



# JGSEE

The Joint Graduate School of Energy and Environment



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CENTER OF EXCELLENCE ON ENERGY TECHNOLOGY AND ENVIRONMENT



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## Contribution to Society

### MOU Signing Ceremony between JGSEE and the Government Saving Bank

A Memorandum of Understanding (MOU) signing ceremony involving the Government Saving Bank (GSB) and 11 partners, including JGSEE-CEE, was held on 1 December 2017 at the exhibition on “Smart SMEs Smart Startup” at the Queen Sirikit National Convention Center in Bangkok. The objective of the MOU is to provide start up and SMEs with adequate knowledge and advice on various potential funding and development opportunities. Along with the ceremony an exhibition was held during which JGSEE showed its research work on Net Zero Energy Buildings (NZEB).



## Contribution to International Forum

### 3rd ICLCA 2017 and 6th LoCARNet Annual Meeting



The 3rd International Conference on Low Carbon Asia and Beyond (ICLCA 2017) and the 6th Low Carbon Asia Research Network (LoCARNet) Annual Meeting were jointly organised by the King Mongkut's University of Technology Thonburi (KMUTT) and the University of Technology, Malaysia (UTM) in collaboration with the Joint Graduate School of Energy and Environment (JGSEE-CEE), the Iskandar Regional Development Authority (IRDA), Malaysia, and the Institute for Global Environmental Strategies (IGES), Japan. Both events were held during 1-3 November 2017 at the Century Park Hotel in Bangkok.

Around 130 participants representing 11 countries worldwide from academia, research organisations, government agencies and businesses, joined ICLCA 2017 and LoCARNet in order to present their research works and attend technical sessions. Dr Wijarn Simachaya, Permanent Secretary, Ministry of Natural Resources and Environment, presided over the opening ceremony and delivered a keynote address on “Expectations to the Research Communities in Supporting Science-Based Climate Policy”. Five prominent scientists were also featured as keynote speakers, including: (1) Prof Priyadarshi R Shukla, IPCC WGIII Co-chair; (2) Dr Shobhakar Dhakal, Asian Institute of Technology (AIT), Thailand; (3) Mr Pravit Prakitsri, Mittr Phol Sugar Corp., Ltd., Thailand; (4) Prof Jiri Jaromir Klemeš, Brno University of Technology, Czech Republic; and (5) Prof Tan Sri Zakri Abdul Hamid, Science Advisor to the Prime Minister of Malaysia, Malaysia.

A number of invited speakers and chairpersons also contributed to the technical sessions of ICLCA 2017. They focused on the following various topics: (1) Energy System and Scenario, (2) Fundamental Science and Engineering, (3) Urban Development, (4) Policies and Mechanisms, (5) Land Use and Agriculture, (6) Behavior Change and Consumption, and (7) Building and Design. For the LoCARNet event, 6 technical sessions were organised focusing on the following topics: (1) Progress and Future: The National Adaptation Process and its Implementation among ASEAN Countries, (2) Mitigation in Asia: Lesson Learnt from Implementation and Relevant Cooperation on Low Carbon Development and Joint Crediting Mechanism, (3) Climate Actions and Interactions with SDGs, (4) Low Carbon Cities, (5) Towards Long-term Carbon-neutrality in Asia: Growing Importance of Forestry and Land Use Management, and (6) Integration of Local Actions into National Development towards Achieving SDGs in Asia and the Role of Science and Technology: Development and Application of Models and Monitoring Technologies to Evaluate Transition to the SDGs.

On the last day of the conference, a “City Mayors’ Summit” was held to discuss about Low Carbon Society in Asia. The panel was composed of a number of distinguished participants from the region. These included Mr Vijai Amaralikit, Mayor of Phanatnikhom Town Municipality, Thailand; Mr Nor Rahman bin Mustafa, Director of Town Planning, Pengerang Local Authority, Malaysia; Dr Dao Anh Dung, Vice Chairman of Can Tho’s People Committee, Vietnam; and Dr Do Quang Hung, Head of Division, Member of Haiphong City Sustainable Development Council, The Office of Haiphong People Committee, Vietnam. Each of these speakers shared their experiences with regard to the situation of Low Carbon Society development in their respective countries, including challenges, achievements and ways forward.

## Contribution to Knowledge Platform



### JGSEE holds EleCity Conference with the University of Stuttgart

On 13 November 2017, JGSEE-CEE organised the EleCity Conference on “The Electrified City - Sustainable Cities in the context of Energy Transition” in collaboration with the Institute of Energy Economics and Rational Energy Use (IER), University of Stuttgart, Germany. The event was held at the Century Park Hotel in Bangkok. It aimed at addressing the various challenges and potentials for a sustainable energy future in the context of cities and their development. Presentations on energy generation and distribution, urban planning, industry and transportation were delivered by German and Thai experts as detailed below.

In the morning, two sessions were held. The first one focused on “Energy System Perspective” and included a couple of talks. The first presentation was delivered by Dr Ulrich Fahl (IER, University of Stuttgart) on “Integrated Transition Pathways for Energy Systems”. The second talk by Mr Christian Schneider (Smart Grids-Plattform Baden Württemberg e.V.) was on “Smart Grid and the Internet of Things”. Following some discussions, a second session was held on “Urban Development”, which included three talks. The first presentation by Dr Sigrid Busch (Department of Urban Planning and Design, University of Stuttgart) was on “Activating Resources – Sustainable Development through Integrated Urban Governance”. The next presentation by Prof Dirk Schwede (ILEK, University of Stuttgart) was on “Potential and Challenges of the Electrification and the Integrated Electricity Generation in Buildings and Neighbourhoods”. The session ended with a presentation by Dr Robert Himmler (JGSEE) on “A Sustainable Single Family House in Thailand”.

In the afternoon of the event, two sessions were held, the first focusing on “Renewables and the Industry” and the second on “Transport and Air Pollution Control”. During the first session, three talks were delivered. The first presentation by Dr Ludger Eltrop (IER, University of Stuttgart) was on “Renewable Energy for the Electrified Cities of the future” as per the theme of the event. The second presentation by Dr Athikom Bangviwat (JGSEE) was policy oriented and titled “Use of Renewable Energies in Thailand – Status quo and Challenges”. The last presentation by Dr Bernd Franke (ifeu) was on “Potentials for Electrification and Energy Efficiency in Industry and Commerce”. In the last session of the afternoon, three presentations were delivered. This included a first presentation by Ms Tanja Schafer (PTV group) on “Potentials and Challenges for the Electrification of Urban Transport”, a next presentation by Dr Yossapong Laonual (EVAT and KMUTT) on “Electric Vehicle Technology in Thailand – Status Quo and Challenges”, and a last presentation by Mr Rashane Sala-Ngarm (GIZ) on “Integrated Resource Management in Asian Cities: The Urban Nexus”. The event ended with a wrap-up session moderated by Dr Sirintornthep Towprayoon (JGSEE Director). The conference provided a useful platform for German and Thai experts to interact and network. Over 50 participants joined the conference mostly from academic institutes and government agencies.

## Collaboration Meeting between JGSEE and Stuttgart University



As a follow-up event of the EleCity conference that was held on 13 November 2017 and which involved Thai and German experts from JGSEE-CEE and the University of Stuttgart, a collaboration meeting was held on 14 November at KMUTT. The meeting focused on discussing opportunities and options to promote research collaboration and student exchange programs between the two organisations. The German team was also given a tour of the laboratory facilities, including JGSEE's pilot plant and net zero energy house.

## JGSEE holds a Special Talk Session Involving Two Distinguished Contributors from ICLCA 2017



On 31 October 2017, two talks were delivered at JGSEE-CEE by distinguished contributors to the ICLCA 2017 conference that was subsequently held during 1-3 November 2017 in Bangkok. The first speaker, Prof Jiří Jaromír Klemeš from Brno University of Technology, Czech Republic, delivered a talk on "Smart Cities Potential for Reducing the Environmental Footprint". During his talk, Prof Klemeš provided an overview of the various options and pathways that should contribute paving the way towards the sustainable development of our modern societies. Prof Klemeš is the Co-Editor-In-Chief of the international Journal of Cleaner Production. A second talk was delivered by Assoc Prof Dr Chew Tin Lee from the University of Technology, Malaysia. She delivered a

presentation on "Sustainable Composting system for Organic Waste Management". This is a topic that she has been dedicating her research life on to promote the sustainable management of organic waste in Malaysia and the production of crops using organic fertilisers from various composting systems. The two presentations were followed by a fruitful Q&A session chaired by Assoc Prof Dr Sirintornthep Towprayoon (Director of JGSEE).

## Contribution to Research Platform

### 5th BESA Project Meeting and Workshop on Algebraic Models for Biomass-based Supply Chains



On 29 August 2017, the 5th BESA project meeting was held at JGSEE-CEE. The BESA project is a collaborative research work on biomass resources and bioenergy led by the Institute for Industrial Production of Karlsruhe Institute of Technology (KIT-IPP, Germany) and JGSEE. Other partners of the project from Germany include: (1) the Clausthal Institute of Environmental Technology (CUTEC); (2) the Institute of Environmental Technology and Energy Economics (IUE), the technical University Hamburg-Harburg; and (3)

Trier University of Applied Sciences. The objective of this research work is to evaluate within a sustainability framework, the availability of biomass resources at regional level and to determine via modelling the most appropriate technical conversion processes. During the meeting, discussions were held to identify research topics for further collaboration in the future, including, the organisation of training workshops and the exchange of researchers.

Following the meeting, JGSEE in collaboration with KIT organised a workshop on "Algebraic Models for Biomass-based Supply Chains". The event was held during 30-31 August 2017 at KMUTT. As part of the workshop, Mr Tobias Zimmer, Mr Florian Diehlmann and Mr Andreas Rudi (KIT) gave an overview of the algebraic models frequently used in the area of supply chain management, including the model types which are particularly relevant for biomass-based supply chains using GAMS and Excel.

## JGSEE visits Karlsruhe Institute of Technology in Germany



During 9-13 October 2017, JGSEE's researchers from AFPL and AGAR visited the Karlsruhe Institute of Technology (KIT) in Germany. The team from JGSEE-CEE included: Assoc Prof Dr Savitri Garivait, Dr Supachita Krekkaiwan, Dr Agapol Junpen and Ms Orachorn Kamnoet. The visit aimed at exchanging experiences and knowledge on bioenergy technology and bio-economy, including biomass resource potential. It also aimed at discussing future opportunities for the joint development and implementation of research projects contributing to address Thailand's development and societal needs in the context of Thailand 4.0.

## SATREPS Joint Coordinating Committee Meeting



JGSEE-CEE in collaboration with PTT-RTI, Kyoto University, Akita University, CRIEPI and Kobe Steel Co. Ltd organised the Joint Coordinating Committee Meeting of the Science and Technology Research Partnership for Sustainable Development or SATREPS – a program supported by the Japan International Cooperation Agency (JICA) and the Japan Science and Technology Agency (JST). The event was held on 22 November 2017 at PTT Research and Technology Institute in Wang Noi, Ayudhaya Province, Thailand.

Following some Opening Remarks delivered by Assoc Prof Dr Bundit Fungtammasan (Project Director), KMUTT Senior Vice President for Research and Innovation, and some Welcome Remarks by Ms Arunratt Wuttimongkolchai, Vice President of the Petroleum Products and Alternative Fuels Research Department (PTT-RTI), a progress report of the project was presented by Prof Kouichi Miura, the Research Director of the SATREPS project. The committee was then invited to visit the semi-continuous solvent treatment unit of PTT-RTI. Wrap-up discussions were then held between members of the coordinating committee and representatives from JICA and JST in order to prepare for the next step of the project activities.

## Public Hearing on the Potential of Pineapple and Coconut Waste as Energy Feedstock



JGSEE-CEE with support from the Energy Conservation Promotion Fund (ENCON Fund) of the Energy Policy and Planning Office (EPPO) of the Ministry of Energy, organised a Public Hearing on “Study of Biomass Pellets/Briquettes Production from Pineapple and Coconut Waste for Energy Purposes in the Communal, Municipal and Industrial sectors”. The event was held on 15 December 2017 at the Twin Tower Hotel in Bangkok.

At the start of the event, some Welcome Remarks were delivered by Assoc Prof Dr Suneerat Fukuda, Director of JGSEE-CEE. As the head of the project, she also gave an overview of its activities. A series of presentations were then delivered by contributors to the project. First, Dr Pichet Nilduangdee (Phetchaburi Rajabhat University) delivered a presentation detailing the potential of pineapple and coconut waste as energy feedstock in the western and upper southern regions of Thailand. This was followed by a presentation by Dr Awassada Phongphiphat (JGSEE researcher) on the conversion and use of such biomass feedstock as pellet fuels at the municipality level. Related research results at the community and industrial level were then presented by Assoc Prof Dr Soydoa Vinitnantharat (KMUTT) and Dr Supachita Krekkaiwan (JGSEE researcher). The meeting ended with a Q&A session. The event gathered participants from the academic, private and government sectors.

## Public Hearing on Energy Efficiency Resource Standards



JGSEE-CEE, with support from the Energy Conservation Promotion Fund (ENCON Fund), Energy Policy and Planning Office (EPPO), Ministry of Energy and the three electricity authorities of Thailand, including, the Electricity Generating Authority of Thailand (EGAT), the Metropolitan Electricity Authority (MEA), and the Provincial Electricity Authority (PEA), organised a Public Hearing on the collaborative project entitled “Energy Efficiency Resource Standards (EERS)”. The event was held on 26 December 2017 at the Twin Tower Hotel in Bangkok.

At the start of the event, some opening remarks were delivered by Dr Twarath Sutabutr, Director-General of EPPO. This was followed by a presentation by Assoc Prof Dr Bundit Fungtammasan, managing director of the project, detailing the background and main objectives of the research work. Focus of the research is mainly on end-users and in-house energy savings (electricity), and decision-makers with particular emphasis on the planning of EERS measures and set up of guidelines to establish energy saving targets and implementation. Related research results were presented by Dr Athikom Bangviwat of JGSEE. The meeting ended with a presentation on pilot programs on EERS and a Q&A session involving representatives from EAGT, PEA, and MEA. The event was very successful, involving over 100 participants from educational institutions, office buildings as well as industry, academic, private and government sectors.

## Awards

### JGSEE receives the TIS 2677-2558 Certification from NRCT and MASCI



On 23 August 2017, JGSEE-CEE received the TIS 2677-2558 certification on the Ultimate Laboratory from the National Research Council of Thailand (NRCT) and the Management System Certification Institute (MASCI). The TIS 2677-2558 certification was awarded to successful laboratories involved in the project on “Assessment of Safety Management on Laboratories related to Chemicals”. JGSEE’s laboratory is one of the 22 laboratories in Thailand that were able to meet the criteria for the certification. The ceremony took place as part of the Thailand Research Expo 2017 that was held at the Centara Grand & Bangkok Convention Centre at CentralWorld in Bangkok.

### Best Oral Presentation and Best Paper Awards at ITICHe 2017



JGSEE-CEE is pleased to congratulate Mr Hafiz Usman Ghani, Master student in Environmental Technology and Management supervised by Prof Shabbir H Gheewala, for receiving the Best Oral Presentation award and Best Paper award for the study titled “Life Cycle Assessment of a Sugarcane Biorefinery Complex in Pakistan”. The awards were delivered at the occasion of the 7th International Thai Institute of Chemical Engineering and Applied Chemistry Conference 2017 (ITICHe 2017) on the theme “Innovative Chemical Engineering and Technology toward a Sustainable Future”. The event was held during 18-20 October 2017 at the Shangri-La Hotel in Bangkok. In

relation to the same event, JGSEE is pleased to congratulate Ms Kunnika Changwichan, Ph.D. student in Environmental Technology also supervised by Prof Shabbir H Gheewala, for receiving the Best Oral Presentation award for her study titled “Production of Bioplastics Towards Sustainability”.

## KMUTT 2016 Academic Awards



On 29 August 2017, KMUTT organised a reception in honour of the recipients of the 2016 Academic Awards at the Bangkok Marriott Hotel Sukhumvit. In this regard, JGSEE-CEE is pleased to congratulate Prof Shabbir H Gheewala and Prof Navadol Laosiripojana for receiving each an Excellence Award.

The award of Prof Shabbir is to acknowledge the 2016 NSTDA Research Chair Grant he received for the research project on "Network for Research and Innovation for Trade and Production of Sustainable Food and Bioenergy". The award of Prof Navadol is to acknowledge a number of his research achievements, including: (1) the 2015 National Researcher Award (Engineering and Industrial Research) he received from the National

Research Council of Thailand (NRCT) for the research work on "Development of Alternative Fuel Production Processes"; (2) the 2015 TRF - Thomson Reuters - OHEC Research Excellence Award for the research work on "Development of Integrative Biorefinery Processes and Units for Complete Conversion of Agricultural Biomass to Value-added Products: Initiative Concepts Model for Industry"; and (3) the 2015 Outstanding Researcher Award (Commercial Outstanding Research) he received from TRF for the research work on "Development of Innovative Technology for Energy and Biochemical Industry on the Transformation of Agricultural Biomass to Value-added Products at the Industrial Level".

During this KMUTT event, JGSEE also received two Honorary Awards, one for the Environment Division and the other for the Energy Division. Both awards are to acknowledge the excellence of its Environmental Technology program (TRF index 5.0) and Energy Technology program (TRF index 4.5-4.9) as assessed by TRF.

Last but not least, JGSEE is very pleased to congratulate Assoc Prof Dr Bundit Fungtammasarn, KMUTT Senior Vice President for Research and Innovation, for receiving an award in acknowledgement of the one he received from the French government in 2016 as "Officier dans l'Ordre des Palmes Académiques".

## Best Oral Presentation Award at JCREN2017



JGSEE-CEE is pleased to congratulate Assoc Prof Dr Nakorn Worasuwanarak and Mr Nattawut Setkit for receiving the Best Oral Presentation award for the study on "Effect of Mechanical Pressure on the Carbonization Behavior of Woody Biomass" at the 6th Joint Conference on Renewable Energy and nanotechnology (JCREN2017). The event was held during 12-14 October 2017 at Chulalongkorn University, Bangkok.



## Recognition

### Congratulation to Dr Sebastien Bonnet for his Promotion to Associate Professor



JGSEE-CEE is pleased to congratulate Dr Sebastien Bonnet for his promotion to the position of Associate Professor. Dr Bonnet who was recruited in 2004 as a research associate by Dr Bundit Fungtammasan, former Director of JGSEE, contributes to the activities of the Life Cycle Sustainability Assessment Laboratory headed by Prof Shabbir H Gheewala. Over the years, his research work has been dealing with a broad range of subjects, including, sustainability assessment of solid waste management and biofuels, as well as assessment of air pollution, particularly from biomass open burning, and health risks. He has contributed to the publication of 25 international journal papers and 5 book chapters in related areas. Dr Bonnet has also played a key role in leading a number of outreach activities, which aside from the coordination of Franco-Thai seminars, workshops and summer schools, includes the technical organisation of JGSEE's bi-annual international conference on sustainable energy and environment.

### LCSAL Contribution to Special Issue of the International Journal of Life Cycle Assessment



LSCAL of JGSEE has been intimately involved in the publication of a Special Issue in the International Journal of Life Cycle Assessment on "Promoting Sustainability in Emerging Economies via Life Cycle Thinking". As the name of the journal implies, this is the "de facto" journal for life cycle assessment (LCA). The entire guest editorial board of this Special Issue is from Thailand, including two members from LCSAL (Prof Shabbir and Asst. Prof. Dr. Thapat). Apart from the topic of the special issue, what is so special is that about 50% of the articles in this issue are from Thailand. This is a confirmation of Thailand's international standing in the LCA field and LCSAL's role in this. Prof Shabbir has been a subject editor (for energy and waste management systems) on this journal for close to a decade. In fact, he is the only subject editor from Asia; the rest being mainly from Europe and the US.

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