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TREASURES OF THE CASPIAN:

THE COMING STRUGGLE FOR ENERGY EAST AND WEST

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The Henry M. Jackson School of International Studies
University of Washington
Treasures of the Caspian:
The Coming Struggle for Energy East and West
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Faculty Advisor: Professor Scott Montgomery

Task Force Members:

Brittany Bonning
Igor Cherny
Ellie DeMartino
Alicia Erickson
Gennie Gebhart (editor)
Mara Isaacson
Wing Chung (Alex) Lee
Laura Nelson
Lauren Pace (coordinator)
Lauren Rock (deputy editor)
Martin Su
Kathryn Teagarden
Sarah Wong
Hiu Yan (Jessica) Yip
Dean Yonev

Evaluator: Mikkal Herberg

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Glossary of Abbreviations and Acronyms

ACG	Azeri-Chirag-Guneshli oilfield
ADF	Agricultural Development Fund
AIOC	Azerbaijan International Operating Company
AZSTAT	State Statistical Committee of the Republic of Azerbaijan
Bbbls	Billion barrels (of oil)
bbl(s)	Barrels (of oil)
Bbls/d	Barrels per day
Bcf	Billion cubic feet
Bcm	Billion cubic meters
BN	Baku-Novorossiysk gas pipeline
BP	British Petroleum
BTC	Baku-Tbilisi-Ceyhan oil pipeline
BTE	Baku-Tbilisi-Erzurum gas pipeline
CAC	Central Asia-Center pipeline
CAGP	Central Asia Gas Pipeline
CAOP	Central Asia Oil Pipeline
CCAR	Caspian Central Asian Republic
CIPCO	Caspian International Petroleum Company
CIS	Commonwealth of Independent States
CLDP	Commercial Law Development Program
CNPC	China National Petroleum Corporation
CPC	Caspian Pipeline Consortium
CTBT	Comprehensive Test Ban Treaty
DSc	Doctor of Science (Local usage)
EaP	Eastern Partnership
EBRD	European Bank for Reconstruction and Development
EC	European Commission
ECT	Energy Charter Treaty
EEZ	Exclusive Economic Zone
EIA	Energy Information Administration
EITI	Extractive Industries Transparency Initiative
ENP	European Neighborhood Policy
ESPO	Eastern Siberia-Pacific Ocean route
EU	European Union
FDI	Foreign Direct Investment
FERF	Foreign Exchange Reserve Fund
FSR	Former Soviet Republic
GDP	Gross Domestic Product
GIWA	Global International Water Assessment
GMM	Gazi-Magomed-Mozdok gas pipeline

GW	Gigawatts
H_2S	Hydrogen Sulfide
HDI	Human Development Index
IAEA	International Atomic Energy Association
IDP	Internally Displaced Person
IEA	International Energy Agency
IGB	Interconnector Greece-Bulgaria
IGI	Interconnector Greece-Italy
IMF	International Monetary Fund
ITC	Information and Communications Technology
ITG	Interconnector Turkey-Greece
ITGI	Interconnector Turkey-Greece-Italy
IWG	International Working Group of Sovereign Wealth Funds
KEGOC	Kazakhstan Electricity Grid Operating Company
KMG	KazMunayGaz
KW	Kilowatts
Mbbls	Million barrels of oil
MML	Modified Median Line
MWt	Megawatt
NATO	North Atlantic Treaty Organization
NBK	National Bank of Kazakhstan
NFRK	National Fund of the Republic of Kazakhstan
NGO	Non-governmental Organization
NICO	Naftiran Intertrade Company
NNC	National Nuclear Centre
NPT	Nuclear Non-Proliferation Treaty
NWF	National Welfare Fund
OECD	Organization for Economic Cooperation and Development
OPEC	Organization of Petroleum Exporting Countries
OSCE	Organization for Security and Cooperation in Europe
PKK	Kurdish Worker's Party
ppt	Parts per thousand
PSA	Product sharing agreement
RATS	Regional Anti-Terrorism Structure
RDB	Russian Development Bank
REC	Regional Environmental Centre for Central and Eastern Europe
SCO	Shanghai Cooperation Organization
SDFI	Social Development Fund for Internally Displaced Persons
SFDOG	State Fund for the Development of Oil and Gas
SME	Small and Medium Enterprise program
SOCAR	State Oil Company of Azerbaijan Republic
SOFAZ	State Oil Fund of the Republic of Azerbaijan

sqmi	Square miles
STEM	Science, Technology, Education, and Math (Educational Usage)
SWF	Sovereign Wealth Fund
TAP	Trans-Adriatic Pipeline
TAPI	Turkmenistan-Afghanistan-Pakistan India gas pipeline
Tcf	Trillion cubic feet
TCGP	Trans-Caspian Gas Pipeline
Tcm	Trillion cubic meters
TCO	Tengizchevroil
TCOT	Trans-Caspian Oil Transport System
UAE	United Arab Emirates
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Program
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environmental Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNWTO	United Nations World Tourism Organization
USAID	United States Agency of International Development
USDA	United States Department of Agriculture
USSR	Union of Soviet Socialist Republics
VEB	Vnesheconombank
WTO	World Trade Organization
WTTC	World Travel and Tourism Council

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Preface

For nearly two thousand years, oil and gas have flowed in the imaginations of those who have come to the Caspian Sea region. When Marco Polo traveled the Silk Road to the city of Baku in 1264, he found "a fountain from which oil springs in vast abundance," volcanoes of mud built by seeps of natural gas, and a flaming hill where burned the "eternal fire" of Absheron.[1] By the time the Nobel brothers arrived from Sweden in the 1870s to establish one of the great early petroleum companies, Baku had become the largest center of oil production in the world.

Today there stands the vision of a "New Silk Road"—a strategy put forth by the U.S. to more fully integrate and advance the economies of the greater Caspian region, based in no small part on sound stewardship of the area's hydrocarbon resources. As stressed by Secretary of State Hillary Clinton during a foreign ministerial meeting in 2011, "lasting stability and security go hand in hand with economic opportunity."[2] For the present, such opportunity is closely tied to the sound, efficient extraction of oil and gas and their export both east and west: to China and perhaps India on the one hand, and to Europe and the global market on the other. With the forecasted rise in global hydrocarbon demand, the Caspian states of Azerbaijan, Kazakhstan, and Turkmenistan will all gain importance. If their reserves are not of the same scale as those of the Middle East, they are certainly large enough to make up for declining exports in such states as Norway and Mexico. Most crucially, they provide an alternative to the U.S.'s rapidly accelerating dependence on the Organization of Petroleum Exporting Countries (OPEC). Such is key in the near- and mid-term geopolitics of global energy.

Although oil and natural gas reserves were first discovered around the Caspian Sea centuries ago, the effects and impact of that discovery have yet to fully play out in the five littoral states. Oil and gas, however, are not the only resources of value in the Caspian region.

Considerable uranium, rare earth metals, and other mineral deposits are also present in the region, and Azerbaijan, Russia, Kazakhstan, Turkmenistan, and Iran all have access to this vast wealth that the Caspian has to offer. Such treasure, however, presents serious concerns for the U.S., including complicated relations with the above littoral states, border disputes, infrastructure and technology advancement, the development of higher education systems, Caspian governments' varying transparency and spending, and, above all, the looming question of energy security. This report strives to acknowledge such issues and offer feasible courses of action by which to address them, while recognizing the complications inherent in their respective resolutions.

This report proceeds in four sections, each of which consists of two to four papers grouped according to topic and theme. Each paper, with the exception of those profiling the Caspian's littoral states in Part I, begins with background discussion before delving into consideration of the issues that confront the U.S. and presenting various options available to American policy makers. An accumulated list of policy recommendations follows these papers and concludes the report.

In closing, this Task Force team extends its sincerest gratitude and appreciation to the Consulate General of the Republic of Azerbaijan, whose generous support made this Task Force possible. We would also like to express our deep thanks to the Consul General, whose attendance at our presentation provides a rare opportunity to discuss our findings directly with government representatives. It is our hope that the many benefits of this relationship with the Republic of Azerbaijan might serve as a model for future Task Forces at the University of Washington.

[1] Marco Polo, *The Travels of Marco Polo*, trans. Henry Yule (New York, NY: Dover Publications, 1993), 519.
[2] Hillary Rodham Clinton, "Remarks at the New Silk Road Ministerial Meeting," September 22 2011. http://www.state.gov/secretary/rm/2011/09/173807.htm.

Executive Summary

I. Background

The Caspian Sea region is comprised of its five littoral states: Azerbaijan, Kazakhstan, Turkmenistan, Iran, and Russia. Azerbaijan is a large oil and gas producer, and its sizeable gas deposits are primarily used for fulfilling domestic demand. Azerbaijani foreign relations are largely based on economic ties through its strong petroleum industry. Iran provides a strategic location on the Persian Gulf and the Strait of Hormuz provides significant maritime routes for crude oil transport. Its activities in the Caspian Sea have remained limited due to political stances that run counter to other Caspian neighbors, further stalling relations amongst the littoral states. Russia's role as littoral state, global actor, and oil producer and exporter ensures its continued, but weakening, control over most of the export routes for Central Asian oil and gas. Additionally, European demand for the regions' supply of oil and gas, especially from Kazakhstan, has led to several westward-oriented pipelines that continue to be political flashpoints as nations' conflicting interests impact pipeline construction, location, and safety. Depending on the Caspian's definition legal definition as either a sea or a lake, the division of the seabed, surface waters, and associated resources changes.

II. Issues

Due to Russia's political and economic dominance, Caspian nations have sought to establish bilateral relations with the U.S., China, and Europe, with each presenting conflicting interests regarding pipeline routing and construction. While oil and gas wealth have contributed to the development of urban capital cities, rural regions are not seeing the same development. Disparity in living conditions and job opportunities between urban and rural centers is a likely catalyst of social unrest. The Caspian region faces increasing population, which the oil and gas industries must address through academic infrastructure in order to develop domestic expertise in order to address economic engagement. Emerging environmental issues also pose a serious threat to ecological biodiversity, water supply, soil quality, and important non-hydrocarbon industries like fishing.

III. Options and Recommendations

- Maintain American relations with and influence in Caspian nations.
- Actively support programs to promote sociopolitical stability in the region.
- Implement global strategy with allies and world powers to support U.S. foreign policy in the region.
- Promote resource stability, including not only hydrocarbons but also related biological and water resources.
- Invest in Caspian energy resource development.

Part I:
Nation-State Analyses

Chapter One
Azerbaijan
Laura Nelson

Summary
A former member of the USSR, the Republic of Azerbaijan is located on the west side of the Caspian Sea and south of Russia. Azerbaijan is a major oil and gas producer, with oil exports forming 90 percent of its export income. Its sizeable gas deposits are primarily used for fulfilling domestic demand. Azerbaijani foreign relations are largely based on economic ties through its strong petroleum industry. Azerbaijan currently has positive relations with the United States and Turkey, and tense relations with Russia and Iran. It is currently embroiled in an ongoing dispute with Armenia regarding the status of the Nagorno-Karabakh region, an officially Azerbaijani territory that is demographically Armenian and autonomously governed. This dispute also significantly colors Azerbaijan's relations with Iran and Russia.

I. Background

Land & People

Azerbaijan is bordered by Armenia to the west, Georgia to the northwest, Russia to the north, Iran to the south, and the Caspian Sea to the east (see **Figure 1**). Its area covers just under 86,600 square kilometers (km^2) (34,000 square miles).[1] Azerbaijani territory includes the autonomous regions of Nagorno-Karabakh (the control of which is contested; see "The Nagorno-Karabakh Dispute", below) and Nakhchivan (located entirely within Armenian borders but recognized as Azerbaijani territory).

Figure 1: Azerbaijan and its neighbors. (Source: CIA World Factbook).

Azerbaijan's strategic location near the Caspian has made it a target for various empires, such as the Persian and the Ottoman, throughout its history. The territory was ultimately split between Russia and Persia in the late 19th century. Foreign interest in Azerbaijani oil began to substantially increase around this time, leading to the development of Azerbaijan's modern oil industry.[2]

After the collapse of the Russian Empire in 1917, Azerbaijan established a republic in 1918 and became the world's first Muslim democracy. Notably, the republic gave women the right to vote in 1919.[3] Azerbaijan was reincorporated as part of Russian territory in 1922 and became part of the USSR in 1936. It remained a member of the USSR until the USSR's collapse, upon which it declared its independence in August 1991. Azerbaijan approved the first version of its current constitution in 1995.[4]

Throughout the 20th century, Azerbaijan was a leading supplier of oil to Russia and Europe, making it of great strategic importance to Soviet leaders. This was particularly true during WWII and afterwards; Azerbaijan accounted for 70 percent of the USSR's oil production in 1940 and "the Azeri oil industry supplied a significant share of the oil equipment required for the exploitation of oil and gas in western Siberia."[5] After WWII, however, mid-century investment into Azerbaijani oil fields decreased, in part because of a shift in foreign interest toward energy reserves in Western Siberia.[6] Only after the USSR collapsed and Azerbaijan gained independence did Western oil companies regain an interest in the region. Azerbaijani officials, recognizing the potential for economic revitalization via the oil industry, carefully but quickly constructed a contract with British Petroleum (BP) and Staloil to increase oil production.[7]

As of April 2010 the Azerbaijani population tops 9 million people, with 4.3 million in the work force.[8] While formally considered a Muslim state, with approximately 93 percent of the populace identifying culturally as Shia Muslim, Azerbaijan's people and government are for the most part secular in practice. 90 percent of the population consists of ethnic Azeri, and the Dagestani are the country's largest ethnic minority. Azeri is the official language of the country, but much of the population is also bilingual in Russian, particularly in the capital city of Baku.[9]

Azerbaijan's literacy rate is 99.5 percent with an average life expectancy of 74 years for women and 63 years for men.[10] The largest economic sector in terms of employment is the forest and agriculture industry, in which just under 40 percent of the population works.[11]

Energy & Economy

Azerbaijan has significant reserves of oil and gas, which it has been developing primarily for export. As of 2010, according to the International Energy Agency (IEA), the country had 7 billion barrels (Bbbls) of proven oil reserves. The IEA also estimates that Azerbaijan will ultimately be able to recover 18.2 Bbbls from its oil fields. Azerbaijan is consistently a major world supplier of hydrocarbon resources: in 2008 Azerbaijan was the world's 22nd largest oil producer, and in 2009 it was the 23rd largest natural gas producer.[12] Despite the global financial crisis, oil production has remained strong, increasing from 800,000 barrels per day (bbls/d) in 2006 to 1.1 million barrels (Mbbls) per day in 2010, with production forecast to reach a plateau of around 1.1-1.2 Mbbls/d by the end of 2012.[13] Consumption of oil within the country has remained under 200,000 bbls/d, thereby leaving the overwhelming majority of production (more than 80 percent) for export. Oil provides 90 percent of the country's export revenues, and Azerbaijan is highly dependent on this single commodity.

Azerbaijan has two refineries, both in the Baku area, with a total refining capacity of 399,000 bbls/d. Built while Azerbaijan was still part of the Soviet Union, they are in need of upgrading, perhaps through foreign investment.[14] In an effort to reduce the country's dependence on oil exports, in 2009 Baku invested more money into non-oil sectors, such as agriculture, than it did into the oil sector.[15] However, Azerbaijan has yet to find a feasible export alternative that could take the place of peaking or decreasing oil revenues.[16]

Azerbaijan's gas reserves are less extensive than its oil reserves. According to the IEA, Azerbaijan held 1.4 trillion cubic meters (Tcm) in gas reserves and 4.1 Tcm in ultimately recoverable gas.[17] The most current reports (2011-2012) claim that proven reserves of gas are actually in the range of 2.2-2.4 Tcm.[18] Domestic levels of gas consumption are significant, as Azerbaijan uses gas to generate over 80 percent of its electricity. It became a net exporter of gas in 2006, concurrent with the beginning of operations in the Shah Deniz gas field. In 2010, it produced about 600 billion cubic feet (Bcf), approximately one-third of which was exported.[19] With the discovery of a new gas field off the Absheron Peninsula in late 2011, which purportedly holds approximately 350 billion cubic meters (Bcm) of gas, Azerbaijan is poised to export more gas in the future. However, Azerbaijan currently lacks the mechanisms to export gas in greater volumes to locations that are not its neighbors (e.g. Turkey and Georgia).[20] Azerbaijan also serves a small amount of its domestic energy demand with hydropower, the capacity of which it has attempted to expand with assistance from the United Nations Development Program (UNDP) and the government of Norway.[21]

The country is currently seeking to develop a civilian nuclear energy program. In 1980, Azerbaijan aimed to build a nuclear power plant, but it abandoned these plans in the wake of Chernobyl. In 2007, the Azerbaijani government announced plans for a 10-15 megawatt (MWt) nuclear reactor for research purposes. The International Atomic Energy Association (IAEA) gave approval to the project in 2008, and construction is to begin this year.[22] The Azerbaijani government may use this research reactor as a precursor to the development of a full-sized power reactor built to serve domestic energy needs. The construction of such a reactor would allow Azerbaijan to reserve a larger percentage of its gas for export purposes.

Foreign investment in Azerbaijan is concentrated in the petroleum sector. BP is the largest investor in this sector. BP projects, some of which are operated and planned in conjunction with Azeri capital or small businesses, spent US$ 1.3 billion in 2010.[23] In addition to BP, American companies Chevron, ExxonMobil, Devon Energy, and Amerada Hess have been active in the development of the supergiant Azeri-Chirag-Guneshli field (ACG). Chevron, for example, works through the Azerbaijan International Operating Company (AIOC), which produces and develops crude oil reserves.[24] Norway's Statoil, Turkey's Turkiye Petrolleri, and Japan's Inpex are also shareowners of the field. All of these companies, with the addition of Italy's Eni, France's Total, and America's ConoccoPhillips, helped finance the Baku-Tbilisi-Ceyhan (BTC) pipeline. Foreign investment plays a major role in Azeri gas fields as well: BP, Statoil, Russia's Lukoil, Iran's Naftiran Intertrade Company (NICO), and Turkiye Petrolleri are all responsible in varying degrees for the development of the giant Shah Deniz field.[25]

The Nagorno-Karabakh Dispute

Azerbajian's most contested political issue is the question of the Nagorno-Karabakh region (see **Figure 2**), which is the source of an ongoing, long-term dispute between itself and Armenia. Ethnic Armenians constitute approximately 1.5 percent of Azerbaijan's population. However, they largely reside within the Nagorno-Karabakh region, where they represent over 95 percent of the 145,000-person population.[26] Nagorno-Karabakh is governed autonomously of both Azerbaijan and Armenia, and is led by elected leader Bako Sahakyan.[27] The conflict between Azerbaijan and Armenia over the region began in 1988 at the end of the Cold War. While Russia, to some extent, was able to mitigate the conflict, the dispute escalated in 1991 after the fall of the Soviet Union and Nagorno-Karabakh's declaration of independence. The war between Armenia and Azerbaijan continued until Russia assisted in the brokering of a ceasefire

Figure 2: Armenian military presence in Azerbaijan/Nagorno-Karabakh. (Source: www.telegraph.co.uk).

Camel: Territory of Azerbaijan occupied by Armenian military forces
Brown: Territory comprising Nagorno-Karabakh

between the two sides in 1994. Approximately 30,000 people were killed in the conflict.[28] Armenia provided support to Nagorno-Karabakh during the war and afterwards, and Armenian soldiers remain stationed in the region.

During the war, many of the ethnic Azeri who lived in Nagorno-Karabakh fled to Azerbaijan and have since been unable to return. According to the Azerbaijani government this conflict resulted in roughly 1 million refugees and internally displaced persons (IDPs) within Azerbaijan.[29] Other estimates place this number at closer to 600,000; however, the logistical difficulties that even this lower estimate presents for the Azerbaijani government remain numerous and extensive.[30]

There are some signs of progress. Since the brokerage of the original ceasefire, both the Azerbaijani and Armenian governments have attempted to resolve the situation. The Organization for Security and Cooperation (OSCE) Minsk Group, an international body chaired by Russia, France, and the U.S., has been tasked with bringing a long-term agreement to the

region. However, Azerbaijani leadership feels the group maintains a pro-Armenia bias.[31] Further, the presidents of Armenia, Azerbaijan, and Russia met in 2008 and agreed to continue meeting to make progress towards a resolution for Nagorno-Karabakh.[32]

Unfortunately, there has been little notable change in the overall situation, and violations of the ceasefire are common. While these violations have not escalated into wider conflict, each has resulted in a number of deaths; in 2010, twelve soldiers were killed between August and November in a series of border shootings. Azerbaijan maintains that Armenia is not doing enough to engender peace in the region despite the efforts of Azerbaijan and the OSCE.[33] As recently as the end of last year, President Aliyev stated that should the Nagorno-Karabakh situation remain stagnant, an Azerbaijani attempt to retake the region militarily was not out of the question.

This dispute also influences Azerbaijan's relations with Iran and Russia. Azerbaijan perceives Iran to be a clear Armenian supporter. Russia has maintained its position as a third-party broker in its attempts to resolve the dispute. However, Azerbaijani authorities question Russia's neutrality on the matter. The general population also appears to share these sentiments, believing that the Russians "see it in their interest to use Nagorno-Karabakh to 'divide and rule' the South Caucasus".[34] This has made the prospect of advancing a peace agreement over Nagorno-Karabakh more difficult and created further tension in Azerbaijan's relationship with Russia. [35]

Regional & International Relations

The goal of strengthening economic ties with other states characterizes Azerbaijan's foreign relations policy. This complements its dual goals since independence: first, "to protect its sovereignty and territorial integrity," and second, "to secure foreign investment in its petroleum

sector".[36] Iran and Russia are two of Azerbaijan's largest trade partners. As of 2010 Russia accounted for 4.4 percent of Azerbaijan's exports and for 14.5 percent of its imports. In comparison, the US accounted for only 8.4 percent of exports. Turkey, which is emerging as a potential middleman between the Caspian region and Europe, is also a vital trade partner. Turkey and Azerbaijan have signed several gas export agreements. Turkey is also the country from which Azerbaijan imports most heavily, counting for 17.7 percent of Azerbaijani imports.

Ongoing issues in relations with Iran and Russia, however, plague Azerbaijani foreign policy. These disagreements partially, but not entirely, revolve around the Nagorno-Karabakh region. Territorial disputes over the division of the Caspian Sea and its energy reserves also remain an ongoing issue among Azerbaijan and the other Caspian littoral states. Kazakh and Azerbaijani leadership have taken strides to coordinate their policies regarding the Caspian Sea, particularly vis-à-vis Russia.[37] However, similar agreements with Iran and Turkmenistan have not taken shape due to continued disputes over ownership of oilfields.

The sizeable population of ethnic Azeri in Iran's northern region complicates relations as well; the Azeri are Iran's largest minority, accounting for approximately 16 percent of the population as of 2008.[38] While the Azeri-Iranian populace does not express active desire to secede, cultural differences (such as the teaching of Azeri in schools) have emerged as causes of protest.[39]

Azerbaijani-Iranian relations are tense in large part due to conflicting bilateral relations maintained by both sides. The largest point of dispute is the fact that Azerbaijan considers Iran an ally of Armenia, as noted above. On the other hand, Azerbaijan is also a noted ally of the U.S., in part because it is staunchly opposed to Iran's growing nuclear weapons capabilities. In addition, Azerbaijan is also an ally of Israel. Israel is a major consumer of Azerbaijani oil,

ranking second only after Italy. Azerbaijani oil covers just under a third of Israel's oil consumption. The two countries also work together in the co-production and sale of military equipment.[40]

These two bilateral relationships, particularly Azerbaijan's ties with Israel, have made maintaining positive relations with Iran more difficult. In January 2012, Azerbaijan arrested two Iranians suspected of planning to attack the Israeli Ambassador in Baku, and then reported that that the two men had ties to Iran's intelligence.[41] Soon after, in February 2012, Iran's Foreign Ministry accused the Azerbaijani government of assisting Israeli intelligence in the killing of a known Iranian nuclear scientist, which the Azerbaijani government forcefully denied.[42] Azerbaijan's relations with Israel have also come under fire from Turkey within the past year. Ankara is increasing pressure on Baku to reduce its ties with Israel, which is especially worth noting as some of the oil that is shipped to Israel goes through the Turkish port of Ceyhan. However, the Azerbaijani government has shown no sign of bowing to these demands.[43]

Strain in Azerbaijan-Russian relations has also made Georgia an Azerbaijani ally: in 2011, Georgia's President reportedly said that "whoever opposes Azerbaijan is Georgia's enemy."[44] Trade relations between the two countries are strong; in February 2012 Azerbaijan's Economic Development Minister announced that Azerbaijan increased its investments in Georgia by 50 percent in 2011.[45] Trilateral relations between Georgia, Turkey, and Azerbaijan are also very good. However, relations between Azerbaijan and Georgia expand the network of opposing bilateral relations (e.g. Russia and Armenia versus Azerbaijan and Georgia; Azerbaijan and Israel versus Iran) that complicate Azerbaijani foreign policy.

Relations with the U.S.

Azerbaijan has maintained positive relations with the U.S. since its declaration of

independence in 1991. As noted above, U.S. companies are heavily invested in developing Azerbaijani oil and gas fields. Azerbaijan and the U.S. also have a bilateral trade agreement, and in 2010, the U.S. provided US$22 million to support economic reform and humanitarian aid in Azerbaijan.[46] Sources of tension within the relationship are based primarily on U.S. insistence for decreased levels of corruption in business, particularly the oil sector. The U.S. has also called for increased levels of transparency, higher levels of political competition, and more freedom for the media.[47] However, Azerbaijan's tense relations with Russia and Iran mean that maintaining positive relations with the U.S. and Turkey is of great importance to the state. In this way, Azerbaijan hopes to have powerful backers that can counterbalance Iranian and Russian influence in the region.

However, Azerbaijani leadership also recognizes that U.S. would likely still act to contain Iran and Russia even if its own relations with the U.S. were to sour. Azerbaijan and the U.S. have an understanding, but this is in large part due to the political and economic reality of each country's foreign policy. Their relations, while solid, are an alliance based off of convenience. If the U.S. wishes to strengthen ties with Azerbaijan even further, it would likely require action by the U.S. (possibly through the OSCE Minsk Group) regarding Nagorno-Karabakh. Similarly, differences over Nagorno-Karabakh also pose the greatest potential to shake Azerbaijan-U.S. relations.

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[1] US Department of State: "Background Note: Azerbaijan." http://www.state.gov/r/pa/ei/bgn/2909.htm
[2] Ibid.
[3] Ibid.
[4] Ibid.
[5] Willy Olson. *The role of oil in the development of Azerbaijan*. *The Caspian: Politics, energy and security*. Edited by Shirin Akiner. (London and New York: Routledge, 2004), 127-128.
[6] US Department of State: "Background Note: Azerbaijan."
[7] Ibid, pp 129-130.
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Chapter Two

Kazakhstan and Turkmenistan

Hiu Yan (Jessica) Yip

Summary

This report provides a full-scale overview of Kazakhstan and Turkmenistan. It is divided into four sections: people, economy, history and foreign relations. The first section reviews the population and ethnicities make-up of Kazakhstan and Turkmenistan. The second section reviews economic activities, emphasizing both countries has vast gas and oil reserves and enormous economic potential. The third section provides basic history backgrounds: Central Asia was formerly controlled by the Soviet Union for almost 80 years, and in 1991 five former Soviet republics including Kazakhstan and Turkmenistan became independent. The fourth section focuses the two states' respective foreign relations with China, Russia, and the United States, explaining Kazakhstan and Turkmenistan's political agendas and their constraints.

I. Kazakhstan

Kazakhstan is a landlocked country of 2.7 million km^2 (1.1 million square miles) with a population of 15.6 million and vast mineral wealth. It is roughly the size of Western Europe and stretches from the eastern shores of the Caspian Sea to the western border of China.[1] Much of the land is semi-arid steppe, with desert to the south and southeast, temperate lowlands on the Caspian coast, and mountainous areas along the eastern borders with Russia and China. Kazakhs suffered from widespread famine and experienced mass deportations and forced migrations under Soviet rule. Between 1945 and 1970, the Soviets used Kazakhstan as a mining and agricultural center as well as a major nuclear testing ground. Several reactor sites, uranium mines, and nuclear fuel fabrication sites from this era remain today.

Though a large portion of its population works in agriculture, Kazakhstan has begun to benefit economically from its abundant mineral resources. Since 1991, Nursultan Nazarbayev has served as the President of Kazakhstan, and the country has achieved high economic growth and the highest gross domestic product (GDP) per capita in the Caspian Sea region. President

Nazarbayev encourages economic reforms, foreign investments, and is strongly in favor of expanding natural resource development for economic growth.[2]

People

Kazakhstan is the second most populated country in Central Asia. Fertility rates are near or below replacement levels at 1.87 children per woman, suggesting that the population is stable or slowly declining.[3] With continued economic expansion, however, it is likely that migration into the country from surrounding states will occur. Kazakhstan is a considerably ethnically diverse country; ethnic Kazakhs make up over half the population, Russians comprise 24.5 percent, and smaller minorities of Uzbeks, Koreans, Germans and others accounts for the remainder.[4] Religiously, the majority (65 percent) of the population identify as Muslim, 30 percent as Russian Orthodox, and the remainder as Protestant or other religions.

Economy

Oil and gas are the engines of growth in Kazakhstan's economy. After Russia, Kazakhstan has the second largest oil reserves and the second largest level of oil production among the Former Soviet Republics (FSR). At the end of 2009, Kazakh proven oil reserves amounted to 5.3 billion tones, which counts for 3 percent of the world oil reserves.[5] Kazakhstan's oil production is projected to increase with the start of commercial production in the supergiant Kashagan field and a projected rise in output from the Tengiz field.[6] Oil production is also likely to rise with new on and offshore developments. The production of oil is expected to reach 480,000 bbls/d by 2014.[7] Kazakhstan is aiming to become one of the world's top oil exporters in the next decade based on the development of three major oil fields: the Tengiz, the Karachaganak, and the Kashagan.

With large amounts of natural gas in its oil fields, Kazakhstan is on the verge of becoming a net gas exporter. Kazakhstan's gas reserves amount to 131 trillion cubic feet (Tcf), and its gas total production expected to rise to 2.5 Tcf by 2015.[8] The country's main priority is to increase gas production to supply its growing domestic needs. Kazakhstan has Central Asia's largest recoverable coal reserve, and is the second largest coal producer in the former Soviet Union after Russia. Despite the plentiful supplies of other minerals and metals—including uranium, base metals (i.e. copper, zinc, lead), and rare earth metals—its economy is overwhelmingly dependent on oil and gas production.[9] Geographic limitations and decaying infrastructure present serious obstacles to long-term economic growth.[10] In response to over-dependence on natural resources, the government has embarked on an ambitious diversification program called the Small and Medium Enterprise Program (SME), which is aimed at developing targeted sectors such as mining, transport, pharmaceuticals, telecommunications, petrochemicals, and food processing.[11]

Oil, gas, and mineral exports are crucial to Kazakhstan's economic success. Kazakhstan's economy grew by 8.5 percent in 2007, 10.7 percent in 2006, 9.7 percent in 2004 and 9.2 percent in 2003 respectively.[12] Since 1993, Kazakhstan's extractive industries have attracted US$30.7 billion in foreign investment, which represents almost 76 percent of total Foreign Direct Investment (FDI) in Kazakhstan for that period.[13] While oil and gas remain pivotal for economic growth, the country is also the largest exporter of uranium in the world.[14] The government has plans to upgrade and expand its nuclear fuel fabrication capability, and to capture as much as 30 percent of the global market for nuclear fuel.[15] This could be highly profitable in the future, especially as China leads the second major period of growth in global nuclear power.

History

Nomadic tribes have been living in Kazakhstan since the 1st century BCE. Beginning in the 13th century, the Mongol invasion brought new peoples—and with them new a new language, culture, and economy—to the area.[16] The following 150 years brought the gradual colonization of Kazakh-controlled territories by tsarist Russia, which established military outposts and garrisons as part of the so-called "Great Game" between Russia and Britain over control of Central Asia and the defense of British India.[17]

Rebellion against colonial rule occurred between 1880 and 1916, but it was brutally crushed, beginning a large-scale migration of Kazakhs into neighboring countries, including China. The Soviets forced the remaining nomadic Kazakhs to settle on collective farms in the Aral Sea Basin and encouraged or forced Russians and other Slavs to settle in the region.[18] Collectivization in the late 1920s and 1930s brought about mass huger and starvation, widespread killing of elites, and more migrations, much of it linked to Stalin's program of internal ethnic cleansing.[19]

In the wake of independence in 1991, many Russians left the country due to a perceived lack of employment opportunities and the government's "Kazakhization" policy, meant in part to reclaim the ethnic Kazakh identity that had been suppressed in the Soviet era. Kazakhstan proclaimed its membership in the Commonwealth of Independent States (CIS) on Dec 21,1991, along with ten other FSRs.[20] The years following independence are marked by significant reforms to the Soviet command economy and by a political monopoly on power. Under the leadership of President Nazarbayev, the country has developed a detailed economic plan to move towards the open world market.

Government and Foreign Relations

Kazakhstan pursues "multipolar" foreign policy with regards to Russia, China, and the U.S. The country has set an agenda with three main foreign policies: increasing integration with Russia to maximize the possible economic gains from exporting oil to Russia; improving cooperation and strengthening economic ties with China; and establishing long-term, stable relations with the United States.[21] Kazakhstan's overall strategic goal is to diversify its economy and integrate fully into the global system. The pipelines built in 2000 linking Kazakhstan to Russia further their relationship by benefiting both Kazakhstan and Russia economically.

In June 2002, members of Shanghai Cooperation Organization (SCO)—China, Kazakhstan, Kyrgyzstan, Russia, Tajikistan, and Uzbekistan—signed the SCO charter promising to increase cooperation in economic policy, foreign trade, and investment in St. Petersburg.[22] The SCO also made a joint statement pledging cooperation in the war on terror. Kazakhstan has been an active and willing participant in this regional organization and has staged joint security exercises with both China and Russia as part of the SCO's Regional Anti-Terrorism Structure (RATS).[23]

Kazakhstan has also maintained a good relationship with the U.S. Senior American officials, including Vice President Joe Biden, Secretary of State Hilary Clinton, and other cabinet members, visited Kazakhstan in 2006. Further, President Nazarbayev paid a state visit to Washington, D.C. and met with President Bush at the White House in September of that year.[24] However, the Kazakhstani government has expressed concern that the American emphasis on democratization is viewed by many Caspian Sea nations to be ill considered and destabilizing.[25]

With its geopolitically advantageous borders with China and Russia, Kazakhstan is strategically significant in promoting integration between South and Central Asia. Further,

Kazakhstan is crucial to world energy markets because it has vast deposits oil and natural gas. With the combination of vast storehouses of oil and an increasingly open business environment, it attracts substantial FDI and it is expected to become one of the world's largest oil producers and exporters.

II. Turkmenistan

Turkmenistan is situated on the eastern coast of the Caspian Sea, with a total area of 488,100 km^2 (189,999 square miles) and the smallest population of the Caspian's five littoral states. It stretches from the Amu Darya River in the east to the Caspian Sea in the west. Roughly 80 percent of its land is covered by the Karakum Desert.[26]

People

Turkmenistan has approximately 5.3 million people.[27] The fertility rate is higher than the replacement level, with an average of 2.16 children per woman, conveying that the population is steadily increasing.[28] With the growth of the population, the median age of the country has decreased to 25.3 years.[29]

The majority of the population lives on the eastern shore of the Caspian Sea and on the fringes of the Amu Darya.[30] Of the total population, the largest ethnic group is Turkmen (85 percent), with minority ethnic groups consisting of Uzbeks (9.3 percent), Russians (6.7 percent), and Kazakhs (2 percent).[31] The most commonly spoken languages are Turkmen and Russian. Among the population, Islam is the largest religious group, accounting for 89 percent of the population; other religious groups are Eastern Orthodox (9 percent), and others (2 percent).[32]

Economy

Turkmenistan's economy remains relatively underdeveloped, with exports mainly consisting of gas (50 percent), oil and oil products (32 percent), cotton (2 percent), and other

related agricultural activities.[33] The country's main trading partners are Russia, Iran, Italy, Turkey, and China.

After Uzbekistan, Turkmenistan is the second largest cotton supplier in the former Soviet Union, with an estimated 823,000 tons of cotton exported each year.[34] However, the crop yield has been steadily declining since 1991 due to poor irrigation and lack of sustainable management practices. Agriculture accounts for roughly 10 percent of GDP, and employs nearly half of the country's workforce.[35] Turkmenistan's post-communist government has taken a cautious approach to economic reform, hoping to use gas and cotton export revenues to sustain the economy.[36]

From independence in 1991 until 2005, Turkmenistan suffered from a severe lack of adequate export routes for natural gas, as well as from obligations on extensive short-term external debt. However, in recent years, total exports have risen by an average of roughly 15 percent per year thanks to high global oil and gas prices as well as increasing demand from developing countries such as China and India.[37] Two new pipelines from Turkmenistan to Iran and from Turkmenistan to China provide additional gas export revenue and venues to transport gas.[38] Unfortunately, the newly built pipelines have not offset the sharp drop in gas export revenue since Russia exponentially decreased its gas imports from Turkmenistan in 2009.[39]

The new government has established a State Agency for Statistics, but the GDP numbers and other figures it reports are often falsely inflated or misrepresented. As a result, the growth rate of GDP is a mystery. Since President Gurbanguly Berdymukhammedov took office in 2007, he has unified the country's dual currency exchange rate, reduced state subsidies for gasoline, and initiated the development of a special tourism zone on the Caspian Sea. Yet economic

growth remains low.[40] The 2006 UNDP Human Development Report placed Turkmenistan in the category of "medium human development" with unemployment rates as high as 70 percent.[41]

History

Turkmenistan was originally part of the Persian Empire. In the 7th Century, Arabs successfully conquered the country, carrying with them the Islamic religion and incorporating the Turkmen population into Middle Eastern culture.[42] In the 12th century, Genghis Khan gained control of the region east of the Caspian and continued his march west.[43] In the following centuries, the country was harried by constant intertribal wars and changing empires. The 16th century marked the beginning of Russia's occupation of Turkmenistan.[44] As the Tsarist Empire strengthened and consolidated its military power, Russia sent forces to Turkmenistan and killed 7,000 Turkmen at the desert of Gokdepe, near Ashgabat.[45] By 1894, Imperial Russia had taken complete control of Turkmenistan. The October Revolution of 1917 in Russia and the subsequent political uprisings led to the declaration of the Turkmen Republic, one of the 15 republics of the Soviet Union. Following the Cold War and the break-up of Soviet Union, Turkmenistan declared its independence on October 27, 1990.[46] Saparmyrat Niyazov was the first president of the new republic and was "president for life" until his death in 2006.[47] Upon Niyazov's death, Berdymukhammedov became president.

Government and Foreign Relations

The Turkmen constitution defines Turkmenistan as a secular democracy and a presidential republic. In truth, Turkmenistan is ruled by a presidential regime which gives consolidated power to the presidential administration, and over which the president is the ultimate decision maker and ruler of the country.[48]

Turkmenistan's government defines its foreign policy as "positive neutrality" with "open doors," and it has built bilateral relations with Russia and China.[49] Turkmenistan is China's most crucial contact in the Caspian region and one of its key energy suppliers as the continued growth of the Chinese economy intensifies its need for oil and gas. In the meantime, in order to reduce reliance on Russian demand, Turkmenistan is actively seeking alternative trading partners. As a result, both China and Turkmenistan are in favor of building and developing strong bilateral ties. Between 1992 and 2006, total trade between the two countries grew from US$4.5 million to US$178.6 million.[50] In April 2006, an ambitious natural gas agreement was signed between the countries to allow for the construction of gas pipeline linking them together.[51] Under the terms of the agreement, Beijing would purchase 30 Bcm of gas from Turkmenistan annually for three decades.[52] In 2009, gas exports to China had reached 60 Tcf.[53] Additionally, China has strengthened its ties with Turkmenistan through the maturing SCO.[54]

Energy diplomacy between China and Turkmenistan still remains fragile to some extent. Although China has taken measures to pursue further energy relations with Turkmenistan, there remain formidable issues for China to address. First, the geographic separation and the associated costs are obstacles for Beijing. Transporting gas and oil presents a daunting challenge when there is a limited network of transport links between Central Asia and China, and it requires tremendous capital investment to build cross-regional pipelines.[55] Further, security will have to be factored into any future energy cooperation between China and Central Asia. If Turkmenistan becomes a failed state, it would pose serious political and economic consequences for the region as well for China.[56]

Because it is landlocked, Turkmenistan relies heavily on Moscow for transport of its natural gas to the international market. With Russia seeking to take more control of

Turkmenistan export pipelines, Turkmenistan aims emerge from Russia's shadow by developing new pipelines. Under the Caspian Basin Energy Initiative in 1990's, Turkmenistan, Georgia, Azerbaijan, and Turkey agreed to cooperatively build a pipeline under the Caspian Sea and export Turkmen gas to the Turkish domestic energy market and beyond, called the Trans-Caspian Gas Pipeline (TCGP).[57] However, in 2000, the government of Turkmenistan removed itself from the negotiations and refused to continue the project.[58]

After the withdrawal of the Caspian Basin Energy Initiative, Turkmenistan still remains an important player in the global energy stage as it holds the world's second largest gas field. Due to the country small population and its rich in natural gas, it exports substantial gas to Russia. However, since 2009, Russia has considerably decreased demand for natural gas, Turkmenistan has been forced to seek alternative markets such as China and Iran. Pipeline construction and reduction of economic dependence on gas exports to Russia will likely remain top priorities on the Turkmen government agenda.

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Chapter Three

Russia and Iran:
World Powers and Caspian States

Kathryn Teagarden

Summary

Both a global power and a littoral state of the Caspian Sea, the Russian Federation is the world's second-largest oil producer and exporter, as well as the leading gas producer. It also maintains vast control over most of the export routes for Central Asian oil and gas, but lately its control has been waning. Russia's former territories have sought to maintain relations with Russia while emphasizing their independence by forming alliances with the U.S., China, and Europe. Russian foreign relations have been concerned with sustaining influence in the "near abroad" consisting of the Caucasus and Central Asia, while restraining U.S., European and Chinese power within the Caspian region. The only nation within the Caspian Sea region that is not a former USSR, the Islamic Republic of Iran is situated in the Middle East in a strategic location on the Persian Gulf and Strait of Hormuz, which are vital maritime pathways for crude oil transport. The Iranian sector of the Caspian Sea region has remained largely unexplored due to a policy of intransigence in regards to border disputes, furthering exacerbating its foreign relations among the littoral states. Russia and Iran continue to have strained relations built upon mutual distrust of the U.S. and obtaining political power within the region.

I. Russia

The Russian Federation is not solely a littoral state of the Caspian Sea region, defined only by its proximity to Central Asia, but rather a world power with extensive international influence (see **Figure 3**). The largest and most populous state in the Caspian Sea region, Russia has immensely varied climate and terrain; due to extreme heat and cold coupled with long distances, exploitation of its vast natural oil, natural gas, coal, and other mineral resources is relatively costly.[1] In

Figure 3: The Russian Federation and its neighbors. (Source: http://novaonline.nvcc.edu/eli/evans/HIS241/Notes/Geography/Geography.html).

addition to holding roughly a quarter of the coastline of the Caspian Sea, Russia controls the Volga River. The Volga River supplies approximately 85 percent of the Sea's fresh water inflow. Its delta also provides a rich, if polluted, agricultural center. The Volga-Don Canal, which was built in 1952 under Soviet rule, connects the Caspian and Black Seas. This provides the most direct navigable connection between Europe and Asia.[2]

The Russian provinces that border the Caspian Sea include the Republics of Dagestan, Kalmykia, and Astrakhanskaya (see **Figure 4**). Dagestan is located in the southwest of Russia above Georgia and Azerbaijan, and to the east of Chechnya. It is an ethnically diverse region, with a large Muslim population. Due in part to its proximity to Chechnya, Dagestan has maintained a low-level Islamic insurgency. Additionally, the dispute between the two Islamic factions within the region, the Sufi and the Salafist—which advocate secular government and Sharia law, respectively—has inflamed tensions. The economy of Dagestan is primarily focused on engineering and metalworking, but also includes a rapidly developing hydroelectric power industry.[3] The Republic of Kalmykia is to the north of Dagestan along the Caspian Sea coast. Kalmykia is the only province within Europe that is predominantly Buddhist. Kalmykia also has a large developed agricultural sector growing wheat, maize, and fodder crops, in addition to producing wool, meat and fish.[4] The Republic of Astrakhanskaya is located north of the Caspian Sea and to the east of Kalmykia. Astrakhanskaya

Figure 4: Russian provinces bordering the Caspian Sea. (Source: http://memory.loc.gov/cgi-bin/map_item.pl).

is centered on the Volga River and as a result, has a rich agricultural sector that produces rice, fruits, and vegetables. Additionally, Astrakhanskaya boasts an oil-gas sector.[5]

Russian Relations with Former USSR Territories (Littoral States)

The new Russian Federation's initial reaction after the fall of the Union of Soviet Socialist Republics (USSR) was to disengage from its former territories. In 1992, Russia became concerned about "spillover" from the violent conflicts that took place within the region as the new nations struggled to achieve stability. With echoes of the U.S.'s Monroe Doctrine, Russian President Dmitry Medvedev recently stated that Russia has "'privileged interests'" in its former territories and current neighbors.[6] Consequently, Russia has begun to look at the Caspian Sea region as a "broad and loose multilateral 'umbrella'... that covers a system of Russia-centric bilateral ties."[7] This is a continuation of President Boris Yelstin's 1996 foreign policy, which shifted focus from global activism to international promotion of core Russian interests. This promotion included Russia's so-called "near abroad" consisting of the Caucasus and Central Asia.[8]

The Chechen War in the mid-1990s and increased restlessness within Dagestan have intensified long-held Russian concerns about radical Islam and the threat of terrorism within and on Russian borders, as well as the country's energy security.[9] This unease has made Central Asia invaluable to Russia as a buffer zone between the perceived "Muslim threat" from the south in Iran, Turkey and Afghanistan. Additionally, Russia sees the Caspian region as essential to curbing the global influence of the U.S. and China.

Russia is the world's second-largest oil producer and exporter, as well as its leading gas producer. In addition to its own natural resources, Russia has maintained vast control over most of the export routes for Central Asian oil and gas.[10] This is largely due to the fact that many of

the pipelines within the region were built during the Soviet era, and consequently, run through Russia. Recently, however, Russia's monopoly has been weakening, as many of the other Caspian littoral states form alliances with the U.S., China, and Europe. This is clearly illustrated in the construction of the Baku-Supsa oil pipeline in 2998 and the BTC pipeline in 2005, neither of which run through Russia.

Sino-Russian Relations

Sino-Russian relations have improved significantly since the 1990s. With the 2004 Complementary Agreement, Russia and China resolved a long-standing border dispute on the eastern section of the Sino-Russian Boundary and effectively ended one of their greatest conflicts (see **Figure 5**). This in turn opened the door for greater cooperation in the SCO, and provided opportunities for increased trade between the two countries. In 2008, trade between Russia and China reached a peak of US$59 billion--a substantial increase from their rather negligible levels before the fall of the USSR.[11]

Figure 5: Eastern section of the Sino-Russian Boundary. (Source: http://news.bbc.co.uk/2/hi/world/analysis/29263.stm).

Despite this, Sino-Russian relations remain complex in a number of areas, especially energy. For more than a decade, China has been eager for Russia to become one of its major suppliers of oil and gas. Yet Russia's proclaimed "look east" policy has yielded only one major new pipeline to Asia—the Eastern Siberia-Pacific Ocean route (ESPO)—which has a spur to Daqing, the site of a large refinery in China. The pipeline was originally planned to run exclusively to China, but was extended to the Pacific Ocean as a result of lobbying from Japan and Korea.

In 2010, Russia was only China's fifth largest crude oil supplier, despite its proximity to

China.[12] Furthermore, the two nations share no natural gas relationship. Chinese leaders have continued to state their desire to diversify oil sources away from the Persian Gulf to keep up with the country's increasing natural gas consumption. Russia, on the other hand, wishes to diversify its buyers and reduce its dependence on Europe.[13] With China's growing demand for oil and Russia's desire to expand its markets, along with their mutual distrust of U.S. supremacy, these two nations seem likely partners.

Yet, even greater deterrents stand in the way of a stronger Sino-Russian relationship. As previously mentioned, China and Russia both share an interest in impeding the U.S. and other Western powers from gaining a greater foothold in the Caspian Region. Russia also fears, however, a growing Chinese power. By providing China with more oil and other natural resources, Russia believes it will be helping to promote a bipolar political order with the U.S. and China as the prominent players. China, meanwhile, views Russia as a distrustful partner "prone to rash action" that stands to threaten its position as a dominant power in the East.[14] Furthermore, these two nations have had disagreements about contracted rates for the oil delivered to China by the ESPO. This is largely a result of China seeking to pay less than the global market price, and Russia's attempt to accommodate opposing domestic companies in a system where corruption and patronage are widespread.

II. Iran

The Islamic Republic of Iran is the only nation within the Caspian region that is not a former member of the USSR. Furthermore, Iran is situated in the Middle East in a strategic location on the Persian Gulf and Strait of Hormuz, both vital maritime pathways for crude oil

transport (see **Figure 6**).[15] Iran's natural resources include petroleum and natural gas, as well as coal, chromium, copper, iron ore, lead, manganese, zinc, and sulfur.

Figure 6: The Islamic Republic of Iran. (http://www.dailymail.co.uk/news/article-2080760/Iran-delays-missile-testing-prepares-enter-talks-nuclear-programme.html).

Iran is the second most populous state in the Caspian region. It is a theocratic republic, of which 98 percent of the population is Muslim. Of that 98 percent, 89 percent are Shia as opposed to Sunni.[16] Iranian provinces along the Caspian coast include Gilan Province, Mazandaran Province and Golestan Province, which all lie south of the Caspian Sea (see **Figure 7**). Because of Iran's economic problems, due largely to the U.S.-initiated blockade and technological underdevelopment, Iran has not pursued a major economic role in the Caspian Sea region. Rather, Iran has pursued a policy of intransigence in regards to border disputes, choosing to build up naval forces along its shore and disputed sea border instead of building trans-Caspian oil and gas pipelines.[17]

Figure 7: Iranian provinces bordering the Caspian Sea. (Source: http://www.hoeckmann.de/karten/asien/iran/index-en.htm).

Iranian Relations with Littoral States

While Iran benefits from positive relations with Turkmenistan, Iranian relations with the other Caspian Sea littoral states are strained.[18] More significantly, Iran is the only nation within the Caspian Sea region demanding that the sea not be divided along the Modified Median-Line

(MML). Russia concluded agreements affirming the MML division with Kazakhastan and Azerbaijan in 2001, and Turkmenistan has been in the process of negotiations with the other littoral states concerning territorial disputes.[19] Iran has stated its preference to either hold the sea in common or for each of the five littoral states to control an equal 20 percent of it. Such equitable division is clearly preferable to Iran, as its coastline is much smaller than that of the other littoral states. Kazakhstan has been vehemently against this measure, however, as it holds the largest coastline and thus has the most to lose. Kazakhstan has tried to settle this dispute with Iran by promising energy pipelines through Iran and other trade incentives, but Iran has remained inflexible on the matter.[20]

Furthermore, the establishment of U.S. military bases in the Middle East and Central Asia following September 11, 2001, has provided challenges for Iran. Like Russia, Iran wishes to limit American and Western influences within Central Asia. Its government views action taken by the U.S. within the region, such as backing the BTC pipeline and maintaining a military presence within the region, as "efforts to make Central Asia part of an anti-Iranian bloc."[21] Additionally, while the U.S. has aimed to contain the expansion of energy pipelines through Russia, it is against any pipeline that would run through Iran instead of Russia; Iran is the only natural gas producing country that could potentially threaten Russia's leading position.[22] More recently, the U.S. has sought to minimize the flow of energy resources from Kazakhstan to Iran until Iran changes its foreign policy of nuclear armament.[23]

Although Russia and Iran have both been opposed to American influence within the region since the 1990s, they are not necessarily allies. Since 2005, Iran has been an observer state within the SCO. It has recently applied for membership in the hopes that its entry would guarantee Russian and Chinese commitment to Iranian security, but as yet remains a non-

member.[24] Furthermore, Russia and Iran's respective goals do not align. While Russia simply wishes to limit U.S. influence within the former Soviet bloc, Iran aims to restrict U.S. authority within the Middle East. Russia is in fact generally supportive of U.S. efforts to combat terrorism within the Middle East and does not wish to alienate the predominantly Sunni Arab world by aligning with Iran's Shiite Islamic Republic.[25]

Nevertheless, the two nations have cooperated on numerous matters. In the 1990s, Russia provided Iran with arms and assistance in building nuclear power.[26] In return, Iran effectively let Russia take control of the predominantly Muslim republics of the former USSR and expressed little criticism of the Chechen War. Furthermore, Russian policy concerning Iran's nuclear quest has been contradictory. Russia has essentially been paying lip service to the idea of preventing Iran from gaining nuclear weapons by voting in favor of the United Nations Security Council sanctions, while actively helping Iran to build its nuclear infrastructure.[27] Though Russia does not necessarily favor a nuclear-armed Iran, it does not see it as the biggest threat. As Russian President Medvedev stated in 2009, Iran's nuclear program is less disconcerting than North Korea "because, whereas Iran is communicating with international community, North Korea has now virtually cut all of its contacts."[28] By supporting Iran, Russia can profit by knowing exactly what Iran is doing and playing off of U.S. sentiments.

Recently Iran and Russia have partnered in their opposition to a trans-Caspian pipeline that would run west from Turkmenistan to Azerbaijan along the Caspian seabed. This pipeline is supported by the European Union (EU), which seeks to bring Caspian oil westward while reducing its energy dependence on Russia and avoiding a "politically problematic Iran."[29] Iran has claimed opposition to the project based on ecological and legal grounds, stating that the pipeline threatens the Caspian Sea's ecosystem and violates maritime law, as the boundaries

within the Caspian are still unclear. Russia strongly opposes the pipeline, as it would allow Central Asian gas to avoid Russia completely, reducing Russia's "political and commercial leverage."[30]

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Chapter Four

The European Union, Turkey, and China:
Spheres of Influence, Activities, Interests, and Options

Mara Isaacson

Summary

China, Turkey, and the European Union each have a vested interest in the Caspian region. The EU is interested in diversifying its sources of oil and natural gas, and the Caspian region offers a valuable alternative to Russia- and OPEC-controlled resources. The EU is pursuing diplomatic and economic avenues to gain access to the region, and to maintain stability within it. Turkey acts as a corridor between the Caspian region and the West. However, it does not always have a smooth relationship with either the EU or the U.S. Despite discord, it is in both American and Turkish interests to maintain strong political and economic. China has interests similar to the EU's, including a desire to gain access to resources and lessen their dependence on Russia and OPEC. China is investing heavily in infrastructure and politically in the Caspian region. It is in American interests to support China because of economic ties, but equally important to prevent China from gaining a monopoly over the region's resources.

The European Union:

I. Background

The EU's interests in the Caspian region are primarily based on its perceived need to diversify suppliers of oil and gas. On November 13, 2004, the European Commission (EC) called a meeting among representatives of EU member states, the governments of the Caspian littoral states, and neighboring countries including Turkey, Armenia, Georgia, Ukraine, and Uzbekistan. The meeting was hosted by Azerbaijan and had a single purpose: to enhance "energy co-operation between the EU, the Caspian Littoral States and their neighboring [transit] countries."[1]

Since that time, EU interest in such cooperation has only grown. The EC has stated their priorities with regards to energy security as follows:

> The EU imports over 60 percent of its gas and over 80 percent of its oil. It faces growing competition for fossil fuel resources, including from emerging countries such as China and India, and energy producers themselves. In this complex reality, the EU needs to take a strong, effective and equitable position on the international stage to secure the energy it needs."[2]

This is partially because the EU wishes to increase competition and lower prices, but also because it finds itself completely dependent on only a few suppliers. Because of this reliance on key importers, European states have faced the repeated shut-off of both oil and gas as result of disagreements between Russia and Ukraine over gas pricing.

The Caspian region is a key alternative source of oil and gas to Russia and OPEC. As of 2011, a majority of oil imports to the EU's 27 member states came from four countries: Russia (31 percent), Norway (12.4 percent), Libya (9.5 percent), and Saudi Arabia (6.7 percent).[3] Distribution, however, has not proven stable. During the Libyan revolution in 2011, Libya removed most of its crude exports from world markets. Norway's production, meanwhile, peaked in the late 1990s and early 2000s and is now in a fairly rapid decline. The next four largest sources of energy imports to the EU are Kazakhstan (6.7 percent), Nigeria (5.4 percent), Azerbaijan (4.4 percent), and Iran (4.4 percent). In late 2011, the EU agreed to suspend imports from Iran starting July 2012 in protest against its nuclear program. Nigeria, meanwhile, is in a state of turmoil, and its pipelines are subject to militant attacks. Given this uncertainty, Kazakhstan and Azerbaijan emerge as stable and reliable suppliers. With total oil exports from the Caspian forecast to double by the early 2020s,[4] Kazakhstan and Azerbaijan together could provide as much as a quarter of all Europe's petroleum by 2025.

From a European perspective, this would be a considerable improvement over present circumstances. The Caspian region offers potential sources of energy without the difficulties associated with importing from Russia and the Middle East. In the pursuit of this goal, EC President José Manuel Barroso recently went on a tour of the Caspian region. This tour focused primarily on Azerbaijan and Turkmenistan, as they are currently the greatest exporters to the EU, and forging alliances that would help supply energy to Europe.

II. Issues

In addition to the EU, Russia, China, and India seek to gain influence in this region. All will remain in competition for control of natural resources, including oil and gas. Various proposals for different pipeline routes have been proposed to transport hydrocarbon resources west, east, north, and southeast, each fought over as countries attempt to gain or maintain their control and access. Europe has had significant success with the BTC pipeline, which has been transporting as much as 1 million bbls/d from Baku through Georgia and Turkey to the Mediterranean. The EU is now engaged in constructing and planning the Nabucco pipeline, a natural gas route that would run from Baku through Turkey into Bulgaria and to Austria, a major gas hub. An extension of this route across the Caspian to Turkmenistan, with further connection to the giant Tengiz field in Kazakhstan, will be essential to break Russia's current near-monopoly on gas exports from the Caspian in the long term. Both Russia and Iran strongly oppose Nabucco because it would weaken their control and increase competition. However, based on the fact that the BTC route was constructed despite similar objections, it appears unlikely that Russia, despite its recent invasion in Georgia, will resort to military intervention to prevent Nabucco's construction.

Europe views the Caspian as central to its future energy plans. As such, it will continue to invest the time, money, and diplomatic resources necessary to ensure access to the region and its resources. As seen in the economic crisis of 2008, the EU and U.S. markets are integrally linked and reliant upon each other. The issues facing the EU should therefore be at the forefront when considering U.S. policy.

In addition, the U.S. will gain from EU investment in the Caspian region. Diversification in the oil and gas markets will weaken both OPEC's and Russia's dominance in the energy

market. This makes worries possible disruption transport or withholding of resources due to conflict less of an issue for the EU. U.S. imports of foreign oil dropped to 49.3 percent in 2011, under 50 percent for the first time since 1997.[5] However, according to the U.S. Energy Information Administration (EIA), the U.S. imported 11.8 Mbbls/d in 2010, the majority of which came from OPEC.[6] Reliance on this often-unstable region of the Middle East is not in U.S. interests. Therefore, it is necessary to support the pursuit of new sources of fossil fuels.

III. Options

At the forefront of options for U.S. policy in regards to the EU and the Caspian region is support for the EU's involvement and investment in the region, both politically and financially. Support for the development and construction of pipelines, such as the Nabucco pipeline, is one example of this. The research and development of oil and gas fields that will support and provide EU and U.S. markets will require economic support from both European and American governments, as well as their private sectors. This means creating agreements with the Caspian states as well as reinforcing commitment to and developing those that already exist.

The U.S. should work with Caspian governments in the interest of economic relations, giving less priority to democracy promotion in certain areas. Though democracy is a primary goal of U.S. foreign policy, stability in the region is paramount. Any conflict could likely lead to disruption of resource exportation. The U.S.'s primary goal in the region is the development and perpetuation of resource exportation to counter OPEC and Russian monopolistic power; if this export ceased, prices would be subject to their control. The stability maintained by leaders in Caspian states is therefore essential to U.S. interests.

Iran and Russia will continue to combat the development of oil and gas pipelines that undermine their own interests. Russia wants to continue in its role as an intermediary between

Caspian hydrocarbon resources and global consumers. Iran also seeks to gain and maintain control of the transportation of resources. The use of other intermediaries, such as Turkey, will be key to reducing the monopolies of Iran and Russia in export and in transport.

The U.S. should support the pipelines, both existing and proposed, that allow oil and gas to flow to the EU. Because the energy demand of China, India, and Pakistan, along with other developing counties, will continue to increase, oil and gas from all sources is in ever increasing demand. The development and maintenance of strong political ties between Caspian littoral states, with the current exception of Iran, is another goal to be pursued. The U.S. should take steps to ensure that the EU maintains relations with Caspian exporters and claims a share of Caspian fossil fuel exports. Finally, direct investment in the region in support of and accordance with EU policies—including trade, foreign aid, and American private sector involvement—will aid in the realization of all of these goals.

Turkey

I. Background

Turkey is in a unique position concerning energy resources from the Caspian region. A non-EU state, it acts as the corridor between Europe and the Caspian region, offering an alternative to Russia's previous transport monopoly. The BTC pipeline and proposed Nabucco route have made Turkey a major strategic state to Europe and the U.S.

Turkey has applied to the EU, but various issues stand in the way of its membership, including disputes over the control of Cyprus; the Armenian conflict; the jailing of journalists, writers, and dissidents; and the "Kurdish problem", i.e. the war between the Kurdish Workers' Party (PKK) and the Turkish state that has claimed over 30,000 lives since 1984 and has yet to be fully resolved.[7] Public and political opinion has shifted in recent years within Turkey, and

internationally, from support for Turkey's EU membership to anxiety and even resistance. This has led to the deterioration of international relationships with the EU and the U.S as Turkey reaches out to countries in Central Asia, Russia, and the Middle East. While still very strongly linked with the EU economically, Turkey no longer has a driving desire to present itself as a so-called "model EU state."[8] The U.S. has, however, consistently supported Turkey's bid to join the EU and petitioned on its behalf. The U.S. National Intelligence Council's 2010 report states:

> The question of Turkey's EU membership will be a test of Europe's outward focus between now and 2025. Increasing doubts about Turkey's chances are likely to slow its implementation of political and human rights reforms. Any outright rejection risks wider repercussions, reinforcing arguments in the Muslim world—including among Europe's Muslim minorities—about the incompatibility of the West and Islam.[9]

Both are members of North Atlantic Treaty Organization (NATO) and the Organization for Economic Cooperation and Development (OECD), and share strong economic and military ties.

Turkey has historically had close ties with the U.S., particularly against the Soviet Union. However, in the time since the fall of the Soviet Union, Turkey has been reaching out to the Middle East, the Caucuses, and the Caspian region, including Iran and Syra. Turkey faces possible threats from a Kurdish uprising, Iraqi violence, war in Iran, and potential uprisings in Lebanon. American trepidation concerning these relations is understandable, particularly those between Turkey and Iran. However, these diplomatic ties are not immediate cause for worry.[10]

One of the most important problems facing U.S and Turkish relations is the use of the term "genocide" by American policy makers in reference to the Armenian conflict. American policy makers' use of this term prompted the Turkish ambassador to be recalled from the U.S. in 2007. President Obama said in his official visit to Turkey in 2009 that he would refrain from referring to associated historical events as "genocide," but that such events needed to be acknowledged. While this issue has not been resolved, with renewed contact and a willingness to

discuss the issue, it is possible that progress may be made.[11]

The relationship between the U.S. and Turkey is made more difficult by respective relations with Iran. The U.S. and the EU have embargoes and sanctions against Iran, but Turkey, India, and China continue diplomatic relations and economic activity with Iran. The U.S. has refused to sell arms to Turkey indefinitely because of these relations.[12]

Yet the greatest risk is Turkey's desire to establish closer ties with Russia and Iran, both of which have much larger reserves than do Azerbaijan, Kazakhstan, or Turkmenistan. In addition, Turkey shows great interest in building nuclear power plants and has already signed agreements with the Russian firm Rosatom to begin construction of a four-reactor station at Akkuyu beginning in 2013.[13] Turkey's plans include the construction of 10 or more reactors by 2025. This would fuel economic growth and contribute to higher employment in rural areas. Furthermore, the establishment of nuclear power facilities could serve as a model for other states in the region.

II. Issues

Sustained oil flow through the BTC pipeline alone is enough to ensure that U.S. relations with Turkey continue. The stability and reliability of this pipeline is, and will continue to be, a great concern for U.S. policy. This pipeline is a valuable source of fuel over which neither Russia nor OPEC has any control.

However, Turkish foreign policy very often conflicts with that of the U.S. For example, Turkey's continued political and economic ties to Iran caused the U.S. to withhold arms sales. Turkish alliance with Iran leaves the U.S. to question its own ties to Turkey. Historical differences and difficulties such as the Armenian conflict, conflict between Israel and Turkey, disagreement on nuclear issues, and Turkey's refusal to support the U.S. in the Iraq war by

allowing U.S. invasion through the Turkish border, place the U.S. and Turkey on opposite sides of the diplomatic spectrum. The U.S. could be allied against Turkey if conflict were to break out involving Iran or Israel; however, U.S. military bases within Turkey complicate this possibility. Turkey is also the only Muslim country with which the U.S. has an alliance. Its strategic location gives the U.S. valuable access to the region and the U.S. must not give this up, even with the problems that must be faced.[14]

President Obama has made it clear that he intends to continue relations with Turkey. The U.S. must continue diplomatic relations to maintain its military advantage in the region in order to maintaining stability and energy access with the threat of possible violence or retaliation. The U.S. can also continue to display its displeasure over Turkish policy in regards to Iran in an attempt to steer Turkey toward a foreign policy more in line with the U.S.'s. Relations between Turkey and the U.S. must evolve to deal with Turkey's continued outreach out to countries unfriendly to the U.S., ethnic conflicts, etc.

III. Options

The most important factor for an improved and continued relationship between Turkey and the U.S. is communication. Both sides must consult one another on policy decisions. Washington should address the ethnic conflicts threatening Turkey, including PKK presence in Iraq. Turkey will respond favorably to the U.S. if it aids in the resolution or removal of the problem of Kurdish radicals and separatism. In Iraq, the U.S. should continue to fight against the Kirkuk referendum. Without it, the Iraqi Kurds will be unable to break away from Iraq, which will in turn reduce Kurdish unrest within Turkey. The second issue is that of an Armenian resolution. Dialogue between Turkey and Armenia is essential. The U.S. should foster talks to assist with the settlement of the Nagorno-Karabakh conflict and to aid overall reconciliation.[15]

The U.S. must accept Turkish relations with Russia and the Middle East. While much of Turkey's foreign policy does not line up with U.S. priorities, its relationship with countries like Iran play a key role in maintaining stability in the region. The U.S. can continue to foster relations among Israel, Turkey, and Palestine, but must also accept bilateral relations that conflict with U.S. policy between Turkey and countries such as Iran, Russia, Georgia, Ukraine, and Syria. The U.S. can then more fully take advantage of energy development and transport. The U.S. must be clear about its intentions regarding Iran and its expectations from Turkey in regards to relations, conflict, and energy. For example, the U.S. must assure Turkey that if there are military actions against Iran by Israel or the U.S., Turkey will not be asked to get involved.

It is in American interests to support Turkey's EU membership, and maintain positive American-Turkish relations through NATO and other international organizations. Supporting the Turkish economy—not necessarily by removing sanctions, but through continued economic interaction, particularly in energy—will be beneficial to both parties, and will increase American influence in Turkey. It is important to ensure that relations continue, and that they are clearly defined and controlled. If the U.S. were to abandon diplomacy with Turkey, it is likely that Turkey would ally with Iran, leaving the U.S. without the access to the energy-related and strategic advantages from which it currently benefits.

China

I. Background

Chinese interests in the Caspian region are focused primarily on oil and natural gas. China's rapid modernization and economic growth are deeply dependent on access to hydrocarbons. Securing access from diverse sources is one of Beijing's top foreign policy priorities. Moreover, the Chinese government sees its growing need for imports as a distinct

vulnerability and energy security as a primary concern. Given the complexity of energy relations between China and Russia, the former has developed a strong interest in Kazakhstan and Turkmenistan.[16] Kazakhstan in particular shares an extensive border with China and therefore offers the potential for easy transport of energy resources. Such access is now established in the form of the Kazakhstan-China oil pipeline, on which construction began in 1997 and reached completion in 2009. The Turkmenistan-China gas route, on the other hand, which threads its way across both Uzbekistan and Kazakhstan to westernmost China, was built in only three years (2007-2010) and has opened another major new supply route for the Chinese.[17]

In 2011, China consumed over 87 Mbbls/d, with this consumption projected to increase by over 40 percent in the next 15 to 20 years.[18] Domestic reserves cannot keep up with this increase in demand, and China must therefore continue to invest in foreign sources. Like Europe and the U.S., China is wary of over-reliance upon OPEC, especially the Persian Gulf, for its oil and gas. Caspian energy states, in contrast, appear to present fewer risks and potential complexities than relations with countries like Iran, Iraq, Oman, Libya, or Saudi Arabia.

Securing more oil and gas from Russia is another alternative for Beijing. Like the EU and U.S., however, China is reluctant to rely too heavily on Russia, just as Russia seeks to avoid too much dependence on China as an export destination. China and Russia have had problematic relations in the past and today view each other with a certain distrust or wariness. While Russia fears being eclipsed by China on the world stage, and is reluctant to feed China's rise to power through large-scale oil/gas exports, then Beijing tends to view Russia as a difficult, even unreliable partner, prone to rash actions (including military ones) and conflict with many states.[19]

China therefore views the Caspian as an essential alternative. Beijing has transported oil by train and truck to China from the Caspian, but with new pipeline routes in place, a much

faster and more secure supply has been established. Beijing is interested in more routes between China and the Caspian, especially a new gas pipeline to parallel the oil route from Kazakhstan. The ability of Chinese companies to negotiate agreements with a number of these states for the Turkmen-China gas pipeline is notable.[20]

While China may seem to get more out of this relationship—access to oil and gas—with the Caspian it is nevertheless a reciprocal relationship. China supplies 20 percent of Kazakhstan's electricity with hydropower, and Chinese investment in infrastructure, roads, and railways has contributed to Kazakhstan's program of economic development and modernization.[21] Such investment now also includes loans to the country's national welfare fund, development and sales of uranium supply, financing of petrochemical facilities, water quality and agricultural projects, a high-speed rail line between Astana and Almaty,[22] and a recent 1,300 km Atasu-Alashankou pipeline, which will transport millions of barrels of oil annually from Kazakhstan to the Xinjiang province. With projects such as these, China is establishing long-term relationships for access to Caspian resources, and is becoming less reliant on the Persian Gulf for energy.[23] This places China in direct competition with Russia, for whom Kazakhstan is a key "near abroad" nation. Notably, however, Astana does not desire a situation in which it becomes overly dependent on a China that considers it a mere province of natural resources. Thus, while they are ever increasingly linked in a reciprocal relationship, it is unlikely that China will gain further control over Kazakhstan.

China and Azerbaijan established diplomatic relations on April 2, 1992, and for the past 15 years have maintained a mutually profitable relationship. In 2006, their trade volume reached US$368 million. This included communication, agriculture, and infrastructural exchange.[24] Oil and gas are the primary exports of Azerbaijan, and are the foundation of this relationship. China

is interested in investing in and accessing the Azeri oil and natural gas reserves; however, Azerbaijan maintains a keen interest in diversifying its consumers, as its oil production is expected to peak within the next year.[25]

II. Issues

China will continue to consume oil, gas, coal, and metals in rapidly increasing quantities over the next decade and beyond. The Caspian region offers a key prospect for the diversification of sources, particularly of oil and gas, away from Russia and OPEC. Given that OPEC holds approximately 70 percent of remaining proven oil reserves, its dominance in global production and transportation sectors will only grow over time. Thus, the Caspian is vital for China's future. This urgency of this interest holds the potential to spur direct competition with Europe's demand for Caspian resources, and with Russia's attempts to maintain control over energy exports from its near abroad.

According to recent reports, the EU's official view is that China's strategy in the Caspian is "entirely legitimate." Because China is not yet a dominant presence in the region, the EU and China "can act independently and in their own best interests over the long-term."[26] Despite such statements, it remains unclear however, the extent to which China aims to achieve dominance over Caspian resources. Growth in future demand from Europe, particularly for natural gas, has been described by the IEA and other forecasting agencies as modest.[27] However, with the recent phase-out of nuclear power in some states in the wake of the Fukushima incident, as well as the uncertainty of achieving renewable energy targets, such forecasts could prove premature. Direct competition between the EU and China remains a possibility for the future.

Multilateralism in energy relations across the Caspian region will help to enhance energy security. China is not at present a signatory to the Energy Charter Treaty (ECT), which requires

multilateral and transparent relations in energy matters among former soviet states. To date, Beijing has courted mostly bilateral energy agreements in Central Asia. This creates a regional situation of greater competition as well as the possibility of conflict with other players.[28]

III. Options

Establishing a multilateral network of energy cooperation in Central Asia and the Caucasus, and making use of ECT mechanisms, will improve the short and long-term situation for the U.S. Improving environmental protection with agreements such as the Energy and Environment Cooperation Initiative, the Statement of Intent on Cleaner Air and Cleaner Energy Technology, and the International Energy Forum are perfect examples of this. Without diplomacy and agreement on energy policy, from nuclear power to carbon dioxide emissions, the possibility of an energy crisis is high. Cooperation will also ensure that both countries maintain their supplies of oil and gas. Sharing technology and working together to invest and to maintain stability, particularly in the Caspian, will benefit all parties.[29]

While maintaining an accord with China, the U.S. must also prevent China from gaining a monopoly over Caspian energy resources. This should be attained by investing in and supporting pipelines heading west to the EU from the Caspian. The U.S. should not necessarily fight the construction of pipelines going toward China, and can instead focus on energy diversification to ensure a measure of stability, equality, and competition. The U.S. should also initiate and maintain alliances with the Caspian states to ensure that the success of American projects and influence in the region. This will mean more control over the distribution and allocation of resources, particularly that of oil and gas, and thus more leverage to compete with China's influence in the region.

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Part II:

Energy Resources and Security

Chapter Five

Energy Security: Meeting Growing Demand In The Face of Competing Interests

Igor Cherny

Summary

With the reliability of current primary energy suppliers growing more uncertain due to popular revolts, unexpected cutoffs, and other issues, finding alternative, more consistent energy suppliers is becoming increasingly urgent for the world's biggest energy consumers. Given their substantial energy reserves, Azerbaijan, Turkmenistan, and Kazakhstan in the Caspian Sea region present the most viable options. Whether or not they realize this potential depends on the relative security of their energy systems.

I. Background

Worries over the supply of energy resources are rooted in several major factors: political instability in exporting nations; surging economic growth in China and the developing world; questions about resource abundance; and impacts from policies that address climate change. These factors have focused attention on oil and gas, particularly on sources of export. Russia and the OPEC together now control 55 percent of the global market for oil and over 60 percent of the gas imported to Europe and East Asia.[1] Uncertainties about the reliability of these exporters highlight the need for alternative suppliers.

For U.S. allies in Europe, and for China as well, the most important new source of oil and gas since the beginning of the 21st century has been the Caspian Sea region. Together, Azerbaijan, Kazakhstan, and Turkmenistan have enough reserves to possibly satisfy as much as 25 percent of Europe's hydrocarbon needs.[2] The general stability of these countries and their demonstrated interest in expanding their oil and gas sectors place them at the forefront of hopes for a more diverse and secure supply portfolio. For an importer like the U.S., energy security means reliability of supply, affordability, and sufficient production. Yet in the case of the Caspian states, it is necessary to examine energy security from the point of view of the exporter as well. For these countries, energy security requires five basic elements: substantial and verified

reserves in the ground; adequate and updated infrastructure for extracting and transporting those reserves; reliable demand for them; prices sufficient to generate a secure revenue stream; and, finally, market diversity.

Global Oil Outlook and the Caspian Region

Recent forecasts regarding oil demand over the next few decades, such as that in *World Energy Outlook 2011*, emphasize three main conclusions: first, that demand will grow about 12 million bbls/day (Mbbls/d), from 87 Mbbls/d in 2010 to about 99 Mbbls/d by 2035, with such growth concentrated in developing countries; second, that markets will remain fairly tight and prices will climb slowly but progressively from $100/bbl to perhaps and more $150/bbl; and, third and finally, that diversity of export sources for crude oil will decrease, with the global market becoming more dependent on OPEC, especially Persian Gulf producers.[3] Given continued instability in Iraq and reverberating impacts of the Arab Spring regionally, there is much reason for concern over the potential for a new period of unrest. The uncertainty is compounded by the continuing nuclear situation in Iran and the prospect of related Israeli military action.

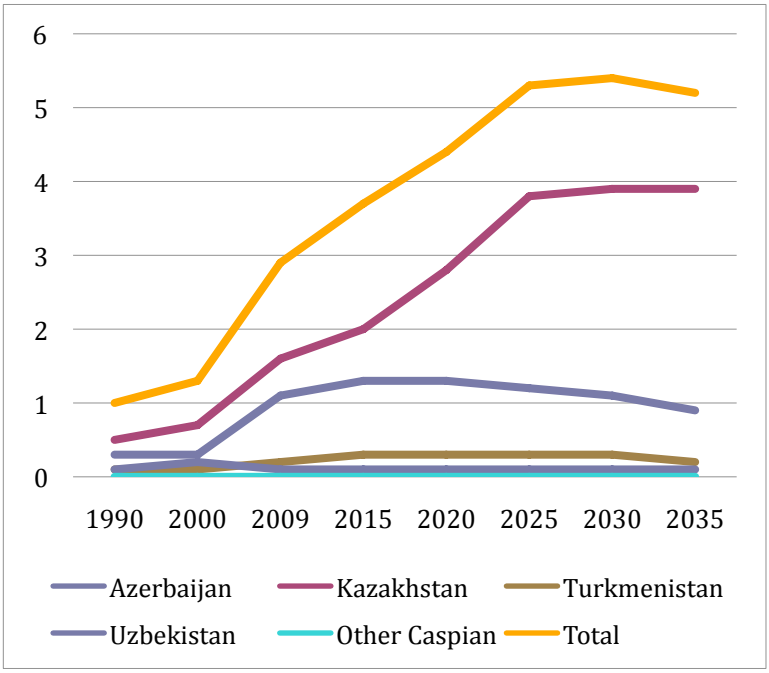

Figure 8: Oil production forecast (Mbbls/d). (Data: WEO 2010).

According to the 2010 World Energy Outlook, the Caspian Sea region has proven reserves of 48 Bbbls of oil and 13.2 Tcm of gas.However, remaining recoverable resources are estimated to be much larger than this—108.6 Bbbls and 38.2 Tcm, respectively. At rougly 3 Mbbls/d, current production in the region is not relatively large in global terms. Yet by the mid-2020s, this is predicted to rise by another 2.4-2.5 Mbbld/d, equal to 21 percent of the total projected increase in global oil demand by 2035 (see **Figure 8**). Given that domestic consumption will likely remain low (<0.5 Mbbls/d oil and 200 Bcm gas) and that recoverable resources are so large, supply might reach even higher levels. Thus, this region could a key source for global oil security in the future.

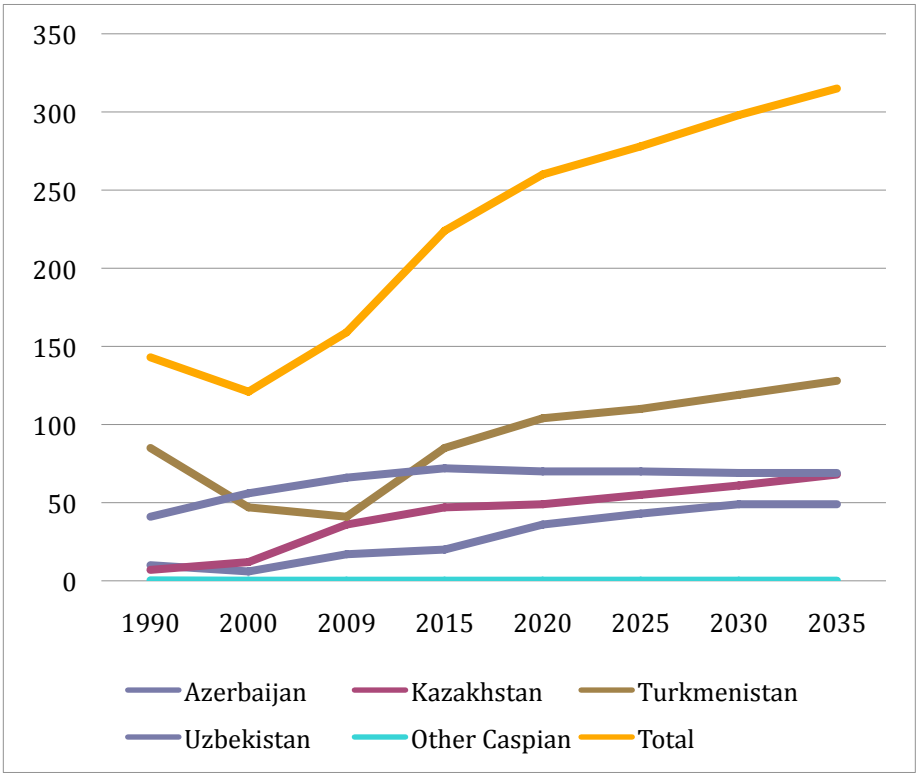

Figure 9: Natural gas production forecast (Bcm). (Data: WEO 2010).

Natural gas forecasts yield a similar but somewhat more complicated interpretation, given that gas is still traded mainly on a regional basis. In its special report on Caspian energy, the 2010 *World Energy Outlook* projects demand in Europe rising 73 Bcm between 2008 and 2035, with much larger increases in China (310 Bcm) and India (135 Bcm). Growth in export capacity

for the Caspian region, meanwhile, is forecast to be 140 Bcm by 2035, dominated by Turkmenistan (see **Figure 9**).[4] These numbers, in addition to the possibility for higher levels of production based on newly revised figures for Turkmenistan, suggest that the Caspian could satisfy a considerable portion of Europe's future demand while simultaneously exporting large amounts of gas eastward. Were China—or China and Russia—to gain control over such exports, this would considerably weaken Europe's position and would also reduce energy security for the Caspian states themselves via low market diversity. An important question thus concerns energy production and transport infrastructure, especially pipeline routes.

Azerbaijan

Production Capacity

Azerbaijan's crude oil reserves have remained at 7 billion barrels since 2003 (see **Figure 10**). Yet its ultimately recoverable resources are more than four times this number. Azerbaijan currently produces over 1 Mbbl/d, accounting for 35 percent of the region's total. Its average annual growth rate in oil production of 13.2 percent in the past 5 years is by far the highest in the Caspian region, primarily due to its successful encouragement of foreign investment. Between 2008 and 2010, the growth rate fell from 15.5 to 12.8 percent due to the need to repair a gas leak at the Azeri-Chirag-Guneshli (ACG) field,

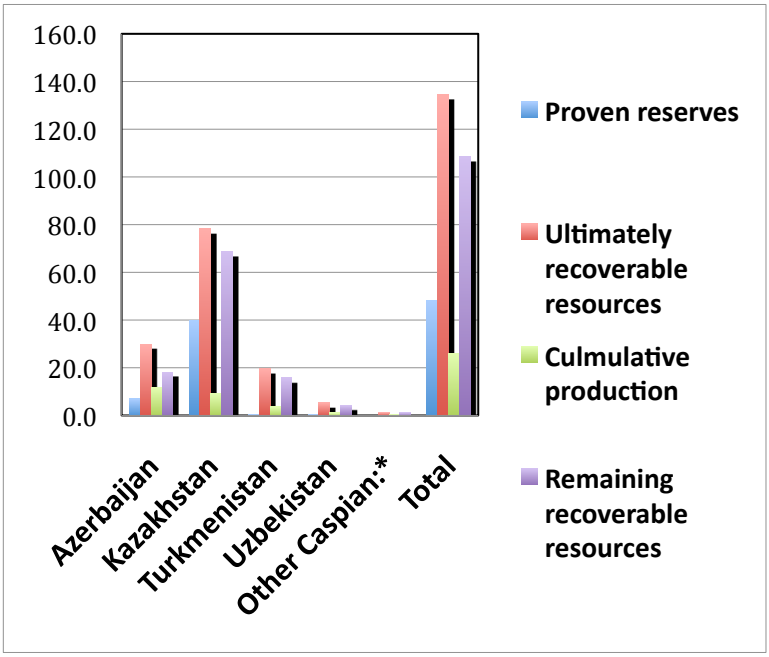

Figure 10: Proven and ultimately recoverable reserves of oil (Bbbls). (Data: WEO 2010).

responsible for nearly 80 percent of Azerbaijan's output.[5] This field is projected to reach a plateau in production between 2013 and 2015. Most of ACG is using gas- and water-injection. The plateau in production here is expected to cause a flattening in the country's total oil output, forecast to decline slowly from 1.2-1.3 Mbbls/d through 2022 to 0.9 Mbbls/d by 2035.[6] This projection does not take into account the possibility for increased recovery from a sizeable number of older onshore and offshore fields. Enhanced oil recovery, using updated techniques in older fields where recoveries are 30 percent or less, could potentially raise production levels.

Azerbaijan's position in the Caspian will become even more salient (particularly for Europe) as it increases its production and export of natural gas. Azerbaijan became a net gas exporter with the opening of the Shah Deniz field in 2007. As of January 2011, the country had roughly 1.4 Tcm (49.4 Bcf) of natural gas reserves according to IEA estimates, with over 4 Tcm (141 Tcf) potentially recoverable (see **Figure 11**). Shah Deniz and the ACG complex account for the vast majority of these reserves. Of the 589 Bcf it produced in 2010, Azerbaijan exported about 40.5 percent. The country's gas production is expected to increase in the future with continued development of Shah Deniz, led by BP, the project's technical operator.[7]

Infrastructure

With help from American and British companies, Azerbaijan has developed an extensive network of oil and gas development infrastructure in addition to pipelines and roadways for related services. All pipelines oriented westward have avoided passing though Armenia, with which Azerbaijan remains technically at war, and the western part of the country, which remains either occupied by Armenia troops or within the contested Ngorno-Karabakh territory.

Azerbaijan has 3 major oil export pipelines: the BTC, the Baku-Novorossiysk pipeline, and the Baku-Supsa Pipeline. The BTC pipeline, with a capacity of 1 Mbbls/day, now carries the

majority of Azerbaijan's oil exports, running from Baku on the Caspian Sea, through Georgia, to the Mediterranean port of Ceyhan, Turkey, where oil is loaded on to tankers bound for Europe.[8] The BTC was not only the first pipeline in the region to be directly funded and operated by Western countries,[9] but was also the first to break Russia's monopoly on oil exports out of the region; thus, the Kremlin strongly opposed its construction. The Baku-Novorossiysk pipeline (100,000 bbls/d) runs 830 miles from the Sangachal Terminal to the Black Sea at Novorossiysk, Russia. Operation is divided between State Oil Company of Azerbaijan Republic (SOCAR), which controls the Azeri section, and Transneft, which operates the Russian section. This arrangement has led to continued disputes between the two parties over transportation tariffs. Despite this, there are proposals to increase capacity up to 200,000 bbl/d, as output from the ACG oil fields increases. Finally, the Baku-Supsa pipeline (145,000 bbls/d) runs 520 miles from Baku to the Black Sea port of Supsa, Georgia. The pipeline was briefly shut-in during the Russo-Georgian War of 2008, when the Russian Black Sea fleet blockaded the port of Supsa. To date, the problems related to expanding infrastructure in Azerbaijan have mainly stemmed from Russia.[10]

Regarding natural gas, infrastructure is similarly well developed, but also relatively uncertain. The Baku-Tbilisi-Erzurum gas pipeline (BTE), also known as the South Caucuses or Shah Deniz pipeline, provides the primary conduit for exporting Azeri natural gas at present. BTE has a capacity of 9.9 Tcf/year, and parallels the BTC pipeline until it connects to the Central Turkish gas pipeline. Tensions between Azerbaijan and Armenia led to the building of the Baku-Astara pipeline in 2006. This pipeline enables Azerbaijan to ship gas into the geographically isolated Nakhchivan exclave through Iran. Iran charges a 15 percent commission on transit fees for transporting the gas to Nakhchivan via a separate 30-mile pipeline.[11]

In an effort to diversify its markets, Azerbaijan has been involved in plans with at least six other countries to develop the Nabucco pipeline. If built, Nabucco will send gas from Shah Deniz field through Turkey to Bulgaria and ultimately to the rest of Europe. Nabucco has been the focus of deliberations since planning first began in 2002, as it would substantially improve Europe's gas security by reducing dependence on Russia. There is, however, great uncertainty related to Nabucco's completion. Though the four European countries through which Nabucco would pass (Austria, Bulgaria, Hungary, and Romania) signed an agreement with Turkey on July 13, 2009, thereby clearing the way for construction, the project's viability is still in question, given, among other things, that there are official suppliers have committed yet. While the U.S. supports Nabucco, Russia, Iran, and China all oppose it. Without supply from Turkmenistan, Nabucco would not transport enough gas to be economical; such added supply, however, requires the TCGP from Turkmenbashi to Baku be built, which adds additional uncertainty. A smaller capacity pipeline might make sense, but would have reduced impact for Europe.

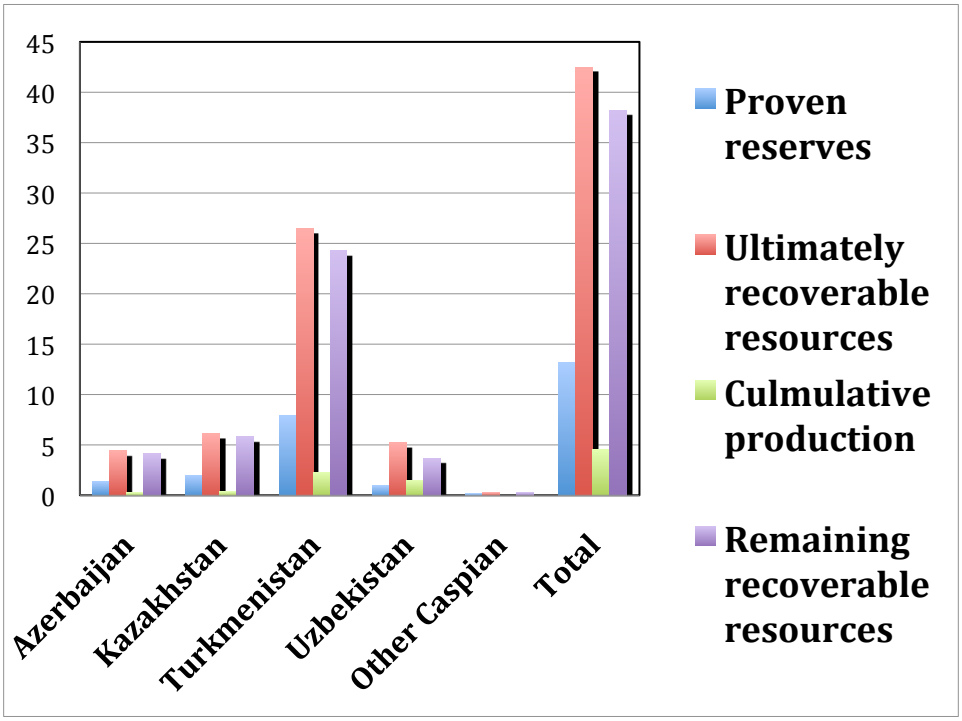

Figure 11: Proven and ultimately recoverable reserves of gas (Tcm). (Data: WEO 2010).

For the time being, the BTC and BTE pipelines provide the most strategic value by enabling Azerbaijan's oil and gas exports to bypass Russia and Iran. This affords Azerbaijan a level of energy independence, as well as stability in its transport networks.

Policies

Azerbaijan has provided a favorable environment for FDI. In 1994, then-president Heydar Aliyev signed what became known as the "Contract of the Century." This production sharing agreement (PSA) was signed with a consortium of eleven oil companies—led by the SOCAR with a 20 percent stake, and BP with 17 percent—which committed BP and partners to a $7.4 billion investment over 30 years in developing the supergiant Azeri, Chirag, and Guneshli field complex.[12] This PSA marked the first time Western multinational oil companies invested in any country of the former Soviet Union. It also led to the establishment of the AIOC, which, in addition to SOCAR, now includes BP (U.K.), Chevron (U.S.), Devon Energy (U.S.), Amerada Hess (U.S.), Inpex (Japan), Itochu (Japan), Statoil (Norway), Turkiye Petrolleri (Turkey), and ExxonMobil (U.S.). AIOC produces roughly 80 percent of Azerbaijan's total output.[13]

FDI has provided a vital lifeline to the oil industry in Azerbaijan. Like many post-Soviet republics that struggled to transition to a market economy, Azerbaijan encountered difficulty mobilizing sufficient resources to pursue infrastructure and natural resource development. By fostering a welcoming investment climate, the country has been able to increase its production capacity many times over. Such openness to outside participation bodes well for future development in the oil/gas sector and for Azerbaijan's reliability as a continued exporter in the decades ahead. For Europe and U.S. interests, the Nabucco and TCGP pipelines would enhance such reliability. These would not only benefit Azerbaijan's economy, but would give Azerbaijan greater leverage in international energy politics.

Risks

Azerbaijan is struggling to resolve an ongoing maritime boundary dispute with Iran. The dispute came to light in July 2001, when Azeri research ships briefly intersected with an Iranian gunboat in a disputed oil field in the Caspian (Farrar-Wellman 2010). Despite multiple attempts at a resolution since then, the issue remains outstanding.

Azerbaijan's endeavor to diversify its market base in gas is threatened by the uncertainty surrounding Nabucco, which faces both economic and political challenges. The most endemic challenge comes from Russia, which desires to preserve Europe's dependence on its gas supply. Currently, Europe acquires over 40 percent of its natural gas from Russia.[14] To counter Nabucco directly, Russia has proposed its own South Stream pipeline under the Black Sea to Turkey and then Europe. Not all analysts agree that this would negate Nabucco's value.

Turkmenistan

Production Capacity

At only 600 million barrels (Mbbls) as of January 2012, Turkmenistan's proven crude oil reserves represent less than 10 percent of Azerbaijan's and only 2 percent of Kazakhstan's reserves. Crude oil production levels are similarly much lower, accounting for less than 7 percent of the region's total as of 2010. Nevertheless, production has steadily increased from roughly 177 thousand bbls/d in 2006 to 202 thousand in 2010 (with half being consumed domestically)—a 3.4 percent average annual growth rate.[15] The Turkmen government has stated a goal of reaching 2 Mbbl by 2030, but this is extremely unlikely given the country's reserves picture.[16]

What Turkmenistan lacks in crude oil, however, it makes up for in its natural gas reserves and production. As of January 2012, Turkmenistan's natural gas reserves stood in the neighborhood of 850-950 Tcf, due to recent re-evaluations of the supergiant South Yolotan field,

the second largest gas accumulation in the world. Production, however, is more limited, due to lack of FDI until very recently. Yearly production rose moderately from 1.7 Bcf to 2.5 Bcf between 2000 and 2008, falling to 1.6 Bcf in 2009 following an explosion on the main Central Asia-Center (CAC) pipeline and a substantial decrease in demand from Russia. Turkmenistan's government is eager to expand production to much higher levels, with a goal of achieving over 8.1 Tcf by 2030. This will require substantial capital and technological investment, due in part to South Yolotan's high temperature and pressure reservoirs and high H_2S gas content.[17]

Infrastructure

Infrastructure, including field development, is the limiting factor for Turkmenistan's hydrocarbon future. At present, the CAC transports nearly all of Turkmenistan's natural gas to Russia, which remains the country's major export market. Gazprom, Russia's state-owned oil company, controls the set of pipelines that make up the CAC. Though the CAC is supposed to have a capacity of 3.5 Tcf/y, actual capacity is about half of this due to poor technical conditions, particularly in the western branch.[18]

In an effort to expand and diversify its export markets, Turkmenistan has recently sought partnerships with companies from China and Iran, and pipelines leading to these countries have recently begun operations. The Korpezhe-Kurt Kui and the Dauletabad-Khangiran routes have connected Turkmenistan's natural gas to the Iranian market. The 120-mile Korpezhe-Kurt Kui pipeline, sending 212 Bcf/y across the border to Iran, was built in 1997 as the first Central Asian natural gas pipeline to bypass Russia, representing a significant step for Turkmenistan towards increasing its own energy security. More recently, the Dauletabad-Khangiran pipeline came online in January 2010, and is expected to raise capacity to 424 Bcf/y.[19]

In December 2009, the Central Asia-China pipeline linking Turkmen natural gas to the Chinese market via Uzbekistan became operational. The 1,140-mile pipeline was constructed by the Sino-Turkmenistan Gas Pipe Corporation, a subsidiary of the China National Petroleum Corporation (CNPC). CNPC expects the pipeline's capacity to rise to 2,100 Bcf/y by 2015.[20]

Beyond existing pipelines, Turkmenistan is currently in the planning and early building stages for several other routes. Among these, the TCGP offers perhaps the most strategic opportunity in offering the prospect of establishing Europe as a new market. The subsea TCGP would have an estimated capacity of 1.1 Tcf/y, and would connect to the BTE pipeline, and potentially Nabucco.[21] The TCGP viability remains dubious, however, due to Turkmenistan's strained relations with Azerbaijan over maritime boundary issues. The dispute came to the surface in 2009 when Azerbaijan attempted to develop disputed fields in the Caspian, leading Turkmenistan to protest. The maritime boundary dispute remains unresolved.[22]

Turkmenistan is in the planning stages for two other routes. The East-West pipeline, a domestic route to run from the southeastern gas fields to the coast of the Caspian Sea, will offer new export links to Russia. Via the TCGP, links Europe would be possible as well.[23] The pipeline is expected to become operational by 2015, with a capacity of 1.06 Tcf/y. Another strategic pipeline is the Turkmenistan-Afghanistan-Pakistan-India pipeline (TAPI) (also called the Trans-Afghan pipeline), which would provide an alternative route for exporting gas to Asia through Afghanistan. The prospects for the TAPI pipeline in the short-term are slim, however, as long as the security and stability situation in Afghanistan remains unresolved.

Policies

Turkmenistan has been far less open to foreign investment than its neighbors in the Caspian region have been, and this policy has directly impeded its export potential. With the

installment of a new government in 2006 under President Berdymukhammedov, the country appears to have changed course and is more open to FDI. After 15 years of isolation, it began this process in 2007 by renewing diplomatic relations with China, Russia, Europe, the U.S., and other Central Asian countries. This has paid off: between 2009 and 2011, the China Development Bank provided it with $8.1 billion in loans to develop its South Yolotan gas field. In addition, CNPC has been working since 2009 to develop Turkmenistan's onshore gas reserves at Bagtyiarlyk under a 35-year PSA, which feeds gas into the Central Asia China pipeline at a capacity of 192 Bcf/y. Foreign companies are now involved in developing Turkmenistan's offshore oil and gas reserves as well. Petronas (Malaysia) and Dragon Oil (UAE) have controlling stakes in the Divarbekir and Celeken oil fields. Petronas further signed a gas purchase agreement with Turkmengaz in July 2011 to build a 360 Bcf/y-capacity gas processing plant on the Caspian coast.[24]

Risks

Lack of diversification in its export markets and an insufficient energy infrastructure limit Turkmenistan's energy security. To meet these challenges Turkmenistan needs capital, technical assistance, and political support for alternative pipelines. Currently, the country is mainly dependent on exporting its oil and natural gas to Iran and Russia, though China is emerging as a viable market. The TCGP offers the greatest prospect for further expanding exports to the West. However, as discussed above, Turkmenistan is struggling to resolve a series of maritime boundary disputes with Azerbaijan, which are inhibiting development on the TCGP and other infrastructure projects.

Kazakhstan

Production Capacity

At 30 Bbbls proven reserves, with nearly 70 Bbbls remaining to be potentially ultimately recovered, Kazakhstan is a significant oil player in the region.[25] Half of its proven reserves are concentrated primarily in the five main onshore oil fields in the western part of the country (i.e. Tengiz, Karachaganak, Aktobe, Mangistau, and Uzen), with the other half coming from the offshore Kashagan and Kurmangazy oil fields in Kazakhstan's portion of the Caspian Sea. Current production is 1.6 Mbbls/d, more than double the rate a decade ago. Moreover, industry sources expect production to double again by 2019 through continued development of the Tengiz, Karachaganak, and supergiant Kashagan fields. Indeed, it is largely development of these fields that will determine future production growth. The country has relatively diverse export markets that include Russia, Azerbaijan, Turkey, Georgia, and China.[26]

Through continued development of its the natural gas sector, Kazakhstan became a net exporter in 2009. It has proven reserves of 2 Tcm (71 Tcf) and exports 374 Bcf/d, the largest in the region after Turkmenistan. Its remaining ultimately recoverable gas resource is 6.8 Tcm (204 Tcf), suggesting it could be a major regional supplier for some time to come.[27]

Infrastructure

Though Kazakhstan's oil/gas infrastructure is relatively well developed, it is nevertheless insufficient to allow full exploitation of the country's energy resources. The inefficiency of Kazakhstan's pipelines, some of which date from the Soviet era, as well as the inadequacy of the infrastructure linking the western producing region with the eastern industrial region, are part of the reason that natural gas development has trailed the development of the crude oil system.

Compounding the infrastructure problems are the geology and climate of Kazakhstan's oil and natural gas fields. The gas in the Kashagan field, for instance, is highly pressurized, the oil contains large amounts of sulfur, and the offshore rigs require additional buffers to withstand winter ice and storms. These factors add to the time and cost required to complete any project.

Policies

Since the end of the Soviet era, Kazakhstan has sought to open its economy to international trade and FDI. In the 2000s, China has emerged as a primary investor, both in Kazakhstan's oil/gas and mining sectors. As part of China's strategy in Central Asia, it has specifically assisted Kazakhstan with investments in infrastructure and loans to help stabilize the financial institutions. The Export Import Bank of China has over 20 major infrastructure projects in Kazakhstan, worth a total of US$7 billion.[28] Kazakhstan has sought other neighbors in the region for support. In 2007, it signed an agreement with Russia and Turkmenistan to renovate the CAC pipeline, and in 2010 entered into a Customs Union with Russia and Belarus, effectively lowering transport tariffs and other trade barriers on energy products.[29]

Created in 2002, the national company KazMunaiGas (KMG) plays an active role in oil and natural gas production and export, and is the second largest oil producer in Kazakhstan after the Chevron-led Tengizchevroil consortium (TCO), where KMG has a 20 percent stake. More recently, however, the government reserves for KMG a majority stake in all new projects. KMG has entered into joint ventures and consortiums with numerous firms. The TCO venture, for instance, established in 1993, includes U.S.-based Chevron (50 percent stake), U.S.-based ExxonMobil (25 percent), KMG (20 percent), and Russia's Lukoil (5 percent).[30]

The Kazakh government has ambitious goals for future production increases. In a 2010 interview, Prime Minister Karim Massimov expressed hopes of raising oil exports to 3 Mbbls/d

by 2020. Industry experts from *EurasiaReview* suggest, however, that such goals will require greater development of Kazakhstan's infrastructure. In recent years, the Kazakh government has further passed laws that have given it greater authority to revise, or even break, contracts retrospectively if they are deemed to pose too great a threat to the country's security. Nonetheless, the investment climate appears healthy at present.

Risks

Two main risks currently confront Kazakhstan's potential as a long-term reliable supplier. One of these risks concerns political and labor stability oil producing areas. Recent worker strikes and police suppression imply unsolved problems. The government appears willing to attempt to address related grievances (e.g. raising worker salaries), but the true scale of the problem remains unknown. A second risk concerns increasing resource nationalism. The new laws demanding majority share for KMG in all projects and allowing it to revise or break agreements, though they have had little impact thus far, could set the stage for problems in the future.

II. Issues

Europe's Interests

Europe desires to become a major market for Caspian oil and, especially, natural gas. This means reducing its dependence on Russia. Russia will strongly resist this move, as Europe is its largest gas export market. A wild card in this mix is the possibility of Europe developing a new domestic source in shale gas in Poland, France, and some other states. This potential remains unproven at this writing. If development were successful, it could significantly reduce Europe's demand for imports, both from Russia and from the Caspian region.

Nagorno-Karabakh

Though geographically distant from any major oil/gas field or pipeline, Nagorno-Karabakh still poses a potential threat to the stability and, thus, energy security, of the region. Azerbaijan's dispute with Armenia over the territory—now in its 24th year—shows few signs of resolution. Negotiations appear at a standstill in this so-called "frozen" conflict. Moreover, Azerbaijan is investing US$3 billion a year of its energy revenues into its military, a troubling sign of a possible intent to recapture the region from Armenia by force.[31] Given the network of alliances affected by this dispute—including Russia, Iran, Turkey, and Georgia—a new episode of open warfare could create a prolonged period of regional and major power conflict.

Energy Charter Treaty

The ECT emphasizes the need for a more multilateral approach to strengthening energy security in the Caspian region. Since being signed in December 1994, the ECT has grown to include signatories from 52 countries in Europe, Asia, and the Caucasus.[32] It has proven to be a valuable, though occasional, tool in promoting freer trade and transit in energy supplies, as well as the protection of foreign investment and more effective dispute settlement processes. One goal of the ECT is to move beyond bilateral arrangements in energy, which tend to dominate the region at present. The limits of the ECT's influence, however, are suggested by Kazakhstan's recent moves toward greater resource nationalism.

Russia's Interests

In order to preserve its influence in the region, Russia appears interested in maintaining political instability in the Caspian, while minimizing Azerbaijan's, Turkmenistan's, and Kazakhstan's access to external markets. Further, Russia has fueled the Nagorno-Karabakh conflict by supplying Armenia with weapons. It is also firmly opposed to the Nabucco pipeline,

which would benefit Azerbaijan and Turkmenistan but reduce its own influence. Energy security for the other Caspian states thus appears in conflict with Russian policy.

Iran's Interests

Like Russia, Iran is set on maintaining its influence in the region in the face of Western investment. Though willing to contribute gas to the Nabucco pipeline, Iran faces strong objection from the United States and the European Union. Given the lack of suppliers available to feed Nabucco at the moment, it is worth contemplating whether Europe's interest in breaking its dependence on Russia's natural gas outweighs their political objections to Iran.

China's Interests

China's seemingly insatiable demand for energy, and its high rate of economic growth, will increase the strategic importance of the Caspian region. It has increasingly turned to the region—Turkmenistan and Kazkhstan in particular—in its endeavor to increase its access to energy reserves.[33] Chinese demand for Caspian oil and gas will continue to grow. A major question is therefore whether the region has sufficient recoverable resources, and whether it can develop the needed infrastructure, to satisfy China as well as Europe.

III. Options

It is in the United States' interest to pursue a strategy that promotes energy security both for states in the Caspian Region and, at the same time, for its allies in Europe. This means providing support for projects and policies that enhance diversity of export markets and the building of infrastructure to permit this. This has involved promotion on behalf of western energy companies, including U.S.-based multinationals such as ChevronTexas and ExxonMobile. While these companies dominated in the early phases of oil and gas development in the region, they now have significant competition from Chinese firms, particularly in

Kazakhstan and Turkmenistan. These latter companies do not have nearly the same level of knowledge, experience, and technological sophistication as do Western firms, a point that the U.S. should emphasize in its dealings with regional powers.

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Chapter Six

Nuclear and Renewable Energy

Dean Yonev

Summary

Conflicts may arise as a result of the furthering of nuclear technologies in the Caspian region. This paper discusses not only the nuclear energy potential of the Caspian littoral states, but also their potential for, and interest in, renewable energy sources. The USSR left a nuclear imprint on Azerbaijan, Turkmenistan, and Kazakhstan, and Iran is working towards gaining the capacity for nuclear energy production. American policy makers must consider the nuclear power capabilities and interests of the Caspian littoral states, as well as consider avenues by which that power can be safely used and distributed.

I. Background

Nuclear power is a viable economic opportunity for the countries surrounding the Caspian Sea for a number of reasons. First, there is a distinct need in the region to improve the supply and distribution of electricity, both within each nation and possibly in cross-border cooperation and trade. Second, Kazakhstan possesses abundant local sources of uranium ore, a well-developed uranium-mining sector, and fuel fabrication facilities. Third, nuclear power could both reduce carbon emissions and reduce the use of natural gas, which could then be sold for export instead. Finally, nuclear power provides dual-use technology for power and clean water generation through desalination. This is important for the Caspian littoral states, as demand for clean water and electricity is expected to undergo a steep increase in the coming years.

Overview of Kazakhstan's Alternative Energy (Nuclear and Non-Nuclear) Supply

At present, Kazakhstan has 18.7 Gigawatts (GW) of installed power generation capacity, nearly 80 percent of which is coal-fired and supplied by local mines.[1] Much of this capacity, however, is unusable due to degraded and obsolete Soviet-era plant equipment. The balance of the country's power generation is provided by hydropower. The government recognizes that this situation is incompatible with rapid economic growth. Its goal is to develop alternative energy

sources through foreign investment. This includes a plan to construct a new nuclear power station by the year 2020, as well as to examine the feasibility of renewable sources.

Kazakhstan has been a source of uranium for over 50 years. In 2009 it became the world's largest producer, and by 2011, it accounted for no less than 35 percent of global extraction. Twelve of its 17 operating mines are joint ventures with foreign companies, mainly from Russia, Japan, China, and South Korea. From 1971 to 1999, the country had a single nuclear power reactor for electricity and desalination. This station, located at Aktau on the Caspian Sea, was a sodium-cooled, fast breeder reactor that supplied power and water to the city. The first new nuclear plant currently planned, possibly using a small or medium-sized reactor of innovative design, has been contracted for with Russian companies near this same location. Further agreements have been signed with several Japanese companies to build at least one other power station, possibly to be sited at Lake Balkhash. Interestingly, Kazakhstan's National Nuclear Centre (NNC) has made a proposal to have as many as 20 reactors at 50-100 Megawatts (MWt) each to provide electricity to selected areas across the country.[2]

Kazakhstan's Energy Policy

Kazakhstan's overall energy policy has recently shifted from more deregulated and open markets to increasing government control. For example, the 2004 Law on Electrical Energy allowed for a fully competitive electricity market but, due to rapid price increases, was replaced in 2009 by a new Law on Electricity that includes price regulation.[3] The 2004 law was passed to address Kazakhstan's increasing power demands, and, at the same time, the inefficiencies in its present system. The government anticipates a switch back to a more competitive market after 2015. This is likely to positively impact the growth of the nuclear energy sector in the country, because there will be fewer restrictions. It also indicates that the country is interested in

encouraging more outside participation in this sector beyond Russian companies alone. One of the primary goals of domestic energy policy is to improve the network and transmission of electricity from one region of Kazakhstan to another. Presently, the country has no unified national grid; its northern areas are linked with Russia's own power network, while the southern areas link with Uzbekistan and Kyrgyzstan. With the new 2009 law now in force, energy companies, regardless of whether they are regional or not, as long as they are under the jurisdiction of Kazakhstan, must sell and purchase a certain portion of their output and demand at the electricity exchange.

Another policy that could significantly affect the growth of non-fossil energy technology in Kazakhstan is the first renewable energy law passed in June of 2009.[4] The policy's objective is that by 2024, at least 5 percent of the country's energy balance will be from renewable sources. It remains unclear, however, how much of this will come from large hydroelectric plants rather from technologies such as wind and solar power.

Kazakhstan's Major Sources of Renewable Energy

Although coal currently remains the primary source of electricity in Kazakhstan, the country has a strong interest in exploiting its potential for clean and renewable energy sources. Kazakhstan's major sources of clean and renewable energy are wind, geothermal, solar, biomass and hydroelectric energies. Development of these sources would both reduce carbon emissions and pollution and also conserve gas reserves for export.

Kazakhstan has enormous potential to be a major supplier of wind energy, with its large areas of open steppe and extensive coastline along the Caspian Sea. Different factors, such as existing energy transmission lines and almost perfect weather, favor the major installations of wind power stations. As of late 2011, there were encouraging signs that the country's large wind

resources might begin to be harnessed. A renewable energy consortium known as Central Asia Green Power is planning a $1 billion investment in two large wind farms, to be located in the southern, energy deficient part of Kazakhstan.[5]

Three-to-four percent of Kazakhstan's total landmass (approximately 10-11 million hectares) is covered with forests. Major sources of biomass waste include timber wastes from felling areas and wood from wood factories. The country is a major producer of wheat (15 million hectares) and, to a lesser degree, barley (3 million hectares). Straw from these grain crops is also often used locally as a significant source of renewable energy. Such use could be considerably expanded in the future with appropriate technology and incentives.

There are approximately 2,200-3000 hours of sunlight in Kazakhstan per year, concentrated in the southern, semi-arid portion of the country. The solar energy potential for this country is considered large by experts because of the amount of vast, open, flat, uninhabited or lightly inhabited land. However, despite the advantages of territorial space and number of hours of sunlight, there is still little use of this renewable resource.

Azerbaijan

Azerbaijan also has significant oil and gas deposits that will eventually deplete, and as a result, it is likely to consider nuclear power as a future alternative. Like Kazakhstan, Azerbaijan has a complicated electrical transmission system which was built mainly during the Soviet era. More than a third of the country's power stations are over 30 years old. Many of these power stations are in the western part of the country, while demand is centered in the east, particularly in the capitol city of Baku, and this disparity creates inefficiencies. Some parts of the country outside Baku receive only intermittent power. The government is in the process of upgrading this system and bringing on new sources of power, as electricity demand is forecast to rise

rapidly, by at least 4.7 percent by 2015. Natural gas appears the dominant choice; however, there is considerable interest in nuclear power for the future, and at least one pilot renewable energy project, combining wind and solar power, is now being tested.

According to several sources, nuclear facilities have never been built in Azerbaijan, though a sizeable quantity of low-level nuclear waste from Soviet military work remains stored at the Izotop Industrial Complex 30 km from Baku,[6] and small amounts are scattered around the country. A project to build a 1 GW nuclear station was begun by the Soviets in 1980 in the Avai area, in the southern part of the country, but never completed due to the impact of the Chernobyl accident in 1986. In 2007, the Azerbaijan Academy of Sciences proposed constructing a 1.5 GW plant on the same site in the Avai area, and Russian companies have offered to build the new reactor. This plan appears to have been postponed. Currently, Azerbaijan intends to construct a small research reactor to help train its own nuclear personnel and to generate medical isotopes. First-round approval of the research reactor was granted by the IAEA in 2008. The plan for this project will be submitted to the Azerbaijani government in 2012 for approval.[7]

Azerbaijan is a member state of the Nuclear Non-Proliferation Treaty (NPT) and the Comprehensive Test Ban Treaty (CTBT), and has protocols in force with the IAEA. Thus, it is in compliance with basic international standards for starting up a nuclear program. Such a program has economic support, since over 60 percent of the country's power generation is now based on natural gas. A large nuclear power station (1.5 GW) could significantly reduce that usage. The present generation capacity of natural gas plants is on the order of 6.1 GW.

Wind, biomass, solar and hydroelectric energy sources are available in several areas in Azerbaijan. The country has recently established a State Agency or Renewable and Alternative Energy Sources under the Ministry of Industry and Energy. Wind resources are particularly

large, and the agency is interested in developing a more conducive market for wind energy investors. A demonstration project including several wind turbines (0.9 MWt capacity), a small solar installation (1.8 MWt), and a bioenergy plant (1 MWt) is current in progress near Gobustan, southwest of Baku and along the Caspian coastline. However, the dominance of the oil and gas industry in Azerbaijan could act to reduce any urgency for alternative sources of power. According to one recent report, Azerbaijan will not need to construct a new nuclear power plant 10-15 years.

Building a nuclear reactor will not only help address the country's increasing demand for electricity, it will also have a positive impact on the country's scientific image. The construction of a new nuclear reactor for research and energy purposes could also serve as a basis for the state's decision to use nuclear technology peacefully. At present, the only operating nuclear power plant in the region is the pressurized water reactor at Mersamor, 30 km from the Armenian capital of Yerevan. This is an old plant, built in the mid-1970s, approaching the end of its licensed life-time, and it is a source of safety concerns in the region due to large nearby earthquakes. The country plans to replace it with a new, fully updated reactor by 2018, and there is little chance of it shutting down the current station since it produces no less than 40 percent of the country's electricity.[8] Azerbaijan's plans might be seen, in part, as a response to the Armenian situation, in the sense of establishing its own, more well-grounded and comprehensive "nuclear culture." It is also important to note that Azerbaijan has shown no signs of interest in using nuclear technology to develop nuclear weapons in the past years.

Turkmenistan

Like Azerbaijan and Kazakhstan, Turkmenistan is a party to the NPT, CTBT, and IAEA protocols. It is one of Iran's allies, and also one of the supporters of Iran's peaceful nuclear

program. The Caspian littoral states have declared that they would assist each other out regarding peaceful nuclear energy. In addition to being neighbors, Iran and Turkmenistan have a strong and diverse trade relationship, including the sale of Turkmen gas to Iranian facilities. Without Iran's help, Turkmenistan would be more limited in its trade options because it is a landlocked country, and it does not have access to a large network of trade partners. Iran has also helped Turkmenistan develop several of its gas fields, as well as several water and energy facilities. At the same time, the Turkmen government has expressed its strong desire for the Caspian region to remain free of all nuclear weapons.

According to the IEA, in 2009, Turkmenistan's use of alternative (including nuclear) energy was 0.00 percent of its total usage.[9] Thus, it is entirely dependent on fossil fuels, in particular natural gas, which accounts for as much as 78 percent of total energy use and 100 percent of power generation. In 1991, 0.35 percent of Turkmenistan's power was provided by alternative power sources,[10] including nuclear energy, though located outside the boundaries that now define the country. One of the possible reasons why Turkmenistan has since chosen not to pursue nuclear technology itself is the fact that it has the largest proven natural gas reserves of any of the FSRs. Though power consumption has been rising rapidly, at over 1 percent per year since 2003, little discussion of nuclear or renewable energy potential appears to have taken place. The country has significant wind and solar potential, however. Gas consumption, growing at 2 percent per year,[11] has fed the country's increasing appetite for energy services.

Russia: Exporter of Nuclear Technology to the Caspian Region

Russia is one of the countries that pioneered the spread of nuclear technology around the Caspian Sea as well as in the Southern Caucasus region. Russia's plans for its domestic nuclear capability, according to the World Nuclear Association, are to nearly double output by as early

as 2020.[12] Its nuclear export enterprise, the state-owned Atomstroyexport, is involved in a number of overseas projects to build reactors on an export basis. Rosatom has agreed to partly finance and construct new reactors in Ukraine, Belarus, India, China, Vietnam, and Turkey. Its approach to these projects is unique, in that it builds, owns, and operates a facility, while, in the case of a non-weapons state, it also takes possession of the used fuel which is shipped back to Russia for reprocessing.

These contracts and agreements with nations in its "near abroad," and in Turkey, suggest that Russia will aggressively compete for any export opportunities in the Caspian region. Atomstroyexport has already discussed with the government of Kazakhstan the building of a series of small reactors, mentioned previously, to be distributed around the country in local urban areas. It is uncertain whether Azerbaijan will follow suit regarding to its own nuclear plans or turn to companies from the U.S., South Korea, Canada, or Japan.

Nuclear-Weapon-Free Zone in Central Asia

On March 2009, a treaty was signed that prohibits the development, the use, and presence of nuclear weapons in Central Asia. The countries involved in the signing of the treaty were Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. This treaty is a step towards reinforcing the efforts of the United Nations and other organizations to promote a world free from nuclear weapons. This treaty was signed in 2006 and establishes a new nuclear-weapon-free zone, adding to those that currently exist in Africa and South Africa, Southeast Asia, and Antarctica. The treaty was also signed because it serves as an important confidence-building and security measure for the Caspian littoral states and in Central Asian region, given plans for significantly expanding nuclear technology. By the year 2020, at least five nations in the region are likely to have such technology: Russia, Kazakhstan, Azerbaijan, Armenia, and Iran. Further,

the Central Asia Nuclear Weapons Free Zone treaty prohibits the manufacture, development, stockpiling, purchase and sale, and possession of a nuclear explosive device or of any nuclear weapon within the agreed zone.

II. Issues

The most immediate and serious issue regarding nuclear concerns is the possibility of Iran acquiring a nuclear weapon. This would alter the balance of power in this region, which already borders two nuclear powers, Russia and China. In particular, Azerbaijan's position could be affected, given its conflicts with Iran over oilfields in the Caspian Sea. A move toward closer ties with NATO and the U.S., in response to a nuclear Iran, would not be well-received by Russia. Thus, a shift in power relations and an increase in regional tensions could result.

The safety of new reactors built in the region defines another potential issue: seismic hazards. These hazards are particularly high in southeastern Kazakhstan, westernmost Turkmenistan, and along the Elburz and Caucasus mountain ranges. The 2011 Fukushima accident in Japan indicates the need for strict and thorough stress tests on reactor facilities, as well as special attention paid to multi-level backup systems.

Another important issue relates to the processing and disposal of nuclear waste and any potential future interest in reprocessing. There already exists a significant amount of nuclear waste material in Azerbaijan that needs to be fully secured. An integrated plan for handling waste, either onsite or through one or more geologic repositories seems needed.

Finally, Russia's attempts to monopolize oil and gas export in the Caspian region suggest that this could possibly be an issue regarding nuclear technology as well. However, given that Kazakhstan has entertained investment from companies in Japan and China (though not the U.S.), this does not pose a problem at present.

III. Options

The situation with Iran and nuclear weapons presents a challenge to countries of the Caspian region. Beyond supporting UN efforts to block Iran's development of such a weapon, options are limited. This report does not consider it likely that a nuclear Iran would lead to a strong desire for such weapons among any other Caspian state.

Options for the U.S. include establishing closer ties with these countries, as a bulwark against Iranian power. However, these ties will always risk angering Russia. The two axes of linkage—the U.S., Azerbaijan, and Turkey on the one hand, and Russia, Armenia, and Iran on the other—currently leave out Kazakhstan and Turkmenistan, both of which have been allied with Russia in the past but are now turning toward Asian and European countries and companies for help in their continued development. This is a welcome sign, but leaves the U.S. in an uncertain position in terms of actual involvement.

Russia's provision of expertise, training, and technology is largely responsible for bringing Iran's nuclear program to its present state, minus weaponization. It has continued to asert that Iran has a right to develop enrichment and that there is no hard evidence that the country is pursuing a weapons effort. This could continue until Iran actually tests a nuclear device. One option for the U.S. is to push for the establishment of a multilateral, international fuel bank, thereby removing any incentive for countries to enrich and reprocess on their own soil. This might not dissuade the Iranians, but it would prevent their program from setting a precedent.

Meanwhile, if Azerbaijan and other Caspian states were to embark on peaceful nuclear programs, the highest levels of safety could be ensured by involvement of IAEA personnel in planning and facility inspection. Since Azerbaijan, Kazakhstan, and Turkmenistan are all

members of the IAEA, this would be a straightforward matter. To handle nuclear waste, consideration might be given to a regional geologic repository, preferable located in Kazakhstan, which has the lowest potential for seismic activity. The U.S. is most concerned with international security and with its own economic and political standing in the Caspian region. In this regard, the U.S. would benefit from offering to aid nuclear programs in the region with its own expertise. In this it could pave the way for some of its own green technology companies by encouraging Caspian littoral states to seriously begin developing the considerable wind resources that exist along the margins of the Caspian Sea and in the shallow offshore.

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Chapter Seven

Resource Development in the Caspian Sea Region

Martin Su

Summary

This report examines the resource wealth and development in the Caspian Sea region in the past decade and possibilities for the future two decades. Azerbaijan's oil product will peak within this decade and its gas production and mining operations will be more dependable in the long term. Kazakhstan has solicited great foreign investment in local resource extractions, and potentially sits on the top of oil production in 2030. Turkmenistan is slowly opening up for international interaction to develop its immense gas industry. Russia has recently built up its portfolios in the Caspian and will continue to grow throughout the next 20 years. Iran has yet to exploit its resources in the Caspian but mainly focus on the broader disputes. New pipeline routes will be crucial to global energy security. Internal social economic equality must to be addressed, however, to maintain regional resource production stability The U.S. should support U.S. companies in the Caspian and maintain good economic and social relations with Caspian littoral states. Finally, the U.S. government should encourage the Caspian to invest a certain percentage of the resource revenue into the local renewable energy industry to ensure stable future exports.

I. Background

Caspian Sea Region

The littoral states of the Caspian Sea are highly endowed with mineral resources in great demand by the global economy. These resources include oil and gas in addition to coal, uranium, copper, iron, and rare earth metals. Further, the region has high natural capacity for renewable energy production in the form of wind, hydro, and solar power. These realities make the region nearly self-sufficient in energy and capable of considerable wealth accumulation from natural resource exports.

Oil reserves are largest in Kazakhstan and Azerbaijan, both onshore and offshore, with proven reserves of 2 Bbbls recently discovered in Russia's offshore portion of the Caspian (see **Figure 12**). Together the Caspian nations own about 5.5 percent of the global proven oil reserves, with the possibility for this to rise to 8 percent or more with further discoveries and development.[1] A key point in this regard is that prospective areas written off as non-commercial

in the 1990s, when prices were below US$25 per bbl and during the first major era of exploration by international oil companies, are now being re-evaluated in light of a price of US$100. This could lead to significant increases in reserves for all countries.

Gas is abundant onshore in Turkmenistan and Kazakhstan as well as offshore in Azerbaijan. Among these states, Turkmenistan has the greatest gas reserves by far, its total having reached 7.9 Tcm proven. The supergiant South Iolotan field (see **Figure 13**), the second largest gas field in the world, alone holds over 22 Tcm.[2] Coal is mainly located in Kazakhstan, which uses it for the majority of its domestic power generation.[3] There are great quantities of uranium in Kazakhstan (17 percent of the world's reserves) and Uzbekistan (ranked right after Kazakhstan).[4] In 2010, Kazakhstan became the world's largest producer of uranium ore, at 33 percent of the global total.[5]

	Proven reserves	Ultimately recoverable resources	Cumulative production	Remaining recoverable resources
Azerbaijan	7.0	29.9	11.7	18.2
Kazakhstan	39.8	78.2	9.2	68.9
Turkmenistan	0.6	19.5	3.6	15.9
Uzbekistan	0.6	5.5	1.1	4.3
Russia*	2.0	8.0	0.2	7.8
Total	48.0	141.1	25.8	115.1

Figure 12: Conventional oil resources in the Caspian by country, 2009 (Bbbls). (Data: IEA World Energy Outlook 2010). *Rough estimates based on discoveries to date.

	Proven reserves	Ultimately recoverable resources	Cumulative production	Remaining recoverable resources
Azerbaijan	1.4	4.4	0.3	4.1
Kazakhstan	2	6.1	0.4	5.8
Turkmenistan	7.9	26.5	2.3	24.3
Uzbekistan	1	5.2	1.5	3.7
Other Caspian	0.2	0.3	0	0.3
Total	13.2	42.5	4.5	25.8

Figure 13: Conventional natural gas resources in the Caspian by country, 2009 (Tcm). (Data: IEA World Energy Outlook 2010).

	1990	2000	2009	2015	2020	2025	2030	2035
Azerbaijan	0.3	0.3	1.1	1.3	1.3	1.2	1.1	0.9
Kazakhstan	0.5	0.7	1.6	2	2.8	3.8	3.9	3.9
Turkmenistan	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.2
Uzbekistan	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Other Caspian	0	0	0	0	0	0	0	0
Total	1	1.3	2.9	3.7	4.4	5.3	5.4	5.2

Figure 14: Oil production in the Caspian by country in the New Policies Scenario (Mbbls/d). (Data: IEA World Energy Outlook 2010).

	1990	2000	2009	2015	2020	2025	2030	2035
Azerbaijan	10	6	17	20	36	43	49	49
Kazakhstan	7	12	36	47	49	55	61	68
Turkmenistan	85	47	41	85	104	110	119	128
Uzbekistan	41	56	66	72	70	70	69	69
Other Caspian	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total	143	121	159	224	260	278	298	315

Figure 15: Natural Gas production in the Caspian by country in the New Policies Scenario (Bcm/d). (Data: IEA World Energy Outlook 2010).

Azerbaijan

Oil and Gas Reserves

Azerbaijan is the smallest country in the region in size but nevertheless sits on abundant resources. Azerbaijan has developed its oil and gas fields quite rapidly since the late 1990s (see **Figure 14**). The proven oil reserves in the country have now extended to 7 Bbbls and its source is mainly the offshore sea area of the ACG field.[6] Ultimately, recoverable resources are estimated to be as high as 30 Bbbls, with 18.2 Bbbls remaining (see **Figure 12**). In addition to the ACG field complex, most of the country's fields are in a mature state of production; however, they only have recovery factors of 0.3 (30 percent) or less. Application of enhanced oil recovery techniques could significantly improve production levels or longevity. More than 90 percent of oil produced is exported to the Europe, as Azerbaijan located in a crucial energy pathway for Europe.[7]

According to the IEA, proven gas reserves are 1.4 Tcm, with ultimately remaining recoverable resources at 4.1 Tcm. The giant Shah Deniz gas/condensate field, with reserves of

850 Bcm, greatly contributes to this figure. Future gas production will be closely tied to this field, which is expected to reach a peak capacity of 16 Bcm/y.[8]

Azerbaijan has rapidly developed its oil and gas sector by encouraging a significant amount of foreign investment, mostly from the U.S. and Europe. Such investment, which has involved companies from the U.S., Europe, Turkey, and Japan thus far, has been key to all phases of exploration and development, from geologic analysis and drilling, to offshore and pipeline construction. Recent forecasts show Azerbaijan's oil production reaching a plateau in 2015 at about 1.3 Mbbls/d and declining gradually thereafter to 0.9Mbbls/d by 2035 (see **Figure 14**). Predictions for gas production on the other hand, show a continued increase from 17 Bcm/y in 2009 to 49 Bcm/y by 2030, with no decline and with increasing export capacity (domestic consumption remains moderate). The implication, therefore, is that the country's long-term hydrocarbon production will come to depend increasingly on gas by the 2030s.

Minerals

In addition to oil and gas, Azerbaijan has rich mineral deposits. The iron ore industry is producing 1.8 million tons of raw ore annually, and known resources should be able to maintain such production for the next 80 to 90 years.[9] The gross weight for iron ore is about 28,000 metric ton in 2008.[10] However, the actual amount of the iron ore is unclear due to the lack of consistent data. Copper ore is found along with lead in the Samkir region with 30,000 metric tons annual capacity.[11] The regions of Filizchay, Kasdagh, Kateh, and Sagatar contain 90 percent of the ore and are able to provide profitable mining for many decades to come.[12] Gold discoveries are recent and 65 percent of the resource is located in the Karabakh region, which is currently occupied by Armenians troops. Gold production reached 1775 kilograms and the silver production reached 1217 kilograms in 2011. The country claims, however, that it is capable of

producing up to 15 tons of gold a year.[13] Data is lacking for the mineral sector, as explorations are not fully established. There is potential for further development in the metals sectors, but refining capability is lacking at present.

Major Projects

Azerbaijan's key oil and gas development sites are the ACG, Absheron, and Karabakh areas. ACG is located offshore in the east side of Baku. The field is operated mostly by foreign oil industries within the AIOC, with only 10 percent ownership by the SOCAR.[14] Production started in late 1997, and the Baku-Suspsa pipeline has been built in late 1990s to transfer the oil to the Black Sea. Maximum production from ACG is forecast as 700,000 bbls/d at around 2010 to 2011, with capability to maintain this level for about four years.

Absheron is a significant new discovery, with estimated recoverable rserves of 350 Bcm and 329 Mbbls condensate. The original PSA contract aimed at exploration involved a consortium in 1997 led by Chevron Texaco, but, due to the low price at the time (<$25/bbl), was found commercially unattractive. A new contract involving SOCAR (40 percent of ownership), Total (40 percent of ownership), and Gaz de France (20 percent of ownership) was signed in 2009, and a well drilled in 2011 confirmed large recoverable reserves. Karabakh field, also offshore from Baku, was explored by the Caspian International Petroleum Company (CIPCO) in the late 1990s and, like Absheron, deemed non-commercial. In 2006, SOCAR stated it would develop the field itself, the recoverable reserves of which fall in the range of 100-220 Mbbls.[15] As a whole, most of the oil fields are operated largely by international firms with small ownership held by Azeri companies.

Outlook

Oil production in Azerbaijan is forecast to plateau around 2012 to 2015, and then decline

after 2020; gas production is projected to reach a stable point in 2030 (see **Figure 14** and **Figure 15**). However, as recent operations at Absheron and Karabakh demonstrate, there remains significant potential to re-explore in the offshore area, as well as opportunities to re-condition and upgrade older, existing fields, with continued high price for both oil and gas; such potential may prove to offer new opportunities for foreign companies. Mining operations, meanwhile, are not valued as much as the hydrocarbon sector at present, but could prove beneficial in the long-term.

Turkmenistan

Oil and Gas Reserves

Turkmenistan has little oil compared Azerbaijan and Kazakhstan, but enormous reserves of natural gas. Until quite recently, the nation was closed with regard to foreign relations and foreign investment in its petroleum sector, as any outside participation in natural resource development was prohibited by the constitution written under Saparmurat Niyazov, who ruled the country until his death in 2006. Therefore, data is limited and uncertain, and development has been constrained. Total proven oil reserves are 0.6 Bbbls (see **Figure 12**). With recent outside appraisal of its supergiant South Iolotan gas complex, however, estimates for the country's gas reserves have been boosted from roughly 8 Tcm to over 26 Tcm, placing it among the top four nations in the world. Nonetheless, as shown in **Figure 15**, gas production has remained modest, due to lack of new infrastructure.

In 2006, Berdymukhammedov's ascent to power took the nation on a different path toward global openness as it started to allow international companies to enter. Chinese companies quickly moved in and picked up the most maximum shares offered. Companies like the CNPC obtained contracts to produce gas and develop infrastructure in the area.[16]

Turkmenistan's gas production is increasing but will be limited for some time by lack of infrastructure such as production and transportation facilities. Oil production is minimal compared to other Caspian regions at about 213,000 bbls/d.[17] Due to domestic consumption, oil production, and exports are predicted to decline in the future. Given its enormous resources, only recently confirmed, Turkmenistan's gas production is moderate at about 50 Bcm in 2010. This is less than in 2009, when production was 70 Bcm. A dispute between Russia's Gazprom and Turkmenistan's government over pricing led the latter to shut off distribution to Russia for nine months, causing a loss to Turkmenistan of nearly 25 percent of GDP.[18] With the issue resolved and new agreements signed, Turkmenistan plans to increase the output to 125 Bcm/yr by 2015.[19] Plans to raise this to 104 Bcm/yr by 2020 will require significantly more investment by foreign companies, and rapid development and pipeline construction. The Turkmen government, meanwhile, has cited a figure as high as 230 Bcm/yr to be achieved by 2030, with 180 Bcm for export.[20] Compared with the three other nations with world-leading reserves, this is twice the level of production of Qatar, 75 percent above that of Iran, and half that of Russia.

Increasing foreign investment fits with the government's goal of diversifying markets for its gas. This market is current monopolized by Russia, which re-sells the gas to Europe and China at higher prices.[21] President Berdymukhammedov has spoken favorably of the Nabucco pipeline, which would carry gas to Europe but would also require Turkmenistan to agree to the TCGP link to Baku. This will be strongly opposed by Russia and Iran.

Minerals

Since all mineral production was, until very recently, closed to outside investors, it is unclear what Turkmenistan's natural resource endowment might be. The new president's plan to

open the country to foreign investment will likely bring more exploration and thus information on this endowment, which appears to include some essential minerals.[22]

Major Projects

The largest project by far in Turkmenistan, and one that will remain the focus of development for some time, is the South Iolotan gas field. It is now the world's second largest.[23] This gas site was discovered in 2006 and had a 2010 independent reserve estimate of 21.2 Tcm. It is located in southeast Turkmenistan, several hundred kilometers from the Caspian Sea. Recent news of the field's size has generated interest among a number of foreign companies like the CNPC from China. Drilling depths are 13,000-17,000 feet and much of the gas is sour (i.e. hydrogen sulfide-bearing); thus, significant costly processing will be needed. Most likely, a sizeable consortium will be formed to develop South Iolotan.[24] The pipeline question, for transport to China, Europe, or both, remains unresolved at this time.

Outlook

The main issue with the hydrocarbon development in Turkmenistan is the degree of available technology along with the country's openness to international companies. The country has gigantic potential to increase production, as it sits on tremendous reserves, and this potential may even grow further. It is interesting to contemplate, as Ashgabat clearly has, this small country of 5.4 million becoming a rival to Russia in the European gas market.

Russia

Oil and Gas Reserves

Russia is in the early stages of developing hydrocarbon resources in its portion of the Caspian Sea region. As of early 2012, a total of six significant fields have been discovered, with only one, the Yury Korchagin field, in actual production. Others, such as Filanovsky (1.2 Bbbls

recoverable) and Sarmatskoye fields, are not scheduled for development until 2015 or after. As many as 16 other prospective structures have been identified, but they remain untested. The proven oil reserve in the region are said to be over 7.3 Bbbls, with an undetermined volume of natural gas.[25]

The current output of oil is low and not considered indicative, as it represents only the earliest phase of development at one field, Yury Korchagin, with reserves of 212 Mbbls oil and 63 Bcm gas. Lukoil, the explorer and operator of Russia's North Caspian offshore projects, plans to bring a new field online every two to three years. Nevertheless, Moscow officials have stated that production will be up to 271 million barrels of oil and 18 Bcm of gas by the year 2023.[26] Production will rise as Russia puts more emphasis on the Caspian Sea region.

Major Projects

The Yury Korchagin field is a moderate-sized development project in the Caspian. It will be succeeded by the much larger Filanovsky field in 2015, which could eventually produce more than 210,00 bbls/d. Additional oil and gas fields will be brought online successively between 2017 and 2030, at rates to be determined. Most of the eight fields discovered to date lie more than 100 km east of the Russian coastline, close to the agreed-upon boundary line between Russian and Kazakhstani waters. Lukoil, which began first production at Korchagin in 2010, is pursuing all of these projects.[27] The company has now an almost 100 percent drilling success rate in the area.

Outlook

For an energy superpower like Russia, whose largest fields in West Siberia are near or in decline, the Caspian Sea represents a significant new source of future supply. Though production levels are difficult to estimate, since development has just begun, it is evident that the Kremlin

and Lukoil will seek to keep the area productive for decades into the future. The government is aiming to reach an output of 270 million barrels of oil per year around a decade.[28]

Kazakhstan

Oil and Gas Reserves

As the nation with the largest oil reserves in the Caspian, Kazakhstan controls about 40 Bbbls of proven reverses at present, with twice this amount judged to be ultimately recoverable (see **Figure 12**). Though most fields are not fully developed, the country has great potential to become a major crucial energy power in the region and a large exporter globally. Currently, however, most of the 85 percent of exported production goes to Russia.[29] Like Azerbaijan and Turkmenistan, Kazakhstan is open to foreign investment, with the result that its production has more than doubled during the past decade alone. Gas reserves are also moderate-to-large (2 Tcm proven, 6 Tcm ultimately recoverable) and will contribute to exports in the future (see **Figure 13**).

The production level of oil reached approximately 1.8 Mbbls/b in 2011, and the government plans to more than double this by the early 2020s and to remain at about 4 Mbbls/b through 2035 (see **Figure 14**). The largest producing field at present is Tengiz, an onshore complex with recoverable crude oil reserves of 6 to 9 Bbbls. Total liquids production from Tengiz is 0.5 Mbbls/b by a Chevron-led consortium that also includes ExxonMobil, and Kazmunigaz, the state oil company. Other large active fields include Karachagank (0.2 Mbbls/d; Agip, Chevron, Lukoil, BG Group), Uzen (0.14 Mbbls/d; Kazmunigaz), and Mangistau (0.12 Mbbls/d; China National Petroleum Corp. and Kazmunigaz).

For increased production levels, the main limiting factor at present is infrastructure, especially pipeline capacity. However, in the case of the country's largest field, the supergiant Kashagan complex (9 to 11 Bbbls recoverable), this involves building specialized production and

treatment facilities to deal with challenging surface and subsurface conditions, as well as high sulfur contents.

The large input of foreign investment seems likely to expand, as international firms from Europe, the U.S. and Asia bring in modern production facilities to effectively extract resources in Kazakhstan.[30] Similar deals will involve natural gas, as it will increase from the 40 Bcm in present day to about 60 Bcm in 2030 (see **Figure 15**). With more foreign cooperation with the Kazakhstan state resources production, the energy exploitation will only rise in the future.

Minerals

Oil and gas are not the only abundant resources that the Kazakh nation controls. The country owns a healthy amount of coal that totals 34.5 billion tons.[31] Most of the coal production generates power for domestic use; however, the country is looking into exporting the resource in the future and increasing production to 32 million tons per year.[32] Uranium is also abundant in Kazakhstan. The nation increased production of uranium 45 percent between 2008 and 2009, and surpassed Canada and Australia to become the largest producer worldwide.[33] The country has a nuclear fuel fabrication facility that it intends to upgrade. In addition, Kazakhstan has an undetermined but considerable deposit of rare earth metals, key materials for hybrid vehicles and other green technologies. The government signed an agreement with Germany in February 2012, which initiates cooperation between German firms and Kazakhstani companies to extract raw materials in the area.[34] Overall, the country plans to produce 1,500 tons of rare earth metals in 2012 to fill in the decrease in Chinese rare earth supply to the world.[35]

Major Projects

Kashagan is one of the largest fields ever discovered outside the Middle East and will require more than a decade to develop entirely. Originally scheduled to begin production in

2005, start-up has been repeatedly delayed due to cost over-runs related to severe levels of overpressure, large amounts of associated natural gas, and the high sulfur content of the oil. Water depth of only three to five meters means that this northern part of the Caspian freezes solid in winter, requiring the building of artificial islands for drilling and production. As of early 2012, Kashagan was forecast to come online in October 2013, with initial oil rates as high as 450,000 bbls/b, and ramping up to 1.5 Mbbls/b by 2020.[36] The field, in addition to other discoveries in the area, is being developed by the North Caspian Operating Company, a consortium that includes Total, Eni, ExxonMobil, Shell, ConocoPhillips, and Kazmunigaz. With the Kashagan field running, Kazakhstan will achieve greater oil and gas production in the near future.

Outlook

Kazakhstan has the potential to recover considerable wealth from the extraction and sale of its natural resources. It could easily become a key global oil producer in the decades ahead, taking the place of countries, like Mexico, whose production levels have peaked and are now falling. The country's domestic consumption is forecast to remain below 0.3 Mbbls/d, leaving the great majority of production for export.[37] In Kazakhstan, the openness to foreign investment, both from western oil companies and from Chinese companies, and the price of $100/bbl or more, promise to keep oil and gas development moving ahead. The country could be producing over 4 Mbbls/d by 2035, placing it among the top exporters in the world (see **Figure 14**). Its metals sector will certainly expand, as well as its nuclear fuel trade. In general, Kazakhstan can be expected to remain highly dependent on natural resource extraction for the foreseeable future, as oil industries make up 60 percent of its economy.[38]

Iran

Oil and Gas Reserve

Iran is an immense energy power due to its large hydrocarbon resources in its southern territory near the Persian Gulf. However, Iran is unsure about its reserves in the Caspian region, and consequently there is no current oil or gas production from Iran's sector of Caspian Sea.[39] Iran is very interested in exploring for hydrocarbon resources in the offshore region, but it has not yet done so to any significant degree. Every littoral state except for Iran has exploited the sea for hydrocarbon resources.[40] Nonetheless, Iran has recently expressed its intention to develop oil fields in the Caspian Sea region and welcomes the participation of both foreign and domestic companies.[41]

Outlook

It is likely, given current geologic knowledge, that resources exist near or within the disputed boundary area with Azerbaijan. Until there is a resolution of Caspian Sea maritime boundary issues, however, conflict will exist over this area and any development will likely be postponed. Despite having no reserves in the Caspian Sea as of yet, Iran still plays a powerful role in the energy politics of the region, and this will continue. Iran has even tried to gather the littoral states together to set peace and cooperation in the Caspian Sea region, including discussion of energy transport routes through Iran to other continents.

II. Issues

With global energy demand projected to increase 53 percent in the next 20 years, alternative hydrocarbon sources are crucial for stability in global economy.[42] The Caspian Sea region provides a new source of fuel apart from the OPEC nations. For the benefit of the U.S., good relations must be built and maintained with the nations in the Caspian to foster cooperation

in trading resources and investing U.S. capital in the area. Meanwhile, other powers like Russia and China also desire influence in the region to profit from the energy sector. Kazakhstan, Azerbaijan, and Turkmenistan will be the decided focus of this competition in the Caspian-Central Asian region. The "pull" on their resources will come from the north (Russia), west (Europe), east (China), and possibly the south-southeast (India, Pakistan).

Thus, a core issue relates to pipeline routes. New routes will need to be built to handle a doubling or greater in export capacity. For the global economy, it would be best if these routes were not monopolized by Russia and China. Though China-only routes would supply the nation whose demand is forecast to grow the most, such routes leave no room for flexibility in case of a major change in China's situation. Routes through Russia, meanwhile, serve Russian interests only, in terms of control over its "near abroad." Western routes able to serve Europe and global markets would be preferable.

Concern over stability in the Caspian oil industry and its society in general will also remain impactful issues as well. The recent troubles in Zhanaozen, Kazakhstan, where police and striking refinery workers clashed, with up to 17 strikers killed, provides evidence that challenges lie ahead and that improvements need to be made.[43] As in other developing states where oil revenues have grown very rapidly, stark differences in wealth can provoke unrest and distrust. Because extraction of oil and gas stimulates only a limited range of employment and businesses, governments in this region need to find ways to share the economic benefits with all their people.

III. Options

The U.S. should maintain a presence in the Caspian region by supporting current oil companies' investment in the region. The oil industry stands in the forefront of the interaction between the governments of the Caspian littoral states and the western word. It is vital to create

and continue those business relationships to lead the nations to better development as well as to benefit U.S. energy stakeholders. Economic development can enhance stability in the region and promote forms of cooperation.

The U.S. can reassure Azerbaijan that it continues to be a "strategic partner," a designation with special status, regarding energy security in Eurasia and the Northern Distribution Network for transport of supplies to the effort against the Taliban in Afghanistan. Rotating visits to the region by the Secretary of State, Secretary of Defense, and U.S. trade representatives, certainly to Azerbaijan but also to Kazakhstan and perhaps even Turkmenistan, would also be a safe way to augment American encouragement of increased trade relations with the West.

It also makes sense for the U.S. to avoid providing any further military aid or sales in favor of commercial relations with American companies. The U.S. might negotiate with Caspian states a provision in energy contracts that Western companies perform on-the-job training of local engineers, geologist, mechanics, and other skilled personnel.

In addition, U.S. trade representatives should consider proposing that a certain, at first small, percentage of state oil revenues be devoted to pilot projects using renewable energy. Such development of renewable sources for domestic uses would preserve more hydrocarbon resources for export, while also providing a base for transition to a low-carbon energy system in the future.

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Chapter Eight

Pipeline Politics

Ellie DeMartino

Summary

Europe's demand for Caspian energy is rising as it seeks to reduce reliance on Russian oil and gas transport systems. Consequently, Europe and Russia have produced conflicting plans for pipeline construction in the Caucasus and Central Asia. While Europe's proposed routes may threaten Russia's control of westbound energy transport, Russia's counter-proposals offer a plausible alternative that could obstruct the EC's recent attempts at supply diversification. Accompanied by the producing countries' need for a tangible method by which to put their oil and gas on the market, it will be crucial to conclude Eurasia's pipeline plans as safely and quickly as possible without sacrificing international security.

I. Background

At present, the driving force of contention in pipeline politics is Russia's determination to remain within the main transport route of European energy imports, particularly opposite Europe's desire for greater energy security. Because Caspian oil and gas production was appropriated during the Soviet era, all transport was routed through pipeline systems now controlled by Russia. A brief period of production and transport privatization occurred after the collapse of the Soviet Union. In the 2000s under Vladimir Putin, Russia has re-implemented state control primarily through the government companies Transneft and Gazprom. Until recently, the existing pipeline structure facilitated near-monopolization of energy export to Europe from the land-locked Caspian region. Lack of alternative transport routes has enabled Russia to purchase oil and gas from Caspian countries at prices below those in the European market and subsequently sell to Europe at a profit.[1] This near-monopoly has been progressively eroded by completion of the Baku-Supsa and, more importantly, BTC pipelines in 1998 and 2005, as well as the Kazakhstan-China route in 2009.[2,3] However, Russia continues to enjoy considerable control in the region and strongly opposes any new routes that avoid its territories.

Kazakh oil is predominantly transported through Russia's state-owned Transneft system, which includes the Druzhba pipeline that carries most Russian and Kazakh oil to Europe.[4] The Caspian Pipeline Consortium (CPC), not part of Transneft, runs from Tengiz to Novorossiysk and exists as a potential Bosphorus bypass. In addition, a limited amount of oil from Azerbaijan flows from Transneft's Baku-Novorossiysk (BN) pipeline to the Black Sea, and of gas through the Gazi-Magomed-Mozdok (GMM) pipeline.[5] **Figure 16** shows the location of oil routes from the Caspian region to Europe. Russia also dominates the transportation of Turkmen gas via the CAC pipeline (see **Figure 17**). Azerbaijan, however, has successfully reduced its dependence on exports to Russia and instead it primarily sends its oil and gas west through the BTC and BTE (also known as the South Caucasus) pipelines, respectively (see **Figure 18**).

Figure 16: Oil pipelines in Europe. (Source: EIA Country Analysis Brief Russia).

Figure 17: Caspian gas pipelines. (Source: EIA Country Analysis Brief Turkmenistan).

Figure 18: Baku Pipelines. (Source: Thomas Blomberg).

Routes East

Kazakhstan and Turkmenistan also want to expand their customer bases and ensure that they will have a market for increased oil production. The Kazakhstan-China oil pipeline, owned by state-owned companies KMG and the CNPC, reportedly transports 200,000 bbl/day of crude oil to China. KMG and CNPC plan to double the capacity of the Kenkiyak-Atyrau section of the pipeline to 400 bbl/d by 2013.[6] China has political goals for increased imports beyond its expectation of a rapid increase in energy demand: It also wants to use increased ties and economic progress, both brought by energy transport with Kazakhstan, to increase stability in its XinJiang region and therefore dissuade separatist movements taking place on its border with Central Asia.

In regards to natural gas, Turkmenistan and China have constructed the Central Asia-China pipeline (CAGP), which became active in 2009 (visible on **Figure 17**). The pipeline was originally only suppose to transport 1,060 Bcf/year but plans to increase the capacity to 2,100 Bcf by 2015.[7] Despite that China's growing influence in the region may pose a threat to Russia's political and economic dominance, Russia does not appear to have any qualms about gas being sent east; gas going east won't compete with Russian westbound transport. Yet China's moves to acquire increasing amounts of Caspian resources, through routes that serve China alone, could pose a potential long-term challenge to Europe's own desire for these same resources. In any case, for its own export security, Central Asia will not let itself easily be dominated by one major power so soon after it has escaped another. For the present, its resources are sufficient to increase supply both to Europe and China.

Two export projects heading toward Pakistan are under negotiation but still several years away from coming online. The Central Asia Oil Pipeline (CAOP) would run from Turkmenistan

to Pakistan via Afghanistan and a gas pipeline would stretch from Turkmenistan to Pakistan and India via Afghanistan (TAPI). (TAPI can also be viewed in **Figure 17**.) Both face significant regional security obstacles before construction can be seriously considered.

Routes West

The Trans-Caspian Gas Pipeline is a proposed undersea route that would carry Turkmen gas to Baku (see **Figure 18**), thus providing a crucial link for transport to Europe. Russia objects to this because it would bypass Russian pipelines and, paired with BTE and Europe's Nabucco proposal (discussed in next section), could make transport through Russia obsolete altogether. Iran, which already exports Turkmen gas to Turkey and Armenia, is also opposed to the TCGP. The pipeline, which could carry natural gas from Turkmenbassy to Baku, would directly connect to BTE, and if the Nabucco pipeline is built, would carry gas straight into Europe. The Trans-Caspian Oil Transport System (TCOT) is another potential pipeline that would threaten Russia's sources of supply by carrying oil from Kazakhstani oil fields to Baku.

These westward routes bring with them a larger context of economic, political, and even social relations. In contrast to China, which seeks to avoid involvement in sociopolitical matters, the EU is attempting to establish more direct relations with the Caspian region. Part of this is exhibited in the European Neighborhood Policy (ENP)'s Eastern Partnership (EaP) section, of which Azerbaijan, Georgia, and Armenia are a part of (in addition to Ukraine, Belarus and Moldova). The EU hopes to strengthen the Eastern countries' integration and cooperation with each other and with the EU economy. Another EU project, the Black Sea Synergy, is designed to improve cooperation between Turkey, Bulgaria, Romania, Ukraine, Russia, Georgia, Azerbaijan, and Armenia by encouraging political and economic reform. This is to be achieved by addressing regional issues ranging from democracy to frozen conflicts to maritime policy. Evident of

European concern about energy security, specific partnerships will concentrate on transport, energy, and the environment, as well as aim to "facilitate practical projects in areas of concern."[8] One program, INOGATE, which consists of the EU, Turkey, and all NIS states but the Baltics and Russia, focuses on energy cooperation in particular.

Multinational projects such as these maintain an undercurrent of EU-specific goals. European-led cooperation and economic development will increase these countries' incentives and means of energy transport, especially between them and Europe. Europe's own particular reasons for improving cooperation, transportation, and energy policies are directly linked to its desire to diversity its energy supply.

Europe is increasing its reliance on alternative energy, but also remains focused on energy security regarding fossil fuels, as these will continue to be dominate sources for many decades. European nations do not want to be victim to supply disruptions such as the "gas crises" of the 2006 and 2009 Russia-Ukraine disputes. For its part, Russia has sought to improve its image as a reliable supplier by developing new pipeline routes that avoid Ukraine. It has built the subsea Nord Stream route to Germany, begun work on its South Stream line under the Black Sea, and maintained supply through the Yamal-Europe pipeline. Active since 1999, this pipeline, which will provide long-term gas from the West Siberian and Yamal Peninsula fields, carries gas via Russia and Belarus into Poland and Germany.

None of this, however, has quelled Europe's desire for a southern alternative. Accordingly, it has been attempting to increase direct relations with the producing and transport countries of the Caspian region and has initiated several Southern corridor projects in order to bypass Russian transportation services.

The construction of the BTC (the region's largest pipeline) and its accompanying BTE gas pipeline have already drastically increased Turkey's potential to replace Russia as a key fossil fuel intermediary. The Interconnector Turkey-Greece-Italy (ITGI) gas pipeline is a potential route to Europe, with the Interconnector Turkey-Greece (ITG) already constructed and the Interconnector Greece-Italy (IGI) under negotiation. The Interconnector Greece-Bulgaria (IGB) is also part of the project (the entirety of which is shown in **Figure 19**). Another option, the Trans-Adriatic Pipeline (TAP), also for natural gas, follows a similar route that instead passes from Greece through Albania on its way to Italy.

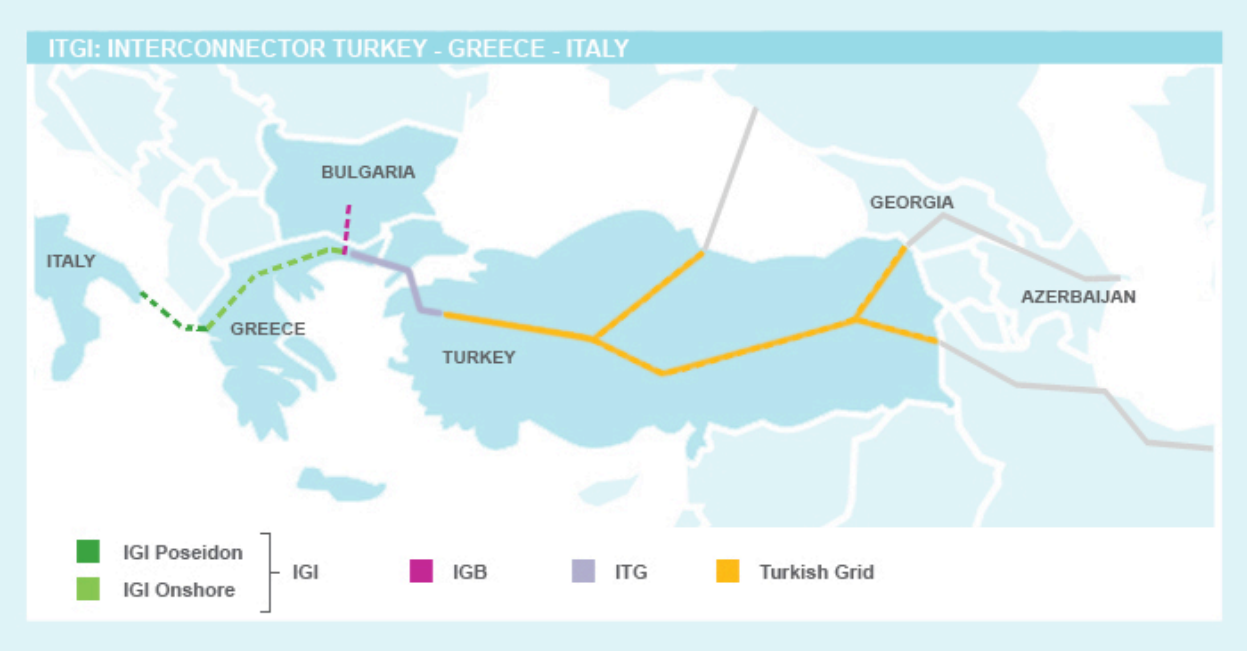


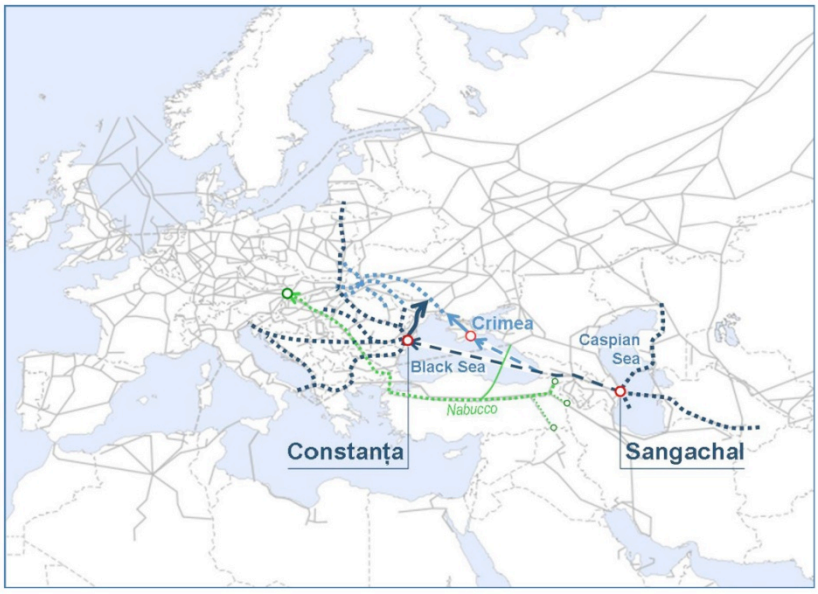
Figure 19: ITGI Gas Pipeline. (Source: Edison).

The European Commission is also considering the White Stream, which is further from being fulfilled as it lacks any major investors. A pipeline from Azerbaijan's Sangachal terminal would carry gas to the Georgian Black Sea coast from which a multiple pipeline system would carry it either across the Black Sea to Romania or through an offshore route towards Crimea. The

White Stream Consortium, which consists primarily of the White Stream Pipeline Company Limited (UK) and GUEU Inc. (U.S.), has produced a map to depict the routes (see **Figure 20**).[9]

Nabucco Route

The fourth and most controversial gas pipeline alternative is the Nabucco pipeline, also known as the Turkey-Austria pipeline. Nabucco is close to a construction date; the official timeline states that it is still in the development phase but that it will begin construction in 2013, with its first gas flow predicted for 2017.[10] The pipeline will continue on from the BTE in Erzurum through Ahiboz (directly south of Ankara) and around the south-eastern side of the Marmara Sea in order to avoid the highly-populated Bosphorus. Unlike the Turkey's Anatolian plain, Bulgaria's landscape possesses a mountain range and fault lines. Once in Bulgaria the pipeline will feed north to access the existing compressor station in Lozenets, cross the Stara Planina range then run along the north of the country. It will enter Romania under the Danube and follow the country's south-western border. From Romania it will enter Hungary where it will need flood protection barriers in order to cross several rivers. Nabucco's route will conclude in Baumgarten, Austria.[11] **Figure 21** contains a complete map from the European Dialogue.



Source: White Stream Pipeline Company Limited, overlay on a base map of the European gas pipeline network from the World Bank

Figure 20: White Stream gas pipeline. (Source: GUEU-White Stream).

The Nabucco Gas Pipeline International GmbH has six shareholders that possess an equal share of 16.67 percent; Turkey's BOTAŞ, Bulgarian Energy Holding (also state-owned), Romania's Transgaz (all three of which are state-owned), MOL Group in Hungary, OMV in Austria, and RWE from Germany. The European Investment Bank and the European Bank for Reconstruction and Development (EBRD) have also expressed interest in assisting in the project's financial backing.[12] However, as of 2012 the project still lacks concrete investment.

A major impediment to Nabucco's construction is the lack of sufficient gas supply necessary to make it economically feasible. If built, the TCGP would provide the BTE and subsequently the Nabucco with natural gas from Turkmenistan. Furthermore, the project still does not yet have any formal supply agreements with either Azerbaijan or Turkmenistan despite initial support from the two and the existence of the BTE.[13] Should Azerbaijan, which out of its suppliers has displayed the most support for the pipeline, make a concrete agreement to supply the 7 Bcm per year that it has offered, it would still not be enough to fill the pipeline's capacity.[1415] In order carry enough gas to Europe the pipeline will need to be expanded to include supplies from Iran and Iraq.[16] This would subject the pipeline to political risks as well as regional instability, especially considering the conflict in southeastern Turkey and northern Iraq triggered by the PKK. Furthermore, while Iran has expressed interest in supplying 10 billion cubic meters of gas to the project, US opposition – and consequently, EU opposition – has prevented negotiations.[17]

Despite such obstacles, Nabucco is nevertheless scheduled for construction in the near future. Worried over competition of transit via the Southern corridor, Russia has started to offer higher prices for its Caspian imports. Where it was once able to buy up all Central Asian oil and

Figure 21: Nabucco gas pipeline. (Source: European Dialogue).

gas for lack of other options on the part of the latter, Russia now shifts its goals towards maintaining a monopoly on supply purchase rather than merely maximizing profits.[18]

South Stream

Russia seeks to render Nabucco unfeasible by building its own Southern corridor: The South Stream pipeline would transport gas from the Russkaya compressor station in Krasnodar Krai on the Russian coast to Varna on the Bulgarian coast by running under the Black Sea and avoiding Ukraine waters (Gazprom's full map of planned connections to South Stream is located in **Figure 22**).[19]

Countries that have signed agreements on its implementation are Austria, Bulgaria, Croatia, Greece, Hungary, Serbia, and Slovenia. Companies involved, in addition to Russian

Gazprom, are Serbian Srbjagas, Hungarian Development Bank, Bulgarian Energy Holding EAD, OMV in Austria (notably involved in both this and Nabucco), and the Hellenic Gas Transmission System Operator DESFA. Importantly, the expected carrying capacity is twice that of Nabucco's – 60 billion cubic meters as opposed to 30 – and is twice as costly to build.

Figure 22: South Stream gas pipeline. (Source: Gazprom).

As of 2012, the South Stream pipeline project is reported as "fully on schedule" with construction due to begin in December of this year.[20] In 2011 Gazprom finalized the Consolidated Feasibility Study of South Stream and last month Alexey Miller, Deputy Chairman of Gazprom's Management Committee, approved the South Stream Construction Charter. Furthermore, in December 2011, Turkey issued Russia permission to build in Turkish territorial waters.[21]

The South Stream would enable Russia to preserve its position as the dominant exporter of gas to Europe rather than allow Turkey to secure that position. The Blue Stream, however, is a

shared system between the two. Constructed in a joint venture by Gazprom and BOTAŞ under the Blue Stream Pipeline B.V. in the Netherlands, the pipeline carries gas from the Beregovaya compressor station on the Russian coast through the Black Sea, the Durusu Terminal in northern Turkey, and into Ankara (depicted in **Figure 23**). The Blue Stream was supposed to be expanded into Southeastern Europe as Blue Stream 2, but this aspect of it was replaced by the South Stream proposal.

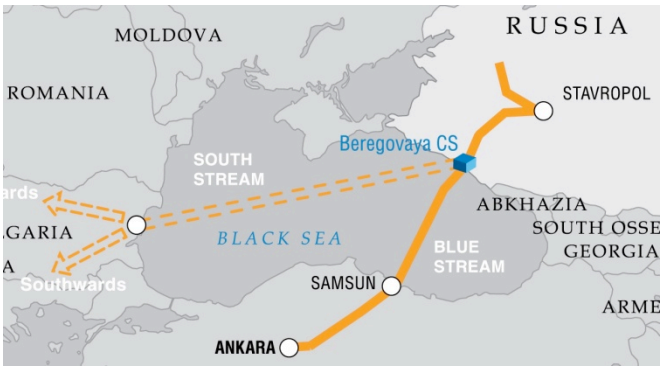


Figure 23: Blue Stream. (Source: Gazprom).

Russia has also recently implemented European-bound pipeline alternatives in the north in order to increase flexibility and reliability of gas supply. The Nord Stream gas pipeline replaced the proposal of a Yamal-Europe extension. Active since 2011, Nord Stream extends from Vyborg, Russia to Griefswald, Germany via the Baltic Sea (map available in **Figure 24**).

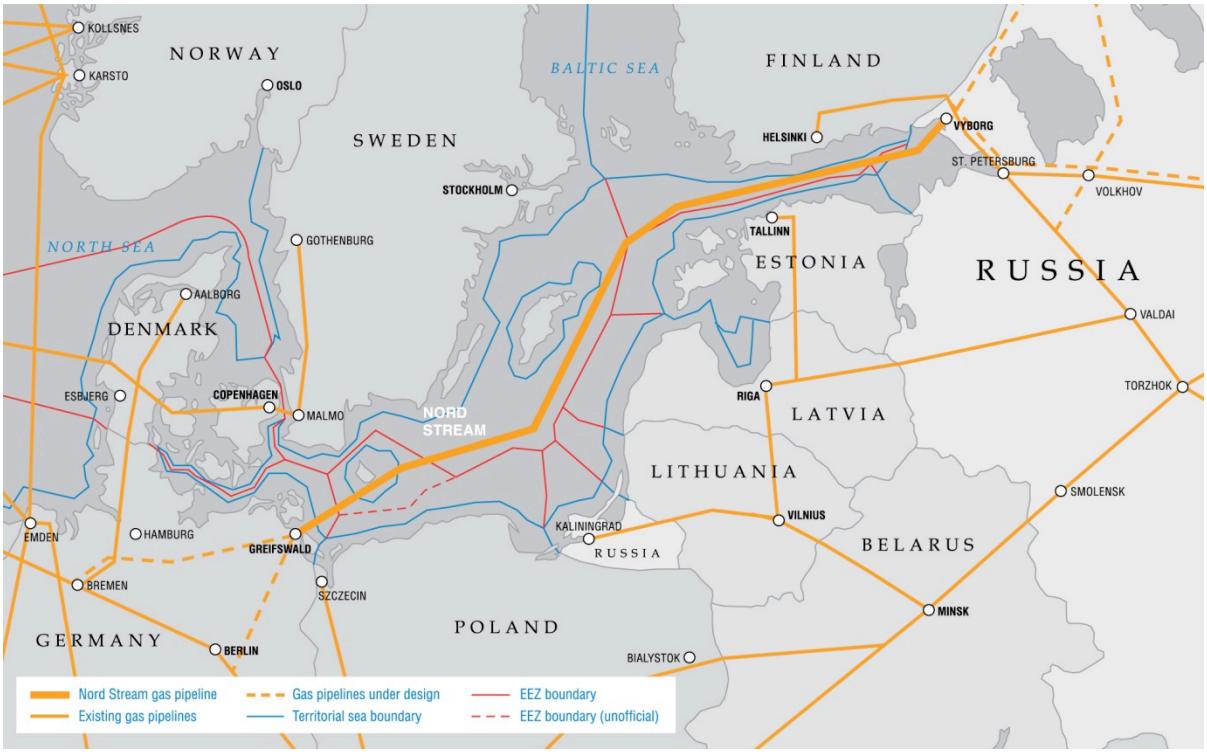


Figure 24: Nord Stream gas pipeline. (Source: Gazprom).

However, although it improves the stability of gas supply to Europe, Nord Stream is only for Siberian gas and does not help solve the question of how to transport Caspian gas.

While Russia still dominates Russian and Caspian energy transport to Europe, the EU's Nabucco project threatens to deprive it of that advantage. Yet despite the presence of Russia's own alternative route through the Southern corridor, the European Commission is unwavering in its desire for its own project running through Turkey.

II. Issues

Russia tenaciously advocates sustaining a gas transport monopoly to Europe through its South Stream proposal. The South Stream proposal is fortified by convincing reason, among which are concerns about the EU's Southern corridor designs running through politically unstable areas, the highly populated Turkish straits, and lack of supply sources. Furthermore, production plans for South Stream are progressing ahead of schedule as per Vladimir Putin's authorization while Nabucco has yet to finalize its investment decisions – which have been further troubled by the recent economic crisis – nor has it confirmed adequate sources of supply. A further obstacle is U.S. opposition to a supply link to Nabucco from Iran, without with the project is unfeasible. Refusal to cooperate undermines the project and furthermore sacrifices an opportunity for the West to improve diplomatic relations with Iran. Yet another diplomatic obstacle is Europe's the drawn-out negotiation over Turkey's EU ascension, which gives Turkey cause for increased bilateral relations with Russia, leading to Turco-Russian projects such as Blue Stream and agreements on the South Stream route.

III. Options

In order to render Nabucco economically viable it will need to receive natural gas supplies from Iran. The U.S. may continue to object, but in consideration of the European

Commission's targeted activation date, further rejection of this option may induce Europe to diverge from the American standpoint on the subject. The South Stream could easily replace Nabucco as the Southern corridor route for natural gas into Europe. Russia, untethered by need for US approval, would likely have less apprehension about forging a link with Iran. Europe may also reconsider its decisions pertaining to acceptance of Turkey, Georgia, Armenia and Azerbaijan into the EU.

Despite bypassing Turkey in building the South Stream, Russia has also proposed an option that does not threaten Turkey's densely populated straits. Combined with increasingly positive bilateral relations between the two, refusal of Turkey's accession may further alienate the country from European obligations. The Caspian states will continue to agree to the production and transport opportunities that best serve their economies and development schemes and so competing pipeline proposals must take this into account. Diplomacy and compromise will be crucial in mapping the distribution of the Caspian's energy resources.

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Part III:

Social and Environmental Issues

Chapter Nine

Azerbaijan as a Case Study for the Expansion of Human Capital in the Caspian Sea Region

Brittany Bonning

Summary

In order to engage with the Caspian Sea region, American policy must reflect an understanding of the people who live there. Just as it would be illogical to estimate the quantity of a natural resource without considering the difficulty of extraction, it is illogical to consider Caspian Sea energy potential without examining the potential of people of the Caspian. Azerbaijan needs to revitalize its scientific community in order to fully exploit the potential of their extractive industries. With a growing population, economic engagement will be an issue in the future. The oil and gas industries can address this need if the academic infrastructure is in place to develop domestic expertise.

I. Background

Educational Trends

Pre-Soviet Trends

The Caspian has long served as a Eurasian crossroads, and has enjoyed the academic benefits of this exchange. For centuries, the Caspian's position as a tripartite junction of Slavic and European trade from the Northeast, Islamic culture and learning from the South East, and Asian trade goods and philosophy from the Far East fostered a lively scholarly community in the region. Its position on the Silk Road allowed the Caspian Sea region to be a key intellectual bridge between Islamic civilizations and China for the transfer of advanced knowledge in all subjects, including engineering, philosophy, medicine and art. Such exchange continued between Persia, India, and China for several centuries, but was diluted in the Caspian region after it came under the control of the Ottoman Empire.

Soviet-Era Trends

During the Soviet era, education—specifically Russian Soviet education—became institutionalized as a culturally universalizing mechanism. The purpose of education was to create Soviet citizens that could work equally well anywhere within the union. This led to a high

degree of academic migration within and between republics, depending on the will of the state. Since these jobs were very prestigious, many parents intentionally enrolled their children in Russian-language schools instead of schools that taught in the local language, as Russian was seen as the language of advancement. In the Soviet Union, Russian was the language of "industry, medicine, education and the state"; it was the language of progress.[1] Additionally, under Soviet rule, basic education became mandatory for the first time in regional history. As a consequence, literacy rates in the Soviet Union were some of the highest in the world.[2] (Literacy rates in the FSRs continue to remain in the high ninetieth percentile.[3]) Mandatory schooling allowed ordinary civilians to become well educated, within the confines of the state. In addition, this fostered the growth of a relatively large intellectual class in the region.

However, collapse of the state apparatus decidedly shifted the character of most of the scholarly communities in the Caspian Sea region. After the fall of the Soviet Union an almost immediate exodus of Russians and other minorities out of Central Asia caused a scientific "brain drain" as Soviet-educated specialists left for Russia (see **Figure 25)**, and gave rise to nationalist movements in response to Russian decolonialization. The pursuant nationalist policies still affect the region.

Nationalism in this context has often manifested as government endorsement of the resurgence of local language and culture. While these traditions (such as informal Islamic education and traditional family hierarchies) had never quite disappeared, they had been hidden during Soviet rule.[4] Other "traditions" were largely new developments. Principally, de-Russification manifested itself in minimizing governance, which reduced the amount of jobs available in the state sector. Another common trend was to reemphasize the importance of national culture through new systems of writing. This was done either by transitioning from

Russian to the local language in government publications, by transitioning from Cyrillic to Latin script, or both simultaneously. These changes essentially rendered the working population illiterate almost overnight.[5]

Figure 25: Population change in Central Asia by ethnicity, 1989-1996. (Data: Suliamanova 2004, 380).

	Percent		Thousands	
	1989	1996	1989	1996
Tajikistan				
Tajiks	62.1	68.1	3,172	4,006
Uzbeks	23.4	24.4	1,198	1,435
Russians	7.6	3.4	388	199
Other	6.9	4.1	350	244
Kazakhstan				
Kazakhs	39.5	47.0	6,535	7,781
Russians	37.7	33.9	6,228	5,615
Germans	5.8	2.6	957	426
Other	17	16.4	2,817	2,721
Turkmenistan				
Turkmen	72	75.4	2,536	3,163
Russian	9.5	6.6	334	278
Other	18.5	18.0	653	757

Transitional Trends

Over years of centralized Soviet rule, Soviet citizens came to believe that many social services, such as health care and education, ought to be provided by the government.[6] This did not cease to be the case after the fall of the Soviet Union. Many FSRs still maintain a close connection between the state apparatus and the domestic educational system. With the exception of Russia, Caspian littoral states report spending more on education than military expenditures (see **Figure 26**). Russia, meanwhile, reports an even amount of spending in both areas. Increased investment in domestic education is critical to the development of new jobs, especially in scientific or technical fields. Caspian Sea nations must construct academic frameworks that allow domestic contributions to the energy industry. Without such infrastructure, domestic engagement with the oil and gas industries will not develop to its full potential.

Figure 26: Comparative educational and military expenditures as a percentage of GDP. (Data: CIA World Factbook).

Nation	Total GDP (PPP in 2011 USD)	Military Expenditures (percentage of GDP)	Educational Expenditures (percentage of GDP)
Azerbaijan	$93.02 Billion	2.6 % (2005 est.)	2.8% (2009)
China (PRC)	$11.3 Trillion	4.3% (2006)	Not reported
Iran	$928.9 Billion	2.5% (2006)	4.7% (2009)
Kazakhstan	$214.5 Billion	1.1% (2010)	2.8% (2007)
Russia	$2.373 Trillion	3.9% (2005)	3.9% (2006)
Turkmenistan	$41.51 Billion	3.4% (2005 est.)	Not reported
United States	$15.04 Trillion	4.06% (2005 est.)	5.5% (2007)

Current Trends

De-Russification has not only affected the demographic character of the general population, but also that of the regional scholarly base. The post-Soviet academic exodus severely reduced the number of qualified scientists available to work in domestic oil and gas industries. Such a scholarly deficit has serious implications for the region. Many of the Caspian Central Asian Republics (CCARs: Azerbaijan, Kazakhstan and Turkmenistan) have viable physical infrastructure to support large-scale energy extraction, but do not possess the domestic expertise to do so. The task is to cultivate technical knowledge to develop Caspian Sea energy resources so as to fully exploit their economic potential on the world market. To do so, it is equally necessary to develop local regional experts, and a multinational consumer base.

Recent regional government programs in the CCARs have encouraged the use of English, not Russian, as the regional *lingua franca*. Some nations have even mandated that the local language must be written in Latin, rather than Cyrillic, characters to emphasize this shift.[7] Often,

political leadership will legitimate the switch from Cyrillic to Latin script as a step towards facilitating English language learning.[8] Therefore, this trend may indicate a growing desire to join the international community on the part of the CCARs.[9] English is the global language of communications, international trade and tourism; it is also the common language among scientific and technical professionals around the world, including those in the global energy industry. In contrast, resistance to the infiltration of Chinese, Turkish and Iranian cultural influences remains. However, as the economic importance of these countries in the region has increased, a demonstrable, corollary warming towards their languages and cultures has occurred.

Lingual and economic transitions have been followed by modifications of the state educational paradigm. The modern Azeri educational system is still a system in transition. Despite the fact that literacy rates in the country are commonly cited in the 99th percentile, a recent United Nations Educational, Scientific, and Cultural Organization (UNESCO) report found that students' test scores in reading and science were "worrying".[10] Low demonstrated performance in scientific, technological, engineering and mathematical (STEM) subjects does not present an optimistic outlook for the future growth of the Azeri scientific community, or for the creation of a strong body of domestic experts to support the growing oil and gas industry.

However, the Ministry of Education has undertaken curriculum changes aimed at increasing student performance in STEM subjects. State-mandated curriculum for 10th graders requires that seven periods (315 minutes)[11] a week must be dedicated to the study natural sciences, and work and technological training. The same curriculum provides two periods (90 minutes) a week to study the Azeri language, and four periods (180 minutes) a week for mathematical instruction. In total, 10th grade students in Azerbaijan spend about the same amount of time studying science as they do on mathematics and language instruction

combined.[12] Clearly, Azeri secondary education is reorienting itself so that future generations will have a stronger background in STEM subjects, and greater economic potential in those fields. While this provides a favorable outlook for mid- to long-range projections, short-term projections are not as encouraging.

The primary issue is low student participation in high-level academic programs, as can be seen by comparing basic and collegiate enrollment rates. Primary and secondary matriculation rates are high; however, the number of doctoral candidates has declined in recent years. Primary school gross enrollment rates have remained in the low ninetieth percentile for the past five years; secondary education enrollment rates have held at 99 percent since 2008.[13] In sharp contrast, the number of doctoral students, in both PhD and scientific programs (Doctor of Science, or DSc, in local terms) has decreased in recent years (see **Figures 27** and **28**). This is especially worrisome for DSc programs, which have reported less than 50 new graduates a year for the past ten years (see **Figure 28**). It is clear from these statistics that there is little probability of a new regional scientific elite emerging in the near future.

Figure 27: Statistics on Doctoral Students in Azerbaijan, 2000-2010. (Data: the State Statistical Committee of the Republic of Azerbaijan [AZSTAT]).

Indicator	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of Universities with PhD Programs	83	84	83	86	88	94	96	96	94	95	95
PhD Candidates	963	982	1059	1178	1318	1479	1705	1681	1636	1084	786
Newly Admitted PhD Candidates	367	292	303	398	470	503	5550[14]	452	455	51	5[15]
PhD Recipients	321	244	202	260	320	317	340	431	503	593	455

Figure 28: Statistics on students in scientific doctoral (DSc) programs in Azerbaijan, 2000-2010. (Data: AZSTAT).

Indicator	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of Universities with Scientific PhD Programs	21	16	17	19	20	21	19	24	31	32	26
Scientific PhD Candidates	47	40	58	57	68	80	80	83	93	64	91
Newly Admitted PhD Candidates	9	17	18	14	14	18	17	19	22	20	13
PhD Recipients	22	7	7	15	6	8	11	20	25	43	12

Education and resource usage directly relate to the economic potential of a people, on both a national and individual level. For example, service is the main employment sector in Azerbaijan (see **Figure 29**). However, if Azerbaijan were to increase its educational initiatives to cultivate domestic expertise in the extraction of energy resources, education and labor from the service sector would naturally flow to the industrial sector. Domestic urges for technical self-sufficiency require the development of domestic expertise in order to expand and diversify the Azeri economy in the future. However, domestic cultivation of scientific expertise has yet to come to economic fruition.

Gender-Based Trends

Most of the employees in the Azeri oil and gas industry, particularly those involved in drilling, production, and varied types of construction, are male.[16] Given the role of agriculture in the domestic economy, it will be necessary for many men to migrate from the agricultural to the industrial sector in order to sustain the expansion of an extensive industrial natural resource sector. However, due to the lack of domestic technical expertise, the potential for long-ranging economic expansion is still unexplored. Unemployment and underemployment continue to be

Figure 29: Comparison of GDP by employment sector. (Data: CIA World Factbook).

Nation	Percentage of GDP by U.S. Dollars by Sector(2010)	Percentage of GDP by Sector Population (2008)
Azerbaijan	Agriculture: 5.2 percent Industrial: 65.4 percent Service: 29.4 percent	Agriculture: 38.3 percent Industrial: 12.1 percent Service: 49.6 percent
China (PRC)	Agriculture: 9.6 percent Industrial: 47.1 percent Services: 43.3 percent	Agriculture: 38.1 percent Industrial: 27.8 percent Service: 34.1 percent
Iran	Agriculture: 10.9 percent Industrial: 41.2 percent Service: 47.9 percent	Agriculture: 25 percent Industrial: 31 percent Service: 35 percent
Kazakhstan	Agriculture: 5.4 percent Industrial: 42.8 percent Service: 51.8 percent	Agriculture: 28.2 percent Industrial: 18.2 percent Service: 53.6 percent
Tajikistan	Agriculture: 19 percent Industrial: 22.9 percent Service: 58.1 percent	Agriculture: 48.8 percent Industrial: 22.9 percent Service: 58.1 percent
Russia	Agriculture: 4 percent Industrial: 36.8 percent Service: 59.1 percent	Agriculture: 10 percent Industrial: 31.9 percent Service: 59.1 percent
United States	Agriculture: 1.2 percent Industry 22.1 percent Services: 76.7 percent	Agriculture: 0.7 percent Industrial: 20.3 percent Service: 79.1 percent

major concerns in Azerbaijan.

The greatest challenge facing Azeri development is the country's rapidly growing population coupled with unmatched growth in job creation. Between 2000 and 2009, the labor force increased 14 percent while the labor force participation rate only increased 1 percent.[17] While the Azeri government reported the development of 839,890 new jobs between 2003 and

2009, the EC stated that the actual growth rate only amounted to 324,000 permanent new jobs.[18] Of these new positions, the majority (17 percent) were in the agricultural sector.[19] Jobs created by foreign investment rose nominally, from 1.1 to 1.5 percent over the same time period.[20] The oil industry currently employs approximately 44,000 Azeris, about 0.005 percent of the population.[21] The vast majority of "new" employment arose from the registration of farms in the agricultural sector. However, it is not possible to determine how many of these farms are subsistence family plots and how many are commercial enterprises due to statistical coding constraints[22].

In general, women in the Soviet Union were educated for service sector occupations, especially governmentally regulated occupations, such as teaching and nursing. Men, on the other hand, were more likely to be employed in the industrial or agricultural sectors, which were less intertwined with state operations.[23] This trend holds true today. The EC found that "[w]omen kept majority positions in traditional areas of occupation such as education (67.2 percent), health and social services (76.6 percent) and other community activities (54.7 percent)".[24] When the Soviet Union fell, government jobs were often the few that still existed and were paid with some regularity. Men often turned to farming or mechanical repair services when their collective farms or manufacturing plants were closed. Government employment is viewed as more stable than agricultural work, which means that women often produce the bulk of household income.[25]

In contrast to the stability of female-dominated state sectors, traditionally male-dominated sectors are those that exhibit the fastest growth in Azerbaijan.[26] This is especially pertinent for the growing agricultural and informal sectors, which are experiencing the greatest growth and are most difficult to regulate.[27] Additionally, males are more likely to migrate domestically to find work then females.[28] As a result, the Azeri male labor market tends to be

more responsive to economic stimuli than the female labor market; that is, male labor tends to shift more rapidly between sectors, and respond more rapidly to market demands (see **Figure 30**). This trend has become especially true in recent years.

Figure 30: Types of contracts for hired labor. (Data: World Bank).

Type of Contract	Total		Male		Female	
	2003	2006	2003	[29]	2003	2006
Total	100 (%)	100 (%)	100 (%)	Total	100(%)	100 (%)
Open-Ended	55.4	67.3	50.0	61.3	63.6	77.1
Seasonal	4.4	4.4	5.0	5.5	3.5	3.7
Temporary	21.2	9.2	24.2	11.4	16.6	5.6
Casual	11.0	3.4	10.6	4.5	11.6	1.5
Fixed-Term	3.7	13.0	4.4	13.5	2.5	12.1
One-time specific job assignment	4.4	2.7	5.8	3.8	0.2	0.9

II. Issues

Educational Trends

Education in the FSRs is still undergoing a period of transition. The fall of the Soviet Union created an academic deficit that has yet to be fully addressed. While there has been some progress to rectify this issue, especially in student retention and literacy rates, there is no evidence that a strong, domestic scientific community will emerge in the Azerbaijan in the short-term. This is a concern as the oil and gas industries become increasingly important in the region. Development of this sector necessitates greater investment in STEM studies—monetarily, temporally, and academically. Currently, domestic educational infrastructure is lacking such support. As the Azeri energy sector grows without the domestic academic capital to support it, technical jobs will have to be outsourced. Turning to foreign specialists would not be beneficial

for incentivizing domestic scientific specialization, increasing the sustainable development of the energy sector or facilitating domestic infrastructural development.

The gap between the future economic potential and the current economic reality of the Azeri energy industry would make it an attractive investment option for American businesses. However, the responsibility of providing not only physical but human capital to develop the project reduces the draw. Therefore, it is in American economic interest to develop strategies to maximize Azeri educational enrichment in STEM fields. In turn, these policies foster a more welcoming environment, incentivizing American investment in the region.

The best way to develop a body of Azeri experts without the benefit of Azeri educational infrastructure is to encourage students with potential to study abroad and return to their country at the conclusion of their studies. American economic interests would be well served by facilitating such exchanges and interactions between Azeri and American scientists. Academic exchanges foster the development of strong academic networks. In the energy industry, where academics work closely with entrepreneurs, such networks could easily translate into investment opportunities. Expanding the range of economic activities available to American businesses is conducive to enhancing American investment in the region. This would be mutually beneficial. Azerbaijan would receive a market for both its oil and its scholars, incentivizing the future production of both, while America gains a Central Asian ally and trading partner.

Gender-Based Economic Trends

Economic trends in the FSRs reflect a period of post-colonial economic transition. Workforce demographics continue to strongly reflect Soviet tendencies. The greatest challenge to Azeri development is creating sustainable growth. Female-dominated sectors tend to be more stable, but also more static. Male-dominated sectors, such as the oil and gas industries, tend to

grow faster but have a lower GDP to labor output ratio.[30] The oil and gas industries are growing, but they have yet to make a significant impact on the domestic job market. Instead, agriculture and the informal sector are the fastest growing industries.

It is a concern that the fastest growing industries in Azerbaijan are very difficult to regulate. Regulation is vital to standardizing industrial activity, which is a major component in attracting foreign investment. American companies are most interested in regulated sectors, because their universalism is more conducive to multinational trade. Therefore, it is necessary to standardize and regulate such rapidly growing sectors, before the encouragement wide-ranging American investment becomes a viable option.

For the most part, American companies looking to invest abroad are not interested in investing low-earning, high-labor industries, such as agriculture. However, some companies have become successful in the region by taking advantage of the large, primary goods markets already present. It is in the American interest to develop a method of connecting primary producers in Azerbaijan with secondary producers in America to encourage economic interaction between the two. This will, in turn, facilitate Azeri integration with the world market, a foundation that will be essential to increasing the strength of the domestic oil and gas industries. Creating and maintaining strong commercial networks with Azeri suppliers will be valuable to both American producers and consumers in the next ten to twenty years.

III. Options

In order to encourage the development of the oil and gas industry in Azerbaijan, the American government must support the development of the Azeri scientific community in two main ways: first, by facilitating international academic exchange; and second, by supporting programs which activate unemployed or underemployed groups.

Academic exchange among scholarly institutions in both countries would create scientific networks between America and Azerbaijan, which are essential to supporting the growth of the Azeri oil and gas industries. In addition, it would be beneficial to foster a climate of equality by incentivizing female participation in such exchanges, especially among scholars in STEM fields. On a more basic level, academic exchange may be facilitated by the expansion of cultural understanding. Young Azeris and young Americans may interact under the auspices of English language exchange programs. In addition, it is possible to foster Azeri academic development by actively recruiting high-achieving lyceum and Bachelor's degree graduates to study in the United States on the condition that they return to work in the Caspian region after the completion of their higher education.

Furthermore, economic forums in which American investors can network with Azeri scholars and entrepreneurs would naturally lead to an overlap between academic and commercial sectors. This would have the additional benefit of encouraging high achievement in STEM studies by incentivizing investment in the technical sector. Incentivizing high achievement in STEM fields would also engage the underemployed youth cohort in economic activities by maximizing educational output to match economic needs.

It would also be beneficial to support programs in Azerbaijan that foster the development of rural industries. This would simultaneously create jobs and facilitate an Azeri-American economic interface. Such programs could most easily be implemented under the auspices of charitable developmental agencies with the support of commercial enterprises. In addition, such work would enhance female participation in the non-service sector by incentivizing economic participation through local industry and activating an important but underemployed demographic in the agricultural sector. Tying economic success to positive changes in the community would

incentivize the greater participation in such programs, gradually activating cumulatively greater numbers of workers in the agricultural sector.

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[4] Ibid.
[5] Clement, Victoria. "Alphabet Changes in Turkmenistan, 1904-2004." In *Everyday Life in Central Asia*, edited by Jeff Sahadeo and Russell Zanca, 266-280 (Bloomington: Indiana University Press, 2007), 266.
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[8] Luong, Pauline Jones, ed. *The Transformation of Central Asia: States and Societies from Soviet Rule to Independence* (Ithica: Cornell University Press, 2004), 19.
[9] Clement, Victoria. "Alphabet Changes in Turkmenistan, 1904-2004." In *Everyday Life in Central Asia*, edited by Jeff Sahadeo and Russell Zanca, 266-280 (Bloomington: Indiana University Press, 2007), 279.
[10] United Nations Educational, Scientific and Cultural Organization (UNESCO). "Azerbaijan." *World Data on Education.* 2010/2011. http://unesdoc.unesco.org/images/0021/002112/211298e.pdf (accessed February 19, 2012), 11.
[11] Periods are 45 minutes long; the educational year lasts 31 weeks.
[12]Students study math and language subjects a total of six periods or about 270 minutes a week. United Nations Educational, Scientific and Cultural Organization (UNESCO). "Azerbaijan." *World Data on Education.* 2010/2011. http://unesdoc.unesco.org/images/0021/002112/211298e.pdf (accessed February 19, 2012), 10.
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[14] Although this number is reported at 5550 newly admitted PhD candidates, the data suggests that this number should properly be 555 or 550 instead. State Statistical Committee of the Republic of Azerbaijan. "Education: Doctorate (at the end year)." *The State Statistical Committee of the Republic of Azerbaijan.* http://www.azstat.org/MESearch/details (accessed February 18, 2012).
[15] This number is reproduced as reported in "Main Indicators on PhD Program" from AZSTAT. State Statistical Committee of the Republic of Azerbaijan. "Education: Doctorate (at the end year)." *The State Statistical Committee of the Republic of Azerbaijan.* http://www.azstat.org/MESearch/details (accessed February 18, 2012).
[16] Bacheva, Fidanka, Manana Kochladze, and Suzanna Dennis. *Boom Time Blues: Big Oil's Gender Impacts in Azerbaijan, Georgia, and Sakhalin.* (Status Report, Washington, D.C.: CEE Bankwatch Network and Gender Action, 2006), 12.
[17] According to the State Statistical Committee, the only demographic that experienced an increase in economic participation was 55-64 cohort, which saw an increase of 6 percent. 30-34 year olds are the most highly employed, with 90 percent of the cohort group involved in the economy. European Commission, Directorate-General for Employment, Social Affairs, and Inclusion. *Social Protection and Social Inclusion in Azerbaijan.* Status Report, (Brussles: European Commission, 2011); 24, 25.
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[19] Ibid.

[20] European Commission, Directorate-General for Employment, Social Affairs, and Inclusion. *Social Protection and Social Inclusion in Azerbaijan.* Status Report, (Brussles: European Commission, 2011), 25; World Bank: Human Development Sector Unit, Europe and Central Asia Region. *Report 52801-AZ: Azerbaijan--Living Conditions Assessment Report* . (Annual Situational Report, World Bank, 2010), 92.
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[22] European Commission, Directorate-General for Employment, Social Affairs, and Inclusion. *Social Protection and Social Inclusion in Azerbaijan.* Status Report, (Brussles: European Commission, 2011) Footnote 6.
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[25] Ibid; World Bank: Human Development Sector Unit, Europe and Central Asia Region. *Report 52801-AZ: Azerbaijan--Living Conditions Assessment Report* . (Annual Situational Report, World Bank, 2010), 88.
[26] European Commission, Directorate-General for Employment, Social Affairs, and Inclusion. *Social Protection and Social Inclusion in Azerbaijan.* Status Report, (Brussles: European Commission, 2011), 24.
[27] World Bank: Human Development Sector Unit, Europe and Central Asia Region. *Report 52801-AZ: Azerbaijan--Living Conditions Assessment Report* . (Annual Situational Report, World Bank, 2010); 91, 93.
[28] World Bank: Human Development Sector Unit, Europe and Central Asia Region. *Report 52801-AZ: Azerbaijan--Living Conditions Assessment Report* . (Annual Situational Report, World Bank, 2010), 94.
[29] No date is given for this column in the original document. Data is not available for the categorization of informal male labor in 2006.
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Chapter Ten

Environmental Threats to the Caspian Sea

Sarah Wong

Summary

In the Caspian region, there are a number of ecological problems that are inherited from the past as well as new challenges due to recent rapid economic development. Environmental issues like overfishing, climate change, and pollution are becoming a serious threat to ecological biodiversity, water supply, soil quality, and important non-hydrocarbon industries like fishing. Rapid economic development without consideration of environmental security can seriously erode the social and economic stability of the entire region. Today, many questions arise as to whether environmental safety and sustainability in the Caspian region is sufficient enough. In order to ensure further growth in the region, environmental agreements must be signed to promote joint action among the littoral states.

I. Background

Physical characteristics

The Caspian Sea is the world's largest inland water body. Located in the western part of Eurasia, it covers approximately 378,000 km^2 and has a total volume of 78 100 km^3, which accounts for 40 percent of the region's global inland water supply. The Caspian is divided into three basins: northern, middle, and southern. The northern part of the basin is the shallowest, with an average depth of 5 m (see **Figure 31**) and only contains 0.6 percent of the total volume of the Caspian. Further south the depth of the Caspian Sea increases, and the southern basin contains the greatest volume of water and has a maximum depth of 1025 m. The coastline stretches over 7000 km and the Caspian Sea has a total catchment area of the 3,500,000 km^2; Azerbaijan in particular has over 800 km of coastline, with almost the entire country within the Caspian's catchment area.

The five littoral states situated around the Caspian Sea influences the sea through river discharge. There are more than 130 streams and five major rivers that contribute to a total water inflow of 300 km^3 per year.[1] The Caspian Sea has no surface outlets, meaning that environmental contaminants accumulate. There are more than 130 streams and five major rivers that contribute

to a total water inflow of 300 km^3 per year. The rivers of the northern coast, the Volga, Ural, and Terek rivers, account for 88 percent of total river inflow.[2] Water inflows along the western coast originate from the Caucasus Mountain rivers: the Kura, Sulak, Samur, and others. Along the southern shore, the Elburz Mountains are situated near the coast of the Caspian Sea, where the climate is much drier. Therefore water discharged along the southern coast travels a shorter distance. The Caspian's eastern coast is mostly desert with little to no permanent river inflow.

Surface area (km^2)		378 000	
Volume (km^3)		78 100	
Catchment area (km^2)		3 500 000	
Coastline (km)		7 000	
Length (km)		1 200	
Width (min-max) (km)		196–435	
Average depth (m)	North	5 (max 20)	
	Middle	190 (max 790)	
	South	330 (max 1 025)	
Average surface temperature (°C)	North	Winter: 0	Summer: 25
	South	Winter: 10	Summer: 26
Surface salinity (ppt)	North	0.1	
	Middle	10	
	South	13	

Figure 31: Main characteristics of the Caspian Sea. (Source: GIWA Report).

Depending on the season, surface temperature varies from north to south. In the north, the average surface temperature during winter is 0°C and in the summer it increases to approximately 25°C. The surface temperature in the southern part of the Caspian Sea tends to be warmer, during winter the surface temperature is roughly 10°C and increases to 26°C in the summer. Due to climate change surface temperatures are now frequently changing, posing a serious threat to the natural habitat.

Salt levels in the Caspian Sea range from 0.1 to 13 percent, providing a varied environment that supports a large diversity of species (e.g. fish, mollusks, Caspian seal). The highest number of native species is found in the middle of the Caspian, while the greatest biological diversity is found in the northern part of the basin.[3] For many species the Caspian acts as a feeding ground or resting area. Most importantly, the sea and the coastal areas intersect migration routes, and serve as way stations for various species of birds.

Fishing

Since the 1990s, revenues generated from agricultural and fisheries have been steadily declining. To the coastal population, however, fisheries contribute to livelihoods in a range of crucial ways: as food, as a source of income, and as a means by which to achieve reduced vulnerability to poverty. Approximately 16 million people live along the coast of the Caspian. Apart from two large urban areas—Baku-Sumgait and Makhachkala-Kaspiis—most of the Caspian shoreline is rural (see **Figure 32**). The cash income generated by the sale of fish give them access to basic goods and services such as education, health, food and other assets. This source of income has been very

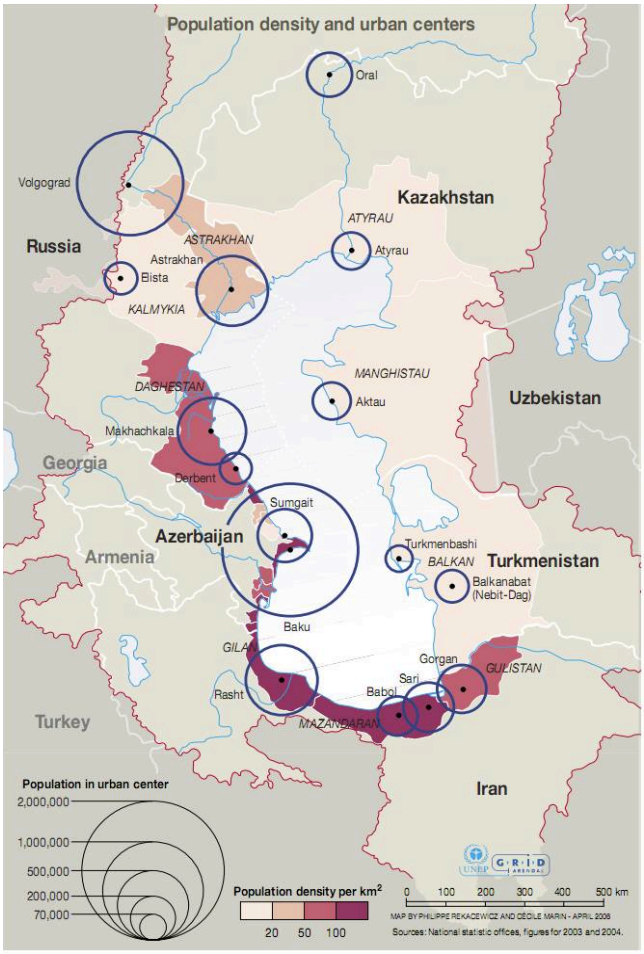

Figure 32: Population density in the Caspian region. (Source: UNEP/GRID Arendal, April 2007).

important to people living in coastal areas, especially those in Turkmenistan and Kazakhstan. However over the years, there has been a significant wage difference between the oil-and-gas sector and other sectors, particularly agriculture and fisheries. Thus a further decrease in sturgeon and other fish can foster greater wage inequality.

The world's largest population of sturgeon can be found in the Caspian Sea. Currently, a range of factors such as overfishing, climatic and hydrological changes, and local population fluctuations are suggested to have caused a decrease in sturgeon population, but their relative importance is still highly uncertain (see **Figure 33)**. In 1989, caviar prices rose due to the former Soviet Union's restraint on sturgeon fishing as a result of pollution, and the U.S. ban on Iranian caviar due to Iran's anti-U.S. policies.[4] America resumed its imports of Russian and Iranian caviar, and in 1980s U.S. also became a supplier of caviar. However real caviar comes only from

sturgeon caught in the landlocked Caspian Sea, which lies between Iran and Russia, therefore making the Caspian area the world's main producer of caviar. For fisheries, caviar trade has become a convenient way in generating a source of income. Moreover, the Caspian supplies caviar to the three largest markets: the EU, Japan, and the U.S (see **Figure 34**). World caviar tradetrade in the Caspian region is to be faced with greater scrutiny because importers and consumers are key to sturgeon's survival. High consumption means higher demand, and encourages more fishing for sturgeon. Today, sturgeon are being fished to extinction and little is left in the sea for reproduction; moreover, the construction of several hydroelectric power plants and dams along the Volga river has significantly altered the flow of water into the delta. Such human impacts has destroyed about 90 percent of the sturgeon's spawning grounds, therefore money generated through caviar production has reduced and fisheries who rely on this source of income is affected.

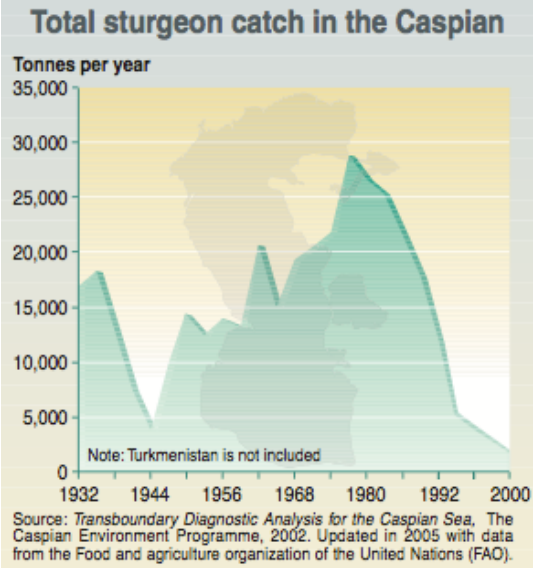

Figure 33: Total sturgeon catch in the Caspian Sea From 1932-2000. (Source: UNEP/GRID Arendal).

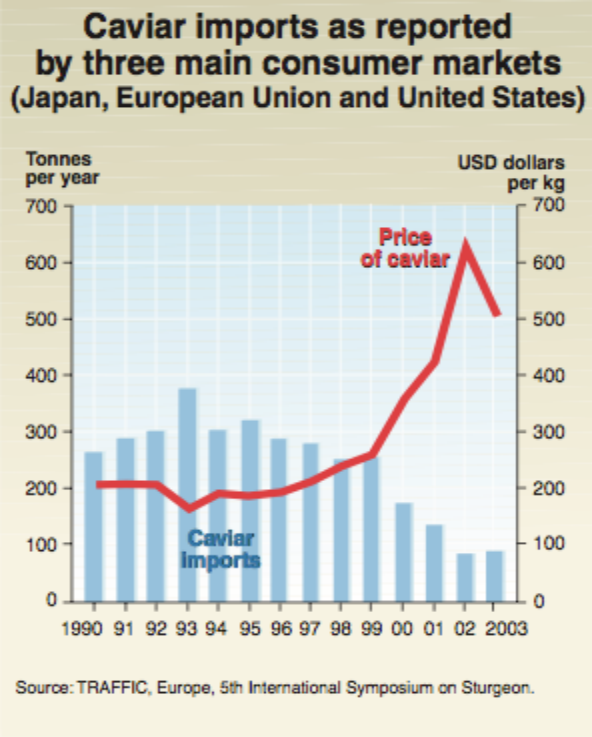

Figure 34: Caviar imports to Japan, the EU, and the U.S. (Source: UNEP/GRID Arendal, 2007).

Pollution

Pollution as a result of industrial development has been has created serious threats to the delicate environment. Undesired discharge in the Caspian Sea has been coming from sewage, industrial, and agricultural activity by the surrounding states. Today's pollution in the Caspian Sea has been accumulated since the Soviet era. The highest pollution levels were recorded in late 1980's, representing an accumulation of impacts from the Soviet era. After the collapse of the USSR, the resulting economic downturn reduced industrial activity in the Caspian region, therefore lowering pollution levels on a short-term basis. The origin of the pollution varies, but two sources contribute to the vast majority of coastal pollution: the Volga River flowing south from Russia, and the Kura River entering from the west in Azerbaijan. Both rivers pass through agricultural and industrial areas, and as well as oil field. The Volga Delta in the northern Caspian is heavily polluted, and the pollution is flowing into the Caspian Sea. This could be due to soil salinization and nuclear testing sites. Pollution also comes from flooded and leaking oil wells, especially in the southern part of the Caspian Sea. Records also indicate that hazardous industrial waste or polluting activities are also present in the middle part of the Caspian Sea, but it is significantly less than that of the northern and southern part. The second most pressing concern is toxic waste, induced by heavy metals (e.g. lead, cadmium, zinc, and copper). Such substances have had a greater impact on the function of the fish's immune system and thus the long-term health and sustainability of fisheries. The most evident toxins present in the Caspian are petroleum hydrocarbons, heavy metals, phenol, surfactants, and chloral-organic pesticides. Hydrocarbon-related pollution was particularly severe in the late 1940s at the Apsheron Peninsula near the Baku. The construction of artificial islands in the northern, very shallow part of the sea, close to the Kazakh and Russian coasts, has also contributed to recent problems, with

drilling fluids and other toxicants escaping into the sea. However, oil pollution remains the most dangerous. High concentrations of crude oil and its derivatives reduce the growth and development rate, fertility, and reproductive capability of many fish populations, therefore reducing the fish's physiological condition. [5] In addition, most of the river-based pollution comes from the east, around the Armenia-Georgia area, and is then carried to the Caspian via the Kura Araks River.

A Changing Environment: Water Levels & Climate Change

Issues of climate change are closely interwoven with the issues of water availability and energy security, and a change in climate poses serious threats to the region's surroundings and habitat. Records show that climate change is directly affecting the Caspian Sea environment. Milder winters and higher temperatures in the region have caused a decline in the ice cover along the northern Caspian Sea. According to Perelet, "46 Glaciers are already shrinking, which may eventually decrease water flows. From the 1950s to the 1990s, the Pamir-Alai glaciers lost 19 percent of their ice, with the process now gaining in intensity."[6]Such reductions in ice affect the living conditions and breeding habits of the endangered Caspian seals. A decrease in ice availability means that seals must live in closely packed areas. Further loss of ice cover can facilitate the spread of disease. Moreover, experts estimate that climatic changes could further reduce river flows by 50 percent, leading to even less ice. According to reports generated by UNEP, ENDP, UNECE, OSCE, REC and NATO: "In the 1960-70s the river was dry for five to seven months. Since the 1990s, the river has not reached the sea, virtually putting an end to fishing in the delta and coastal zone."[7] Therefore overfishing is not the only factor posing a threat to people's livelihood but also changes in climatic conditions. Today the Atrek River is greatly affected, putting an end to fishing and local jobs.[8] Climate variations and changes in the

mountain ecosystems affect water quantity, but environmental pollution reduces its quality, therefore a combination of climate change and pollution threatens the availability of clean water in the area. Lack of water flowing into the Caspian disrupts the entire ecosystem and could lead to a collapse due to less food and income for fisheries.

Fluctuations in sea level, triggered by changes in climatic conditions, have been evident in this region. Researchers have observed that rainfall has increased since the 1970s in the northern parts of the Caspian basin. This is especially evident in the Volga river basin, which accounts for more than 80 percent of the water in the Caspian Sea. Therefore, in the long run, water flow in the Volga and Ural rivers will increase and raise sea levels. In Turkmenistan, the rising sea levels are evident in the Cheleken Peninsula. Any further rise will flood major waste sites and affect the Caspian Sea. In the worst case, researchers predict that there would be a sea level rise of 1-3m.[9] Such levels would cause flooding in many coastal settlements. In essence, raising sea levels could cause major damage to or loss of local infrastructure, oil fields (Goturdepe, Cheleken), and agricultural land. As climatic changes intensify, flooding could raise water levels even further (approximately 2-3m in extreme cases)[10]. According to UNEP, ENDP, UNECE, OSCE, REC and NATO:

> The most recent 2.5m rise in the Caspian Sea from 1978 till 1996, when the sea reached the highest level of -26.5m, considerably affected Atyrau province in Kazakhstan as well as Turkmenistan's shoreline. In the past ten years, however, the level of the sea has been largely stable, even dropping 1m then rising again, following a trend of seasonal fluctuation. Estimates of the damage caused by the rising sea level and wave surges in Kazakhstan's Caspian region over the period from 1978 to 1996 amount to US$1 billion, mostly due to the impacts on oil wells and coastal infrastructure. [11]

Most towns, farmland, industrial activities and oilfields are situated near the Caspian's coastal regions, thus rising sea levels and storm surges have flooded vast areas containing oil wells and important energy infrastructure. Communication and production facilities in some areas have

also submerged therefore increasing production costs, fertilizer use and unemployment. As a result, pollution levels have increased and farmlands are threatened. The Kazakh province of Atyrau has suffered the most due to the decline in agriculture. Atyrau's wastewater accumulated in the Tulaya Balka reservoir and it is just 10 km away from the Caspian Sea. Due to these negative effects, the concern over climate change is growing incredibly. Scientists have come to find that changes in sea level have been associated with climatic changes (e.g.: regional precipitation and evaporation) and human activity. With the increase of climate change and human activities in the region, the ecosystem, agriculture and human health in the surrounding area may be further affected if ignored. This could lead to political tension among the countries unless the issue is collectively and carefully managed.

Desertification around the entire northern half of the Caspian as a result of climate change is an ongoing problem. Due to desertification, agricultural production has steadily declined and has failed to supply the needs of the progressively increasing population. According to the GIWA report, "in Kazakhstan, agricultural outputs decreased by 21 percent between 1993 and 1994 and by half between 1993 and 1995."[12] The biggest food producer in Central Asia is Kazakhstan due to its large amount of arable land and its large farming sector. According to Anker, et. al, "until 2007, Tajikistan was self-sufficient in fruit and vegetables and supplied most of its own meat and dairy products. That has now begun to change, and even greens are imported from Afghanistan"[13]. Reduced domestic food production would create higher prices, and Central Asia may eventually have to rely on imports.

II. Issues

The Caspian region is affected by a number of different environmental changes, some of which are regionally and locally produced. Although the environmental issues are generated locally, they are of global interest due to the region's key natural resources: oil and natural gas. With the increase in natural resources exports, as well as foreign oil companies' increasing presence in the region, it is evident that future development will increase. Yet rapid development without consideration of environmental security can profoundly affect the livelihoods of the populations and could lead to social tension and instability, therefore decreasing the overall global energy supply. If environmental issues are left unregulated, insecurity can promote the following mechanisms: scarcity, degradation, lack of access, disputed right of resource use, and extreme natural events. Moreover, the wealth and future development in the region could slow and become less stable. As a result, a stable energy supply becomes a matter of national security and the center of geopolitical interests. These undesired consequences could limit U.S.'s involvement in the Caspian region and limit the amount of resources it could receive.

III. Options

- Stress the importance of a healthy environment in order to fuel economic growth.
- Encourage the transparency of environmental data.
- Establish environmental funds to finance projects associated with improving the Caspian environment.
- Implement and foster academic exchange programs, which will provide the young population around the Caspian region with an opportunity to see and learn more. This approach enables them to bring back knowledge and insight from abroad, and the knowledge can be used to help determine an alternative future for the Caspian.
- Create marine protected areas and implement fishing quotas on sturgeon.

- Place import quotas on caviar.
- Stimulate research in the Caspian Sea in order to improve the scientific understanding of the decreasing fish stocks.
- Educate local fisheries on the impacts they are posing.
- Facilitate in educating fisheries with eco-friendly fishing gear (e.g. biodegradable fishing line, biodegradable lures, and lead free fishing sinkers).
- To reduce unwanted toxic waste, encourage the replacement of old technology and infrastructure for oil extraction, and provide technical support on how to operate new environmentally technologies.

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[1] F Stolberg, O Borysoya, I Mitrofanov, V Barannik, and P Eghtesadi, GIWA Regional assessment 23 Caspian Sea, (Kalmar, Sweden: University of Kalmar, 2006), 14.
[2] Ibid
[3] Ibid.,17.
[4] "Caspain Sea, Iran and Caviar (CASPAIN Case)." Last modified December 21, 1995. Accessed February 26, 2012. http://www1.american.edu/TED/caspian.htm.
[5] Nicolai Aladin, and Igor Plotnikov, "The Caspian Sea: Lake Basin Management Incentive": 8-15, http://www.worldlakes.org/uploads/CaspianSeajun04.pdf (accessed February 13, 2012)
[6] Renat Perelet, "Central Asia: Background Paper on Climate Change," Human Development Report (2007): 9-10.
[7] Ibid.,61.
[8] Ibid.,60.
[9] Ibid.,61-62.
[10] Ibid., 60.
[11] Ibid, 6 0 - 6 6 .
[12] Ibid.,33.
[13] Anker, Baev, Brunstad, Overland, and Torjesen, 43.

Part IV:

Economics and Resource Allotment

Chapter Eleven

Energy Economics in the Littoral Post-Soviet States: Regional Development and the Future of Energy-Dependent Economies

Alicia Erickson

Summary

Post-Soviet socioeconomics combined with the introduction of massive oil wealth to the economies of Azerbaijan, Kazakhstan, and Turkmenistan has resulted in unequal development among regions as well as the depletion of non-energy sectors. The dissolution of the former Soviet Union drastically increased unemployment and poverty rates in the newly independent states. The introduction of oil and gas wealth in the last decade provided new opportunities for economic growth and development of infrastructure. However, it is essential for each state to avoid overdependence on natural resources to prevent economic, social, and political instability. Disparity in living conditions and job opportunities between urban and rural centers is a likely catalyst of social unrest. The U.S. should take an active role in investing in other sectors of littoral states' economies to prevent an overdependence on energy resources, expand the job market, and provide the grounds for long-term economic success. Further, the U.S. should aid in rural development throughout the region. Such action will ensure economic and social stability, which is essential to securing the Caspian region as a stable energy market for the U.S.

I. Background

Post-Soviet Economies

Kazakhstan, Azerbaijan, and Turkmenistan experienced sharp economic decline and a severe blow to their public services, particularly education, upon the dissolution of the Soviet Union. Challenges faced by the newly independent states included creating a sense of national identity, establishing market economies, and enacting institutional reforms. Economic instability, price hikes, high levels of unemployment, and decreases in standard of living shaped this decade. The GDP in Azerbaijan dropped by 60 percent during this time period and by 40 percent in Kazakhstan.[1]

Conversely, the period from 2000-2007 was defined by economic growth as a result of rapidly increasing oil and gas production coupled with high global demand for energy. Azerbaijan's economy grew 16.4 percent annually during that period and Kazakhstan's economy grew 10.1 percent annually.[2] Such wealth has contributed to significant increases in various

indicators of general well being, including export revenues, GDP/capita, and the Human Development Index (HDI). Given that the forecast for oil and gas prices is to remain high for the next several years, the economic outlook for these countries is strong.

The Dutch Disease

The danger of overdependence on natural resources is highlighted in the idea of the "Dutch disease," or the "resource curse." The Dutch disease refers to the relationship between a state's increased dependence on natural resources and a decline in the manufacturing sector of the economy. A resource-based economy is commonly defined as "one where natural resources account for more than 10 percent of the GDP and 40 percent of export."[3]

Currently, all three Caspian littoral states are at risk for the Dutch disease. Over-reliance on natural resources has the potential to cause growing inflation, real exchange rate appreciation, and high rates of export. Upon depletion of the resource(s), which in the case of the Caspian states are oil, gas, and minerals, the potential for economic instability is extremely high.[4] Yet another risk is that such wealth will not be evenly distributed, increasing the gap between rich and poor. Such unequal intrastate development poses the potential for not only economic but also social instability.

Resource Nationalism

Resource nationalism, or the manipulation of natural resources by exporter states for their own political and economic benefits, has become a real concern for states that, like the U.S., import mass amounts of resources. The definition of resource nationalism extends to include policies that aim to increase state control of natural resources by means of private actors.[5] The manipulation of resources by the state reduces the transparency of negotiations with foreign

investors, impacts the distribution of oil wealth among different geographic and demographic regions of the states, and results in inefficient government spending.[6]

The most common outcome of such control is the weakening of non-resource sectors of the economy, which feeds back into the problem of the resource curse.[7] With an increase in oil revenue, states become less dependent on citizens' taxes and thus less accountable to the people. A small upper class and large lower class, with no middle class, often emerge.[8] Currently, resource nationalism is present to a degree in the Caspian littoral states. Kazakhstan, for example, is using its resources to form foreign alliances and to capitalize on economic benefits for the state.[9]

Kazakhstan

The breakup of the Soviet Union challenged Kazakhstan's new government to assume the responsibilities of the formerly Soviet-run oil industry, which included the inheritance of the former Soviet project, the Tengiz agreement.[10] During the 1990s, exploration and exploitation of the oil reserves was inhibited by lack of expertise, Russian control over pipelines, and stalled negotiations with potential foreign investors.

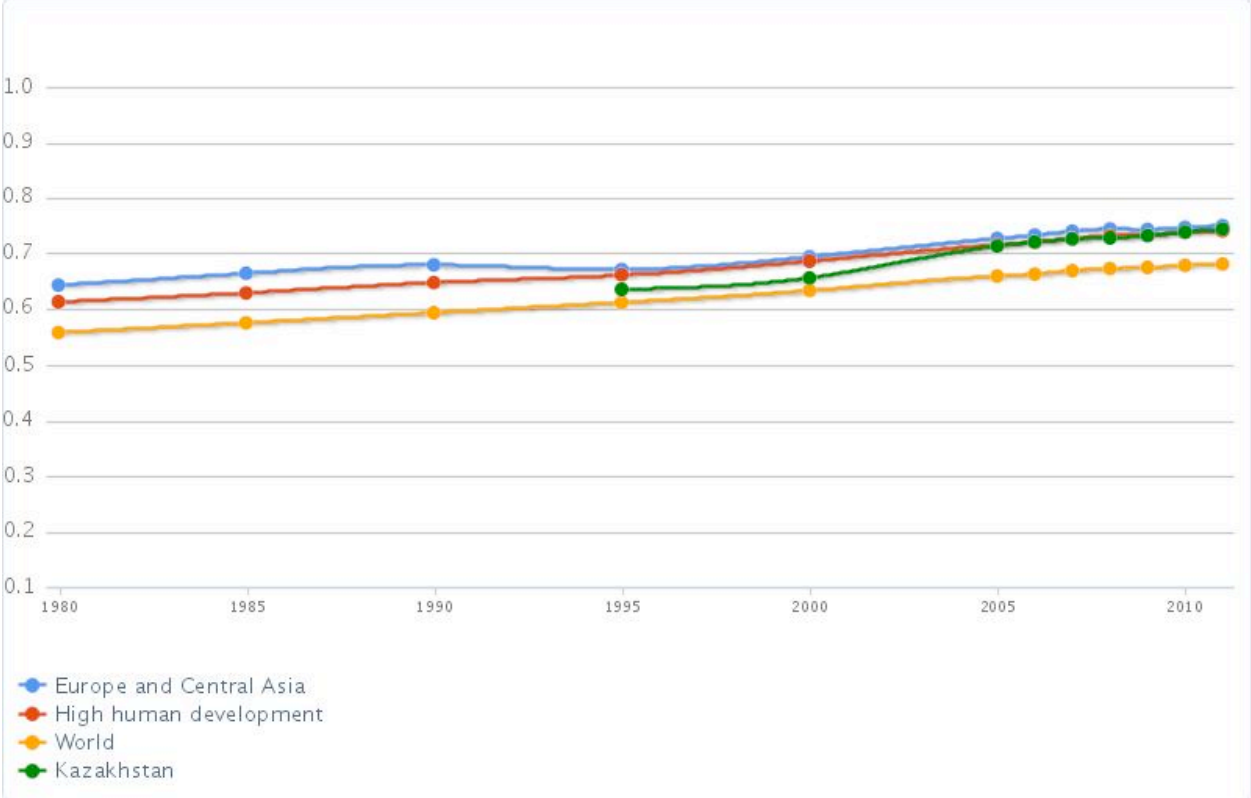
A combination of assertive macroeconomic policies and high oil prices has allowed for successful socioeconomic reforms. One of the most successful reforms was the implementation of currency convertibility in 1996, which allowed government intervention in the foreign exchange market. The introduction of currency convertibility greatly improved Kazakhstan's trade and its foreign exchange, which are essential to its role as a hydrocarbon exporter.[11] The resolution of obstacles in oil production and exporting coupled with the rise in oil prices led to economic growth at a level of about 10 percent annually.[12] Since 2000, economic developments include the aforementioned economic growth of about 10 percent per year, halving the

unemployment rate and tripling the per capita income.[13] Kazakhstan's overall poverty rate decreased from 30 percent in 2001 to 20 percent in 2003 to 18 percent in 2006.[14] Along with a general increase in per capita income came improved access to access and reliability of electricity and the expansion of service and retail facilities. Improvement of electricity supply has largely been a result of numerous international investment projects, including the most recent loan of 15 million euros from the EBRD. The EBRD project aims to improve electricity-related technology and infrastructure and improve electricity efficiency by up to 25 percent per year.[15] Investment was also funneled into improving private and higher education.[16] While such reforms have helped stabilize Kazakhstan's economy and improve standards of living, repercussions of the high growth have included a debt overhang and a domestic banking crisis in 2007.[17]

The HDI has tracked Kazakhstan's progressive growth since 1995, and now ranks it as a high development country. While Kazakhstan still ranks lower than the regional average (which includes Europe and Central Asia) of 0.751 with an average of 0.745, it still ranks highest among the three states in question in this report (see **Figure 35**).

While the introduction of hydrocarbon revenues has stimulated Kazakhstan's economic growth and development, it also threatens the stability of its economy. Overreliance on oil and gas revenues is a direct cause of unequal development between rural and urban regions. As of 2010, the oil sector accounted for 11.5 percent of GDP, oil exports accounted for 57 percent of the total exports of goods and services, and oil extraction and exports constituted 46 percent of Kazakhstan's revenues. The majority of FDI is directed at extraction of hydrocarbons (at 75.2 percent in 2010).[18] Large-scale export of hydrocarbon resources has resulted in an influx of foreign currencies and, consequently, rising inflation. [19] The inflation rate rose from 6.6 percent

Figure 35: Kazakhstan's HDI rating. (Source: http://hdrstats.undp.org/en/countries/profiles/KAZ.html).



in 2002 to its highest at 10.7 percent in 2007. However, as of 2011, it is back down to between 6.5-7 percent.[20]

The influence of energy-dominated markets is evident in the declining prominence of agricultural sectors of Kazakhstan's economy and resultant social unrest. In the late 1990s, discontent began to mount among local populations, primarily in the oil-rich Artyrau province, as sub-contractors (mainly from non-Western states, such as Turkey) of foreign oil companies began laying off local staff and replacing them with foreign specialists. In response, the Nazarbayev regime introduced new political and economic measures to promote local labor and protect the local job market.[21]

As of 2007, however, agriculture in the province of Artyrau made up only 3 percent of the GDP, whereas in the early 1990s it accounted for 22 percent of the GDP.[22] Artyrau experienced rising unrest as it became a center for oil production. Redistribution of oil revenue

and an apparent gap between wages of local employees of the oil industry and foreign employees of oil companies were two key triggers of unrest. Such reduction in the manufacturing and agricultural sectors has two key consequences. First, it has narrowed the job market and the variety of skills needed to attain a secure job. Second, this reduction has also resulted in state neglect of the manufacturing and agricultural industries, two essential sectors of the economy, which are responsible for producing food and basic products. Poverty and deindustrialization remain as further possible consequences of this economic shift.

The global financial crisis in 2008 aggravated Kazakhstan's economic situation. The sharp drop in oil and commodity prices in 2008 caused Kazakhstan to go into a recession. Kazakhstan's overreliance on energy resources become especially apparent during this crisis, resulting in reforms aimed at stabilizing and diversifying the economy. The government devalued Kazakhstan's currency, the tenge, in order to stabilize market pressures, and additionally invested US$19 billion to stimulate the economy.[23] Between 2010 and 2011, the economy grew by about 7 percent, proving that the current reforms and the rise in oil prices had been a success. Despite its recent economic comeback, Kazakhstan recognizes the need to protect itself from the Dutch disease and in 2011 adopted an extensive diversification program, which aims at targeting economic sectors such as transport, pharmaceuticals, telecommunications, and petrochemicals.[24]

Azerbaijan

Before independence, Azerbaijan was one of the poorest republics in the former Soviet Union, with about one-third of its population below the poverty line.[25] Following independence, the country's GDP per capita dropped from US$1,347 in 1989 to US$518 in 2000.[26] Widespread market privatization left employees of formerly state-owned enterprises to find jobs within the

informal sector, and led to a significant decline in government-provided social and public services.[27]

The introduction of oil in the last decade, however, has opened up new possibilities for economic growth. In 1994, Azerbaijan, along with a consortium of oil companies from the U.S., the UK, Turkey, Russia, and Saudi Arabia, signed a contract agreeing to invest US$8 billion in Azerbaijani oil companies over the next 30 years.[28] This contract marked the state's divorce from Russian economics, a new alliance with the West, and a new opportunity to develop its economy.[29] For Azerbaijan's national social and economic security, as well as for the U.S.'s investment in Azerbaijan as a major supplier of energy resources, long-term development and security is essential. In 2006, major energy-related developments emerged, the most notable among them being the operation of the BTC pipeline and the first gas extractions in the Shakh Deniz deposit. These two developments will be major determinants of Azerbaijan's long-term development strategy and will be crucial to strengthening Azerbaijan's economy through substantial growth, regional development projects, and increasing global competitiveness."[30] As of 2011, GDP per capita had risen to US$10,200.[31]

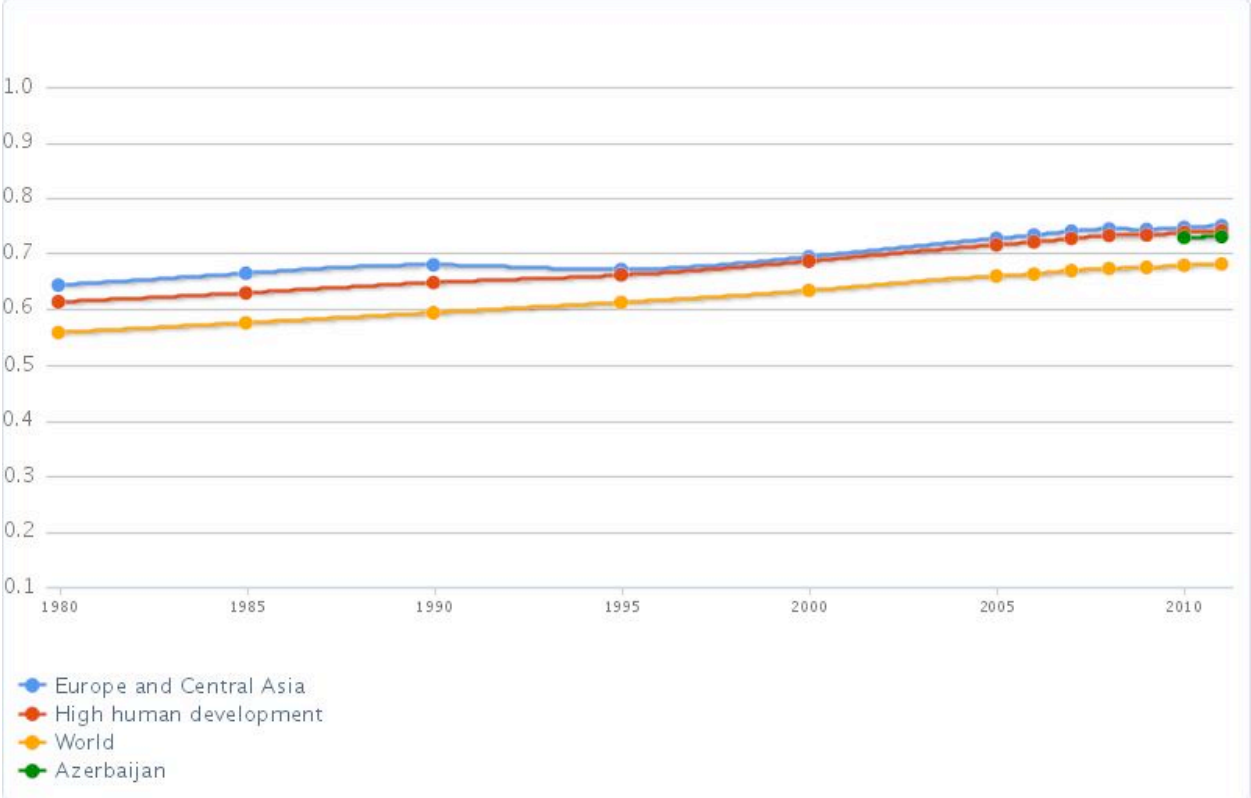
Although oil wealth has undoubtedly played a significant role in triggering economic growth and regional development, this growth has recently slowed down. In 2007, Azerbaijan's GDP growth rate was approximately 30 percent; as of 2011, it was less than 4 percent.[32] This trend signals the need to diversify the Azerbaijani economy in order to maintain development. In response, President Aliyev announced plans to develop other sectors of the economy, stating that "oil and gas have provided us with the opportunity to invest in human capital."[33] One area of particular focus is information and communications technology (ICT), which Aliyev has described as a key component in the creation of a more knowledge-based, sustainable economy.

Additionally, President Aliyev's joined of the United Nations World Tourism Organization (UNWTO) and World Travel and Tourism Council (WTTC) Global Leaders for Tourism Campaign in November 2011. The President has emphasized the importance of tourism for Azerbaijan's economy and pledged to increase investments in infrastructure. These efforts aim to develop all regions of Azerbaijan as equally as possible as well as to curb the number of people migrating to Baku in search of jobs.[34] The tourism sector is projected to increase employment by 8.3 percent in the next ten years.[35]

Since 2005, Azerbaijan has strove to increase public investments, which rose by over 100 percent between 2005 and 2007.[36] Public investment was intended to increase the amount of capital allotted for the production of public services and goods, such as the improvement of technology and machinery and renovation of public assets. Further, Azerbaijan aims to increase job creation throughout the country through public investment.[37] Evidence of Azerbaijan's efforts to invest in sectors essential to improving the standards of living—education, health, gender equality, employment—is instrumental in its high HDI righting However, Azerbaijan still falls below the regional average of HDI 0.751 with an HDI score of 0.731 (See **Figure 36).**

Although oil money is Azerbaijan's current largest source of economic revenue, the wealth is not being distributed equally to benefit all demographics and geographic regions of the country. An estimated US$160 billion is projected to flow into the country from oil over the next two decades, and its distribution is central to the socioeconomic stability and development of Azerbaijan.[38] While Baku is already benefiting from oil income, rural areas outside the capital are not experiencing the same level of economic growth. Forty percent of the population lives below the poverty line; crumbling infrastructure and frozen salaries are among the grievances

Figure 36: Azerbaijan's HDI rating. (Source: http://hdrstats.undp.org/en/countries/profiles/AZE.html).



of rural populations.[39] Ingilab Ahmadov, Director of the Public Finance Monitoring Center in Baku, warns that, "If you have this money coming in and you don't have a clear and transparent government system, you will have corruption. It means you will have a very unstable social situation."[40] The potential for corruption also impedes foreign investment in Azerbaijani oil markets. Consequently, Azerbaijan has less FDI than Ukraine, Belarus, and Georgia, three non-resource-rich countries in the region.[41]

Finally, IDPs, who account for approximately ten percent of Azerbaijan's population, add significant pressure to the stability of Azerbaijan's economy and development and contributes to increasing the poverty rates in rural areas.[42] IDPs are largely a result of Azerbaijan's 1988-1994 disputes with Armenia over Nagorno-Karabakh.[43] Most have been relocated into government-funded housing projects, which are largely located in isolated areas lacking employment opportunities. The city of Mingechevir currently hosts 100,000 people, 20,000 of whom are

IDPs. Mingechevir's infrastructure has deteriorated since the fall of the Soviet Union, and industrial output is only at about 20 percent of pre-independence levels.[44] IDPs are unable to participate in the newly booming construction and industry sectors and are losing employment opportunities as the economic presence of agricultural sector decreases in favor of the energy industry.[45] Conversely, the IDPs living in Baku are generally unable to integrate into the local, energy-centric workforce due to their background in agriculture.

Turkmenistan

Before independence and into the 21st century, cotton and natural gas have been Turkmenistan's two main sources of national revenue. [46] Post-independence, market privatization accelerated the development of Turkmenistan's energy industry and it became the propeller behind the state's political and economic evolution. As of 2010, Turkmenistan's oil production was at 216,000 bbls per day and exports were at 97,430 bbls/day. In 2010, natural gas production was at 42.4 Bcm and natural gas exports at 18 Bcm.[47]

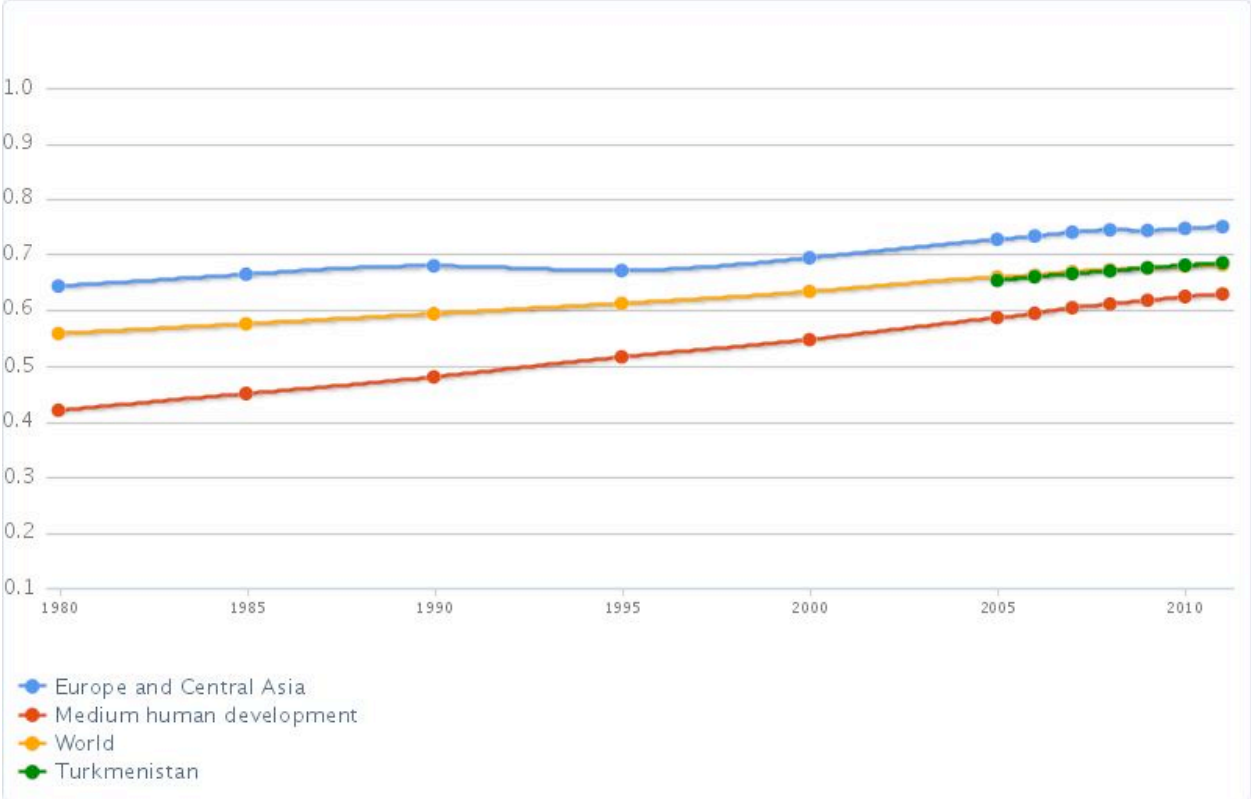
The socioeconomic transition from socialism under the Soviet Union to independence under the Niyazov regime has been characterized by failed social and economic reforms and unfulfilled promises. In the early 1990s, with the hope of oil wealth on the horizon, Niyazov announced that the government would provide subsidized housing and free electricity, gas, water, hot water, heating, and sanitation.[48] Niyazov followed through on some of these promises, all of which were funded by gas wealth. However, in 1999, gas production declined and export revenues plummeted, resulting in severe electricity rationing and food shortages. The decline in gas production was largely a consequence of political disagreements with Russia and difficulties gaining access to Russia's gas pipeline network.[49] The government failed to introduce further significant post-Soviet reforms such as reduction of state dominance, monetization of the

economy, and price liberalization.[50] The eventual economic gains of the state were used to support Niyazov's authoritarian government rather than improve public services and infrastructure; health facilities lost funding and Niyazov eliminated public education.

President Berdymukhammedov, elected in 2006, has maintained the general climate of his predecessor's regime. Unemployment is projected to be the most severe in Turkmenistan out of all the Caspian littoral states, and is currently estimated to be 60 percent.[51] Unemployment persists as a result of state neglect of public education, lack of opportunities for graduates, and the unpredictability of agricultural jobs.[52] With 60 percent of the population living in rural regions, the declining opportunities for jobs outside urban centers is highly problematic.[53] Such trends both detract from viable employment opportunities and lead to the decline of two essential sectors of the economy, agriculture and manufacturing.[54] Currently, Turkmenistan ranks as having medium human development on the HDI (see **Figure 36)**. It still remains far below the regional average of 0.751 with a rating of 0.686, placing it as the lowest of the Caspian's three littoral post-Soviet states.

Oil and gas resources have the potential to expand Turkmenistan's economy and improve living conditions for citizens. However, government regulations have impeded many of the possibilities for development. The combination of Turkmenistan's poorly developed banking system and rigid control over its energy sector has deterred FDI and inhibited general economic development. " Foreign investment is essential for the development of Turkmenistan as an energy resource supplier. However, "due to difficulties dealing with the regime," major oil firms are deterred from exploration of oil fields and investment in Turkmenistan.[55] The strict authoritarian nature of the regime is the most problematic obstacle impeding Turkmenistan's potential as a primary exporter of oil.

Figure 37: Turkmenistan's HDI rating. (Source: http://hdrstats.undp.org/en/countries/profiles/TKM.html).



Turkmenistan's strict regime and its use of hydrocarbon revenue are central to its status as a future source of revenue for the U.S. With the idea that development follows good governance, the World Bank, International Monetary Fund (IMF), and EBRD have begun to assist Turkmenistan in privatizing and modernizing its financial and banking sectors, and improving public services such as transportation and water quality.[56] Western governments, international organizations such as the OSCE, and NGOs have also begun to place pressure on Turkmenistan to conform to international standards. The 2008 U.S. State Department report on human rights cites limited progress in Turkmenistan, and is critical of its continued abuse of basic rights and restriction of political and civil liberties, including "citizens' inability to change their government; torture and mistreatment of detainees; arbitrary arrest and detention…denial of due process and fair trial; restrictions on freedom of speech, press, assembly, and association;

restrictions on religious freedom."[57] Turkmenistan's reliability as an exporter will depend on the ability of external states and organizations to successfully alter its rigid restrictions.

II. Issues

Kazakhstan, Azerbaijan, and Turkmenistan are vulnerable to three key repercussions of their growing energy markets: price swings, a limited economic base, and economic inequality among regional populations. Each of these factors threatens the economic, political, and social stability of the Caspian region, which could impede the United States' ability to rely on them as sustainable sources for hydrocarbons. The challenge for these states is to maintain a balanced economy and ensure equal development among rural and urban regions.

Currently, energy resources dominate the exports and overall economies of each state.[58] A country can avoid the resource curse and its aforementioned dangers if it has strong institutions, sound economic policy, and a well-managed petroleum fund. Without economic diversification, a nation will be ill prepared for when these begin to deplete, leading to a rapid decline in economic stability. State reliance on energy exports has left inequality gaps among intrastate populations. Capital cities are reaping benefits from the oil revenues, but the majority of citizens, outside the bounds of the major cities, are not. All of the littoral states have large rural populations who are unable to access the new job markets. Investment in rural areas by both the local governments and the U.S. will diversify the economy, curb regional disparities, and prevent a massive influx of people to urban areas. Prevention of migration to urban areas is especially crucial in avoiding overpopulated urban centers and over-pressured urban infrastructure and job markets. IDPs in Azerbaijan are among those most vulnerable to shifting income distribution.

Finally, in order for Kazakhstan, Azerbaijan, and Turkmenistan to be stable sources of hydrocarbons, they require reliable market economies and privatization. If these states establish more reliable market economies they will attract more foreign investment, which in the long run will increase development in the energy sector as well as in other state industries. Lack of privatization is especially apparent in Turkmenistan, where the government maintains tight control over banks and enterprises, and mandates highly restrictive trade.[59] Foreign investment is always subject to the policies and control of the littoral states' governments. State policies towards foreign investors in all three states are often arbitrary or come with ulterior motives, such as requiring foreign companies to train and hire locals, invest in social projects in the region, and use local inputs.[60]

III. Options

The focal point of U.S. interests in the Caspian region is to maintain Kazakhstan, Azerbaijan, and Turkmenistan as reliable sources of hydrocarbons. To achieve the ultimate goal of stability the U.S. should invest in a few main reforms in these states. Rural and infrastructure development, the diversification of the economy, the expansion of the job market, the integration of Azerbaijan's IDPs, privatization of Caspian economies, and the encouragement of peaceful governance, are the six focus points required for the U.S. to play a role in the long-term maintenance of social and economic stability in the region.

The first area requiring attention is infrastructure development, with an emphasis on aid to rural regions to ensure more equal statewide development and expand the job market. Investing in rural development programs, primarily the improvement of public services (transportation, education, water accessibilities, and health facilities), would raise living standards, ensure greater statewide equality, and lower the probability of social instability while

providing jobs. In 2009, the Obama Administration increased aid to Central Asia to US$494.5 million.[61] It is possible for legislation to provide loans with this aid. Additionally, mplementation of microfinance opportunities through a microfinance bank for rural populations can create employment opportunities and encourage independent innovation.

In urban areas, infrastructure development must target the same public services as rural communities. The construction of new infrastructure would provide new jobs both during the projects and with the development of new health, education, transportation, and other service facilities. Further, the introduction of environmental protection programs can expand the job market as well as promote sustainability. Past models of infrastructure investment include loans in 1999 to improve electricity in Kazakhstan and create a competitive electricity market with the Kazakhstan Electricity Grid Operating Company (KEGOC). Improvement of equipment, increased reliability of electrical supply, and installation of a computer-based Management Information System were among the goals. Contributors included the World Bank, EBRD, and KEGOC, and the project cost US258.4 million with a 20- to 25-year range for completion.[62]

The second area of focus should be on economic diversification. By using some of the budgeted aid for Central Asia in investment in tourism, this has the potential to improve relations with the states and increase access to energy sources. Other viable options for economic diversification include investment in the communications and the agricultural sectors. Azerbaijan currently has plans to invest in IT and telecom development. In the agricultural sector, AgroLeasing, a state-owned company, is the only source of machinery and fertilizers. AgroLeasing is reportedly corrupt and inefficient, and only "leases machinery, equipment and fertilizers to farmers allegedly on favorable conditions."[63] Conditions for Azeri farmers are improving, partially due to the increased availability of government loans. The U.S. could invest

in providing small loans for farmers and providing new equipment and fertilizers. Investment in the agricultural sectors of the Caspian littoral states has the potential to improve the standards of living for people living outside major cities, decrease regional disparities, and provide overall economic and social stability in the region. Finally, Baku is also worth consideration for U.S. investment as a transport hub for hydrocarbons coming from Turkmenistan and Kazakhstan. The use of Baku as a transport hub will add another dimension to the economy and aid in the expansion of the job market for Azerbaijan. While this is not a large enough project to provide national employment, it will absolutely aid in the diversification of the economy.

The third area that requires action is the issue the IDPs in Azerbaijan. The Azerbaijani government is currently a primary investor for IDP-related development projects.[64] Research by the United Nations Refugee Agency in 2002 found that less NGO intervention has proven to be most beneficial.[65] Instead, U.S. support of major national programs like the Social Development Fund for Internally Displaced Persons (SDFI) would be most valuable. However, these programs are limited by the government's desire to keep IDP populations isolated. Policy makers should refer to "Proposed Grant Assistance to the Republic of Azerbaijan for the Integration of IDPs" from the Asian Development Bank, which outlines a viable project intended to integrate and create job opportunities for IDPs.[66] The main goals include providing housing, services, and infrastructure, improving educational, social, and health facilities, and supporting IDP relocation to areas with economic opportunities.[67] The program's projected costs were US$3,000,000. US$1,452,021 would be used for the upgrade of shelters and services for IDPs; US$319,332 would be used for school rehabilitation; US$301,600 for microfinance programs; US$54,000 for community renewal institutions; US$353,047 for project management; and US$20,000 for poverty impact assessment.[68]

Privatization is also a goal to which U.S. policy should be oriented. It would be beneficial for the U.S. to foster relations with private companies in the littoral states in order to encourage privatization. In the long run, privatization would reduce the risk of investing in corrupt, government-run companies, increase transparency in agreements, and reduce the threat of resource nationalism.

Finally, U.S. policy must address Turkmenistan's authoritarian state and human rights abuses. During the late 1990s, the U.S. attempted to promote human rights and economic and social reform. However, without the cooperation or investment of the Turkmen government, such policy changes have been difficult to implement. While the U.S. in the past has provided some assistance, including the FREEDOM Support Act Funds and the Defense Department humanitarian funds, Turkmenistan has consistently received the least amount of U.S. funding among the CIS.[69] The establishment of concrete terms of agreement is essential when negotiating treaties regarding U.S. investment and trade with Turkmenistan and should be grounded in the encouragement of improvement of human rights and good governance. While the U.S. should not entirely cut off ties with Turkmenistan, it would be in the U.S.'s best interests to channel the majority of its resources into Kazakhstan and Azerbaijan, whose governments are more cooperative and show more potential for sustained development.

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Chapter Twelve

Sovereign Wealth Funds and Public Spending

Wing Chung (Alex) Lee

Summary

This chapter presents background information on sovereign wealth funds (SWFs) in the Caspian region (excluding Iran). Most Caspian SWFs are stabilization funds, a specific type of SWF that is designed to protect a nation's economy from the effects of major revenue influx brought about by the export of oil, gas and other natural resources. Most of the stabilization funds reserve their natural resources revenues for future savings, but generally a certain percentage of the fund is used for public spending. In the latter part of this chapter, the issues section introduces the primary imperatives that the Caspian states and their SWFs are currently facing (e.g. diversifying their economies, increasing transparency for SWFs, etc.), as well as an option section that presents the policy recommendations that the U.S. should act upon (e.g. contributing towards the development of the Santiago Principles and Assisting Caspian states in World Trade Organization Accession Process).

I. Background

Introduction to Sovereign Wealth Funds

A sovereign wealth fund (SWF) is a government-owned pool of money that allows a country to use its excess revenues to invest in projects that benefit its citizens and economy. The sources of such revenues include foreign exchange assets derived from the export sales of oil, gas, and mineral reserves. In February 2012, JP Morgan Asset Management indicates that the SWFs together held approximately US$4 trillion in total assets[1] at the end of 2011 and it is expected to grow 5 to 7 percent this year.[2]

The first SWF was created by the Kuwaiti government in 1953 for diversifying their oil revenues.[3] Over the last 60 years, many governments have established different types of SWFs to reinvest their revenues for future generations, and now there are more than 50 SWFs have been established in 35 countries.[4] Revenues are mainly drawn from "fiscal surpluses; official foreign currency operations; the proceeds of privatizations; or receipts resulting from exports of commodities such as oil, diamonds, and copper."[5]

The SWFs of the Caspian region are mainly stabilization funds, a specific type of SWF. These funds protect a nation's economy from the effects of major revenue influx brought about by the export of oil, gas and other natural resources. The revenues of each SWF's assets are determined by the difference between the market price of the natural resource and the cost of extraction.[6] Therefore, contrary to traditional fiscal revenues, the revenues from natural resources are very volatile due to price changes in global commodities markets.[7] In addition, the finite amount of natural resources means that the income stream will eventually decline, perhaps precipitously, and reach depletion.[8]

Unstable natural resource revenues have posed a problem in the past. The objectives of stabilization SWFs were therefore established to counter such issues. One of the notorious examples of a country that relied on revenues from natural resources can be found in the Netherlands, for which *The Economist* coined the term "Dutch disease" to describe the downfall of their manufacturing sector after the discovery of natural gas deposits in the North Sea in the 1960s.[9] In the short and medium term, the state must be cautious about the natural resource prices. The government should accumulate savings and spend less when the market price is high and minimize government expenditure when the market price is low. In the long run, in order to maximize future government expenditure, a percentage of natural resource revenues should be saved in the central bank and the rest should be invested by the stabilization SWFs.[10] Investing in physical capital, human capital, and/or financial assets can diversify the government's income portfolio and prolong the life of the natural resource revenues.[11]

The resource-rich countries of the Caspian region have created stabilization SWFs to mitigate the risks of boom and bust cycles. However, some research studies have shown that stabilization SWFs suffering from political pressures tend to create "twin problems of

overoptimistic price forecasts and insufficient concern for long-term fiscal sustainability".[12] An effective stabilization SWF, researchers suggest, must have appropriate rules of operation that are followed in practice.[13]

SWFs in the Caspian Region

Azerbaijan

In 2000, former President of Azerbaijan Heydar Aliyev created the State Oil Fund of the Republic of Azerbaijan (SOFAZ) for accumulating and managing oil revenues. The objectives of SOFAZ include maintaining macroeconomic stability, decreasing dependence on oil revenues, diversifying the economy of non-oil sector, ensuring enough of country's oil wealth for future generations, and financing major national scale projects.[14] The President is responsible for overseeing the entire Fund's execution and appointing the supervisory board members.[15] As of the end of 2011, the total assets of SOFAZ are US$29.8 billion (see **Figure 38**).[16]

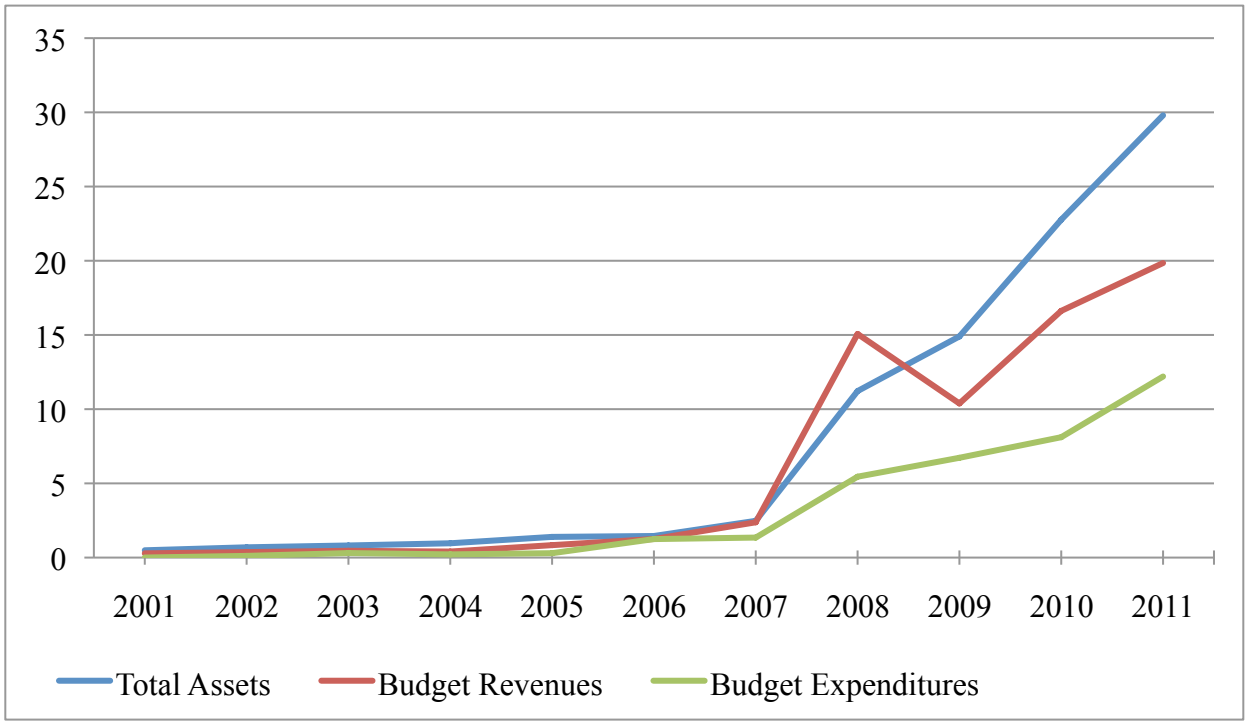

Figure 38: SOFAZ Annual Statement, 2001-2011 (US$billion). (Data: www.oilfund.az).

According to the SOFAZ Revenue and Expenditure Statement for 2011, the US$19.7 billion revenues of SOFAZ come from proceeds from profit oil and gas sales (97.6 percent), dividends from BTC project (0.43 percent), revenues from management of the Fund's assets (1.1 percent), price adjustment revenues under Shah Deniz Phase I (0.65 percent), transit fees (0.05 percent), bonus payments (0.1 percent), acreage fees (0.01 percent), and other revenues (0.01 percent).[17] Further, 95.7 percent of the US$11.5 billion Fund's expenditure was transferred to the state budget, 3.7 percent for infrastructure and social projects, and 0.6 percent for administrative expenses.[18] Of the US$444.8 million infrastructures and social project's expenditure, SOFAZ provided the funding for housing refugees and IDPs, improving water pipelines and irrigation infrastructures, and financing outstanding students to study abroad.[19] All of these projects were enacted according to the Long-Term Strategy on the Management of Oil and Gas Revenues, which President Ilham Aliyev approved in September 2004.[20]

Recently, with oil production in Azerbaijan is expected to reach its peak this year,[21] President Aliyev has approved SOFAZ to invest in gold,[22] private equities,[23] and real estate[24] to pursue a more liberal investment strategy with its investment portfolio in non-oil sector. Back in 2005, the Investment Policy of SOFAZ stated that "foreign currency assets of [SOFAZ] should not be invested in purchasing precious metal and stones, real estate and goods."[25] However, as the overall economy has been slowing down since the global financial crisis in 2007-2009, many countries' SWFs including Azerbaijan have been diversifying their investment portfolios by investing in financial and physical assets other than fixed income securities.

Among the SWFs of the Caspian states, SOFAZ is the most transparent SWF, and Azerbaijan generally regarded as a supporter of transparency.[26] In September 2002 when then-Prime Minister Tony Blair of United Kingdom launched the Extractive Industries Transparency

Initiative (EITI), which aims to increase the transparency of the oil, gas, and mining companies in the resource rich countries, Azerbaijan was the first country to join the initiative and embrace its principles.[27] In February 2009, Azerbaijan achieved status as an EITI Compliant, in which the compliant country must follow the EITI principles such as "instituted a regular process of disclosing, reconciling and publishing company payments and government receipts."[28] At the Sovereign Wealth Fund Institution's website, the Linaburg-Maduell transparency index shows that SOFAZ achieved a score of 10 out of 10 in the 3rd quarter of 2011.[29] This is considered as a relatively high score since of the 44 listed SWFs, only 9 other countries[30] achieved such a score.

Kazakhstan

The National Fund of the Republic of Kazakhstan (NFRK) was established in 2000 under a decree by President Nursultan Nazarbaev, who modeled it on the Norwegian petroleum SWF.[31] Managing by the National Bank of Kazakhstan (NBK) on behalf of the government, the fund is intended for both stabilization and as a savings fund as the oil prices and outputs were rising.[32] Since 2007, the NFRK has received all central government oil revenues on oil sector enterprises[33] (except for taxes that transfer to local budgets), which constitutes as the principal revenues for the Fund.[34] In addition, its total revenues also include proceeds from oil sector's operations, privatization of state property in mining and processing sectors, sale of agricultural land, and investment income from the Fund management.[35]

The NFRK will be responsible for paying for development-related expenditures and to transfer money to the government if and when there is a budget deficit.[36] During the global financial crisis in 2007-2009, NFRK had carried out stabilization measures by allocating resources to the financial sector, housing sector, small and medium enterprises, agro-industrial complex, and industrial and infrastructural projects.[37]

Prior to 2007, according to the Kazakhstani government, 10 percent of all oil revenues were guaranteed to be transferred to the NFRK savings account every quarter regardless of the actual oil price. This left 90 percent for government spending.[38] When the actual price of the oil exceeds the NFRK reference level for the oil, gas, and four metals (chrome, zinc, lead, and copper) market price, the excess oil revenues will go to the stabilization fund account for yield-seeking investments; when the actual price is lower, a portion of the stabilization fund will be used to balance out the shortfall of government deficit if necessary.[39]

However, with the volatility of the oil price in the last decade, the Kazakhstani government decided to modify the NFRK model. Starting in 2010, US$8 billion is guaranteed to transfer to the republican budget annually, while a minimum NFRK balance of 20% of the forecast GDP is transferred to the savings account.[40] In 2011, NFRK has accumulated US$ 45.5 billion (see **Figure 39**).

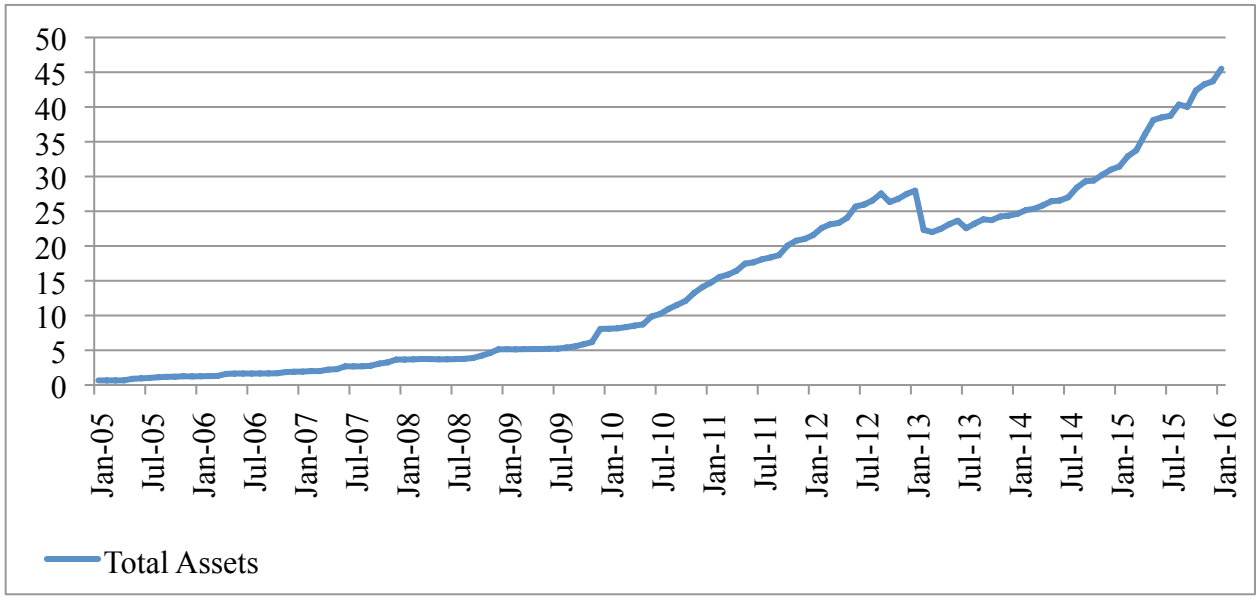

Figure 39: NFRK total assets, 2005-2016 (US$billion). (Data: www.nationalbank.kz).

Throughout the mid-2000s, the NFRK was criticized for its investment abroad. The NFRK uses the savings account for long-term investment (80 percent of the fund) and the

stabilization account for short-term investment (20 percent of the fund).[41] All of the invested assets are off-shored to "sterilize the economy against appreciation of the real exchange rate."[42] Critics argue that because Kazakhstan is a developing country with low physical and human capital, the country would make a better return if the NFRK invested the oil revenues in domestic social and capital spending rather than gaining profit from the foreign financial returns.[43] During the 2007-2009 financial crisis, the Kazakhstani government was heavily exposed to the global economic downturn; the entire NFRK portfolio was invested abroad and 64.9 percent, ratio of external debt to GDP, was foreign financial assets in 2004.[44]

Another common criticism of the NFRK is the political structure of its operation. Under the operation rules for the NFRK, the parliament has a limited role in deciding the use of resource-related revenues.[45] Instead, President Nazarbayev has sole authority to oversee the operations of the NFRK, including "creation of binding regulations, oversight provisions and the approval of the external auditing."[46] NGOs such as the Revenue Watch Institute and Human Right Watch worry that the fund will be used improperly and lead to corruption within the state.[47] In addition, despite the fact that the NBK publishes reports for the Ministry of Finance, only a shortened version of the report is available to the public. The public NFRK reports reveals the total amounts of assets, inflows received, expenditures, and interest earned by the fund, but none of the reports publish information on the fund regarding government spending and individual company payments.[48]

To further diversify Kazakhstan's oil revenues, the government created SWF Samruk-Kazyna, a state financial vehicle, to ensure sustainable development in the country. Under the Decree of President of the Republic of Kazakhstan dated October 13, 2008 No. 669 and Decree of the Government of the Republic of Kazakhstan dated October 17, 2008 No. 962, Samruk-

Kazyna was established from the merger of two state-owned holding companies, Samruk State Fund of Sustainable Development and Kazyna State Holding.[49]

At the beginning, without sufficient capitals to initiate the financial plans, the Kazakhstani government had received US$10 billion credit line in China, US$3.5 billion credit line in Russia, and US$1 billion credit line in the UAE.[50] In 2009, the NFRK also provided US$9 billion to Samruk-Kazyna during the global financial crisis.[51] Now, after series of successful government strategic plans, Samruk-Kazyna has accumulated US$ 90 billion worth of assets in early 2012.[52] The emergence of the fund has allowed the Kazakhstani government to consolidate most of the key companies (oil, gas, chemical, airline, bank and etc.) into national assets (see **Figure 40**).[53]

Name of Subsidiary and Affiliated Organization	Shares of Participation
KazMunayGas	100%
Samruk-Energy	94%
Alliance Bank	67%
Kazakhstan Temir Zholy	100%
Kazatomprom	100%
Kzakhtelecom	51%
Air Astana	51%
BTA Bank	81.5%
Kazakhstan Electricity Grid Operating Company	100%
SK-Pharmaceuticals	100%

Figure 40: Selected subsidiary and affiliated organizations of Samruk-Kazyna, 2010. (Data: www.sk.kz).

Russian Federation

Initially, the Stabilization Fund of the Russian Federation was established in January 2004 to "serve as an important tool for absorbing excessive liquidity, reducing inflationary pressure and insulating the economy from volatility of raw material export earnings."[54] The Fund was further intended to hedge against the risk of future decline in oil prices on federal budget revenues. In July 2007, the Russian government divided the Fund into a Reserve Fund and a

National Welfare Fund (NWF) – two brand new entities.[55] The Reserve Fund is basically a substitute of the original Fund, with the exception that it accumulates revenues from the production and export of natural gas and oil products in addition of federal budget revenues from the production and export of oil.[56] The NWF was created to support the pension system by investing in long-term, stable foreign securities.[57]

According to the Ministry of Finance of Russian Federation, the size of the oil and gas revenues equal to 3.7 percent of forecasted GDP in the corresponding fiscal year is used to finance the federal budget expenditures. Of the remaining oil and gas revenues, the Reserve Fund receives an amount equivalent to 10% of forecasted GDP in the corresponding fiscal year, and the rest is transferred to the NWF. However, since the Russian government had been drawing the reserves to cover its budget deficit before and during the global financial crisis in 2007-2009, the size of the Reserve Fund had shrank fivefold between March 2009 and January 2011 from US$ 137 billion to US$ 25 billion (see **Figure 41**). Therefore, in order to stop further declination of total assets in the Reserve Fund, the government approved the amendments to cease the transfer of oil and gas revenues to the Reserve Fund and the NWF,[58] and to allow all the oil and gas revenues to finance the federal budget expenditures till January 2014.[59]

For the Funds investment strategy, the Reserve Fund invests in foreign currencies and short-term bonds denominated in foreign currencies (AA- or higher for Fitch and S&P, and Aa3 or higher for Moody's),[60] whereas the NWF invests in foreign currencies and long-term bonds and equities in both foreign (same rating criteria as Reserve Fund) and domestic (BBB- or higher for Fitch and S&P, and Baa3 or higher for Moody's) currencies.[61] Both Funds are managed by the Russia's Ministry of Finance and Bank of Russia, with the exception that the NWF might be assisted by domestic financial entities to exercise some specialized functions.

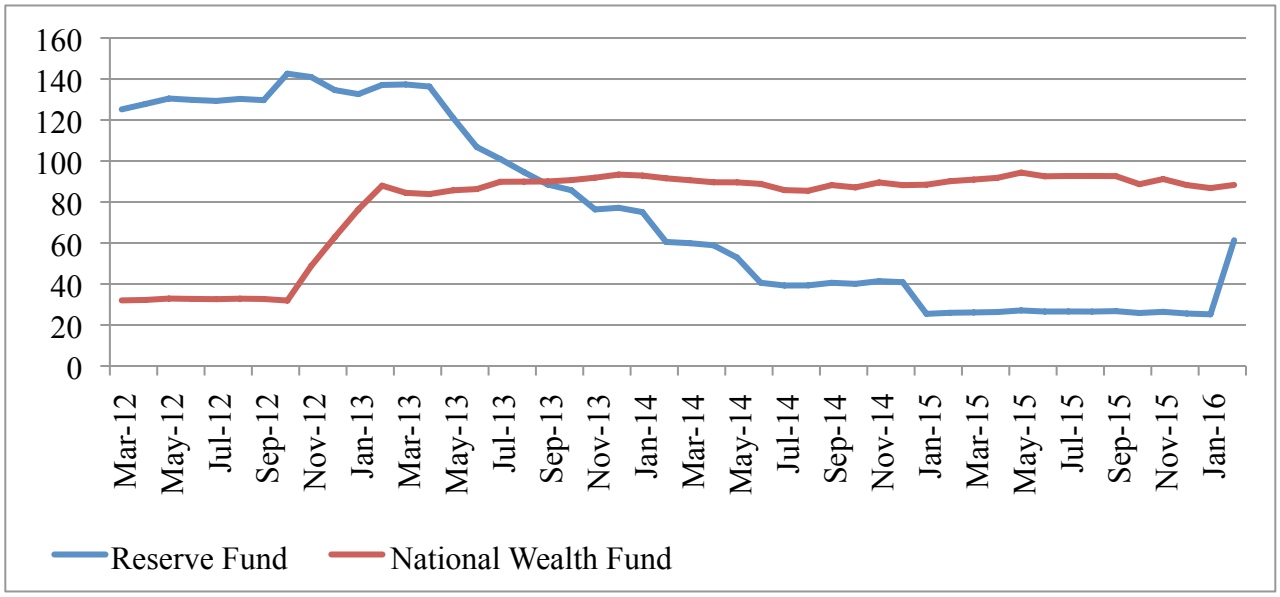

Figure 41: Reserve Fund and NWF total assets, 2008-2011 (US$ billion). (Data: www.minfin.ru/en).

For the NWF, another use of it is transferring money to Vnesheconombank (VEB), the Russian financial vehicle that was established after the merger of Bank for Foreign Economic Affairs of the USSR (Vnesheconombank USSR), the Russian Development Bank (RDB) and Roseximbank in 2006.[62] Between January and October 2011, the NWF transferred USD 1 billion to VEB, holding a total deposit of RUB 455 billion and USD 6.3 billion from the NWF.[63] According to the website, VEB supports "social and economic development initiatives rather than to generate profit."[64] Its two main objectives are to support the small-medium enterprise sectors and non-raw material sectors.[65] Throughout the past six years, VEB had invested heavily in the infrastructure development (infrastructures for Olympic Games, the agro-industrial sector, and the oil and gas sector).[66] Notice that among all the financial lending in 2011, most of those were lent to state-owned companies (see **Figure 42**).[67]

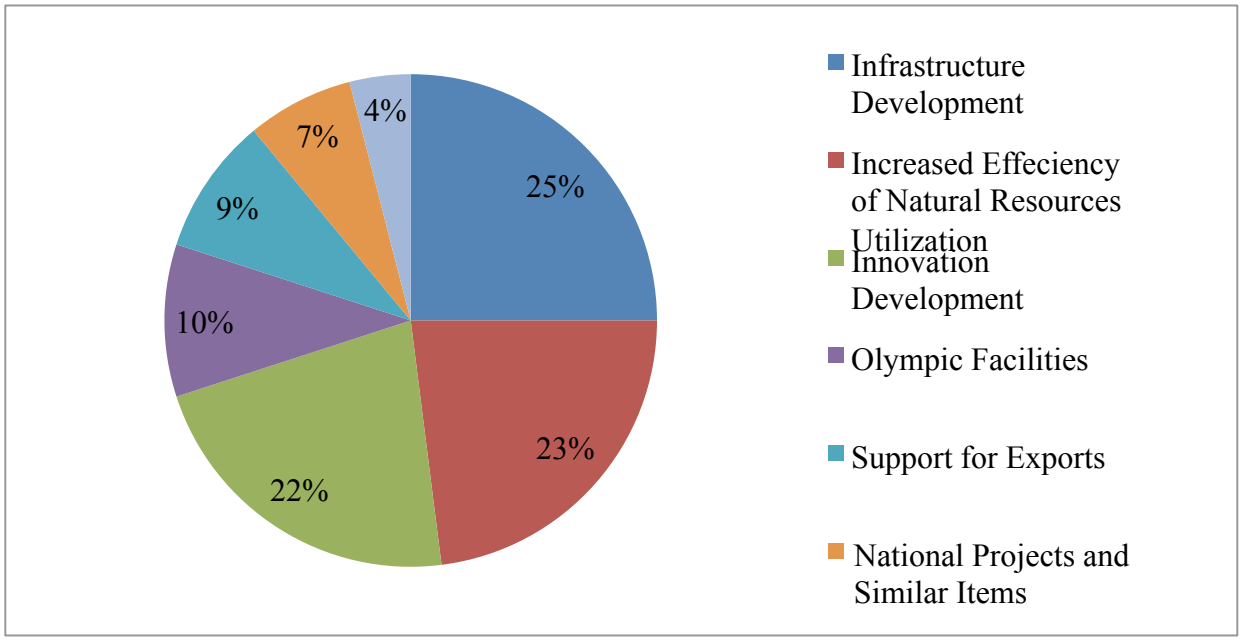

Figure 42: Structure of decisions made by Vnesheconombank's governance bodies by lines of activity as of October 1, 2011 (Data: www.veb.ru/en).

Turkmenistan

The establishment of Stabilization Fund of Turkmenistan (the "Fund") was introduced in October 2008 by President Gurbanguly Berdymuhamedov. Modeled similar to the Norway's and Russia's stabilization funds, the purpose of the Fund is used for accumulating state budget surpluses from the natural resources revenues, and to make long-term investments for basic infrastructures and public welfare.[68] According to the EBRD, the Fund has been receiving foreign exchange revenues since its establishment.[69] Also in a report by the Chatham House, it states that a portion of gas revenues have been transferred to the Fund, but the actual amount is unclear.[70]

The Fund's priorities and functions have never been disclosed to the public and there is no evidence whether the Fund is existed for stabilization.[71] When the U.S.'s Helsinki Commission staffs attempted to further clarify the operation of the Fund in May 2010, the Fund managers denied the requests of any further inquiries regarding the Fund.[72] Despite the fact that

the Fund was established in 2008, the authorities of Turkmenistan continue to transfer most of the gas revenues to the Foreign Exchange Reserve Fund (FERF), an off-shore, off-budget bank account that has been managing by Deutsche Bank for more than a decade.[73]

Allegedly operated as the President's "private bank," FERF is an account that has zero-transparency on the financial investment of the fund, in which most of money is believed to be invested in President's pet construction projects.[74] In addition to FERF, Turkmenistan also has two other funds, namely State Fund for the Development of the Oil and Gas (SFDOG) and Agricultural Development Fund (ADF), both of which like the FERF are highly non-transparent.[75]

II. Issues

Diversification of the Economy

Most of the Caspian states are heavily dependent on natural resources revenues (see **Figure 43**). In order to maintain long-term growth and to protect the future generations, the Caspian states must diversify economically by investing in non-resource sectors.

Transparency and Accountability

A successful SWF requires the operation of the fund to be as transparent as possible. Low transparency generally leads to bad governance and it creates widespread corruption across the government.[76]

	Nominal GDP			Value of Hydrocarbon Exports		
	2009	2010	2011 (Projected)	2009	2010	2011 (Projected)
Azerbaijan	43.1	54.4	68.5	20.0	25.1	31.3
Kazakhstan	115.3	148.0	180.1	26.2	37.0	52.2
Russia	1222.0	1479.8	1884.9	148.7	206.3	277.4
Turkmenistan	18.7	20.0	24.1	8.4	8.6	13.2

Figure 43: Selected economic indicators (US$ billion). (Source: http://www.imf.org/external/data.htm).

Efficiency of Public Spending

Azerbaijan, Kazakhstan, and Russia have accumulated a lot of revenues from the surging oil and gas prices between 2000 and 2007. Yet, their level of public spending is significantly low compared to other more advanced transitional economies.[77]

Lack of Local Talent

Most of the SWFs are trying to limit the presence of foreign investment entities in the Funds operation. Unfortunately, there are only limited supplies of local investment managers that are qualified to work in the finance industry.

Massive Nationalization

Excessive state interferences have deterred many international companies from investing in the Caspian States. The state governments should promote healthy competition and support privatization within their states. A careful, step-wise approach makes the most sense, given the disastrous effects of sudden, wholesale privatization that took place in the early 1990s.

World Trade Organization (WTO) Membership

Among the four countries, Russia has just recently become a WTO member, Azerbaijan and Kazakhstan are currently in the accession process, and Turkmenistan has yet to apply for the WTO membership. Being a member of WTO allows the country to strengthen their international trading system such as receiving preferential treatments from WTO and WTO members.

III. Options

Contributing towards the development of the Santiago Principles

The U.S. should promote the Santiago Principles, which is a set of best practices drafted by the International Working Group of Sovereign Wealth Funds (IWG) for the SWFs to manage their transparency and accountability issues. Since the U.S. (also Russia and Azerbaijan) is

already a member of the IWG, the U.S. should convince Kazakhstan and Turkmenistan to join the IWG, and could provide technical assistance if they required. If all the Caspian states adhered to the Principles, the U.S. would have more opportunities to directly compete with domestic companies in a more transparent environment.

Assisting Caspian states in WTO Accession Process

With the group of experts from United States Agency for International Development (USAID), United States Department of Agriculture (USDA), and the Commercial Law Development Program (CLDP) of the U.S. Department of Commerce, the U.S. could provide technical assistance to Caspian states that seeking accession to the WTO. The U.S. had once provided technical assistance to Azerbaijan and Kazakhstan in their WTO accession process,[78] but the U.S. should now take a more active role in their application process, so that the countries could speed up their political and economic transformations.

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Chapter Thirteen

Dividing the Caspian and its Resources: How to Share the World's Largest Lake

Lauren Rock

Summary

The Caspian Sea can be defined and divided as either a sea or a lake. Depending on the definition, the division of the seabed, surface waters, and associated resources (oil, gas, fish) changes. Past treaties between Russia and Iran regarding the division of the Caspian do not elucidate the status of the body of water, and as such, do not present a guide for modern divisions between the five littoral states. Currently there are bilateral agreements dividing the northern Caspian, but disputes over oilfields on the proposed MML prevent agreements from being reached in the southern Caspian.

I. Background

Sea or Lake?

The Caspian, though commonly called a "sea", is most accurately defined as either a lake or a special enclosed sea. An enclosed sea, according to the 1982 United Nations Convention on the Law of the Sea (UNCLOS), is "a gulf, basin or sea surrounded by two or more States and connected to another sea or the ocean by a narrow outlet or consisting entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal States."[1] If the Caspian were categorized as a sea, both its surface and seabed would be partitioned according to the percentage of coastline each country controls.

UNCLOS delineates the way in which seas are to be divided in terms of sitance from the shoreline. A country is free to set laws, regulate passage, and use or extract any resources in the first twelve nautical miles out from the coastline, deemed the "Territorial Waters" (See **Figure 44**). Other countries' marine activity must pass through this territorial zone "expediently and continuously,"[2] and their ships may not fish, pollute or hold weapons practice in another country's Territorial Waters. The next twelve nautical miles beyond the Territorial Waters are

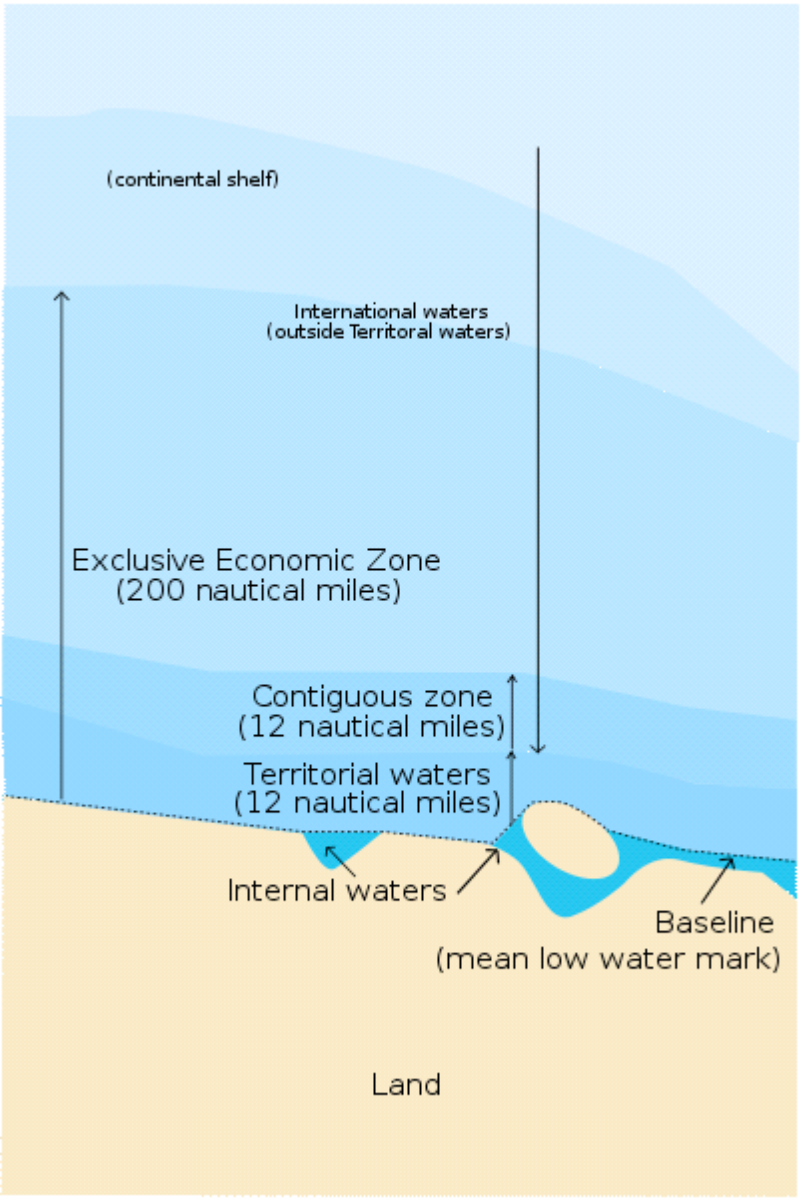


Figure 44: Division of international waters based on UNCLOS. (Source: http://en.wikipedia.org/wiki/File:Zonmar-en.svg)

designated the "Contiguous Zone." A country regulates the immigration, taxation, customs, and pollution of this zone. Beyond this, up to 200 nautical miles, is the "Exclusive Economic Zone" (EEZ), in which the country has sole exploitation rights over any and all natural resources, particularly over oil, natural gas, and fisheries. With these variations in mind, UNCLOS would allow each country control over the waters directly within the line of their borders and as far out as the EEZ. The Caspian, however, is 750 miles long and 200 miles wide; the full EEZ is not possible for each country. Instead, UNCLOS would partition the Caspian Sea as shown in **Figure 45**.

If the Caspian is defined as a lake rather than an enclosed sea, the divisions change. Rather than relying upon UNCLOS, the legal division of a lake simply demands that all littoral countries receive an equal share of both surface and seabed. In this situation, the Caspian would

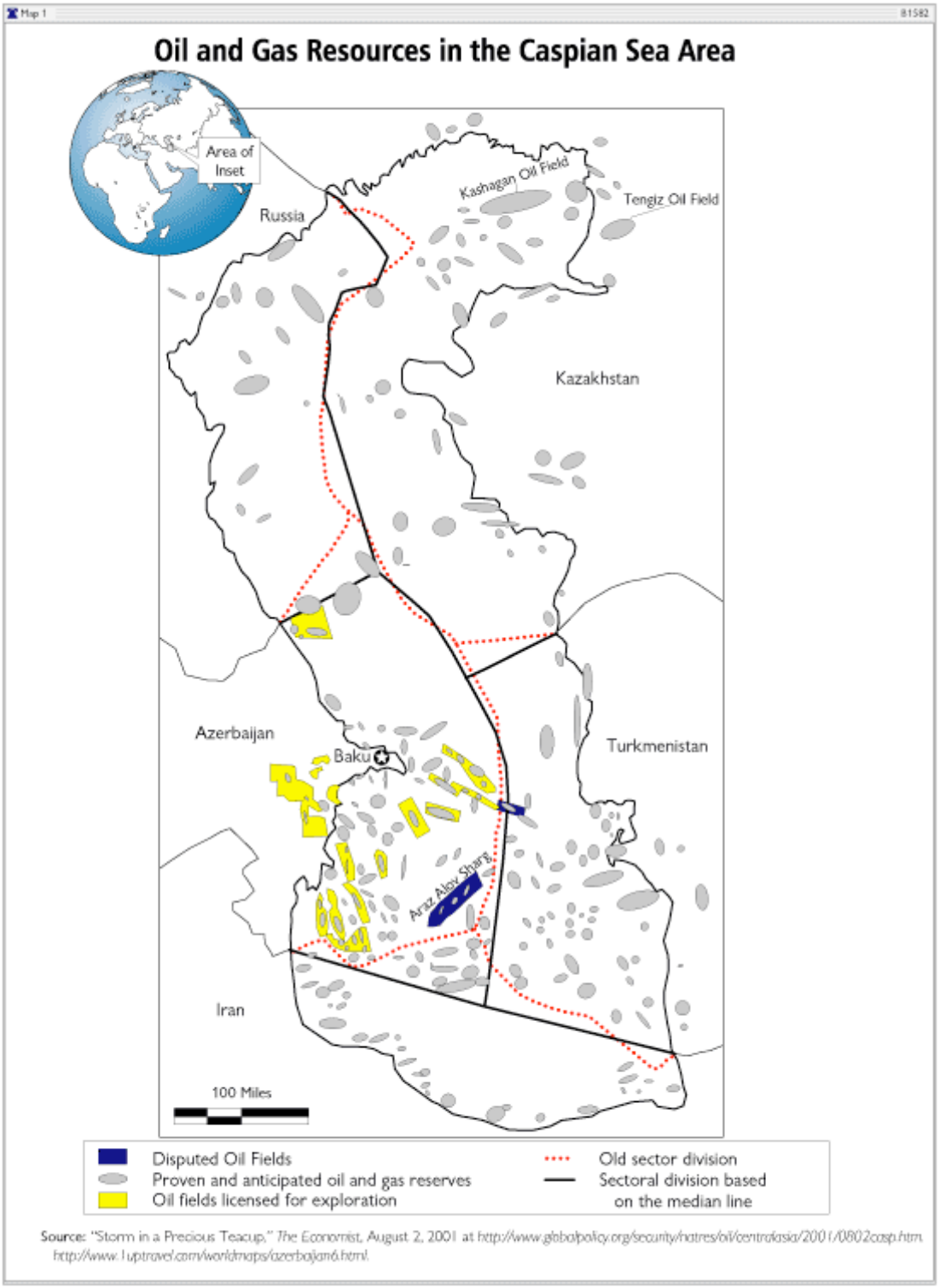
be divided equally between the countries. As a lake, the Caspian would be jointly owned and managed, rather than each country controlling as much of its own EEZ as is possible. The 20 percent of surface and seabed accorded to each country would be extended from the coastline until it meets the 20 percent of the other countries as show in **Figure 46.** This figure also shows the UNCLOS dividing line for comparison.

Figure 45: Proposed UNCLOS division of the Caspian. (Source: http://www.economist.com/node/719184).

The oil and gas potential of each country vary greatly depending on whether the Caspian is divided as a "sea" or as a "lake." For example, if the Caspian is recognized as a sea, then Iran only controls 13 percent of the seabed surrounding its coastal baseline.[3] Compared to current delineations, this arrangement would significantly reduce the potential resources under Iranian control. The 7 percent of disputed territory between the UNCLOS division and the equitable lake division of potential Iranian territory is home to oil and gas reserves (see **Figure 46**). Without an agreement on how to divide the Caspian, those reserves cannot be extracted, and the territory remains unstable.

According to a purely geographic definition, the Caspian is a landlocked body of partially salinated water. Its salt concentration varies from 1.0 to 13.5 parts per thousand (ppt), averaging roughly a third of normal ocean water (33-37 ppt).[4] With such salinities, the Caspian is clearly an isolated saltwater basin. An enclosed sea, however, is not always entirely isolated from other bodies of water. However, the Caspian is linked only to the Black Sea by way of the Volga-Don

Figure 46: Division of Caspian based on equal divisions and median line divisions. (Source: http://www.heritage.org/research/reports/2002/09/irans-claim-over-caspian-sea-resources-threaten-energy-security).



Canal and the Sea of Azov. Canals and waterways connect them to each other and to other seas, but they are also both enclosed seas.

Environmental and Economic Importance of Dividing the Caspian

In addition to its oil and gas resources, the Caspian is also home to approximately 80 percent of the world's sturgeon population.[5] Sturgeon are fished primarily for their highly valuable roe, which is then turned into caviar. As a result, the Caspian's sturgeon population is at risk. The greatest abundance of the fish is in the northern portion of the Caspian, where sturgeon are overfished. Overfishing is the greatest threat to the biodiversity of the sturgeon. After the fall of the Soviet Union, fishing controls and regulations collapsed, and open maritime fishing of sturgeon increased.[6] While the governments of each littoral state have imposed catch limits, significant damage to the sturgeon population is done by illegal international fishing.[7] Only border patrol guard boats work in the boundary sectors, but due to the contested territory, it is insufficient protection, and in some areas, the sturgeon populations has been completely lost.[8] Further pollution levels in the Volga and Ural rivers have negatively impacted spawning in the northern Caspian, thus causing major decline in existing populations. Without clear definition of national boundaries within the Caspian, the catches of sturgeon cannot be patrolled and monitored to ensure future sustainability of populations and thus the industry that depends upon them.

Russia wields control over a majority of the existing pipelines to ship hydrocarbon resources, so any gas or oil extracted under the current status quo must be shipped through Russia to be sent to Europe. Other routes pass overland through Iran. There are plans for a trans-Caspian pipeline (the TCGP), but such plans cannot be completed without an agreement for

division of the seabed. If routes continue overland alone, Russia and Iran will hold control over Turkmenistan's exports to Western Europe. Further, Russia holds sole ownership over the Volga-Don Canal, which links the Caspian to the Black Sea. This means Russia controls the link between the Caspian and the Mediterranean, and if any heavy equipment is to be shipped in for extracting sources, it must go through Russia. Iran has a similar stranglehold over the shortest route from the Caspian to the Persian Gulf and east from there to Asia.

Previous Divisions of the Caspian

The Caspian has long been a point of contention between Russia and Iran, and a series of existing bilateral treaties between the two divide it. In January of 1723, despite war between the Russian and Persian Empires, the two countries signed the Resht Treaty on Cooperation.[9] The Treaty gave Persia only a few rights, such as the right of navigation, and the right of the merchant marine to moor in the ports along the coast. As the Russian Empire expanded over the next century, so too did its control over the Caspian. Both the Gulustan Treaty of October 12, 1813, the Turkmenchay Treaty of February 22, 1828 continued to acknowledge the right of the merchant marine to traverse the Caspian, but they prohibit any Persian naval presence on the waters. These early treaties are dedicated to the navigational rights over the surface of the Caspian, rather than over a territorial divide.

The Russo-Persian 1921 Treaty of Friendship superseded all previous agreements. It gave equal rights of shipping and navigation to both countries, as well as the right to fly their respective national flags on commercial vessels on the sea.[10] However, like the two agreements preceding it, the Treaty of Friendship made no distinction of territorial boundaries within the Caspian. The first agreement to provide any boundaries was the Treaty of Establishment, Commerce and Navigation concluded by Soviet Russia and Persia in August of 1935.[11] Notably,

the Treaty made no mention of seabed mining or of the extraction of possible hydrocarbon resources below the surface. The Treaty refers to the Caspian as a "Soviet-Iranian sea,"[12] and does not allow for the possibility of other littoral states.

The most recent agreement pertaining to the Caspian between the Soviet Union and Iran is the Treaty of Commerce and Navigation of 1940, which reinforced the Treaty of Establishment, Commerce and Navigation of 1935.[13] The 1940 Treaty furthered the concept of a Soviet-Iranian sea, and stressed the fact that only ships belonging to the two littoral states had the right to float on the Caspian; all other countries operating on the sea under contract were to restrict their operations to the boundaries of that contract. The Treaty focused more on the fishing rights of each littoral state, and for the first time clearly presented definite zones of influence of each country within the Caspian. Both Russia and Iran were accorded the right to fish the coastal waters up to a limit 10 nautical miles.[14] Beyond that 10-mile zone, fishing was restricted to nationals of the two states. However, the Treaty did not give a specific classification of the water basin that was shared between Russia and Iran. The particular rules instituted in the Treaty of 1940 regarding fishing territories preclude the Caspian from consideration, at least in its existence as the Soviet-Iranian Sea, a common and shared body of water. As it stood, Iran did not focus on, or use extensively, the water that was its northern border. It restricted its fishing to onshore efforts, and there was no clear delineation across the width of the Caspian dividing what was Russian from what was Iranian.

When the Soviet Union collapsed in 1991, new littoral states emerged, and instead of being the boundary between two states, the Caspian was now shared by five states. The question of how to divide the Caspian became urgent due to the influx of governments into the region, and the potential resources beneath the seabed. If the Treaty of 1940 is still considered binding and

enforceable, all of the power regarding the resources and wealth is in the hands of Russia and Iran. This is of major concern to the U.S. due to the American population's high consumption of Caspian resources and the often-strained relations between the U.S. and those countries. Since neither UNCLOS nor any other major decision ratified by all five littoral states specifically defines the Caspian, the disputed gas and oil fields remain undeveloped and the resources unavailable to consumers.

Current Treaties Regarding the Division of the Caspian

Currently, three bilateral agreements that divide the northern section of the Caspian: one each between Russia and Azerbaijan, Russia and Kazakhstan, and Kazakhstan and Azerbaijan. The Russian-Kazakh agreement was signed in 1998, and the Russian-Azeri agreement was signed in 2001. This set of bilateral agreements has set the stage for the Caspian's current division: an MML which, as designed by Russia, separates the seabed on the basis of national boundaries while having nothing to do with the maritime territories, over-flight, and navigation of the commercial and military units of the coastal and non-coastal states.[15] This agreement does not necessitate the classification of the Caspian, and it still serves as an accepted division among Russia, Azerbaijan, and Kazakhstan.

Current Territorial Conflicts and Disputes

Azerbaijan- Iran

In July 2001, an Iranian naval vessel forced two oil-exploration ships off of the Araz-Alov-Sharg field in disputed territory between Azerbaijan and Iran (see **Figure 46**).[16] The ships were owned by British energy giant BP and jointly operated with an Azerbaijani company. Iran followed the naval action by twice sending aircraft into the airspace above Araz-Alov-Sharg which is claimed by Azerbaijan. A series of diplomatic slurs between the two countries over the

territory and its resources followed. After the incident, BP ceased drilling operations in the Araz-Alov-Sharg field.[17]

Iran and Azerbaijan have a history of diplomatic tensions, which include their differing views on the division of the Caspian. Iran disagrees with the division based on Russia's MML, and has proposed alternate divisions of its maritime borders with Azerbaijan and Turkmenistan (see **Figure 47**). Without a definition of the borders of the seabed and the associated mining rights, the dispute over the oilfields that exist beneath contested territory will continue, and they will remain undeveloped.

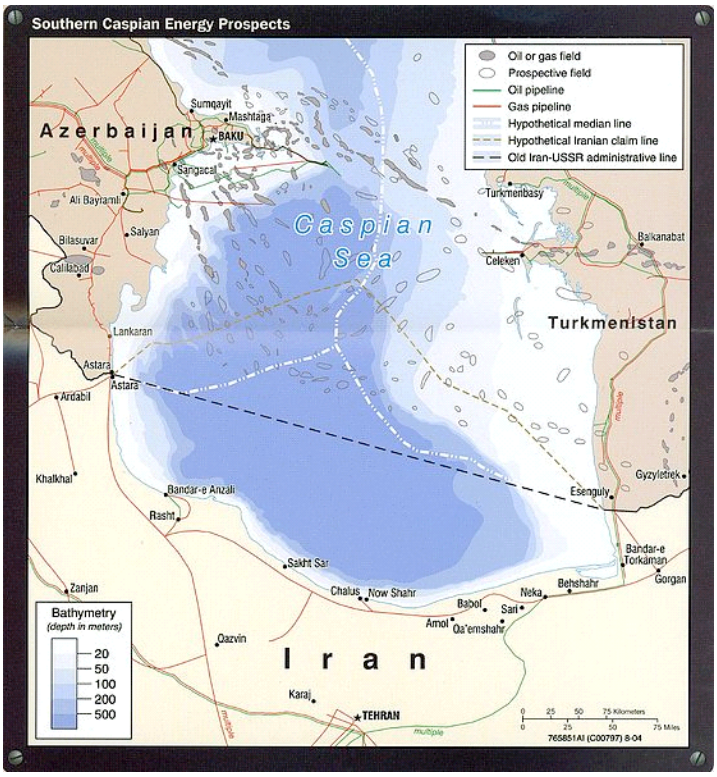


Figure 47: Iran's proposed divisions of the southern Caspian. (Source: http://en.wikipedia.org/wiki/File:Iran_southern_caspian_energy_prospects_2004.jpg).

Azerbaijan-Turkmenistan

The disagreement between Turkmenistan and Azerbaijan is two-fold. The first aspect is an alleged debt owed to Turkmenistan by Azerbaijan for gas supplies that were delivered in the early 1990's. This debt was solved in 2008 when Azerbaijan paid the US$44.8 million owed to Turkmenistan.[18] The second aspect is once again a dispute over oilfields in contested territory. The oilfields in question are split across the MML. Two of the fields, Azeri/Omar and Chirag/Osman are a part of the vast ACG field, which lies not far off the coast from the Absheron Peninsula of Azerbaijan (see **Figure 48**).[19]

Azerbaijan is developing this field despite the dispute, and in spite of threats in 2009 from Turkmenistan that it would take the case of the fields' ownership to the International Court of Arbitration.[20] The third field is the Kyapaz/Serdar field, which is further north than

Figure 48: Location of the Azeri-Chirag-Guneshli field. (Source: http://www.bbc.co.uk/news/10185429).

the ACG field.[21] Kyapaz/Sendar also straddles the MML between Azerbaijan and Turkmenistan and is undeveloped as a result.

Disputes over the ownership of these fields flare up periodically between the countries and sour relations between them. In addition to preventing drilling, the lack of agreement regarding the contested fields stands in the way of the Nabucco pipeline project.[22] Nabucco hypothetically includes a linkage to Turkmenistan gas—the TCGP—meaning it would pass through the center of the Caspian, and through the disputed territory. The argument over ownership of the three fields makes construction impossible.

II. Issues

The West has little reason to want either Russia or Iran to control vast stretches of the

Caspian and the offshore energy resources it contains. How the Caspian is divided will be crucial in determining who has control over the resources and, subsequently, how and by whom those resources are used. The U.S. has a vested interest in attempting to stymie energy expansions in Iran and Russia, as well as in attempting to limit the countries' influence in the region. A loss of diplomatic and financial ties to the other states surrounding the Caspian would mean an equal loss of a share of the resources beneath the Caspian seabed. Without a decision regarding the division of the Caspian or a treaty ratified by the littoral states, many of the offshore fields—such as those on the disputed boundary between Iran and Azerbaijan—cannot be developed. The U.S. should aim to help the countries with developing those fields to help ensure the flow of oil and gas to their allies in Europe.

Also of concern is that the disputed fields between Azerbaijan and Turkmenistan will prevent the addition of Turkmen gas to the Nabucco pipeline. Without an agreement as to the division of the seabed, the TCGP cannot be built, preventing Turkmen gas from transport.[23] The EU is a large consumer of gas, and, over the next five to ten years, it is expected that they will need further gas resources. Nabucco would be a way to provide for those needs without the dependence on Russia or the Middle East. Especially following the Ukrainian gas crisis of 2008, the EU wants to diversify its suppliers of hydrocarbons.

III. Options

It is in the interest of the U.S. to promote the security of the Caspian region. While determining the maritime borders of each country is the right of bilateral agreements between the littoral states, the U.S. has a vested interest in ensuring that such an agreement comes about. The U.S. should be present in the region as an ally; however, it should refrain from direct involvement in the existing disputes between Azerbaijan and Iran, and Azerbaijan and

Turkmenistan. The U.S. is a biased party with regards to the division of the Caspian, and as such should not directly intervene so as to prevent further conflict. That being said, the U.S. should continue its support of the Nabucco Pipeline, particularly of the TCGP connection. More external pressure on the pipeline may encourage further talks between Azerbaijan and Turkmenistan to come to an agreement regarding ownership of the ACG and the Kyapaz/Serdar field. If not, the U.S. should also encourage the use of the International Courts to arbitrate a division of the southern Caspian that would be accepted by all parties involved.

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Recommendations

This Task Force's evaluation indicates that issues particular to these resource-rich, mostly post-Soviet states can have the potential to not only impede U.S. influence in the region, but also to prevent supplier states from reaching agreeable economic terms with a diverse set of consumers and consumer states from achieving adequate levels of perceived energy security. Thus, the U.S. must pursue new strategies to ensure its long-term energy security in the region.

In order to implement such strategies, this Task Force offers recommendations in five primary categories: maintenance of American relations with, and thus influence in, Caspian nations; active support of programs to promote sociopolitical stability in the Caspian Sea region; implementation of global strategy with allies and world powers to support U.S. foreign policy in the region; promotion of resource sustainability, including not only hydrocarbons but also related biological and water resources; and, finally, investment in energy resource development.

I. American relations with and influence in Caspian nations

- Work both directly (through high-level discussions) and indirectly (through financial and other support) with the IAEA to ensure that the Caspian remains a nuclear-weapon-free zone, regardless of developments in Iran. This may require future security guarantees.
- Continue annual policy roundtable with the Turkmen government to enhance U.S.-Turkmenistan trade and investment, advance the U.S.-Turkmenistan bilateral relationship, and educate the public about its importance.
    - Pursue similar bilateral roundtables with Azerbaijan and Kazakhstan.

- Continue to encourage progressive privatization in order to separate government interests from hydrocarbon investments. This would also encourage more transparent investment policies between the U.S. and the Caspian states.
- Promote the Santiago Principles, i.e. the set of best practices drafted by the IWG for SWFs to manage their transparency and accountability issues. Since the U.S., along with Russia and Azerbaijan, is already a member of the IWG, the U.S. should direct diplomatic resources toward incentivizing Kazakhstan and Turkmenistan to join the IWG, and may provide technical assistance if required. If all the Caspian states adhered to the Principles, the U.S. would have more opportunities to compete directly with their domestic companies in a more transparent environment.
- Collaborate with experts from USAID, the USDA, and the CLDP of the U.S. Department of Commerce to provide technical assistance to Caspian states seeking accession to the WTO. The U.S. has in the past provided technical assistance to Azerbaijan and Kazakhstan in this process, and must now take a more active role in their application process with the goal of speeding up their political and economic transformations.
- Encourage and support an EU-hosted "Caspian summit" with the littoral states, China, and Turkey. Advise discussing, among other issues, the construction of the TCGP and the resolution of maritime border disputes.
- Send a delegation of high-ranking officials, possibly including the Secretary of State, to Azerbaijan, Russia, and Kazakhstan to symbolically and practically convey the high priority importance of these states to American foreign policy.

II. Sociopolitical stability

- Provide intelligence assistance in uncovering and foiling any terrorist activities in the region, such as the recent plot against Israeli targets in Tbilisi and repeated attempts against such targets in Baku.
- Refocus the priorities of American NGOs in the region to emphasize the establishment of open society infrastructure (e.g. access to Internet, independent judiciary, etc.) rather than strictly promoting democratization.
- Increase inter-Caspian educational exchange among youth, especially women, in science, technology, engineering, and mathematics by facilitating the creation of networks for high-level scholars in graduate and doctoral programs.
    - Facilitate similar educational exchange between Caspian and American institutions of higher education.
- Fund the reintegration of Azerbaijani IDPs (including sustainable housing, jobs, schools, and basic public services) through microfinance carried out by domestic independent groups and NGOs.

III. Global strategy

- Instead of pursuing a containment-like policy, aim for stronger relations with Russia through acknowledging the country's prominence within the Caspian Sea region. Possibly collaborate with Russia in order to produce more pipelines and/or explore new regions for development.

- Engage with China in bilateral and multilateral discussion of Caspian energy policy, with special focus given to resource extraction and infrastructure development.

IV. Resource sustainability

- Support and promote the use of international courts to arbitrate an agreement over the division of the Caspian seabed and associated resources.
- Stress the importance of protecting the environment of the Caspian region by stimulating fisheries research, educating local fisheries on the use of eco-friendly fishing gear (e.g. biodegradable fishing lines, biodegradable lures, and lead free fishing sinkers), and encouraging the countries to publish environmental data.
- Establish environmental funds, or assist (with financial investment, training, technical assistance, etc.) Caspian governments with the establishment of such funds, to finance projects associated with improving the Caspian Sea environment.
    - Encourage the use of these funds for the replacement of old technology and infrastructure for oil extraction with the goal of reducing unwanted toxic waste, and provide technical support for the development and operation of new environmentally friendly technologies.

V. Energy resource development

- Coordinate foreign policy in the Caspian with the EU to implement economic incentives to stimulate FDI, especially concerning construction of pipelines favorable to mutual U.S. and EU interests.

- Invest in clean and renewable energy in the Caspian, including wind turbine construction, with the goal of enabling producer states to increase and diversify export revenue.
- Invest in the development of Europe's shale gas reserves, especially those in France and Poland. While the actual size of the reserves is uncertain, shale gas offers great potential to increase Europe's energy self-sufficiency.
- Assist the littoral states and foreign investors in the endeavor to improve Caspian marine infrastructure, including enhanced environmental monitoring in internationally owned and operated drilling fields.

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