Energy Security: Toward a Methodology Enabling Good National Security Decisions

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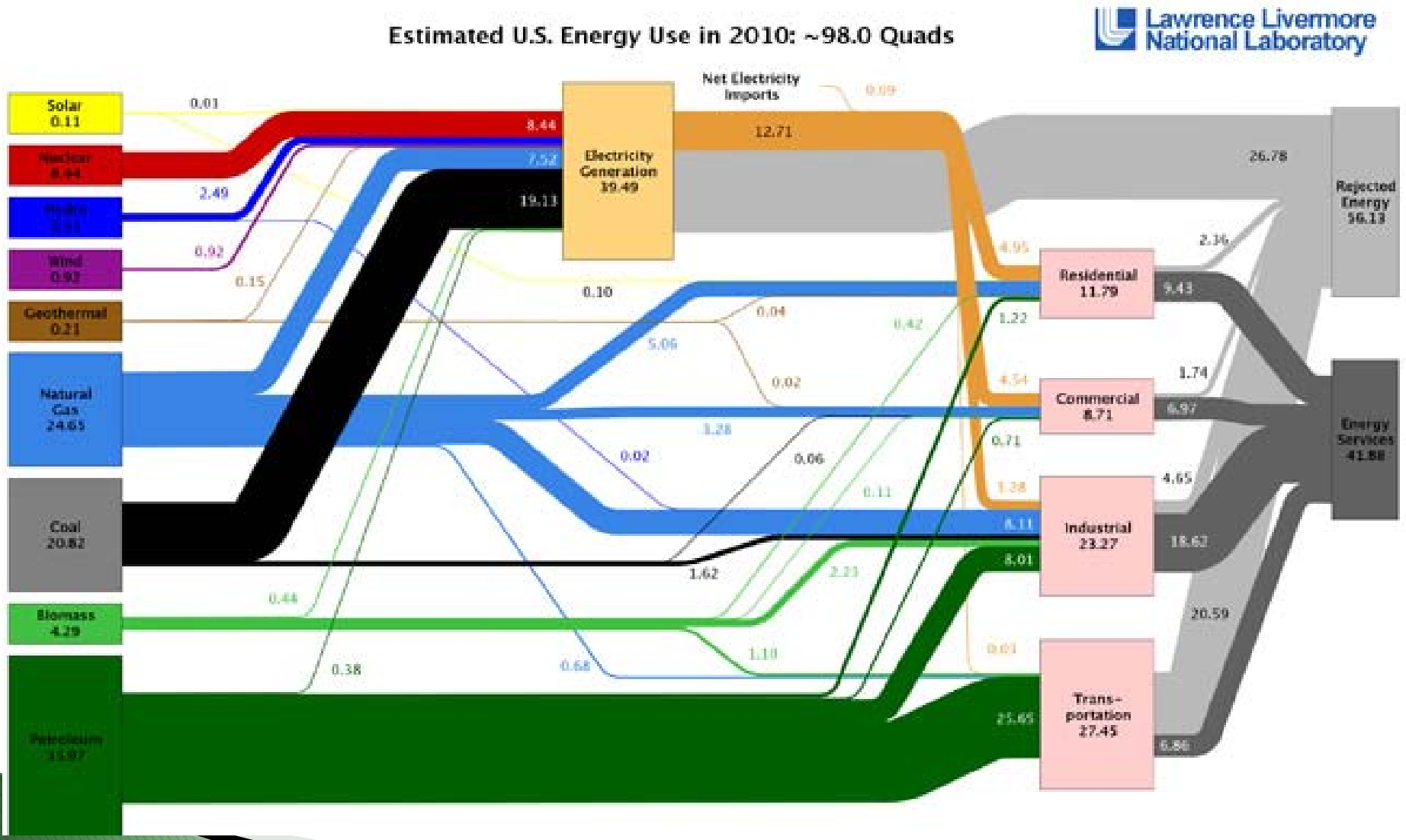
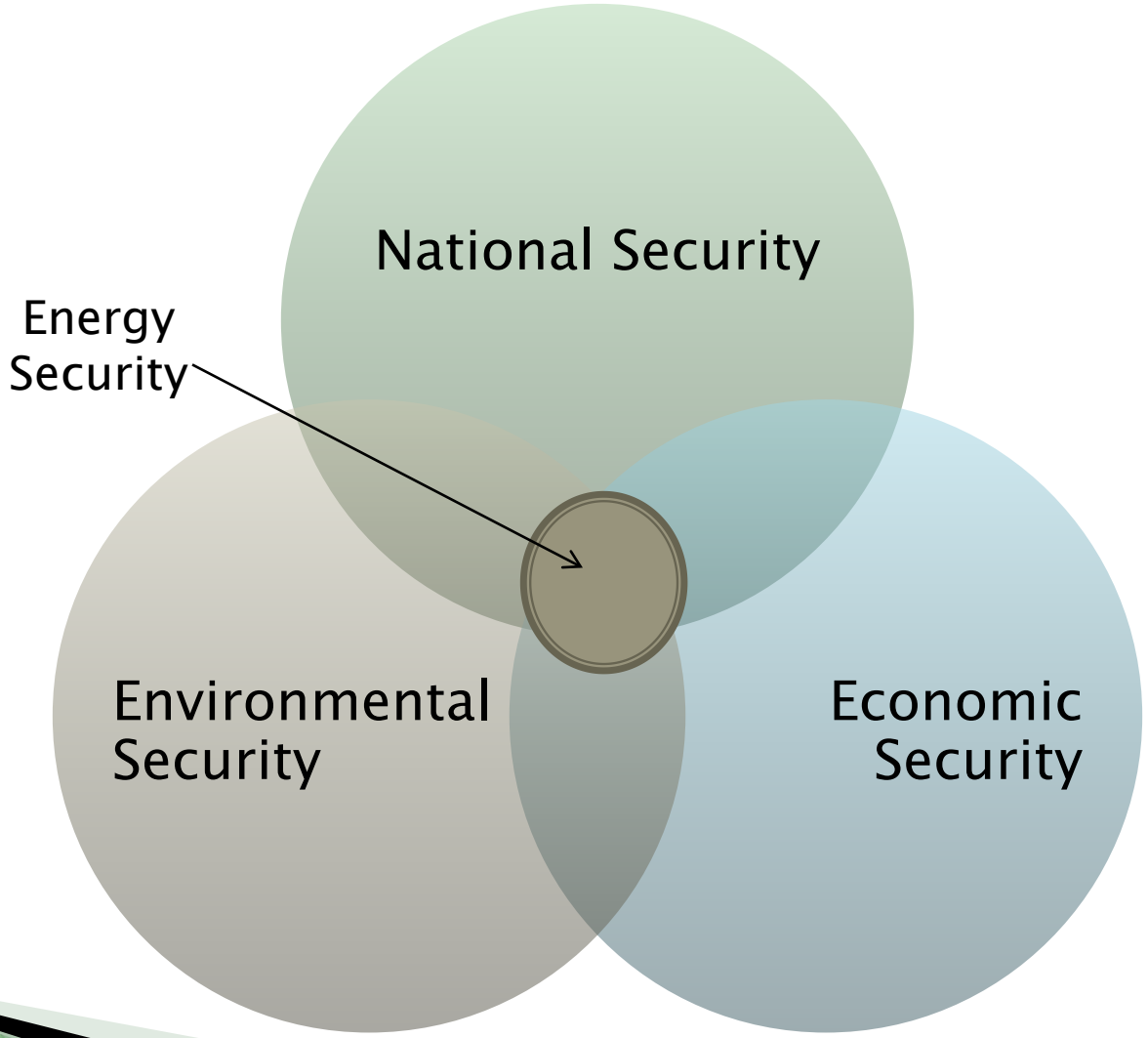
Defining Energy Security

- "…having assured access to reliable supplies of energy and the ability to protect and deliver sufficient energy to meet operational needs" (2010 QDR)
- U.S. DOE mission "to ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions"
- CNAS issued a 2009 report on "natural security" = natural resources + national security

Data on U.S. Energy Use



Situating Energy Security



A Broader View of Costs

Progress!

- Energy key performance parameter
- Fully burdened cost of fuel — 7-step methodology includes environmental and "other costs" (e.g., force protection)
- Tool to compare TCO

Energy Security Costs

Typical	Comprehensive
Extraction Production Distribution Costs/market factors R&D (RD&D) Resource longevity Operations and maintenance	Security/protection Emissions Health impacts Risk/geopolitics Lifecycle costs Interdependence/ independence

Energy Security Costs, continued

How to Determine

- Military costs for strategic energy areas
- Emissions and health impact costs borne by others, but affect total cost of powering the economy
- Risk/geopolitics contribute to volatility in pricing
- Operational/ongoing costs of resources must be included
- Benefits of independence and interdependence
- Jobs

Comprehensive

- Security/protection
- Emissions
- Health impacts
- Risk/geopolitics
- Lifecycle costs
- Interdependence/ independence
- Economic security

Energy—National Security

Protecting the supply chain

- Resources (raw materials and natural)
- Production
- Distribution
- Usage (critical infrastructure/safe grids, etc.)

Blueprint for a Secure Energy Future

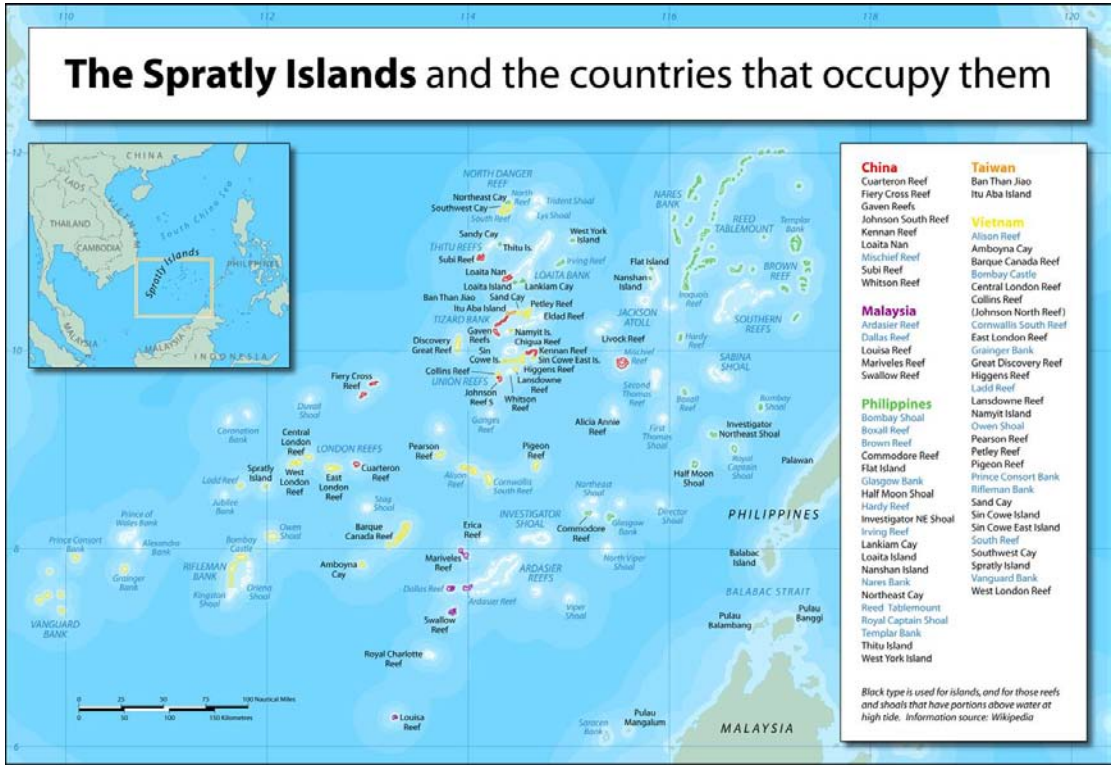
- President's challenge to reduce foreign oil imports by one-third, and
  - Reduce oil consumption by 1.8 billion barrels
- Compare total costs to benefits
- Efficiency?
- Own resources? Fuel substitution?
- Activity substitution?

Multidimensional Framework

Energy Resource	Cap Ex	Op Ex	Security of Supply	Resource Efficiency	Envir. Impact	Carbon Footprint	Job Creation	Health
Type of energy			based on location or quantity of resource	1= <20% 2= <40% 3= >40%	Ability to mitigate	Relation to reduction goals	Job creation: local, supply chain, new	Based on medical/ scientific literature
Project A			1	2	3	2	2	2
Project B			2	1	2	1	2	2
Project C			3	2	1	1	3	1

- 1 = low, 2 = medium, 3 = high; multiply across to get total
- Can consider weighting criteria components
- Add dollar values as step 2 when narrow down criteria?
  - NPV over energy asset lifetime

Asia Scenario



The Spratly Islands

- **Value** – Contains large amounts of oil and natural gas; extended continental shelf; productive for fishing
- **Contention** – 9 states lay claim to the islands
- **Military conflicts** – Vietnam and PRC (1988); Philippines and PRC (2011)
- **Diplomatic solutions** – ASEAN and PRC negotiated treaty
- **U.S. interest** – Respect for international law, peaceful regional resolution
- **Demand** – Rapid growth in population and energy demand in Asia in next 20 years

Situation

The year is 2027, and **significant potential exists for U.S. military engagement in Asia.** The epicenter of this potential conflict is the chain of islands known as the Spratly Islands in the South China Sea. Nine Asian nations claim ownership rights over the islands, which contain ample supplies of oil and natural gas—**resources required to sustain the region's growing economies. Meanwhile, most of China China and Japan are restless over uncertain energy prices.** Political unrest, growing unemployment, and high prices as a result of escalating demand and diminished supply threaten the stability of these competing powers. Vietnam and the Philippines had decided in 2017 to host a U.S. Expeditionary Readiness Group and a U.S. Carrier Battle Group to protect its claims of sovereignty over the Spratly Islands. The U.S. president in 2027 convenes his National Security Council on Energy Security to develop options to prevent a military conflict.

Discussion Points

- How could U.S. national security and energy security policy prevent this scenario from emerging in the next 15 years?
- How may energy security professionals assess sustainable sources of energy to provide energy security to growing economies in Asia?
- How may a regional energy security policy, crafted jointly by the United States, China, Japan, and the nations who claim sovereignty in the Spratly Islands prevent conflict in the region?

Discussion Points, continued

- How may industry influence our respective governments to develop the national will and common interest in China, Japan, and United States?
- What would be the potential direct and indirect costs of maintaining course?
- Considering those costs, determine benefits of a proactive approach to energy security. How could industry change behaviors, prevent conflict, and ensure access to energy resources (including renewables) to meet domestic demand in the Asia Pacific theatre?

Conclusion

Reasonably assess costs and benefits to make policy change to scale the impact and avoid:

- Overreliance on limited resources
- Damage to environment and natural resources
- Risk conflict/vulnerability

Keeping total costs reasonable

- Tactical-level link to mission analysis (self-sufficiency, not risking lives)