximize profit by expanding access to consumers.¹⁵⁷ With Russia's state-owned company, Gazprom, expanding infrastructure to Europe, particularly through Nord Stream 2 and TurkStream, President Trump has

¹⁵⁵ U.S. Department of State.

¹⁵⁶ Trump, *The National Security Strategy*, 38.

¹⁵⁷ Dimitar Bechev, *Rival Power: Russia in Southeast Europe* (New Haven, CT: Yale University Press, 2017), 200–201.

publicly criticized European leaders for paying billions of dollars in oil and gas and then pursuing greater dependence on Russian energy while trade deficits exist with the United States, instead of containing Russia as NATO should.¹⁵⁸ The United States views these planned natural gas projects as symbolic to Russian expansion since they are subversive to NATO and the very definition of energy security. As the Trump administration promotes initiatives to lessen European allies' dependence on Russian energy, Europe will likely look toward other sources, which is where the Middle East and pipelines through Turkey will come into play. If the United States pursues a strategy that seeks to threaten Russian energy interests in the long-term and reduce Russia's stranglehold of Europe, then opening the natural gas market up to competition may be a good option.

Although the Iranian reformist government recognizes that "constructive engagement with the world" is the path toward the resistance economy, reformists are still constrained by the theocracy; therefore, the likelihood of cooperation with the regime of non-elected hardliners diminishes due to the apparent incompatibility on national objectives.¹⁵⁹ The United States and Iran would have to come to the negotiating table willing to give up or moderate interests for any deal to emerge and survive. For the United States, it will be its presence in the Middle East and its support for Israel. For Iran, it will be its nuclear program, ballistic missiles, and sponsorship of Shi'ite militias throughout the Middle East. Comprehensive deals of this magnitude are not likely due to years of mistrust and oscillatory behavior. Optimistically, a deal is achievable because both parties have demonstrated the ability to reach an agreement addressing singular issues, such as nuclear enrichment during a defined period under the JCPOA. However, for episodes of cooperation to evolve into greater trust and prove effective, signals of restraint that show respect for one another's interests will have to be communicated and demonstrated. The lack of trust between the United States and Iran will hinder the effectiveness of any potential cooperative deal.

¹⁵⁸ Brooke Singman, "NATO Pledges to Boost Defense Spending after Stern Words from Trump," Fox News, 11 July 2018, <http://www.foxnews.com/politics/2018/07/11/trump-tangles-with-nato-leaders-in-testy-start-to-brussels-summit.html>.

¹⁵⁹ Takeyh, "Iran's 'Resistance Economy' Debate."

If trust materializes between Iran and the United States and allows natural gas initiatives to potentially ease U.S.–Iranian political tensions through cooperation, the Iranian regime risks its legitimacy. The regime’s legitimacy rests on the population’s perception of the regime’s anti-Western ideology. Afshon Ostovar explained to the World Affairs Council of the Monterey Bay Area that, “United States influence must be countered for the revolution to be secured.”¹⁶⁰ Moreover, the propaganda value of cooperating and allowing the very oil companies that reaped their profits in the early 20th century, which hardliners vehemently objected to, would contradict the hardliner’s traditional position of preferred isolation.¹⁶¹ Though it is imperative for Iran to adopt the same cooperative spirit for a new deal, Iran’s hardliners and their supporters will not tolerate a cooperative relationship with the United States since it undermines the regime’s claims of marginalizing Western influence.

Cooperating with Iran on its natural gas initiatives has two inherent risks for the United States: enriching a regime that has yet to demonstrate respect or change its behavior under the JCPOA; and creating competition for U.S. LNG exports. First, stemming from the emergence and return of foreign investors, a cooperative strategy will provide Iran the ways and means to achieve its robust growth within the natural gas sector by 2022 and the financial resources for the regime to pursue its ardent national interests, if it chooses. Though the JCPOA did not specifically address the seven non-nuclear issues within Secretary Pompeo’s 12 demands, focusing on ballistical missiles and support for proxies, the United States had hoped that Iran’s reintegration would incentivize further cooperation, but it did not seem to.¹⁶² Therefore, when crafting a new deal, the United States will have to formally negotiate the tenets of the deal and not leave its national interests to interpretation in the peripheries or chance. Second, if Iran chooses to expand its natural gas infrastructure to Turkey for Europe’s Southern Gas Corridor, the United States could lose its market share of potential consumers, or worse, the increase in supply could drive prices

¹⁶⁰ Ostovar, “Why Iran Remains a Challenge for U.S. Foreign Policy.”

¹⁶¹ Takeyh, “Iran’s ‘Resistance Economy’ Debate.”

¹⁶² U.S. Department of State, “After the Deal: A New Iran Strategy.”

down and hurt producers' profit margins. Pipeline gas is cheaper than LNG market price, typically by almost half. Efficacy alone, if trade relations normalize between the European Union and the United States, will cause customers to find ways to cut costs for natural gas where it can.

The United States could cooperate with Iran to increase energy security in the global market, especially for European allies and partners, to decrease the monopolizing efforts of Gazprom, and potentially threaten Russian energy interests in the long term. Although cooperating with Iranian natural gas initiatives could potentially ease U.S.–Iranian political tensions, the United States would have to employ high levels of strategic optimism by assuming that the Iranian regime would employ the same. The risks may be too steep for either to accept blindly, but through this strategy, the United States ought to find a way that better manages short-term setbacks by creating opportunities to expand trust and focuses on long-term political ends that best serve both parties, the region, and global community's interests.

2. Confrontation

Aside from its military strength, the United States has many tools at its disposal to coerce favorable behavior from its adversaries, including its economic prowess and ability to mount a coalition of support. “Principled realism” guides the 2017 *National Security Strategy* in that state power is important in politics and “advancing American principles spreads peace and prosperity around the globe.”¹⁶³ The Trump administration reverberates the Reagan-era motto of “peace through strength” and desires to use all elements of national power to arrive at peaceful resolutions.¹⁶⁴ President Trump seeks to deliberately challenge an Iranian regime that “supports terrorist groups and openly calls for our [United States’] destruction” while advancing the U.S. principles, democracy, and reform abroad.¹⁶⁵ An international effort of sustained coercive pressure will be required to prevent

¹⁶³ Trump, *The National Security Strategy*, 55.

¹⁶⁴ Trump, 4, 25.

¹⁶⁵ Trump, 7, 47.

Iran from dominating the Middle East and destabilizing global energy markets.¹⁶⁶ However, a confrontational strategy is a bit complicated to implement, as it challenges Iran's malign activities with United States-led economic sanctions and requires the endorsements of international stakeholders.

A strategy of confrontation keeps Iran weak for an indefinite period, improving the prospects for regime change or the transition to more moderate politics in Tehran in the long term. By denying Iran the ability to develop its natural gas industry and export its natural gas and other energy resources, the Iranian government will have a difficult time generating economic growth and would have to look for other ways to monetize its resources. Iran subsidizes 90% of the cost for natural gas in its domestic market, which equates to one-tenth the price of natural gas in the United States.¹⁶⁷ According to Vali Nasr, dean and professor of International Affairs at Johns Hopkins University's School of Advanced International Studies, ongoing protests across Iran stem from "economic stagnation, mismanagement and corruption, and growing income inequality along with conspicuous concentration of wealth at the top."¹⁶⁸ Forced to find alternate ways to generate revenue, President Rouhani's agenda to cut natural gas subsidies could gain traction among elites and could accelerate economic protests within the country.¹⁶⁹ The population's discontent, once mobilized, could initiate a revolution and lead to regime change within the country toward pro-Western ideas. However, the strategy will backfire if the United States mismanages operations in the information environment. The Iranian government could merely blame the West, especially the United States, for not following through with its international agreement, which is causing the population's undue suffering.

¹⁶⁶ Trump, 4, 48.

¹⁶⁷ Azadi et al., "The Outlook for Natural Gas," 10.

¹⁶⁸ Vali Nasr, "What the Iran Protests Were Not," *The Atlantic*, 10 January 2018, <https://www.theatlantic.com/international/archive/2018/01/iran-economic-protests-urban-rural-divide/550211/>.

¹⁶⁹ Smyth, "Iran's Protests: All About the Economy?"

A confrontational approach would limit, if not prevent, competition from Iran and increase the prospects for U.S. LNG in the European market, but pricing remains a key factor. The strategy would deny the global economy, especially the U.S. European allies and partners, with an alternative source of natural gas, and the U.S. emerging LNG capabilities could theoretically help to lessen Europe's dependency on Russia. According to the 2018 *BP Statistical Review of World Energy*, the Russian Federation exported 189.3 bcm to European countries in 2017.¹⁷⁰ As of early 2018, U.S. LNG export capacity was 32 bcm a year, with plans to increase this capacity to 94 bcm and 100 bcm by 2020 and 2022, respectively.¹⁷¹ If 100% of the U.S. LNG exports went to Europe, the United States could decrease the Russia Federation's natural gas export capacity to Europe by 50% in 2020. This is a very optimistic estimation, as it is very doubtful that all of the U.S. LNG will go to Europe since the United States also seeks to offset trade deficits with China, whose trade deficit in 2017 was over \$375 billion as compared to the \$151 billion trade deficit with the European Union.¹⁷² On 25 July 2018, European Union president Jean-Claude Juncker and President Trump agreed to increase U.S. LNG exports to Europe. Although this may sound mutually beneficial for both parties, the price of U.S. LNG is much higher than the current price of natural gas from Russia. According to Alexander Kornilov, an analyst at Aton LLC in Moscow, the current price for U.S. LNG to Europe stands at \$6 to \$7.50 per million British thermal units, as compared with \$3.50 to \$4 for Russia's pipeline.¹⁷³ Therefore, the United States will either have to convince European nations to pay more for energy security or to subsidize the overall costs of U.S. LNG to

¹⁷⁰ BP, *BP Statistical Review of World Energy 2018*, 34.

¹⁷¹ The report provided figures in billion cubic feet per day, which the authors converted to billion cubic meters per year (i.e. 3.1 bcf per day, converted to 32 bcm per year). David Sandalow, Akos Losz, and Sheng Yan, "A Natural Gas Giant Awakens: China's Quest for Blue Skies Shapes Global Markets," Columbia SIPA, 27 June 2018, <https://energypolicy.columbia.edu/research/commentary/natural-gas-giant-awakens-china-s-quest-blue-skies-shapes-global-markets>.

¹⁷² "Trade in Goods with European Union," U.S. Census Bureau, accessed 20 July 2018, <https://www.census.gov/foreign-trade/balance/c0003.html>; "Trade in Goods with China," U.S. Census Bureau, accessed 20 July 2018, <https://www.census.gov/foreign-trade/balance/c5700.html#2017>.

¹⁷³ Anna Shiryaevskaya, Elena Mazneva, and Mathew Carr, "Trump Says Europe to Buy Boatloads of U.S. LNG. Don't Bet on It," Bloomberg, 26 July 2018, <https://www.bloomberg.com/news/articles/2018-07-26/europe-is-likely-to-disappoint-trump-as-big-buyer-of-u-s-lng>.

European allies and partners in order to minimize Russia's market share. Neither of these options are realistic under current geopolitical conditions.

While the United States employs economic and political coercion against Iran's natural gas sector, this strategy requires an international effort to increase its effectiveness and ensure success. As evidenced from 2010 to 2015, the European Union's support in sanctions against Iran led to maximum pressure. The United States needs meaningful alliances to reinforce its asserted role as the global economic leader. A unilateral, confrontational endeavor could be messy and potentially isolate the United States. Ambassador Lincoln Bloomfield stated in recent testimony that "letting Iran divide the United States from our European allies would be a policy failure."¹⁷⁴ The *National Security Strategy* argues, "the United States must compete for positive relationships around the world. China and Russia target their investments in the developing world to expand influence and gain competitive advantages against the United States."¹⁷⁵ Division in this matter creates vulnerabilities that will allow formidable adversaries, such as Russia and China, to benefit. The United States cannot rely on unilateral sanctions to adjust Iran's behavior but instead ought to work with the international community to ensure the sanctions' effectiveness. The United States' frustration is with the Iranian regime; therefore, surgical statecraft must be performed to avoid causing hardship to allies and the Iranian people through confrontation.

If the United States wishes to coerce better behavior from Iran, the European Union's support may be required, but its unwillingness to support the United States' withdrawal from the JCPOA demonstrates that European nations have important national interests at stake. Federica Maria Mogherini, the High Representative of the European Union for Foreign Affairs and Security Policy stated, "As long as Iran continues to implement its related nuclear commitments, as it is doing so far, the European Union will remain committed to the continued full and effective implementation of the nuclear

¹⁷⁴ *Confronting the Iranian Challenge: Hearing before the Committee of Foreign Affairs, U.S. House of Representatives*, 115th Cong., (2018) (statement by Ambassador Lincoln P. Bloomfield, Jr., Chairman Emeritus at the Stimson Center).

¹⁷⁵ Trump, *The National Security Strategy*, 38.

deal.”¹⁷⁶ The threat of secondary sanctions on businesses of traditional allies has become a major international issue. In 2014, a United States judge fined French BNP Paribas \$8.9 billion for violating United States sanctions against Iran, which has caused European banks to exercise excessive caution when operating in the peripheries of future sanctions.¹⁷⁷ In 2017, the European Union trade with Iran amounted to approximately \$25 billion, split between \$13 billion exports and \$12 billion imports, as opposed to the \$0.2 billion in business dealings Iran had with the United States.¹⁷⁸ Maja Koijancic, the European Union spokeswoman for foreign affairs, stated, “We are working on plans to protect the interests of European companies.”¹⁷⁹ The United States’ secondary sanctions will force companies like France’s Total, which has invested in South Pars; Airbus, which won the contract to rebuild Iran’s airline fleet; Volkswagen, Peugeot, and Renault, which will be exporting automobiles; and Siemens, which has invested in railway reconstruction and power generation, to reconsider the risk of continuing to do business with Iran.¹⁸⁰ A 20-year-old European Union law that “protect[s] against the effects of the extra-territorial application of legislation adopted by a third country,” known as the blocking regulation, may prove to be another foreign policy hurdle for the United States.¹⁸¹ The resurgence of unilateral U.S.– led sanctions on Iran, stemming from the United States’ withdrawal from the

¹⁷⁶ Mohammed Cherkaoui, “Trump’s Withdrawal From the Iran Nuclear Deal: Security or Economics?” Al Jazeera Centre for Studies, 10 May 2018, 7, <http://studies.aljazeera.net/en/reports/2018/05/trumps-withdrawal-iran-nuclear-deal-security-economics-180510123910355.html>.

¹⁷⁷ Bruno Tertrais, “Trump’s Trap: Europe, Iran, and the Future of the Nuclear Deal,” Al Jazeera Centre for Studies, 27 June 2018, 6, http://studies.aljazeera.net/mritems/Documents/2018/6/27/d1c8bae69054434c8497130ecf717506_100.pdf

¹⁷⁸ Tertrais, 5.

¹⁷⁹ Cherkaoui, “Trump’s Withdrawal From the Iran Nuclear Deal,” 7.

¹⁸⁰ Sudip Kar-Gupta and John Irish, “France’s Total to Quit Iran Gas Project If No Sanctions Waiver,” Reuters, 16 May 2018, <https://www.reuters.com/article/us-iran-nuclear-france-total/frances-total-to-quit-iran-gas-project-if-no-sanctions-waiver-idUSKCN1IH1XK>; John Irish and John Revill, “EU Defense of Iran Deal Brings Companies Little Relief,” Reuters, 09 May 2018, <https://www.reuters.com/article/us-iran-nuclear-companies/siemens-psa-and-airbus-monitoring-iran-developments-after-trump-move-idUSKBN1IA0WK>; “Siemens Signs Contract to Upgrade Iran’s Railway Network,” Siemens Iran, accessed 27 June 2018, <http://www.siemens.co.ir/en/news-events/press-releases/siemens-signs-contract-to-upgrade-irans-railway-network.htm>; “What Keeps the Lights on in Iran’s Capital Tehran?,” Siemens, accessed 27 June 2018, <https://www.siemens.com/ir/en/home/company/topic-areas/ingenuity-for-life/rudeshurpowerplant.html>.

¹⁸¹ “Council Regulation (EC) No 2271/96 of 22 November 1996,” EUR-Lex, Document No. 31996R2271, accessed 10 May 2018, <http://data.europa.eu/eli/reg/1996/2271/oj>.

JCPOA, has nonetheless increased financial risk and negatively impacts international investments from European companies engaging in business with Iran. It is unknown at this time whether the European Union can mount a sizeable opposition to the secondary sanctions to protect their multinational corporations and challenge the United States' economic prowess.

Cooperation with Russia may prove to be a necessity for U.S. LNG efforts and to isolate Iran. While at the United States–Russia Summit in Helsinki in July 2018, President Trump and President Putin expressed a mutual interest in keeping energy prices at a manageable bracket for overall stability even though the two countries are strategic competitors.¹⁸² Better cooperation in markets could reduce the glut of supply and incentivize profits for both countries. On the Middle East front, Russia's interests are at stake. A recent Council of Foreign Relations blog post explained, “The United States needs to weigh any pledge of oil cooperation with America against Russia's active involvement in troubled oil sectors as diverse as Venezuela and Iran [and] the United States should think longer and harder about what assistance Russia could actually provide to U.S. interests.”¹⁸³ Prior to the Helsinki Summit, Russia and Iran agreed to \$50 billion in oil and gas sector investments, despite threats of U.S. sanctions returning at the end of 2018 on Iran.¹⁸⁴ The reality is that Russia has a lot at stake in the Middle East and an escalation in the conflict between the United States and Iran will be problematic and costly for Russia. Therefore, there are opportunities for a cooperative, but cautious, relationship with Russia in confronting Iran.

The United States' confrontation could have some undesirable outcomes if allies are not in congruence and the conflict escalates. The unilateral pursuit of economic sanctions on Iran without regard for the allies' interests may be ineffective since Russia and China are willing to fill the economic void by evading the international banking system

¹⁸² Miranda Green, “Putin on High Gas Prices: There Is ‘Space For Cooperation Here,’” *The Hill*, 16 July 2018, <http://thehill.com/policy/energy-environment/397208-putin-on-high-gas-prices-theres-a-space-for-cooperation-here> .

¹⁸³ Amy Myers Jaffe, *The Oil Context of the Trump-Putin Meeting* (blog), Council on Foreign Relations, 16 July 2018, <https://www.cfr.org/blog/oil-context-trump-putin-meeting>

¹⁸⁴ Jaffe.

and trading in non-U.S. currency. The Chinese have been agile at creating subsidiaries to circumvent U.S. sanctions, and they appear to be posturing to purposefully defy the United States with regard to Iran.¹⁸⁵ Although confronting Iran may reduce its ability to project malign regional influence in the short term, since Iran will not have the monetary equities to sustain operations. Iran will likely continue to further its support of asymmetric proxy forces in the region, which have proved to be a much more cost-effective means over the years. If not managed appropriately, a continuous exercise of power will most likely deepen the Iranian regime's hostilities toward the United States in a downward spiraling trajectory. Iran's positioning of proxies throughout the region, specifically in Yemen to threaten Bab al-Mandeb, has already proved of strategic value with the corridor's recent suspension.¹⁸⁶ If the Middle East and the Persian Gulf are unable to sustain energy exports, the United States–Iran conflict could usher in a global energy crisis. More dangerously, the Iranian regime's ego and the threat to pursue nuclear enrichment at a faster pace could inadvertently initiate an arms race in the Middle East since other regional stakeholders (especially Saudi Arabia) will seek nuclear capabilities as an active deterrence mechanism.¹⁸⁷

Confrontation is a complicated matter for the United States, and therefore, it must not embark on it alone. The United States requires meaningful alliances to present a unified front against Iran. If the United States challenges Iran unilaterally, Iran will exploit the seams of political relationships, reducing the effectiveness and intent behind sanctions.

¹⁸⁵ Rick Noack, "China's New Train Line to Iran Sends Message to Trump: We'll Keep Trading Anyway," *Washington Post*, 11 May 2018, https://www.washingtonpost.com/news/world/wp/2018/05/11/chinas-new-train-line-to-iran-sends-message-to-trump-well-keep-trading-anyway/?noredirect=on&utm_term=.28b6af95ee3d.

¹⁸⁶ Hafezi, "Iran's Special Forces Chief Warns Trump."

¹⁸⁷ Kenneth Katzman, Paul Kerr, and Valerie Heitshusen, *Options to Cease Implementing the Iran Nuclear Agreement*, CRS Report R44942 (Washington, DC: Congressional Research Service, 2018), 10, <https://fas.org/sgp/crs/nuke/R44942.pdf>; "MBS: Saudis Will Pursue Nuclear Weapons if Iran Does," *Al Jazeera*, 15 March 2018, <https://www.aljazeera.com/news/2018/03/mbs-saudis-pursue-nuclear-weapons-iran-180315152433732.html>

3. Hybrid Approach

In today's reality, with escalating tensions between the United States, Iran, and other stakeholders, a hybrid strategy would seek to find the middle way between cooperation and confrontation. While optimistically assuming that one day a cooperative future may exist, this strategy acknowledges confrontation is necessary to change Iran's behavior, and cooperation is required to preserve influence with stakeholders and a generally pro-American Iranian population. Global energy security is not elusive. Under a hybrid strategy, we introduce two competing natural gas initiatives that will challenge Iran and offer an Iranian natural gas initiative to cooperate with Iran. Policymakers will need to "work with reformers," a priority action in the 2017 *National Security Strategy* that introduces a "program that empowers reform-minded governments, people, and civil society."¹⁸⁸

The United States is not alone in the international community and must continue to acknowledge that along with "peace through strength" is "strength in numbers." The Trump administration recognizes that it must compete for relations around the globe and be a positive example for democracy, while realistically understanding "the American way of life cannot be imposed upon others, nor is it the inevitable culmination of progress."¹⁸⁹ While the West may be at odds with a hostile Iranian regime, Russia and China are not and will use the scarcity of investors in their debt-driven expansion. If international energy companies desire to compete for projects, the United States should allow them through cooperation. The United States can accomplish a lot on its own, but multilateral efforts are more effective to make the world a safer, less nuclear, and more principled place that respects to state sovereignty.

A hybrid strategy does not cooperate blindly; it seeks to limit monetization efforts through competition. In order to contain Iran's malign influence in the region, the United States and the international community must find a way to regulate Iran's natural gas monetization efforts. Confrontation will come in the form of competition on Iran's eastern

¹⁸⁸ Trump, *The National Security Strategy*, 40.

¹⁸⁹ Trump, 4, 38.

and western fronts. Strategic support to competing projects could curtail some of Russia and China's debt-driven expansionism.

In Central Asia, due to rising demand for natural gas, the Turkmenistan-Afghanistan-Pakistan-India (TAPI) pipeline, a \$10 billion project that stretches over 1,800 kilometers, will export 33 bcm of Turkmen natural gas to South Asian countries.¹⁹⁰ Upon completion, TAPI will deliver 5 bcm to Afghanistan, 14 bcm to Pakistan, and 14 bcm to India. Regional security will undoubtedly affect the project's success, not to mention the contentious geopolitical situation in the region between the project's partners. The United States should find ways to bolster this project to reduce the necessity for the Iran-Pakistan-India (IPI) pipeline that could include China.

In the Mediterranean, recent natural gas discoveries in Egypt, Israel, and Cyprus afford two opportunities: an alternative supply to Turkey and the potential emergence of Egypt as a Middle East energy hub. First, according to a Harvard study, 10–20 bcm of natural gas could be exported to Turkey, if the Cyprus reunification is resolved, reducing Turkey's need to renew its contract with Iran in 2026, much less expand trade with Iran to facilitate Europe's Southern Gas Corridor.¹⁹¹ More broadly, these experts argue that "Israel can benefit not only economically, but can also gain politically from enhanced trade agreements with Turkey [, and] rapprochement between Israel and Turkey could restrain Iranian influence in the region in which both sides are interested."¹⁹² Second, Egypt wants to be a gas hub and could be a viable alternative as well, bolstering a balanced power between Sunni Arabs and Iran.¹⁹³ The 2015 discovery of the Zohr gas field and its quick development is forecasted to make Egypt a net exporter in 2019, prompting an increase in

¹⁹⁰ Catherine Putz, "TAPI Moves Into Afghanistan, Taliban Promise to Protect the Project," *The Diplomat*, 27 February 2018, <https://thediplomat.com/2018/02/tapi-moves-into-afghanistan-taliban-promise-to-protect-the-project/>.

¹⁹¹ Austvik and Rzayeva, "Turkey in the Geopolitics of Natural Gas," 7, 13.

¹⁹² Austvik and Rzayeva, 13.

¹⁹³ Robin Mills, "Importing Israeli Natural Gas Makes Sense for Egypt," *Bloomberg*, 19 March 2018, <https://www.bloomberg.com/view/articles/2018-03-19/egypt-israel-natural-gas-deal-could-reshape-middle-east-energy>.

Israeli and Egyptian cooperation.¹⁹⁴ Egypt will then be able to initially export up to 7.5 bcm per year through LNG, while tentatively importing 64 bcm of natural gas from Israel over the course of a decade, which it can export if not domestically consume.¹⁹⁵ Robin Mills concludes that “If Egyptians can overcome their discomfort at buying from Israel, they have the chance to secure their own future needs, and be the indispensable player in Eastern Mediterranean gas.”¹⁹⁶ For the United States, either option supports Israeli monetization efforts and protects the United States’ Noble Energy investments.

Through competition, Iran will have to make better geopolitical decisions if it wishes to not fall farther behind in the natural gas sector. However, if Iran does not make better decisions, it will be important that the population views this as another regime failure. As described in the confrontation strategy, President Rouhani’s goal of reducing subsidies in general to generate more investment capital, Iranian protests will continue to put pressure on both the government and regime if Iran chooses this path. For Iran to effectually compete for contracts and gain investments, other states could assist in efforts to get Iran to regulate its behavior for economic benefits.

The young people of Iran should be the target audience of a hybrid approach to promote reforms in Iran; therefore, the United States should continuously explore ways to garner their support. The educated Iranian youth population supports initiatives to improve the relationship between Iran and the United States.¹⁹⁷ The CIA reports over 40% of Iran’s population is under the age of 24.¹⁹⁸ Additionally, the unemployment rate for young people between the ages of 15 and 25 was approximately 24.8% (21% male, 42.8% females) in 2014.¹⁹⁹ As of 2015, 84.6% (91.2% male, 82.5% female) of Iranians age 15 and over were

¹⁹⁴ Mills.

¹⁹⁵ Mills.

¹⁹⁶ Mills.

¹⁹⁷ Mohsen M. Milani, “Iranian Politics After the Deal,” *Foreign Affairs*, 15 July 2015, <https://www.foreignaffairs.com/articles/iran/2015-07-15/iranian-politics-after-deal>.

¹⁹⁸ “The World Factbook: Iran,” Central Intelligence Agency, 30 August 2017, <https://www.cia.gov/library/publications/the-world-factbook/geos/ir.html>.

¹⁹⁹ Central Intelligence Agency.

literate.²⁰⁰ These facts present a substantial disenfranchised Iranian youth population susceptible to reforms due to their discontent with current economic stagnation and inequality within Iran due to economic sanctions.

Furthermore, Iran does not eagerly seek to return to the pre-JCPOA days of confrontation and multilateral sanctions.²⁰¹ With the timeliness of Iran’s natural gas sector maturing in the next decade, the United States should leverage Iran’s desires to monetize its natural gas reserves as a catalyst for change. This opportunity could encourage reformists to pressure and isolate hardliners for a better future through cooperation. At the conclusion of President Trump’s statement on 08 May 2018, he offered Iran an invitation to re-negotiate the agreement, something the regime has vehemently rejected, that would “benefit all of Iran and the Iranian people.”²⁰² A hybrid scenario will require the United States to succinctly signal its cooperation with the government and the Iranian people, not the regime of unelected hardliners who oppose the West and refuse to abate controversial regional engagements.

We offer the Oil-For-Food Program as a potential model for an “Iranian Natural Gas Initiative Program” to serve as the United States’ hybrid strategy toward Iran. The initiative provides the Iranian government a path to modernize and monetize its natural gas sector. The revenue from energy trades will go directly into providing food and medicine for the population, as well as investing in the aging oil sector and emerging natural gas sector—both domestic and export capabilities. In exchange, Iran cannot use the revenues to advance its malign activities abroad, nuclear proliferation program, or ballistic missile initiatives. Beyond accepting Iran as a partner to promote global energy security, monetization of natural gas will help provide for the Iranian youth who will see the long-term benefits of international inclusion.

²⁰⁰ Central Intelligence Agency.

²⁰¹ *Confronting the Iranian Challenge: Hearing before the Committee of Foreign Affairs, U.S. House of Representatives*, 115th Cong., (2018) (statement by Stephen G. Rademaker, Senior Counsel, Covington & Burling LLC).

²⁰² White House, “Remarks by President Trump.”

Following Saddam Hussein's invasion of Kuwait, the United Nations established the Oil-for-Food Program under UN Security Council Resolution 986, allowing regulated oil sales that afforded humanitarian assistance to the Iraqi population. The Resolution prohibited the utilization of funds for military expansion with the specific intent to provide food, medicine, and other humanitarian needs for Iraqi citizens.²⁰³ From 1995 to its termination in 2003, the Oil-for-Food Program provided about \$31 billion worth of humanitarian supplies and equipment to the Iraqi population, while also reinvesting \$10 billion worth of supplies and equipment back into the oil industry.²⁰⁴ In formulating a hybrid strategy, U.S. policymakers should reference the Oil-for-Food Program as a starting point. A similar program, which we call the "Iranian Natural Gas Initiative Program," could satisfy the United States' interests in safeguarding the pro-American popular opinion of Iranian youth while containing the Iranian regime's military expansion, and additional sources of natural gas for European allies.

The Oil-for-Food Program ensured that the Iraqi government provided for its population. According to the United Nations, nutritional intake countrywide increased from 1,200 to about 2,000 kilocalories per person between 1996 and 2002.²⁰⁵ In the health sector, the capacity to undergo major surgeries in Iraq increased by 40% between 1997 and 2002, while common diseases such as cholera, malaria, measles, mumps, meningitis, and tuberculosis were reduced.²⁰⁶ Funds from the Oil-for-Food Program also improved the nation's transportation system, water and sanitation system, electricity infrastructure, and education system. Between 1996 and 2002, primary school attendance increased by 32% and secondary school attendance increased by over 74% due to higher availability of education facilities.²⁰⁷ The UN Security Resolution that intervened in the Iraqi

²⁰³ United Nations Office of the Iraq Programme: Oil for Food.

²⁰⁴ "Fact Sheet," United Nations Office of the Iraq Programme: Oil for Food, accessed 11 May 2018, <http://www.un.org/depts/oip/background/fact-sheet.html>.

²⁰⁵ United Nations Office of the Iraq Programme: Oil for Food, "About the Programme."

²⁰⁶ United Nations Office of the Iraq Programme: Oil for Food.

²⁰⁷ United Nations Office of the Iraq Programme: Oil for Food.

government's utilization of revenue from oil exports significantly improved the socio-economic conditions of the Iraqi people.

Although the Oil-for-Food Program was successful in providing for the Iraqi people, it failed to account for innovative loopholes that ultimately allowed the Iraqi government to divert money away from the population. According to the Central Intelligence Agency, Saddam Hussein exploited the Oil-for-Food Program and earned over \$12.5 billion in kickbacks, surcharges, and smuggling.²⁰⁸ These loopholes emerged due to the wide latitude given to the Iraqi government regarding oil sales and from which vendors it purchased humanitarian aid, which enabled Saddam Hussein to manipulate the flow of revenue through the control of these decisions.²⁰⁹ After further investigation, the United Nations reported that nearly half of the 4,500 companies that participated in the program were involved in kickbacks and illegal surcharges to earn lucrative contracts.²¹⁰ Saddam Hussein was not the only person to profit from the loopholes. International stakeholders, including the UN Chief of the Oil-for-Food Program, Benon Sevan, were accused of "irreconcilable conflict of interest."²¹¹ The United Nations' tarnished reputation, stemming from its ineffective implementation of the Oil-for-Food Program, will pose a challenge in future attempts to execute similar programs, but an improved implementation of the program using natural gas could provide the United States and Iran a gateway to cooperation.

The Iranian Natural Gas Initiative Program serves to synchronize several mutually beneficial priorities for the United States, Iran, and European allies to mend geopolitical relations between Iran and the international community. For Iran, this program could help the Iranian government appease the population and welcome it as part of a contributing member of the international community through the exportation of natural gas. Additionally, Iran would garner much needed foreign investments and revenue to

²⁰⁸ Sharon Otterman, *Iraq: Oil for Food Scandal*, Council on Foreign Relations, accessed 11 May 2018, <https://www.cfr.org/background/iraq-oil-food-scandal>.

²⁰⁹ Otterman.

²¹⁰ Otterman.

²¹¹ Otterman.

reenergize its natural gas industry by modernizing its domestic consumption infrastructure and expanding export capabilities. U.S. allies, especially in Europe, would benefit from this program since they will have better energy security and be less susceptible to political coercion by Russia. A hybrid approach with Iran, which balances cooperation and confrontation, will allow the United States the time and space to better employ the NERD program that will help introduce long-term behavior change starting with the Iranian youth, while in the short-term denying the Iranian regime's ability to invest monetary equities into its military and further destabilize the region.

D. CONCLUSION

Under the Trump administration, the United States has shown that it too seeks to monetize its natural gas sector in an effort to acquire a share of the market for economic gains. While the United States struggles to find a comprehensive strategy that addresses all of the Iranian regime's behavior, it ought to take steps to secure support from the Iranian youth and moderate political entities within Iran. Cooperation should be, and we believe is, the ultimate political end of any U.S. foreign policy toward Iran, while recognizing the important role that episodes of confrontation play in achieving U.S. national interests. The United States could see Iran as a competitor, but it will not allow an Iranian regime to consistently and flagrantly pursue policies that conflict with U.S. national interests without consequence. Repeated application of confrontation has led to spiraling security concerns due to distrust and poor communication, making confrontation the easy answer when national interests are squarely challenged. While episodes of confrontation are necessary for states to reinforce their threats, confrontation should not dominate foreign policies.

We remain cautiously optimistic that cooperation can be reached again despite a relapse of confrontation with the United States' withdrawal from the JCPOA; therefore, the United States ought to pursue cooperation, but not blindly. As depicted in this chapter, strict implementation of either cooperation or confrontation strategies will not likely produce the intended effects that support the United States' priorities of global energy security and rectifying Iran's malign behavior. Through the employment of a hybrid strategy, the United States can reap the benefits of both cooperation and confrontation

without the use of sanctions, leveraging Iran's desire to monetize its proved natural gas reserves. A hybrid approach may be the most feasible solution to secure the political sentiment of the Iranian population while utilizing the timeliness of Iran's natural gas sector's maturation to embolden Iranian government officials who seek reform.

It is debatable whether the Oil-for-Food Program was entirely effective in its intended goals of providing for the Iraqi population and denying Saddam Hussein the resources to fund his military. However, with additional oversight and deliberate planning to avoid making similar mistakes, the United States should spearhead the Iranian Natural Gas Initiative Program to contain Iran's malign behavior while cooperating to provide energy security for allies and supporting the Iranian population for at least the informational value of a hybrid approach.

A methodical, long-term approach to countering the current Iranian regime's ideology is essential to achieve U.S. strategic objectives. While the Iranian Natural Gas Initiative Program attempts to address the immediate non-proliferation of nuclear weapons and promote global energy security, the underlying effort targets the Iranian youth to shape their perceptions of democracy and influence future Iranian leaders toward reform. The program will provide the population with essential social benefits while reinvesting critical funds into Iran's energy sector and discourage the expansion of Iran's military efforts. While based on the framework of a seemingly failed Oil-for-Food program from Iraq, we believe that there remain some lessons learned that might prove beneficial for Iran. However, getting Iran to agree to anything less than what they had under the JCPOA will be a tough task.

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IV. CONCLUSION

Iranian nuclear proliferation is not the only threat to the balance of power in the Middle East, as energy endeavors will inevitably reshape the region as well. In 2006, Senator Richard Lugar asserted that conflict over energy resources presented a problem on par with nuclear proliferation and argued that control of energy resources “is the new security strategic weapon and it is powerful.”²¹² That claim is becoming more accurate by the day as many states adjust their economies to a post-oil-dominant era. While experts predict that the global natural gas demand will continue to rise, surpassing coal as the second-largest source of energy behind oil by 2025, the economies of oil-producing states will need to transition to alternative industries. For Iran, that industry will be natural gas, which supports its ability to export electricity. For those on the Arabian Peninsula that do not possess natural gas, such as Saudi Arabia and the United Arab Emirates, that industry will become renewables, such as solar power.²¹³ The global demand for natural gas is on the rise, with a shortage looming in the 2020s.

Based on empirical evidence, Iran’s rising domestic demand for natural gas, which ranks fourth in global market, will drive future production growth to satisfy forecasted subsidized consumption. Due to Iran’s vast proved natural gas reserves and rising domestic demands, the state’s natural gas production growth is not only inevitable, but necessary. However, robust growth is Iran’s ultimate goal, which is on the horizon for the Iranian natural gas sector if Iran can achieve its production goals for 2022. Under optimistic conditions, Iran wants to exponentially increase its natural gas production from 223.9 billion cubic meters (bcm) in 2017 to 475 bcm by 2022. If Iran achieves its goal, it will have more than 200 bcm of natural gas for trade, a volume that could afford Iran greater economic and geopolitical leverage in the region. Even though Iran possesses vast proved natural gas reserves, the country requires foreign investments or a reduction in natural gas

²¹² C-SPAN, “US-India Cooperation Agreement.”

²¹³ James M. Dorsey, “Natural Gas: The Driver of Saudi Hostility Toward Iran and Qatar,” *Fair Observer*, 27 March 2018, https://www.fairobserver.com/region/middle_east_north_africa/saudi-arabia-iran-qatar-crisis-gulf-news-khaleej-43098/.

subsidies to generate revenue internally. Due to the unfavorable consequences of the latter, the influx of foreign investments into its natural gas infrastructure will most likely determine Iran's growth trajectory.

Beyond increasing production from its underdeveloped fields, Iran must attract foreign investments and technology advancements to develop its domestic and export capacities. As of August 2018, Iran has the capacity to only export 46.4 bcm a year through pipelines to regional partners with no liquefied natural gas (LNG) capabilities. Current development projects will increase Iran's natural gas export capacity to 119.7 bcm, to include two LNG terminals that can export beyond regional markets. The status of Iran's ongoing projects varies in stages of completion, as most are stagnate due to the lack of foreign investments and regional trade partners. All of this is currently on pause due to looming economic sanctions led by the United States that aim to marginalize Iran's nuclear proliferation, ballistic missiles program, and malign activities in the region.

Under current geopolitical conditions, Iran cannot unlock its potential and unilaterally monetize its vast proved natural gas reserves due to renewed economic sanctions led by the United States, at least along its robust desires. If Iran adamantly wants to monetize its natural gas reserves, it must risk the regime's legitimacy and cooperate with the United States. Iran's hardliners and their supporters will not tolerate a cooperative relationship with the United States since it undermines the regime's claims of minimizing Western influence. Afshon Ostovar explained to the World Affairs Council of the Monterey Bay Area in 2018 that, "United States influence must be countered for the revolution to be secured."²¹⁴ In other words, Iran has a dilemma as to whether to cooperate and risk legitimacy and deal with the United States, which has the power to affect investors through primary and secondary sanctions, or confront and risk not achieving its projected growth within the natural gas sector. Iran possesses an incredible opportunity to develop and monetize its vast natural gas reserves, if it can strike a balanced relationship with the West, an approach the regime's hardliners have vehemently opposed.

²¹⁴ Ostovar, "Why Iran Remains a Challenge for U.S. Foreign Policy.

The United States, as outlined in the *National Security Strategy*, seeks to promote the viability of global energy sources, not just for itself, but for its allies.²¹⁵ Russia's primary objective has been to block or at the very least impede European nations' diversification of natural gas supplies to further secure its economic and political leverage in Europe.²¹⁶ The European Union could use an alternate source of natural gas open to foreign investments and in competition with Russian energy companies that already have a firm grip on Europe. With a looming natural gas shortage on the horizon, those who cannot produce enough natural gas to satisfy domestic demands will look toward those who can. We believe in the next decade, Iran will begin to demonstrate its capacity as a natural gas exporter and investments will come from consumers who demand gas for economic growth and energy security.

The United States requires an integrated regional strategy to protect its national interests with regard to Iran, in particular, preserving favor among the Iranian youth to encourage long-term cooperation. In the thesis, we outlined three alternative approaches: cooperation, confrontation, and hybrid. A confrontational approach has done little to change regime behavior, but the United States has somehow maintained favor with the Iranian youth who desire better relations with the West. Confronting Iran will deny allies an additional source for natural gas and energy security for the foreseeable future unless the United States is willing to subsidize LNG exports to Europe. However, it will deny the Iranian regime revenue to support its malign activities in the region. A cooperative approach invites an alternative source of natural gas for the global market and may help to increase energy security, but may indirectly fund Iran's malign activities that directly counter United States' interests in the region. It is here that a hybrid approach based on a strategy of containment should manifest itself, preserving the pro-American sentiment for the next generation of policymakers to pursue cooperation and moderation as did the United States and Japanese following World War II, if such an optimistic ambition can happen. We believe that Iran's natural gas sector can become the gateway to future

²¹⁵ Trump, *The National Security Strategy*, 22, 23.

²¹⁶ Bechev, *Rival Power*, 201.

cooperation, exploiting Iran's desires to become a major exporter of natural gas and using it to reward and embolden reforms in the Iranian government.

The United States must pursue a strategy that promotes global energy security and maintains a dialog with the Iranian government. We believe that the Iranian Natural Gas Initiative Program, in conjunction with the next attempt at cooperation, can start that dialogue. The program appropriates revenue from the monetization of Iran's natural gas to support the population while diverting funds from supporting the regime's malign activities in the region. However, due to the history of the program's derivative—Iraq's Oil-for-Food program—more research is required prior to implementation.

This thesis suggests two important opportunities for future research. First, research should focus on the implementation of the Iranian Natural Gas Initiative Program. Understanding Iran's requirements for almost \$100 billion to complete the South Pars project and its need to provide for its population, the international community must formulate a hybrid approach that allocates funds through phases. In other words, should the majority of the initial revenue go to supporting the population and reinforce a revisionist narrative or go back into the energy sector to more efficiently monetize natural resources?

Second, future research should evaluate the United States' ability to employ economic warfare, the nation's current weapon of choice, if the petrodollar continues to decline or becomes obsolete. The United States' economic prowess and incredible sanctioning power stem from the petrodollar and cooperation with allies, such as Saudi Arabia. In 1979, the United States and Saudi Arabia established the petrodollar through the Joint Commission on Economic Cooperation, where oil contracts would be conducted exclusively in U.S. dollars and U.S. dollars would be recycled back to the United States through U.S. contracts. This agreement was beneficial to both sides as the United States was the biggest oil consumer and guaranteed protection for Saudi Arabia's monarchy from regional threats. As states adjust economic posture for a post-oil era, how will the United States maintain economic prowess within the international banking system and within energy markets that it may not be able to control? In other words, what happens to the United States' ability to levy unilateral sanctions (employ effective economic warfare) after

natural gas overtakes oil in the 2030s and is traded in another form of currency outside the U.S. dollar?

In most international relation scenarios such as the Iran–United States relationship, there is no straightforward right-or-wrong strategy; there are only strategies with different consequences. The world’s natural gas market is rapidly expanding and offers significant economic growth opportunities for Iran, if the United States and Iran can develop a cooperative relationship built on trust and cooperation. The United States risks affording Iran economic space to expand its regional malign activities, while the Iranian regime risks its legitimacy by negotiating with the West and allowing the international community greater access within Iran. Ayatollah Khamenei will not live forever, but his policies may. The United States must think beyond the current social generation by investing in the Iranian youth to set conditions for better relations. U.S. policymakers must act promptly and intentionally to understand Iran’s potential to monetize its natural gas reserves in the next decade. More importantly, the United States must recognize strategic opportunities and risks associated with natural gas to achieve U.S. national interests.

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