

Energy Cooperation in
Northeast Asia

Conservation
Efficiency
Sustainability

comments by

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THEMES from AUTHORS

- Struggle what is the general public perception about “energy solutions/problems” and how does it relate to their specific issue.
- Timing and technology
- Economic and financial context

Conservation: RATIONAL VALUES

- We do need to reduce emissions that induce climate change.
- Why do we need to conserve?
 - 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))

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...

EFFECIENCY: Technology

- Recognition of 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**

WEALTH FOR NORTHEAST ASIA REGION

- Riches **don't** come from natural resources, **wealth** comes from the **trade** of these resources.
- Gains from **trade** (17th Century Invention)
- Arguments against trade, especially in the name of security, are ultimately **COSTLY** to nation.

SUSTAINABILITY: Using Market Forces

- Market forces allocate resources efficiently through the price mechanism
- Any alternative method costs **MORE** than the default market solution
- **PRICES** and **MARKETS** are **CYCLICAL**.
- Forecasters are often wrong. Wrongness often in scale and direction.
- Data is important:
“garbage” data INDI IT= “garbage”

SUSTAINABILITY: CHANGE IN PRICE is a TOOL

- HIGH prices can shift supply sources and change demand patterns.
 - Almost always preferable to alternative methods
- Investors and entrepreneurs welcome change (that is where you make money)
- Investors and entrepreneurs welcome when “conventional wisdom” or forecasters are wrong and they are