Global Shales and Renewed Conventional Resources
Catalysts for Global Economic and Geopolitical Change

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Hachiko – a/k/a @gaslawdog
Our Goals

• Briefly consider what is happening in energy supply, demand and sourcing in our world
• Briefly consider the distribution of shale oil and gas resources around the globe and the technological renewal of conventionals
• Lightly explore two “non-intuitive” oil and gas venues
• A little discussion of “big picture” issues
Core Theses

• GOOD NEWS!
  – Global communications are accelerating global development
  – Accelerating global development drives global energy demands
  – Accelerating global energy demands require accelerating global energy development
  – THUS, barring global governmental stupidity, the future is bright for global energy business
What possible Global Stupidity???

One example, Alan Greenspan: NAPE 2014

Failure to preserve energy transit through the Strait of Hormuz could be fatal to global economics
What Possible Domestic Stupidity?

• Failure to effectively and aggressively combat rampant carbophobia that leads to
  – Unreasonable public fear and uncertainty
  – Anti-development governmental policies
  – Anti-development regulations

• Failure to make US oil / gas / coal available to global markets

• Failure to grasp and to pursue the truly global nature of modern economics and the global role of energy
World Energy Consumption

Consumption: 129.1
Consumption: 118.4
Consumption: 213.1
Consumption: 18.9
Consumption: 29.7

(Quadrillion Btu [2007])

World Energy Consumption

Consumption: 123.7
Projected Consumption (2040): 133.8

Consumption: 17.8
Projected Consumption (2040): 143.6

Consumption: 28.0
Projected Consumption (2040): 46.6

Consumption: 166.8
Projected Consumption (2040): 161.7

Projected Consumption (2040): 35.0

Projected Consumption (2040): 383.9

Projected Demand  ExxonMobil Projection

Quadrillion BTUs
Projected Demand  ExxonMobil Projection

Quadrillion BTUs
Projected Demand

ExxonMobil Projection

MM Bbl /Day Oil Equivalent
Projected Demand
ExxonMobil Projection

Quadrillion BTUs
Projected Demand  ExxonMobil Projection
Projected Gas Production

ExxonMobil Projection

Conventional (Red) / Unconventional (Pink)
Global Oil Production
By Discovery Date

ExxonMobil Analysis

Source: ExxonMobil estimates based on Wood Mackenzie Limited & Nehring Associates data

Grey <1930 | Black 1930’s | Aqua 1940’s | Blue 1950’s | Lt Green 1960’s | Dk Green 1970’s | Orange 1980’s |
Brown 1990’s | Red 2000’s

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The “equalizer”!

Internet Users in the World Distribution by World Regions - 2012 Q2

- Asia: 44.8%
- Europe: 21.5%
- North America: 11.4%
- Lat Am / Caribb: 10.4%
- Africa: 7.0%
- Middle East: 3.7%
- Oceania / Australia: 1.0%

Source: Internet World Stats - www.internetworldstats.com/stats.htm
Basis: 2,405,518,376 Internet users on June 30, 2012
Copyright © 2012, Miniwatts Marketing Group
So Why Think Internationally?

• US producers have something to sell
  – Experience, technology and expertise
• World energy prices are high compared to US prices
  – A little more work for a lot more return
• Diversification of location opens different markets
• Diversification of reserves AND economies
  – Improved balance in varying economic cycles
US Energy Information Agency

• April, 2011 Study on 14 Potential Shale Plays

• Available in summary and in full text (51.4 mb) at:

  www.eia.gov/analysis/studies/worldshalegas/
Global Potential Shale Resource Plays

Source: Dan Jarvie, Energy Institute, Texas Christian University
World Shale Gas Reserves

• Thus far, around 32,500 trillion cu. ft. estimated globally (but...may be a conservative estimate)
  ❖ Could increase global gas reserve estimates from 50-250%

• Shale gas exploration & drilling in:
  ➢ Europe [Poland, Hungary, Germany, Sweden, UK, etc.]
  ➢ China
  ➢ India
  ➢ Africa
  ➢ Australia
  ➢ South America [Peru]
Potential European Shale Gas Reserves

Legend:
- Yellow: Potential Shale Gas basins
- Green: Shale Gas exploration active

Portugal: Lusitanian basin and Peniche basin
North Spain: Ebro basin
South West of France: Aquitaine Basin, Ales Basin, East Paris Basin
Italy: Po basin (Po Valley)
United Kingdom: Wessex Basin
Southern Ireland: Dublin Basin, NW basin and offshore basins
Germany/Holland: North German basins
(Green LSB: Lower Saxony basin: active unconventional (shale and Tight gas) exploration and development)

Switzerland/Germany/Czech Republic: Molasse basin
Austria: Vienna basin
Romania: transylvanian basins
Hungary: Pannonian basins
Poland: Shale gas: 1. Peri-baltic basin (orange)
2. Polish trough
Tight gas: Polish trough
South Sweden: Scania basin (orange)

EPRC, Dec. 2009
Gazprom:
A Major Hindrance to European Energy Security and Friend to Internal Production

- European reliance on imports from Russia
  - 25-33% of imports of natural gas (expected to increase as much as twofold in coming years)
    - 80% by pipeline via the Ukraine
  - Projected increase in demand
  - European energy prices often 2x + those in the U.S.
    - A liberalizing market or political motivation?
  - Russia often uses energy to divide and rule its Western neighbors

- “The Blame Game”: Russia & Ukraine
  - Repeated supply cuts
    - Preemption of transit gas by Ukraine or curtailment of deliveries by Russia?
    - Price disputes
Proposed Pipeline Solutions

- **Nord Stream (Baltic Sea)**
- **South Stream (Black Sea)**
  *costly options + Eastern Europe still susceptible to Russian bullying*
- **Nabucco (C. Asia via Turkey)**  
  *[Russian bypass option]*
  *not enough gas to supply European demand*
And from Yesterday’s Headlines

- *The Christian Science MONITOR*
- US approves more LNG exports as Europe looks to curb Russian gas
- The US Energy Department conditionally approved its seventh liquefied natural gas export terminal Monday. The authorization comes as President Obama visits Europe to discuss European energy security and the continent's response to Russia's Crimea annexation.
- By [David J. Unger](mailto:Davide.J.anger@steptoe.com), Staff writer / March 24, 2014
Relevant?

• Voice of America, March 4, 2014
• Russia-Ukraine Standoff Prompts Energy Fears in Europe
• LONDON — Gas prices have risen in Europe over fears the standoff between Russia and Ukraine could result in disruptions to supply and possibly undermine the continent’s economic recovery. (Henry Ridgwell)
Other Potential Global Shale Plays

- **India**
  - High dependence on imports
  - Large potential for shale gas production (set to begin in 2011)
  - No official estimates, but initial studies:
    - [Damodar Basin] – 35 Tcf
    - [Cambay Basin] – 90 Tcf
    - Largest conventional gas field [KG Basin] – only 10 Tcf!

- **Africa**
  - Tunisia [Ghadames Basin]
  - South Africa [Karoo Basin]
    - Chesapeake, Statoil ASA, & Sasol Ltd

- **South America**
- **Australia**
Why US Companies Must Internationalize

- Market
- Diversification of Reserves
- Technology Value Recapture
- Pricing / Returns
- Politics
- Environmental Benefits
Let’s Compare Pricing

- European Union Natural Gas Import Price
- Henry Hub Natural Gas Spot Price

Sources: World Bank, EIA

Jun 21 2013, 2:25PM UTC. Powered by YCharts

The Motley Fool
Price / Return Differences Why?

- Different economy (ies)
- Different sources of supply
- Different transportation options
- Still more linked to oil than US which is totally disconnected
  - But see analysis of growing rejection of Russian effort to preserve linkage to oil in future contracts
    - See—Verleger, *Crude Oil Spreads: There Is No Limit*, The Petroleum Monthly, Volume XXVIII, No. 6 (June 2011)
AND . . .

• Note the focus on shales to this point in our discussion?
• What about conventional formations?
• Only need to look to the Permian to see what time and technology can provide on the conventional front!
• Extrapolate that to the thousands of conventional basins around the globe and WOW!
A Tale of Two (Potential and Non-intuitive) Opportunities

• Iraq / Kurdistan Region of Iraq
  • Paraguay
Iraq and the Kurdistan Region of Iraq
Where in the World is Kurdistan?
The Challenges

• The Neighborhood

• The KRG - Baghdad Disconnect

• The novel terms of the KRG standard agreement
  – The good: Production Sharing Format
  – The bad: KRG can nominate new “partners” after production is achieved

• The tonic - Industry Consensus: Exxon, Chevron, Total, Gulf Keystone, etc., are there!
What the Industry is Doing

• US energy giant Chevron signs oil deal with Iraqi Kurdistan—June 18, 2013

• Joining 39 companies from 19 countries in KRG oil and gas activities

Kurd Net June 18, 2013
ekurd.net
What the KRG is Projecting

• Iraq’s Kurdistan Region expects to produce one million barrels of oil per day (bpd) by 2015, an ambitious fivefold increase over current output, the autonomous northern enclave’s natural resources minister says in a report.

Kurd Net  6/7/2013
ekurd.net
What Producers are Saying about the KRG

• “The Kurdistan region is proving to be a world class hydrocarbon resource base, discovery is well above industry standards and the growth rate of infrastructure development is accelerating,” said Nicholas Atencio, DNO general manager of Kurdistan, speaking at ADIPEC last month.” (ADIPEC 2012).

DNO International is an entrepreneurial independent E&P company, geographically focused on the Middle East and North Africa with operations in Yemen, the Kurdistan region of Iraq, Tunisia, Oman and Ras Al Khaimah. The group is headquartered in Oslo and listed on the Oslo Stock Exchange.
What Producers are Producing

• Gulf Keystone Petroleum will produce 40,000 barrels of oil per day (bpd) within the coming weeks after the Iraqi Kurdistan-focused explorer's field development plan was approved, the region's energy ministry said on Wednesday.

Kurd Net, June 26, 2013
www.ekurd.net
The Potential: Iraqi Reserves

• According to OPEC, Iraq's resources of 143 billion barrels of crude oil and 126.7 trillion cubic feet of gas are the fourth largest in the world after Venezuela, Saudi Arabia and Iran. However, Iraq's oil production is almost half that of Iran, meaning there is plenty of room for growth.

PUK Media October, 2012
Pukmedia.com/EN
The Potential: KRG Reserves

• Kurdistan accounts for 43.7 billion barrels of proven oil reserves, 25.5 billion more barrels of unproven reserves and between 3 and 6 trillion cubic meters of gas (30% of Iraq's proven oil reserves). If Kurdistan were a country, the amount of oil and gas reserves would place it among the top 10 oil rich countries in the world.

Pukmedia.com October, 2012
Paraguay
Where in the World is Paraguay?
Paraguay Energy Facts

• In 2006, Wikipedia reported
  – Paraguay does not produce any crude oil
  – Paraguay has no proven oil and gas reserves, and it neither produces nor consumes natural gas.

• Paraguay produces 51.8 Bkwh of electricity while consuming only 3.1 BKwh
  – Paraguay uses only 16% of its share of the production from its Itaipu dam and only 1% of its share of production from its Yacyreta dam
And Then. . . .

• 2012—A large oil discovery has been made in the Chaco region and Paraguay could join the petroleum producers club in 2013, President Federico Franco said. (Fox News Latino, 11/27/2012)

• Estimated Reserves
  – Oil—4 billion barrels
  – Gas—14 trillion cubic meters (with oil and liquids) (Americas Quarterly, July 12, 2013)
Leading to Aggressive Search for Development and Concession Offers
The Challenges

• Chaco region is remote, sparsely populated and has limited infrastructure

• “Because so few companies have managed to exploit the area and seismic studies have been limited, it has proved to be extremely risky for prospective companies to get involved. With the cost of drilling a well approximately $10 million, and limited credit available, the smaller oil companies that are present in Paraguay have been skittish about making large investments. These companies do not have the financial backing of the majors.” (Americas Quarterly, July 12, 2013)
So. . . .

- Do the following facts not suggest unique opportunity
  - New resource discovery in a nation formerly totally dependent upon imports for oil and not able to enjoy the benefits of gas
  - Huge, energy thirsty neighbors
  - Huge reserve estimates based on current data
  - Limited competition—strong government interest in fostering development
AND . . .

• IF the unintuitive resources of IRAQ and Paraguay have moved into such potential global energy prominence . . . .

• What others are simply waiting to be recognized and pursued?

• How much more opportunity is waiting to be developed in more conventional venues?
But How ?? ??

• Single company pursuit of profit through exploration, production and marketing of oil and gas; or

• Collaboration in capital and expertise of a group independents to explore and drill for and to produce and market oil and gas

• Etc.
U.S. Product Exports by Product and by Region 2013 First Half (thousand barrels per day)

- NGLs/LPGs (395)
- Gasoline (509)
- Diesel/distillate (934)
- Jet fuel (144)
- Resid (381)
- Pet. coke (516)
- Other products (250)

Total: 3,129,000 barrels/day

Source: Energy Information Administration
And this. . . .!
Recommendations for Reading

The Bottomless Well
The Twilight of Fuel, the Virtue of Waste, and Why We Will Never Run Out of Energy
Peter W. Huber and Mark P. Mills

The Prize | The Quest
David Yergin
In All Events

We DO live in the most interesting of times!
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