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The Implications of Natural Gas and Oil Dependence on Nuclear Proliferation Efforts: A Case Study of the 1970s Energy Crisis and the Beginning of OPEC's Nuclear Ambitions.

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Abstract

This thesis examines the effects of the 1970s Energy Crisis on nuclear proliferation efforts in the Persian Gulf region. The OPEC oil embargo of 1973 shocked global energy markets and forced the Atlantic Alliance to fragment and engage in continuous cut-throat bilateral deals with oil-producing countries. What started as oil-for-arms deals quickly transitioned into oil-for-nuclear reactor deals once countries struggled to find new ways to remain competitive in the trade market. When France initiated the first transfer of nuclear infrastructure to Iran, the morality taboo of trading nuclear secrets dissipated. Countries were now encouraged to engage in their own nuclear deals to maintain their supply of oil and natural gas, oftentimes even at the expense of safety protocols and security measures preventing proliferation. In an environment where the energy spoils go to the most prolific nuclear exporter, it was the oil-producing states who controlled the Atlantic Alliance's foreign policy decisions.

Introduction

During my third year of university I took a course on nuclear politics which piqued a specific interest in the field of International Relations. More than the eerie lore that often attracts students to the study of weapons of mass destruction, I was rather interested in the peculiar relationships of the nuclear marketplace. When the Non-Proliferation Treaty went into effect in the 1970s, it granted every signatory the right to request peaceful nuclear assistance from nuclear-exporting states.[1] This included the transfer of nuclear reactors, nuclear fuels to power these reactors, research centers, enrichment facilities, and so on; essentially, everything one would need to build the bomb if not for the extensive controls and safety protocols.

What seemed foreign to me was the idea that nuclear exporters could market sensitive nuclear technologies to potential buyers. Intercountry trade is intuitive when it comes to infrastructure, automobiles, or electronics, but I had never imagined that nuclear information and technological know-how would be permitted for trade in the same capacity. I started wondering whether this system propagated a nuclear industrial complex: some form of a system of nuclear-exporting firms controlling every foreign policy decision based on the highest bidder. The reality, as I found out in my thesis, is not so "gotcha-journalism" as I had romanticized. There is no Illuminati equivalent nuclear-exporter group controlling foreign affairs.

Nevertheless, what I did find was *almost* as entertaining. As I studied the effects of the 1970s Energy Crisis on EU and US relations with Persian Gulf states, I noticed the Western bloc fragment and engage in continuous cut-throat bilateral deals with oil-producing countries. In part one of my thesis, which includes Chapters Two and Three, I examine what were the events

[1] Akbar E. Torbat, *Politics of Oil and Nuclear Technology in Iran*, 1st ed. (Palgrave Macmillan Cham, 2020), 187, https://doi-org.ccl.idm.oclc.org/10.1007/978-3-030-33766-7.

leading up to the 1970s energy crisis as well as the initial implications of this energy shortage on the global economy. After the Yom Kippur War of 1973, the United States and its Western allies supported Israel in their attempt to regain control over the recently captured territories in the Sinai Peninsula and the Golan Heights. Angered by the continuous US-led intervention in Middle Eastern affairs, the Persian Gulf members of OPEC decided to enforce an oil embargo on all of the countries that showed support for what they believed was an unjustified occupation of Arab land. Since most of the Western world was overwhelmingly reliant on Persian Gulf oil, this embargo ruptured European energy markets and left many governments wondering how they could regain OPEC's favor. France was the first country to detach itself from its Western allies and approach OPEC members with an ambitious oil-for-arms deal. With its own recession fears and domestic loss of faith in the government, France had no patience to wait for the United States to make amends with OPEC. They had to secure their energy needs before the franc devaluated any further. Though there was some initial pushback from the Atlantic Alliance, most European states quickly followed France's footsteps. West Germany, Italy, England, and many more eventually approached OPEC with their own enticing bilateral deals. Any hope of a unified, multilateral response to OPEC's manipulation of the energy markets had died. By 1974, the United States and all of Europe had shifted their foreign policy to favor bilateral deals with OPEC.

What started as oil-for-infrastructure deals quickly transitioned into oil-for-nuclear reactors deals once countries could not remain competitive with America's and West Germany's prodigious capacity for military exports. In Part Two, which includes Chapters Four and Five, I examine what I believe to be the most prolific nuclear exporter of the 1970s and the most ambitious nuclear importer: France and Iran, respectively. When France initiated the first transfer

of nuclear infrastructure to Iran, the morality taboo of trading nuclear secrets was lifted and countries were encouraged to engage in their own nuclear deals - oftentimes even at the expense of safety protocols and security measures preventing proliferation. France had just unveiled a high-cost plan to completely restructure their energy policy and divert away from a hydrocarbon future. In order to finance 70 percent of their energy needs through nuclear energy, Paris made dangerous oil-for-atoms deals with Iran and Iraq which threatened the global nonproliferation regime. Similarly, Iran also wanted to diversify their energy pool. To maintain prominence in a post-hydrocarbon world meant that Iran had to shift away from a petroleum-based economy and embrace nuclear power. So, they began marketing themselves throughout Europe and secured different technologies and infrastructure encompassing the whole nuclear cycle: nuclear fuel from the United States, spent fuel enrichment facilities from France, and so on.

A cursory review of the current literature within nuclear scholarship highlights two motivations for these types of peaceful nuclear assistance. The first is championed by author Mathew Fuhrmann who defined peaceful nuclear assistance to be any transfer of technology, materials, or know-how intended to advance a country's civil nuclear program.[2] He argues that peaceful nuclear cooperation is like any other tool of economic statecraft intended to transform bilateral relationships. Subsequent motivations will arise in different situations. For example, the controversial civil and nuclear deal between the United States and India first and foremost aimed at strengthening the strategic partnership between the two countries. Further motivations could include improving India's deterrent capability towards China and US's favorable status for any future bilateral trade occurrences.

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[2] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, Cornell Studies in Security Affairs (Cornell University Press, 2012), 2, https://doi-org.ccl.idm.oclc.org/10.7591/9780801465758.

The second is promoted by Mathew Kroenig who defines peaceful nuclear assistance as any transfer of nuclear materials that is not directly relevant to a military program.[3] He believes that nuclear proliferation does not threaten every state equally. Power-projecting states, those with the conventional military capability to overwhelm another country, will be more likely to oppose nuclear proliferation for two reasons: it will jeopardize their ability to threaten a nuclear-acquiring state and it will reduce the number of countries under that state's nuclear protection umbrella. Non-power-projecting states are not as affected by nuclear proliferation because it doesn't put these same foreign policy goals in jeopardy. So, his theory focuses on a very realistic conception of global politics.

Ultimately, my thesis will focus on a particular concept that is found in both Fuhrmann's and Kroenig's books but is treated as an afterthought. I believe that oil aspirations are what motivated the sale of peaceful nuclear assistance during the 1973 energy crisis more than any tool for strategic partnership or power-projecting stability. While I was wrong about an all-powerful nuclear exporter group controlling foreign policy decisions, I wasn't completely off-base - I just reversed the sides of the equation. In an environment where the energy spoils go to the most prolific nuclear exporter, it was the oil-producing states like Iran who controlled nuclear-exporting countries' foreign policy decisions. In this particular crisis, most foreign policy decisions focused on securing a steady flow of oil and natural gas into their crippling energy economies. Since Europe and the United States operated on Persian Gulf oil, they had no choice but to succumb to the oil exporters' demands.

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[3] Matthew Kroenig, *Exporting the Bomb Technology Transfer and the Spread of Nuclear Weapons* (Cornell University Press, 2011), 2, https://www-degruyter-com.ccl.idm.oclc.org/document/doi/10.7591/9780801458910/html.

PART ONE

Chapter I: The 1970s Energy Crisis

The 1970s Energy Crisis was a direct consequence of the United States and the Soviet Union's struggle for dominance. In 1948, the United States led an Allied powers movement to grant Israel territory by siphoning off sections of British-controlled Palestine and making it Israeli. The agreement to establish a Jewish national home in Palestine had been planned since 1917 when the United States signed the Balfour Declaration supporting a home for disenfranchised Jews from around the world.[4] Palestinians, and a majority of the Arab population in general, were fed up with the Western sense of entitlement over Arab affairs. As a result, many subsequent wars were fought in different Arab states - and within Israel itself - because of the Arab refusal to acknowledge Palestinian territory as Israeli.

In October 1973, Egypt and Syria initiated a surprise attack on the Jewish holy day of Yom Kippur and captured territories in the Sinai Peninsula and the Golan Heights.[5] Israel had two options. They could (1) mobilize their armies and attempt to recapture the lost territories, but because these were combined attacks by two different countries, the Israelis would be severely outnumbered and most likely encounter defeat.

Or, they could (2) appeal to the United States and use the US army to regain their captured territories. The decision wasn't a hard one to make. President Nixon immediately began resupplying Israel with heavy machinery and arms to stifle the Egyptian army in the Sinai Peninsula and the Syrian army in the Golan Heights. The Soviet Union, in a typical Cold War response, began sending arms to Egypt and Syria to counteract American influence. This resulted

[4] "Energy Crisis (1970s)" (A&E Television Networks, 2010), https://www.history.com/topics/1970s/energy-crisis.
[5] Mustafa Kibaroğlu, "Iran's Nuclear Ambitions from a Historical Perspective and the Attitude of the West," *Middle Eastern Studies* 43, no. 2 (2007): 229, https://doi.org/10.1080/00263200601114083.

in another proxy war in which the global superpowers fought each other at the expense of Arab and Israeli lives and land. This time, however, America was successful. The Soviet Union could not match the influence the United States exerted over the Middle East and they terminated their supply of arms and munitions to the Arab states.[6] Israel eventually assumed victory over Egypt and Syria and regained the territories they had lost.

The anger and resentment amongst Arab nations as a result of this intervention festered. Disappointed by the feeble Soviet attempt to send military aid, the oil-rich monarchies of the Persian Gulf region sought another weapon at their disposal: oil. In 1973, no other region in the world had even a sliver of the control that OPEC imposed over the oil market. Persian Gulf oil reserves accounted for 62 percent of the total global proven reserves: 22 percent in Saudi Arabia, 11 percent in Iran, and about 10 percent in Iraq, Kuwait, and the United Arab Emirates.[7] The only non-Persian Gulf state that came even remotely close to these colossal oil shares was the Soviet Union, with around 9 percent of the world's proven oil reserves.[8]

The share of the natural gas market in 1973 followed a similar pattern. The Soviet Union led the global share of natural gas reserves with over 26 percent, followed by Iran and Qatar providing 30 percent between them.[9] However, the amount of exportable oil and natural gas available in the Persian Gulf in comparison to the Soviet Union is outstanding. The Gulf's exportable oil capacity due to their significantly smaller populations and low cost of exploration meant that they could profit off of oil at a spectacular rate. If we recalculated the share of global

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[6] "Energy Crisis (1970s)."
[7] Mohammed Ayoob et al., "The Middle East in 2025: Implications for U.S. Policy," *Middle East Policy Council* 13, no. 2 (2006): 148, http://ccl.idm.oclc.org/login?url=https://www-proquest-com.ccl.idm.oclc.org/scholarly-journals/middle-east-2025-implications-u-s-policy/docview/203675489/se-2?accountid=10141.
[8] Mohammed Ayoob et al., 148.
[9] Mohammed Ayoob et al., 149.

oil and natural gas testing only for exportable reserves, the Gulf's share would have been well over 80 percent.[10]

So in response to Western intervention and support in the Yom Kippur War, members of OPEC drastically reduced oil shipments to the United States and the European Union and proclaimed an embargo on all supporters of Israel's military efforts. Not only were oil shipments limited, but OPEC also agreed to limit production under the understanding that increasing their price per barrel of oil would more than makeup for the reduced production levels.[11]

The posted prices of crude oil, for which producing countries received royalties and taxes, increased 300 percent. The price of the Persian Gulf crude oil in January 1972 was posted at $2.49. In November 1973, the posted price jumped up to a whopping $11.65. For emphasis, a barrel of crude oil contains around 20 gallons of gas. This means that it would cost $0.12 per gallon in 1972 or $1.69 today when adjusting for inflation. After OPEC's embargo on oil production and supply, the price per gallon - adjusted for inflation - would be $6.78. For gas producers, this embargo was incredibly lucrative. Government revenue for Saudi Arabian crude oil, for example, increased from $1.52 to $7.01 since the embargo.[12] The oil import bill was expected to transfer $70 billion from oil consumers to Persian Gulf oil producers; non-communist countries alone experienced an oil import increase from $45 billion in 1973 to $116 billion in 1974.[13]

For Western Europe and Japan, the OPEC oil embargo crushed their supply of energy. The oil import bill threatened a loss of purchasing power equivalent to 3 percent GNP in Western

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[10] Mohammed Ayoob et al., 148.
[11] "Energy Crisis (1970s)."
[12] "Declassfied/Released International Economic Impact of Increased Oil Prices in 1974," January 1974, https://www.cia.gov/readingroom/docs/CIA-RDP85T00875R001500190021-9.pdf.
[13] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," *Texas National Security Review* Volume 5, no. 3 (2022): 61, http://dx.doi.org/10.26153/tsw/42079.

Europe and Japan. Western Europe experienced a $33 billion increase and Japan experienced an $11 billion increase.[14] The United States, who initially assumed that an oil boycott would only hurt OPEC states, were expected to experience a 170 percent increase in their oil import bill; they were eventually forced to absorb a $16 billion increase in oil imports.[15]

Soaring payments for oil was OPEC's response to the Western alliance with Israel. Many countries in the European Community scrambled to search for alternative sources of energy to fuel their industrialized economies, but feasible alternatives were impossible given the immediate energy requirements which plagued European economies.

[14] "Declassfied/Released International Economic Impact of Increased Oil Prices in 1974."
[15] "Declassfied/Released International Economic Impact of Increased Oil Prices in 1974."

Chapter Two: Self-interested Bilateralism or Western Solidarity

The first oil shock of the 1970s Energy Crisis plunged the global political system into a state of panic. One thing became immediately clear: European nations, and the broader Atlantic alliance, had to decide whether they would approach OPEC members with bilateral diplomacy, or whether they would remain a unified Western bloc and sanction member states. In this section, I will be discussing how the member nations of the Atlantic Alliance frantically chose the former.

France

As a resource-poor state, France's dependence on oil imports and looming recession fears catalyzed their trade drive. The French government predicted that gasoline prices would rise by 20 percent, domestic fuel oil prices by 60 percent, and heavy fuels by 120 percent, as a direct result of the OPEC gas spike.[16] All of this would, unfortunately, coincide with a slew of labor upheavals around the country which were a result of the public's rapid decline in purchasing power. A decline that started much earlier than the OPEC gas spike; it started after the *Trente Glorieuses*: a thirty year period of particular economic growth for the country. Suddenly, at the beginning of the 1970s, the franc's valuation started depreciating after various trade deficits and plummeting foreign gas reserves – specifically, their gas terminal in Algeria, which supplied 15 percent of France's natural gas, broke down a couple of months before OPEC increased the import bill, leaving France with no natural gas supply.[17]

France was heading into a recession and grew desperate. Paris hastily sent government officials to countries in the European Economic Community to request aid and potential resource

[16] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 62.
[17] Marino Auffant, 62.

sharing, but they were greeted with cold shoulders. Every European nation was experiencing its own doomsday - or, at least, anticipating that the day will come very soon.[18] As a result, none of them responded to France's request. So they looked toward another alliance of states: OPEC.

France began trading military equipment in exchange for OPEC's oil to address two of the nation's primary concerns: acquiring a stable flow of oil and natural gas into the country and trading a high-value-added export that would strengthen the franc and shake off a recession. In exchange for oil, they decided to trade their military equipment – mostly Gazelle helicopters and Mirage aircraft. This was done for two reasons.

First, the exports were competitive enough for OPEC states to agree on an oil-for-machine trade. The helicopters and aircraft were prized in the global markets as the best in their respective fields and the Gulf Arab monarchies had no domestic infrastructure significant enough to indigenously produce machines of this caliber.[19]

Second, France already conducted this trade agreement with Kuwait before they froze their sales due to the Arab-Israeli War of 1973.[20] The infrastructure and blueprint for arms negotiation were still fresh. If Kuwait increased its oil supplies to France, France would be eager to recommence their deal as if it had never stopped.

The United States, on the other hand, was enforcing its own foreign policy objective: one which was contingent on no bilateral trade agreements between any nation and OPEC.[21] It was in their best interest to encourage a united bloc of oil consumers against OPEC nations and pressure them to reduce gasoline prices. France's aggressive pursuit of bilateralism with OPEC weakened

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[18] "Declassfied/Released International Economic Impact of Increased Oil Prices in 1974."
[19] Akbar E. Torbat, *Politics of Oil and Nuclear Technology in Iran*, 194.
[20] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 63.
[21] "Excerpts From the Opening Address by Secretary Kissinger at the International Oil Meeting in Washington," *The New York Times Archives*, February 12, 1974, https://www.nytimes.com/1974/02/12/archives/excerpts-from-the-opening-address-by-secretary-kissinger-at-the.html.

America's diplomatic might. Communications between Saudi Arabia and OPEC quickly soured thereafter, which meant that the Persian Gulf governments had all the leverage in the negotiations.[22]

France continued to market its bilateral trade agreement to other OPEC nations. Saudi Arabia was particularly keen on France's high-value-added exports but did not want to be completely reliant on the import of foreign industrial goods. In addition to the sale of Mirage aircraft, Saudi Arabia demanded a new oil refinery so that their entire oil refining process could be accomplished indigenously. So, in 1973, France signed a three-year agreement with Saudi Arabia: a consistent supply of oil in exchange for a new refinery.[23] France was no longer feeling the economic burden of its European allies. The country, presuming all agreements remain uninterrupted, could avoid a recession that just months ago seemed inevitable.

But benefiting from self-interested bilateralism did not go unnoticed. At the Washington Energy Conference in February 1974, Secretary of State Henry Kissinger made a passionate speech in favor of multilateralism and pleaded with France to reconsider its dealings with OPEC nations.[24] By March, many European nations agreed that France's bilateral proceedings were harming the Western bloc and they publicly condemned the French foreign minister for his facetious response to Kissinger at the conference. The French official responded that there was no such thing as a supportive Western bloc and that multilateralism only existed in thought, not in practice.[25] France, as the world would soon discover, was right.

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[22] "Excerpts From the Opening Address by Secretary Kissinger at the International Oil Meeting in Washington."
[23] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 63.
[24] Marino Auffant, 68.
[25] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, 118.

Despite every European nation agreeing to America's multilateral promise, no formal commitment was ever drafted restraining bilateral dealings between oil-consuming countries and OPEC.[26] As a result, a cut-throat rivalry among European companies festered. Without America's engagement, European and Asian nations were in a better position to compete for preferential treatment. Of these, West Germany, Japan, and Italy were the most aggressive.

The Federal Republic of Germany and Japan

West Germany's Chancellor Willy Brandt was in favor of a united bloc but was under no expectation that it would ever come to fruition. Brandt conceded that "until the European Commission develops a common approach to the energy crisis, Germany will increase its bilateral contacts with oil-producing countries."[27] By the summer of 1974, a German consortium of oil firms which included Veba and Kraftwerk Union agreed to an oil-for-infrastructure trade with Iran. This resulted in a delivery of 1 billion cubic meters of natural gas per year to Germany, in exchange for Germany building a 25-million-ton oil refinery and a petrochemical complex in Bushehr.[28]

Japan's MITI Minister Yasuhiro Nakasone was less diplomatic to his Atlantic alliance than Brandt. Despite the growing concerns for bilateral oil diplomacy, it became clear to Japan that no restrictions among the Atlantic Alliance would be ratified to limit trade partnerships with OPEC. So, similar to France and West Germany, Japan started to shy away from U.S. foreign policy interests. On November 22, 1973, Japan adopted a pro-Arab policy and suggested Israeli

[26] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 70.
[27] "Declassified/Released US Department of State EO Systematic Review: FRG Flirting with Bilateralism," June 2005, https://aad.archives.gov/aad/createpdf?rid=13830&dt=2474&dl=1345.
[28] "Declassified/Released US Department of State EO Systematic Review: FRG Flirting with Bilateralism."

forces retreat from occupied territories.[29] This was the first step in a marked diplomatic change in Japan's foreign policy. Remember, the pro-Israel stance that America and the EU enforced was the cause of the first oil spike in 1973. Japan adopting an anti-Israel policy would go a long way with the Gulf states.

Once their diplomatic slate was cleared, like a traveling salesman, Japan visited OPEC members across the Middle East, "dropping hints or promises of economic aid that totaled… $2 billion to $3 billion."[30] While West Germany found a friend in Iran, Japan's guardian angel was Iraq. Nakasone promised credits of $1 billion to Iraq and the construction of a "natural-gas processing plant, a refinery, a fertilizer plant, a cement plant, a petrochemical complex, and an aluminum smelter."[31] In exchange, Iraq would supply crude oil amounting to 160 million tons over the next ten years.[32]

The Japanese and German trade agreements should come as no surprise. The same reliance on Gulf petrol and energy that France had was mirrored by every member of the Atlantic alliance. For Japan, 80 percent of its petroleum needs came from the Middle East.[33] For Germany, 55 percent of all energy requirements were fulfilled by petroleum, of which over 60 percent was imported from the Arab Gulf.[34] For Italy, 72.3 percent of domestically consumed

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[29] Richard Halloran, "Japan Pursuing Easier Oil Policy," *The New York Times*, April 28, 1974, https://www.nytimes.com/1974/04/28/archives/japan-pursuing-easier-oil-policy-early-frenzy-gone-moves-to-aid.html.
[30] Richard Halloran.
[31] Richard Halloran.
[32] "Declassified/Released US Department of State EO Systematic Review: Japan-Iraq Engage in Bilateral Oil Deal," June 2005, https://aad.archives.gov/aad/createpdf?rid=36005&dt=2474&dl=1345.
[33] Richard Halloran, "Japan Pursuing Easier Oil Policy."
[34] "Declassified/Released US Department of State EO Systematic Review: FRG Flirting with Bilateralism."

crude oil was supplied by OPEC states.[35] Europe ran on Middle Eastern oil and no American-led intervention would change that fact.

West Germany was the first European country to implement government chapeau agreements to boost the German oil firms' chances of securing favorable oil deals. A chapeau agreement is the formal introducing text of a treaty between two countries that cannot be contradicted by the subsequent terms of the treaty; for example, the Free Trade Agreement is a broad chapeau agreement between many countries with overlapping trade interests. A chapeau agreement between an oil company and a nation, however, is very uncommon – but that is exactly what West Germany's Kraftwerk Union did. The firm was able to secure the first oil shipments from Iran faster than any other nation because the Chapeau agreement provided security for the oil-producing states. Regardless of changing policy interests, the Chapeau agreement required the trade to follow through to completion: 1 billion cubic meters of natural gas per year to Germany, in exchange for Germany building a 25-million-ton oil refinery and a petrochemical complex in Bushehr.[36]

It wasn't long before other oil firms understood the benefits that accompanied chapeau agreements and started implementing their own. Ironically, Italy's SNAM and France's Gaz de France (GDF) tried a multilateral approach to bring Iran's offshore natural gas to European markets. Both countries initiated chapeau agreements with Iran, but the friendly commercial partnership soon backfired when GDF discovered that SNAM was using the joint venture to undercut its own bilateral deal with Iran.[37] If France ever needed one more reason to shun multilateralism forever, this was it. GDF approached Iran and proposed a comprehensive

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[35] U. Colombo, "Energy Issues and Policies in Italy," *Annual Reviews Energy*, no. 9 (1984): 42, https://www.annualreviews.org/doi/pdf/10.1146/annurev.eg.09.110184.000335.
[36] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 79.
[37] Marino Auffant, 64.

economic partnership exclusively between GDF and the Shah's oil reserves. Iran ended up accepting France's offer but saw no reason why it couldn't also accept Italy's, Germany's, and Japan's offer as well.

Iran

Out of every OPEC member, Iran was the most aggressive and attractive trade partner. Before the first embargo of the 1973 Energy Crisis was imposed, the Iranian Shah was already preparing a new political strategy for his country. Since most of Europe relied heavily on Iran's oil and natural gas, it seemed like the obvious commodity to flaunt. The Iranian government marketed itself to two very different audiences.

The first was to the countries participating in the European scramble for oil. The Shah wanted to reduce American influence both in the Gulf and in Europe, so he conveyed his eagerness to distribute financial aid and oil only to those countries not affiliated with U.S. foreign policy.[38] The Shah wanted to build oil refineries in the developing world, especially India and Pakistan, and even establish a new world bank in which OPEC members were the purse and countries no longer had to request aid from the U.S. or Europe. This policy especially pleased French diplomatic ears because they had already distanced themselves from the European Union at the Washington Energy Conference. From the ruins of European solidarity rose an unprecedented bilateral oil deal between the two countries.

The second was to the Iranian people and government officials. With France keen on purchasing Iranian oil, the Shah was able to promote a new branch of government to restructure

[38] Marino Auffant, 64.

Iran's energy sector: the Atomic Energy Organization.[39] Policy officials working for this organization would deliberate on a post-hydrocarbon world for the Iranian people; an effort to move away from a petroleum-based economy and toward nuclear energy. This revitalized energy policy serves (1) to accelerate Iran's ascent as a technological world power and (2) to gain the knowledge and infrastructure required to build The Bomb.

Iran has the population size and land mass to become a global power. Besides Israel, no country has a regional grip on the Middle East - and Israel's diplomatic proceedings with the Middle East are almost nonexistent.[40] The only force that Israel imposes over the Middle East is the fear of nuclear weapons; none of the countries are tied economically or strategically to Israel because of a deep-rooted mistrust. This gap in regional domination is bound to be filled. The numerous bilateral oil-for-atoms trades with European countries can accelerate this goal.

In an interview with *Les Informations* on June 23, 1974, the Shah was asked whether Iran is actively pursuing nuclear weapons, to which he replied "Certainly, and sooner than is believed, but contrary to India, we have first thought of our people and then of technology."[41] This response is somewhat of a dog whistle and once again reinforces the different audiences which the Shah was trying to reach. On the one hand, France and other potential nuclear suppliers were interested in Iran's oil, and the Shah's interest in nuclear weapons presents an opportunity for trade: oil-for-atoms. On the other hand, Iranian citizens focused less on the trade specifics of the Shah's remarks and instead paid more attention to what he said prioritizing citizen well-being

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[39] Akbar E. Torbat, *Politics of Oil and Nuclear Technology in Iran*, 165.

[40] While I maintain my opinion that Israel has very few diplomatic ties with the Middle East, there is another side of this debate. See, for example, Aaron Magid's article published in Foreign Policy discussing Jordan and Israel's bilateral relationship. I think that Israel has a policy of opacity and it is hard to say for certain whether Israel acknowledges a domestic nuclear arsenal.

[41] "Declassified/Released US Department of State EO Systematic Review: Interview with Shah," June 2005, https://aad.archives.gov/aad/createpdf?rid=127628&dt=2474&dl=1345.

over nuclear capacities. The suggestive language in the Shah's reply to *Les Informations* garnered support from both groups without provoking opposition. This is why this type of political messaging is referred to as a dog whistle; two groups hear two different frequencies of information.

Besides the global clout that came along with being a nuclear weapon state (NWS), Iran was also interested in acquiring nuclear weapons for deterrence capabilities. Iran is surrounded by NWS all around, with Russia in the north, Israel in the west, India and Pakistan in the east, and the U.S. Fifth fleet stationed in Bahrain in the south. While the same argument holds for Saudi Arabia, there was a crucial difference between the two countries: Saudi Arabia had a much smaller population size. This meant that Saudi Arabia could not absorb the exceptionally high profits generated from the OPEC price hike as well as Iran could have. Iran, as mentioned above, had implemented ambitious restructuring policies and steps to modernize the country. This required large sums of capital which would have invariably been attained due to the spoils of the Energy Crisis. As long as Iran operated under high levels of oil production and sold their oil barrels at a high cost, the short-term gains could be well distributed to the modernization programs and the Iranian citizens.[42]

This is all to say that Iran was primed to be the main benefactor of the 1973 Energy Crisis – and they knew it. In 1973, Iran had a total revenue of $5.5 billion; by the end of 1974, Iran had a total revenue of $18.5 billion.[43] Higher prices were working so well in their favor that at the OPEC Conference in Quito on June 12, 1974, Iran proposed an inflation adjustment to maintain

[42] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 63.
[43] "Declassfied/Released International Economic Impact of Increased Oil Prices in 1974."

high price levels, even creating "…tax methods that would permit OPEC members to tax away present high company profits, which would serve to raise oil prices."[44]

Saudi Arabia, on the other hand, didn't have a population large enough to absorb these profits. The OPEC price hike would generate too much money too fast and cause hyperinflation, which meant that it was in Saudi Arabia's best interest to reduce oil production and prices. In essence, go against the OPEC embargo. In one meeting between Saudi and U.S. officials, Kissinger reported that "...Saudi Arabia had long favored lifting the boycott; they hoped other Arab countries could soon be brought around… Our [America] oil import needs will start dropping soon."[45] Since Saudi Arabia lacked any sufficient mechanism for capitalizing on these exceptionally high profits, they were less aggressive in pursuing trade partnerships than other OPEC states.

The United States

An ideal situation for Saudi Arabia would have been to find a singular powerful partner that could absorb the high profits in exchange for some of the high-value-added imports which their Gulf neighbors were receiving. The most powerful partner you could have in 1974 was the United States - and their rigid policies against bilateral oil diplomacy were starting to waiver. In a conversation between Saudi Officials and a U.S. diplomat in 1974, one Saudi diplomat claimed that American cooperation would remove the "... need for the French or the British or the Japanese. The United States can do everything. This is exactly what I have always wanted."[46]

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[44] "Memorandum From the President's Deputy Assistant for International Economic Affairs (Cooper) and Harold H. Saunders of the National Security Council Staff to Secretary of State Kissinger," *Foreign Relations of the United States* XXXVI, no. Energy Crisis (1974 1969), https://history.state.gov/historicaldocuments/frus1969-76v36/d353.
[45] "Declassified/Released US Department of State EO Systematic Review: Joint US-Saudi Economic Commissions," June 2005, https://aad.archives.gov/aad/createpdf?rid=55952&dt=2474&dl=1345.
[46] "Declassified/Released US Department of State EO Systematic Review: Joint US-Saudi Economic Commissions."

The discussion between the United States and Saudi Arabia went smoothly. The United States, after taking the multilateral high ground for six months, was far behind its peers in Europe. The OPEC oil embargo targeted the U.S. the hardest and they were no closer to getting it lifted or reaching a deal with any oil producer. American officials had to change course and strike an agreement with the only country that has more oil than Iran: Saudi Arabia.

Between March 8th and March 11th, 1974, the United States made concessions to the Sultan in order to secure a steady supply of oil and apologize for their previous tumultuous correspondence, referring to the regrettable instance of the US cabinet threatening the Sultan to leak their private discussions in order to pressure Saudi Arabia to lift the embargo.[47]

Nixon felt that he had been cheated out of a trade with Saudi Arabia. In exchange for oil, the Sultan wanted Nixon to cut back aid to Israel and publicly denounce their aggression on occupied territories. Every time Nixon conceded, the Sultan would move the goalposts to satisfy another condition. The president finally threatened to leak these conversations and expose his duplicitous diplomacy, but his bluff had no effect; the Sultan wouldn't budge.[48] So, Nixon gathered his Western alliance at the Washington Energy Conference and preached his multilateral sermon. But as we have seen, Kissinger's pleas fell on deaf ears and the U.S. had to return to Saudi Arabia.

The U.S. embassy revealed that despite hostile tensions between the two nations, they ended up reaching a mutually beneficial proposal. The two countries collaborated on economic, technical, and military commissions which would not only open up a "new chapter in Arab-American relations" but would also, according to the head of the Saudi Central Planning

[47] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 68.
[48] "Excerpts From the Opening Address by Secretary Kissinger at the International Oil Meeting in Washington."

Authority, bind the U.S. and Saudi economy "so closely entwined that there could be no turning back…"[49] In exchange for two million barrels a day of Saudi oil, Iran had contracted to purchase $9.1 billion worth of U.S. weapons and equipment.[50] This may seem like an unfair deal, but remember Saudi Arabia had to funnel the high profits into any sector to avoid hyperinflation.

The United States' decision to enter a bilateral oil agreement with Saudi Arabia in 1974 should have been strange for two reasons. First, the United States was the poster child of the multilateral movement and publicly denounced European governments – especially France - for their lack of solidarity. Second, and more importantly, because hypocrisy is by no means rare in international politics, is because Kissinger's opening address at the energy conference in Washington said that the United States was doing fine; a little hurt, but not wounded. He mentioned that "while we [the United States] are less immediately affected than others, we see it as a matter of self-interest to collaborate in the survival and restoration of the world economic system."[51] He even mentioned that the United States would be implementing a new program called Project Independence which will eliminate foreign dependence on oil for America's energy needs - signaling to all conference attendees that the United States is currently financially apt enough to undergo this restructuring.

So if the United States was so solid, why approach Saudi Arabia? I hypothesize that the same pattern of reliance which plagued France, West Germany, Japan, Italy, and other countries, was also affecting the U.S. Specifically, I believe America brokered a deal because (1) the oil embargo caused serious oil shortages and threatened short-term inflationary damage to their

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[49] "Declassified/Released US Department of State EO Systematic Review: Joint US-Saudi Economic Commissions."
[50] "Memorandum From the President's Deputy Assistant for International Economic Affairs (Cooper) and Harold H. Saunders of the National Security Council Staff to Secretary of State Kissinger."
[51] "Excerpts From the Opening Address by Secretary Kissinger at the International Oil Meeting in Washington."

economy; (2) Project Independence was not feasible with their current balance of payments problems; and (3) U.S.-led western oil hegemony was being challenged.

The OPEC oil embargo decreased the quantity of oil supplied to the United States. After the initial oil spike in 1973, Saudi oil production capped at 8.9 million barrels a day. The U.S. needed an additional 1.7 million barrels to meet its energy demands, and that figure was growing daily. While Iran had more available oil on the market, there was no incentive for the Shah to decrease prices. As mentioned above, he was leading a movement within OPEC to raise the price of oil to expand their collective profits. But Saudi Arabia's economy and population size couldn't handle these profits; it wasn't in their best interest to extract higher revenue from tax and inflation adjustments. For the kingdom, "market conditions are basically favorable to lower oil prices…"[52]

If the United States could have brokered a deal that would involve auctioning two million barrels of oil per day, it would have been a win-win scenario. If Saudi Arabia removed the political restriction and increased available oil production, prices would have significantly decreased by 1976[53]. This was in Saudi Arabia's best interests, but only for an alluring exchange. They could have also chosen to offset market forces, curtail their own production of oil, and partner with Iran in favor of high oil prices.

A deal with Saudi Arabia also helped the pace of Project Independence. On November 7, 1973, Nixon unveiled this project in response to growing concerns over the OPEC-led energy crisis. Some efforts involved in this mission for energy self-sufficiency included greater use of coal, reduced quantities of fuel for aircraft, reduced supply of heating oil for homes and offices,

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[52] "Memorandum From the President's Deputy Assistant for International Economic Affairs (Cooper) and Harold H. Saunders of the National Security Council Staff to Secretary of State Kissinger."
[53] "Memorandum From the President's Deputy Assistant for International Economic Affairs (Cooper) and Harold H. Saunders of the National Security Council Staff to Secretary of State Kissinger."

lowered interior temperatures, reductions in energy consumption throughout the Federal Government, increased licensing and construction of nuclear plants, and reduced highway speed limits to 50 mph.[54]

In an attempt to calm the nation down, Nixon unveiled a plan which would interrupt everyone's daily lives. His cabinet, on the other hand, were hoping that the supply of Saudi oil would freeze Project Independence long enough to make it a decade-long mission rather than an immediate response to the energy crisis. At the very least, if Nixon was adamant, Saudi oil would fund certain areas of Project Independence that the U.S. economy could not support independently, such as the construction of nuclear plants.

But there is one additional reason which motivated the United States to engage in bilateral oil diplomacy: controlling the geo-economics of oil in the Persian Gulf. The United States consumes 25 percent of all oil globally but only accounts for 3 percent of the world's crude oil reserves.[55] Moreover, "The U.S. has imported on average nearly 2 million barrels a day of its total oil imports from Persian Gulf countries."[56] This means that the United States is vulnerable to the market conditions of oil supply and has a vital strategic objective to control it.

After Saudi Arabia, Iran has the second largest oil reserves in the world, and Iraq the third. One of the U.S. foreign policy objectives should be to ally or usurp these three oil-rich nations. Since I am writing this post-1974, it is common knowledge that Iraq will eventually be invaded and controlled by the United States. The extent to which controlling Iraqi oil motivated the invasion is outside the scope of this paper - however, I am strongly hinting at it. If, in 1973,

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[54] "Editorial Note 237: Project Independence," *Foreign Relations of the United States* XXXVI, no. Energy Crisis (1974 1969), https://history.state.gov/historicaldocuments/frus1969-76v36/d237.
[55] "Declassfied/Released International Economic Impact of Increased Oil Prices in 1974."
[56] Akbar E. Torbat, *Politics of Oil and Nuclear Technology in Iran*, 194.

Saudi Arabia and Iran experienced this same invasion, they would have surely met the same fate[57].

But international reputation prohibits imperialist aggression that is this poorly concealed. If the United States were to control the global oil market, it had to ally with one of these states. Iran controlled the Strait of Hormuz, "the most important chokepoint with an oil flow of about 17 million barrels per day as of 2011, the highest of any other path."[58] But, once again, they favored higher prices and it was in their strategic interest to accept numerous bilateral oil deals with oil-consuming countries. Saudi Arabia, on the other hand, only wanted one partner and was open to decreasing oil prices. Saudi Arabia was the best option.

[57] Akbar E. Torbat, 190.
[58] Akbar E. Torbat, 194.

PART TWO

Chapter Three: Expanding France's Nuclear Industry

In this chapter, I spend some time discussing one of the more prolific nuclear exporters during the 1970s Energy Crisis: France. The French government became frustrated at the European competition for bilateral oil deals. Trading Mirage Aircraft and Gazelle helicopters for oil was no longer a viable long-term solution for France's growing energy concerns. Once the United States and the rest of Europe began charming OPEC states with their own bilateral oil deals, France could no longer receive favorable trade terms. There were too many competitors in the 1974 relentless bilateral trade environment to ask Persian Gulf states for exclusive deals. If France wanted to get their undivided attention, they had to market some other high-value-added asset.

I split this chapter into four sections. The first section discusses what should be a familiar pattern in French foreign policy by this point: France decides to side against the United States and becomes the first nation to trade nuclear technology with OPEC states. Eventually, other Western European nations and the United States finally follow France's pursuits and complicate the competitive nuclear market further. In the second and third sections, I spend some time discussing two particular case studies. In section 2, I analyze France's nuclear cooperation with Iran, which I believe merits the 'most prolific nuclear exporter' title I provided France with earlier. In section 3, I analyze France's nuclear cooperation with Iraq, which I believe showcases the most careless and dangerous nuclear partnership of this period. Finally, in section 4 I discuss how France's energy future was funded through the Franco-Iranian nuclear partnership.

France: a nuclear trailblazer

After the incident with Italy's gas company SNAM, France's Gaz de France pleaded to the Iranian government to undercut Italy and enter into an exclusive deal with the French government. The Shah proposed an unprecedented pact. In exchange for Iran's oil and natural gas, France would export nuclear reactors as part of a civilian nuclear assistance program.[59]

Once again, France stood out as the dissonant note in the Western alliance; the first country to trade nuclear capacities for oil. France's oil-driven push to fund nuclear reactors in the Persian Gulf only further destigmatized nuclear assistance to non-NPT members and encouraged other countries to follow along. In April of 1974, West Germany approached Iran for an ambitious bilateral oil deal that would establish ten new industrial refinery complexes in Tehran[60] and two 1,300 MW reactors at Bushehr.[61] In May, Indian Prime Minister Indira Gandhi was welcomed to the Niavaran palace to negotiate a new partnership symbolizing the strength of the great empires of India and Persia and left feeling optimistic about their new energy partnership.[62] But while France certainly destigmatized nuclear trade, these countries were eager to continue their bilateral oil partnerships regardless. Many of these countries, like the ones I discussed in Chapter two, already initiated oil-for-infrastructure agreements with Persian Gulf states and wanted to maintain their revenue stream.

The United States was confronted with yet another dilemma. While Washington originally opposed bilateral oil deals, we saw in Chapter two how they eventually caved to OPEC's energy pressures. But exporting nuclear knowledge and capacities held considerably more weight than exporting arms. On the one hand, the US risked triggering an arms race in the

[59] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 65.
[60] Marino Auffant, 74.
[61] Marino Auffant, 79.
[62] Marino Auffant, 74.

Middle East in exchange for oil; not a terrible outcome, given that the US stood to benefit the most from increased demand for military equipment. On the other hand, if the US funded nuclear weapons in the Middle East, they risked nuclear war. The stakes were much higher.

This time, the United States did not try to curb the bilateral export drive. From a geopolitical standpoint, if France or West Germany secured a substantial or exclusive deal with Iran, the United States would see its regional influence weaken. Iran would be dependent on France for goods, services, and technologies, just like France would be dependent on Iran for long-term energy supplies. While neither country achieves perfect autonomy, it cuts the United States out of the trade market. Any country that didn't engage in the upgraded bilateral nuclear-oil deals would experience this same dissolution of regional influence and loss of revenue from the previous oil-for-arms bilateral deals. Argentina, Sweden, India, Thailand, and Poland, who were all slow to engage in oil-for-arms bilateral deals, immediately shifted their policies to favor nuclear trade exports.[63] The United States did too.

Prompted by France's nuclear trade with Iran, US diplomats traveled to Tehran in April to propose a joint economic commission similar to the one signed with Saudi Arabia a couple of months before. This one, however, crucially included peaceful nuclear trade in addition to partnerships in the fields of "mechanical engineering, electronics, water desalination, solar power, [and] military industries…"[64] France once again found themselves competing with the United States; yet this time, the playing field was level. Though Washington had more nuclear weapons than France, France's nuclear export industry was among the most competitive in

[63] Marino Auffant, 72.
[64] Marino Auffant, 74.

Europe in 1974 and would later on become the most competitive due to trade with Iran and Iraq in the 1970s.[65]

But everything changed on May 18, 1974, when India conducted a successful test of an atomic bomb in the Rajasthan desert. Operation Buddha, as it was later codenamed, demonstrated that a developing country was capable of exploding a nuclear weapon using knowledge and resources exclusively obtained from peaceful nuclear assistance. Canada, in 1955, began a decade-long partnership with India engaging in peaceful nuclear assistance to expand the Canadian nuclear export market's influence.[66] By 1974, India had covertly built and tested a successful nuclear weapon, drastically changing the nuclear export relationship with OPEC. Most countries in Europe and the United States immediately halted trade with the Persian Gulf because the Indian test revealed a crucial fact about nuclear cooperation which was universally known but shrouded in a code of ignorance: the line that separates civilian nuclear assistance from the development of nuclear weapons is very fine.

The Nuclear Suppliers Group was created in the aftermath of Operation Buddha. This group was created as a multilateral effort to restrain nuclear exports and enforce closer collaboration with the International Atomic Energy Agency (IAEA).[67] All six of the major nuclear-exporting countries who were currently engaging in bilateral oil-for-atoms deals with OPEC participated in this group: France, the United States, Canada, the United Kingdom, West Germany, and Japan. But as with all multilateral efforts during the 1970s, the United States was the loudest voice of the NSG and France the loudest opposition. While the US tried to harmonize

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[65] "Declassified/Released US Department of State EO Systematic Review: French Views on Coordination of Nuclear Export Policy.," June 2005, https://aad.archives.gov/aad/createpdf?rid=260684&dt=2474&dl=1345.
[66] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, 94.
[67] "Declassified/Released US Department of State EO Systematic Review: French Views on Coordination of Nuclear Export Policy."

nuclear export policies to prevent a future developing country from carrying out another Operation Buddha, France disagreed with most proposals on exports of nuclear material and equipment.[68] Since France did not sign the NPT, they were not required to behave according to the global nonproliferation standard. While they agreed to strengthen the international safeguards system, they were vehemently opposed to the termination of bilateral deals with OPEC states. The National Security Council advised President Nixon to pressure President d'Estaing to collaborate with the NSG by threatening the relationship of US exports of enriched uranium to France.[69]

But France was not satisfied; even after Operation Buddha, France refused to take their foot off the gas. Their economy could not handle being on the periphery of the numerous oil-for-arms deals with other nations and OPEC. Their gasoline prices rose by 20 percent, domestic fuel oil prices by 60 percent, and heavy fuels by 120 percent[70]. They had no choice but to out-compete Western Europe and the United States by trading the one commodity no one would flaunt.

French Nuclear Cooperation with Iran

On June 27th, 1974, Iran and France agreed to a long-term nuclear arms-for-oil trade that would exceed $10 billion. The first $4 billion would be transferred almost immediately. Framatome, France's nuclear engineering contractor, would supply two 950 MW reactors to

[68] "Declassified/Released US Department of State EO Systematic Review: French Views on Coordination of Nuclear Export Policy."
[69] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 75.
[70] Marino Auffant, 62.

Darkhovin in the following month, and before the new year, Framatome would end up supplying the rest of the 5,000 MW total nuclear reactors.[71]

Despite the Shah calling this deal "the most important ever signed between an oil producing and an industrialized country,"[72] France was concerned with Iran's ability to exchange additional oil. In the summer of 1974, Iran had already signed extensive trade agreements with the United States, West Germany, and Japan. Most of its exportable oil and natural gas had already been bought in other bilateral trade deals, as shown in chapter two. In fact, when the Shah visited Paris, he mentioned that most of Iran's available reserves had been committed to other European countries.[73]

Despite this, France continued their bilateral agreement. With the oil embargo lifted, securing stable oil supplies from Iran was no longer a primary concern. France was planning to outsource the majority of its oil needs to other OPEC states like Iraq. Instead, what Iran offered was a unique opportunity to solve France's monetary problems which ravaged the Franc's valuation due to the initial oil shock. Securing a guaranteed 10 billion of Iran's petrodollars would prevent an economic recession. More importantly, I will discuss in the next section how these petrodollars were necessary for the implementation of a new domestic energy policy that France would soon implement.

Far from the absence of oil, France should have been concerned by the Iranian motivations for nuclear reactors in the first place. Four days before the signed agreement, the Shah was interviewed by France's *Les Informations* on his incentives for seeking atomic aid. When he was asked whether Iran had any future plans to develop nuclear weapons, the Shah

[71] Marino Auffant, 64.
[72] Marino Auffant, 75.
[73] Marino Auffant, 76.

replied "certainly, and sooner than is believed".[74] This sentence shocked Europe and the Nuclear Suppliers Group. Countries once again urged France to halt the sale of nuclear materials to Iran, exclaiming that a nuclear Middle East would be detrimental to regional stability. France was apparently unaffected by the threat of nuclear proliferation and they didn't believe any other country was either. According to France, the world did not fear nuclear proliferation. They feared missing out on the potential profits. The United States for years had been funneling billions worth of nuclear reactor deals with Israel and Egypt[75], the Soviets delivered several shipments of highly enriched uranium to Libya[76], Canada supplied India with the heavy water reactor India used to build a nuclear bomb (with the United States supplying the heavy water necessary to power the reactor),[77] and Italy started talking to Saddam Hussein to generate a deal which would deliver enough plutonium for Baghdad "... to produce a nuclear weapon in about a year's time."[78] Although none of these countries intended their nuclear assistance to be used for military purposes, the threat was present in each one of these agreements. This made France disillusioned with the superficially altruistic declarations of the global nonproliferation regime.

But since they agreed to be a member of the NSG, they had certain responsibilities. The first was to ensure nonproliferation safeguards bilaterally since France was not a part of the nuclear nonproliferation treaty and therefore the IAEA protocols did not necessarily extend to their agreement. The second was to communicate to the Shah that the NSG would not tolerate any development of nuclear weapons on Iranian soil. On June 25, two days after his original interview, the Shah went on French television once again to categorically renounce nuclear

[74] Marino Auffant, 75.
[75] Marino Auffant, 75.
[76] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, 89.
[77] Matthew Fuhrmann, 95.
[78] Matthew Fuhrmann, 123.

weapons - only, with a little caveat. He mentioned that a non-nuclear Middle East is in Iran's best interests and that so long as no other country in the region acquires nuclear weapons, Iran won't either. However, if the United States helped Saudi Arabia to build the bomb, "the national interests would…demand that it [Iran] would do the same".[79]

After the Franco-Iranian deal was signed, many Iranian nuclear scientists who had received training in France were brought back to accelerate their nuclear program. All of them had urged the Shah to invest in uranium enrichment - a peculiar request since the control over uranium enrichment was, and still is, a key protocol for nonproliferation.[80] Before we can understand why Iran requested to invest in EURODIF, a French-based European consortium that exported uranium enrichment services, it might be useful to know why certain nuclear materials are controlled so heavily. Among the most common are natural uranium, enriched uranium, and plutonium.

Natural Uranium

Natural uranium contains less than one percent of the isotope U-235 and is mined from the earth's crust and processed into a chemical substance called "yellowcake".[81] But natural uranium is highly concentrated in three countries: Kazakhstan holds 45 percent of the world's supply, followed by Namibia (12 percent) and Canada (10 percent).[82] For the overwhelming majority of countries, natural uranium must be exported.

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[79] "Declassified/Released US Department of State EO Systematic Review: Further Remarks by Shah on Nuclear Weapons," June 2005, https://aad.archives.gov/aad/createpdf?rid=126592&dt=2474&dl=1345.
[80] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 77.
[81] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, 15.
[82] World Nuclear Association, "World Uranium Mining Production," July 2022, https://world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx#:~:text=About%20two%2Dthirds%20of%20the,produced%20by%20in%20situ%20leaching.

Plutonium

Plutonium is also a popular nuclear export because it can be used to fuel reactors (or to build nuclear bombs - remember, the line separating the two is very fine). However, plutonium does not naturally exist. Spent fuel rods that are burned up due to the controlled nuclear chain reactions in a reactor release new isotopes (one of them being plutonium). Once Plutonium is separated and merged with U-235, the mixed oxide can be used as fuel to power a nuclear reactor.[83] However, very few nuclear programs prioritize the "reprocessing" of plutonium since it is economically inefficient. More often, countries will export plutonium, as Italy did to Iraq in 1976.[84]

Enriched Uranium

Enriched uranium is another beast entirely: it contains a modified, higher percentage of U-235. There are two kinds of enriched uranium: low-enriched uranium (LEU) and highly enriched uranium (HEU). Most nuclear reactors that were traded in 1973 and 1974 only required uranium to be enriched to 2-3 percent U-235.[85] This, itself, is not enough to develop a nuclear weapon. The United States, France, and the Soviet Union were the main competitors offering enrichment services to countries.

Like natural uranium and plutonium, most enriched uranium is exported. This is done for two reasons. The first is that it makes consumer countries dependent on the producing countries, and the second is because the knowledge needed to reach low-enriched uranium is the same as that required to reach highly-enriched uranium. HEU refers to uranium that is enriched to at least 20 percent. What's strategically important to Iran, for example, is not to import HEU, but to

[83] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, 15.
[84] Matthew Fuhrmann, 123.
[85] Matthew Fuhrmann, 15.

acquire the knowledge to enrich uranium to 20 percent U-235 indigenously. This would grant Iran's nuclear scientists the knowledge needed to build a nuclear weapon since the same facilities that produce LEU for power generation could also yield highly enriched, weapons-grade uranium. It would still be a challenging task since enriching uranium to 90 percent is the hardest and most expensive part of the process, but the knowledge required to do so would be obtained. This could prompt Iran to outsource to China or the Soviet Union for funding, for example, if their relationship with the West were to sour.[86]

In sum, acquiring the knowledge to indigenously enrich uranium would bring Iran one step closer to building the bomb. This is why in September 1974, Iran requested to invest in EURODIF, a French-based European consortium that exported uranium enrichment services. The Shah asked for a 22.5 percent share in the consortium in return for 1 billion petrodollars.[87] As a courtesy of the Franco-Iranian deal, the Shah offered France the first bid. But France found this unsettling. Any share in EURODIF would expose the Iranian government to the sensitive information required to enrich uranium and would threaten a vital revenue stream for France's nuclear fuel exporter firms. This was especially true for Iran more than any other OPEC nation since the Shah expressed a desire to build oil refineries in the developing world[88]. A 22.5 percent share in EURODIF would grant Iran enough power to make developing nations dependent on Iranian exports of nuclear fuels instead of French exports or other Western European firms.

Despite their concerns, France chose to remain competitive in the Iranian nuclear program. By October 1974, West Germany had already negotiated the sales of two 1,300 MW nuclear reactors and had plans to construct five more.[89] Even the United States, the country most

[86] Matthew Fuhrmann, 15.
[87] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 77.
[88] Marino Auffant, 64.
[89] Marino Auffant, 79.

vocal about the injustice of nuclear arms-for-oil trades, had a considerable influence over the Iranian nuclear program.

Considering the Indian test in May, Department of Defense officials debated for weeks on whether the United States should implement additional safety protocols for Iran beyond those that the IAEA established[90] - notice that the Department of Defense didn't debate whether they should export nuclear facilities in the first place, just whether the Shah would feel offended by additional bilateral controls and inspections.

Apparently, these concerns were overcome. The United States and Iran signed a $15 billion trade agreement which included the Iranian participation in a United States commercial uranium enrichment facility. The deal also included the US supplying eight nuclear reactors in exchange for $6.4 billion.[91]

These prospects alarmed the French government as they saw their influence starting to wane again. Once Sweden left the EURODIF consortium, France leaped at the opportunity to present Sweden's ten percent shareholding position to Iran. By the end of 1974, France and Iran had agreed on a $10 billion trade agreement along with influential shares in the uranium enrichment business.[92]

French Nuclear Cooperation with Iraq

One year after the French government hailed the Franco-Iranian nuclear deal as an "unprecedented triumph"[93], Saddam Hussein approached the newly appointed President Jacques Chirac with a proposition that would guarantee France something Iran did not: oil. The proposal

[90] Marino Auffant, 78.
[91] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, 83.
[92] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 79.
[93] Marino Auffant, 76.

would complete France's domestic policy objectives. On the one hand, Iran supplied all of the necessary petrodollars to save France from a recession. On the other hand, Iraq would supply all of the oil imports necessary to meet France's energy demands.

So, on November 18, 1975, France agreed to another atoms-for-oil deal. In the following year, France would supply Iraq with a 40 MW heavy water research reactor, a decommissioned Uranium Naturel Graphite Gaz reactor, and a radioactive waste treatment station.[94] In exchange for French nuclear sales, Iraq would supply 30 million tons of oil - a 50 percent increase from 1974.[95]

There are two reasons why France's nuclear deal with Iraq was one of the world's most notable nuclear crises. The first is Iraq's unusual request for a heavy water reactor. Heavy-water reactors, unlike light-water, run on natural uranium. This is significant because France had only traded light-water reactors in 1974, allowing them to control the enriched uranium that is ultimately imported by the nuclear consumer. Heavy-water reactors, on the other hand, do not run on enriched uranium which makes it harder to ensure safeguards in terms of fuel supplies. In fact, if you signed and ratified the NPT, any country trading or receiving sensitive fuel cycle facilities is required to sign a bilateral comprehensive power NCA (nuclear cooperation agreement). This is a crucial safeguard since most of the sensitive nuclear facilities, like reprocessing plants, enrichment centers, and heavy water reactors, are designated under "restricted technology".[96]

But France is not a signatory of the NPT and did not engage in any comprehensive power NCA with Iraq. This is especially concerning because weapons-grade plutonium can be extracted

[94] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, 117.
[95] Matthew Fuhrmann, 118.
[96] Matthew Fuhrmann, 156.

from a heavy-water reactor more efficiently than in a light-water reactor. Usually, plutonium reprocessing is not feasible for nuclear importers so countries like Italy have a nuclear industry solely dedicated to exporting plutonium. But heavy-water reactors make it cost-effective for a country to indigenously reprocess plutonium if this country also has a radioactive waste treatment station - which uncoincidentally was part of the Franco-Iraqi deal as well. Both of these factors made it almost impossible for the IAEA to ensure that no plutonium was being repurposed for military aims.

The Osiraq research reactor that France ultimately sold to Iraq satisfied both of these factors. In July 1980, France supplied Iraq with 13 kg of uranium (enriched to 93 percent) for use in the Osiraq reactor[97]; if you recall from the previous section, 93 percent HEU is suitable for use in a nuclear bomb. As if that wasn't enough, they also constructed a reprocessing center to produce weapons-grade plutonium.[98]

This wasn't the first time that a country asked for a working heavy water reactor in tandem with a radioactive waste treatment station. Canada supplied India with its first CANDU pressurized heavy water reactor on December 16, 1963, which made it easier for Indian scientists to extract weapons-grade plutonium and reprocess the spent fuel to develop a nuclear bomb.[99] Similarly, on November 8, 1956, France agreed to supply Israel with a 40 MW heavy-water reactor along with an underground plutonium reprocessing plant. The reprocessing plant would give Israel "the capability to reprocess the spent fuel from the nuclear reactor and separate weapons-grade plutonium that could be used in the core of an atomic bomb."[100] Heavy water

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[97] Matthew Fuhrmann, 117.
[98] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 80.
[99] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, 95.
[100] Mathew Kroenig, *Exporting the Bomb Technology Transfer and the Spread of Nuclear Weapons* (Cornell University Press, 2011), 73,

allowed Israel to build nuclear weapons five years later.[101] This deal should sound familiar since France proposed the same nuclear trade framework to Iraq: one 40 MW heavy water reactor and a weapons-grade plutonium reprocessing facility.

The second concern that arose from the Franco-Iraqi nuclear deal was Hussein's unambiguous motivations for his imported nuclear facilities. Many nuclear deals during these two years' post-energy crisis had clandestine incentives that were often gossiped about but never corroborated. Iraq, however, was always vocal about its aggressive intentions. On his way to Paris to sign their bilateral agreement, Hussein told journalists that he was launching "the first Arab attempt at nuclear arming."[102] He added that in response to Israel's covert nuclear arsenal, Arab states had to be ready to retaliate with nuclear capacities. Hussein even requested a highly unconventional Uranium Naturel Graphite Gaz (UNGG) reactor. The UNGG uses graphite gas instead of water as a cooling system to slow down the neutrons that are released when the nucleus of an atom is split. Like a heavy water reactor, graphite allows you to use natural uranium and facilitates the extraction of weapons-grade plutonium. This non-conventional nuclear reactor was used by France in the 1950s to develop its own nuclear weapons.[103]

Despite the confidential nature of these agreements, the United States heard about Hussein's unusual request for a UNGG reactor and urged France to reconsider its partnership with the Iraqi nuclear program. But the global nonproliferation concerns were not echoed by the French government; instead, the French concerns "… reflected the kind of practical economic considerations that so often lie behind great political decisions."[104] If it weren't for Israel

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[101] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, 189.
[102] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 81.
[103] Marino Auffant, 80.
[104] Steve Weissman and Herbert Krosney, *The Islamic Bomb* (Times Books, 1981), 92.

violating the international norms of war and destroying Osiraq in 1981, Iraq would have produced atomic bombs.[105]

The Messmer Plan and The PEON Commission

I have so far argued that France engaged in multiple nuclear bilateral trades to secure two domestic policy initiatives: secure a stable flow of oil to meet France's growing energy needs and funnel enough petrodollars into the French economy to save the franc's valuation. But I believe that there is an additional motivation for France's aggressive nuclear export policy which helps us understand why they continuously undermined the Atlantic Alliance and its non-proliferation protocols. On March 6th, 1974, Prime Minister Pierre Messmer announced an audacious plan to completely restructure France's energy policy, "Our great opportunity is nuclear power ... We have decided to launch 13 nuclear power plants in 1974 and 1975, each with a capacity of 1000 MW, at a cost of about 1 billion francs each."[106] Since France was anticipating a recession, the only way to finance this ambitious policy would be with Iranian petrodollars.

The oil shock of the 1973 energy crisis marked the end of the "Trente Glorieuses," the 30-year period of economic growth in France that occurred after the second world war. Despite the oil embargo not applying to France, its citizens still realized how dependent their economy was on hydrocarbons. French inflation rose from 6.2 percent in 1972 to 13.7 percent in 1974 and their 6 percent growth which they experienced throughout the Trente Glorieuses suddenly dropped to 3 percent from 1974 to 1979.[107]

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[105] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, 117.
[106] Cécile Fraysse, "Du Pétrole à l'atome : Étapes et Financement de La Transition Énergétique Française Post-1973" (Paris School of Economics, 2021), 21, ⟨dumas-03461211⟩.
[107] Cécile Fraysse, 19.

As a result, beginning in the early 1970s, there was a shift in public opinion favoring alternative strategies to ensure France's long-term energy needs. The PEON Commission, the government's nuclear-advising body, met and set the groundwork for eight 1,000 MW nuclear reactors between 1971 - 1982.[108] But the Ministry of Economy and Finance was skeptical about the government's ability to fund such a program. The best that they could agree upon in 1970 was three 1,000 MW reactors.

In 1974, the PEON Commission convened once again to discuss France's energy strategy post-OPEC oil shock. They concluded that national independence was paramount; France could not continue depending on foreign exports of oil and natural gas. Latching onto this newfound nuclear euphoria, Messmer announced his plan shortly after the PEON report. Not only did he promise to increase the number of nuclear power plants from 8 to 13, but he also promised: "the construction of more than 50 nuclear reactors within the decade." Electricité de France (EDF) was contracted to build 6-8 nuclear power plants per year between 1974-1980. By the end of the decade, the Messmer Plan was promised to be completed and the country could replace fuel oil with enriched uranium as their primary source of electricity.[109]

When asked in the same interview with ORTF how France was going to finance this $13 billion new energy strategy given its current trade deficits, Messmer vaguely responded "through increases in capital, self-financing, and loans."[110] But how many loans - and from whom - was never elaborated upon.

The investment expenses necessary to carry out the Messmer Plan turned out to be more than initially expected. In 1973, EDF estimated that each nuclear power plant would cost 1

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[108] Cécile Fraysse, 28.
[109] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 65.
[110] Cécile Fraysse, "Du Pétrole à l'atome : Étapes et Financement de La Transition Énergétique Française Post-1973," 21.

billion francs to construct, requiring a total of 13 billion francs. In 1980, nuclear investment expenditures ended up reaching an absolute maximum of 26 billion francs.[111] This rapid increase in expenditures was also mirrored in France's total sum of investments during the same period, which increased from 18 billion francs in 1973 to 49 billion francs in 1982.[112]

Messmer's financing plan was incomplete. For France to restructure its domestic energy consumption, the Messmer Plan and the Franco-Iranian nuclear deal would have to mutually sustain each other. In exchange for France exporting nuclear reactors abroad, Iran would fund $13 billion worth of Messmer's plan. As I mentioned earlier in the chapter, it was a blessing in disguise when the Shah told France he had no oil reserves left to trade; this meant that the Franco-Iranian deal was no longer an atoms-for-oil bilateral agreement but one of atoms-for-cash.

Since all OPEC nations experienced a colossal increase in their oil profits in 1974 - recall from Chapter two that Iran experienced a $14 billion increase in total revenue,[113] - the French government proposed setting up a petrocurrency recycling mechanism. Since France was dealing with short-term financial pressures, they invited Iran to establish an account in the Banque de France allowing any number of excess profits which Iran incurred due to the oil shock to be held on French soil. Under this framework, the excess profits could be used as prepayments for French nuclear exports since the reactors would take at least five years to build. Iran ended up holding $4 billion in the Banque de France, which allowed Messmer to kickstart the nuclear restructuring plan and finance the buildup of the 13 1,000 MW reactors.[114]

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[111] Cécile Fraysse, 44.
[112] Cécile Fraysse, 44.
[113] "Declassfied/Released International Economic Impact of Increased Oil Prices in 1974."
[114] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 67–68.

After the joint French-Iranian Interdepartmental Commission for Economic Cooperation began deliberations on the petrocurrency recycling mechanism, the EDF became less vague on how they planned to finance the Messmer Plan: "we can finance half of our future investments with our own resources, the other half remains to be financed by [OPEC] loans."[115]

Once again, self-interested bilateralism trumped global solidarity. During the 1970s, France rapidly expanded its nuclear capacities both domestically and in the Persian Gulf at the expense of global proliferation concerns. Today, France is a pioneer in nuclear energy, deriving over 70 percent of all its energy needs from enriched uranium[116].

[115] Cécile Fraysse, "Du Pétrole à l'atome : Étapes et Financement de La Transition Énergétique Française Post-1973," 44.
[116] World Nuclear Association, "Nuclear Power in France," 2023, https://world-nuclear.org/information-library/country-profiles/countries-a-f/france.aspx.

Chapter Four: Building Iran's Nuclear Industry

In the early months of 1974, the Shah announced the creation of three new ministries: the Ministry of Energy, the Ministry of Water, and the Atomic Energy Organization. The first two were bureaucratic fillers that would simply allocate a portion of the monarchy's funds into new sectors. The Atomic Energy Organization, however, was more ambitious. The Shah recognized that his gas reserves, no matter how lucrative, were finite. In order to maintain prominence in a post-hydrocarbon world, Iran had to diversify away from a petroleum-based economy and embrace nuclear power. This would essentially serve two functions. It would build the foundation for Iran's industrialization and signal to other world leaders that Iran is a technological world power.[117] It would also present Iran with all of the technological expertise that is required to build a nuclear bomb. If an occasion that demanded a nuclear response were to arrive, Iran would be equipped with the necessary knowledge.[118]

The rapid increase in oil prices due to the OPEC embargo in the 1970s led many oil-dependent developing countries to look towards nuclear capacities for their energy consumption. Even oil producers, despite their low cost of exploration, were beginning to siphon their gas as exportable commodities since it was becoming too valuable to be used as fuel.

Once the Atomic Energy Organization was created, the Shah unveiled his ambitious energy plan to reduce domestic oil consumption in the future and repurpose oil for producing petrochemical products. Initially, Iran wanted to have a 10,000 MW(e) installed nuclear capacity by 1990. But the scientists that they sent to America established a study in 1974 with the Stanford Research Institute which determined that 10,000 MW(e) was not sufficient enough to

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[117] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 65.
[118] Akbar E. Torbat, *Politics of Oil and Nuclear Technology in Iran*, 167.

generate nuclear energy in the future. Hence, in 1974, the Shah promised to "…establish 20 nuclear reactors in 15 years for generating about 23,000 megawatts of electricity to be added to the existing oil-burning power stations."[119]

The scientific infrastructure of Iran was already well-established by the time of this historic statement. The Shah had sent hundreds of Iranian students to universities in Western Europe and the United States to learn how to operate a nuclear energy program once Iran was ready. Following the Shah's remarks, there was a wave of scientists and technicians migrating back to Iran to establish its first nuclear research and technology-related departments.[120] The issue was not having a scientific base in the country to run the nuclear program; rather, it was securing the nuclear reactors and materials to kickstart the program in the first place.

Washington was not willing to let Western European countries supply Iran with any nuclear capacities because of the consequences that a nuclear-armed Iran would have on USA-Middle Eastern relations. The United States acted as a power broker in the Middle East and its regional influence over its Sunni Arab neighbors would diminish drastically should Iran acquire nuclear weapons. Nuclear proliferation could also potentially have a worse outcome for the United States: if Iran has access to WMD, it could ensnare the United States in future regional disputes between Iran and Israel. Because new nuclear states have no experience with nuclear diplomacy, the US feared regional instability.

Iran signed the Nonproliferation Treaty to appease the United States, despite many Iranian officials feeling like the document was just an additional manifestation of the US desire to control the Middle East. The unilateral nature of the nonproliferation regime meant that the three original signatories – The United States, The United Kingdom, and The Soviet Union –

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[119] Akbar E. Torbat, 168.
[120] Mustafa Kibaroğlu, "Iran's Nuclear Ambitions from a Historical Perspective and the Attitude of the West," 225.

controlled the supply of credible nuclear technological capability to developing countries and could dictate the direction of their nuclear program. For this reason, Iran felt that signing the NPT stripped away their national sovereignty.

Nevertheless, the Shah signed it and claimed that Iran's nuclear programs are civil and so it is their right to develop nuclear technology for peaceful purposes under Article IV of the NPT.[121] But before signing the NPT, the Shah included an unprecedented caveat. Should other states in the Persian Gulf acquire nuclear weapons, Iran maintained the right to revise its nuclear policy and seek weapons capability themselves. If this had happened, the 23,000 MW(e) would have been equivalent to 600-700 warheads.[122]

Despite this caveat, Western Europe and Washington did not hesitate to engage in bilateral oil-for-atom deals with Iran. The financial drawbacks from the oil embargo were still sitting heavy on global economies and they had to risk a potential nuclear-armed Iran in order to fulfill their growing energy needs.

United States Nuclear Cooperation with Iran, 1957-1979

The Iranians, as I discussed in Chapter three, had already brokered a deal with France to supply 5,000- 7,000 MW(e). The bulk of their power reactor capability was still yet to be agreed upon. Since the United States had already established a trade framework with Iran in the past, the Shah wanted America to be the prime benefactor of the Iranian nuclear program.[123]

In March 1957, the United States expanded its nuclear industry to Iran. As part of the US Atoms for Peace program, the two countries signed a 10-year deal concerning non-military

[121] Akbar E. Torbat, *Politics of Oil and Nuclear Technology in Iran*, 187.
[122] Assistant Secretary of Defense, "Nuclear Cooperation with Iran – Action Memorandum" (International Security Affairs, 1974), https://nsarchive2.gwu.edu/nukevault/ebb268/doc02.pdf.
[123] Assistant Secretary of Defense.

transfers of nuclear material. Because Iran didn't have the electrical capacity to support multiple power reactors, the peaceful nuclear exchange between the two states was limited. The United States mostly supplied the necessary knowledge to develop nuclear reactors, such as the design, construction, and operation, as well as their use in research development.[124] By the end of their agreement, the United States had supplied the Shah with a 5 MWt heavy-water-moderated reactor and 5.5 kgs of low-enriched uranium to fuel it.[125]

In 1969, Iran established a national grid with sufficient electrical capacity to support a more prodigious nuclear infrastructure. As a result, the United States extended its peaceful nuclear transfer with Iran for an additional ten years. When the Shah unveiled his plan for the Atomic Energy Organization, the United States was presented with the perfect opportunity to cement its leadership in the nuclear exporters' community. The implications of this decision were not alien to US policymakers. If Iran received peaceful nuclear assistance, it would free remaining oil reserves for the export and production of petrochemicals, thereby strengthening Iran's economy. But Iran would receive nuclear assistance whether or not the US supplied it. If Iran was going to be a regional power, the United States had to ensure it remained an ally. It would also present the US military with significant advantages over the Soviet army since allying with Iran would allow military intelligence agencies to establish themselves on Iranian soil and coordinate overflight rights to the Indian Ocean and South Asia.[126]

So, in March 1975, U.S. firms agreed to sign a $15 billion trade agreement with Iran which included eight nuclear power reactors with a total power capacity of 8,000 MW(e) in

[124] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, 82.
[125] Matthew Fuhrmann, 82.
[126] Matthew Fuhrmann, 85.

exchange for 6.4 billion petrodollars.[127] The United States agreed to supply Iran with around 25 tons of highly enriched uranium for use in these heavy-water reactors and accepted the Shah's proposal to invest $2.75 billion in a uranium enrichment facility in the United States.[128]

Since the reactors would be controlled by heavy water and powered by highly-enriched uranium, the United States demanded to sign a nuclear cooperation agreement (NCA) with Iran. This nuclear transfer NCA guaranteed that the technology supplied would not be used to create any nuclear explosive device and that routine checkups could be administered by IAEA members. However, it is fairly easy to bypass these protocols set forth by the NCA and build a nuclear weapons program covertly – we witnessed this happening in India a couple of months before this signed trade agreement. In addition, in previous nuclear transfer agreements, the United States always ensured that no reprocessing plutonium plants were allowed to be operational since this is one of the key safety protocols of nuclear nonproliferation. But Iran was not rejected reprocessing rights, which gave them "most favored nation" status.[129] The United States was willing to let Iranians invest in a reprocessing facility so long as it was a multinational facility not located in Iran – similar to their agreed-upon uranium enrichment facility in the US.

The United States was once again very aware of the implications of this caveat, citing in a declassified National Security Council document that "… the possibility of proliferation is really extraordinary."[130] But Washington had to consider the economic situation in the 1970s both in terms of the current energy crisis's effects on the US economy and the future potential benefits which Iran's oil wealth will generate.

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[127] Mustafa Kibaroğlu, "Iran's Nuclear Ambitions from a Historical Perspective and the Attitude of the West," 229–30.
[128] Mustafa Kibaroğlu, 230.
[129] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, 83.
[130] Matthew Fuhrmann, 88.

As a result, the world witnessed a burgeoning trade partnership that ended up lasting 22 years and included the construction of nuclear reactors, uranium reprocessing plants, spent fuel reprocessing plants, highly enriched uranium, and the knowledge required to extend this nuclear program should the United States decide to back out.

When the Islamic Revolution occurred in 1979, the US-Iranian partnership experienced an abrupt end and the many years of exports and knowledge traded with Iran suddenly seemed like a national security risk. Imam Khomeini returned from his exile to Tehran and his drive to consolidate new order in his country manifested itself in a war cry against Iraqi forces who launched a sudden offensive under Saddam Hussein's command.[131]

Decades later, these feelings have not abated. The United States continuously undermines the Iranian nuclear program and fears the relationship Iran and China have had since 1991 when the two countries first signed an agreement to construct a 20 MW(e) nuclear reactor from China.[132]

Western Europe's Nuclear Cooperation with Iran, 1970-1979

In the early 1970s, the United States and the Soviet Union led an effort to prevent the nuclear-requesting states to enrich uranium on their soil. Both of these countries were among the largest exporters of enriched uranium in the nuclear market and a state's ability to indigenously enrich uranium would threaten their prodigious revenue stream.[133] Iran, frustrated by America's incessant meddling in domestic affairs, formed a partnership with EURODIF, a joint venture uranium enrichment company of France, Belgium, Spain, and Italy. Iran obtained a $163 million

[131] Mustafa Kibaroğlu, "Iran's Nuclear Ambitions from a Historical Perspective and the Attitude of the West," 232.
[132] Mustafa Kibaroğlu, 235.
[133] Akbar E. Torbat, *Politics of Oil and Nuclear Technology in Iran*, 171.

equity interest in EURODIF and paid $47 million in advance to the consortium for future nuclear fuel sales. These sales, which were promised to amount to 270 tons of uranium U-235 enriched to 3 percent, would provide Iran with enough low-enriched uranium to power the Framatome reactors until the mid-1990s - which if you recall from chapter three, included two 950 MW(e) pressurized water reactors in Darkhovin.[134]

After 1974, the nuclear fuel market changed. Iran had received nuclear reactor sales from all over Western Europe and realized how dependent they were on foreign fuel exports to power these reactors. Many nuclear exporters took advantage of this dependent relationship and manipulated their supply of fuel as they saw fit. As a result, Iran felt a newfound urgency to accelerate its indigenous uranium enrichment capabilities. Three events, in particular, exacerbated this decision: the United States restricting their uranium supply, West Germany manipulating their fuel sales with the Shah, and EURODIF members breaching their contract.

The first was the sudden suspension of American-exported low-enriched uranium following Operation Buddha. As I mentioned earlier, the United States and the Soviet Union were among the largest suppliers of enriched uranium - most of the communist countries received their supplies from Moscow, and most of the noncommunist countries, from the USA.[135]

One consequence of this abrupt suspension was the increased demand for Western European and Japanese fuel exports. Many of these firms began developing their own fuel technologies and constructing enrichment and reprocessing plants for the sole purpose of merchandising the fuel abroad.[136] The commercial demand these firms experienced due to the

[134] Mustafa Kibaroğlu, "Iran's Nuclear Ambitions from a Historical Perspective and the Attitude of the West," 231.
[135] Mustafa Kibaroğlu, 231.
[136] Mustafa Kibaroğlu, 231.

competitive edge they had over Persian Gulf states meant that they could make up some of their losses incurred from previous nuclear reactor deals. Because Europe was in a state of economic shock due to the energy crisis, many oil consumers could not dictate the terms of their bilateral deals with OPEC and ended up drawing the shorter straw. France's prime minister Jacques Chirac, for example, worried that Paris had received the "short end of the deal" ahead of their first nuclear agreement with Iran in 1974.[137] The United States had a similar concern with Saudi Arabia when Nixon threatened the Sultan to leak their private discussions in order to pressure Saudi Arabia to lift the embargo.[138] In both scenarios, the oil consumers had no bargaining power and were forced to accept the terms laid out by OPEC states.

But when it came to the supply of nuclear fuel, the relationship flipped. OPEC states did not have control over the nuclear fuel market and were not capable of setting the price for these exports. West Germany, among other Western European nations, took advantage of their power and gained some money back from these expensive nuclear reactor deals.[139] Iran noticed the consequences that resulted from their dependence on fuel exports but could not fall back on alternative sources. For this specific trade partnership, they were price takers.

The absence of the United States from the nuclear fuel supply market gave room for West Germany's firms to flourish. As a non-nuclear weapons state, they had every right under the NPT to "develop, produce, and operate technologies encompassing the whole nuclear cycle."[140] But contrary to the nonproliferation regime, they did not discuss the details of any transfer of sensitive technologies to the newly established Nuclear Suppliers Group. This made them a

[137] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 76.
[138] Marino Auffant, 68.
[139] Akbar E. Torbat, *Politics of Oil and Nuclear Technology in Iran*, 168.
[140] Mustafa Kibaroğlu, "Iran's Nuclear Ambitions from a Historical Perspective and the Attitude of the West," 232.

highly desirable trading partner for Iran since they could covertly discuss the terms of a nuclear fuel and reactor deal.

In late 1975, as I mentioned in Chapter two, the Shah signed a $4-$6 billion contract with the German Kraftwerk Union to build two pressurized light water reactors in Iran in exchange for 1 billion cubic meters of natural gas.[141] Since the German firm signed a chapeau agreement with the Iranian government, the construction's investments were contractually bound against any loss. But because the deal was shrouded in secrecy, West Germany could renege their promise of construction if it suddenly ran counter to domestic policy interests - which is exactly what happened after the Islamic revolution. When the war with Iraq started in 1979, tensions between Iran and the Kraftwerk Union increased. The firm realized they were losing more money than they would end up receiving from the German-Iranian nuclear deal and decided to finish construction only "after the war with Iraq was over."[142] The Iranian government was outraged and appealed to the IAEA for the urgent breach of contract, which they promptly dismissed.

One year later, in 1981, EURODIF member countries also felt that the environment in Iran had de-escalated to the extent that it was no longer in their best interest to supply Iran with nuclear fuels and decided to breach their contract with Iran. Despite Iran having obtained a 10 percent ownership in the energy consortium, the French government failed to deliver the promised 50 tons of uranium hexafluoride (UF6) and tarnished their relationship with the Iranian nuclear program.[143]

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[141] Akbar E. Torbat, *Politics of Oil and Nuclear Technology in Iran*, 168.
[142] Akbar E. Torbat, 169.
[143] Akbar E. Torbat, 171.

Due to these three connected events, the Iranian nuclear program moving forward became more hostile to Western intervention or partnership of any kind. Most of the knowledge required to operate a nuclear reactor had already been transferred to Iranian nuclear scientists, along with the infrastructure and some sensitive enrichment facilities. The focus of the Iranian government post-1981 was to develop its own indigenous fuel supply so that it would no longer have to be dependent on foreign exports to power its nuclear reactors. Years later when United States intelligence discovered uranium enrichment sites within Iranian borders, Iran defended its right to produce nuclear fuels indigenously after the "distrust" that resulted from multiple breached contracts with the West.[144]

[144] Akbar E. Torbat, 171.

Conclusion

This thesis concludes that the European and American dependence on oil and natural gas imports from Persian Gulf states was the sole motivator for their bilateral trade partnerships in the 1970s. Furthermore, this dependence contributed to the nuclearization of the Persian Gulf region and granted several countries, most notably Iran and Saudi Arabia, the means to construct a nuclear bomb should an occasion necessitate it. The structure of my paper strengthened the empirical validity of each chapter's analysis by exhibiting a linear progression of foreign policy decisions. In Part One, I focused solely on the economic implications of the energy crisis and the subsequent bilateral actions taken by oil dependent states. In Part Two, I focused on the nuclear implications of the energy crisis by examining France and Iran in depth.

The specific economic implications of the 1970s energy crisis in Chapter 1 should have given the reader some background into the chaotic atmosphere of the global energy markets post-oil shock. The oil-rich monarchies of the Persian Gulf region controlled 62 percent of the total global proven reserves, and if you accounted for just exportable reserves, the Gulf's share would have been well over 80 percent.[145] When OPEC signed the oil embargo into effect, they increased the posted prices of crude oil by 300 percent, which had a devastating impact on Western Europe's and the United States' supply of energy. The former experienced a $33 billion import increase in oil and natural gas and the latter, a $16 billion increase. [146] For countries like France and Italy, this not only threatened their future energy requirements but also the state of their economy as a whole since they were battling recession fears. Overall, my hope for the reader as they finished reading this chapter was to get a sense of the economic pressures felt by

[145] Mohammed Ayoob et al., "The Middle East in 2025: Implications for U.S. Policy," 148.
[146] "Declassfied/Released International Economic Impact of Increased Oil Prices in 1974."

Western governments, and subsequently, to make some sense of the radical and careless trade proceedings that would follow the embargo.

In Chapter 2, I explain some of these radical and careless trade proceedings. France was the first country to anticipate the need for bilateral deals with the Persian Gulf States. Ending a 30-year period of economic growth, the franc's valuation began rapidly depreciating after various trade deficits and plummeting foreign gas reserves – the most notable being the failure of their Algerian gas terminal to supply 15 percent of France's natural gas needs. As a result, France began trading military equipment in exchange for OPEC's oil to address two of the nation's primary concerns: acquiring a stable flow of oil and natural gas into the country and trading a high-value-added export that would strengthen the franc and shake off a recession. In exchange for oil, they decided to trade their prized Gazelle helicopters and Mirage aircraft. Once two successful deals were accomplished with Iran and Iraq, France was no longer feeling the economic burden of its European allies.

The United States accused France of undermining the West's traditional values of multilateralism and rallied other European nations at the Washington Energy Conference to remain unified against OPEC's manipulation of the energy markets. Despite the nods of approval, no formal commitment was ever drafted limiting bilateral dealings between oil-consuming countries and OPEC.[147] Hence, game on.

By the summer of 1974, West Germany had secured an oil-for-infrastructure trade with Iran building a 25-million-ton oil refinery in Bushehr in exchange for steady delivery of 1 billion cubic meters of natural gas per year to Germany; Japan promised credits of $1 billion to Iraq for a supply of 160 million tons of crude oil over the next ten years; and the United States entered

[147] Marino Auffant, "Oil for Atoms: The 1970s Energy Crisis and Nuclear Proliferation in the Persian Gulf," 70.

into an exclusive oil partnership with Saudi Arabia which would bind the U.S. and Saudi economy "so closely entwined that there could be no turning back…"[148] None of this should come as a shock, however, since the readers should know from Chapter One that the global energy markets relied predominantly on Persian Gulf oil. In the absence of a common EU energy policy, most of the European nations had no choice but to approach these states with bilateral deals.

Chapters Three and Four are where I shift my paper's focus to the impact that the 1970s energy crisis had on nuclear proliferation efforts in the Persian Gulf. In Chapter Three, I analyzed France's contribution to the nuclear scene in the 1970s. Frustrated with the competition for OPEC oil and natural gas, France could no longer rely on trading Mirage aircraft and Gazelle helicopters for their supply of oil. They needed to remain competitive in that relentless trade environment and they opted to flaunt the one commodity that was too taboo for any other country: nuclear infrastructure.

In the second section of this chapter, I looked at France's nuclear cooperation with Iran and the influence they had in creating Iran's nuclear industry. The two countries agreed to a long-term nuclear arms-for-oil trade that would exceed $10 billion. France agreed to supply 7,000 MW(e) to Iran in exchange for cash since Iran's gas reserves were already promised to other countries in previous bilateral agreements. For France to continue getting preferential treatment, Paris also agreed to invite Iran into EURODIF, a consortium dealing with uranium enrichment, and granted the Shah a 10 percent share.

I also looked at France's nuclear cooperation with Iraq and highlighted in my opinion the most dangerous nuclear deal of this period. France agreed to supply a 40 MW heavy water

[148] "Declassified/Released US Department of State EO Systematic Review: Joint US-Saudi Economic Commissions."

research reactor, a decommissioned Uranium Naturel Graphite Gaz reactor, and a radioactive waste treatment station.[149] In exchange for French nuclear sales, Iraq would supply 30 million tons of oil - a 50 percent increase from 1974. However, Paris was careless with their supply of sensitive nuclear technologies. They agreed to transport 13 kg of uranium enriched to 93 percent for use in the Osiraq reactor, which is suitable for use in a nuclear bomb, and also constructed a spent-fuel reprocessing center that would facilitate Iraq's pursuit of producing weapons-grade plutonium.

But France's dangerous nuclear export drive makes sense when you take into consideration that Prime Minister Pierre Messmer announced a highly expensive energy plan to construct 13 nuclear reactors by 1975 and more than 50 nuclear reactors by the end of the decade. Since France was anticipating a recession, the Messmer Plan and the Franco-Iranian nuclear deal would have to mutually sustain each other. In exchange for France exporting nuclear reactors abroad, Iran would fund $13 billion worth of Messmer's plan.

In Chapter Four, I looked at the impacts of the 1970s energy crisis on nuclear proliferation efforts from an oil producer's perspective, rather than an oil-consumer. I examined the US Atoms for Peace program and their 22-year deal with Iran which included a $15 billion nuclear cycle trade agreement in exchange for 6.4 billion petrodollars.[150] The United States also agreed to supply Iran with around 25 tons of highly enriched uranium for use in these heavy-water reactors and accepted the Shah's proposal to invest $2.75 billion in a uranium enrichment facility in the United States.[151] The United States, I concluded, was responsible for supplying the bulk of Iran's nuclear program power reactor capability.

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[149] Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity*, 117.
[150] Mustafa Kibaroğlu, "Iran's Nuclear Ambitions from a Historical Perspective and the Attitude of the West," 229–30.
[151] Mustafa Kibaroğlu, 230.

Western Europe also occupied a significant share in the future of Iran's nuclear program. But instead of reexamining bilateral deals between Western Europe and Iran in further detail, I chose to analyze three particular events which I concluded led to Iran's motivation to indigenously enrich uranium and their subsequent distrust of trade partnerships with the West. These events were the United States restricting their uranium supply, West Germany manipulating their fuel sales with the Shah, and EURODIF members breaching their contract.

Ultimately, if Europe wants to avoid another energy emergency in the future, I think the priority moving forward should be to create a common EU energy policy. To do this, members of the European Union should no longer approach gas producers as an individual country but rather as a unified bloc of European nations. Since the EU has many member states each with their own increasing energy demands, approaching gas suppliers as a unified bloc ensures gas security for the consumers and ensures a predictable revenue stream for the producers. If this is not achieved, Europe is going to continue experiencing energy emergencies like the 1973 energy crisis or the more recent energy shortage resulting from the Russian war in Ukraine.

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