

# **Revisiting Energy Supply Security: the Case of APEC Energy Cooperation**

By

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## **Abstract**

‘Energy security’ was originally synonymous with ‘energy supply security,’ in contrast to energy demand security. Since the beginning of the 21st Century, the threats for energy security have diversified, and both energy supply security and energy demand security have become obsolete concepts. However, the concept of energy supply security is once again necessary in focusing the supply side of energy security, not only the supply side purpose of energy security but also its supply side measures. In the case of APEC energy cooperation, regional aspirational goals of reducing energy intensity and doubling the share of renewable energy are regarded not to enhance energy security but to achieve the global climate goals. However, APEC is expected to remain dependent mainly on fossil fuels and the supply gap in fossil fuels would widen. This implies APEC will face more challenges in a stable supply of energy in future. APEC will need to address energy security by focusing on supply security of all fossil fuels including coal, and also electricity as the most important secondary form of energy.

## **1. Introduction**

‘Energy security’ was originally synonymous with ‘energy supply security’. In the 20th Century the threats to energy security for energy importing countries were mainly perceived as geopolitical risks such as a war involving energy exporting countries or a revolution within an energy exporting country [1]. Typical cases are the Oil Crises in the 1970s. The First Oil Crisis was triggered by the Yom Kippur War (also referred to as the 4th Arab–Israeli conflict). In October 1973, Egypt and Syria started the war against Israel. As a result, a large group of oil-producing countries declared a crude oil embargo to pro-Israel developed countries and decided to increase the price of crude oil exports by 70%. In 1979, a revolution in Iran created the Second Oil Crisis which quadrupled crude oil prices. These oil price hikes were initially perceived as threats of stopping or decreasing oil exports to oil importing countries and finally brought inflation and economic depression to them. Thus, the main purpose of energy security has been considered as ensuring a stable supply of energy. Following this perception, the International Energy Agency (IEA) defines energy security

as “the uninterrupted availability of energy sources at an affordable price. [2]”

On the other hand, energy exporting countries argued that they also faced other risks in energy security. While energy importing countries had to cope with energy supply security, energy exporting countries encountered challenges to their energy demand security, that is, uncertainty of future energy demand. For example, ‘Energy Supply and Demand Security’, a speech by Mr. Mohammed Barkindo, Acting for the Secretary General of Organization of the Petroleum Exporting Countries (OPEC) which was delivered by Mr. Mohamed Hamel, Head, Energy Studies Department at EUROPIA Conference (London, England, 15-16 February 2006) stated “there is a call for a ‘road-map’ for oil demand, reflecting the need for security of demand as a legitimate concern for producers, just as consumers express concern over security of supply. [3]”

The term ‘energy supply security’ was sometimes used instead of energy security in order to emphasize the supply side of energy security. In contrast, energy demand security did not become a widespread concept, as world energy market was in general tight and needs to secure energy demand was not strong.

## **2. The Supply Side Purpose of Energy Security**

Since the beginning of the 21st Century, the concept of energy security has expanded. Now the threats to energy security are not limited to geopolitical ones. They include threats by natural disasters and man-made disasters to the energy supply system. Like energy importing countries, energy exporting countries may similarly suffer energy shortage or disruption by these disasters, Energy exporting countries are no longer immune from risks in their energy supply system [4]. Though there is still uncertainty in future energy demand, the term ‘energy demand security’ is seldom used. Likewise, the term ‘energy supply security’ has become obsolete. Instead, only the term ‘energy security’ is now widely used.

However, the concept of energy supply security is once again necessary in focusing the supply side of energy security. As mentioned above, the concept of energy security has expanded in this century. Asia Pacific Energy Research Centre (APEREC) produced a special report on energy security in 2007 for energy cooperation under the framework of Asia Pacific Economic Cooperation (APEC). The report proposed the 4 A’s of energy security: Availability, Accessibility, Acceptability, Affordability. In the report, accessibility is discussed in supply side in terms of transportation, workforce or technology transfer for energy resource development and utilization. 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 [5].

In order to discuss the traditional purpose of a stable supply of energy, the concept of energy

supply security needs to be revived.

### **3. The Supply Side Measures of Energy Security**

In addition, the concept of energy supply security is necessary in focusing not only on the supply side purpose of energy security but also its supply side measures.

In the case of APEC energy cooperation, senior energy officials of APEC member economies (countries and territories) formed the Energy Working Group (EWG) in 1990 and held semiannual meetings since then. Among four aims of EWG, energy security comes first: “Strengthening regional and domestic energy security and resilience across the region.”[6] Thus, enhancing regional and domestic energy security has been a key component of APEC’s energy agenda. Toward this goal, the EWG established the Energy Security Initiative (ESI), endorsed by APEC Leaders in October 2001, which comprises a series of measures to respond to temporary energy supply disruptions and longer-term challenges facing the region’s energy supply. The agendas of EWG biannual meetings were designed according to the ESI. In other words, almost all agenda items were linked to energy security. For example, the latest meeting, EWG56 in Lima, Peru, during 5-7 November 2018 proceeded according to the following agenda:

1. Opening Addresses and Adoption of the Agenda
2. Energy Working Group Management and Direction
3. Policy Dialogue
4. Notable Energy Developments since EWG55
5. APEC Center Activities
6. Progress on Crosscutting APEC Energy Smart Communities Initiative (ESCI) Projects  
*Energy Security Initiative, including short-term and long-term measures (7-12)*
7. Emergency Response
8. Energy Resiliency
9. Clean Fossil Energy
10. Energy Data Analysis
11. Energy Efficiency
12. New and Renewable Energy
13. Crosscutting Issues
14. APEC Sub-fora Collaboration
15. External Organizations’ Presentations
16. Planning ahead
17. Election of EWG Lead Shepherd (2019~2020)
18. Other Issues

#### 19. Concluding Business (EWG Secretariat)

If excluding 10 logistical agenda items (1,-3, 5, 14-19), two-thirds of the remaining 9 agenda items, that is, 6 agenda items (7-12) belong to Energy Security Initiative, including Energy Efficiency (11) and New and Renewable Energy (12).

However, as the international community has become concerned with climate change in recent years, APEC members have shifted their focus of energy policy from energy security to climate change. Policy measures for energy security such as improving energy efficiency or introducing renewable energies are now evaluated more from the viewpoint of climate change. In 2007, APEC Leaders agreed to a regional aspirational goal of reducing energy intensity by at least 25 percent by 2030 with a 2005 base year. Under ever-increasing energy demand across the APEC region, APEC Leaders agreed in 2011 to substantially increase the goal to a 45 percent reduction of regional aggregate energy intensity by 2035. At the 2014 APEC Leaders' Meeting, Leaders endorsed a new aspirational goal to double the share of renewable energy in APEC's overall energy mix by 2030 over 2010 levels. This new goal supports the UN's Sustainable Energy for All (SE4ALL) initiative to double global renewable energy by 2030. These aspirational goals are regarded to achieve the global climate goals. The EWG web page clearly shows 'Reducing Energy Intensity' and 'Doubling Renewable Energy' as separated items from 'Enhancing Energy Security' in their major goals [6]. This shift in focus reflects waning concern over energy supply security. It can result in negative impact on energy supply security of each country.

## 4. Dependence on Fossil Fuels Import

On the other hand, according to *the APEC Energy Supply Demand and Supply Outlook 6th Edition* published in 2016 by APERC, APEC is projected to remain dependent on fossil fuels with over 80% of the fuel mix in 2040, though renewables would be the fastest growing energy source (2.4% CAGR). In addition, it stated that the energy supply gap would widen in APEC as the region would become a net gas importer and net oil imports would continue to rise [7].

This implies 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 in a number of ways including the APEC Oil and Gas Security Initiative (OGSI), which the author has discussed previously [4].

However, OGSI does not cover coal. In fact, coal reserves are abundant in the APEC region. In 2017, among the top 10 largest coal exporting countries in the world, 6 countries are in the APEC region: Australia, Indonesia, Russia, the U.S., Canada, and China in the order of export revenue. As a result, coal prices have been relatively inexpensive and stable in the region, bringing few concerns over the supply security of coal. On the other hand, as coal emits much more carbon

dioxide (CO<sub>2</sub>) than other fossil fuels, there is a growing anti-coal movement in the world, especially in Europe from the view point of climate change. Divestment from coal mining and coal power generation is now encouraged. Even in the APEC region, investment for coal use would be discouraged in near future. But, divestment in coal power plants result in the survival of old and less efficient (and often less clean) coal power plants by prohibiting replacement by new efficient and cleaner plants. In any event, especially 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 and 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**

Moreover, OGSi partly covers electricity security with regards to gas power generation, but it does not cover other parts of electricity security such as security of grid system or distribution networks. Electricity's role in modern societies will expand further. Not only in lighting, heating/cooling and motive power, but also digitalization and electro mobility are increasing electricity demand. The IEA's 2018 World Energy Outlook introduced a scenario called 'The Future is Electric (FiES)' "to examine what would happen to electricity demand if economic opportunities for electrification were maximized." In the FiES by 2040, "almost half of the car fleet goes electric; electricity makes rapid inroads into heating needs for buildings and industry; a digital economy connects nearly all consumer devices and appliances; and full electricity access is achieved." [8]

In relation with energy supply security, it is noteworthy that the electricity supply system is more vulnerable than other energy supply systems. It employs extensive networks of cables both in transmission and distribution. They are not as sturdy as oil pipelines or gas pipelines. In addition, electricity is very difficult to stockpile. A pumped hydropower system can store considerable amount of electricity, but is very expensive and often causes environmental concern. Electricity supply require maintaining frequency, but its control is not easy.

## **6. Growing Optimism on Renewable Energy**

In relation with further electrification, there is an emerging optimism that electricity supply by renewable energy will alleviate energy security concerns. It is argued that renewable energy will become a predominant energy source in future, and that unlike fossil fuels, as renewables are widely distributed among almost all countries, they will greatly reduce reliance on energy trade and its entailing risks. The International Renewable Energy Agency (IRENA) organized Global Commission on the Geopolitics of Energy Transformation and published its report recently,

introducing such an argument [9].

However, 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 [10]. However, according to Shell, it 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” [11]. Even if the scenario comes true in the future, we have to rely more on fossil fuel than on renewables until around 2050, for the coming 30 years or for next one generation: it will take 60 years or two generations for renewables to become the predominant energy source around 2080.

John Maynard Keynes, a prominent economist in the first half of the 20<sup>th</sup> Century, predicted in 1930 in his short essay titled *Economic Possibilities for our Grandchildren* as follows: “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 and an important increase in population was brought after that war. 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 also make the gap that renewable energy would need to fill even wider

Rather, we are better to remind Keynes’ famous remarks in *A Tract on Monetary Reform* (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. However, we cannot ignore supply security of fossil fuels until such a brave new world (not in the sense of Aldous Huxley but of William Shakespeare) is come.

## **7. Conclusions**

APEC will face more challenges in a stable supply of energy in future.

While 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 as coal is an abundant resource in the APEC region and thus inexpensive, even though coal is criticized because it emits more CO<sub>2</sub> than other fossil fuels. It would not be realistic policy option for APEC economies to simply phase out coal use. Instead, promoting cleaner use of coal would strengthen energy supply security by having a diverse portfolio of fuels – both fossil and renewable. Coal’s role in energy security should be reevaluated and 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.

At the same time, as electricity becomes more and more important in peoples' lives as the most important secondary energy, its security should be pursued more consciously. Electricity supply system is more vulnerable than other energy supply systems since it employs networks of cables and electricity is difficult to stockpile and to control its 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.

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