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Future of Energy Markets and Roles of Technology

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On November 12 and 13, the Emirates Center for Strategic Studies & Research hosted its 18th annual energy conference in Abu Dhabi of the United Arab Emirates. After an opening session, there were four panel sessions where two keynote speeches were given along with presentations by 12 panelists, followed by panel discussions. Under the theme of "Technology and the Future of Energy," conference participants discussed impacts of various new energy technologies and technological advancement on all the energy markets, while paying attention to technological potentials and challenges.

This was the third time for me to take part in the annual conference. While themes had been selected from key current topics for earlier conferences, the latest gathering attracted attention by putting forward the roles, effects, constraints and challenges of technology as a united theme. In the first speech of the conference, I presented a comprehensive report on how the future picture of energy will change in line with technological advancement, while introducing our institute's Asia/World Energy Outlook, reviewing the global situation and focusing on Asia and the Middle East in particular. After my speech, experts on various individual technologies made presentations.

Technological advancement, diffusion, and development persistently continue in global energy markets. Sometimes, technological breakthroughs can dramatically and rapidly change the global energy situation. In this sense, the conference focused on energy technologies that are now significant for the world, particularly the Middle East. But technologies covered by the conference ranged very broadly, including those for unconventional oil and gas resources development, renewable energy for various areas, nuclear power generation, energy conservation, and effective fossil fuel uses, such as carbon capture and storage.

At the conference in the Middle Eastern emirate of Abu Dhabi, participants made enthusiastic discussions on how the advancement and global diffusion of technologies for developing oil sand and other unconventional oil resources, and deepwater oil and gas resources will change international oil and gas supply and demand, and affect oil and gas producing countries in the Middle East. Technological advancement has dramatically increased the potential of unconventional resources development, reducing the possibility of the world’s shifting away from fossil fuels in view of peak oil and other constraints on fossil resources. At the same time, however, this development could lead a growing number of unconventional oil and gas supply sources to globally emerge and compete against the Middle East. In this sense, the Middle East has no choice but to grow alert. The Middle East is strongly interested in how the United States’ envisioned

"Energy Self-sufficiency" through the development of unconventional resources would affect the Middle East. Conference participants also argued that how to enhance the Middle East's interdependent relationship with Asia, which is set to substantially increase its dependence on oil imports, would become a major challenge for the Middle East.

Conference participants also indicated their great interest in renewable and nuclear energy as non-fossil energy options from the technological viewpoint. Given that the conference took place in the UAE, presentations and discussions on nuclear energy were particularly interesting. The UAE, which is the first Arab country to introduce nuclear power generation, is recognizing the importance of introducing more advanced technologies to enhance safety after the Fukushima accident. Other Middle Eastern countries considering introducing nuclear energy are doing the same. In this respect, many conference participants argued that the Middle East should build on lessons from the Fukushima accident to introduce the latest and best technologies, and take technological and policy measures to simultaneously achieve "the 3S", namely Safety, Security, and Safeguards. They also noted that nuclear safety would be important, particularly for the Middle East and Asia where nuclear capacity is expected to grow substantially.

On renewable energy, conference participants indicated great expectations and pointed to some problems. Renewable energy is expected to diffuse as domestic and clean energy. Ongoing technological advancement has heightened expectations of renewable energy technologies as new advanced energy technologies. But there are problems, such as high costs and intermittent/unstable supply, which remain as major technological and economic challenges. In addition to these points, conference participants indicated concerns over emerging difficulty with regard to policy support measures for the feed-in-tariff system as seen in Europe. At the conference, attended by many technology experts, a dominant view was that technological breakthroughs would be expected to boost the role of renewable energy. But some noted they cannot brush off some constraints and problems regarding renewable energy. Particularly, the Middle East has difficulties in diffusing renewable energy because of its abundant oil and gas resources and very low domestic energy prices. Some conference participants noted that while additional technological advancement and cost reduction would be required to further diffuse renewable energy, policy support would have to be based on higher policy/strategic perspectives, including the diversification of energy sources in oil/gas-dependent economies, the development of knowledge/technology-oriented economies, environmental protection, and the diversification of the energy supply structure.

Conference participants indicated great interest in the importance of energy conservation technologies, attracting my attention. At the third session of the conference, experts in the power generation, construction/housing, transportation/communication, and industrial sectors made presentations respectively on the present conditions and roles of technologies for energy efficiency improvements and energy conservation (as well as the potential diversification of energy through the renewable energy introduction), followed by active discussions on these matters. Behind the active discussions may have been great concerns over the Middle East's urgent policy problems, such as how to address growing domestic energy demand and how to hold down energy demand growth without affecting economic growth, development, or living-standard improvements. As a matter of course, not only technological problems, including the development, introduction, and diffusion of

advanced technologies, but also non-technology problems, such as policy measures and public awareness, are important for energy conservation. From economic and market perspectives, some conference participants said that, given that it would be very difficult to promote energy conservation even amid very low energy prices in the Middle East, no optimism could be warranted on energy conservation in the region.

The Middle East, in which the conference took place, includes many countries that have very plentiful oil and gas resources and have taken advantage of these resources for their development. They also have problems and difficulties due to such abundant fossil fuel resources. Impressing me was the fact that the Middle East places great hopes on the development and diffusion of new technologies to help resolve those problems.

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