

New US Energy Policy

*Potential implications for
Northeast Asian Demand and Policy*

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John Tichotsky, Ph.D. (Cantab.)
Alaska Cambridge Group, LLC



Wasilla Main Street = Parks Highway



Chukotka is the Russian region closest to the United States and Alaska. Since 1992, one of 87 equal subjects of the Russian Federation



The Chukotka Autonomous District



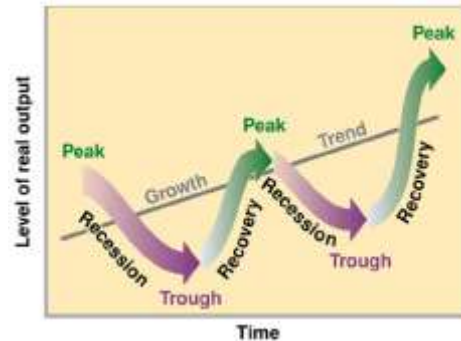
- Located in extreme Northeast of Russia
- Area is 737,700 square kilometers, twice the size of Japan, or France and the UK combined
- Population 56,000, of which, 17,000 Native people
- More than half of area located north of the Arctic Circle
- Extreme climactic conditions, with permafrost

A Year of GREAT Change for Chukotka
Roman Abramovich, Head of Chukotka Parliament



Practical Economics

Business Cycle



Robert Malthus – Protect Fair Domestic Price

- It would be dangerous for Britain to rely on imported corn - lower prices since it would reduce workers wages and manufacturers would lose out due to the fall in purchasing power of landlords and farmers



David Ricardo Comparative Advantage

- Free trade will allow Britain could use its capital and population efficiently to utilize the countries comparative advantage.
- Price is a tool for determining amount and mix of imports and domestic production.



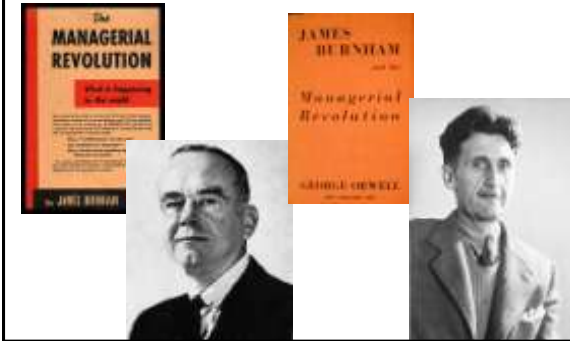
US Policy Advisor
Benjamin Franklin

“No nation was ever ruined by trade.”

More Ricardo...

- Main argument **against** trade and price control is that these policies are **ultimately COSTLY** to nation.
- Are government planners any better or worse at guessing prices than speculators ?

Avoiding the Managerial Revolution



OBAMA ADMINISTRATION US Energy Policy



Energy Plan is a "Green Plan"



Obama Administration "Guiding Principles"

- "To take this country in a new direction, the President is working with Congress to pass comprehensive legislation to protect our nation from the serious economic and strategic risks associated with **our reliance on foreign oil** and the **destabilizing effects of a changing climate**. Policies to **advance energy and climate security** should promote **economic recovery efforts, accelerate job creation, and drive clean energy manufacturing....**

"Investing in the Clean Energy Jobs of the Future"

- "Creating new Jobs in the Clean Energy Economy. Drive the development of new, green jobs that pay well and cannot be outsourced."
- "Investing in the Next Generation of Energy Technologies. Invest \$150 billion over ten years in energy research and development to transition to a clean energy economy."



\$150 Billion?????

- "Help create five million new jobs by strategically investing **\$150 billion over the next ten years to catalyze private efforts to build a clean energy future.**"

What is the real scale of the problem?

- EXAMPLE: \$45.22 Billion profit only for Exxon Mobil for 2008
- Current US deficit projection is \$11 trillion
- \$150 billion OVER TEN YEARS = \$15 billion a year investment in a “clean energy future” seems to be a joke...

Major Integrated Oil Companies 2007

(Millions)

Company	Revenue	% Change	Net Income	% Change	% Return on Sales	% Return on Equity
ExxonMobil	404,552	7.1	40,610	2.8	10.0	33.4
Royal Dutch Shell	355,782	11.6	27,564	8.7	7.1	22.2
BP	291,038	6.2	17,287	-22.3	5.9	18.5
Chevron	220,904	5.1	18,688	9.0	8.5	24.2
ConocoPhillips	194,495	3.2	11,891	-23.5	6.1	13.4
Marathon	65,207	-0.4	3,956	-24.4	6.1	20.6
Amstaris Hess	31,924	11.2	1,832	-4.6	5.7	18.8
Occidental	18,784	9.4	5,400	28.8	28.7	23.7
Murphy	18,438	28.9	766	18.8	4.1	15.1
Total	1,601,524	7.1	127,994	-2.9	8.0	22.7

Source: CRS Report for Congress *Oil Industry Profit Review 2007* Robert Prog, Specialist in Energy Economics, Resources, Science, and Industry Division April 4, 2008

Independent oil producers 2007

(millions)

Company	Revenue	% Change	Net Income	% Change
EnCana	21,466	30.8	3,559	-30.0
Devon	11,362	16.3	3,596	26.8
Anadarko	15,892	55.3	3,778	-20.4
Apache	9,978	20.4	2,807	10.2
Chesapeake	7,800	6.5	1,229	-35.5
XTO	5,513	20.5	1,691	20.5
EOG	4,191	7.1	1,083	-16.0
Noble	3,272	11.3	944	39.1
Pioneer	1,833	22.2	373	-49.6
Newfield	1,783	6.6	450	-23.9
Total	83,970	24.7	19,910	-12.8

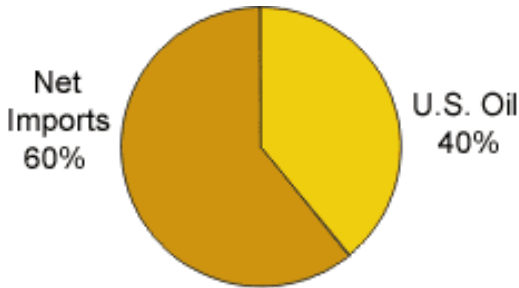
Source: CRS Report for Congress *Oil Industry Profit Review 2007* Robert Prog, Specialist in Energy Economics, Resources, Science, and Industry Division April 4, 2008

More Energy Policy



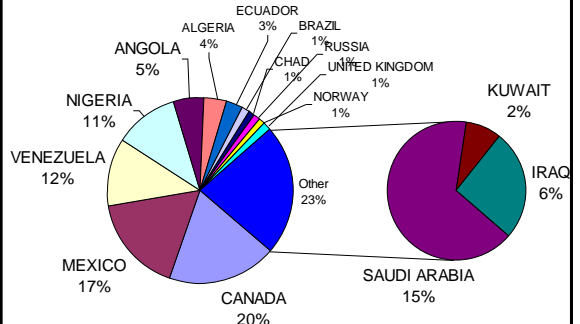
- “Our reliance on oil poses a threat to our economic security. Over the last few decades, we have watched our economy rise and fall along with the price of a barrel of oil. We must commit ourselves to an economic future in which the strength of our economy is not tied to the unpredictability of oil markets. We must make the investments in clean energy sources that will curb our dependence on fossil fuels and make America energy independent.”

US Energy Dependence



Source: Energy Information Administration

US Crude Oil Imports (Top 15 Countries)



Source: EIA

Even if it were realistic or desirable to eliminate imports from Venezuela and Mid-East

– what would that percentage be?

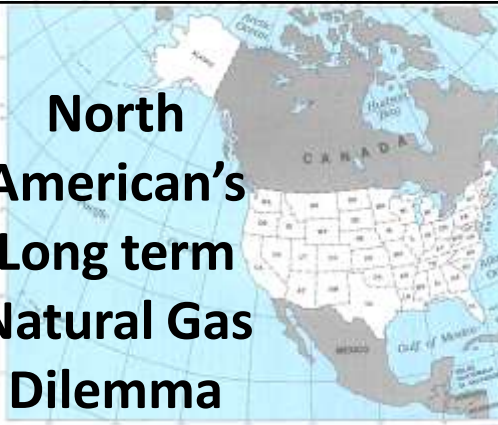
- 60 percent TIMES 35 per cent = 21 percent
- That means the US would have to increase its domestic production 2% to 4% a year over ten years!!!

“Securing our Energy Future”

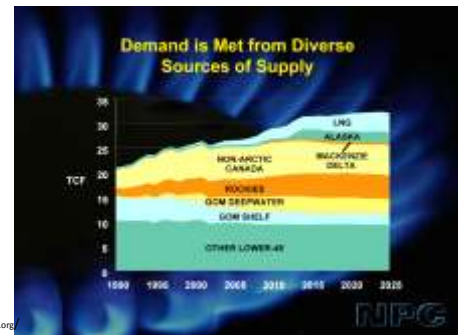
- **Producing More Energy at Home.** Enhance U.S. energy supplies through responsible development of domestic renewable energy, fossil fuels, advanced biofuels and nuclear energy.



North American's Long term Natural Gas Dilemma



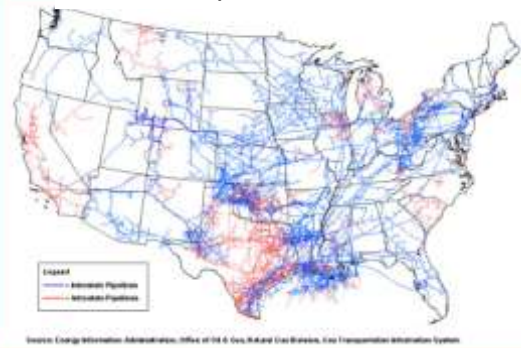
How can North America resolve its need for natural gas as demand is likely to increase?

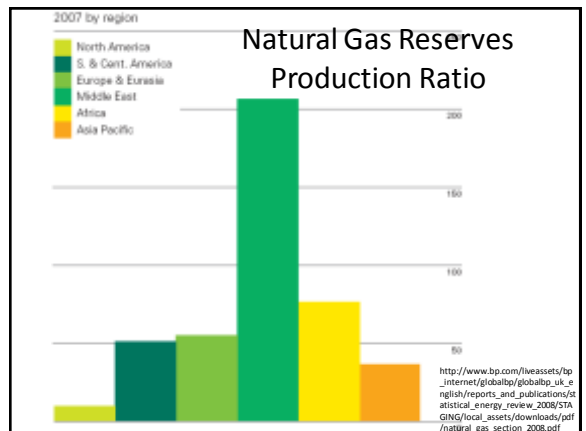
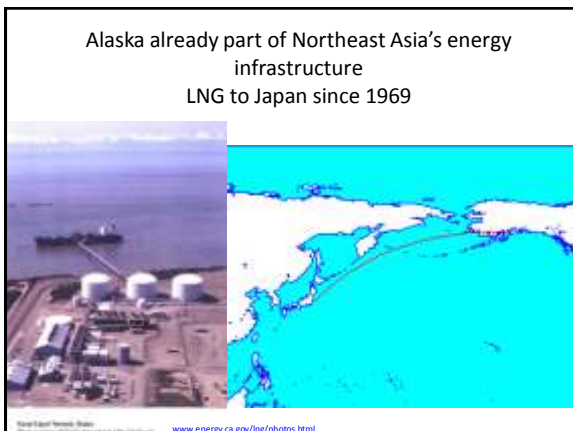
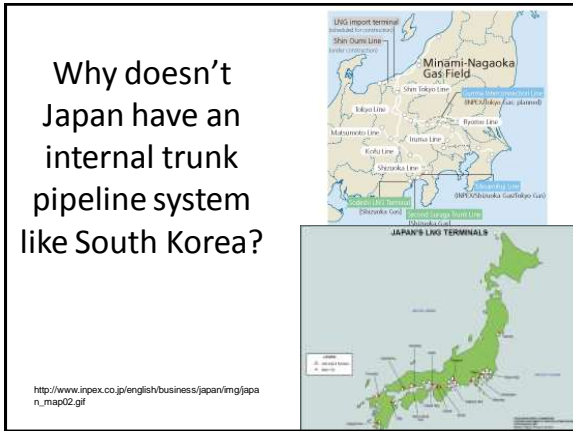
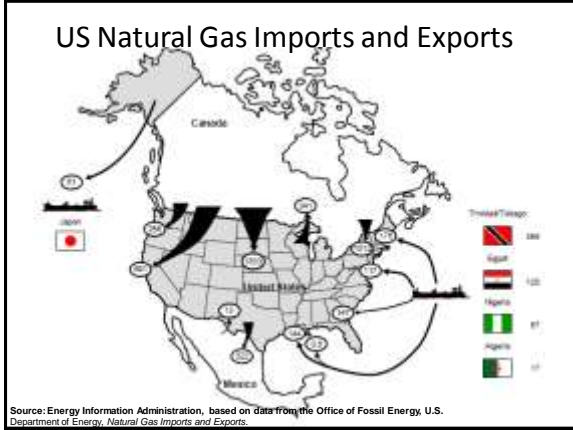


US has the “reverse” Japan problem



Pipelines in US





US Long-term trend natural gas prices



<http://tonto.eia.doe.gov/dna/v/ng/hist/n9190us3m.htm>

Is the solution MORE LNG to US Markets?



MORE LNG TERMINALS ARE NOT REALLY POSSIBLE, SINCE PEOPLE ON WEST COAST ARE AFRAID OF LNG



http://www.raceforcleanenergy.org/lmg/original/f6_nopipeline.jpg

http://www.bbidsplays.com/images/LNG-Pierce_Brosnan.jpg

LNG Terminal in BAJA CALIFORNIA, Mexico



Gas from Arctic Alaska and Canada



<http://www.neb.gc.ca/cf-nst/npol/chn/npch/ndp/ndp/ndp/2007/hv-directiv/hv-directiv-eng.html>

All about scale

- Alaska gas pipeline is now estimated as high as \$40 Billion
- Proposed pipeline would initially be designed to carry 4.5 Bcf/d of natural gas at an operating pressure of 2,500 psig.
- Federal guarantee (2006) of \$18 Billion for 80% is NOW TOO SMALL

How the North Slope and Mackenzie tie into US Natural gas transmission



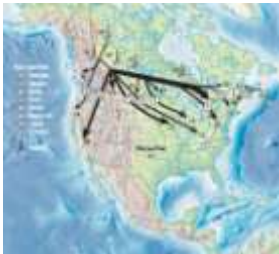
http://www.transcanada.com/investor/annual_reports/2008/comm-on/images/mda/pipeline_map-transmissions.png

Relevance - Scale of project is on order of most Northeast Asian gas pipeline projects



Source: enen.teej.or.jp/en/data/pdf/240.pdf

Canada-US Movement of Natural Gas



<http://www.neb.gc.ca/cf-nslv/mrg/mfn/mrgypr/vtrnsprt/vtrnsprtsssmn/2008/vtrnsprtsssmn/2008-eng.html>

Canada-US Relations 1814-1850



WHERE WILL THE MONEY FOR ENERGY INFRASTRUCTURE COME FROM??



Ex-Governor Sarah Palin of Alaska



GOVERNOR PALIN and the GAS PIPELINE

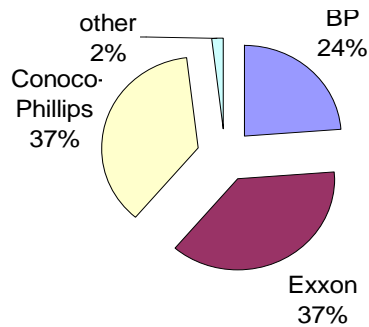
- Alaska Legislature passes Law Alaska Gasline Inducement Act (AGIA) and approves TransCanada application - an energy transportation company - (2008).
 - Comes with \$500 million from State of Alaska
- Legislation changed net profits tax from 22.5% to 25%
- Why not a contract with the producers (BP, Exxon, Conoco-Phillips)?

A Trans-Alaska–Canada Gas Pipeline needs “The Producers”

- This is recognized by TransCanada,
- NOT recognized by much of Alaska political leadership...



“The Producers” - North Slope Alaska Natural gas ownership



“Prioritize the Construction of the Alaska Natural Gas Pipeline.” President Obama



www.ctv.ca

Potential of Methane Hydrates



Lessons for Northeast Asia

- Energy Infrastructure is constrained at the level of demand no greater than Year 2002 at historic prices (Average \$15 real 1985).
- Governments are stressed by current commitments for economic crisis
- Private capital is risk adverse
- Natural Gas prices are down
- “Paradigm shift” in markets
 - Not opposed to the idea
 - But most of the time the fundamentals are the best explanation....


Will Russia change its strategy of excluding or reducing foreign investors, while funding its own development?



Why is multi-lateral worse than bi-lateral?
Why avoid Mongolia to deliver Kovykta Gas to China?



North Korean Pipeline Corridor?



“Securing our Energy Future”

- **Breaking Dependence on Oil.** Promote the next generation of cars and trucks and the fuels they run on.
- **Promoting Energy Efficiency.** Promote investments in the transportation, electricity, industrial, building and agricultural sectors that reduce energy bills.



Capital Costs Changing American behavior



China




USA- how do you cut gasoline consumption?

1. High fuel price OR
2. Lack of consumer spending



Europe

NEW CAFE Regulations

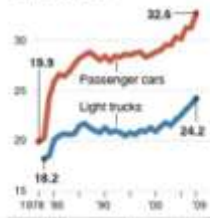
39 miles per gallon by 2016

\$1200 per vehicle higher cost

More fuel mileage

By 2016, new efficiency standards require passenger cars to reach 39 miles per gallon and 30 mpg for light trucks for a combined 35.9 mpg.

Average fuel economy
30 miles per gallon



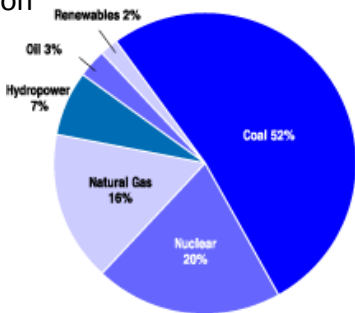
SOURCE: Transportation Department AP

Electric cars are “green”- but where does/will the electricity come from??



Electrical Generation

US Electricity Production Sources



Source: U.S. Department of Energy, Energy Information Administration

Electricity generation by fuel

- Coal continues as base fuel in US
- Natural gas is number two
- Environmental and Political pressure to increase share of Nuclear, petroleum and renewable fuels generation

Who will produce these cars?



Internal Combustion Engine Reliable Since 1885



PROBLEM OF EMISSIONS

Carbon Emissions and US Public

- Public will exists to reduce emissions that induce climate change.
- Public will for change in US policy on emissions
- However,

“Conservation” and environment

- Why do we need to conserve (preserve) for conservation’s sake?
 - Do we need oil for “future generations”?
- “Depleting non-renewable” resources to generate energy is NOT SYNONOMOUS with emissions of greenhouse gases.

Conservation: PHYSICAL REALITIES

- Energy cannot be created or destroyed – it can only be TRANSFORMED from one form to another

$$E=mc^2$$

SOURCES OF ENERGY AVAILABLE

- Nuclear Fusion (SUN: Main source)
 - Solar
 - Hydrocarbon fuel: coal, oil, natural gas (is all gas biotic?), ethanol
 - wind, hydro
 - fusion plants (future),
- Nuclear Fission
 - current nuclear plants
- Gravity
 - tidal and hydro (solar component))

Hydrogen?



Hydrogen Basics

- Hydrogen is not primary fuel, but method of energy storage
- Hydrogen **does not** occur freely in large quantities.
- Two ways to create free hydrogen
 - Electrolysis
 - Reforming hydrocarbons (fossil fuels)
 - treatment of methane with steam
 - $\text{CH}_4(\text{g}) + \text{H}_2\text{O} + \text{e} > 3\text{H}_2(\text{g}) + \text{CO}(\text{g})$.
 - $\text{CO}(\text{g})$ carbon monoxide gas (greenhouse gas).

What is the best way to store hydrogen?



H₂ or as a Liquid in combination with Carbon????



“Cracking Down on Polluters”

- “We must take immediate action to reduce the carbon pollution that threatens our climate and sustains our dependence on fossil fuels. We have had limits in place on pollutants like sulfur dioxide, nitrogen dioxide, and other harmful emissions for some time. After decades of inaction, we will finally close the carbon pollution loophole by limiting the amount of carbon pollutants are allowed to pump into the atmosphere.”

“Closing the Carbon Loophole”

- “**Closing the Carbon Loophole.** By stemming carbon pollution through a market-based cap, we can address in a systematic way all the energy challenges that we face: curbing our dependence on foreign oil, reducing our use of fossil fuels, and promoting new industries right here in America.”



- “**Protecting American Consumers.** Revenues generated by closing the carbon loophole will be returned to the people, especially vulnerable families, communities, and businesses.
- **Promoting U.S. Competitiveness.** Ensure a level playing field for domestic manufacturing and secure significant actions to combat climate change by our trading partners.”

FORMS OF ENERGY FOR USE and STORAGE

- We know how to USE energy
- Better understanding ENERGY STORAGE may be the breakthrough needed for our energy PROBLEMS...

Liquid Hydrocarbons remain one of the most effective methods for transporting and storing energy

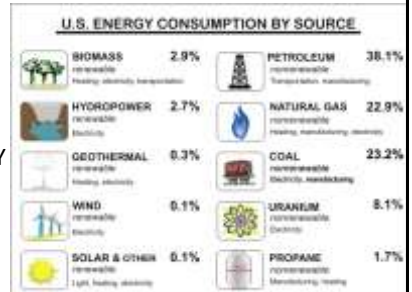


Capital Investment in New Energy Sources, New Energy Infrastructure or New Energy Technology

- A promise of an upward trend demand in energy, infrastructure and technology
- A promise of an upward trend in prices, that is represented by greater demand
- OR much greater volume of demand with falling prices – the process of commoditization.

LONG-TERM REALITIES

- INVESTMENT IN ALTERNATIVE ENERGIES AND NEW TECHNOLOGY



Investment in Alternative Energies

- Problem if prices of traditional fuel is low – what is the incentive??
- Government funding potentially competes with investment for conventional fuels and creates distortions to the markets.
- Dampens anticipated long-term prices for conventional fuels – but what is real outcome.
- What role does economic crisis and investment climate play in reality of such investment...

“Clean Coal” Technology

- Carbon Capture
- Using supercritical and ultra-supercritical steam to reduce coal consumption at the plant
- USA – 0 China- more than 40



Technology

- Need recognition of the LONG TIME TO IMPLEMENT from idea to mass use
 - At least 3 years from idea to proto-type
 - At least 3 years from proto-type to pilot plant
 - At least 2 years from pilot to mass use of technology
 - Elections cycles are much shorter...

Where does

new technology come from?

- Large corporation R&D
- Universities and research institutes
- Government laboratories (including military and space programs)
- **Entrepreneurs**



John Tichotsky

- International Affairs Advisor: Roman Abramovich, Head of Chukotka Parliament, Russia (private sector consultant)
- Arctic Research Consortium US Board member; Scott Polar Research Institute, University of Cambridge (UK); Institute of Social and Economic Research, University of Alaska; University of Hawaii, Alaska Pacific University
- Director and CFO, gold exploration company; small-scale developer (practical business experience)
- Economist and Consultant specializing natural resource economics (Russia, Mongolia, UK, US)
- Fitch-IBCA, credit ratings
- Education: Dartmouth College (USA); Jesus College, University of Cambridge (UK)