



# JGSEE

The Joint Graduate School of Energy and Environment



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Consortium involving five leading institutions

CENTER FOR ENERGY TECHNOLOGY AND ENVIRONMENT

## JGSEE Newsletter

Vol. 12, January - April 2012



## ***Message from the Director***

Established in 1998, The Joint Graduate School of Energy and Environment - Center of Excellence on Energy Technology and Environment (JGSEE-CEE) is now entering its 14th year of existence with top rank academic and research achievements in the fields of energy and environment.

The year 2011 was that of change at JGSEE. Starting since April 2011, JGSEE's former director, Associate Professor Dr Bundit Fungtammasan was requested based on its executive experience at JGSEE to join KMUTT as Vice-President responsible for Research Affairs. It is therefore my privilege to replace him as the new Director of JGSEE. This is certainly one of the most challenging time of my life, taking the helm of JGSEE-CEE at a time of important transition to phase III (2012-2016) as Center of Excellence on Energy Technology and Environment under the Science and Technology Postgraduate Education and Research Development Office (PERDO).

Entering now into phase III of its CEE mission, the way forward for JGSEE is to be more focused on technologies and policies that answer to National Strategic Plans including the Thailand 20-year Energy Efficiency Development Plan (2011-2030), the Thailand 15-year Renewable Energy Development Plan (2008-2022), the Thailand Strategic Plan on Climate Change, the National Master Plan of Climate Change, the National Policy and Plan for Science, Technology and Innovation (2012-2021) and the 11th National Economic and Social Development Plan. High impacts, including to society, from the outputs of JGSEE-CEE's scientific and research activities are expected.

The content of this newsletter covers academic and research contributions from JGSEE-CEE over the last year. It also covers many challenging issues of energy crisis and climate change that JGSEE-CEE has contributed to at national, regional and international levels. These activities serve well as the foundation to step forward into the ASEAN community in 2015 as well as the international forum on energy and climate change. More is expected to come in 2012.

In addition to such contributions, it is JGSEE-CEE's pride to congratulate Professor Shabbir H Gheewala on his promotion, our first JGSEE's Professorship, and Associate Professor Dr Bundit Fungtammasan for its contribution as Lead author to the IPCC Fifth Assessment Report: Working Group III. These recognitions are the result of their cumulative contributions and valuable works at JGSEE-CEE.

I hope this newsletter will provide you with interesting insights concerning the activities of JGSEE-CEE and its 5 university partners and our intention to contribute knowledge to serve the academic forum and civil society in the years to come.

Sirintornthep Towprayoon  
Director

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Energy Technology & Environment

## Contribution to International Organizations

### IPCC's 5th Assessment Report on Climate Change



Former Director of JGSEE-CEE, Dr Bundit Fungtammasan has recently been selected by the Intergovernmental Panel on Climate Change (IPCC) to contribute to its 5th Assessment Report as one of the Lead Authors. The IPCC is the leading international body for the assessment of climate change. It was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts. Every 6-7 years, IPCC produces a policy-relevant global assessment report dealing with three main areas of knowledge about climate change, which are assessed in three Working Groups (WG): the Physical Science Basis of Climate Change (Working Group I); Climate Change Impacts, Adaptation and Vulnerability (Working Group II); and Mitigation of Climate Change (Working Group III). The reports compiled by the three Working Groups serve as a basis for the international climate policy negotiations. Thousands of scientists from all over the world contribute to the work of the IPCC on a voluntary basis. They are nominated either by governments or by the IPCC Bureau. Dr Bundit was nominated by the latter to serve as one of the 17 Lead Authors in Working Group III who will contribute to the writing and review of the Energy Systems chapter. The report, including the peer review process, will take about 3-4 years to complete, and will be reviewed by member governments of IPCC before being accepted, adopted and approved at the plenary sessions.



**Task Force on Hemispheric Transport of Air Pollution**

### Task Force on Hemispheric Transport of Air Pollution

The Task Force on Hemispheric Transport of Air Pollution (TF HTAP) was established by the Executive Body of the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP Convention) to develop a fuller understanding of intercontinental transport of air pollution in the Northern Hemisphere. The main tasks of TF HTAP are (1) To plan and conduct the technical work necessary to develop a fuller understanding of the hemispheric transport of air pollution for consideration in the reviews of protocols to the Convention; (2) To plan and conduct the technical work necessary to estimate the hemispheric transport of specific air pollutants for the use in reviews of protocols to the Convention; and (3) To carry out such other tasks related to the above work as the Executive Body may assign to it in the annual work-plan. The Task Force serves as a forum for international scientific communication and collaboration and as a bridge between the international research community and the international policy community. To focus its work, the Task Force has identified a series of policy-relevant science questions. The Task Force is working to address these questions through periodic assessment reports and through new collaborative research and analysis efforts related to global and regional modeling, emissions and projections, and observations. HTAP 2010 Assessment Report is the first comprehensive assessment of the state of the science with respect to the intercontinental transport of air pollutants in the Northern Hemisphere. Assoc Prof Dr Savitri Garivait has joined the TF HTAP since November 2006 as expert in the field of Emissions from Biomass Burning, and contributed to the HTAP 2010 Assessment Report, Part A-Ozone and Particulate Matter, Chapter 3-Emissions Inventories and Projections. Currently, she takes part in the TF HTAP Working Team 3 in charge of HTAP 2015 Assessment Report, Part A-Ozone and Particulate Matter, Chapters dedicated to Emissions and Mitigation Options.

### IPCC 2013 Supplement Guideline on Wetlands

The UNFCCC Subsidiary Body for Scientific and Technological Advice (SBSTA) at its 33rd session held in December 2010 in Cancun, Mexico, invited the IPCC to prepare additional methodological guidance on wetlands, focusing on the rewetting and restoration of peatland. This guidance is so called later as the "2013 Supplement to 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands". In this regards, Assoc Prof Dr Sirintornthep Towprayoon was nominated by the Task Force Bureau of National Greenhouse Gas Inventory, IPCC and was selected as the Coordinating Lead Author of Chapter 6: Constructed Wetland. The objective of the supplement GL is to develop additional national-level inventory methodological guidance, including default



ipcc 2013 Supplement: Wetlands

emission factor values, on wetlands to address the gaps identified in the 2006 IPCC Guidelines. This supplement guideline is to be completed by 2013.

## Bioenergy Water Nexus - UNEP, Oeko-Institut and IEA Bioenergy Task 43



### THE BIOENERGY AND WATER NEXUS



Bioenergy and water are inextricably linked. The availability of freshwater is already a major concern for agriculture, and is expected to be exacerbated in the near future due to the effects of climate change. The promotion of bioenergy may put additional pressure on water resources, if not managed properly. To address these issues, a workshop: "Spotlight on Bioenergy and Water" was jointly organized by the United Nations Environment Programme (UNEP), Oeko-Institut and IEA Bioenergy Task 43 in Paris, France, in July 2010. Experts on water and bioenergy were invited for deliberations which resulted in the publication of a report "The Bioenergy and Water Nexus" in 2011. Prof Shabbir H Gheewala of JGSEE-CEE was one of the lead authors of the report.

*The report can be freely downloaded at: [www.unep.fr/energy/bioenergy](http://www.unep.fr/energy/bioenergy)*

## Contribution to Research Arena

### ADB Funded Project to Help Thailand Become CCS-Ready

Carbon Capture and Storage (CCS) is one of the low-carbon technologies that is widely believed to be critical for mitigating CO<sub>2</sub> emissions from power plants and industrial processes fired by fossil fuels or even biomass, if global warming is to be avoided. However the technology is still very costly, particularly on the capture side, and there remain a number of uncertainties such as: suitable storage sites, long-term integrity of the storage, and other safety concerns. Therefore demonstration projects are needed to prove the technical and economic viability of CCS in various locations. Currently there are several such projects around the world, but almost all of them are located in developed countries. The Asian Development Bank (ADB) has therefore initiated recently a technical assistance project to determine the potential for CCS in Southeast Asia (the Philippines, Thailand, Viet Nam, and Indonesia). In Thailand, the counterpart agency for receiving this technical assistance is the Department of Mineral Fuels (DMF) of the Ministry of Energy. The overall objective of the project is the following: (1) Create an inventory of large power and industrial CO<sub>2</sub> sources; (2) Create an inventory of possible sites for geological storage of captured CO<sub>2</sub> (both onshore and offshore); and (3) Identify a promising demonstration project or projects.

To execute the project, the ADB has hired a team of international consultants to lead the study and has also engaged JGSEE as the local consultant to provide technical support and coordination. The JGSEE team is led by Dr Bundit Fungtammasan, with support from Dr Athikom Bangwiwat, Dr Boonrod Sujjakulnukit, and from KMUTT colleagues: Dr Wimolsiri Pridasawas, Dr Sasitorn Suwannathep, and Dr Jaruwan Chontanawat. Two experts from Chulalongkorn University, Dr Sunthorn Pumjan and Dr Phisan Santitamnont, have also been invited to participate in the study, which should be completed by April 2012.

The result of the study will help policy makers in Thailand and the ADB to determine whether CCS demonstration project or projects should be pursued in Thailand.



## Assignment from the Ministry of Energy on BIMSTEC

In 2011, the Ministry of Energy assigned JGSEE-CEE to study and prepare a strategic plan for energy cooperation in BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation). In this project led by Dr Boonrod Sajjakulnukit, JGSEE has performed investigations relating to regional geopolitics and geo-economics realism and studied the energy situation and future trends of each member country and the whole region. The cooperation strategy has been developed with the main objectives of strengthening the energy security of Thailand and of the whole BIMSTEC region as well as to reinforce the leading role of Thailand, and to set out long-term strategies for energy cooperation in 7 key areas including data and information management, power grid connectivity, energy efficiency and conservation, natural gas pipeline, hydropower, new and other renewable energy sources, energy security and trade.



## Water Footprinting of Food, Feed and Fuel for Water Resource Management



Increasing demand of agriculture with rising population and consequent increased demand of food and more recently, the proliferation of biomass-based energy promises to increase stress on water, an already scarce resource. This is of particular concern to Thailand which has a large agricultural base both for food for local consumption and export as well as for feed and fuel (bio-fuels). Prof Shabbir H Gheewala of JGSEE-CEE along with colleagues from Kasetsart University and the Asian Institute of Technology have recently been awarded a project entitled "Water Footprinting of Food, Feed and Fuel for Effective Water Resource Management" by the Thailand Research Fund to assess the water footprint for evaluating the water stress situation in Thailand especially the areas where food, feed and fuel are in competition. Various water footprinting methods will be tested on the field, water footprint of key agricultural products in Thailand identified and suggestions made for water resource management.

## Contribution to Industry



### Feasibility study of freezing desalination technology

Assoc Prof Dr Navadol Laosiripojana of JGSEE's Energy Division has received a project grant from PTT Public Company Limited to perform a feasibility study on the possible implementation of freezing desalination technology to produce fresh water from seawater. The objectives of the study are to develop a mathematical model to predict the overall efficiency of the technology considered and determine for PTT the technical and economic feasibility of constructing a freezing desalination unit in Rayong province using cooling energy from Liquefied Natural Gas (LNG) to produce fresh water.

## Food Footprint Calculator for Promoting Low Carbon Agri-Food Production

Kasetsart University along with JGSEE-CEE (Prof Shabbir H Gheewala) and the Federation of Thai Industries have initiated a collaborative project entitled "Food footprint calculator to enhance carbon footprint measurement and management in the Thai food industry to promote low-carbon economy for climate change mitigation", so called "FOODprint®". The project is mainly supported by the European Union under the Thailand-EU Cooperation Facility Phase II. The overall objective of the project is to develop a carbon footprint calculator tool to facilitate the calculation of carbon footprint for agricultural and food products. A total of 40 companies (agriculture, livestock, fisheries, and aquaculture) have joined as demonstration projects. It is expected that "FOODprint®" will help ease the carbon footprint calculation in practice and facilitate GHG emissions reduction strategies for large companies as well as SMEs in Thailand. It will thus be an effective tool towards the goal of a low-carbon economy for climate change mitigation.

*Further information can be found at:*  
[www.thaifoodprintcal.sci.ku.ac.th/FOODprint\\_Project.html](http://www.thaifoodprintcal.sci.ku.ac.th/FOODprint_Project.html)



## Contribution to ASEAN COMMUNITY

### SEE Forum, What's New?



SEE Forum members

Sustainable Energy and Environment Forum (SEE Forum) is an academic and S&T forum that brings forward the dialogue on global climate and energy security issues of common concerns in the Asia-Pacific region. It was formed during a side-meeting of the first International SEE Conference co-organized by JGSEE and Kyoto University in 2006. The Forum is chaired by Prof Susumu Yoshikawa of Kyoto University with Assoc Prof Dr Bundit Fungtammasan of JGSEE as Vice Chair. Currently, there are more than 30 institutions in 14 countries (ASEAN 10 plus Japan, India, Korea and China) involved in this forum. In Thailand, JGSEE hosts the SEE Forum Thailand Chapter with academics from Rajamangala University of Technology, Chulalongkorn University, Mahidol University, Burapha University, and the Asian University of Technology, and JGSEE as members. The Thai SEE Forum has been an active participant and contributor to all major SEE Forum activities, such as, organizing SEE Forum meetings and SEE Conference, seeking funding and carrying out joint research, publishing a SEE Forum journal (*Journal of Sustainable Energy and Environment*), and mentoring young SEE Forum researchers (Dr Atit Tippichai) who joined networking meetings held in Indonesia and in Vietnam in 2010, and the JSPS Invitation Program for East Asian Young Researchers in Kyoto, Japan, during 25 September-23 October 2011.

On joint research, a bilateral (Japan-Thailand) collaborative research program on Scenario Planning for Future Energy System based-on Low Carbon Technologies in Thailand has been initiated. The project is funded by Japan Science and Technology Agency (JST) and is led by Prof. Keiichi Ishihara from Kyoto University on the Japan side and by Assoc Prof Dr Bundit Fungtammasan on the Thai side. The scope of research covers 5 areas: scenario modeling (JGSEE), clean coal technology (JGSEE), photovoltaic (organic solar cells) (Rajamangala University of Technology Thanyaburi), second generation biofuels (Chulalongkorn University), and low-carbon rice cultivation (JGSEE).

Under the SEE Forum Young Researcher program, a feasibility study on renewable energy potential in Asia has been granted by the Japan Science and Technology Agency (JST) with a total budget of 3 million yen (November 2011 – March 2012). The study aims to publish a comprehensive country report on renewable energy in Asia which may serve as a background for developing new concept research proposals related to the matching of technical and knowledge needs, particularly among Southeast Asian countries, for enhancing energy security and mitigating climate change.

## MoA between JGSEE-CEE and Sriwijaya University

Recently, JGSEE has developed a Memorandum of Agreement (MoA) with Sriwijaya University, Indonesia, to offer a double Master Degree on Energy/Environmental Technology and Management. This program has been developed to promote academic and research cooperation between the two institutes. The graduates of this program will obtain a Master degree from both institutions. Under this MoA, the students are required to spend one year to perform their studies and research in each institute. Lecturers from both institutes will collaboratively supervise the research work. Currently, there are 8 Indonesian students from Sriwijaya University enrolled in this program.



## Capacity Building for National Greenhouse Gas Inventory in ASEAN

Since the set up in 2008 by Assoc Prof Dr Sirintornthep Towprayoon of a research team including Drs Suthum Patumsawad (KMUTNB), Amnat Chidthaisong (JGSEE), Savitri Garivait (JGSEE) and Awassada Phongphiphat (JGSEE) working on "Thailand Greenhouse Gas Inventory Research Project" (<http://www.jgsee.kmutt.ac.th/snc/>), the group has successfully published a national greenhouse gas inventory (NGHGI) contributing to the Second National Communication (SNC) under the United Nations Framework Convention on Climate Change UNFCCC), as well as initiated a systematic data collection for GHG study in Thailand. With such expertise, capacity building programs have been developed by the team for various organizations both in Thailand and the ASEAN community. In this regard, a program was notably developed for Lao People's Democratic Republic under a United Nations Development Programme (UNDP) support called "International Consultant for NGHGI training and implementation support". As part of this program, a three-day training workshop was held in Vang Vieng, Lao PDR, during 21 – 23 April 2010 which gathered over 30 participants. The program aimed at enhancing understanding of the PCC methodologies and software used for conducting NGHGI. It also aimed at encouraging the sharing of knowledge, skills and experiences acquired during the training among fellow public servants in the government and other organizations, groups and individuals.

Further to this activity, JGSEE organized an "International Consultant for GHG Mitigation" program aiming at enhancing understanding of the methodologies used for mitigation planning and assessment. An extensive three-day workshop on this particular topic was organised by JGSEE in Bangkok during 13 – 15 June 2011. In this event focus was on the use of econometric models and application of the Long-range Energy Alternatives Planning System (LEAP). Currently, similar programs are being developed by the JGSEE team for the Republic of the Union of Myanmar and it is anticipated will be extended to other fellow ASEAN countries in the near future.



Training workshop for Lao PDR

## Sustainable Biomass Utilisation in ASEAN and East Asia Region



ERIA WG experts

The Working Group (WG) on "Sustainability Assessment of Biomass Utilisation in East Asia", sponsored by the Economic Research Institute for ASEAN and East Asia (ERIA), started its activity on sustainability assessment of biomass energy utilisation in the East Asian context since 2007. In the first phase (2007-2008), the WG extracted issues of concern for sustainability assessment of biomass utilisation which played an important role for scientific backup for the adoption of the "Asia Biomass Energy Principles" endorsed in the "Second Meeting of Energy Ministers of East Asia Summit" held in 2008. In the later phases, the WG developed and field-tested a methodology to evaluate sustainability of biomass utilisation based on environmental, economic and social pillars and framed the "Guidelines to Assess Sustainability of Biomass Utilisation in East Asia". Thailand is represented in this effort by Prof Shabbir H Gheewala of JGSEE-CEE.

*The reports from this WG can be found at: <http://www.eria.org/research/>*

## Contribution to Knowledge Platform

### Thailand First Assessment Report on Climate Change

The first Thailand Assessment Report on Climate Change 2011 (1st TARC) was released in October last year (2011). The 1st TARC process was initiated in 2009 by the Thailand Research Fund, coordinated by JGSEE-based unit called the Thailand Research Fund's Research Development and Coordinating Center on Global Warming and Climate Change (THAI-GLOB). Its content includes the synthesis of past knowledge on climate change and variability in Thailand, consisting of three volumes; 1) Physical Science, 2) Impact, vulnerability and adaptation, and 3) mitigation.

Assoc Prof Dr Amnat Chidthaisong was acting as the coordinator of this 1st TARC, and serving as the editor of these three volumes. The Director, Assoc Prof Dr Sirintornthep Towprayoon and the Former Head of Energy Division, Assoc Prof Dr Chunpong Sorapipatana were the Leaders of Working Group III: Greenhouse Gas Mitigation. Several faculty staffs also served as the lead authors for the greenhouse gas mitigation volume, especially those related to energy technology.



The 1st TARC is the first of its kind in Thailand, and JGSEE is proud to be at the center of such important task. It has provided the working platform for Thai scientists, served as the basis for knowledge development on climate change, and identified the needs and future research priority areas related to climate change in Thailand.

*Copies of all three volumes and other climate change related publications are available free of charge at <http://climatechange.jgsee.org>*

# EU-FP7 Coordination Action Project on Solid Waste management in Asia



Solid waste management has become a major environmental problem for many countries in Asia. The situation is worsening particularly in fast developing economies such as Thailand where amount of waste generation is increasing at a fast rate. Basic waste collection services are still lacking particularly in rural and remote locations and a large fraction of the solid waste stream is open dumped or at best landfilled. To address the above issues, institutes from several countries in Asia were involved in a 30 months EU-FP7 funded project on Integrated Sustainable Solid Waste Management (ISSOWAMA) totaling a grant of one million Euros. Thailand was represented by JGSEE with Prof Shabbir H Gheewala as project leader and Dr Sébastien Bonnet as project manager. Other Asian countries represented in the project included: India, Philippines, Indonesia, Bangladesh, China and Cambodia. The main outcome of the project was the development through the establishment of a network platform of an integrated solid waste management performance assessment system enabling to evaluating waste management strategies. As a major output of this project, a report entitled "Simplified guidelines on ISWM in Asian developing countries" was produced targeting all stakeholders of the solid waste management sector.

Further information can be found at: <http://www.issowama.net>

## Food, Fuel and Climate Change – Centre for LCA and Policy Research

This new programme aims at assessing the sustainability implications related to the promotion of biomass for energy in Thailand. It also aims at building capacity of researchers in Thailand in the field of life cycle assessment (LCA). This will be done via recruitment of researchers and PhD students who would gain from the experience in working on projects within the programme and thus result in development of capacity and human resources for LCA in Thailand, particularly in the area of agriculture and bioenergy. The programme is being funded by the National Science and Technology Development Agency (NSTDA) of Thailand and the Thailand Research Fund's Royal Golden Jubilee PhD Program. The outcome of this programme mentored by Prof Shabbir H Gheewala of JGSEE-CEE will result in 5 researchers and 5 PhD graduates competent in LCA with numerous peer reviewed publications.

## Contribution to National Policy

### Thailand's Long-term Energy Efficiency Plan

Inline with international good practices, the Thai government has recently set long-term targets and devised a strategic framework to improve energy efficiency in key economic sectors as part of its efforts to reduce oil-dependence and mitigate CO<sub>2</sub> emissions. The framework is contained in the "20-year Energy Efficiency Development Plan (2011 – 2030)", which was approved by the government in November 2011. Essentially the plan targets to reduce Thailand's energy intensity (energy consumption per GDP) by 25% by the year 2030, with 2010 as the base year. This translates to a reduction of about 23% in final energy consumption from the projected BAU (business-as-usual) case in 2030. To achieve the targets, a combination of regulatory and economic policy instruments will be applied.

JGSEE-CEE made significant contribution to the formulation of this master plan by conducting a study to assess the potentials for energy saving in each economic sector/subsector: industry, transport, residential and commercial buildings, and to provide policy recommendations on key strategies and measures to achieve the targets. The study was commissioned by the Energy Policy and Planning Office (EPPO), Ministry of Energy. It was led by Dr Bundit Fungtammasan, with contributions from a number of colleagues and affiliates, including Drs Suvit Tia (Chemical Engineering), Chumnong Sorapipattana, Boonrod Sajjakulnukit, Surapong Chirarattananon, Athikom Bangwiwat, Nattapong Chayawatto, Atit Tippichai, as well as Varunee Tia and Apichit Therdyothin (School of Energy, Environment and Materials) and Bundit Limmeechokchai (SIIT).

The full plan can be obtained from EPPO's website at: [http://www.eppo.go.th/encon/ee-20yrs/EEDP\\_Eng.pdf](http://www.eppo.go.th/encon/ee-20yrs/EEDP_Eng.pdf)

## Energy Efficiency R&D Master Plan

In 2011 the Thai government launched Thailand's first long-term National Energy Efficiency Master Plan. The plan sets targets for energy saving up to 2030 in 4 key sectors: transport, industry, commercial and residential; and strategies and measures to realize these targets. One of the strategies is to enhance the role of technology and innovation in improving energy efficiency. In this context the Energy Policy and Planning Office (EPPO), Ministry of Energy, recently awarded a grant for JGSEE-CEE to help formulate an energy efficiency R&D master plan for the next 10 years. The aim of the project is to identify research areas and potential topics that may serve to enhance the chances of achieving the energy saving targets set in the long-term energy efficiency master plan. The R&D master plan will cover energy efficiency in all main sectors: energy production (power generation and distribution, oil and gas refining), key industry sectors (chemical, metal, cement, glass, ceramics, paper, food, rubber and oil palm), commercial and residential buildings, and transportation. The plan will recommend strategic, priority programs and RD&D actions for next 3-5 years and 5-10 years. This one-year project (October 2011 - September 2012) is led by Assoc Prof Dr Bundit Fungtammasan, in his capacity as a member of JGSEE-CEE's Energy and Environmental Policy Research Laboratory (EEPL).



*Consultation meeting*

## National Greenhouse Gas Inventory: A contribution to National Communication

JGSEE received in 2008 a grant from the Office of Natural Resources and Environmental Policy and Planning, Ministry of Natural Resources and Environment, to compile the Thailand's National Greenhouse Gas Inventory (NGHGI) for the period 2000 – 2004 according to the Intergovernmental Panel on Climate Change (IPCC) Guidelines, prepare the NGHGI of year 2000 for the Second National Communication (SNC) under the United Nations Framework Convention on Climate Change (UNFCCC), investigate on the necessity and possibility to improve emission factors and activity data as well as the overall database, and to support capacity building of the relevant government units in performing calculations both using principle worksheets and softwares. The project was successfully completed in 2010 with a full report and inventory database published in 2011.

Concurrently, the Thailand Greenhouse Gas Management Organization (Public Organization) (TGO) had appointed JGSEE to research further into this topic under a project named "Development of Database and Model Application for Thailand Emission Inventory". It aimed to investigate for proper data collection methods of information required for NGHGI, suggest appropriate country's emission factors, study on the use of models/software to predict country's GHG emission scenario, and evaluate GHG reduction potentials of each GHG source categories. The project was also successfully completed in 2010.

Both projects were led by Assoc Prof Dr Sirintornthep Towprayoon with contribution from Drs Suthum Patumsawad (KMUTNB), Siriluk Chiarakorn (Kmutt), Chart Chiemchaisri (KU), Amnat Chidthaisong (JGSEE), Savitri Garivait (JGSEE), Nattapong Chayawatto and Awassada Phongphiphat (JGSEE). Results from both projects clearly identified activities that are key sources of GHG emissions – the major contributor being the energy sector with 70%. With the help of softwares such as the UNFCCC 1.3.2 and Long-range Energy Alternatives Planning System (LEAP), scenarios of GHG emissions with different mitigation methods could be produced. Furthermore, with the knowledge and experience gained from those activities, capacity building programs were delivered by the JGSEE team for various government bodies and private organizations. These outputs altogether have enabled to gain a better understanding of the GHG emissions and management options for Thailand. In particular, it could enable responsible authorities to develop appropriate national policies including mitigation and adaptation plans for the country.

Further information available at:

[http://unfccc.int/files/national\\_reports/non-annex\\_i\\_natcom/submitted\\_natcom/application/pdf/snc\\_thailand.pdf](http://unfccc.int/files/national_reports/non-annex_i_natcom/submitted_natcom/application/pdf/snc_thailand.pdf)

## Contribution to Society

### Flood Waste Management in Bangkok: Story of a Successful Model

In December 2011, following the flood event which took place in Thailand, a substantial amount of waste was generated which most local municipalities were not able to cope with. Assoc. Prof. Dr. Sirintornthep Towprayoon and Dr. Komsilp Wangyao were invited by the Thai Health Promotion Foundation in order to provide technical support and knowledge to initiate a flood waste management model to deal with the above issue. This model was implemented at the level of a district in Bangkok that is Pasricharoen. The challenge of this model was to establish a collection system enabling the removal and disposal of the whole waste volume within 7 days. The JGSEE team proposed a flood waste management plan including waste separation at source, recycling of specific waste materials, and efficient collection and removal of the remaining waste fraction. The idea of selecting a site for temporary waste storage was also proposed. With the cooperation from all relevant stakeholders, the scheme was successfully implemented in Pasrichareon becoming therefore an example to follow for other locations.

As a result of this positive outcome, the Bangkok Metropolitan Authority (BMA) decided to adopt the model for implementation in other affected districts in the city. Also, Dr Sirintornthep, Dr Komsilp and Dr Tomonori Ishigaki, a researcher from the National Institute for Environmental Studies in Japan, were invited by the Department of Environment in BMA to propose and develop a concept for flood waste management at the level of the city.



*Flood waste management in Bangkok*

## Awards

### JGSEE Faculty, Affiliates and Students Win Research Excellence Awards

Prof Sumrerng Jugjai, an affiliated faculty of JGSEE at the Department of Mechanical Engineering, King Mongkut's University of Technology Thonburi, recently won the 2011 National Researcher Award in the field of engineering and industrial research from the National Research Council of Thailand (NRCT). Prof Sumrerng research expertise is on the combustion augmentation of fuels by porous media, combustion in internal combustion engines, pulsating combustion, heat transfer enhancement in furnace by porous media, and emission regulation and testing methodology. Furthermore, Assoc Prof Dr Amnat Chidthaisong of JGSEE's Environment Division also received the 2012 Excellent Research Award from the Thailand Research Fund (TRF) for his research project of Thailand Climate Change Information and Impact.



*Prof Sumrerng Jugjai receives NRCT Award*



*Dr Amnat Chidthaisong receives TRF Award*

Ms Carina Paton, JGSEE MPhil student along with her academic advisor Assoc Prof Dr Kasemsan Manomaiphiboon, won the Best Presentation Award at the 2011 International Conference on Alternative Energy in Developing Countries and Emerging Economies (2011AEDCEE), organized jointly by the Thaksin University and the University of Moncton (Canada) and held in Songkla during 25-28 May 2011. The title of the presentation is "Enhanced Urban Wind Mapping for Bangkok City Using 1-km Mesoscale Modeling" in which a series of modern wind energy potential maps at multiple heights over Bangkok were developed using a state-of-science atmospheric model and recent land-related satellite-derived information incorporated.

## Upcoming Events



### Renewable Energy Asia 2012

This year, JGSEE has joined forces with the show organiser, UBM Asia (Thailand), to present a special International Conference on "Renewable Energy Asia 2012: Proving Its Worth Here and Now" a regional conference and exhibition showcasing the increasing significance and viability of renewable energy and energy efficiency in Asia and beyond.

This unique conference will be held on 6 June 2012 and run in conjunction with Renewable Energy Asia/EntechPollutec Asia/Pumps & Valves Asia Exhibition at BITEC. JGSEE has been a strong partner of Renewable Energy Asia/EntechPollutec Asia/Pumps and Valves Asia for the past 8 years. This event is one of the environmental exhibitions of utmost importance and relevance in the ASEAN region, which significance grows annually.

*For more information, please contact Ms Kulakarn Soontornwat at: kulakarn@jgsee.kmutt.ac.th*

### Opening of a Thai-German Summer School in September 2012

JGSEE in collaboration with the University of Applied Sciences - Berlin, the University of Technology - Hamburg-Harburg and the Universities of Applied Sciences in Trier and Stralsund, and with the support of the German Academic Exchange Service (DAAD) will be opening a Thai-German Summer School on Renewable Energies at KMUTT. The summer school will start on 3 September 2012 and the courses last for 3 weeks. The program is focused on topics related to bioenergy, solar energy and integrated renewable energy systems.

*For more information, please contact Ms Kulakarn Soontornwat at: kulakarn@jgsee.kmutt.ac.th*

# Journal of Sustainable Energy & Environment

**The Journal of Sustainable Energy and Environment (JSEE)** is an international peer-reviewed, quarterly journal that publishes theoretical, experimental and applied results in the science, engineering and policy aspects of sustainable energy and environment. The journal aims to provide a multidisciplinary and international forum for the dissemination of the latest high-quality research results, particularly those related to or with implications for the Asian region.

Subjects particularly suitable for JSEE include:

- Bioenergy and biofuels
- Biogas and waste-to-energy
- Wind energy
- Solar energy
- Geothermal
- Marine and hydropower
- Hydrogen and fuel cells
- Nuclear energy
- Power distribution
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ISSN : 1906-4918

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