

Challenges for Future Global Energy Investment

Ken Koyama, PhD
Chief Economist, Managing Director
The Institute of Energy Economics, Japan

On February 28, a workshop titled "the Outlook for Energy Investment" took place at the International Energy Agency in Paris. The IEA plans to publish a special report on future energy investment on June this year. IEA hosted the workshop in preparation for compiling the report. Some 100 government officials, industry players and experts from various countries participated in the workshop. Active discussions came at the workshop's five sessions on oil and gas sector investment, electricity sector investment, energy conservation and renewable energy investment, financing for a transition to a low-carbon energy system and wrapping up.

Discussions at the workshop focused on how and whether timely, smoothly and efficiently energy sector investment estimated to far exceed \$30 trillion over the next two decades would be implemented, what conditions would allow such investment to be implemented and what would serve as constraints or barriers on energy investment. As energy demand increases driven mainly rapid increase in emerging countries, sufficient investment will have to be made in all phases from exploration and development to production, transportation, conversion, distribution and consumption. While energy sources will have to be selected appropriately from the viewpoints of energy security and environmental conservation, investment in appropriate sectors and energy sources will be indispensable for realizing the appropriate selection. The problem is that while energy investment will basically affect long-term energy supply, we must make investment decisions now. At present, we see a mountain of uncertainties. Even in the face of massive uncertainties, energy investors must make decisions now. These decisions will shape the future energy market, as noted above.

The first impressive point of the discussions at the workshop is that various challenges have emerged in oil and gas sector investment, while crude oil prices have remained high with the shale revolution making progress. Crude oil prices have stayed above \$100 per barrel for three years, since 2011. High crude oil prices usually boost profits in the upstream oil and gas sector, supporting investment. Nevertheless, profit and profit-to-turnover ratios stagnated in 2013 for the five biggest international oil majors. Rather, they indicated an overall downward trend. Being cited as a factor behind such trend is a steep rise in project costs amid cost inflation. In the face of profit and profit ratio falls even under high crude oil prices, international oil majors are required to exercise more prudence in selecting investment targets.

As the United States expands energy exports amid progress in shale gas and oil development, meanwhile, major conventional gas and oil exporters such as the Middle East and Russia see various pressures emerging on their plans to secure or expand their traditional markets and sales channels. For example, Russia is required to make strategically difficult decisions on the

timings and types of investment for Asian markets. For the Middle East, the future course of other oil supply sources including shale oil greatly affects the sizes and timings of investment in expanding oil production capacity. Regarding the future Asian LNG market, buyers requiring more competitive procurement are clashing with sellers plagued with rising project costs. While uncertain factors exist in regard to investment decisions, authorized U.S. LNG exports surpassing 60 million tonnes are growingly expected to emerge in the market. We must keep close watch on oil and gas sector investment in Asia and the rest of the world.

The second interesting topic at the workshop was electricity sector investment. Half the future energy investment in the world will be required in the electricity sector. China, India and other emerging countries, which are expected to post the fastest growth in electricity demand, will have to diversify electricity supply sources dominated by coal thermal power generation. This is an urgent challenge for China plagued with a serious air pollution problem. But the diversification is not easy. China now depends heavily on coal thermal power generation because coal is domestically available, abundant and cheap. China has to consider how to promote and finance investment in a shift to a more diversified, cleaner electricity supply setup. It may have to mobilize all direct regulatory measures, administrative guidance and pricing mechanisms for the diversification. Emerging countries have unique problems including energy subsidies and non-electrified regions. Electricity sector investment must address all these problems.

Industrial countries also face various challenges regarding electricity sector investment. The workshop discussions focused on European cases. European electric utilities' earnings have deteriorated due to such factors as fiercer competition and rising fuel prices, leading their financial capacity and ratings to decline (worsening fundraising conditions). Under the situation, uncertainties have grown about due investment in the electricity sector. An increase in policy-driven renewable energy and cheap coal power generation has led to a remarkable decline in the operating ratio of natural gas power plants as a buffer electricity source. Some gas thermal power plants have been shut down. While European countries are considering introducing capacity markets to secure appropriate surplus capacities, their systems have varied with no consistent solutions provided, according to workshop participants. In the United Kingdom, a major challenge is how to promote investment in nuclear and renewable energy power generation in the competitive electricity market. For the whole of the European Union, enhancing economic and industrial competitiveness has emerged as a new challenge in addition to the Big Two energy challenges – low-carbon energy and energy security. The union must consider electricity problems from the viewpoint of the new challenge. The problem is how electricity sector investment should address these challenges.

Lastly, discussions on energy conservation investment were also interesting. Great expectations have been placed on energy conservation as a measure to reduce greenhouse gas emissions and hold down demand and imports for energy security. There has been also been a strong call for energy conservation as a theoretically cost-effective measure. The problem is how to actually expand energy conservation investment to meet the expectations. Energy conservation investment faces various economic, technological and institutional challenges and constraints. As each country is enhancing energy conservation in industry, power generation, consumption, transportation and other areas, future achievements are expected. Interestingly, workshop participants questioned how a decline in global energy demand through substantial progress in energy conservation would

contribute to cutting energy supply-side investment and impact the energy industry and the whole of the economy on a net basis. Thus, there are various challenges regarding energy investment.

Contact: report@tky.ieej.or.jp

The back issues are available at the following URL

http://eneken.ieej.or.jp/en/special_bulletin.html