

JGSEE Newsletter

The Joint Graduate School of Energy and Environment

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From the Director

The graduation ceremony held on 27 August 2002 saw three of JGSEE's first cohort of students being conferred

Master of Philosophy degrees. They were: Ms. Nattanee Worayos and Mr. Watcharapong Tachjapong (Energy Technology, CMU), and Ms. Imsub Subkaew (Environmental Technology, JGSEE). Another student, Ms. Monticha Pechsuth (Environmental Technology, PSU), has also been recently approved by the Board of Trustees for graduation. On behalf of JGSEE and our consortium partners, I would like to congratulate them for their success, which did not come easy because they were the pioneers of the JGSEE program and had to pass through very stringent quality assurance requirements of the School – one of which being the publication of at least one refereed international journal paper.

One important element of JGSEE's mission is to be responsive to industrial needs, be they in the area of education, training, research or innovation. Undoubtedly power generation, which has much to do with energy and environment, is a key industrial sector that JGSEE must be associated with. Adequate electricity supply is central to economic growth and quality of life. Unfortunately, even at the beginning of the 21st century, there are still 2 billion people around the world – out of a total of 6 billion – living with no electricity. And for

those fortunate enough to have access to this precious service, a lot of them would find that it is supplied from a power plant with less-than-desirable energy efficiency and environmental performance. Therefore there is a great need to improve the operations of and the technologies used for power production with a view to reducing both fuel consumption, whether it be fossil based or otherwise, and pollutant formation. There is also a compelling need to increase the contribution of renewable energy sources to power production. Viewed in this respect, it is only logical that JGSEE chooses the Electricity Generating Authority of Thailand (EGAT) as one of its strategic partners to advance JGSEE's missions. Indeed a Memorandum of Understanding between the two institutions was signed recently (details inside this issue), which hopefully will lead to a wide range of co-operative activities.

Lastly, as the Chairman of the Organizing Committee for the Second Regional Conference on Energy Technology towards a Clean Environment (RCETCE), I am pleased to announce that we have been overwhelmed by nearly 200 abstract submissions, many of which being contributions from staff and students of JGSEE and consortium partners. With less than three months to go before the Conference date, I hope our readers will give us full support by registering early.

Bundit Fungtammasan

Welcome

JGSEE welcomes among its rank of faculty Dr. Narumon Withers Harvey, who joined the Environment Division in June 2002. Dr. Narumon has a Ph.D. in the field of radioecology from Imperial College, University of London, England. Her previous degrees are in environmental health science and environmental technology from the Faculty of Public Health, Mahidol



Dr. Narumon
Withers Harvey

University. She brings with her a wide range of experience – as an environmental scientist at the erstwhile Office of National Environmental Board and the Bangkok Metropolitan Administration, and faculty at the Division of Environmental Technology, School of Energy and Materials, KMUTT. Her current field of interest is soil radioecology and soil sciences though she has also started to work in atmospheric science and modeling.

JGSEE is also pleased to welcome several new staff to its current team.



Ms. Chanida
Wongchaglor

Ms. Chanida Wongchaglor, as the Chief Administration and Finance Officer. She has an MBA in International Banking and Finance from Birmingham University, U.K. and has 24 years of work experience as a manager in accounting and administration division in various international companies.



Ms. Wattana
Arjhansiri

Ms. Wattana Arjhansiri has been recruited as the Head of Finance and Account Section. She has a Masters of Accountancy from Chulalongkorn University and brings with her, 20 years of experience in accountancy and administration.



Ms. Piyanuch
Wiwanthanant

Ms. Piyanuch Wiwanthanant has joined as secretary to the JGSEE director. She has a BA in Humanities from the University of the Thai Chamber of Commerce and an MBA from Strayer University, USA. Prior to this, she has worked for two years as a securities analyst and four years as secretary to the managing director and administrator.

Consortium meeting

On the 31st of July 2002, the JGSEE Environment division conducted a consortium meeting in order to brainstorm on the collaborative research development among co-universities. The meeting was attended by 24 delegates from the consortium. One important outcome of the meeting was the establishment of "Waste Minimization and Treatment Research" group. The strategies of this research group are (1) to develop research proposal based on the critical area identified (Area Base Project) that combined expertise from co-universities and emphasized the advantage of the projects, and (2) uniting co-university expertise with common interest to work and strengthen research in similar areas (Research Base Project). Finally, Dr. Shabbir Gheewala from JGSEE and Dr. Suthipong Sthiannopkao from KMUTT were assigned to act as the coordinators of this group.

International collaboration with ICCES

Recently, the JGSEE signed a Memorandum of Understanding for on-going collaboration with the International Center for Climate and Environmental Sciences (ICCES), Institute of Atmospheric Physics, Chinese Academy of Sciences. The Agreement focused on research in

atmospheric and environmental science for understanding and tackling problems affecting Thailand, China and international communities in the region.

The areas of interest will include atmospheric dynamics and climate change, the prediction and control of air pollution dispersion, tropical and Asian monsoon phenomena, and applications of remote sensing for atmospheric and environmental studies.

Collaboration will involve the joint supervision of graduate student research, the exchange of technical experts and scientists, and student exchange.

The results of the research will be published regularly. They will benefit East and South-east Asian peoples through the enhancement of knowledge related to the prediction of the effects of energy production on climate, and the preservation of natural resources and the environment.

Chinese scientist delegation's visit to JGSEE

On 1st August 2002, a delegation comprising four top Chinese and one French scientist, led by Prof. Sixiong Zhao, from the Chinese Academy of Sciences came to visit KMUTT and JGSEE. The Chinese scientist team visited Thailand as the guest of National Research Council of Thailand, under the Sino-Thai joint research collaboration project, supported by the Chinese and Thai governments. This visit of the Chinese delegation was a reciprocal trip to Thailand, after the visit of Thai scientists' delegation to China earlier in June 2002.

During the visit, the Chinese scientist team was welcomed by the KMUTT president and the director of JGSEE. A short presentation of research activities was also given by each member of the team. Activities ranged from those of

the Chinese National Satellite Meteorological Center, presented by Prof. Dong Chaohua, the director of the institute; the climate changes monitoring and Asian monsoon studies presented by Prof. Zhaohui Lin, deputy director of the International Center for Climate and Environmental Sciences (ICCES); and Flood Monitoring and Simulation, presented by Assoc. Prof. Dr. Veronique Prinnet of the Institution of Automation. Faculty of JGSEE's environmental division expressed great interest in modeling and techniques used for air circulation and prediction, since there is a high potential of its application for climate and environmental studies in Thailand. Both parties expected to augment research collaboration between JGSEE and ICCES, as well as other institute members of the Chinese Academic of Sciences in the near future.

The 17th World Congress of Soil Science

The 17th World Congress of Soil Science, held at Bangkok during 14-21 August 2002, brought together the diverse groups of soil scientists around the world to share ideas and join the efforts to meet the challenges of soil science in 21st century. Soil fertility is one of the most popular research themes of soil scientists currently. However, of emerging importance is the theme related to integrating soil science to ecosystem study such as soil and global climate change. Several symposia topics directly relate to our research activity at JGSEE. These include



Ms. Kanittha and Ms. Sansanee
JGSEE Ph.D. Students

the topics such as carbon storage in different soil types and under different cropping systems, and emission of greenhouse gases and fluxes of nutrients in various ecosystems. Several JGSEE staff and students participated in this meeting. Dr. Narumon Withers Harvey served as Thai Co-convenor for Symposium 34: Salinization, water management and policy, and Dr. Amnat Chidthaisong served as Thai Co-convenor for Symposium 50: Sustainable paddy soil ecosystem; a global challenge. Four papers from JGSEE were presented: (1) Stable carbon isotope fractionation during methanogenesis in California paddy field by Amnat Chidthaisong et al., (2) Methane production and population dynamics of acetoclastic methanogens in relation to atmospheric methane in paddy field by Sansanee Chawanakul et al., (3) Regional estimation of nitrogen transport in streamwater within the Chao Phraya river basin by Suparb Paramee et al., and (4) Heavy metal load of soils around Mae Moh lignite mining, Thailand, by Kanittha Wongyai et al.



MoU signed with EGAT

On 5 September 2002, Dr. Krissanapong Kirtikara, the President of KMUTT in his capacity as the Chairman of JGSEE's Board of Trustees signed a memorandum of understanding with the Governor of the Electricity Generating Authority of Thailand (EGAT), Mr. Wittaya Kocharat, in a ceremony attended by more than 60 guests of honour, which included the top management of EGAT, JGSEE's staff and representatives of its consortium partners.

The MoU paves the way for JGSEE and its five consortium partners to collaborate with the nation's largest power utility on a wide range of areas, including human resources development, provision of education, training and technical services, and research and innovation, in response to industry needs in the power generation sector. JGSEE is particularly keen to see that the knowledge and expertise of its staff



active participation from EGAT's hydropower division and staff members of JGSEE, KMUTT and KMITNB.

and that of their colleagues in the consortium are applied in a useful and meaningful way in the context of this MOU. Already, seven of EGAT's employees are currently pursuing their graduate studies at JGSEE and are working on thesis topics that are mostly relevant to their work place. A co-operative project to develop turbines for small run-off-river type hydropower is also being pursued with

Special seminars

Microbial control of methane emission from flooded rice fields

Prof. Ralf Conrad from Germany was invited to give a special seminar at JGSEE on "Microbial control of methane emission from flooded rice fields".

Prof. Conrad, the Director of Max-Planck Institute for Terrestrial Microbiology in Marburg, Germany, is a leading expert in the field of trace gas microbiology and trace gases (CO , H_2 , CH_4 , N_2O) production mechanism in various ecosystems. He is also the Executive Editor of the Journal: FEMS Microbiology Ecology, published by Elsevier Science. At JGSEE, he has collaboration with Dr. Amnat on the project to characterize methane oxidation capacity in Thailand.



Clean combustion

JGSEE's Combustion and Emissions Control group organized a special seminar on "Clean combustion as a real challenge in France – designing research programs and defining focused areas: the specific case of coal combustion" by Dr. Pierre Joulain on 4 September 2002 at the President's building, KMUTT. Since 1995, Dr. Joulain has been the Deputy Director of the Laboratory of Combustion and Detonation, French National Scientific Research Agency (CNRS). His research work covers combustion of solid fuels and solid waste, solid propellants, combustion of gaseous fuels, turbulent and micro-gravity combustion, and fire dynamics and fire safety.



The lecture addressed the following main issues: (1) Why it is important to study combustion phenomena in order to improve combustion efficiency and reduce pollutant formation, (2) How to implement a research network at the laboratory, national and international level, and (3) How can state agencies provide support and how to run large power generation facilities with high efficiency. The lecture was attended by faculty and students from the consortium, as well as scientist and engineers from EGAT.

Life Cycle Assessment (LCA) of Bioethanol

Dr. David Minns, Special Advisor to Sustainable Development Technology, National Research Council Canada, presented a seminar on LCA of bioethanol. Dr. Minns started his presentation with the concept of sustainable development and elaborated on various sustainability indicators. Sustainability performance targets for technology proposed by different researchers to preserve quality of life were discussed. This led to the concepts of ecoefficiency, environmental vulnerability indices and sustainable capital. A case study on bioethanol using LCA as the assessment tool was also presented. This seminar was a part of the course on Waste Minimization at JGSEE.

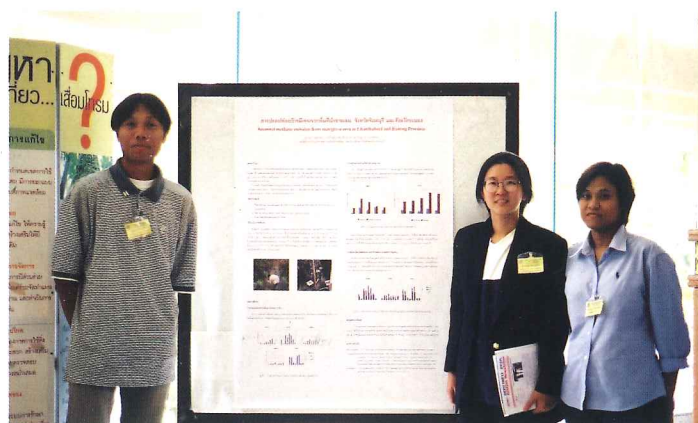


Climate change issues – effects to the environment

Prof. Harald R. Bolhar-Nordenkamp from the Institute of Ecology and Conservation Biology, University of Vienna, Austria, presented a series of lectures as part of the course on Environmental Chemistry and Toxicology at JGSEE. The lectures covered the following topics: (1) Carbon credits from agriculture and forestry (2) Synergism of stress factors (3) Ozone: friend and foe (4) Physiology of plants in a changing environment with relation to CO₂ and (5) Physiology of plants in a changing environment with relation to UV-B.



Seminar on the 12th National Mangrove Ecosystem "Knowledge application to community"



Dr. Amnat, Dr.Suwannee and Ms. Sukanda

JGSEE student poster presentations

International Symposium on Composting and Compost Utilization 2002

Ms. Benjarata Jolunun (Ph.D. candidate – Environment division) presented a poster entitled "Interaction between the ratio of lignocellulosic bulking agent and aeration rate in the vegetative and fruit waste composting: A kinetic approach" at the above symposium held at Columbus, Ohio, USA, during May 6-8, 2002. Her thesis supervisor is Assoc. Prof. Sirintornthep Towprayoon.

Ms. Sukanda Lekphet (JGSEE-M.Phil student) presented the poster entitled "Seasonal methane emission from mangrove area in Thailand" at the above seminar organized by the National Research Council, Thailand, during 28-31 August 2002 at Nakhon Srithammarat. This is part of her thesis work entitled "Seasonal methane emission from mangrove area in Thailand" and her supervisor is Dr. Suwannee Adsavakulchai. The study aims to quantify the emission and to understand environmental factors influencing emissions from mangrove ecosystem in Thailand. The information obtained from this study would be applied to serve community towards sustainable development as well as reducing the adverse effects to the environment from human activities.

Position opening

JGSEE is currently seeking highly qualified persons to join the School as Professor, Associate Professor, Assistant Professor, or Lecturers in the fields that are compatible with the School's research interests (<http://www.jgsee.kmutt.ac.th/about.htm>).

The responsibilities include teaching graduate courses and thesis supervision, conducting research and assisting in laboratory facility development and performing other tasks normally expected of a university academic.

The applicant can be of any nationality and should hold a PhD degree holder in relevant fields, have some teaching experience with a strong background in research and have ability to coordinate academic activities with fellow academics within the consortium. He/she must be excellent in spoken and written English

Regional Conference on Energy Technology towards a Clean Environment (RCETCE)

RCETCE is organized by the Joint Graduate School of Energy and Environment (JGSEE) every two years. The 2nd RCETCE will be held in Phuket, Thailand on 12-14 February 2003. It will focus on "Clean Energy Development: Challenges and Solutions" with a special highlight on the environmental and social impacts of technologies used for power generation.

The Organising Committee is pleased to announce that over 200 abstracts have been received. It is therefore strongly advised that intending participants register well in advance to ensure a seat. The deadline for submission of manuscripts is 15 December 2002. Further details pertaining to the Conference can be found at <http://www.jgsee.kmutt.ac.th/rcetce.html>

JGSEE's list of publications

JGSEE

Gheewala, S.H., and Nielsen, P.H. **Central and Individual Air-Conditioning Systems – Comparison of Environmental Impacts and Resource Consumption in a Life Cycle Perspective**. International Journal of Sustainable Development and World Ecology. (accepted for publication).

Sombatsompop, N., and Kumnuantip, C. (2002). **Rheology, Cure Characteristics, Physical and Mechanical Properties of Tire-Tread Reclaimed Rubber/NR Compounds**. Journal of Applied Polymer Science (accepted for publication).

KMUTT – School of Energy and Materials

Sombatsompop, N., and O-Charoen, N. (2002). **Experimental Studies on Extrudate Swell Behaviour of PS and LLDPE Melts in Single and Dual Capillary Dies**. Journal of Applied Polymer Science (accepted for publication).

KMUTT – Faculty of Engineering

Wongwises, S., Kaewon, J. Wongchang, T., and Wang, C.C. (2002). **A visual study of two phase flow patterns of HFC-134a and lubricating oil mixtures**. Heat Transfer Engineering. 23(4):13-22.

Wongwises, S., and Suchatawut, M. (2002). **A simulation for predicting the refrigerant flow characteristics including the metastable region in adiabatic capillary tubes**. International Journal of Energy Research. (in press).

Sinpi boon, J., and Wongwises, S. **A homogeneous flow model for non-adiabatic capillary tubes**. Applied Thermal Engineering. (accepted for publication).

Consortium members are strongly encouraged to participate in the forthcoming RCETCE



12-14

FEBRUARY

2003

NOVOTEL

PHUKET

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The Second Regional Conference on Energy Technology towards a Clean Environment

Clean Energy Development: Challenges & Solutions

Deadline for full paper submission : 15 December 2002



Special panel on 14 February 2003

Theme: Environmental and social impacts of technologies used for power generation

Topics

1. Advanced combustion technologies
2. Fuel resources and characterization
3. Emission free energy technologies
4. Application of clean energy technologies to power generation
5. Environmental monitoring and modeling
6. Energy policy and planning
7. Environmental and risk management
8. Environmental policy and planning
9. Environmental pollution problems and other topics related to Energy and Environment
10. Anticipating the environmental effects of energy technologies used for power generation

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