

Gist of the Symposium on Smart City

The 20th East Asia Round Table Meeting (EA-RTM) Symposium on Smart City was held on 27 September 2017 in Westin Chosun Hotel, Busan, Korea.

The 20th EA-RTM symposium brought together delegates and speakers from three countries, observers from Australia and AAET, policymakers, academics, local government officers, researchers and businessmen from industry for focused presentations and discussions on the theme of Smart City. In the Opening Session there were three addresses given by Prof. LEE Kunwoo (VP of NAEK), Dr. LIU Xu (VP of CAE) and Dr. KOIZUMI Hideaki (Executive VP of EAJ), respectively. Following three addresses one special presentation with a title of "Looking back 20 years of EA-RTM" was given by Dr. SHIN Kyung-Ho (Chair of International Affairs, NAEK).

Despite of the delicate situations relative to the political issues in East Asia region, three Academies and observers have convened to realize this 20th anniversary celebration of EA-RTM. The EA-RTM has played a positive role in promoting understanding, exchanges and cooperation among three academies, and in advancing the development of engineering science and technology as well as the economy of East Asia. The technical programs were organized with three sessions and brief summary of each session are as follows.

Session 1: Energy for Smart Cities

Co-chairs: Prof. JIAO Bingli, Peking University
Dr. NAGAI Kotobu, EAJ

- **Energy for Smart Cities: What LG is Doing** (Mr. LEE Sang Bong, President of LG Electronics)
- **Renewable Energy for Smart Community** (Dr. OWADANO Yoshiro, Emeritus Researcher, AIST)
- **An Overview of City Smart Grid in China** (Prof. YU Yixin, Tianjin University)

Mr. LEE Sang Bong explained the definition of smart city and explained the energy issue for smart city such as smart ICT convergence real-time, energy intelligence, energy cost anytime and anywhere. The LG Science Park, which has 26 buildings and 20,000 members, utilizes an energy technology application for reducing the cost of electricity by applying ICT for energy management, environmental management. LG's business and energy vision is Clean Energy vision.

Dr. OWADANO Yoshiro described future energy system with large amount of renewable energy. To overcome the intermittency of solar and wind power, future system requires advanced power control with minimum battery and large scale energy storage/transport by chemical energy carrier like hydrogen. A demonstration system is working in Fukushima Renewable Energy Institute, AIST (FREA). He also introduced renewable energy policies of Fukushima in Japan.

Prof. YU Yixin explained view-points of Smart City in terms of PV (Photovoltaic) capacity, CSG (City's Smart Grid) implementation, advanced distribution automation, prime power and smart grids. He also introduced Suzhou as a model city of urban change of energy, and he also mentioned the integration of energy system for smart energy network and energy internet as key challenges for implementing smart grid.

Discussions

How renewable energy can substitute current energy?

- Japan has never said that renewable energy can totally replace traditional energy. We have been doing without nuclear since 2011, but, still we need some adjustable power to balance demand and supply. Biomass is effective to reduce CO2 emission, but potential is small in Japan and coal is still being used.
- Therefore, distributed power generation is necessary and smart grids for energy network is challenging.

Session 2. Transport for Smart Cities

Co-chairs: Prof. MISHIMA Nozomu, Akita University
Dr. OH Young Tae, President, Korea Transportation Safety Authority

- **Overview of Ultra Mega Solar Plant in Japan** (Mr. MATSUMOTO Koji, JX Engineering Corporation)
- **Transportation 5.0 in CPSS: A Paradigm Shift in Smart Transport for Smart Societies** (Dr. WANG Fei-Yue, Institute of Automation, Chinese Academy of Sciences)
- **Transport for Smart City in the Era of Digital Transformation** (Prof. CHOI Keechoo, Ajou University)

Mr. MATSUMOTO Koji presented an overview of JX Engineering Cooperation in energy of petroleum product and natural gas. And he introduced solar power plant projects which are for mountain area in consideration of local residents, risk management, concurrent engineering and construction engineering.

Dr. WANG Fei-Yue mentioned a paradigm shift in smart transportation for smart society like as conversion from CPS (Cyber-Physical- Social) to CPSS(Cyber-Physical- Social- System), and introduced Qingdao as an example of city or transportation for forwarding the Smart Society.

Prof. CHOI Keechoo mentioned the definition of transportation for sustainable smart cities embedded with digital technology as a platform and also introduced transportation services for Smart City such as MaaS (Mobility-as-a-Service) which includes autonomous vehicle, traffics management, parking lot reservation in central business district, bike sharing system and car sharing.

Discussions

The recovery of used solar panels is becoming an environmental issue.

What is the role of government and participation of citizens in smart transportation?

- Killer application for parking is needed.
- How can we overwrite the transition status (for example, autonomous vehicle)?
- The transition period is needed. The duration of transition period and parking lots for space are real problems.

Session3. Safety for Smart Cities

Co-chairs: Prof. LEE In Keun, Seoul National University
Dr. WANG Fei-Yue, Institution of Automation, CAS

- **A Study on Disaster Prevention and Mitigation for next 20 years in China** (Prof. JIAO Bingli, Peking University)
- **Smart City for Citizen Safety** (Dr. CHO Dae Yeon, Korea Agency for Infrastructure Technology Advancement)
- **Evaluation of Safety of Concrete Structures by Using Numerical Analysis** (Prof. TAKAHASHI Ryosuke, Akita University)

Prof. JIAO Bingli mentioned disaster prevention and mitigation by advanced IT in China and he indicated that fundamental problems in disaster forecasting was uncertain nature of the prediction of natural disaster. Tsukuba nuclear power plant failure, Tsunami and train disaster could be mitigated and prevented by IT, and WeChat on smart phone could be one of excellent methodologies for delivering disaster forecasting and warning message.

Dr. CHO Daeyeon mentioned a mega trend analysis in view of demographic change, aging society, stagnation, and urbanization and also mentioned the platform and infrastructure of smart city. Total management system for facilities and integrated adaptability for natural and artificial disaster are key factors.

Prof. TAKAHASHI Ryosuke mentioned the case of concrete as a large civil structure in terms of structure design, numerical analysis of damage evaluation, deterioration and maintenance of concrete structures.

Discussions

The decision for safety in the Smart City will be made based on data abstract and case situation.

The transition could be forwarded though horizontal (parallel) interaction more.

- Combination of analytical interpretation and practical data should be correlated for better prediction
- Safety understanding and management, integrated adoptability for disasters.
- Top-down and bottom-up approaches to be harmonized.
- International collaboration and standardization, knowledge sharing about the evaluation in maintenance in both present and future maintenance methods are important.

Summary and proposal

The energy issue for smart city for reducing the cost of electricity could be handled by applying smart ICT for energy management and environmental management.

The renewable energy is necessary to replace traditional dry-up energy sources, and it can be utilized in much larger scale by adding advanced grid control and minimum storage.

Total management system for facilities and integrated adaptability for natural and artificial disaster is a platform and infrastructure of smart city and the integration of energy system is a key challenge for implementing smart grid.