



Center for  
Global Security



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# Energy Security: The United States & China

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March 2009



# Center for Global Security Efforts on Energy Security in Asia

## Asia Energy Security – Five topics to date

- Nuclear Asia with National Bureau of Asian Research - 2004
- Energy Security in Asia with NBR - 2005
- China's Search for Energy Security with NBR - 2005
- Northeast Asia Energy Cooperation with University of Washington and Seoul National University – 2006, 2007
- Russia's Role in NE Asia's Energy Security – Feb 2008

## ▶ Reports

- China's Search for Energy Security – Kong Bo – Center fellow 2005
- Northeast Asia Energy Cooperation – Carol Kessler – May 2007

## ▶ Planned

- Security Atlas – visualization of security issues interconnections
- US-China Clean Energy Forum - 2008



# Security Problems Linked to Energy

- ▶ Energy systems as targets and weapons for terrorists: nuclear-energy facilities, hydro dams, oil refineries, natural gas storage
- ▶ Potential for conflict over access to remaining supplies of inexpensive oil & gas
- ▶ Links between nuclear-energy technologies and nuclear-weapon capabilities
- ▶ Political tensions & upheavals resulting from energy- strategy inadequacies that create or perpetuate economic or environmental impoverishment.
- ▶ Expectations that climate change will exacerbate resource scarcities



# U.S. Energy Security Policy

- ▶ U.S. is **world's largest energy consumer**; China is next with 1/3 U.S. consumption.
- ▶ U.S. Congress passed Energy Policy Act of 2005 that calls on the **U.S. to play leading role** in addressing world's energy challenges and to ensure adequate, reliable, affordable and market-priced energy.
- ▶ In 2007, then President Bush signed the Energy Independence and Security Act (EISA), which expands the U.S. production of renewable fuels, reduces our dependence on oil, and confronts global climate change.



## Current Thinking on U.S. Energy Policy

- ▶ Brookings ***Energy Security Initiative***, including their definition of the substantive aspects of energy security
- ▶ WRI and CSIS Summary and Presentation, ***A Roadmap for a Secure, Low-Carbon Energy Economy***
- ▶ ***Center for American Progress, A Frame Work for Achieving Energy Security and Arresting Global Warming*** (John Podesta's organization)
- ▶ ***New Science for a Secure and Sustainable Energy Future*** (Report to DOE BES advisory subcommittee)
- ▶ ***A Transition Plan for Securing America's Energy Future***, Institute for 21st Century Energy (General James Jones previous organization)
- ▶ ***Power from Perspective***, A joint Deloitte and Howard H. Baker Center for Public Policy report that discusses a range of potential future energy portfolios based on differences in social perspectives.



# Obama Energy Policy

- ▶ The Obama-Biden comprehensive New Energy for America plan will:
- ▶ 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.
- ▶ Within 10 years save more oil than we currently import from the Middle East and Venezuela combined.
- ▶ Put 1 million Plug-In Hybrid cars -- cars that can get up to 150 miles per gallon -- on the road by 2015, cars that we will work to make sure are built here in America.
- ▶ Ensure 10 percent of our electricity comes from renewable sources by 2012, and 25 percent by 2025.
- ▶ Implement an economy-wide cap-and-trade program to reduce greenhouse gas emissions 80 percent by 2050.



# Global Aspects of Energy Security



Geopolitics



Economic



Environmental

Three Key Interrelated Aspects of Energy Security

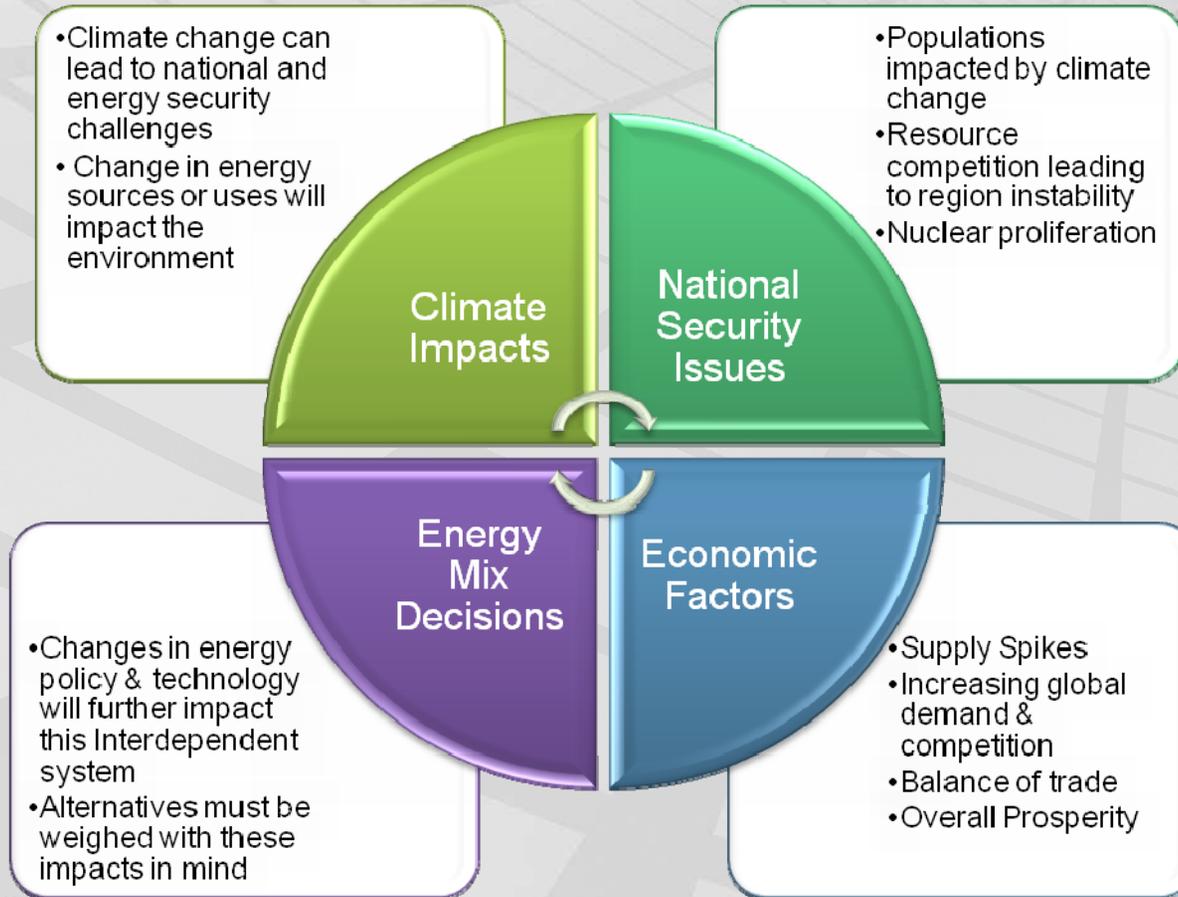
- Geopolitical Conflicts
- Security Risks & Threats
- Political Disorder/Societal Breakdown
- Vulnerabilities to Supply, Transport, & Markets
- Manipulation of Energy Supplies
- Disruptive Technologies

- Supply Disruption
- Price Spikes
- Demand Growth & Increased Competition
- Conflicts over resource shortages (capital, water, food, energy, etc.)
- Financial Instability
- Carbon Tax/Credits & International Offsets

- Climate Change
- Environmental Stress
- Natural Disasters
- Displaced or Impacted Populations
- GHG Emissions/Caps
- Non-Fossil Sources
- Food/Water/Air Impacts



# Energy Security Dimensions

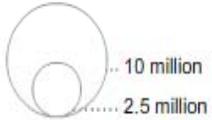




# Global Oil Producers

## Oil produced, barrels per day

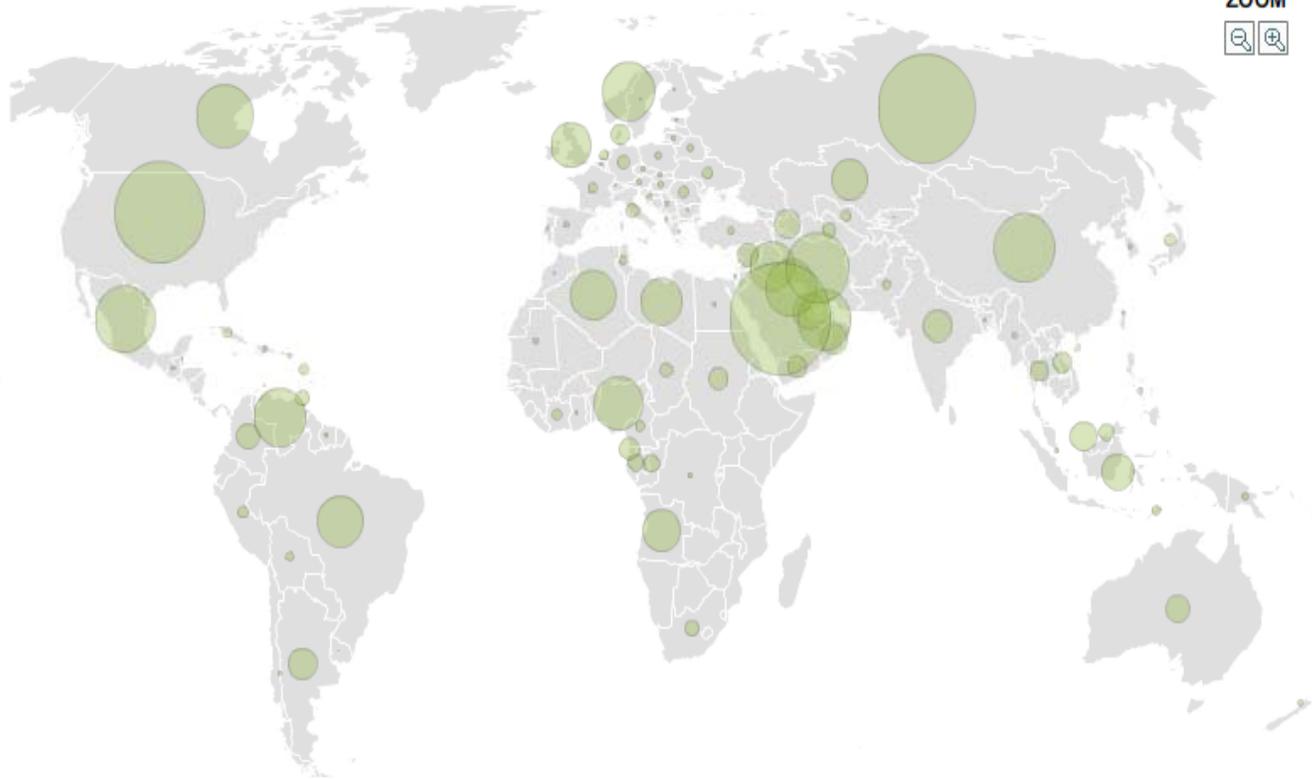
Circles are proportional to the number of barrels.



### Top producers

1. Saudi Arabia	10.7 mil.
2. Russia	9.7 mil.
3. United States	8.4 mil.
4. Iran	4.1 mil.
5. China	3.9 mil.
6. Mexico	3.7 mil.
7. Canada	3.3 mil.
8. United Arab Emirates	2.9 mil.
9. Venezuela	2.8 mil.
10. Norway	2.8 mil.

Source: Energy Information Administration



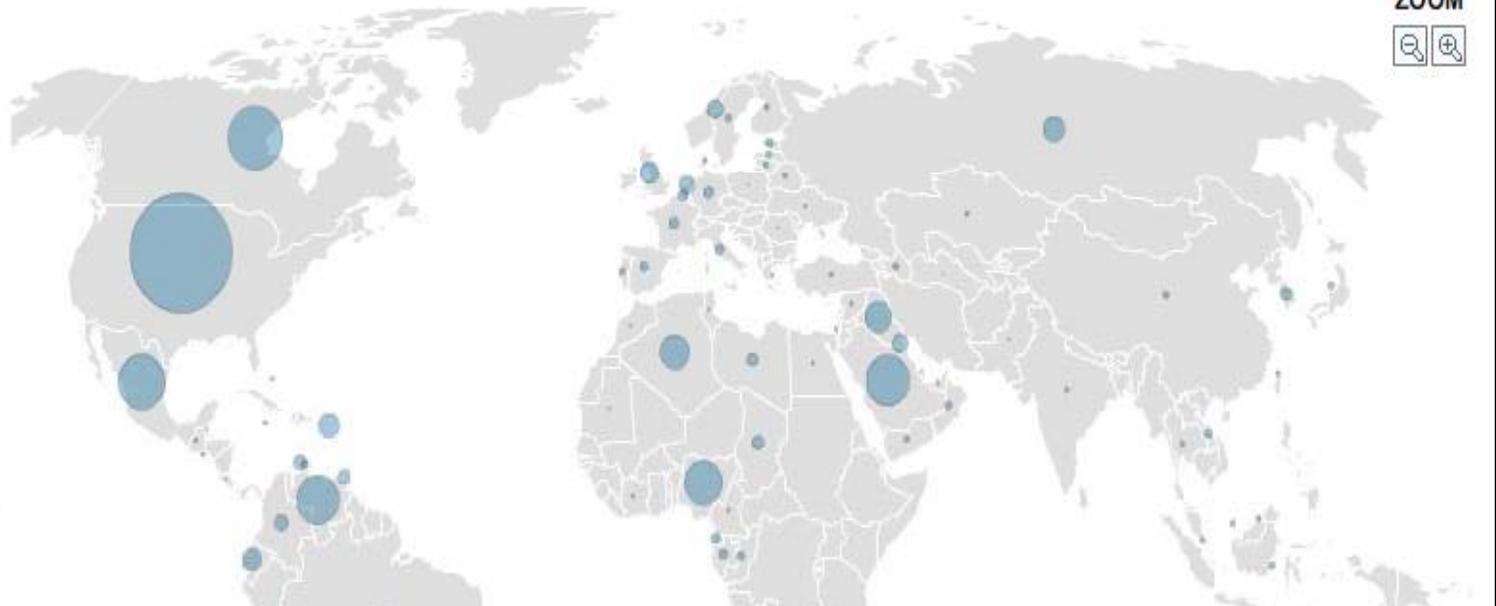
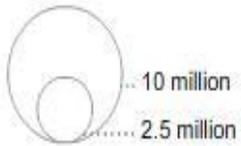
Vu Nguyen / The New York Times



# Oil Suppliers to the U.S.

## Oil supplied to the United States, barrels per day

Circles are proportional to the number of barrels.



ZOOM

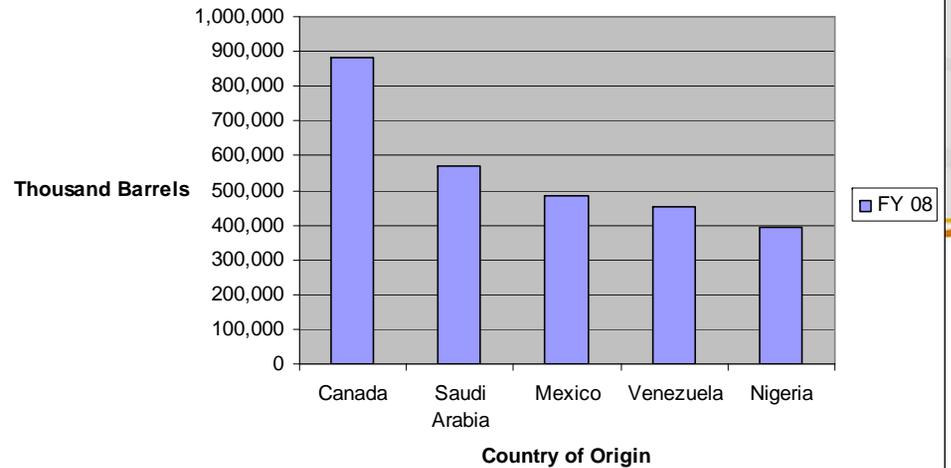


## Top suppliers to the U.S.

1. United States	8.3 mil.
2. Canada	2.4 mil.
3. Mexico	1.7 mil.
4. Saudi Arabia	1.5 mil.
5. Venezuela	1.4 mil.
6. Nigeria	1.1 mil.
7. Algeria	0.7 mil.
8. Iraq	0.6 mil.
9. Angola	0.5 mil.
10. Russia	0.4 mil.

Source: Energy Information Administration

U.S. Oil Imports by Country of Origin

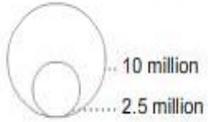




# Oil Consumers

## Oil consumed, barrels per day

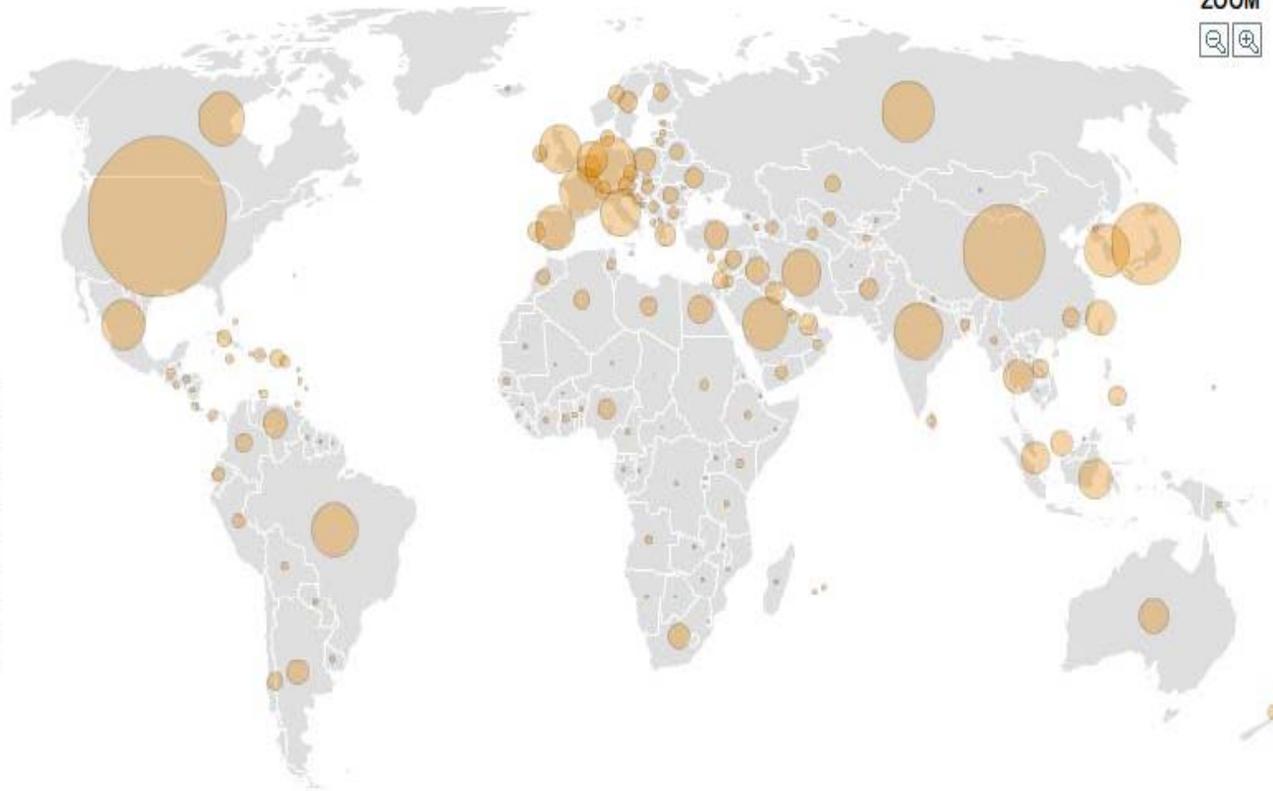
Circles are proportional to the number of barrels.



### Top consumers

1. United States	20.6 mil.
2. China	7.3 mil.
3. Japan	5.2 mil.
4. Russia	2.9 mil.
5. Germany	2.7 mil.
6. India	2.5 mil.
7. Brazil	2.3 mil.
8. Canada	2.2 mil.
9. South Korea	2.2 mil.
10. Saudi Arabia	2.1 mil.

Source: Energy Information Administration

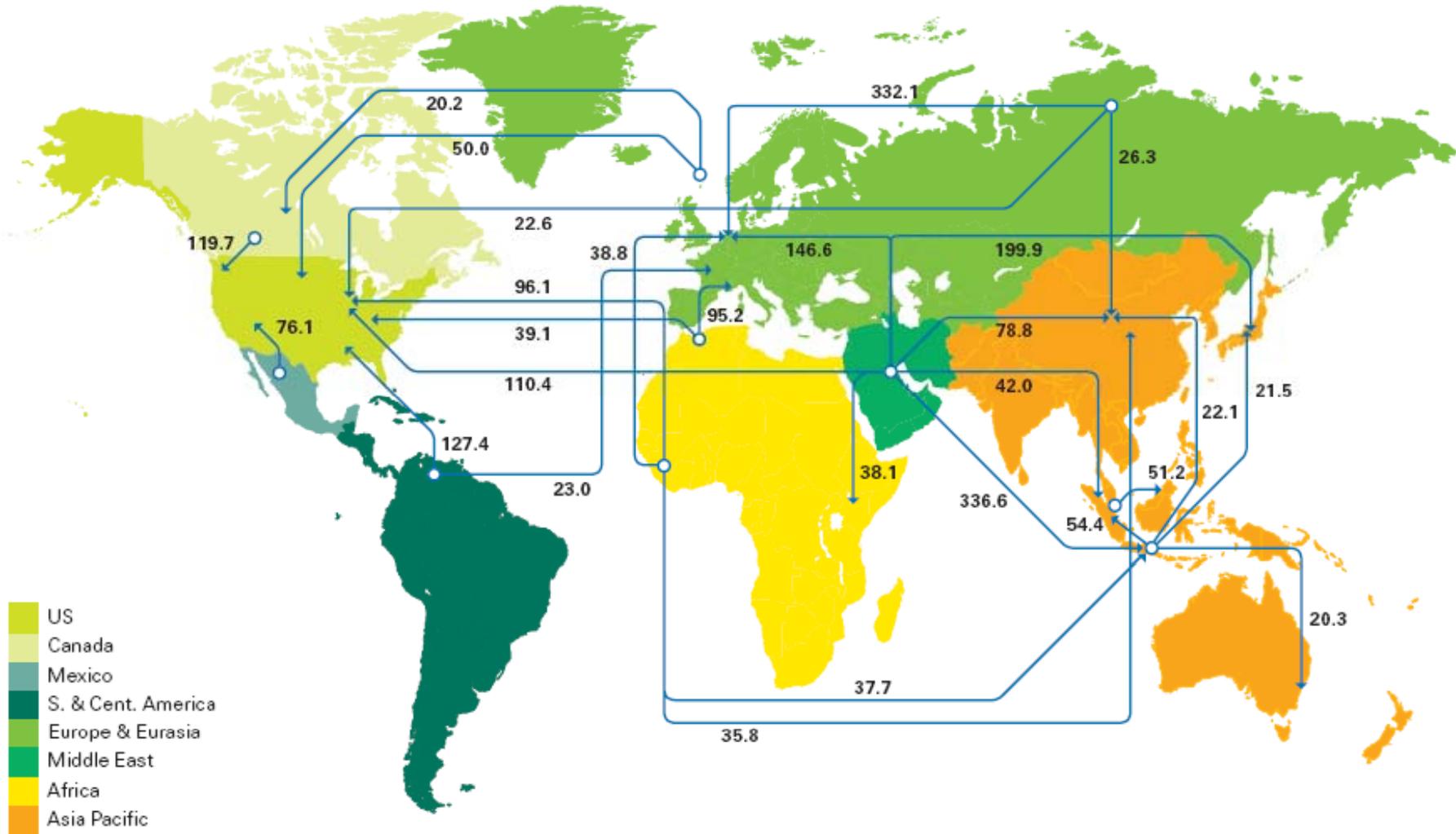


Vu Nguyen / The New York Times



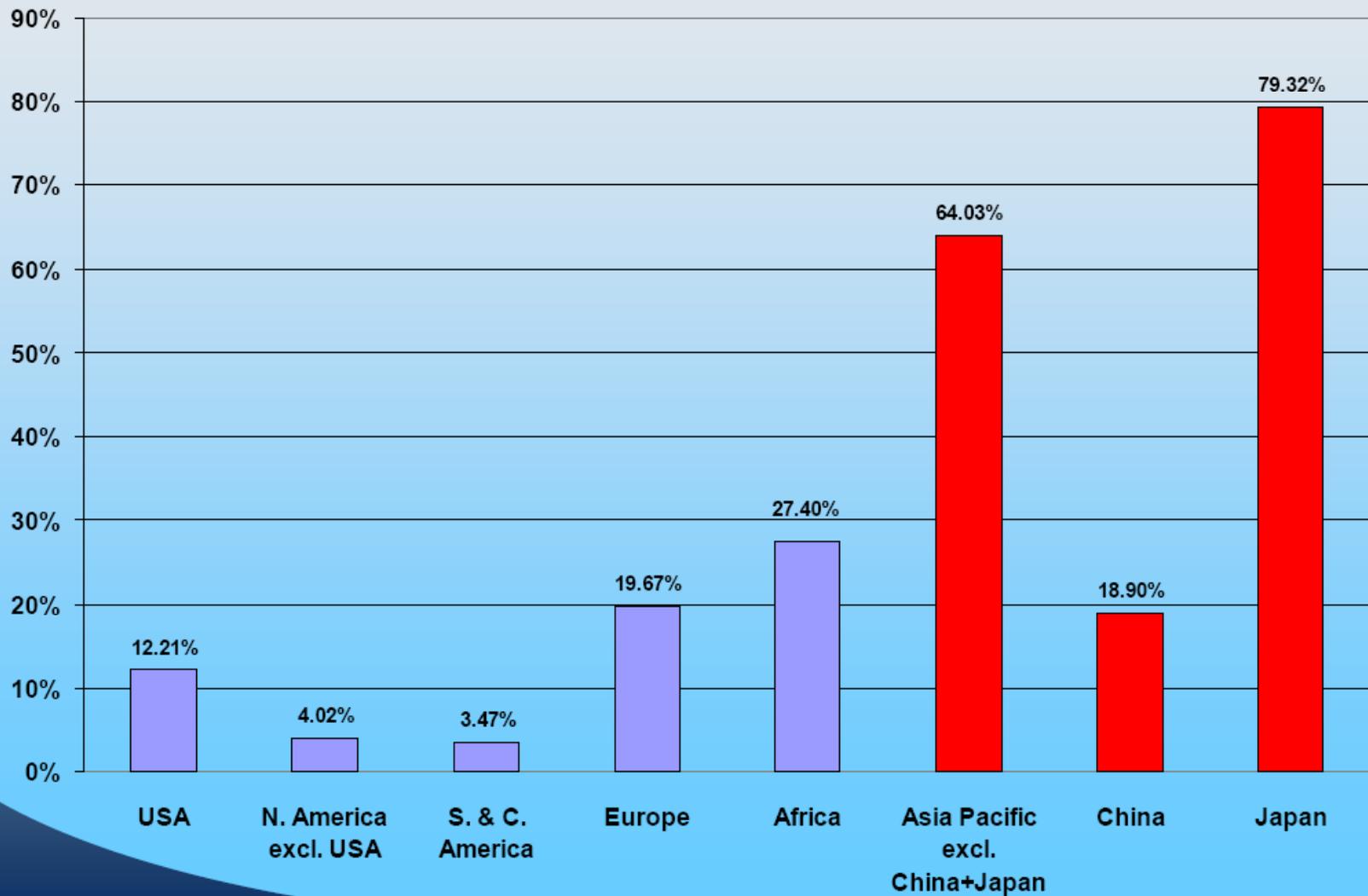
# Major Trade Movements - Oil

Trade flows worldwide (million tonnes)





## Dependence on M.E. as % of Total Oil Consumption, 2004



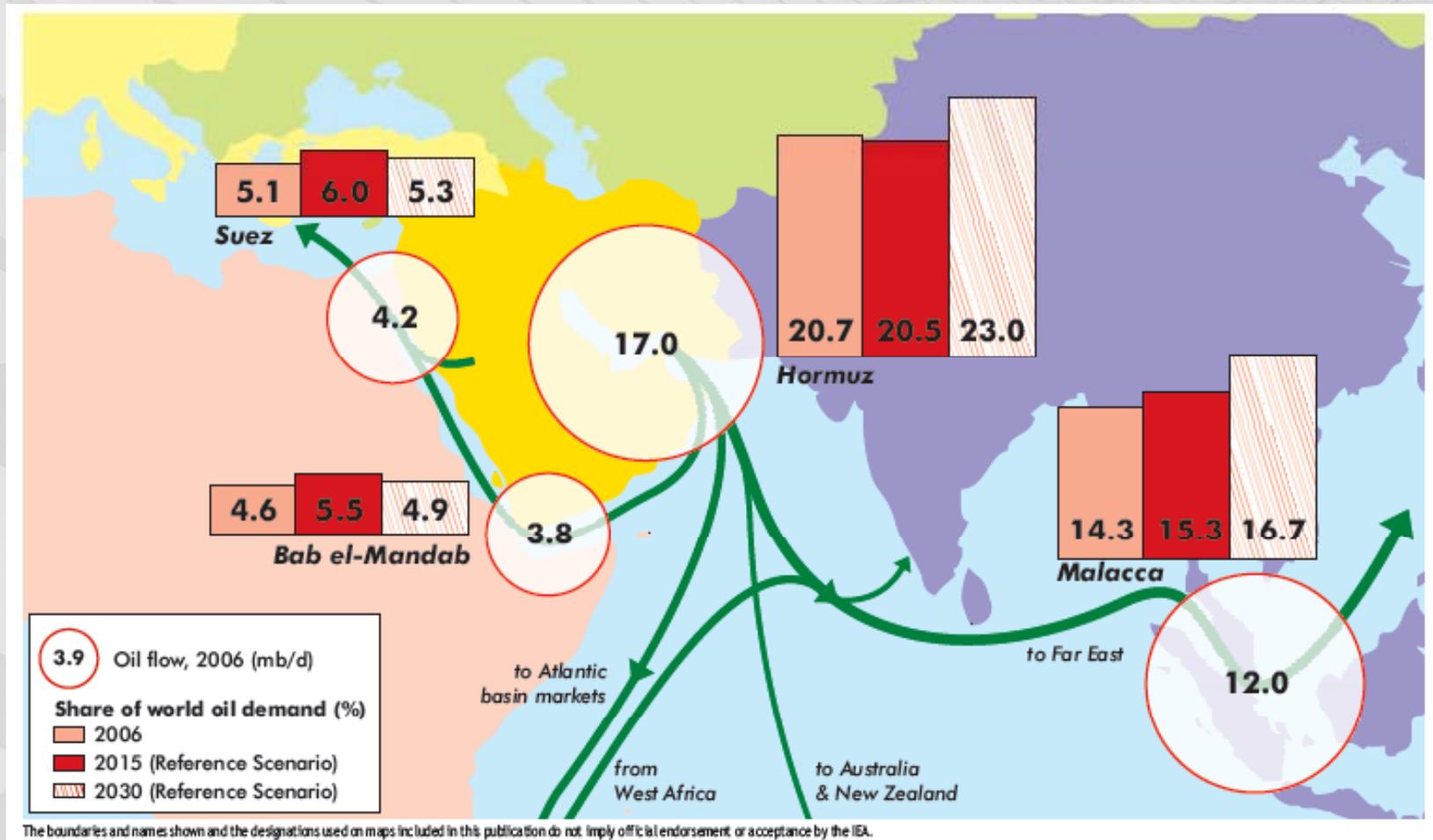


# World Oil Transit Chokepoints

Name	2006E Oil Flow (bbl/d)	Width at Narrowest Point	Oil Source of Origin	Primary Destination	Alternative Routes
<b>The Strait of Hormuz</b>	16.5-17 million	21 miles	Persian Gulf nations including Saudi Arabia, Iran & U.A.E.	Japan, The United States, Western Europe, some Asian countries	745-mile long East-West pipeline through Saudi Arabia to Red Sea.
<b>The Strait of Malacca</b>	15 million	1.7 miles	Persian Gulf nations, West Africa	All Asia Pacific Consumers including Japan and China	Reroute through the Lombok or Sunda Strait in Indonesia. Possible pipeline construction between Malaysia and Thailand.
<b>The Suez Canal/Sumed pipeline</b>	4.5 million	1,000 ft.	Persian Gulf nations	Europe and the U.S.	Reroute around southern tip of Africa (Cape of Good Hope) - additional 6,000 miles
<b>Bab el-Mandab</b>	3.3 million	18 miles	Persian Gulf nations	Europe and the U.S.	Northbound traffic and use East-West oil pipeline through Saudi Arabia; Reroute around Cape of Good Hope.
<b>The Turkish Straits</b>	2.4 million	0.5 miles	Caspian Sea region	Western and Southern Europe	No clear alternative
<b>The Panama Canal</b>	0.5 million	110 ft	The U.S.	The U.S. and Central America	Reroute around Straits of Magellan, Cape Horn and Drake Passage – additional 8,000 miles

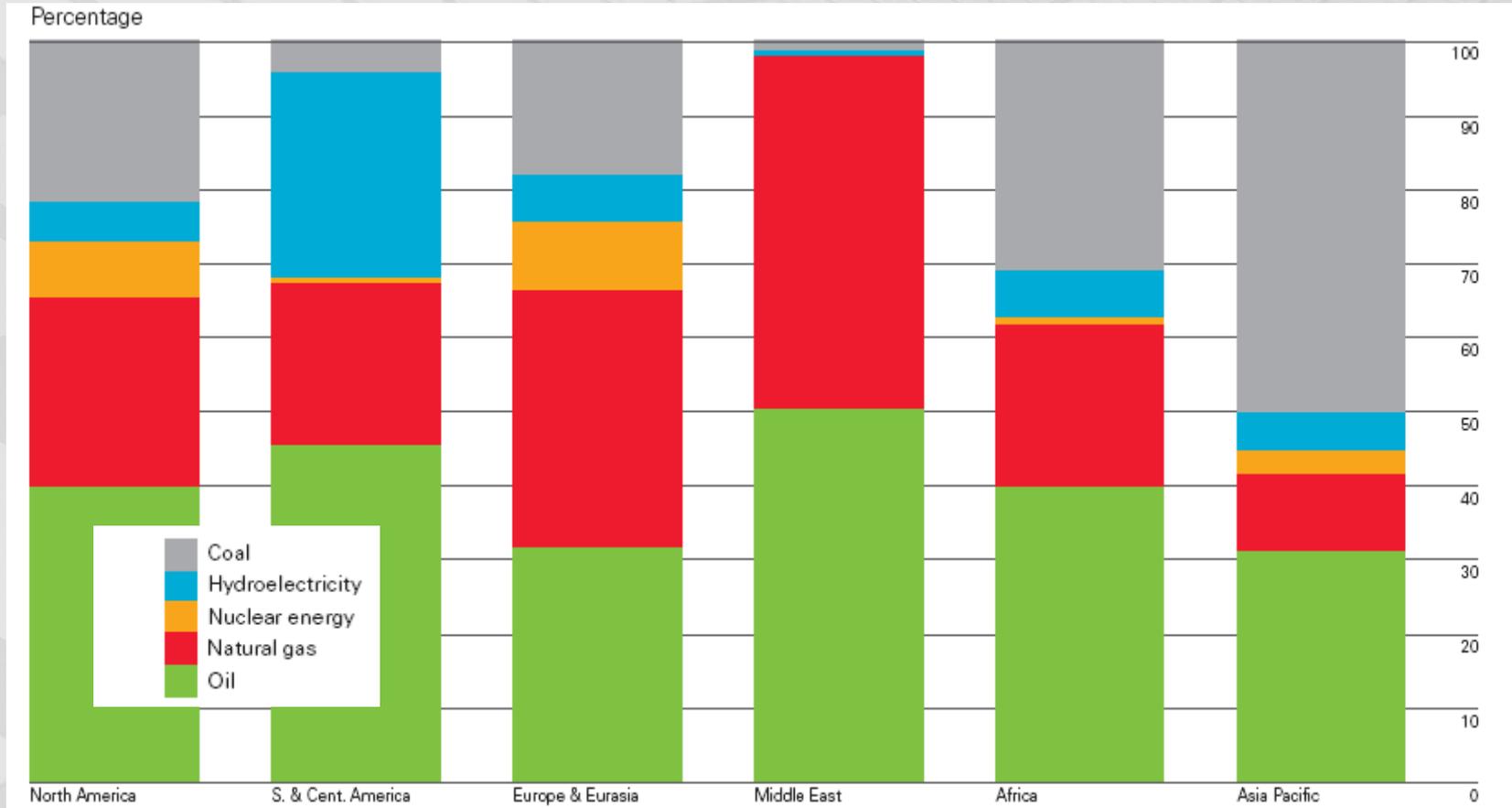


# Oil Export Flows from the Middle East



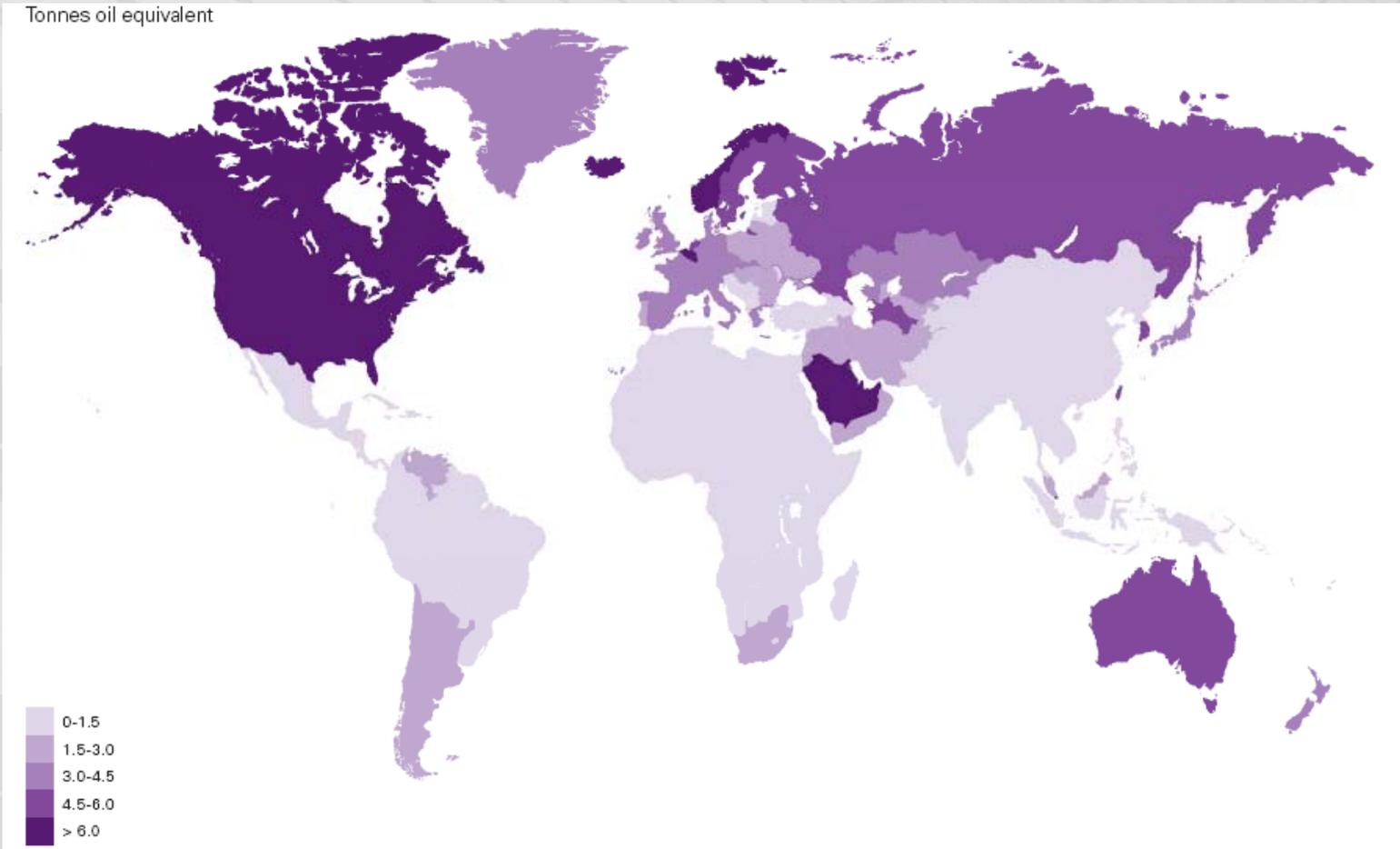


# Regional Consumption Pattern (2007)



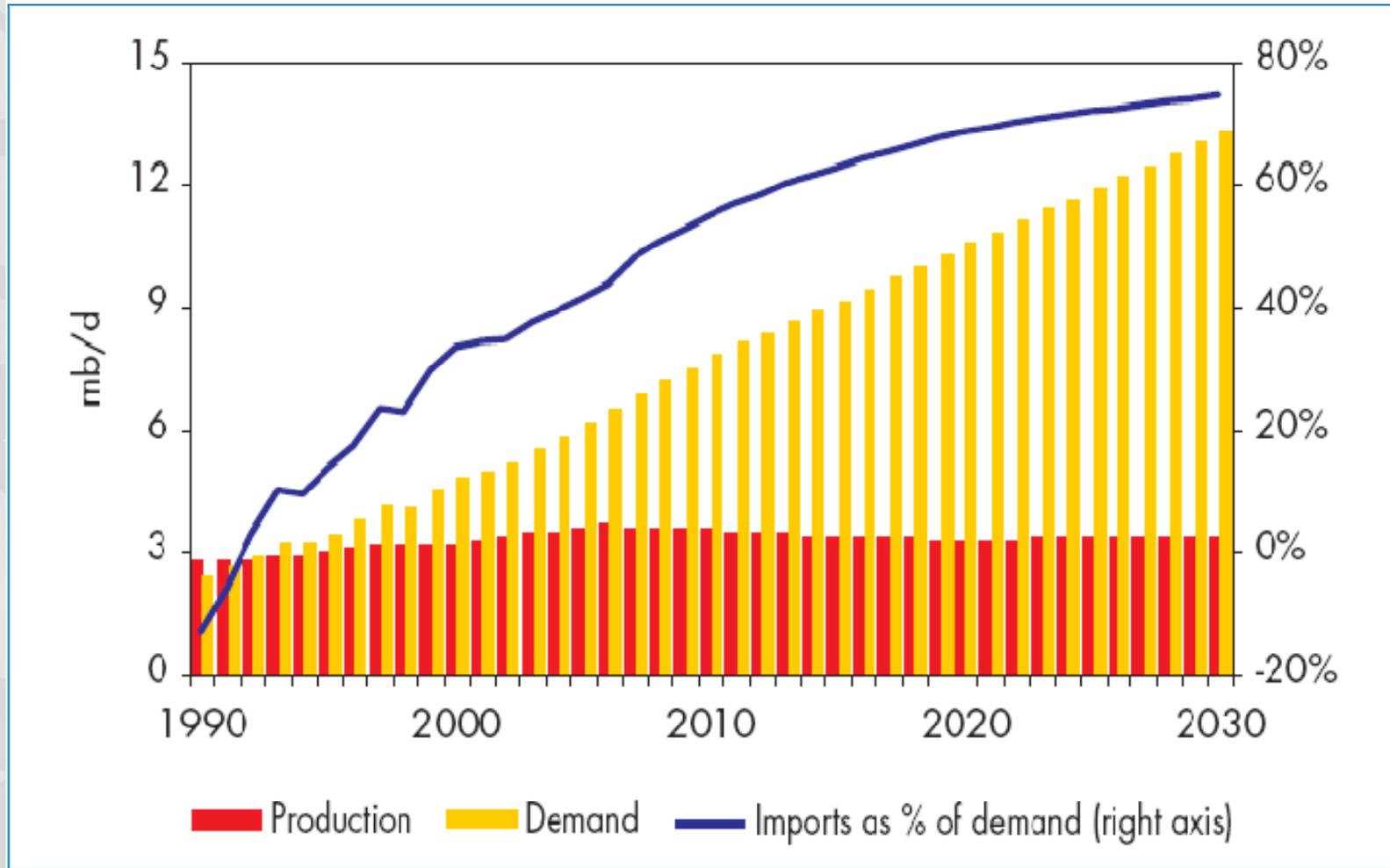


# Consumption Per Capita, 2007





# Oil Balance in China





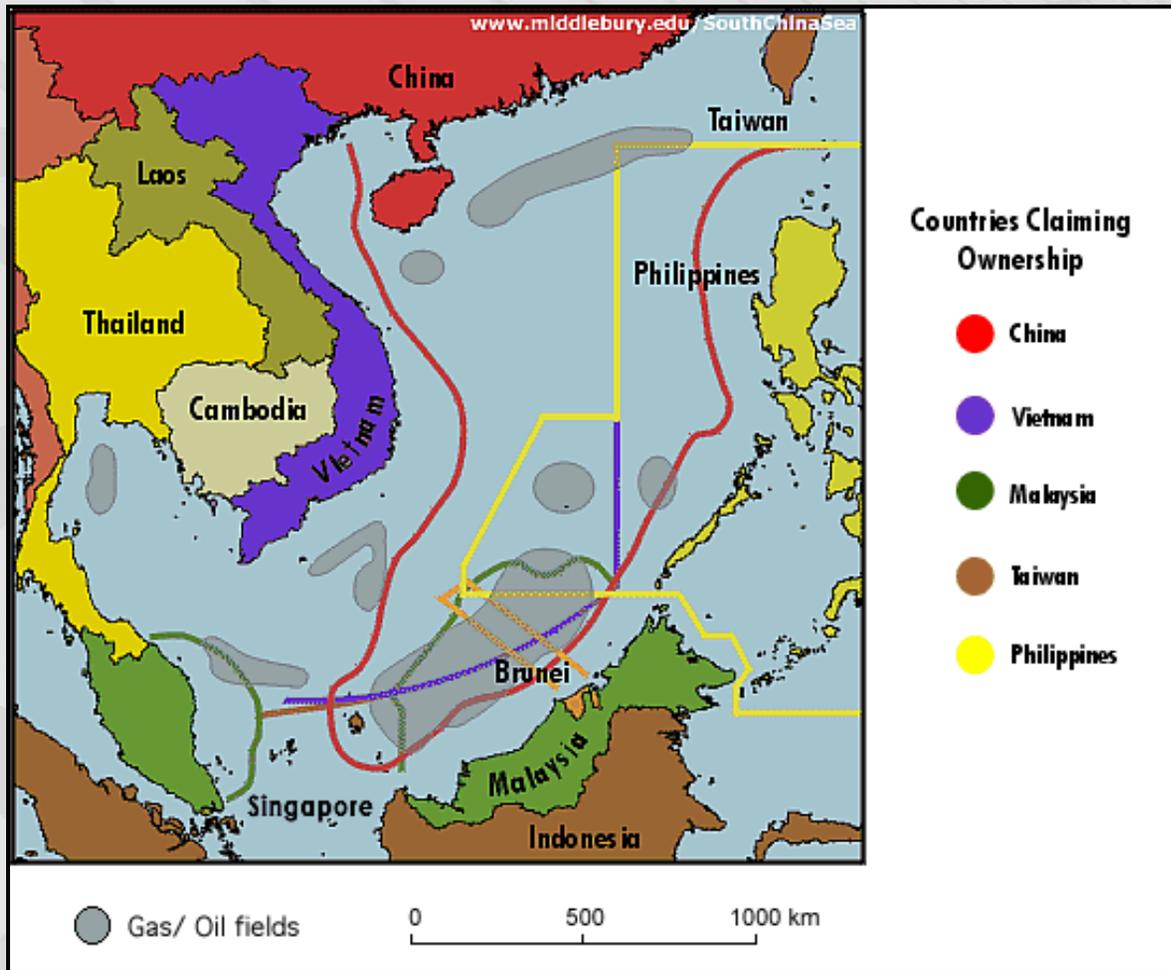
# East China Sea



- ▶ China and Japan dispute ownership of significant portions of the East China Sea, and the disputed areas involve oil and natural gas resources.



# South China Sea



- ▶ Competing territorial claims over the South China Sea and its resources are numerous.
- ▶ The United Nations Convention on the Law of the Sea (UNCLOS) has not yet resolved ownership disputes



# China sees Energy Security through Lens of Global Risk

- ▶ Feeling of “exposure” in the global market
  - Fear of foreign control
  - Global supply disruptions
  - Chronic instability in oil exporting regions
  - Import dependence
  - Volatile prices
- ▶ Global energy geopolitics
- ▶ U.S. Navy’s domination of Sea Lines of Communication
- ▶ Strong sense of exclusion from global energy management institutions like the International Energy Agency



# China's Energy Security Strategy

Common Assumption: Growing dependence on imported oil will bring foreign-policy and economic pressures that might threaten national security and social and political stability.

- ▶ The military is urging investment for increased naval capabilities
- ▶ Alleviate the increase in import dependence, diversify their sources and routes of imported oil and prepare for supply disruptions
- ▶ Development of indigenous resources
- ▶ Increasing emphasis on energy efficiency, conservation and diversification
- ▶ Energy diplomacy



# Why China Matters to U.S. Energy Security

- ▶ **China** is poised to have more impact on the world over the next 20 years than any other country
  - National Intelligence Council - *Global Trends 2025*
- ▶ China has a population of **1.3 billion**
- ▶ An unprecedented expansion of the global economy is driving the increased demand for energy
- ▶ The bulk of China's oil is shipped by sea, which will increase its reliance on two critical shipping channels: The Straits of Hormuz and the Malacca Straits
- ▶ China's search for energy security impacts their foreign policy decisions
- ▶ Potential for "friction"



## U.S. and China – Energy Security is a Common Problem

“It is my belief that we can and should find ways to confront these [energy] challenges together. The United States and the People’s Republic of China are not competing, one against the other, for increasingly scarce energy resources. The projected rise in global energy demand presents common problems for all nations. And these problems require global solutions.”

Energy Secretary Samuel Bodman

"To ensure global energy security, we need to develop and implement a new energy security concept that calls for mutually beneficial cooperation, diversified forms of development and common energy security through coordination."

Hu Jintao at the outreach session of the G8 summit



# U.S. – China Multilateral & Bilateral Cooperation on Energy

- ▶ The Asia-Pacific Partnership on Clean Development and Climate (multilateral)
- ▶ The Asia Pacific Economic Cooperation (APEC) Energy Working Group (multilateral)
- ▶ The US-China Energy Policy Dialogue (US-China)
- ▶ The US-China Oil and Gas Industry Forum (US-China)
- ▶ The Peaceful Uses of Nuclear Technologies Agreement (US-China)
- ▶ The Joint Coordinating Committee on Science and Technology (US-China)
- ▶ Fossil Energy Protocol (US-China)
- ▶ U.S.-China Energy & Environmental Technology Center (US-China)



# The U.S. - China Ten Year Energy & Environment Cooperation Framework

- ▶ Part of the U.S. – China Strategic Economic Dialogue 2008
- ▶ U.S. and China announced consensus:
  - Clean, efficient and secure electricity production and transmission
  - Clean and efficient transportation
  - Residential and Industrial energy efficiency
- ▶ The U.S. also announced support for:
  - China's Membership in the International Energy Agency (IEA)
  - Trade and investments in energy efficiency projects



## U.S. –China Energy Cooperation

- ▶ As part of the agreement in principle that we announced yesterday between myself and Foreign Minister Yang, we will enter into strategic and economic dialogues co-chaired by myself and the Treasury Secretary.

And one of the most important tracks will be clean energy and climate change. We wish to create a series of actions and partnerships between our countries, between our businesses, our academic institutions, our citizens. And we hope to work together in the lead-up to Copenhagen at the end of this year, with a new climate treaty. We hope that there will be many opportunities, as I saw for myself yesterday, for partnerships between American companies and Chinese companies to produce cleaner energy.

Secretary of State Clinton 2/22/2009



# Economics Vs. Security

- ▶ Does the distinction matter?
- ▶ Do states pursue both approaches simultaneously?
- ▶ Under what circumstances are firms leading and under are states driving decisions?
- ▶ Is the global energy system that we are protecting now going to look the same in 20 years and if not, what will we need to secure it?
- ▶ What incentives/signals are the US and EU sending Asia's rising economies to behave as "responsible stakeholders" in the global energy market?



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## China's Stated Energy Policy Goals

- ▶ *Giving priority to thrift.*
- ▶ *Relying on domestic resources.*
- ▶ *Encouraging diverse patterns of development.*
- ▶ *Relying on science and technology.*
- ▶ *Protecting the environment.*
- ▶ *Cooperation for mutual benefit.*
  
- ▶ *White paper: "China's Energy Conditions and Policies"*



## U.S. Energy Security (Future?)

- ▶ Tackle climate change
- ▶ Make energy investments in three critical areas:
  - Basic Research
  - Technology Demonstration
  - Aggressive commercial deployment and clean market creation
- ▶ Increase fuel efficiency for cars and trucks
- ▶ Promote the supply of domestic energy
- ▶ Diversify our energy sources
- ▶ Increase energy efficiency, reduce energy use and lower costs



# What is Energy Security?

- ▶ Energy security for **consumers** means adequate, affordable, and reliable supplies of energy.
- ▶ Energy security for **producers** means increasing markets and resources to sell to markets.
- ▶ Energy security is essential to economic growth and human development.
- ▶ Energy security, in practice, is best seen as a problem of **risk management**.
- ▶ Energy security has become **essential to maintain our way of life**.