

THE GEOPOLITICS OF Oil & GAS

Adnan Aswad, Ph.D.

Professor Emeritus

Industrial & Manufacturing Systems Engineering

The University of Michigan Dearborn

OUTLINE

THE GEOPOLITICS OF OIL & GAS

- I. Energy Sources: *Coal, Wood, Water, Oil, Gas, Nuclear, Renewable, e.g. Sun, Wind, etc.*
- II. Supply & Demand: *Terms, Facts & Figures, Oil Dependency.*
- III. Who Owns & Controls Oil Resources: *History of Oil Companies, Exploration & Development, Production, Transportation, Prices & Profits*
- IV. Consequences of Oil Dependency: *Economic & Social, Militarization & Global Conflicts*
- V. A Perpetual Crisis: *What We Could Do*

Distribution Projected World Energy Consumption 2010-2030

Energy Source	Percent 2010	Percent 2030	% Change Total BTU
Liquids	34.4	31.7	+ 2.3
Natural Gas	23.3	23.3	+ 0.3
Coal	27.6	28.0	- 0.36
Nuclear	5.7	6.0	+ 0.39
Other	9.0	11.0	+ 0.63

Source: International Energy Outlook Report 2009, DOE/EIA

Crude Oil & Gas Processes

- **Exploration & Development** - Proved Reserves
- **Production** - Gross & Net.
- **Transportation** - Pipelines, Tankers, Bottlenecks.
- **Refining** - Gasoline, Diesel, Kerosene, LNG, etc.
- **Manufacturing Petrochemicals** - Plastics, Synthetics, Olefins, etc.
- **Marketing & Distribution**

Usage Terms & Measures

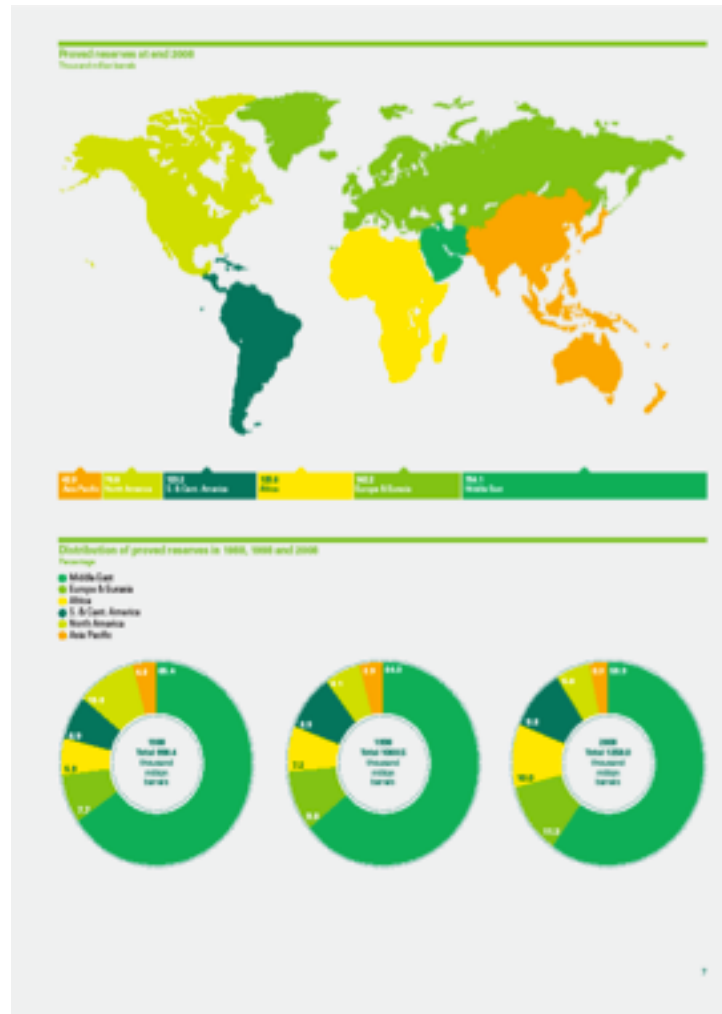
- 1 Barrel (bbl) = 42 US Gallons (gal)
- 1 Barrel of Crude Oil = 5600 (cu ft) of Natural Gas
- 1 Barrel of Crude Oil produces approximately:
 - 20 gals of Gasoline
 - 10 gals of Diesel Fuel
 - 4 gals Jet Fuel (Kerosene)
 - 1.4 gals Heating Oil
 - 1.72 gals Liquid Petro Gas
 - 1.7 gals Heavy Distillates

Types of Oil Exploration & Production Agreements

- **Oil Concession** - *an exclusive license granted by a country to explore and develop oil.*
- **Oil Lease** – *an agreement between parties to allow a Lessee to have access to the property and minerals on the property of the Lessor.*
- **Production Sharing Agreement (PSA)** - *a country's government awards the execution of exploration and production activities to an oil company. The oil company bears the financial risk, explores, develops and produces the field. The profits after cost recovery are shared.*

Worldwide Distribution of Proved Oil Reserves 2008

Source: BP Statistical Review of World Energy 2009



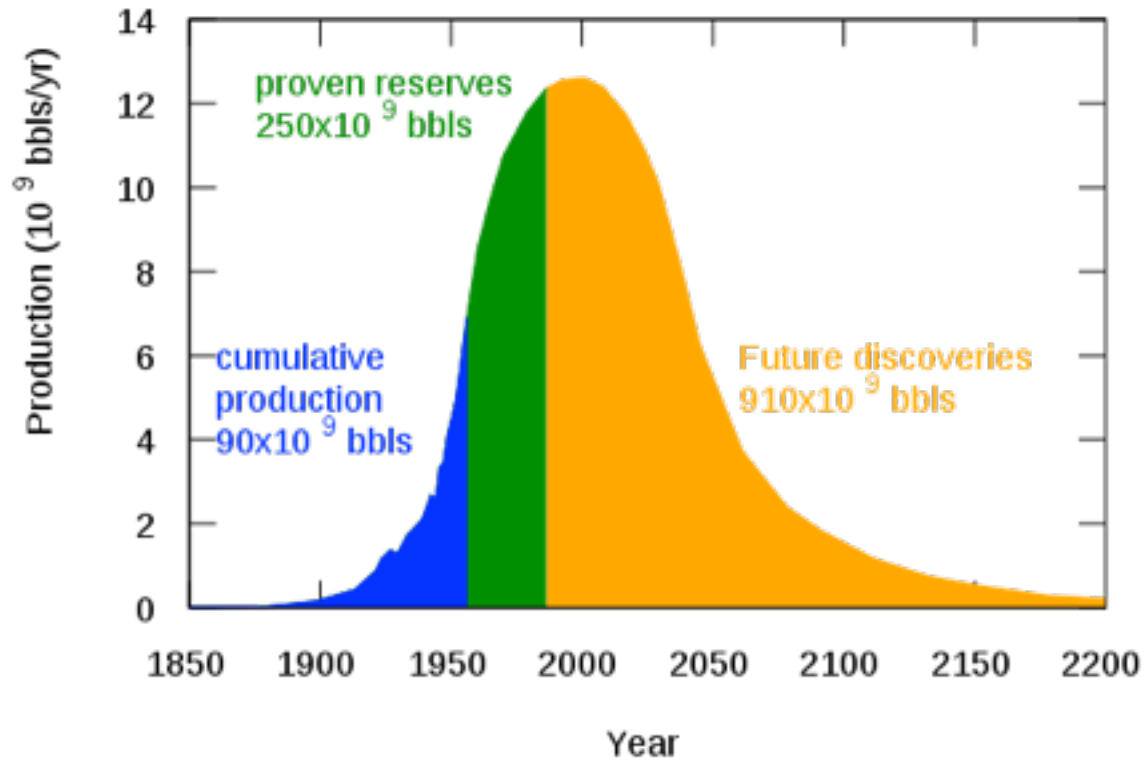
Top World Oil Producers, 2008
(thousand barrels per day)

Rank	Country	Production
1	Saudi Arabia	10,782
2	Russia	9,790
3	United States	8,514
4	Iran	4,174
5	China	3,973
6	Canada	3,350
7	Mexico	3,186
8	United Arab Emirates	3,046
9	Kuwait	2,741
10	Venezuela	2,643
11	Norway	2,466
12	Brazil	2,402
13	Iraq	2,385
14	Algeria	2,180
15	Nigeria	2,169

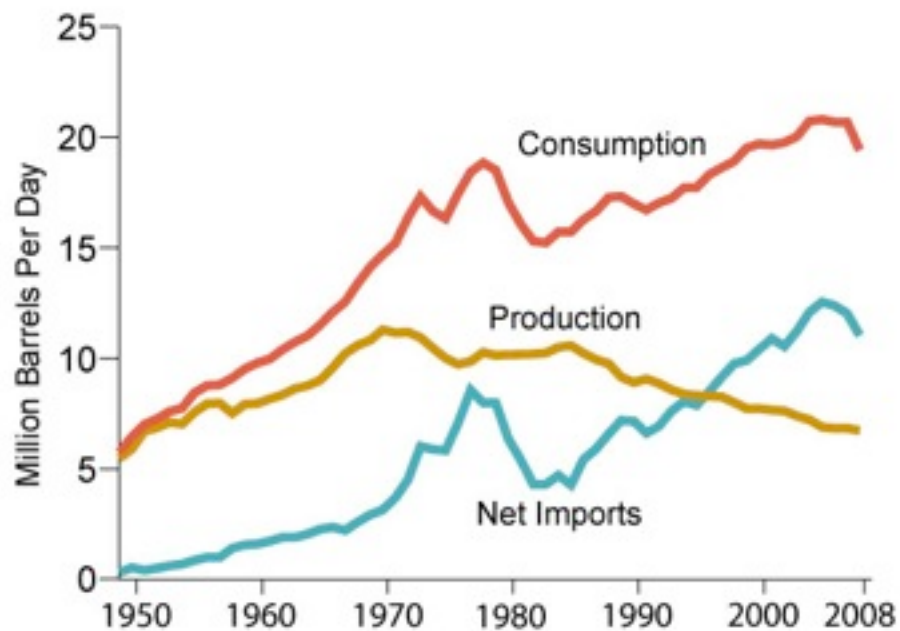
Top World Oil Consumers, 2008
(thousand barrels per day)

Rank	Country	Consumption
1	United States	19,498
2	China	7,831
3	Japan	4,785
4	India	2,962
5	Russia	2,916
6	Germany	2,569
7	Brazil	2,485
8	Saudi Arabia	2,376
9	Canada	2,261
10	Korea, South	2,175
11	Mexico	2,128
12	France	1,986
13	Iran	1,741
14	United Kingdom	1,710
15	Italy	1,639

Hubbert peak oil plot.svg

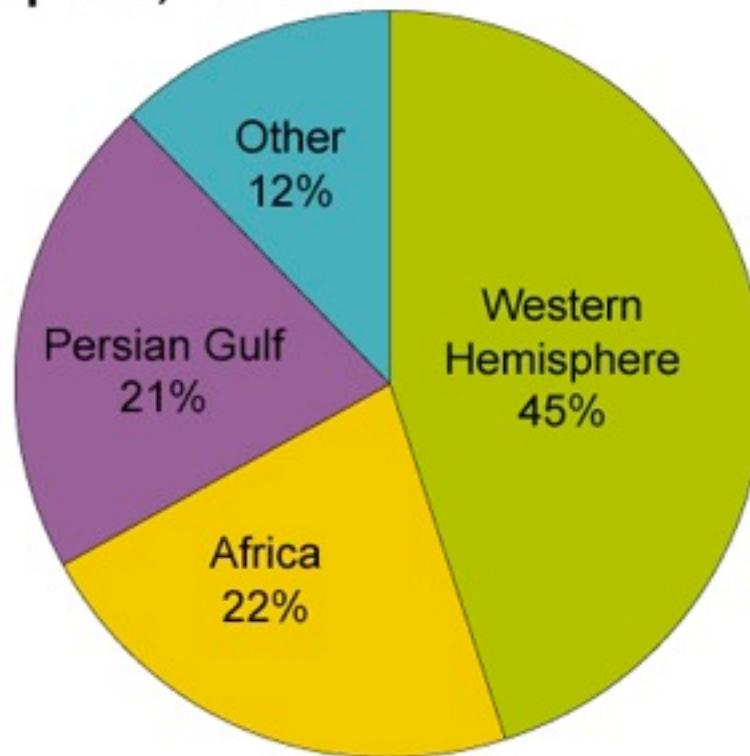


Consumption, Production, and Import Trends (1949-2008).



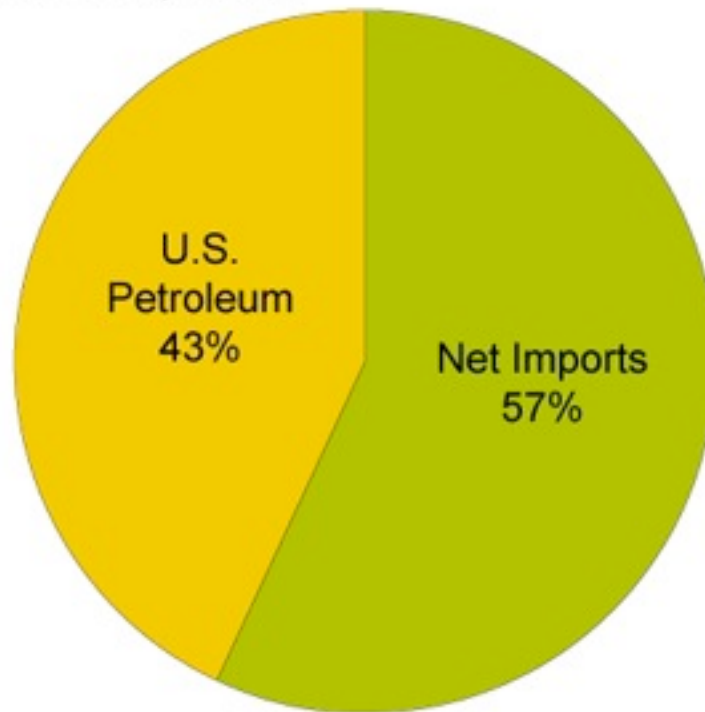
Source: Energy Information Administration, *Annual Energy Review*, Table 5.1. (June 2008)

Sources of U.S. Net Petroleum Imports, 2008



Source: U.S. Energy Information Administration.

Net Imports and Domestic Petroleum as Shares of U.S. Demand, 2008



Source: U.S. Energy Information Administration.

Chronology of US Dependency on Foreign Oil

- *1860 – WWII: Self Dependent and Exporter.*
- *Afterwards the share of Consumption that was Imported increased exponentially, approximately every decade:*
 - 1950s: 10%
 - 1960s: 17%
 - 1970s: 29%
 - 1980s: 41%
 - 1990s: 52%
 - 2008 : 57%

How dependent is the US on Foreign Oil?

Source: Energy Information Administration (EIA)/ DOE

Top Sources of Imported Petroleum to the United States in 2008			
In Million Barrels per Day (and Percent Share of Total Imports)			
Import Sources	Gross Imports	Exports to Import Source	Net Imports
Total, All Countries	12.915	1.802	11.114
OPEC Countries	5.954 (46%)	0.055	5.899 (53%)
Persian Gulf Countries	2.370 (18%)	0.002	2.368 (21%)
Top Five Countries			
Canada	2.493 (19%)	0.264	2.229 (20%)
Saudi Arabia	1.529 (12%)	0.001	1.529 (14%)
Mexico	1.302 (11%)	0.333	0.969 (9%)
Venezuela	1.189 (9%)	0.027	1.162 (10%)
Nigeria	0.988 (8%)	0.006	0.982 (9%)

Who Owns or Controls Oil Resources?

A Brief History of Western Oil Companies

- 1870 - J.D. Rockefeller founded **Standard Oil** Co. which in 30 years time became the largest oil monopoly in the world.
- 1908 Britain went global in the oil business and laid claim to the oil found in Persia (Iran), and in 1914 the British Parliament authorized the British government to become the majority owner of the Anglo-Persian oil (BP) company.
- 1911 - US federal government, invoking the Sherman Antitrust Act, divided Standard Oil into 34 individual US companies.

Who Owns or Controls Oil Resources?

The First International Oil Cartel

- 1928 “*The Red Line Agreement*”: between the western governments and oil company chiefs, awarded concessions to western oil companies in the Middle East (except Iran & Kuwait).
- 1933 Gulf Oil the first American oil company: shared with the British government a seventy four year ‘*Concession for ownership and control*’ of Kuwait’s oil.
- 1933 SoCal and Texaco formed (ARAMCO): the Arabian-American Oil Company and got concessions in Saudi Arabia.

Who Owns or Controls Oil Resources?

The Seven Sisters Cartel

- During the period WW I – WW II, Britain had a monopoly on Middle East oil fields.
- WW II through the 1960s – with a weakened British empire and a growing demand for oil, the largest three of the broken up US companies formed, with four other western companies, the largest world oil cartel which was known as “*The Seven Sisters*”: *Standard Oil of New Jersey (Exxon)*, *Standard Oil of New York (Mobil)*, *Standard Oil of California (Chevron)*, *Gulf Oil*, *Texaco*, *British Petroleum (BP)*, *Shell*

Together they owned, monopolized, and controlled the majority of the world's oil & gas resources.

Who Owns or Controls Oil Resources?

Nationalization of Oil & OPEC Cartel

- 1960s – 1980s: as a reaction to the 7-Sisters, strong national movements arose worldwide to control natural resources. Five countries:
 - *Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela* formed the Organization of Petroleum Exporting Countries (OPEC) in 1965.
 - Within 5 years, they were joined by: *Algeria, Angola, Ecuador, Libya, Nigeria, Qatar, & United Arab Emirates.*
 - 1965 – 1972: *Algeria, Iraq, and Libya* nationalized oil.
 - In 1974 Saudi Arabia acquired 60% ownership in ARAMCO, and 100% later on in 1988.
 - 1979: *Iran* nationalized its oil.
- This ended the Oil concession system in the Middle East. Today 90% of the world's oil companies are National.

Who Owns or Controls Oil Resources?

The Four Sisters Cartel

- In 1972 the 7-sisters produced about 90% of the Middle East Oil, and provided two thirds of the supply to Europe & China.
- But by 1984 their share of the areas oil reserves dropped to one third. Thus, through the motto “merge or die”, additional consolidation and mergers took place beginning 1999.
- Today Four Sisters, if not own as such, control the world’s oil reserves, markets, and in some instances governments. They are: 1) *ExxonMobil*, 2) *Chevron*, 3) *BP*, 4) *Shell*.

Who Owns or Controls Oil Resources? Shanghai Cooperation Organization (SCO)

- In 1996 the “Shanghai Five” consortium was established to promote regional cooperation:
China, Kazakhstan, Kyrgyzstan, Russia, Tajikistan
- Later in 2001, the consortium was formalized into the NATO-like (SCO) upon the joining of *Uzbekistan*.
- Presently, *Iran enjoys “Observer”* status in SCO

PIW's Top 25: How The Firms Stack Up Worldwide

Source: Energy Intelligence Group Inc, UK, 2006

Rank 2005	Company	Country	% State Ownership
1	Saudi Aramco	Saudi Arabia	100
2	Exxon Mobil	US	
3	NIOC	Iran	100
4	PDV	Venezuela	100
5	BP	UK	
6	Royal Dutch Shell	UK/Netherlands	
7	PetroChina	China	90
8	Chevron	US	
8	Total	France	
10	Pemex	Mexico	100
11	ConocoPhillips	US	
12	Sonatrach	Algeria	100
13	KPC	Kuwait	100
14	Petrobras	Brazil	32
15	Gazprom	Russia	50.002
16	Lukoil	Russia	
17	Adnoc	UAE	100
18	Eni	Italy	
19	Petronas	Malaysia	100
20	NNPC	Nigeria	100
21	Repsol YPF	Spain	
22	Libya NOC	Libya	100
23	INOC	Iraq	100
24	EGPC	Egypt	100

Historical Crude Oil Prices 1861-2008

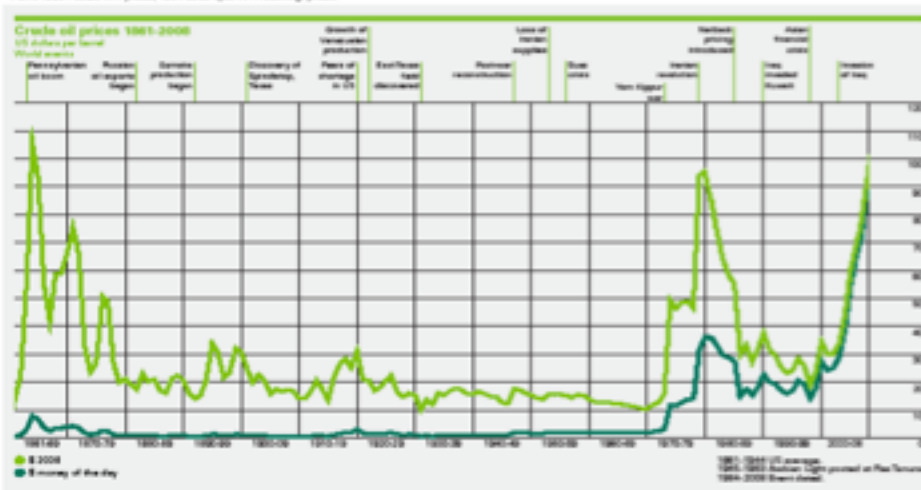
Source: BP Statistical Review of World Energy 2009

Spot crude prices

US dollars per barrel	Crude, Sweet	Crude, Light	Crude, Heavy	West Texas Intermediate
1872	1.00	--	--	--
1873	2.00	--	--	--
1874	10.01	--	--	--
1875	10.70	--	--	--
1876	11.00	10.00	12.07	12.00
1877	12.00	10.00	14.21	14.21
1878	12.00	14.00	14.00	14.00
1879	20.75	21.01	20.00	20.00
1880	20.00	20.00	20.00	20.00
1881	24.22	20.00	20.10	20.00
1882	31.00	20.07	20.00	20.00
1883	28.70	20.00	20.00	20.00
1884	20.00	20.70	20.10	20.00
1885	27.00	27.00	27.70	27.00
1886	10.10	14.00	14.00	14.10
1887	10.00	10.00	10.00	10.10
1888	10.07	14.00	10.00	10.07
1889	10.00	10.00	10.00	10.00
1890	20.00	21.73	20.00	20.00
1891	10.00	20.00	20.11	21.00
1892	17.17	10.00	10.01	20.07
1893	14.00	10.07	12.01	10.00
1894	14.74	10.00	14.00	17.21
1895	10.10	17.00	17.00	10.00
1896	10.00	20.07	21.10	21.10
1897	10.00	10.00	10.00	20.01
1898	12.01	12.70	12.00	14.00
1899	17.00	17.07	10.00	10.21
2000	20.00	20.00	20.00	20.07
2001	22.01	24.44	24.23	20.00
2002	20.74	20.22	20.00	20.10
2003	20.70	20.00	20.00	21.07
2004	30.00	30.27	30.10	41.00
2005	40.00	40.00	40.00	50.00
2006	60.00	60.14	60.07	60.00
2007	60.10	70.00	74.00	70.00
2008	90.00	97.00	101.00	100.00

* 1872-1880 Arabian Light, 1880-2008 Crude sweet.
 † 1872-1880 Eastern, 1880-2008 Sweet, 2008
 ‡ 1872-1880 Persian WTI grade, 1880-2008 Spot WTI (Houston) grade.

Source: Platts.



FIVE YEAR ANNUAL PROFITS OF MAJOR OIL COMPANIES in BILLIONS OF DOLLARS

Company	'05	'06	'07	'08	'09	*Rank	'10 Q1
Exxon	36.1	39.5	40.6	45.6	45.2	1	6.3 (38%)
Shell	25.3	25.4	31.3	26.3	31.4	---	4.8 (60%)
BP	22.4	22.3	21.2	21.2	25.0	---	5.6 (135%)
Chevron	14.1	17.1	18.7	23.9	10.5	3	4.6 (148%)
Conoco	13.5	15.6	11.9	-16.9	4.9	4	2.1 (150%)

*Fortune 500 US companies in 2009

Economic & Social Consequences of Oil Dependency

1. Financial indebtedness and possible insolvency of oil consuming countries.
2. Dependence on oil as the main revenue in oil producing countries, at the expense of other infrastructure development efforts.
3. Adverse impacts on the environment, indigenous peoples livelihoods and social structure.
4. Creating monopolies that nurture corruption in the oil producing as well as the oil consuming countries
5. Militarization of energy security policies leading to conflicts with high economic and human costs.

Oil & Gas Security

Historic Commitments

- Franklin D. Roosevelt in 1944 was the first US president to declare *'Petroleum as a National Security Issue'*. He secretly met with King Abdel-Aziz ibn Saud, and pledged *"to offer him and the Saudi Royal family protection against all internal and external threats."*
- Presidents Truman in 1947 and Eisenhower in 1957, *promised Iran, Iraq, and Saudi Arabia and to other states in the Middle East US military aid if they were attacked by the Soviet Union or any of its allies.*
- After the 'Oil shock in 1973-74', the US Secretary of State, Henry Kissinger, declared that: *"the US was prepared to go to war over oil."*

THE CARTER DOCTRINE

President Carter in 1980 following the Soviet Union's invasion of Afghanistan, formalized US energy security policy by declaring to a joint session of the US Congress:

“An attempt by any outside force to gain control of the Persian Gulf region will be regarded as an assault on the vital interests of the United States of America, and will be repelled by any means necessary, including military force”.

Oil & Wars

- 1980-88, President Reagan, during the Iran-Iraq war supported Iraq's Saddam Hussein, reflagged Kuwaiti tankers with American flags, and provided them with US Navy escorts.
- George H.W. Bush in 1991 relied on the Carter Doctrine to implicitly justify US intervention in the invasion of Kuwait by Saddam Hussein.
- In 1997, President Clinton engineered building a US military base in Kyrgyzstan side by side a Russian military base. The bidding games between the two powers to maintain these bases, are still going on.

Oil & Wars (continued)

- President George W. Bush formally adopted the National Energy Policy Group's (NEP) report in 2001 to: *“make energy security a priority of our trade and foreign policy.”*
- Then it proceeded to invade Iraq in 2003, when Saddam Hussein agreed to give oil exploration rights to Chinese, Russian, French, and other nations excluding the US and British multinational companies.

Oil and the Iraq War

- In 2003 the US invaded Iraq, with President George W. Bush citing various reasons. However, the real reason is expressed in a quote by a prominent US government individual:

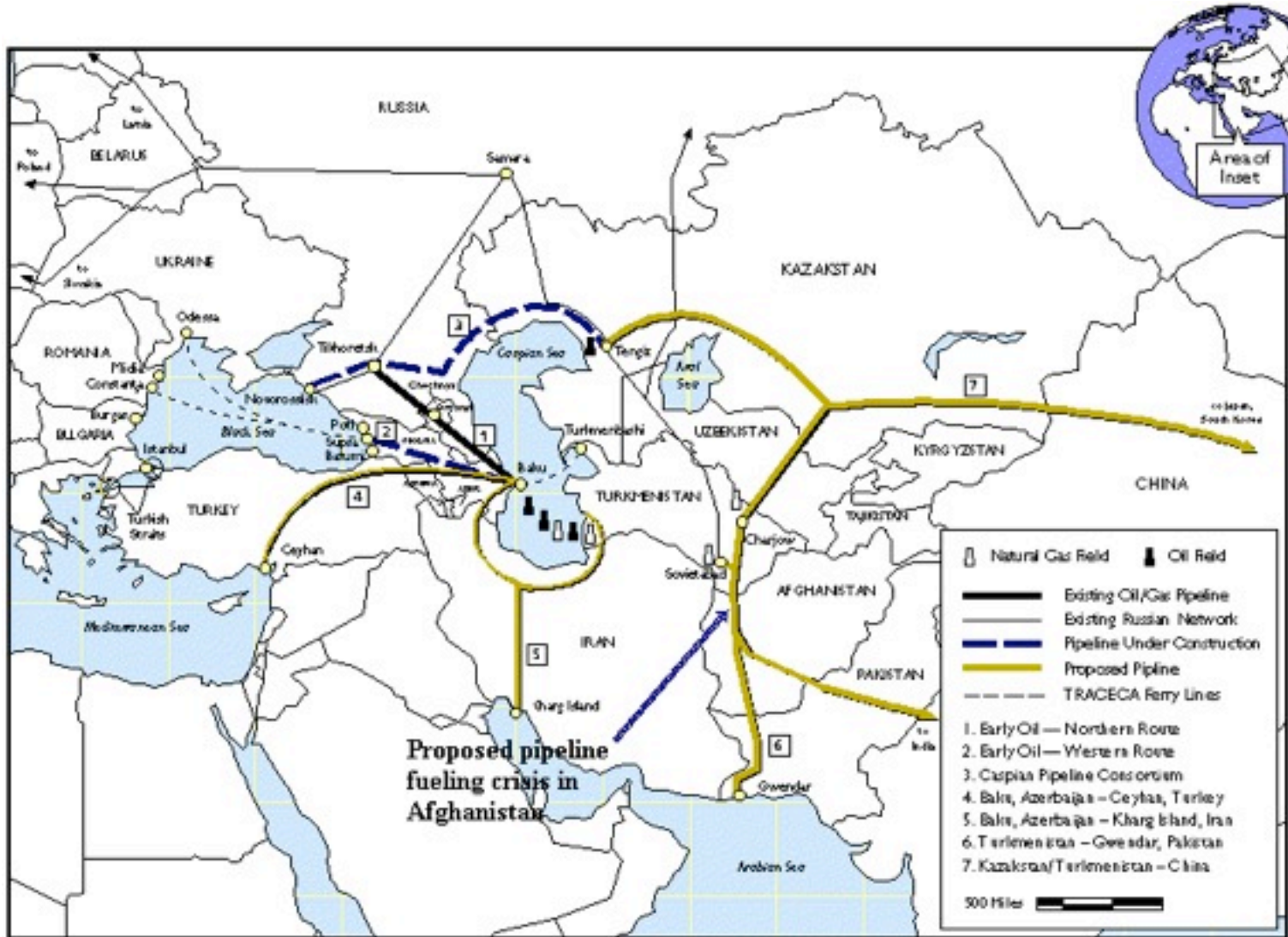
“I am saddened that it is politically inconvenient to acknowledge what everyone knows: The Iraq war is largely about oil.”

Alan Greenspan,
Chairman Federal Reserve Board
1987-2006

Important World Oil Transit Chokepoints

Name	2006E oil flow (bbl/d)	Width at Narrowest Point	Oil Source Origin	Primary Destination	Past Disturbances	Alternative Routes
The Strait of Hormuz	16.5-17 million	21 miles	Persian Gulf Nations including Saudi Arabia, Iran, and UAE	Japan, The United States, Western Europe, other Asian countries	Sea mines were installed during the Iran-Iraq War in the 1980s. Terrorists threats post September 11, 2001.	745-mile long East-West Pipeline through Saudi Arabia to the Red Sea
The Strait of Malacca	15 million	1.7 miles	Persian Gulf Nations, West Africa	All Asia/ Pacific consumers including Japan and China	Disruptions from pirates are a constant threat, including a terrorist attack in 2003. Collisions and oil spills are also a problem. Poor visibility from smoke haze.	Reroute through the Lombok or Sunda Strait in Indonesia. Possible pipeline construction between Malaysia and Thailand.
The Suez Canal/ Sumed Pipeline	4.5 million	1,000 feet	Persian Gulf Nations, especially Saudi Arabia, and Asia	Europe and The United States	Suez Canal was closed for eight years after the Six-Day War in 1967. Two large oil tankers ran aground in 2007 suspending traffic.	Reroute around the southern tip of Africa (the Cape of Good Hope); additional 6,000 miles.
Bab el-Mandab	3.3 million	18 miles	The Persian Gulf	Europe and The United States	USS Cole attack in 2000; French oil tanker in 2002, both attacks off the coast of Aden, Yemen	Northbound traffic can use the East-West oil pipeline through Saudi Arabia; Reroute around the southern tip of Africa (the Cape of Good Hope); additional 6,000 miles.
The Turkish Straits	2.4 million	0.5 mile	Caspian Sea Region	Western and Southern Europe	Numerous past shipping accidents due to the straits sinuous geography. Some terrorist threats were made after September 11, 2001.	No clear alternative; potential pipelines discussed including a 173-mile pipeline between Russia, Bulgaria, and Greece.
The Panama Canal	0.5 million	110 feet	The United States	The United States, and other Central American countries	Suspected terrorist target	Reroute around Straits of Magellan, Cape Horn and Drake Passage; additional 8,000 miles

Central Asia Oil & Gas Pipeline Projects



Oil and Natural Gas Export Infrastructure in Central Asia and the Caucasus

Energy & Oil Security Strategies

The energy hungry big powers have and continue to employ the various strategies of offering energy producing countries:

1. Economic development incentives
2. Industrial development incentives
3. Armament sales
4. Military alliances and bases

Perils of Energy Security Militarization

1. Encouraging the creation of repressive autocratic regimes for 'assuring' energy security.
2. Inducing ethnic violence within states,
3. Invoking violent regional instabilities, resulting in territorial conflicts between states,
4. Leading to military conflicts between big powers, and/or their client states.
5. Breeding Terrorism

Iran - Khuzestan Oil Fields



US Military Bases in the Middle East



A Perpetual Crisis: What We Could Do

1. Incentivize and enforce conservation policies.
2. Demilitarize energy security strategies. War has never been a zero-sum game.
3. Work on breaking up oil monopolies and cartels leading to price manipulations, by encouraging free trade.
4. Use cooperative strategies of economic and industrial development between energy producers and consumers.
5. Encourage international cooperation in renewable energy research and technologies.
6. Adopt international standards that assure human and environmental safety.

REFERENCES

1. “Annual Energy Outlook/International Energy Outlook”, U.S. Energy Information Administration, 2009.
2. BP, “Statistical Review of World Energy”, BP London, 2009
3. Escobar, Pepe, “Pipeline-Stan”, www.alternet.org May 13, 2009
4. “International Energy Outlook”, U.S. Department of Energy Report, May 2009, www.eia.doe.gov/oiaf/ieo/index.html.
5. Juhartz, Antonia, “The Tyranny of Oil”, Harper, 2008
6. Klare, Michael T., “Blood & Oil”, Holt, N.Y., 2004
7. Klare, Michael T., “Rising Powers, Shrinking Planet”, Holt, 2008
8. Stiglitz, Joseph E. & Bilmes, Linda J., “The Three Trillion Dollar War”, Norton Publishing CO, 2008
9. “Worldwide Look at Reserves and Production,” Oil & Gas Journal, Vol. 106, No. 48, December 22, 2008 pp. 23-24