2nd International Workshop on Clean Energy Development in Asian Cities

(Learning From Real Cases)

22 February 2017

Venue:

Institute of Advanced Energy, Kyoto University, Japan

Organized by:

Unit of Academic Knowledge Integration Studies of Kyoto University

Introduction and Purpose of the Workshop:

Cities throughout Asia have experienced an unprecedented economic development over the past decades. In many cases, this has contributed to their rapid and uncontrolled growth, and has resulted in multiple problems, which include a rapid population increase, enhanced environmental pollution, collapsing traffic systems, dysfunctional waste management, as well as a rapid increase in the consumption of energy, water, and other resources. Cities in rapidly industrialized regions of Asia face many tasks related to economic and environmental issues. So far, the energy use and emissions are not well understood. Urban authorities are largely not aware of the multiple benefits of energy management and GHG reduction.

Given their growing scale and significance, Asian cities will have to be active in the global fight against climate change if it is to be effective. Municipal authorities in Asian cities therefore have a significant scope to pursue urban Low emission strategies and clean energy initiatives in ways that will also foster economic development. Moreover, clean energy initiatives at the city scale could generate knowledge and innovations that can have wider economic and social benefits, in addition to inspiring climate action in other cities and at a national scale. Without more coordination between international, national, regional and local institutions, integration into different sectoral priorities and policies, and engagement between the public, private and civic sectors it seems likely that the cities in Asia will lock in more fully to high-cost, high carbon development paths. Because of the global significance of Asian cities, policies and programs, facilitating large-scale adoption and deployment of clean and renewable energy will need to play a central role in this area.

The first international workshop on clean energy development in Asian cities was held on 28-29 March 2016 at our institute. The main achievement of the first workshop was to create a knowledge sharing environment for further cooperation and dialogue between different scholars in order to identify challenges and possibilities. The second workshop was organized to enable a sufficient amount of dialogue between scientists and policy-makers for the specific case studies which may lead to the definition of new collaboration projects on clean energy development in Asian cities. Therefore, the main objective of the 2nd workshop was set to address the case studies of successful clean energy solutions in Asian cities (India, China and Japan) with a special focus on:

- ✓ How clean energy planning contributes to urban resilience and sustainability?
- ✓ Which initiatives are most promising? What are their policy implications?
- ✓ What is the rule of local governments in deploying clean energy policies in cities?
- ✓ What are the main drivers and challenges for clean energy development?
- ✓ What are the international experiences for clean energy development and key learnings?

Based on these learnings and background understanding, a one day open event was hosted by the Institute of Advanced Energy, Kyoto University on 22nd of February 2017 in Kyoto. The workshop was financially supported by the Unit of Academic Knowledge Integration Studies of Kyoto University as part of an ongoing research project designed to assess the multiple benefits

of clean energy development in Asian mega-cities. The workshop was attended by 9 expert speakers from India, Japan, China, South Korea and Australia. These included:

- UNEP-Tongji Institute of Environment for Sustainable Development (IESD), Shanghai, China
- International Cooperation Team, Global Strategy Division, Korea Energy Agency (KEA), South Korea
- Kyoto University, Japan
- Kyoto Women's University, Japan
- Institute for Global Environmental Strategies (IGES), Japan
- The University of Tokyo, Japan
- The United Nations University, Institute for the Advanced Study of Sustainability, Tokyo, Japan
- Indian Society For Applied Research & Development New Delhi, India
- Getulio Vargas Foundation, Brazil
- University of Technology Sydney, Australia

The purpose of this report is to briefly provide a summary of the deliberations of the workshop that included a brief overview of city-level perspective and knowledge areas; sharing knowledge and experiences of practical clean energy development scope and objectives, areas of priority focus, organizational issues and a listing of an actionable program of implementation.

Finally, this report will summarize the presentations made, main issues discussed, and suggested actions that the international community should consider in order to further promote clean energy cities in Asia.

Workshop agenda and participants

	INTRODUCTORY:	
10:00 – 10:15	Welcome Address	Prof. Hideaki Ohgaki, Kyoto University, Japan
10:15-10:30	**Project Status Briefing**: Assessing the multiple benefits of clean energy development in Asian mega cities	Jr. Assoc. Prof. Hooman Farzaneh, Kyoto University, Japan
	Session I	
	Moderator: Assoc. Prof. Benjamin McLellan, Kyoto University	
10:30 – 10:50	Opportunities and Challenges of Decentralized Roof PV Development in Shanghai	Dr. Wang Xin, UNEP-Tongji Institute of Environment for Sustainable Development (IESD), Shanghai, China
10:50 – 11:00	Discussion	
11:00 – 11:20	Clean energy and low carbon development strategy in Shanghai, Challenges and opportunities	Mr. Haixing Meng, College of Architecture and Urban Planning, Tongji University, Shanghai, China Jr. Assoc. Prof. Hooman Farzaneh, Kyoto University, Japan
11:20 – 11:30	Discussion	
11:30 – 11:45	**Break**	
11:45-12:05	Seoul's One Less Nuclear Power Plant program	Mr. Inchul Hwang, International Cooperation Team, Global Strategy Division, Korea Energy Agency (KEA), South Korea
12:05-12:15	Discussion	
12:15-13:45	Lunch	
	SESSION II	
	Moderator: Prof. Keiichi N. Ishihara, Kyoto university	
13:45 – 14:05	Making Low Carbon Development Locally Relevant: Cases from Indonesia and Japan	Dr. Eric Zusman, Institute for Global Environmental Strategies (IGES), Japan Ms. Ryoko Nakano, Institute for Global Environmental Strategies (IGES), Japan
14:05 – 14:15	Discussion	
14:15- 14:35	Participatory Backcasting Approach to Vision Creation for Sustainability, Case of Toyama city	Dr. Yusuke Kishita, The University of Tokyo, Japan
14:35 – 14:45	Discussion	
14:45- 15:05	Health co-benefits of the clean energy development in Asian cities	Dr. Mehrnoosh Dashti, United Nations University, Institute for the Advanced Study of Sustainability, Tokyo, Japan
15:05-15:15	Discussion	
15:15 – 15:30	**Break**	
	SESSION III	

	Moderator: Prof. Hideaki Ohgaki, Kyoto University	
15:30- 15:50	Clean Energy Development in Delhi: Targets and supporting strategies	Dr. Mahendra Sethi, Indian Society For Applied Research & Development New Delhi, India
15:50- 16:00	Discussion	
16:00-16:20	Climate policies and intergovernmental relations in Malaysian cities	Dr. Jose Puppim Deolviera, Getulio Vargas Foundation, Brazil
16:20- 16:30	Discussion	
16:30- 16:50	Building a Sustainable City Against the Odds: a case study of the City of Sydney	Dr. Scott Kelly, University of Technology Sydney, Australia
16:50- 17:00	Discussion	
17:00 – 17:15	**Break**	
17:15-17:35	Workshop wrap-up Session	Jr. Assoc. Prof. Hooman Farzaneh, Kyoto University, Japan Assoc. Prof. Benjamin McLellan, Kyoto University, Japan
17:35 – 17:50	Closing Remarks	Prof. Keiichi N. Ishihara, Kyoto university, Japan
18:30-20:30	Dinner (KIHADA restaurant)	

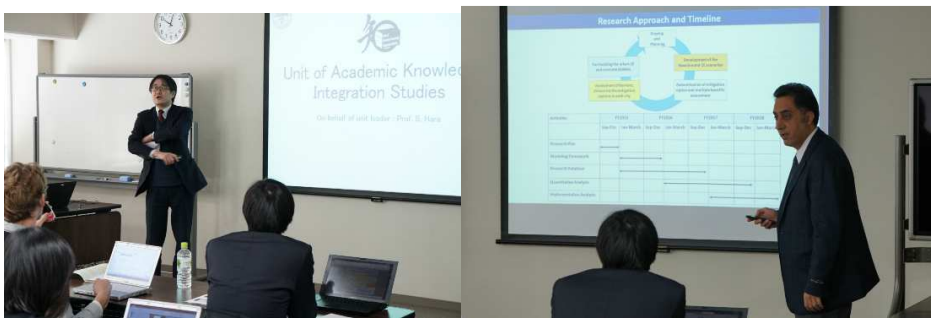
Organizing Committee:

- Dr. Hooman Farzaneh, Institute of Advanced Energy, Kyoto University, Japan
- Prof. Hideaki Ohgaki, Institute of Advanced Energy, Kyoto University, Japan
- Dr. Benjamin McLellan, Graduate School of Energy Science, Kyoto University, Japan
- Prof. Keiichi N. Ishihara, Graduate School of Energy Science, Kyoto University, Japan
- Ms. Yumiko Nagaya, Institute of Advanced Energy, Kyoto University, Japan
- Ms. Sasha Yoshioka, URA Office, Kyoto University, Japan
- Ms. Keiko Takimoto, URA Office, Kyoto University, Japan

Workshop sessions

Introductory:

Introductory remarks were made by the members of the organizing committee. Professor Hideaki Ohgaki gave a brief introduction to the Unit of Academic Knowledge Integration, Kyoto University. Dr. Hooman Farzaneh then introduced the ongoing research project at IAE, entitled" Assessing the multiple benefits of clean energy development in Asian mega cities".



Picture 1: Professor Ohgaki and Dr. Farzaneh, giving the introductory remarks

Morning Session:

Following the introductory session, there was a session on successful clean energy solutions in Asian cities. The panel had representation from 2 speakers from China and one speaker from South Korea.

The first speaker, Dr. Wang Xin (UNEP-Tongji Institute of Environment for Sustainable Development (IESD), Shanghai, China) gave a talk on "Opportunities and Challenges of Decentralized Roof PV Development in Shanghai, a case study of Pudong HITACHI factory project". As he explained, this project with 2.5MW designed electricity generation capacity, was installed on the roof of 3 different buildings of one company, which is located at Pudong District, Shanghai. It was designed to provide up to 30% power consumption of the whole company, according to the current power requirement. The first phase of project with 1.7MW generation capacity has been installed in late 2015 and began to operate. Dr. Wang Xin in his presentation addressed the following topics:

- As the investment cost and efficiency of PV power generation, the profit-making of the generator still mostly rely on the subsidy from the government, and it will take different years to get the investment cost back depending on the size of the project.
- There are still some challenges and difficulties faced by the frontrunner of decentralized power generator, such as looking for the suitable consumer with good condition for project implementation, funding-raising for investing new projects, etc.

- However, the experience of running this project on technical cooperation and operating mechanism can be shared with other area with similar condition for developing decentralized PV energy system.

Picture 2: Dr. Wang Xin introduces the Pudong HITACHI factory project

The second speaker Mr. Haixing Meng (College of Architecture and Urban Planning, Tongji University, Shanghai, China) presented the low carbon development strategy in Shanghai, considering fossil energy and alternative energy systems. He explained the current energy consumption and air pollution in recent years followed by introducing the policy framework for analysis Shanghai's recent policies on clean energy and low carbon development strategy. Mr. Haixing Meng also highlighted the classified information and indicators which were extracted from the policy documents published by Shanghai local government, and related projects by different objectives including energy efficiency improving, emission reduction and new energy development.

Picture 3: Mr. Haixing Meng talks about the low carbon development strategy in Shanghai

The third speakers in this section, Mr. Inchul Hwang, director of the International Cooperation Team, Global Strategy Division, Korea Energy Agency (KEA), South Korea, gave a talk on Seoul's One Less Nuclear Power Plant program. The main goals of this program include energy saving of 4 million TOE, 20% power self-reliance by 2020, GHG emissions reduction of 10 million $TCO2_e$. Mr. Inchul Hwang highlighted the four policy areas in this program as follows:

- Decentralized Energy Production with 19 projects, including 40 thousand mini photovoltaic plants.
- Lower Energy Consumption with 34 projects, including Replacement of Street Lamps and Security Lights to LED.
- Creation of Quality Energy Jobs with 17 projects, including 25 Energy Hub Centers.
- Energy-Sharing, Welfare Community with 18 projects, including Energy Welfare Platform

According to his final conclusion, the first phase of the program made a success by achieving energy reduction of 2.04 million TOE (renewable energy: 0.26 million TOE, energy efficiency: 0.87 million TOE, energy saving: 0.91 million TOE) by June 2014, six months earlier than the original timetable.

Picture 4: Mr. Inchul Hwang introduces “Seoul's One Less Nuclear Power Plant program”

Afternoon Session:

The first speakers of this session, Dr. Eric Zusman and Ms. Ryoko Nakano (Institute for Global Environmental Strategies (IGES), Japan) shared the research that the Institute for Global Environmental Strategies (IGES) has conducted on low carbon urban development in Japan and Indonesia. Dr. Zusman spoke about the importance of framing low carbon reforms in ways that clearly demonstrate their local benefits. Ms. Ryoko Nakano presented the method which has been developed to measure willingness to pay (WTP), together with the lessons learned from the

case studies in Japan and Indonesia. She concluded that the willingness to purchase technologies are positively correlated with some measures of youth and education. She also highlighted that the engagement in community activities has similar positive effects and participating in social organizations can change minds and attitudes on environmental issues.

Picture 5: Dr. Eric Zusman and Ms. Ryoko Nakano give their talks on making low carbon development locally relevant: Cases from Indonesia and Japan

The Second speaker Dr. Mahendra Sethi (Indian Society For Applied Research & Development New Delhi, India) started his presentation with a focus on "Clean Energy Development in Delhi: Targets and supporting strategies", considering three essential components - rooftop solar energy generation, clean transportation and waste to electricity. He highlighted the learning from Delhi's case and long term policy for clean energy as follows:

- At present, there is no single or specific policy towards pushing clean energy
- Practices shows supply, typically being behind the demand curve
- The government's focus is on enhancement of supply than radical shift or major demand side management. On the contrary, bold decisions seem to work in Indian cities.
- Various facilities, energy services in Delhi are highly subsidized and their price does not reflect the cost, adequately, for e.g. - electricity, LPG, waste disposal, etc.
- Delhi's policy is primarily top-down, influenced by the national discourse in climate change, energy and fuel as evident in case of NAPCC, ULSD, Euro norms and SWM Rules
- There are a lot of lateral decisions making being done by the judiciary (Supreme Court of India, Delhi High Court and National Green Tribunal) and appointed committees like EPCA, etc.
- The government needs to enhance its own capacity at multiple levels and coordination in between in addition of focusing on public awareness.

Dr. Mahendra concluded that the clean energy policy has to be integrated considering the demand and supply characteristics of all major sectors including electricity, transport, waste, buildings, household fuel, etc.

Picture 6: Dr. Mahendra Sethi talks about the clean energy development in Delhi

The Third speaker Dr. Mehrnoosh Dashti (United Nations University, Institute for the Advanced Study of Sustainability, Tokyo, Japan), spoke about the analytical frameworks to address health co-benefits of energy technologies in Asian cities. She highlighted the different factors which affect the health co-benefits in urban areas and introduced three case studies as: “Sustainable energy policy in Taiwan”, “Transportation Sector in China” and “Waste Sector in Spain”. Dr. Dashti addressed the major limitations of health co-benefits approach as follows:

- Data accessibility; less information available on emissions to soil and water.
- Exposure of individual to substances influenced by many parameters such as pre-existing health, individual’s diet and lifestyle, home environment, occupation, body condition, etc.

Picture 7: Dr. Mehrnoosh Dashti, giving her talk on health co-benefits of the clean energy development

Prof. Jose Puppim Deolviera (Getulio Vargas Foundation, Brazil) participated in this workshop remotely. He proposed his main research question as “How do inter and intergovernmental relations in Malaysian federal, states and local authorities impact service provision (waste) and climate policies? “. Prof. Deolviera drew lessons from the case studies and mentioned that an open political process can help engaging different political groups and civil society to bring legitimacy, resources and efficiency to public administrations, if it is done in a transparent democratic way with robust institutions; otherwise, administrations can also become a tool for cronyism and patrimonialism, which can undermine the political system, and result in inefficiencies and ineffectiveness in the public sector. Finally, He concluded that:

- A combination of bottom-up and top-down efforts are necessary to weaken the resilience of the system.
- Creating the right institutional and political environment is important to facilitate the emergence of forces to make pressure to change the system and break the resilience.
- However, there are instances when the changes in the system boundaries are not possible or not desirable by the actors in control of the system; or the external or internal pressures do not exist due to lack of capacity or political will.
- Some localities have been successful in improving resource efficiency and tackle certain problems, but not able to have the same effectiveness for other problems as the system boundaries and forces are different.

Dr. Yusuke Kishita (The University of Tokyo, Japan), presented a research project that aims to envisage sustainable visions of Toyama City to 2064, followed by devising effective policies and actions to be taken by local stakeholders. He introduced a participatory backcasting approach which was taken to generate various ideas that help the city more sustainable with discontinuous changes from the present in mind. Dr. Kishita shared his experiences about three participatory workshops which were organized by involving about 20 citizens and several scholars to describe multiple scenarios, which consist of sustainable visions and pathways to reach them. He addressed the participatory backcasting as a promising way for democratic decision-making and concluded that there is a need to test the feasibility of the described visions which will be associated with various constraints such as energy demand and renewable potential.

Picture 8: Dr. Yusuke Kishita, presenting the participatory backcasting approach to vision creation for sustainability

The last speaker of this session, Dr. Scott Kelly (University of Technology Sydney, Australia), gave his talk on "Building a Sustainable City against the Odds: a case study of the City of Sydney". He introduced the City of Sydney's plan to reduce green-house gas emissions by 70% and meet 30% of its electricity demand from renewable sources and 100% from local generation. As he mentioned, on the demand side, Sydney has already embarked on a transition to improve energy efficiency across the city that will eliminate two million tonnes of CO2 by 2030 and save $600m in energy bills whilst simultaneously doubling energy productivity. Dr. Kelly argued that strong local action can still achieve positive net outcomes, despite beleaguered and insufficient attempts at a national level to implement any coherent plan to mitigate emissions. Finally, he listed the challenges for urban scale energy in this city as follows:

- Physical and cultural challenge of retrofitting existing buildings (heritage)
- Installing appropriate renewable technologies in urban environments
- Working with land and space constraints (sensitive land, topography, minimal)
- Working with climatic and weather conditions that are not optimal for renewables
- Overcoming regulatory barriers to decentralized energy
- Local planning conditions and constraints
- Energy pricing structure

Picture 9: Dr. Scott Kelly, introducing the case study of the city of Sydney

Workshop wrap-up

The workshop wrap-up was devoted primarily to general discussion and to distilling and considering the main points that had been presented.

Picture 10: Workshop wrap-up session by Dr. Benjamin McLellan and Dr. Hooman Farzaneh

The wrap-up session was followed by a lively discussion on following key questions:

1) How to foster the Stakeholder engagement in Clean Energy development?

It is important to involve relevant stakeholders in the process of establishing clean energy policies. Participants believe that there is a positive correlation between the effectiveness of a sustainable development strategy and its continuity and the degree of public participation. The stakeholders can include business, industry, non-governmental organizations and local and

regional authorities in the selected cities and can be involve a broad range of stakeholders in different stages as follows:

- Technical: Obtain reliable and timely data through stakeholder interaction, and use this information in turn to further engage with stakeholders.
- Institutional: Involve stakeholders from businesses, non-governmental organizations, and local/regional governments and iterate with them to increase engagement, providing assurance and early signals to businesses.
- Policy: Engage stakeholders, enhance communication, and update of LEDS to understand how goals are set, how strategies are elaborated to achieve them, and to what extent the interface between development and climate change planning is addressed.

A clean energy policy may serve a range of domestic purposes for government, the private sector, the general public and the international community, as well as other institutions and stakeholders. The process of establishing a clean energy policy can enhance coordination across different ministries and communication with other stakeholder groups such as businesses and civil society, and also increase public awareness of climate change science and policy.

2) What is the appreciate methodology for linking the clean energy policy with the master plan of the city, development strategy in the country and other national and international implementation mechanisms?

The precise steps that a city/country would need to follow to develop clean energy policy or NAMAs (Nationally appropriate mitigation actions) will depend on its national circumstances. Two approaches which can be considered for linking clean energy policy with development strategy in the country include: Top-down and Bottom-Up. Under the bottom-up approach, emission reduction options in various sectors are identified and analyzed first, resulting in the determination, quantification and prioritization of mitigation measures or NAMAs. It may be helpful to develop a low-emission development concept, to put NAMAs in each sector into the context, to ensure better coordination of the implementation of actions and to lay a foundation for future efforts towards developing a clean energy policy.

Closing remarks were made by Professor Keiichi N. Ishihara (Kyoto University, Japan). He concluded his remarks by thanking the workshop participants.

Picture 11: Professor Keiichi N. Ishihara giving the closing remarks

❖ **Next Step:**

The main achievement of the second workshop was to enable a sufficient amount of dialogue between scientists and policy-makers for the specific case studies which may lead to the definition of new collaboration projects on clean energy development in Asian cities. The next step would concentrate on **Understanding Stakeholder Engagement** in determining the phase of development and implementation of the clean energy strategy in Asian cities.

Picture 12: Group photograph of workshop participants