

# **The Iranian Refining Crisis: The Argument for Strategic Patience in Relations With the Islamic Republic of Iran**

**A Monograph  
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## **Abstract**

THE IRANIAN REFINING CRISIS: THE ARGUMENT FOR STRATEGIC PATIENCE IN RELATIONS WITH THE ISLAMIC REPUBLIC OF IRAN by MAJ Allan M. Selburg, USA, 47 pages.

The refining industry in Iran is facing a crisis caused by a growing shortfall in production capacity for gasoline and other light fuels to meet rapidly growing domestic demand. The industry is locked into a repetitive cycle of decline due to under investment in new facilities and total capacity, massive government energy and automotive subsidies that encourage continued growth in demand, and a poor investment climate that discourages badly needed foreign investment in the refining industry. The shortfall in refining capacity causes the government to import fuel, the cost of which are growing beyond the government's ability to control.

This refining crisis creates an opportunity for the United States and its allies to exercise strategic patience in trying to influence the Iranian government's behavior in a direction more favorable to our interests. The Iranian government has demonstrated an ability to act pragmatically in order to stave off economic dislocation in the past. It is reasonable to assume they will do so again in response to the economic threat posed by the refining crisis. While a policy of strategic patience carries risk, the available evidence demonstrates that the current program of sanctions and economic pressure are likely to force a favorable change in Iranian behavior.

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## Introduction

Throughout 2007, there has been no shortage of American and Western news coverage of Iran. From the growing debate over Iran's nuclear program to American accusations of Iranian support for Shiite militias fighting U.S. troops in Iraq, Americans have been bombarded with news about Iran as a threat to U.S. security. At times, the degree of news coverage has perhaps approached the point of saturation.

Thus, it is understandable that one of the most critical news stories about Iran barely registered in most mainstream news outlets. On July 27<sup>th</sup>, 2007, the Iranian government imposed a large increase in the price of gasoline, as well as beginning implementation of a controversial gasoline rationing system that sought to limit fuel consumption in the country. The result was widespread rioting lasting several days in Teheran and other major cities, with mobs of angry car owners burning gas stations and shouting insults at Iranian president Mahmoud Ahmadinejad and the government.<sup>1</sup>

This rare, public outburst of anti-government sentiment in normally tightly-controlled Iranian society highlights a fundamental domestic issue the Islamic Republic is dealing with: a severe shortage of refining capacity, specifically the ability to produce transport fuels such as gasoline and diesel fuel. For the United States and other nations who currently view Iran as a regional threat, this fuel shortage presents a potential strategic vulnerability, capable of compelling or enticing the Islamic Republic to favorably modify its behavior and policies.

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<sup>1</sup> Nazila Fahti and Jad Mouawad, "Unrest Grows Amid Gas Rationing in Iran," *New York Times*, 29 July 2007, [http://www.nytimes.com/2007/06/29/world/middleeast/29iran.html?\\_r=1&oref=slogin](http://www.nytimes.com/2007/06/29/world/middleeast/29iran.html?_r=1&oref=slogin), (accessed 2 January 2007).

The refining crisis in Iran is a complex issue that transcends the Iranian energy sector and government energy policy and calls into question some of the fundamental social and economic principles that were the basis of the Islamic revolution. Adding to the complexity of the issue is Iran's foreign policy and its interaction with the international community, particularly the United States. In particular, sanctions play a key role in the refining crisis in Iran.

This study seeks to investigate how the combination of domestic economic policy, international sanctions, and growing demand for refined fuels all converge to create an enormous strategic vulnerability for the Islamic Republic, one that will increasingly force the leadership in Teheran to moderate its behavior in order to attract the foreign investment necessary to alleviate the refining crisis. Iran cannot generate the level of investment on its own necessary to modernize and expand its refining industry to meet growing demand. Likewise, it cannot afford to continue to pay to import and subsidize enough fuel to compensate for the shortfalls in domestic refining capacity. Extensive foreign investment from the private sector is required in the near term to avert a fuel shortage that has the potential to cripple the Iranian economy. However, the current investment climate inside Iran makes such a large investment by foreign companies extremely unlikely.

Given these conditions, the United States and other nations who currently view Iran as a threat to regional security have the latitude to exercise strategic patience in their dealings with the Islamic Republic. The current trends in the growth of energy consumption inside Iran, combined with the magnitude of the refining crisis, leave the Islamic Republic with very little time to remain locked in a diplomatic stalemate with the

West that continues to discourage vitally needed foreign investment in the energy sector. As the current stalemate continues without any clear resolution in sight, the Iranians face a stark choice: to either come to some agreement with the West that results in a loosening of sanctions and an improved investment climate, or continue their current antagonistic behavior and risk economic collapse.

## Historical Background

Oil has, for the most part, defined the interaction between modern Iran and the Western world. Beginning with the first oil concession granted to the Anglo-Persian Oil Company (APOC)(the ancestor to today's British Petroleum) in 1902, the Iranian perception of foreigners "stealing" Iran's natural resources has been a powerful force in both Iranian domestic politics as well as its foreign policy. This view became increasingly apparent in the interwar years, as the APOC used the weakness of the new Shah and the internal disorder in Iran to bilk the Iranians of million of dollars through "creative" accounting practices and outright refusal to pay proper commissions on its oil concession.<sup>2</sup>

This led to Iran's first great confrontation with the West, specifically Great Britain, when Mohammed Mossadegh nationalized the Iranian oil industry in 1954. Mossadegh, a firebrand politician in the *Majles* and champion of the anti-British movement in the Iranian government, used the crisis with Anglo-Iranian Oil Company (AIOC) to virtually overthrow the Shah and returned executive power to the Prime Minister. Nationalization of the oil industry became the vehicle that carried Mossadegh

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<sup>2</sup> Kenneth Pollack *The Persian Puzzle: The Conflict Between Iran and America*. (New York, Random House, 2005), 30-31.

to political power because it was the one issue on which the many, fractured political extremes inside Iran could agree on.<sup>3</sup>

Even after the CIA helped engineer Mossadegh's fall and the restoration of the Shah, the continuing influence of foreign oil companies (now principally American) in the Iranian oil industry engendered anti-Western feelings within Iran. More importantly, the United States, who had helped reinstate the hated Shah's rule in Teheran, replaced Great Britain as the object for most Iranians' hatred of the West. When the Shah's government collapsed under the weight of its own misrule in 1979, the new revolutionary government that replaced him carried with it a virulent anti-Americanism and mistrust of foreigners in general.<sup>4</sup> This anti-Western mentality became cemented into the Iranian political process once the Shia Islamists, led by Ayatollah Ruhollah Khomeini had driven their secular rivals from power in the years following the revolution. The new Iranian constitution would reflect this feeling, forbidding control of natural resources (particularly oil) by foreigners. This understandable aversion to foreign investment and control of Iranian oil facilities and infrastructure has returned to haunt the country as it tried to recover from the disruption and destruction of the revolution and the war with Iraq.<sup>5</sup>

The Iran-Iraq war, fought between 1980-1988, is the other defining historical event that has contributed to the current refining crisis in Iran. Essentially a power grab

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<sup>3</sup> Daniel Yergin *The Prize: The Epic Quest for Oil, Money, and Power*. (New York: Simon and Schuster, 1991), 453-461.

<sup>4</sup> Pollack, 135-140.

<sup>5</sup> Jahangir Amuzegar *Iran's Economy under The Islamic Republic*. (New York: I.B Taurus & Co, ltd., 1993), 29.

by Saddam Hussein's Iraq, the war began in 1980 at the height of the hostage crisis with the United States and the domestic political struggles in Teheran as the new, revolutionary government sought to define itself. The initial Iraqi offensive severely damaged the massive refinery complex at Abadan (once the world's largest). Subsequent air attacks by the Iraqi Air Force throughout the war destroyed what capability the Abadan refinery had left and ensured no repair or reconstruction work would be possible until well after the war ended in 1988.<sup>6</sup>

The hostile worldview retained by the Iranian regime after the war, particularly towards the United States, caused the Iranian government to continue aggressive, asymmetric attacks against the United States and its allies in the region, culminating in the Iranian-directed terrorist attack against the U.S. Air Force barracks at Khobar Towers in 1996. These attacks led to the Iran-Libya Sanction Act (ILSA) of 1996, passed by Congress in response to its perception of Iranian complicity in the Khobar Towers attack (a perception that would be validated several years later by Saudi intelligence)<sup>7</sup>.

ILSA and other economic sanctions will be dealt with in greater detail in another section of this paper, but ILSA began a long period in which the United States used economic and diplomatic efforts to contain Iran. Despite a brief period of détente during the rule of Iranian President Mohammad Khatami, relations between Teheran and the United States remained poor, while the sanctions regime effectively delayed any substantial reconstruction or upgrading of Iran's petroleum infrastructure.<sup>8</sup> Together

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<sup>6</sup> Yergin, 710-711.

<sup>7</sup> Pollack, 282-287.

<sup>8</sup> Pollack, 306-342.

with the country's explosive population growth rate, overly generous and economically destructive subsidies on a multitude of commodities, including gasoline, and sluggish economic growth that slowly but surely began degrading the quality of life for most Iranians, the sanctions regime has left the Iranian petroleum industry without sufficient refining capacity to meet growing demand. Each of these areas (sanctions, the structure of the Iranian economy, and subsidies) is explored in greater detail and demonstrates the almost inevitable collapse of the Iranian government's finances in the near term.

## **The Economy of the Islamic Republic**

The Iranian revolutionaries who helped overthrow the Shah in 1979 encompassed a wide array of divergent, and eventually incompatible, political and economic groups. As Jahangir Amuzegar notes in his excellent analysis of the economic structure of the Islamic Republic, the 1979 constitution reflects the different economic views of these various political constituencies. The overall constitutional framework for the economy, however, is dominated by the Ayatolla Khomeini's concept of "Islamic economics".<sup>9</sup>

Chapter IV, Articles 43-55 of the Constitution of the Islamic Republic deals directly with economic and financial affairs. Article 43 states that "The economy of the Islamic Republic of Iran, with its objectives of achieving the economic independence of the society, uprooting poverty and deprivation, and fulfilling human needs in the process of development while preserving human liberty..."<sup>10</sup> Each of these three themes (economic independence, ending poverty, and responsible development) echo some of

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<sup>9</sup> Amuzegar, 18-19.

<sup>10</sup> Chapter IV of the Constitution of the Islamic Republic, *Iranchamber.com*, [http://www.iranchamber.com/government/laws/constitution\\_ch04.php](http://www.iranchamber.com/government/laws/constitution_ch04.php), (accessed 9 January 2008).

the principle points of opposition during the shah's reign. In particular, the Shah was seen as having sacrificed much of Iran's traditional cultural norms by adopting a flawed Western development model, with the result being a growing dependence on imports and growing poverty and unemployment.<sup>11</sup>

The Islamists, following Khomeini's instructions, sought to remedy these conditions by adhering to loosely defined principles of economic activity culled from the Koran and other schools of Islamic jurisprudence. Amuzegar notes that Khomeini's vision for the Iranian economy generally involved placing economic considerations secondary to spiritual matters, but he never directed specifics of his so-called ideal Islamic economy. In general, these principles involved improving the lot of the poor and dispossessed, ensuring an equitable distribution of natural riches to everyone, and endorsing responsible economic activity, such as the ownership of property and the accumulation of wealth.<sup>12</sup>

The other aspects of the economy applicable to Iran's current crisis are also found in the various articles of Chapter IV of the constitution. In particular, several articles have direct bearing on how the Iranian economy would deal with development of its energy infrastructure and foreign investment. Article 44 divides the economy into three sectors: state, cooperative and private. The state sector includes all major minerals (including oil and gas) and banking, among other things. This left the control of all natural resources and major capital for investment under the purview of the state, rather than private industry. Article 45 leaves all public wealth and property at the disposal of

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<sup>11</sup> Amuzegar, 15.

<sup>12</sup> Amuzegar, 16-18.

the state, with its exact definition defined by laws as passed by the *Majles*. Finally, Article 49 compels the state to confiscate all property and wealth acquired illegally or immorally, after due investigation and furnishing of evidence in accordance with Islamic law.<sup>13</sup>

The outcome of these constitutional directives directly influences the construct of the Iranian energy sector in a multitude of ways. First, since the disposition of major minerals lies with the state, the National Iranian Oil Company (NIOC) controls the entire petroleum industry in the country. Subsidiaries, such as the National Iranian Oil Refining and Distribution Company (NIORDC), handle other aspects of the petroleum industry. All aspects of the industry are thus under the central control of the government and vulnerable to the inefficiencies and bureaucratic inertia that are normally associated with centralized control. In particular, investment and development of the industry by NIOC and its subsidiaries are subject to often-changing developmental priorities and decisions by the government, rather than a more rational market-driven development and investment model.<sup>14</sup>

Articles 45 and 49 also impact how external companies view the investment climate inside Iran. Because all property involved with oil production and refining belongs to the state, any purchase or lease of property for infrastructure investment must be approved by the *Majles*, who retain the freedom to change their decision at any time. The constitutional directive to confiscate any property or assets acquired “illegally or immorally” also raises fears of arbitrary confiscation of petroleum investments,

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<sup>13</sup> Chapter IV of the Constitution of the Islamic Republic, *Iranchamber.com*, [http://www.iranchamber.com/government/laws/constitution\\_ch04.php](http://www.iranchamber.com/government/laws/constitution_ch04.php), (accessed 9 January 2008).

especially considering Iran's history of nationalization of its petroleum industry. These uncertainties make foreign companies, particularly Western companies, view Iranian petrochemical investment opportunities as carrying significant risk.

### **Foreign Investment and “Buyback Schemes”**

With widespread destruction from the Iran-Iraq War, the government in Teheran faced an extremely difficult reconstruction challenge after the final cease-fire in 1988. The constitution and the structure of the economy, along with the internal political climate, prevented the massive influx of capital that the nation required to rebuild from the war quickly. Searching for a solution that would allow for foreign investment (particularly in the petroleum sector) and still not violate the constitution, the Rafsanjani government introduced the so-called “Buyback” scheme as part of a 5-year development plan in 1995.<sup>15</sup>

“Buyback” investments are a means to attract foreign capital while avoiding foreign ownership of Iranian state resources. Project offers are tendered for bidding, with the Iranian government (typically NIOC or one of its subsidiaries) providing 60% of the required capital, with the foreign investor providing the other 40%. The foreign investment becomes sovereign debt, which the Iranian government buys back at a specific rate of return, typically 15-17%. This investment scheme is unique in the world and contrasts sharply with normal petroleum industry financing arrangements, where

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<sup>14</sup> Amuzegar, 242-247.

<sup>15</sup> Roger Stern, “The Iranian petroleum crisis and United States national security”, *Proceedings of the National Academy of Sciences Journal* 104, no 1 (January 2, 2007).  
[www.pnas.org/cgi/doi/10.1073/pnas.0603903104](http://www.pnas.org/cgi/doi/10.1073/pnas.0603903104) (accessed January 2, 2008): 379.

foreign companies agree to provide capital, technology, and management expertise in return for a portion of the resources produced or extracted.<sup>16</sup>

“Buyback” investment schemes, while responsible for the limited amount of foreign investment that has occurred in the Iranian petroleum sector, are not popular with most foreign firms. This has limited Iran’s access to the capital, expertise, and technology needed to truly rebuild and modernize its petroleum sector. This is particularly true since the increase in tensions with the international community over the Iranian nuclear program, because the uncertainty these tensions create tends to discourage long-term investment. This makes the prospect of Iran attracting badly needed investment in the petroleum sector unlikely in the near future.<sup>17</sup>

### **Subsidies and the Iranian Welfare State**

While Iran’s limited refining capacity and the need to rebuild after the damage caused by the turmoil of the revolution and the subsequent war with Iraq would normally combine for a significant development challenge, the additional strain of explosive growth in gasoline consumption further compounds the problem. This growth in demand, far greater over time than might normally be expected, is the result of the enormous subsidy on gasoline provided by the government.

Subsidies are an outgrowth of the Ayatolla Khomeini’s Islamic economic model that focused on providing the basics of life to the poor. At first, subsidies and price controls were the government’s answer to runaway inflation caused by the 1979

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<sup>16</sup> Stern, p379.

<sup>17</sup> United States Energy Information Administration. “Country Analysis Brief: Iran”, *EIA.gov*, October 2007. [www.eia.doe.gov/emeu/cabs/Iran/pdf.pdf](http://www.eia.doe.gov/emeu/cabs/Iran/pdf.pdf), (accessed October 12, 2007): 4.

revolution and the war with Iraq. Combined with rationing of critical commodities, these subsidies allowed the country to continue to function despite the war. This wartime experience also set the precedent that the price of imported goods or commodities could be subsidized below true cost on the basis of social needs.<sup>18</sup>

This resulted in Iran having the largest energy subsidies in the world, with the subsidies on oil products (principally gasoline) accounting for two-thirds of total subsidies.<sup>19</sup> The cost of these subsidies to the Iranian economy are staggering: In 2004, energy subsidies accounted for \$16.5 billion, or an incredible 10% of GNP. The subsidies on gasoline alone for 2005 totaled more than \$2.2 billion in 2007 dollars. Furthermore, this share of GDP devoted to energy subsidies has remained fairly constant for more than a decade, with subsidy growth matching overall growth in GDP.<sup>20</sup>

The cost of these subsidies and the debilitating effect they have on overall government expenditures are not lost on the Iranian leadership. As early as 1999 during the presidency of reform-minded Mohammed Khatami, the government stated publicly that ending subsidies was crucial to ensuring further development for the nation. Implicit in this plan, however, is an effort to encourage the substitution of natural gas for oil products and involves increasing the subsidy for natural gas versus gasoline, further encouraging overall consumption.<sup>21</sup>

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<sup>18</sup> Amuzegar, 79.

<sup>19</sup> International Energy Agency. *World Energy Outlook 2005: Middle East and North Africa Insights*. Paris: IEA Publications Office, 2005. <http://www.iea.org/textbase/nppdf/free/2005/weo2005.pdf> (accessed October 12, 2007): 342-343.

<sup>20</sup> International Energy Agency 2005, 343.

<sup>21</sup> International Energy Agency. *World Energy Outlook 1999: Looking at Energy Subsidies*. Paris: IEA Publications Office, 1999. <http://www.iea.org/textbase/nppdf/free/1990/weo1999.pdf> (accessed October 12, 2007): 160-161.

Despite voicing its intention to end subsidies as far back as 1999, no concrete action was taken until 2007. This inaction is a sign of the tumultuous nature of Iranian politics, particularly with any issue that calls into question the legacy of the Ayatolla Khomeini and his system of Islamist principles. Hardline elements within the *Majles* and especially within the theocratic bodies of the government such as the Council of Guardians routinely attack any initiatives that seem to discredit the Islamist principles and legacy that provide the basis for their political power. Because subsidies are seen as a manifestation of the Ayatolla's system of "Islamic economics", any attempt to erode subsidies opens the door to the erosion of the theocratic system in the government, or so they believe. Thus, energy subsidy reform became one more issue caught up within the fractured landscape of Iranian politics, with any effort to promote reform evoking resistance from a large enough number of political factions to ensure failure.

In the fall of 2006, the Iranian Oil Minister, Kazem Vaziri Hamaneh, announced plans to ration gasoline in order to cut consumption and end imports.<sup>22</sup> Yet, internal resistance delayed the implementation of this plan until July 2007. The government imposed both a large increase in the price of gasoline and a gasoline rationing system. The resulting riots and anti-government demonstrations have already been mentioned. However, the new rationing system had an immediate effect, reducing overall gasoline demand by 30%.<sup>23</sup> However, considering the impact of related energy and non-energy

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<sup>22</sup> Paul Rivlin, "Iran's Energy Vulnerability", *The Middle East Review of International Affairs* 10, no 4 (December 2006). <http://meria.idc.ac.il/journal/2006/issue4/jv10no4a7.html> (accessed October 22, 2007): 9.

<sup>23</sup> Energy Information Administration, 7.

subsidies, such as subsidized production of automobiles, the reduction in consumption achieved by the rationing scheme will quickly be made up by new growth in demand.

## **The Iranian Refining Industry**

As previously stated, the National Iranian Oil Refining and Distribution Company (NIORDC), a subsidiary of the National Iranian Oil Company (NIOC), controls the Iranian refining sector. NIORDC is responsible for all so-called “downstream” petroleum activities in Iran, to include oil refining, distribution and marketing of refined oil products. However, because both NIOC and its subsidiaries are wholly state-owned, there is essentially no difference between the government’s Oil Ministry and NIOC, and the company is wholly subject to government budget decisions and planning guidance, as well as providing all of its profits directly to the government’s coffers.

To fully understand how the Iranian refining industry has been unable to keep up with growth in demand despite the nation’s oil wealth, it is necessary to review what is involved in refining oil into useful products. The refining process itself is not the focus of this study, but understanding the overall process is crucial to fully articulating the Iranian refining problem.

### **A Brief Primer on Refining**

The common image in the United States of an oil refinery is a massive industrial plant, running 24 hours a day and producing tens of thousands of gallons of gasoline, diesel, heating oil, and other products each day. These modern refinery complexes are masterpieces of modern technology, using advanced chemical and industrial processes to maximize yields and customize the percentage of each fuel produced based on seasonal and market conditions. For instance, U.S. refineries produce more gasoline during the

summer, when demand is highest, at the expense of products like heating oil, which is a product only in demand during the winter. It is the high level of technical development of the U.S. refining industry that allows for such efficiency, and the lack of such advanced development is at the heart of the Iranian refining crisis.

Refining is a term that broadly describes the physical and chemical processes used to convert crude oil into useable industrial products, such as gasoline or kerosene. Oil's first use was to provide an illuminant fuel that was cheaper and more plentiful than whale oil. Kerosene, derived from crude oil, quickly displaced whale oil as the illuminant fuel of choice worldwide and became the basic product of the early oil industry.<sup>24</sup>

The industrial age brought with it new uses for the many different types of fuels that are refined from a given amount of crude oil. In addition to Kerosene, Gasoline, Diesel, Light and Heavy Fuel Oil, and many other non-fuel products are produced from refining crude oil through various processes. Modern refining is a complex science, where petroleum engineers and chemists determine the best chemical and industrial refining processes needed for various grades of crude oil in order to optimize the final product for the end user.

In general, refining consists of a chemical process called fractionating to separate crude oil into its various hydrocarbon components. When heated, crude oil separates into its many component liquid and gaseous hydrocarbons based on their respective boiling points. The different hydrocarbons are then siphoned off and either sent for transport or further refined using different chemical additives or industrial processes. Thus, from each barrel of crude oil, a number of different products, such as gasoline and diesel fuel,

are produced. In the industry's early days, the proportion of each product produced from a given quantity of oil was relatively fixed. Advances in technology, however, have allowed modern refineries much greater control over the amount of each hydrocarbon fuel produced, as well as the flexibility to change the ratio of fuels produced at a given refinery based on seasonal or market driven changes in demand. The Iranian refining industry, however, uses equipment and processes that are largely obsolete and that lack the technical development of their Western counterparts.

### **The State of the Iranian Refining Industry**

The Iranian refining industry is remarkably primitive, considering the vastness of its petroleum reserves and the importance of the overall petroleum industry to the nation. As with the overall petroleum industry, the refining sector dates back to the British involvement and the Anglo-Persian Oil Company, who built Iran's first refinery at Abadan in 1912.<sup>25</sup> Today, the Abadan refinery is still Iran's largest refinery, even as the site approaches its 100<sup>th</sup> birthday. Abadan and eight other refineries around the country were capable of refining 1.5 million barrels per day (mbl/d) of crude oil in 2004, and Iran is a net exporter of refined petroleum products.<sup>26</sup> Table 1 lists all currently active Iranian refinery complexes and their associated production.

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<sup>24</sup> Yergin, 20-28.

<sup>25</sup> Yergin, 144.

<sup>26</sup> International Energy Agency 2005, 361-362.

	Start-up year	Capacity 2004 (kb/d)	Light product share (%)	Planned expansions (kb/d)	Expected completion date
Abadan	1970	400	44.5	50	2005
Arak	1993	170	58.3	80	2010
Bandar Abbas	1998	232	59.0	608	2010
Isfahan	1979	284	56.9	108	2010
Kermanshah	1971	25	51.9	-	-
Lavan	1977	30	60.6	-	-
Shiraz	1974	40	59.2	-	-
Tabriz	1978	100	61.9	50	2010
Tehran	1968	225	60.9	-	-
<b>Total</b>		<b>1 506</b>	<b>57.0</b>	<b>896</b>	

#### Crude Oil Distillation Capacity in Iran, 2004

Source: IEA World Energy Outlook 2005, 362

A closer look at Iran's refining sector paints a gloomy picture, however. Table 1 shows that seven of nine active refinery complexes date from before the Iranian revolution. Three other refineries are small, with a capacity of between 25,000-40,000 bld. Furthermore, the light product share (the output from which gasoline and other light transport fuels are produced) of Iran's refineries averages only 57%, meaning that nearly half of total refinery output is unusable for the production of critically needed light transport fuels. These trends are reflective of the age of these facilities and the lack of sophisticated, modern technology throughout the overall refining industry. For instance, the overall average gasoline output of Iranian refineries is only 13% of total refined products, less than half of the average gasoline output of a comparable European

refinery.<sup>27</sup> Iran is a net exporter of refined products only because it produces large amounts of excess heavy fuel oil that it lacks the necessary technology and infrastructure to further refine into badly needed light fuel products.

Because of these shortfalls, NIORDC must import significant quantities of gasoline every year. Estimates of the shortfall of gasoline vary based on the source used, but average around 40% of total demand. According to the United States Energy Information Administration (EIA), which had the latest numbers available for this study, Iran imported on average more than 192,000 bbl/d of gasoline in 2006, costing over \$5 billion. EIA projects that imports will cost nearly \$6 billion in 2007, despite the institution of the new rationing system in July 2007. EIA also notes that the new rationing system resulted in a decrease of gasoline imports of about 13%, but it did not reduce demand sufficiently to eliminate them altogether.<sup>28</sup>

### **Prospects for Growth in Refining Capacity**

The International Energy Agency (IEA) outlook for the Iranian refining sector is gloomy, but reserved in its overall judgments. The IEA projected in 2005 that the Iranian refining sector badly needed modernization that would only be possible with significant foreign investment and modern technology. Its planning scenario projects a requirement of \$16 billion between 2004-2030, investments that would allow total refining capacity to

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<sup>27</sup> International Energy Agency 2005, 361.

<sup>28</sup> Energy Information Agency, 7.

reach 2.6 mb/d by 2030. This represents a modest increase of 1.1 mb/d in total capacity.<sup>29</sup>

However, these estimates are based on the Iranian government's own projections for new investment in the refining sector, which the historical trends demonstrate are rarely achieved. IEA's 2004 outlook projected completion of a planned expansion of 50,000 bbl/d at the Abadan complex by 2005.<sup>30</sup> However, IEA estimates of total capacity show no change between the EIA 2004 numbers and the their own 2007 estimate, with total capacity remaining steady at 1.5 mb/d.<sup>31</sup> Thus, either the planned expansion still has not taken place, or has been nullified by lost production elsewhere. Indeed, total refining capacity today is essentially the same as it was in 1980, when total capacity was estimated at 1.3 mb/d.<sup>32</sup>

Many other oil industry analysts are more pragmatic about the chances of increased development in the refining sector. A recent news article lays bare many of the issues confronting NIORDC in its attempts to increase capacity and modernize its refineries to produce more transport fuels. Analyst Simon Webb notes that a combination of U.S. sanctions and unofficial U.S. pressure on banks and oil firms to avoid doing business with Iranian companies had made some impact, especially when combined with other business pressures and rising demand for refinery additions and expansion worldwide. He also notes that Iran has not yet ordered some refinery equipment that has

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<sup>29</sup> International Energy Agency 2005, 363.

<sup>30</sup> International Energy Agency, 362.

<sup>31</sup> Energy Information Agency, .6.

<sup>32</sup> International Energy Agency, 360.

delivery lead times of 2-3 years, making any expansion in the near term even more unlikely.<sup>33</sup>

Analyst Roger Stern is even more critical of the prospects for increased development within the refining industry. He cites the influence of U.S. pressure to avoid doing business in Iran, but believes that the chaos within the Iranian government and the business uncertainties it creates are equally to blame. The example he uses is of a Japanese consortium, negotiating for the rights to develop the huge Azadegan oil field through a “buyback” agreement. The negotiations have lasted for 7 years with no result. Considering the lower investment returns on refinery projects versus those on oil production projects, the likelihood of attracting the necessary foreign investment in this investment environment is small.<sup>34</sup>

Stern also dismisses the possibility of the Iranians financing these projects themselves through direct investment of budgeted development funds. He sites a NIOC official and claims that because domestic refinery expansion is unprofitable due to the subsidized price structure (and thus does not contribute to the government’s coffers), the continued import of fuel is favored over funding extensive refinery expansion. Instead, investment funds are better spent on the upstream sector, in order to produce more crude oil for export.<sup>35</sup> Webb also supports this view by noting that the entire NIOC investment

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<sup>33</sup> Simon Webb, “Iran Falling Short of Refining Ambitions.” *Iranfocus.com*, 19 June 2007 <http://www.iranfocus.com/modules/news/article.php?storyid=11618>. (accessed October 22, 2007): 2

<sup>34</sup> Stern, 379.

<sup>35</sup> Stern, 379.

budget for 2007 (for both upstream and downstream projects) is not enough to cover the cost of constructing one large refinery.<sup>36</sup>

### **Prospects for Continued Growth in Demand**

Unlike the prospect for refining capacity, continued growth in demand for refined products, particularly gasoline, is virtually assured. Again, the historical trends provide a useful reference for predicting rising growth in demand for fuel. Overall oil consumption has steadily risen for the past decade, and rising domestic demand has consumed most of the net production increases of the past decade.<sup>37</sup>

Growth in gasoline demand has increased at an average rate of 10% annually between 2001-2007.<sup>38</sup> While the new rationing scheme may lower overall growth in gasoline demand, it will not eliminate it. In particular, the growing number of cars on Iran's roads will virtually ensure that demand for gasoline continues to grow at or near the average annual rate, since new drivers will also be permitted a full ration of fuel on top of existing car owners. The total number of cars in Iran grew one hundred fold between 1990-1996, to 2.9 million vehicles. This massive increase is a result of a subsidized domestic automotive industry, protectionist policy that shield domestic auto manufacturers from competition, and the subsidized fuel prices.<sup>39</sup> Similar growth in the size of the vehicle fleet can be expected in the near term.

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<sup>36</sup> Webb, 1.

<sup>37</sup> Energy Information Agency, 5.

<sup>38</sup> Energy Information Agency, 6.

<sup>39</sup> International Energy Agency 1999, 162.

The government rationing scheme does very little to discourage new car ownership, because it only really limits existing fuel customers who previously used more than the rationed amount of fuel. No effort has been made to remove the official subsidies on the auto industry. As such, the drop in gasoline demand engendered by the July 2007 rationing effort is only temporary, at best. Given the previous outlook on new refinery production or modernization, it is safe to assume that Iran's gasoline imports will have to increase to, and eventually exceed, their earlier highs in order to meet unchecked growth in demand.

### **International Sanctions on Iran**

The Islamic Republic has faced the issue of economic sanctions almost since its inception, mostly applied by the United States. These sanctions have taken on a variety of forms, from banning imports from or exports to Iran to denying the Iranian government access to the international banking and credit institutions normally available for financing internal development projects. While the effectiveness of these sanctions, in terms of their relative impact on the Iranian government, have ebbed and flowed over the course of time, the sanctions regime has made further development of the Iranian refining industry problematic in general, and combined with the difficult investment climate in Iran to specifically dissuade badly needed foreign investment in particular.

The first economic sanctions levied against the Islamic Republic were implemented by the Carter administration on November 12, 1979, in response to the takeover of the U.S Embassy in Teheran earlier that month. These sanctions initially consisted of acts via executive order that banned trade (excluding humanitarian goods) with Iran and froze Iranian assets in U.S. banks, and were intended to put pressure on the

new revolutionary government in Teheran to end the hostage crisis.<sup>40</sup> However, the international community only half-heartedly supported the idea of sanctions, and when implemented by the European Union, the European sanctions regime was “...so meaningless as to be insulting to the United States.”<sup>41</sup> Overall, the sanctions had little effect on the Iranian regime.

Aside from a fairly effective arms embargo during the Iran-Iraq War, sanctions had little impact on Iran in the 1980s. The United States still refused to reopen trade with Iran, but since the Iranians were not interested in trade with the U.S. and could still trade with most of Europe and Asia, it mattered very little. The next large step in increasing the economic sanctions regime against Iran occurred in response to Iranian efforts to derail the Arab-Israeli peace process by supporting Lebanese Hezbollah, Palestinian Islamic Jihad, and Hamas, whose continual terror attacks were threatening to destroy the efforts towards a final peace with Israel. In May 1995, President Clinton issued an executive order banning all trade and investment in Iran by U.S. corporations or their foreign subsidiaries, especially investment in the Iranian oil industry. This order closed the remaining loopholes in the Carter and Reagan-era restrictions and scuttled recent attempts by U.S. oil companies to capitalize on the possibility of lucrative reconstruction contracts in Iran.<sup>42</sup>

Although these new sanctions were intended to close off any remaining American trade with Iran and serve as an example of U.S. resolve to the Europeans and Japanese

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<sup>40</sup> Pollack, 164.

<sup>41</sup> Pollack, 170.

<sup>42</sup> Pollack, 273.

(whose trade with the Iranians, except for weaponry, was essentially unrestricted), it did not garner much support outside the U.S. Most other nations continued to trade with the Iranians without restriction, and the Iranians soon found other buyers for their oil at essentially the same prices (oil had been the largest remaining active trade between the U.S. and Iran). The frustration over what appeared to be international apathy over Iran's rogue status and support for terrorism set the stage for the implementation of the Iran-Libya Sanctions Act.<sup>43</sup>

### **The Iran-Libya Sanctions Act of 1996**

Congress quickly followed the Clinton administration's sanction action via executive order with legislative action designed to further punish Iran and change the behavior of the government in Teheran. The Iran-Libya Sanctions Act of 1996 (ILSA) (provisions against Libya were added in response to that nation's refusal to hand over two terrorism suspects) incorporated the full measure of action of previous executive orders and added additional actions to specifically discourage foreign investment in the Iranian energy sector.

This legislation requires the President to apply at least two sanctions from a list of seven possible sanctions against any foreign company, person, or entity that invests more than \$20 million dollars in the Iranian energy sector in a single year. The list of possible sanctions consists of various measures to deny a sanctioned company access to various aspects of the U.S. financial system, including denial of loans or other financial instruments, import or export licenses, and the ability to purchase U.S. government

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<sup>43</sup> Pollack, 280-287.

bonds.<sup>44</sup> This legislation has been updated and extended several times, most recently in 2006, when its application to Libya was terminated and the legislation became known as the Iran Sanctions Act (ISA).<sup>45</sup>

Officially, no foreign firms have been sanctioned under this law. European opposition to what they consider to be extraterritorial application of U.S. law has led to either the State Department making no final determination on whether or not a particular investment is sanctionable or the Administration using the national security waiver provision of ISA to preclude any action.<sup>46</sup> However, the threat of U.S. sanctions under ISA is widely seen as discouraging investment by major foreign firms because the uncertainty involved greatly increases the risk imposed upon a company making a multi-billion dollar investment.

### **United Nations Sanctions Against Iran**

Recently, the revelation of Iran's clandestine nuclear program, in violation of the Nuclear Non-Proliferation Treaty (NPT), has led to a series of sanctions applied against Iran by the United Nations Security Council. The most recent of these actions is UN Security Council Resolution 1747, passed in March of 2007. This resolution seeks to tighten restrictions on Iranian trade and institutions that directly contribute to the country's nuclear and missile programs by calling on member states to prevent the export

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<sup>44</sup> Congressional Research Service "The Iran Sanctions Act (ISA)." (Washington: U.S. Government printing office, 2007), 2.

<sup>45</sup> CRS, 1.

<sup>46</sup> CRS. 4-5.

or funding of activities, institutions and individuals directly involved with the Iranian weapons programs.<sup>47</sup>

While not specifically targeted at the Iranian economy or the Iranian energy sector, these sanctions will further reinforce ISA and other non-UN sanctions in limiting Iranian access to foreign investment and technology for the energy sector. Aside from demonstrating increasing isolation from the international community, a provision of UNSCR 1747 “Calls upon all States and international financial institutions not to enter into new commitments for grants, financial assistance, and concessional loans, to the Government of the Islamic Republic of Iran, except for humanitarian or developmental purposes.”<sup>48</sup> While the wording of this provision leaves plenty of room for banks and corporations to avoid direct censure, the implicit threat will undoubtedly contribute to further reluctance of banks and creditors to do business in Iran.

### **Other Sanctions Against Iran**

Of all the efforts to prevent further foreign investment in Iran’s energy sector, the diplomatic offensive by the U.S. Department of the Treasury seems to have had the greatest impact. Capitalizing on the political uncertainty created by other sanctions programs, such as ISA and UNSCR 1747, the Treasury department has quietly worked to dissuade major banking institutions from doing business with Iran. Analyst Lionel Beehner, writing recently for the Council on Foreign Relations, highlighted the effectiveness of the Treasury Department in closing off Iran’s access to foreign capital.

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<sup>47</sup> United Nations Security Council Resolution 1747, adopted 24 March 2007. [http://www.iaea.org/NewsCenter/Focus/IaeaIran/unsc\\_res1747-2007.pdf](http://www.iaea.org/NewsCenter/Focus/IaeaIran/unsc_res1747-2007.pdf), (accessed 20 January 2008): 2.

<sup>48</sup> UNSCR 1747, 3.

He notes that while not all banks have ceased doing business with Teheran, the financial pressure results in the Iranians being forced to obtain loans at less favorable terms and higher interest rates.<sup>49</sup> If the current impasse over Iran's nuclear program continues and the Iranian government becomes further isolated from the global community, it is reasonable to expect this "risk premium" to increase as well.

### **Analysis: The Argument for Strategic Patience**

The influences of international sanctions, domestic policy and energy sanctions all contribute to a cycle of decline that Iran's refining industry remains locked into. The argument that the United States and other nations opposed to the aberrant behavior of the regime in Teheran can afford strategic patience in forcing change in Iran's behavior is based on the conclusion that Iran is incapable of breaking out of this cycle.

### **The Cycle of Decline**

This analysis is based on dividing the Iranian refining crisis into three distinct phases. The first phase deals with the refining industry's basic infrastructure problems and the lack of investment necessary to alleviate them. The second phase involves Iranian domestic energy and economic policy that simultaneously provides massive subsidies to energy prices while also encouraging unchecked growth in demand for fuel, all in an environment of massive population growth. The third phase involves the multitude of different international sanctions applied against Iran, which combine with an antagonistic investment climate that discourages foreign investment and ensures that Iran

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<sup>49</sup> Lionel Beehner, "U.S. Sanctions Biting Iran." *CFR.org*, January 23, 2007. [http://www.cfr.org/publication/12478/us\\_sanctions\\_biting\\_iran.html](http://www.cfr.org/publication/12478/us_sanctions_biting_iran.html); (accessed 29 January 2008)..

will never have the requisite access to foreign capital, expertise, and technology necessary to revitalize its refining industry.

### Phase 1: Under Investment

The first phase of this cycle, referred to here as the under investment phase, represents the variety of factors that result in the continual lack of investment in NIORDC refining capacity to cope with rising demand for gasoline and transport fuels. This pattern of under investment results in a refining industry that is dominated by older, inefficient refining complexes, suffers from poor maintenance, and is unable to meet the Iranian economy's basic requirements for refined fuels.

The reason it is unlikely that Iran will break this pattern of under investment in the refining sector is principally domestic politics. With the recent rise in global oil prices, the Iranian government should be showing large budget surpluses thanks to increased oil revenues. However, domestic politics has led to a sharp rise in spending on popular but expensive public welfare programs. As *Economist* magazine recently noted, despite record oil export revenues, the government in Teheran finds it increasingly hard to pay its bills.<sup>50</sup> The refining shortfall adds to the budget woes as the wholesale price of gasoline on the world market increases in pace with the rise in prices for crude oil.

The long-term solution would be a balanced investment policy in both upstream (crude oil) and downstream petroleum infrastructure. This would balance the increase in domestic demand for petroleum with additional crude oil production available for export to fund the government's coffers. However, the adoption of such a balanced investment

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<sup>50</sup> Economist, "The Big Squeeze" *Economist Special Report on Iran*, Jul 19 2007, 10.

plan would require an efficient development plan run by competent government technocrats. The Iranian government is currently deficient in both thorough economic planning and competent government technocrats to implement development. The Economist points out how President Ahmadinejad has replaced key experienced members of the Management and Planning Organization and Oil Ministry with cronies from the Revolutionary Guards, crippling two of the more economically important ministries in the government.

President Ahmadinejad is up for reelection in 2009, making any painful transition towards a more balanced petroleum industry investment plan unlikely in the near term. Because most Iranians see the many popular welfare programs run by the government as the means by which the government is fulfilling its promise to share the nation's oil wealth with the people, neither the populist president nor the fractious *Majles* is likely to undertake painful reform. The demand for increased government revenues will ensure that what development funds are available for NIOC are spent on upstream projects that promise to provide more crude oil for export, as well as the growing natural gas industry. Refining projects are likely to remain a lower priority for the government, ensuring that the gap between capacity and demand continues to grow each year.

## Phase 2: Growth in Demand

Many of these same detrimental influences contribute to the second phase of the refining industry's cycle of decline, referred to here as the growth in demand phase. This phase involves the many factors that ensure that the steady, unsustainable growth in demand for gasoline and other transport fuels will continue in the near term. As in the under investment phase, the primary drivers of the continued growth in demand are

domestic Iranian political and economic influences that are both pervasive and extremely difficult to correct.

The principle guarantor of continued growth in demand for fuel in Iran is the massive subsidies provided by the government. While fuel subsidies are not unique to Iran, the scope and cost of this subsidy is unique. Subsidizing fuel refined domestically would be expensive in and of itself; to so heavily subsidize fuel imported from abroad at market prices is unbelievably expensive.

Subsidies are always painful for a government to end, both because many people rely on subsidized products or services to survive and because to end subsidies abruptly can cause massive inflation. In Iran, the fuel subsidy issue is further complicated by the ideals of the 1979 Islamic Revolution and the Ayatolla's conception of an Islamic economy. First, many of the common people see cheap fuel as the means by which the government redistributes the nations' oil wealth, one of the principle tenets of the Revolution and a cornerstone of the Constitution. Any changes to the subsidy structure that prevents all Iranians from having equal access to gasoline would likely be painted in the public's mind as a deviation from the ideals of the Revolution, an accusation tantamount to political suicide in Iran.

One possible way to avert the damage done by massive cost of the gasoline subsidy, at least in the near term, is to leverage the increased revenues drawn from record-high global oil prices to fund the necessary fuel imports until sufficient refining capacity is available to reduce or eliminate fuel imports. However, the relationship between gas prices and oil prices proves this hope is a fallacy. Because the cost of gasoline on the global market is directly influenced by the cost of oil feedstock into the

refineries, increases in international gasoline prices match or exceed the rise in oil prices. In effect, if Iran generates more revenue from oil, it must expect to pay more for refined fuels as well.

Estimates of Iran's oil export revenues demonstrate this relationship. EIA estimates that Iran exported an average of 2.5 million bbl/d in 2006, earning an estimated \$54 billion in oil revenue. However, increases in global gasoline prices left a total cost for imports of \$5 billion for 2006, not counting the costs of subsidized domestic gasoline production. Cost of imports of gasoline is expected to reach \$6 billion or more in 2007, easily keeping pace with increased oil revenue from higher oil prices.<sup>51</sup>

The second major impediment to radical change in the fuel subsidy is the fractious nature of Iranian politics. One of the prominent political blocks in the *Majles* consists of a clerical faction dedicated to realizing the Ayatolla Komeini's vision of an "Islamic Economy", an idea that generally manifests itself as a sort of Islamic socialism. This political block actively resists any changes to the massive social welfare programs and subsidy regime. Because this block is currently well represented in the *Majles*, any change to the fuel subsidy structure beyond the rationing scheme and price increase already imposed in June 2007 is highly unlikely.

Indeed, President Ahmadinejad has already tried to shift blame for the unpopular rationing program away from his government to the technocrats in the various government ministries, leading to the previously noted changes in key ministries such as the Management and Planning Organization and the Ministry of Oil. Popular anger over the impact of the rationing scheme has also begun to erode its effectiveness. The

government has already doubled the gasoline ration during the busy summer holiday season, and insisted that the rationing scheme is temporary and would only last 4 months.<sup>52</sup> These pronouncements, which defy the magnitude of the budget problem for fuel imports, show just how sensitive both the President and the *Majles* are to domestic anger over the subsidy issue. With the government already wavering in the face of public pressure, the effort to reform the fuel subsidy and discourage consumption is guaranteed to stagnate.

The other principle guarantee to continued growth in demand is simple population growth. Iran has a young, reasonably well-educated population that is growing at or above the prevailing growth rates of the region. Iran's population stands at over 65 million already, with a median age of just 25 years.<sup>53</sup> This youthful population is a result of Ayatolla Komeini's policy of encouraging high birth rates in the period immediately following the 1979 Revolution, resulting in an annual birthrate that approached 4% at some points in the late 1980s. As the Iranian economy grows to accept these new workers, so too will overall consumption of fuel.

One aspect of this economic and population growth encouraging consumption of gasoline and other fuels is the growing number of vehicles on Iran's traffic clogged roads. An estimated 14.9 million cars and other gasoline-powered vehicles are on the roads at the end of 2007 (or roughly 1 per every 4 Iranians), and growth in vehicle

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<sup>51</sup> EIA, 6-7.

<sup>52</sup> Economist Intelligence Unit, "A Fuel Pinch." *Economist.com*, Sept 3, 2007. <http://store.eiu.com/product/890000289IR/i672524852/wf-ssb-issues-articles.html> (accessed 28 January 2008).

<sup>53</sup> Central Intelligence Agency, "CIA World Factbook". *CIA.gov*, <https://www.cia.gov/library/publications/the-world-factbook/geos/ir.html>, (accessed 14 February 2008).

ownership has averaged more than 16% annually in the period from 1990-2006.<sup>54</sup> The government, encouraging continued growth in vehicle ownership, heavily subsidizes the automotive industry. If the annual average growth rate holds steady for the period 2008-2012, this will result in an additional 11.9 million gasoline powered vehicles in use by the end of 2012.

It is these numbers that call into question the Iranian government's estimates of how effective the fuel rationing system and planned refinery expansion projects will be in eliminating gasoline imports. Even if all new gasoline powered vehicles were held to the 100 liter per month ration, 11.9 million new vehicles result in an additional monthly demand of 1.19 billion liters of gasoline by 2012. Comparing this growth figure to the total monthly domestic production of gasoline in 2005 of 1.26 billion liters<sup>55</sup>, this 5-year growth in demand will nearly equal current total domestic gasoline production.

While these numbers are estimates based on historical growth and production figures, they are illustrative of the enormity of the problem faced by the Iranian government. Unless a comprehensive overhaul of the subsidy system is undertaken soon, refined fuel imports are guaranteed to continue to grow, acting as a massive drain on the government's already straining budget.

### Phase Three: Poor Investment Climate

The third phase of this cycle of decline in the Iranian refining sector is the poor investment climate created by a combination of Iranian domestic policy and the

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<sup>54</sup> EIA, 7.

<sup>55</sup> Rivlin, 8.

international economic sanctions imposed against Iran. Iran desperately needs foreign investment in all aspects of its economy, and particularly in the petroleum industry, if it is to continue to grow sufficiently to prevent economic stagnation and collapse. However, the existing barriers to investment have translated into little or no foreign investment into the country.

The first aspect of this poor investment climate is the Iranian government's resistance to, and constantly shifting policy on, foreign investment. As previously discussed, the Iranian constitution expressly forbids direct foreign ownership of Iranian natural resources, especially in the petroleum industry. While the creation of the buyback investment scheme created a path to foreign investment in the oil sector, few foreign corporations have taken advantage of this opportunity. Furthermore, various political factions within the country's government oppose foreign investment of any kind. Roger Stern notes the propensity of conservative elements within the government to block investment deals with foreign firms if the Oil Ministry's terms are considered to be too generous.<sup>56</sup>

Iran's current stance with the global community over its nuclear program only exacerbates these problems and creates even more uncertainty for international firms looking to accept Iranian contract offers for investment. First, a buyback deal with India on a liquefied natural gas project valued at nearly \$20 billion was scuttled and forced back into negotiations after India failed to vote with Iran at a meeting of the International Atomic Energy Agency.<sup>57</sup> In another instance, the Iranian Oil Minister threatened

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<sup>56</sup> Stern, 379.

<sup>57</sup> Stern, 379.

foreign firms with expropriation of their assets in retaliation for their government's opposition to Iran's nuclear ambitions.<sup>58</sup>

These Iranian actions only reinforce the effectiveness of the U.S. sponsored regime of sanctions against the Islamic Republic. Although no foreign firms have been penalized under ISA, and the two recent rounds of sanctions imposed by the United Nations Security Council are not targeted at the Iranian economy and are largely symbolic, they create additional tension and uncertainty for international investors. Businesses generally see uncertainty as a negative influence for investment, especially ones in which their returns are set to be delivered over the span of many years. Other measures, such as the denial of the U.S. financial system to Iranian banks and unofficial pressure by the Department of the Treasury to dissuade banks from doing business with Iran only exacerbate the negative influences on the investment climate.

The result is that by May 2006, Iran's credit rating had been severely downgraded, with its risk level equated to countries with active insurgencies.<sup>59</sup> Those few contracts awarded have generally been to less experienced Asian firms, or even to inexperienced domestic firms, further driving up costs and slowing completion of projects. Furthermore, these firms are much less likely to have the expertise and technology, such as advanced catalytic cracking to increase gasoline yields, necessary to provide the needed solutions to Iran's refining problems. With many foreign engineering firms already having full order books amid strong international demand for the same

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<sup>58</sup> Rivlin, 14.

<sup>59</sup> Rivlin, 12.

equipment<sup>60</sup>, Iran is not going to be able to complete the necessary work on its own in the current business environment.

### **The Argument for Strategic Patience**

While the evidence that the Iranian refining industry is in decline is compelling, such a decline, by itself, would not necessarily establish an argument for exercising strategic patience with regard's to the government in Teheran. It is the repetitive nature of that cycle, and the velocity with which it seems to be increasing, that creates both a compelling strategic vulnerability and a reasonable time horizon for the cycle of decline to force the Iranians to alter their behavior in the direction desired by U.S. policy makers.

In order for strategic patience to work, two conditions must be met. First, the Iranian government must demonstrate a susceptibility to the kinds of domestic political pressure caused by a faltering or failing economy or to the social unrest caused by fuel shortages. Second, the Iranian government must demonstrate a willingness to compromise on its foreign policy positions in order to prevent an economic collapse that would seriously damage the nation's overall viability.

The evidence that the first condition has been met is available by examining the timing and type of actions already taken to alleviate the refining shortfall, such as the fuel-rationing scheme introduced in the summer of 2007. Originally, these rationing measures were due for implementation as early as 2005, with recognition by the government of the need to act to curtail domestic fuel consumption as early as 1999. However, it was not until members of the U.S. Congress began calling for a modification

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<sup>60</sup> Stern, 379.

of the ISA to further sanction gasoline exports that the Iranian government actually imposed rationing.

The coincidence between these two events is compelling evidence that the regime in Teheran is acutely aware of the strategic vulnerability created by its current dependence on imported refined fuels. That the Iranians imposed rationing before these congressional initiatives even resulted in new legislation only serves to underscore the depth of Iranian fears over the vulnerability of their fuel imports. While it is unlikely that all nations currently selling refined fuels to Iran would abide by U.S. unilateral sanctions, it is almost inevitable that there would be some disruption in Iranian fuel imports, as some wholesale fuel distributors who also do business with the United States (and are therefore vulnerable to U.S. sanctions under ISA) ceased exports to Iran. While other exports would undoubtedly fill this void, the lag time would likely cause some period of shortages in Iran. The Iranians may also face higher prices exacted by those exporters still willing to do business with them as a risk premium for facing the possibility of sanctions by the United States.

It is the fear of the unrest and economic dislocation caused by such shortages and the damage to the government's budget that demonstrate that the government is susceptible to domestic economic pressure. Any disruption of fuel imports would cause higher prices, increased rationing beyond the current ration limits, an economic recession, or a combination of these effects. If the riots and social unrest unleashed by the 2007 rationing scheme (and the government's willingness to relax the rationing standards in response) is any indicator, the Iranian government is fully susceptible to domestic

pressure to avoid or reduce further social unrest or economic dislocation caused by fuel shortages or high fuel prices.

Evidence that the second condition for strategic patience has been met is more elusive, but may be present in the somewhat convoluted history of the Islamic Republic's foreign policy. The best example of such evidence is the period immediately following the end of the Iran-Iraq War and the death of the Ayatollah Khomeini. Iran was in desperate need of foreign investment in order to finance post-war reconstruction and revive the Iranian economy. Iran had largely shut itself off from the outside world during the war, and its aggressive attacks on international shipping during the 1987-88 "Tanker War" had left the nation with the status of a pariah in the international community.

A realization that the status quo was unacceptable led the Rafsanjani government to introduce the buyback investment scheme to create an avenue for foreign investment in the energy sector and to seek diplomatic rapprochement with the international community. It was also economic conditions that led to the election of the Khatami government and the further liberalization of relations with the West, including the United States. Much of the foreign investment and development of the period since 2000 is directly attributable to contracts signed and investment made during the comparatively liberal foreign policy era exercised by the Khatami government.

However, this liberalization of foreign policy by the Khatami government led to a conservative backlash within Iranian politics and caused the more conservative elements of the Iranian body politic to entrench themselves more deeply than ever in positions of power. With the Guardian Council, a monitoring body with the power to arbitrarily disqualify candidates in Iranian elections based on their revolutionary credentials,

routinely disqualifying any candidates for office aligned with the more liberal political parties, the likelihood of a repeat of the Khatami style foreign policy is uncertain.

However, there is past precedent that economic considerations can cause a change in the behavior of the Iranian regime. Considering the strategic vulnerability created by the current dependency on refined fuel imports, it is not impossible to believe that the threat of economic stagnation or recession caused by fuel shortages would cause even a conservative regime in Teheran to modify its behavior.

### **The Argument Against Strategic Patience**

There is a cohesive argument to be made against exercising strategic patience and allowing the inevitable economic dislocation caused by the refining crisis to force a change in the behavior of the Iranian government. The most compelling of these is the historical willingness of the Iranian people to endure tremendous hardship when faced with an outside threat, and the possibility that the regime in Teheran may use an escalation of violence to try and achieve its goals, rather than “submit” by liberalizing its foreign policy.

The ability of the Iranian nation to endure massive hardships was displayed throughout the Iran-Iraq War. Despite sustaining close to 1 million casualties and suffering from widespread rationing and privation away from the battlefield, the Iranian people continued to support the Ayatolla Khomeini’s determination to continue the war for eight long years. It is reasonable to expect that if the Iranian people can be convinced that the United States and its allies directly threaten the existence of the Islamic Republic, the people may well endure a considerable degree of economic hardship. In this context, it is unlikely that the current success of sanctions such as ISA and the informal pressure

applied to international banks can be sustained indefinitely, and Iran may well find a way to circumvent or undermine the U.S. economic assault on Iran.

The second component of the argument against strategic patience is the ability of the Iranian regime to use violence, either directly or indirectly, to retaliate against the United States and its allies in response to the growing effectiveness of sanctions. The Iranians have demonstrated an ability to act either directly or through proxies to conduct asymmetric attacks throughout the region against U.S. interests or allies. The possibility that the regime could resort to such attacks in response to U.S. economic pressures is very real. While such a course might prove to be ultimately self-defeating for the Iranians, it might prove devastating to the U.S. in the short term.

While both of these arguments are very real possibilities, they ultimately are unlikely to achieve a lasting solution to the problems the Iranians face. While these two courses may see satisfying insofar as they prevent the United States from achieving its goal of a change in Iranian behavior in the short term, both would only accelerate the economic damage posed by the decline in the refining industry and the shortage of fuel to power the economy. Increased violence in the region would only serve to further isolate Teheran from the international community and leave other nations more willing to adhere to the U.S. sanctions regime and to further degrade the investment climate and dissuade crucial foreign investment. As such, these two possible reactions are far less likely than previous Iranian behaviors might indicate.

## **Summary**

While different analysts have come to different conclusions about the severity of Iran's refining crisis, the effectiveness of sanctions, and the impact on total demand of

changes to the fuel subsidy and rationing on demand, it is clear that the Iranian refining industry is in a repetitive cycle of decline. This cycle begins with a pattern of chronic under investment in the state-owned refining sector, a result of the low returns on investment in additional refining capacity versus investment in expanding crude oil production that contributes to government revenues. The pressure on the Oil Ministry to increase oil revenues is a function of the growing costs of fuel subsidies, which are seen by the public as the means by which the government returns oil revenues to the people but which serve to encourage unsustainable growth in demand for fuel.

This growth ensures that the shortfall in domestic refining capacity continues to grow and fosters a reliance on expensive foreign imports of refined fuel. This dependence on imported fuel creates a massive strategic vulnerability, which the United States has identified. The U.S. uses sanctions and pressure on foreign corporations and banks to discourage them from doing business with Iran. The Iranian government also has a historic ambivalence to foreign investment in the country, which together with sanctions create an overall poor climate for investment in Iran. A lack of foreign investment leads to under investment in the refining industry, and the cycle repeats itself.

The argument for the United States to exercise strategic patience by allowing this cycle of decline to force Teheran to change its behavior is based on the Iranian government demonstrating a susceptibility to domestic economic pressure and social unrest caused by the refining crisis, and willingness by the government to modify its foreign policy in order to prevent economic dislocation and collapse. There is ample evidence that both of these conditions have been met, as demonstrated by the Iranian government's recent actions to try and curtail domestic fuel consumption through

rationing and by its past attempts to liberalize its relations with the international community in order to promote economic recovery.

The argument against the United States exercising strategic patience and allowing the refining crisis to force a change in behavior is based on the willingness of the Iranian populace to endure considerable hardship when motivated to do so, and the past incidences when the government in Teheran has used violence against the United States and its allies in the region in response to diplomatic and economic pressure. While neither of these courses of action address the underlining problem of the refining crisis, they both have the potential to exact a price that the U.S. may be unwilling to pay.

## **Conclusion**

The state of the Iranian refining industry is extremely tenuous. An accelerating cycle of decline in total domestic refining capability in relation to a rapidly growing demand for light transport fuel has forced the Iranian government to increasingly rely on imported refined fuels in order to meet domestic demand. This reliance on imports creates a strategic vulnerability for Iran in its dealings with the United States and its allies.

The causes of this cycle of decline in the Iranian refining industry are a complex convergence of poor domestic economic policy in the form of huge government subsidies, the tumultuous and fractious nature of Iranian politics, the effect of economic sanctions by the United States, constitutional limits on foreign investment in the energy sector, and the expectations and consumption habits of the Iranian people themselves. Each of these influences contributed in some fashion to a habitual under investment in the

refining sector, a sustained growth in demand for fuel, and a poor investment climate that discourages badly needed foreign investment in Iran.

The resulting strategic vulnerability of relying on huge imports of refined fuels presents the government in Teheran with a dilemma. The small initiatives already undertaken to decrease fuel consumption and reduce the reliance on imported fuels caused social unrest and a great deal of resentment against the government, without having any real long term effect in reducing demand. The backlash against the rationing scheme has already forced the government to back down, reducing the effectiveness of the program even further. If this minor effort is any indicator, the political climate inside Iran will prevent the government there from undertaking the difficult measures necessary to reduce or eliminate growth in demand and the reliance on imported fuel.

Likewise, it seems unlikely that the government will have the ability or willingness to rapidly add additional refining capacity or significantly upgrade existing refineries to increase gasoline yields. Although the government has announced a number of planned investments in the refining sector, the cost of such work is daunting. The poor investment climate makes the possibility of attracting foreign investment remote, and U.S. sanctions have made it ever more difficult for the Iranians to borrow capital from the international banking community. Even if the funds were available, Iran must compete with growing global demand for refining equipment, and deal with the obstacles sanctions impose in finding engineering companies willing to do business with Teheran.

At the same time, even without any additional U.S. action to further tighten sanctions to include gasoline imports, the cost of continuing to subsidize imported fuel so far below market cost is unsustainable. With the growth in demand within Iran,

combined with rising prices for fuel on the global market, the financial burden of paying for imported fuel will soon cripple the government's budget. With the current energy subsidy already costing Iran an estimated 10% of GNP and the cost of gasoline imports expected to reach \$6 billion for 2007, the Iranian government will have to act soon to avoid economic disaster and massive deficit spending.

This is the core of the argument for the U.S. to exercise strategic patience in pressing for a change in behavior in the Iranian government. Without any additional action against Iran other than those sanctions and pressures already applied, Iran is on course to face a choice between coming to terms with the U.S. or facing economic collapse. The government has shown a willingness to act pragmatically and change its behavior in the past when faced with an economic crisis; it is reasonable to presume it will do so again this time. The refining crisis is the core of Iran's immediate economic issues and its greatest strategic vulnerability. The U.S. should be prepared to receive an overture from Teheran as it grapples with the effect the refining crisis has on its domestic economic and political scenes.

Strategic patience in this context carries risk. Iran has also demonstrated a past willingness to use its proxies within the region employ violence to attack U.S. allies and interests. While such a reaction would do nothing to address Iran's refining crisis or reduce the vulnerabilities posed by its reliance on imported fuel, the Iranians may believe such violent reactions will pressure the U.S. to come to the bargaining table and allow them to negotiate from a position of strength. In this context, a patient approach may prove too costly to the U.S. in terms of the damage Iranian asymmetric attacks can cause before the refining crisis proves debilitating to the Iranian economy.

Some areas of further research would serve to reduce some of the uncertainty in deciding whether or not strategic patience would be effective in compelling the Iranians to modify their behavior. In particular, three topics for further research seem especially relevant to understanding the full impact of the refining crisis on the Iranian economy and the willingness or ability of the Iranian government to modify its behavior in order to avert an economic crisis. They are the willingness of the various centers of political and economic power within Iran to compel or resist government efforts at effecting change domestically or in foreign relations, the technical and industrial effort required to effectively modernize and expand the Iranian refining sector, and the impact of recent elections on the political and economic landscape within Iran and the possible impact the newly elected government will have on Iran's current behavior.

First and foremost, a more complete investigation of the degree with which the different centers of political and economic power within Iranian society view the possibility of an imminent economic crisis is helpful in better understanding Iran's behavior towards the outside world. The constitutionally established government is only one of several centers of power within Iran. An holistic review of how these other centers of power, such as the Iranian Revolutionary Guard Corps, the Shia clerical establishment, and the *Bonyads* (Islamic charities which hold sway over enormous amounts of wealth within Iran) see the imminent danger to the Iranian economy represented by the refining crisis facilitates a better understanding of the decision calculus the Iranian government will use in order to proceed.

Secondly, a technical analysis of the work required in order to upgrade the Iranian refining industry to meet domestic demand would be extremely beneficial. While the

scope of this study looked at the overall estimates of investment required to meet the refining challenge, these estimates are driven by some specific technical assessments on the exact scope of work, technologies, and types of industrial equipment required to actually complete the necessary upgrades. A technical study that lays out these requirements more precisely would develop a better understanding of the scope of the problem the Iranian refining industry is facing.

Finally, Iranians voted in March 2008 to determine the composition of the next *Majles*. Without a doubt, the economy dominated the minds of many voters. With the gasoline rationing system fresh in their minds and many reformist candidates disqualified by the Council of Guardians, Iranian voters faced some stark choices in these elections. An analysis of the voting results and how the changes in composition in the *Majles* might alter the dynamics of debate over economic and foreign policy would demonstrate just how likely it is that badly needed reform within the Iranian economy is going to occur within the next few years.

## Bibliography

- Amuzegar, Jahangir. *Iran's Economy under The Islamic Republic*. New York: I.B. Tauris & Co, Ltd, 1993.
- Beehner, Lionel "U.S. Sanctions Biting Iran." *CFR.org*, January 23, 2007.  
[http://www.cfr.org/publication/12478/us\\_sanctions\\_biting\\_iran.html](http://www.cfr.org/publication/12478/us_sanctions_biting_iran.html); (accessed 29 January 2008).
- Central Intelligence Agency, "CIA World Factbook". *CIA.gov*,  
<https://www.cia.gov/library/publications/the-world-factbook/geos/ir.html>, (accessed 14 February 2008).
- Congressional Research Service "The Iran Sanctions Act (ISA)." Washington: U.S. Government printing office, 2007, p2.
- Economist, "The Big Squeeze" *Economist Special Report on Iran*, Jul 19 2007.
- Economist Intelligence Unit, "A Fuel Pinch." *Economist.com*, Sept 3, 2007.  
<http://store.eiu.com/product/890000289IR/i672524852/wf-ssb-issues-articles.html>  
(accessed 28 January 2008).
- Iran Chamber Society, "Chapter IV of the Constitution of the Islamic Republic",  
*Iranchamber.com*,  
[http://www.iranchamber.com/government/laws/constitution\\_ch04.php](http://www.iranchamber.com/government/laws/constitution_ch04.php), (accessed January 9, 2008).
- International Energy Agency. *World Energy Outlook 1999: Looking at Energy Subsidies*. Paris: IEA Publications Office, 1999.  
<http://www.iea.org/textbase/nppdf/free/1990/weo1999.pdf> (accessed October 12, 2007).
- International Energy Agency. *World Energy Outlook 2005: Middle East and North Africa Insights*. Paris: IEA Publications Office, 2005.  
<http://www.iea.org/textbase/nppdf/free/2005/weo2005.pdf> (accessed October 12, 2007).
- Pollack, Kenneth M. *The Persian Puzzle: The Conflict Between Iran and America*. New York: Random House, 2005.
- Rivlin, Paul, "Iran's Energy Vulnerability", *The Middle East Review of International Affairs* 10, no 4 (December 2006). <http://meria.idc.ac.il/journal/2006/issue4/jv10no4a7.html>  
(accessed October 22, 2007).
- Stern, Roger, "The Iranian Petroleum Crisis and United States National Security", *Proceedings of the National Academy of Sciences Journal* 104, no 1 (January 2, 2007).  
[www.pnas.org/cgi/doi/10.1073/pnas.0603903104](http://www.pnas.org/cgi/doi/10.1073/pnas.0603903104) (accessed January 2, 2008).
- United Nations Security Council Resolution 1747, adopted 24 March 2007.  
[http://www.iaea.org/NewsCenter/Focus/iaeaIran/unsc\\_res1747-2007.pdf](http://www.iaea.org/NewsCenter/Focus/iaeaIran/unsc_res1747-2007.pdf), (accessed 20 January 2008).
- United States Energy Information Administration. "Country Analysis Brief: Iran", *EIA.gov*, October 2007. [www.eia.doe.gov/emeu/cabs/Iran/pdf.pdf](http://www.eia.doe.gov/emeu/cabs/Iran/pdf.pdf), (accessed October 12, 2007).
- Webb, Simon "Iran Falling Short of Refining Ambitions." *Iranfocus.com*, 19 June 2007  
<http://www.iranfocus.com/modules/news/article.php?storyid=11618>. (accessed October 22, 2007).

Yergin, Daniel. *The Prize: The Epic Quest for Oil, Money, and Power*. New York: Simon & Schuster, 1991.