Geopolitics of Energy into the 21st Century

Robert E. Ebel
Resource Person
IGAD Symposium, 16-18 August 2002
It is perhaps ironic that in an age where the pace of technological change is almost overwhelming, the world will remain dependent, for 2000-2020 at least, on essentially the same forms of energy—oil, coal, and natural gas—that fueled the 20th century.
Growth in Energy Consumption by Stage of Development between 2000 and 2020 (Percentage increase)

- Industrialized: 23%
- Developing: 130%

0% - 50% - 100% - 150%
Shifts in World Energy Consumption by Stage of Development, 2000 and 2020
(Percent of total)

2000:
- Industrialized: 53%
- Developing: 34%
- E. Europe & FSU: 13%

2020:
- Industrialized: 43%
- Developing: 46%
- E. Europe & FSU: 11%
Proportional Shifts in Fuel Use
2000 and 2020
(Percent of total)
What Happens to Energy Consumed?

• 38% generates electricity

• 18 percent fuels transportation
  – As does more than half the oil consumed
Geographic Distribution of Oil Production
2000 and 2020
(Percent of total)
Oil Trends...

- European dependence on the Gulf oil will remain significant
- Asian dependence on Gulf oil will expand dramatically
- U.S. imports will continue to grow
Natural Gas Trends...

- Fastest growing primary energy source
- Use to double, worldwide, during 2000—2020
- Growth based on expanded role in electricity generation
- U.S. becoming more reliant on gas imports
Natural Gas Trends...

- Investment in natural gas infrastructure needed

- European gas supplied by small number of suppliers, with Russia providing 26 percent of gas consumed
Coal Trends...

U.S. is the dominant player:

• Leads the world in coal reserves
• Leads the world in coal production
• Leads the world in coal consumption
• But will give way to China
Coal Trends...

• More than 55% of coal consumed worldwide is for electricity generation

• Electricity generation will be the basis for future growth in coal use, worldwide
Nuclear Power Trends…

- Nuclear power currently accounts for 16 percent of worldwide electricity generation
- But by the year 2020 that contribution is expected to decline to just 10 percent
Renewable Energy Trends...

- Large potential, constrained by cost & technology
- Convenience of conventional energy difficult to overcome
- Remain a niche market for near-term future
Key on Electricity

- Electricity is the most rapidly growing form of energy use during the years 2000-2020
- This growth will be concentrated in the developing countries, where electricity use will more than double
“Wherever satellite dishes and cell towers sprout over mud, brick, or thatched roofs, people are coming to demand this consumer lifestyle as an entitlement.”

Peter I. Bijur
former Chairman and CEO, Texaco
Developing Countries are Entering the Electricity Age

• Access to adequate and reliable supply is essential for modern civilized life

• But two concerns emerge:
  – Substantial capital investments will be required to build power plants and grids
  – Can adequate electricity supply be developed while protecting the environment?
Relationships

Mutual Dependence

Exporters

Importers
“When a Brazilian brews her morning coffee today, she is likely to use electricity from a power plant in Uruguay that runs on natural gas from Argentina provided by a Chilean company. She drives to work in a Ford fueled with Venezuelan gasoline, and her Canadian-owned factory may soon be powered by a 2,000 mile natural gas pipeline from Bolivia.”

Thomas “Mack” McLarty
Former White House Advisor
Exporters

“(r)egardless of crisis, disruption or sudden surge in demand, the Kingdom stands ready to respond.”

Ali Al Naimi
Minister for Petroleum and Mineral Resources, Saudi Arabia
Geopolitics...Energy
A Commonly Asked Question:

*Are we in danger of running out of oil anytime soon?*

Answer: *No.*

The demand for oil likely will decline before physical limits on oil supply come into play.

Moreover, the currently known reserves of coal, natural gas, and uranium are not regarded as limiting factors.
The Power of Oil

• Oil fuels much more than automobiles and airplanes. Oil fuels military power, national treasuries, and international politics.
• No longer a commodity to be bought and sold within the confines of traditional energy supply and demand balances.
• A determinant of well-being, of national security, and international power for those who possess this vital resource, and the converse for those who do not.
Conflict and Power Politics

• Potential for armed conflict
• Proliferation
• Market liberalization
• Vulnerability in the Caucasus
Who can Produce What?

Oil Production Capacity by Country: 2020
(Approx. percent of world total)

- Nigeria
- Iran
- Iraq
- FSU
- Saudi Arabia
- Venezuela
OPEC Producers

Organization of Petroleum Exporting Countries (OPEC):

Algeria  Indonesia
Iran       Iraq
Libya      Nigeria
Qatar      Saudi Arabia
United Arab Emirates
Venezuela
Key Non-OPEC Producers

- Russia
- Mexico
- Norway
- United States
- China

- These top five non-OPEC producers equal the OPEC total today, but only because of OPEC cutbacks.
- Simply measuring OPEC production doesn’t measure OPEC influence.
Saudi Arabia

- Critical role in OPEC and world oil trade
- Key Vulnerabilities:
  - External threats
  - Leadership transition
  - Economic reform, diversification
  - Terrorism
  - Unemployed youth
Iran

- Economic pressures, population growth
- Limited investments in oil and gas export capacity
- Two governments
- U.S. unilateral sanctions
Iraq

- Economic basket case
- Sanctions limit current capacity
- Future output to rise sharply depending:
  - Sanctions
  - President Saddam Hussein
  - Investment
Venezuela

- President Chavez’ actions
- Investment needs
- New laws discourage investment
- Growing public unrest
- Deteriorating relations with the U.S.
Nigeria

- Transition to civilian rule
- Oil investments hampered by corruption, poor governance
- Deepwater exploration prospects are good
Russia

- #2 oil producer & exporter
- Once world leader in oil production
- Potential to return?
- Declining reserves
- Ample capital today
Russia

Russia’s dominant role in natural gas:

- Holds 32% of world natural gas reserves
- Leads the world in gas production
- Leads the world in gas exports
The Truth about the Caspian and Central Asian Oil Potential
The Truth about the Caspian and Central Asian Oil Potential

- A victim of media hype
- Not a substitute for Persian Gulf oil
- Equivalent to the North Sea
- Providing possibly 3-3.5% of world oil supply by 2010
- Not pivotal but important at the margin
- Security of supply through diversity of supply
Can Russia, Plus Azerbaijan and Kazakhstan, Challenge OPEC?
(Million barrels per day)

<table>
<thead>
<tr>
<th>Year</th>
<th>OPEC</th>
<th>Russia, Azerbaijan &amp; Kazakhstan</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>30.06</td>
<td>8.12</td>
</tr>
<tr>
<td>2020</td>
<td>53.0*</td>
<td>15.0**</td>
</tr>
</tbody>
</table>

*So said the OPEC secretary-general recently
**Based on potential
Canada: Reliable Supplier to the North

- Canada in 2001 provided the United States with 15.4 percent of its oil imports and virtually all its natural gas imports.

- Defining that country as our leading foreign supplier of energy.
Canada: Reliable Supplier to the North

- Coincidence of U.S. and Canadian national interests protects that supply
- Virtually every incremental barrel in Canadian oil production heads south to U.S. markets
- Which makes the coming of age of Canadian tar sands—oil reserves exceed Saudi Arabia—so important
Who were the Leading Oil Producers in 2001?
(Million barrels per day)

<table>
<thead>
<tr>
<th>Country</th>
<th>Production (MMbpd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>8.09</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>7.67</td>
</tr>
<tr>
<td>Russia</td>
<td>7.0</td>
</tr>
</tbody>
</table>

*Including natural gas liquids*
Where do U.S. Oil Imports Come From?
(Percent of U.S. Total)

*Persian Gulf Includes Saudi Arabia and Iraq*

*Persian Gulf Includes Saudi Arabia and Iraq*
Is U.S. Energy Independence a Political Fantasy?

55% dependent on imported oil
16% dependent on imported natural gas

But the U.S. is also an exporter:
— Roughly 1 million b/d of oil
— Small volumes of natural gas, by pipeline to Mexico and Canada
— Liquefied natural gas (LNG) to Japan
U.S. Energy Independence

U.S. consumers do not care where their energy supplies come from

U.S. consumers have just two concerns, and energy independence is not one of them

- Price
- Availability
Vulnerability

We say that all politics is local. We can also say that all energy politics is local.

Yet, Oil is global.

That means we are vulnerable to any event, anywhere, anytime.

Vulnerability is ever-present, regardless of the degree of dependence on imported oil.
Price Volatility is Here to Stay

It is nothing more than Economics 101.

- Price *declines* contain the seeds of a price *increase*.
- Price *increases* contain the seeds of a price *decline*.

OPEC efforts to maintain high prices may dampen demand and encourage oil supply development outside OPEC.

If left alone, the market *will* adjust itself. But governments find it difficult not to intervene, and that usually prolongs the crisis.
Understanding Tradeoffs: Key to a Successful Energy Policy

Every energy decision has a tradeoff and these tradeoffs carry their own risks and costs.

What is meant by a tradeoff?
Understanding Tradeoffs

An Example:

- For environmental reasons, nations may place certain areas out-of-bounds for oil and gas exploration.
- In turn, a greater reliance on imported energy is accepted as a trade-off.

National security implications to consider:
Rising dependence on imported energy, shapes foreign policy, restricts courses of action, and may mandate military intervention.
Impact of Non-State Actors

“companies are going to have to face a different world, a world in terms not only of economics and return and economic prosperity, but also another category such as social justice and environmental quality”

Luis E. Giusti
Senior Advisor, CSIS
Impact of Non-State Actors

- Terrorism as a threat to energy infrastructure
- Cyberterrorism as a threat to operating infrastructure
- Usurping the decision-making role held by governments and the private sector
U.S. Unilateral Economic Sanctions: Doing Any Good?

The U.S. today imposes unilateral economic sanctions on these oil producers and exporters:
- Libya
- Iran
- Syria
- Sudan

Together these sanctioned countries produce about 5.8 million barrels per day. Have these sanctions been successful?
Sanctions

Have these sanctions brought about the desired changes in the targeted country.

– No real evidence that they have.

Have these sanctions depressed oil production and export levels, thus contributing to higher market prices?

– There is evidence that they have, but host country policies must equally share the blame.
Sanctions

- Practice has shown that nearly all unilateral sanctions fail nearly all the time.

- Unfortunately, sanctions are like taxes. Once imposed, they are difficult, if not impossible, to remove.
What Does It Take for Multilateral Sanctions to be Effective?

- Target country is small, weak, unstable, or highly dependent on the sanctioners
- Suffers high costs from the sanctions while the sanctioners endure low and sustainable costs
- Change demanded is a modest one
- Proportional to the offense
What Does It Take for Multilateral Sanctions to be Effective?

- Imposed quickly and given time to work
- Allow for exceptions such as food and medicine
- Flexible and can be modified or terminated when appropriate
- Backed by force or by the credible threat of force
- Are targeted against specific people, activities, and policies
Multilateral Economic Sanctions against Iraq?

Effective?

Certain criteria have been met for Iraq, but on balance, not enough to bring about success.
Energy...Geopolitics
Where is the World Oil Future to be Found?

• The future will not be found in current oil production levels

• Rather, the future will be found in oil reserve levels
World Oil Future
(Percentage of World Total Oil Reserves)
These four countries control almost 70% -- 7 out of 10 barrels -- of world oil reserves.

Not particularly reassuring of future oil supply and price stability.
Unconventional Oil Reserves?

The Oil Sands of Canada
The Heavy Oils of Venezuela

• Recoverable reserves from either the Canadian oil sands or the Venezuelan heavy oil belt exceed Saudi Arabian oil reserves
• Together provide about 1.1 million b/d to the current world oil market
• Future growth will be defined by technological advances and by world oil price levels
Externalities of Demand Swings

- Economic health of exporters
- World economic growth concerns
Competition for Energy in Asia

- Potential for heightened historical tensions
- China/India’s reliance on Gulf oil
- Russia is eyeing China’s oil and gas markets
China: Driver of Asian Oil Demand Growth

- China’s market today is influenced more by government intervention and less by supply and demand. Nonetheless…
- Oil demand up by more than 5 million b/d between 1996 and 2020
- While prospects for growth in domestic oil supply appear limited
- Which translates into an oil import requirement placed at 2 million b/d as early as 2010
Implications for OPEC

- Saudi dominant role grows
- Competition from non-OPEC oil exporters
- Technological impact on energy supply and demand
- Environmental issues
- Natural gas gains market share
Energy Reliability

- Maintain U.S. defense capability
- Encouraging burden sharing to protect supply
- Emphasis on tension-reducing measures
  - Collaborative energy infrastructure projects
- Protection of critical infrastructure
- Maintain and expand the SPR
- Promote diversity of supply and transportation routes
Energy Availability

- Recognize policy contradictions and the importance of key producing countries
- Re-assess sanctions policy
- U.S. policy in the Caucasus and Central Asia
- Encourage China to diversify energy sources
- Encourage market reforms
Looming Controversy?

• All will benefit if developing countries have access to adequate, timely, and secure sources of energy
• At the same time, a rapidly industrializing South cannot afford to place environmental policy ahead of economic growth
• Which raises the prospect of a divisive North-South controversy
What Is Needed to Respond to Global Warming?

R&D programs must be set up for long-term breakthrough responses to the climate change issue.

And that means substantial resource allocations, not just a business-as-usual approach to R&D.
What Is Needed to Respond to Global Warming?

• Otherwise, the standoff between developed and developing countries continues

• It is essential to ensure clean coal technology is a viable option for developing countries, given their high coal consumption
Energy and the Environment

• Encourage incentives for voluntary actions
• Continue efforts for developing country participation
  – Consider bilateral agreements
• Review domestic producer subsidies
• Sustain technology research efforts
• Lessen barriers for new technology
• Assess feasibility of the nuclear option
The Nuclear Option

- Promote nuclear power in developing countries
- Developing countries are apt to consider nuclear power as an option, especially to supply electricity in rural areas and to promote general industrialization
- Maintain as an option in developed countries
Energy and Technology

Technology provided dramatic increases in quality of life and it will:

– Pace energy development, production and consumption
– Provide a more efficient use of energy consumed and in a more environmentally-friendly way
– Determine the hows and whens,
  • i.e., the move away from the internal combustion engine to a non-polluting source of power
Renewable Energy:

• Interest in expanding renewables increases when:
  – oil supplies are threatened
  – oil prices spike
• Potential resistance and impediments
• Little reduction on oil imports
So, What’s New?

- Influence of nongovernmental organizations (NGOs) on energy-related policy decisions is seen as expanding
- Developing countries take the lead in energy consumption
- Very real prospects of terrorist attacks on energy infrastructure
- Global warming is attracting growing attention
Security of Supply:

If U.S. military power were committed even to an extended protection exercise in NE Asia, the capacity to respond to a crisis like that of 1990 in the Gulf would be severely limited.
So, What’s New?

Policy Contradictions:

• Future need for oil at odds with sanctions on Libya, Iraq, Iran

• U.S. deals with energy policy in domestic rather than international terms; at odds with globalization
Troubles Ahead?

- Where is the growth in energy demand coming from?
  - Unstable countries

- Where is the growth in energy supply coming from?
  - Unstable countries
Troubles Ahead?

• Making for a somewhat uncomfortable and unpredictable future
• End of Cold War discipline has enhanced prospects for increased volatility
  – Which in turn may constrain investment levels, resulting in tight supplies
A Final Thought

• Our assessments stress prospects for instability and interference in energy supplies

• But only to alert policymakers just how fragile timely supplies really are
Focus on Sudan
Focus on Sudan

• In a world that consumes 76 million barrels of oil every day, Sudan is a very small player

• Even so, Sudan must continually compete for its place in the world oil market
Focus on Sudan

When oil companies search for oil, they face 3 distinct risks:

• Geologic risk
• Technical risk
• Political risk
Focus on Sudan

- For Sudan, the geologic and technical risks have been overcome.
- But the political risk remains.
- And the higher the political risk, the higher the return on investment must be.
Focus on Sudan

- Is there perhaps an offsetting advantage to this very real political risk?
- Yes, there is.
- Oil importing nations seek security of supply through diversity of supply.
- The United States is a good example. As the world’s largest oil importer, it buys oil from 60 different countries.
Focus on Sudan

• Sudan offers oil importers another source of supply, albeit limited.

• Why has China taken an interest in Sudan?

• For the very same reason: security of supply through diversity of supply.
Focus on Sudan

• Any oil exporting country is of interest today.
• As consumers seek to opportunities to lessen dependence on the volatile Persian Gulf.
• But the competition will be keen. Oil company budgets have their limits.
• Who will win out?
• Those countries offering the best terms and the most stable investment climate.