

REVISITING ENERGY SUPPLY SECURITY: THE CASE OF APEC ENERGY COOPERATION

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1. Introduction: Energy Security in the 20th Century

- Originally 'Energy security' = 'energy supply security'.
- In the 20th Century, threats to energy security for energy importing countries = geopolitical risks (war, revolution etc.)
- The main purpose of energy security = Stable supply of energy.
- IEA's definition: *"the uninterrupted availability of energy sources at an affordable price."*
- Energy exporting countries' other risks = Uncertainty of future energy demand.
- 'Energy Supply and Demand Security', a speech by Mr. Mohammed Barkindo, Acting for the Secretary General of OPEC.
- 'Energy supply security' was sometimes used in order to emphasize the supply side of energy security.

2. Supply Side Purpose of Energy Security

- Since the beginning of the 21st Century, the concept of energy security has expanded.
- The threats to energy security include **natural disasters** and **man-made disasters**.
- Energy exporting countries may suffer energy shortage or disruption by these disasters,

⇒ Only the term 'energy security' is now widely used.
- The concept of energy supply security is once again necessary in focusing the supply side of energy security.

2. Supply Side Purpose of Energy Security (Cont'd)

- As mentioned above, the concept of energy security has expanded in this century.
- The 4 A's of energy security in *A Quest for Energy Security in the 21st Century* by APERC (2007): Availability, Accessibility, Acceptability, Affordability
- Now accessibility is interpreted more from the demand side, focusing on energy access from an end-user's perspective.
- Acceptability is discussed in the context of environmental impact of energy consumption which also belongs to the demand side.
- In order to discuss the traditional **purpose** of a stable supply of energy, the concept of energy supply security needs to be revived.

3. Supply Side Measures of Energy Security

- The concept of energy supply security is necessary in focusing on its **supply side measures**.
- Among four aims of APEC **Energy Working Group** (EWG) formed in 1990, energy security comes first.
 - *“Strengthening regional and domestic energy security and resilience across the region”*
- EWG established the **Energy Security Initiative** (ESI) in October 2001.
 - Comprises a series of measures to respond to temporary energy supply disruptions and longer-term challenges facing the region’s energy supply.
- Agendas of EWG biannual meetings were designed according to the ESI.
 - = In other words, almost all agenda items were linked to energy security.

3. Supply Side Measures of Energy Security (cont'd)

- APEC members have shifted their focus of energy policy from energy security to **climate change**.
- Policy measures for energy security are now evaluated more from the viewpoint of climate change.
 - **Energy Efficiency**: Energy Intensity Reduction Goal in 2007/2011
 - **Renewable Energy**: Doubling Renewable Share Goal in 2014
- The EWG web page shows '*Reducing Energy Intensity*' and '*Doubling Renewable Energy*' as separated from '*Enhancing Energy Security*' in their goals.
- **Waning concern over energy supply security** can result in negative impact on energy supply security of each country.

4. Dependence on Fossil Fuels Import

- *APEC Energy Supply Demand and Supply Outlook 6th Edition* by APERC in 2016
 - Renewables would be the fastest growing energy source.
 - APEC will remain dependent on fossil fuels with over 80% of the fuel mix in 2040
 - The APEC region would become a net gas importer and net oil imports would continue to rise.
- ⇒ APEC will face more challenges in maintaining a stable supply of energy, especially oil and gas, in the future.
- APEC has already started the effort to enhance energy security.
 - Oil and Gas Security Initiative (OGSI)
 - OGSI does not cover coal.

4. Dependence on Fossil Fuels Import (cont'd)

- **Coal** reserves are abundant in the APEC region and coal prices have been relatively inexpensive and stable in the region.
 - Coal emits much more CO₂ than other fossil fuels.
- ⇒ Growing anti-coal movement in the world from the view point of climate change.
- ⇒ **Divestment** from coal mining and coal power generation is now encouraged.
- ⇒ Divestment in coal power plants result in the survival of old and less efficient (and often less clean) coal power plants.
- In order to supply electricity in affordable prices in some countries, coal will be needed in foreseeable future.
 - Coal's role in energy security should be reevaluated.
 - **A balanced view on coal's role** not only from the viewpoint of climate change but also from that of energy security must be discussed.

5. Increasing Importance of Electricity

- OGSi partly covers **electricity security** with regards to gas power generation.
- OGSi does not cover other parts of electricity security (security of grid system , or distribution networks).
- Electricity's role in modern societies will expand further.
 - Ex. 'The Future is Electric (FiES)' scenario in IEA's 2018 World Energy Outlook
- Electricity supply system is **more vulnerable** than other energy supply systems.
 - Employs extensive networks of cables both in transmission and distribution.
 - Very difficult to stockpile.
 - Requires maintaining frequency.

6. Growing Optimism on Renewable Energy

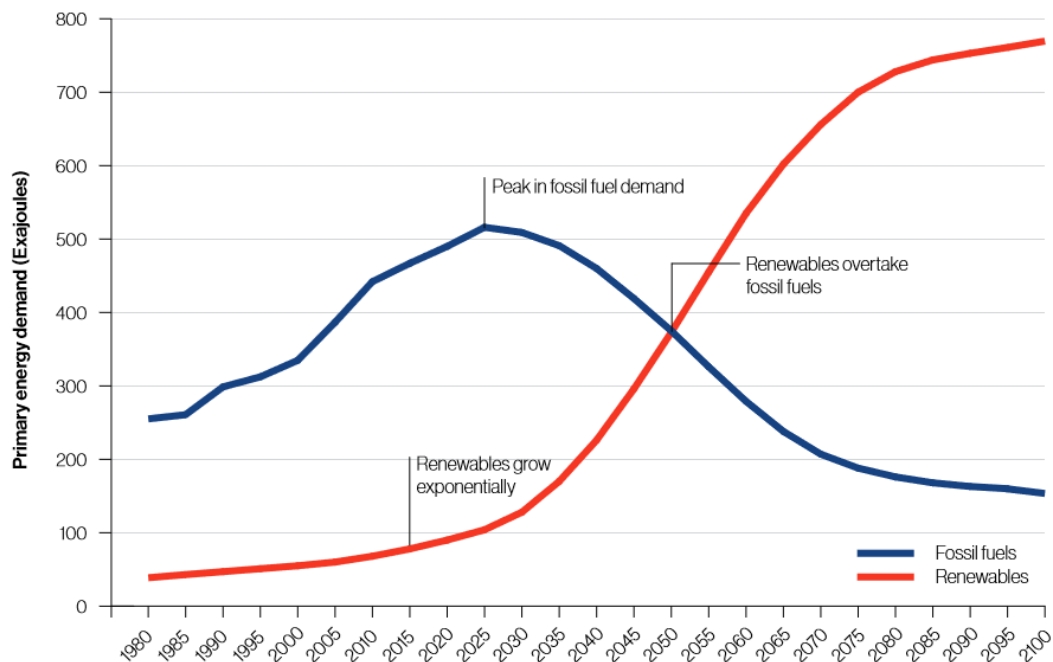
- An **emerging optimism**: electricity supply by **renewable energy** will alleviate energy security concerns.
 - Renewable energy will become a predominant energy source in future.
 - Unlike fossil fuels, as renewables are widely distributed among almost all countries.
 - Renewables will greatly reduce reliance on energy trade.

Ex. *A New World*, a report of Global Commission on the Geopolitics of Energy Transformation organized by IRENA

- It is still not clear if and when renewable energy will be predominant.
 - The IRENA report cites “**the Shell Sky Scenario**” in which renewables will overtake fossil fuels around 2050 and reach share of about 80% around 2080.

6. Growing Optimism on Renewable Energy (cont'd)

Figure 1. The energy transition framework



Note: This data is taken from the Shell Sky Scenario (2018), which has the merit of forecasting to 2100 and therefore projects the nature of the energy transformation over the course of the century. Other energy transition scenarios usually have shorter time horizons. The Sustainable Development Scenario (SDS) of the International Energy Agency (IEA), for example, only looks forward to 2040. IRENA's REmap scenario goes to 2050. Shell's forecast share of renewables and fossil fuels is similar to that of the IEA SDS scenario for 2040 as well as the DNV GL and Equinor Renewal scenarios for 2050. The IPCC 1.5 degree median scenario and IRENA REmap scenario anticipate a substantially larger share of renewables by 2050 with an earlier peak in fossil fuel demand.

Source: Shell Sky Scenario, 2018.

6. Growing Optimism on Renewable Energy (cont'd)

- The Shell Sky Scenario is “a technically possible, but **challenging pathway** for society to achieve the goals of the Paris Agreement” and “our **most optimistic** scenario in terms of climate outcomes”.
- Even if the scenario comes true in the future, we have to rely more on fossil fuel than on renewables for **30 years** until around 2050: it will take **60 years** for renewables to become the predominant energy source around 2080.
- John Maynard Keynes predicted in 1930: *“assuming no important wars and no important increase in population, the economic problem may be solved, or be at least within sight of solution, within **a hundred years.**”*
- In reality, after nearly 90 years from his prediction, the economic problem is not yet solved or at most not within sight of solution.
 - ←An important war occurred in 1939
 - ←An important increase in population was brought after that war.

6. Growing Optimism on Renewable Energy (cont'd)

- Like Keynes' prediction, IRENA's expectation of a renewable future might not become reality.
 - If important innovation in technology does not occur.
 - Increasing energy demand would make the gap that renewable energy would need to fill even wider
- Keynes' another famous remarks in 1923: *"long run is a misleading guide to current affairs. **In the long run we are all dead.**"*
- It might be true in the long run renewable energy will be a predominant energy resource and our descendants will no longer worry about energy security.
- We cannot ignore **supply security of fossil fuels** until such **"a brave new world"** is come.

7. Conclusion

- APEC will face **more challenges** in a stable supply of energy in future.
- **Oil and gas security** will continue to be a major task for APEC energy cooperation.
- **The role of coal** in energy security should be revisited.
 - Coal is an abundant resource in the APEC region and thus inexpensive.
 - It would not be realistic policy option for APEC economies to simply phase out coal use.
 - Promoting cleaner use of coal would strengthen energy supply security by having a diverse portfolio of fuels.
- **A balanced view** on coal's role not only from the viewpoint of climate change but also from that of energy security must be discussed.

7. Conclusion (cont'd)

- As electricity becomes more and more important in peoples' lives as the most important secondary energy, **electricity security** should be pursued more consciously.
- Electricity supply system is **more vulnerable** than other energy supply systems.
 - Employ networks of cables
 - Difficult to stockpile
 - Control frequency.
- **With clear attention in supply side purpose and supply side measures, APEC will need to address energy security focusing on supply security of all fossil fuels and electricity.**



Thank you for your kind attention.

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