

JGSEE Newsletter

The Joint Graduate School of Energy and Environment

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KMUTT



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From the Director

The last few months have been an extremely hectic period for JGSEE. A flurry of activities were undertaken, ranging from strategic planning, to getting ready for the second Annual Technical Evaluation on JGSEE's progress by the MUA-commissioned Technical Expert Group (TEG), holding the Second Regional Conference on Energy Technology towards a Clean Environment (RCETCE), and welcoming and working with a number of visiting professors – with special lectures organized for each at different places. Although these tasks might have been energy and time consuming, the outcomes are rewarding, thanks to the dedication of our staff members and the many contributions of our affiliated staff from the consortium partners.

The efforts to improve the operation of JGSEE, for example, won praise from the TEG, who recommends in its evaluation report that the Thai Government provide financial support for the second phase of JGSEE. The turn-out for the 2nd RCETCE, which saw as many as 38 papers presented by the staff and students of JGSEE and its partners, was also heartening, with the 200 or so participants giving overwhelming approval to the quality of the Conference. I certainly hope that such a scenario can be repeated with perhaps even greater vigor in the 3rd RCETCE, which will be held in less than two years from now.

Still on the subject of international conferences, I am most pleased to note that two of JGSEE's students from the

Environment Division brought fame to JGSEE recently by winning the Young Scientist Award during the International Symposium on Climate Change (ISCC) held in Beijing, China, 29 March – 3 April, 2003. The two were among the 8 participants who were presented with the award on the basis of both the quality of the paper and presentation and their age (under 35). A total of 400 persons attended the Symposium. Following are details of the awards:

- Ms Kruamas Smakgahn, PhD candidate under the supervision of Assoc. Prof. Dr. Sirintornthep Towprayoon, paper entitled "Database development and estimating of methane emission from rice field in Thailand using DNDC Model", won the outstanding paper category out of 174 papers.

- Ms Watita Ariyaphanpitak, PhD candidate under the supervision Dr. Amnat Chidthaisong, paper entitled "Effects of elevated troposphere ozone concentration on yield and physiological performance in Thai Rice Cultivar Chainat I (*Oryza sativa* L.)", won the outstanding poster category out of 158 contenders.

Congratulations and hope that other students will follow this fine example!

Please note that following a recent resolution of the Board of Trustees, PhD candidates may ask for additional thesis grant if needed, but no more than 30,000 Baht, to finance their travel for the purpose of presenting their research findings at international conferences.

Congratulations

JGSEE congratulates **Dr. Suwannee Adsavakulchai**, a core-staff, on her promotion to the position of Assistant Professor. Her main contribution of knowledge is in the field of applications of remote sensing and GIS to the study of environmental problems, particularly those with ecological implications.



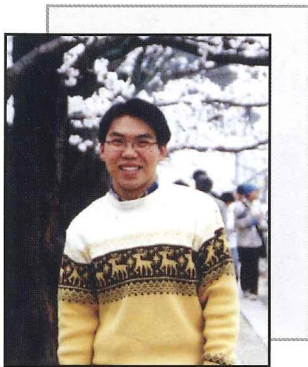
Welcome

JGSEE is pleased to welcome in its rank of faculty:



Dr. Athikom Bangviwat who has joined JGSEE since the middle of February 2003, as a faculty. Dr. Athikom is a B.Eng and M.Eng (Chula) and a Ph.D. (U. of Houston) in Mechanical Engineering. He also obtained degrees in economics: bachelors from Ramkhamhaeng and

masters from Thammasat. His background is in Mechanical Engineering and Economics. He brings with him 14 years of experience in the energy industry, oil refinery and electricity generation, where he was involved in inspection, maintenance and project management. Dr. Athikom hopes to be able to establish research and studies in the area of Energy Policy Analysis and Design, which is one of the focuses of JGSEE. He will coordinate the energy policy studies group within the consortium. He will also assist the Director of JGSEE in a number of administrative functions, particularly external affairs, which include industrial liaison.



Dr. Nakorn Worasuwanarak who has joined JGSEE since April 2003. He has a bachelors degree in Chemical Engineering from Chulalongkorn University (First class honours with Gold Medal). He did his Master and Doctoral degrees in Chemical Engineering at Kyoto University on a Monbusho scholarship. His areas of expertise are coal oxidation and carbonization. Dr. Nakorn has a solid background in the handling of advanced instrumentation for fuel and environmental sample analyses. He therefore will be involved in teaching and research in the area of solid fuel characterization and evaluation, which will serve to complement research activities of consortium members within the Combustion and Emission Control Group.



JGSEE also welcomes **Ms. Nopparath Pookaew** as a member of the Academic Services Section. She has a Master of Education from Srinakharinwirot University and has worked before as secretary and administrative officer at Rajabhat Institute (Suansunandha Campus) at the faculty of Humanities and Social Sciences.

Second Annual Review by TEG

The Loan Project Office (LPO) of the Ministry of University Affairs, which oversees and facilitates the operation of the seven Centers of Excellence (CoE) under the MUA-ADB Loan Project on Higher Education Development, recently commissioned Technical Expert Groups (TEGs) to conduct the Second Annual Technical Evaluation on the progress of the CoE's. The TEG for JGSEE was led by Dr. Wison Luangdilok, a specialist on Nuclear Safety at Fauske & Associates Inc – a consulting arm of Westinghouse, with Dr. Methi Wecharatana, Professor of Civil and Environmental Engineering at New Jersey Institute of Technology, as a member. The evaluation was conducted over the period from 20 – 27 January 2003, with visits by the TEG to JGSEE, two of its partners (CMU and PSU) and selected laboratories at KMUTT. Visits to two other partners, i.e., KMITNB and SIIT were made during the first evaluation.

In its report, which was made available to JGSEE recently, the TEG noted

several major improvements implemented by the School since the first evaluation in July 2001. Indeed the TEG was of the impression that "JGSEE has remarkably turned itself from a traditional Thai graduate school into a transitional configuration pointing toward a center of excellence.....". The TEG was particularly impressed by actions taken by the management of JGSEE in response to TEG's earlier recommendation for strategic planning. The TEG noted however that roadmaps and timetable for actions still needed to be worked out, particularly on the aspects of research and long-term sustainability of the School and the consortium. One of the key observations made by the TEG was that the creation of a center of excellence of this nature could not normally be accomplished in 5 years, rather, 8-10 years being more realistic. The TEG thus recommends that the Thai government provide further funding support to the project in its second phase.

Strategic Planning

In response to one of the key recommendations of the first Annual Technical Evaluation on the progress of JGSEE by the Technical Expert Group (TEG) commissioned by the Loan Project Office, Ministry of University Affairs, a strategic plan to improve the current operation and to set directions for future development of JGSEE has recently been formulated. A series of interviews and seminars involving stakeholders and experts were held to solicit their views. This culminated in a workshop held over a weekend retreat (20-22 December 2003) at Phu Tawan Resort, Nakorn Ratchasima, which was attended by JGSEE's management and staff, representatives of consortium partners, members of the Professorial Board and the Board of Trustees, the Energy Policy and Planning Office (EPPO) of the Ministry of Energy and the Federation of Thai Industries (FTI).

The JGSEE management would like to put on record its deep appreciation to all those who were involved, particularly Dr. Pichet Durongkaveroj and his team at the Policy Innovation Center, KMUTT, and Prof. Naksitte Coovattanachai, advisor to JGSEE, who guided and facilitated through out this strategic planning process. On the same occasion, the administrative staff of JGSEE, led by the Chief Administrative and Finance Officer, Ms. Chanida Wongchamlor, also conducted an in house workshop on team-building to enhance their operations.

JGSEE's strategy addresses five key issues:

- Research: concentrating on identifying research focus areas and building of technology roadmaps
- Management: focusing on financing and sustainability of the program as well as the governance and managerial aspects of JGSEE
- Consortium: devising ways and means to strengthen the consortium partnership
- Faculty and students: finding ways to improve the recruitment and development of faculty/staff and to attract high quality students to the program
- External relations: covering relationships with government, industry, international organizations, and public awareness on JGSEE's programs on general energy and environmental issues

One of the key outcomes that emerged from this strategic planning exercise is the unanimous recognition of the important role of energy policy and economics in our national development. JGSEE's strategy thus calls for urgent arrangement in consolidating and recruiting experts in these fields so that formation of the policy program can be quickly realized. Other focus areas of research identified include: energy efficiency (combustion and emission control); bioenergy (industrial biogas, biofuel and biomass); small hydro; grid-connected photovoltaic (PV) systems; fuel cells and hydrogen technologies; energy-related environmental pollution; atmospheric modeling; and global and regional environment (science and policy on climate change).



*Dr. Naksitte Coovattanachai,
a keynote speaker*



*JGSEE staff express their
"vision" of the school*



Second RCETCE

JGSEE in collaboration with the five consortium partners organized the Second Regional Conference on Energy Technology towards a Clean Environment during 12-14 February 2003. It was attended by about 200 participants with 44 international participants from 14 countries. The opening ceremony was presided over by the Director-General of Mineral Fuels Department, on behalf of H.E Pongthep Thepkarnchana, the then Minister of Energy, who could not attend in person as initially planned due to the change of ministerial portfolio a few days before the conference.

A total of 122 papers (102 oral and 19 posters) were presented, their subjects being distributed across 9 topical areas as shown in Figure 1. JGSEE's students and staff and affiliated staff from consortium partners were well represented in the Conference, with 25 contributions from within JGSEE center and 13 from the partners, which account for about 30% of all the papers presented (Figure 2). In addition, non-JGSEE staff members and students of the 5 partner universities also contributed 32 papers. Keynote lectures were delivered by Professors Prida Wibulswas of Sirindhorn International Institute of Technology, Pierre Joulain of ENSMA-CNRS Laboratoire de Combustion et de Detonique, France, and Ashwani Gupta of the University of Maryland, USA. A special panel on "the Social and Environmental Impact of Technologies

used for Power Generation", featuring Professor Naksitte Coovattanachai (moderator), Professor Yoshitaka Nitta (Japan), Mr. Niclas Svenningsen (UNEP), and Dr. Krissanapong Kirtikara (KMUTT), was held as part of the Conference program.



Left to Right : Prof. Nitta, Mr. Niclas, Prof. Naksitte, and Dr. Krissanapong on panel discussion



Award presentation for best posters



Excursion to Phuket Municipal Solid Waste Incineration plant

More than 90% of the respondents to the post conference opinion survey ranked the organization and content of the Conference as being good to excellent.

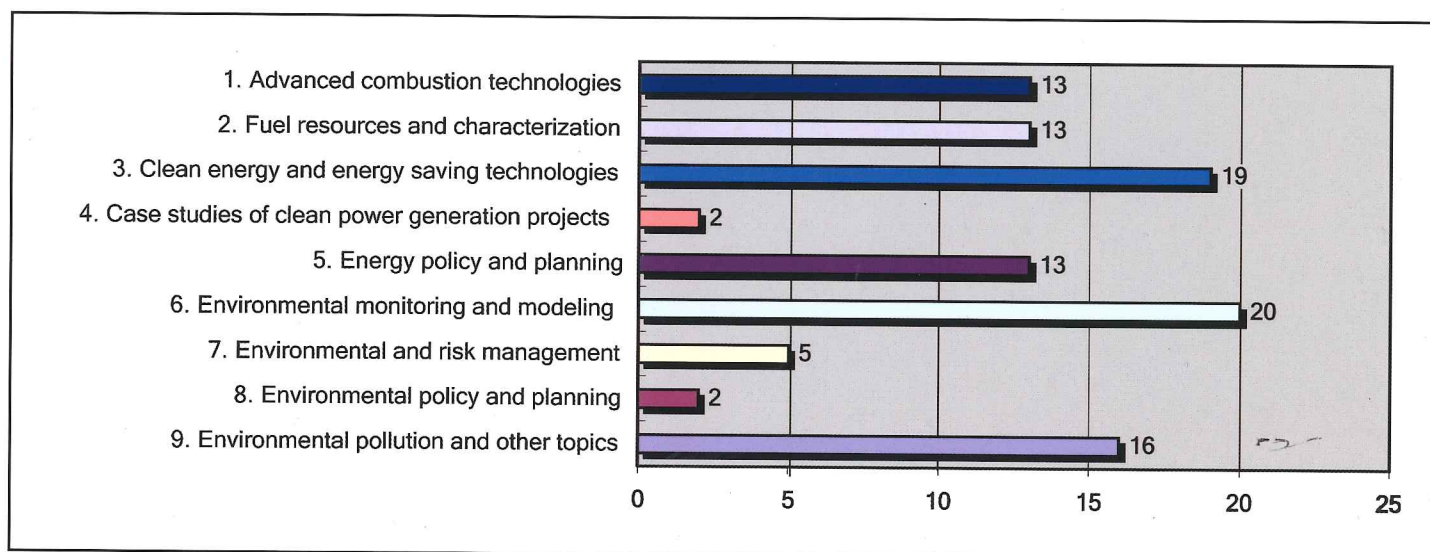


Figure 1. Number of papers presented at the 2nd RCETCE distributed according to topic

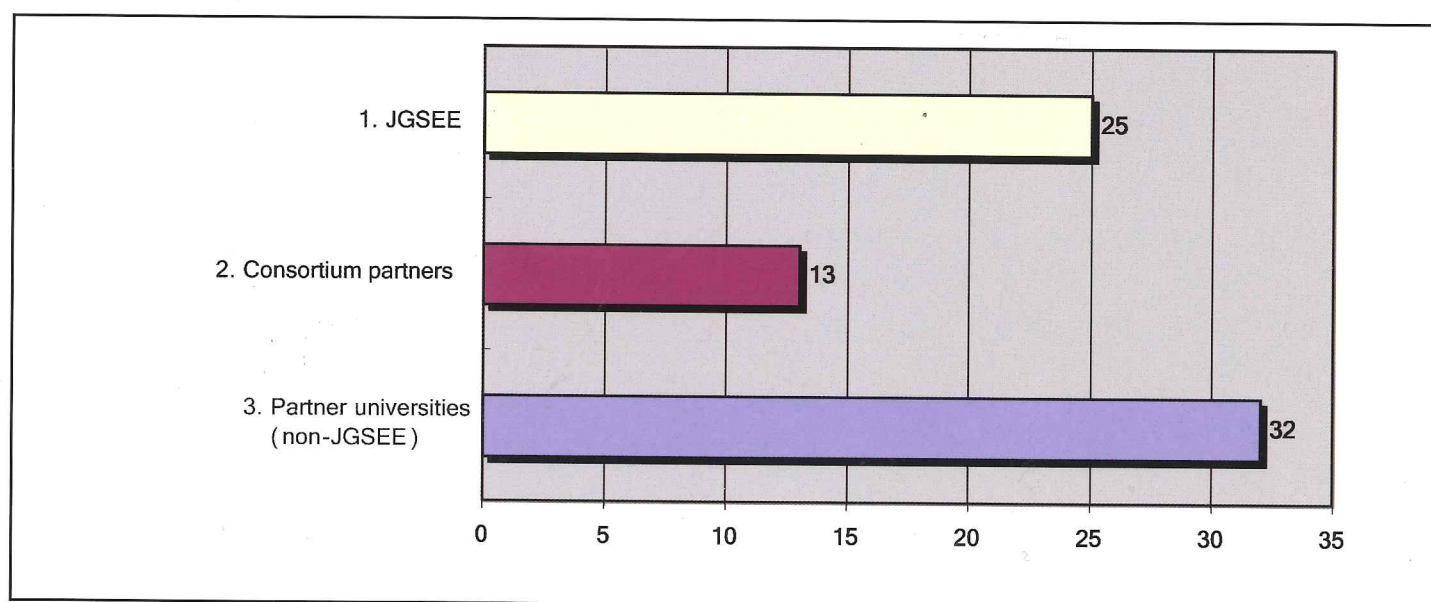


Figure 2. Number of papers presented at the 2nd RCETCE by students and staff of JGSEE and consortium partners

Visiting Professors to JGSEE



Name	Dr. Pierre Joulain, Deputy Director, Laboratoire de Combustion et de Detonique CNRS ENSMA, Poitiers, France
Expertise	Combustion, heat transfer, fire safety
Tasks	Assist JGSEE's efforts in identifying research focus in the power production sector and in promoting collaborative research among consortium partners, advise staff and students on research.
Special Events	<ul style="list-style-type: none"> - Delivered lectures, held discussion on research at KMITNB, CMU, PSU and JGSEE - Delivered keynote lecture at RCETCE - Authored a report on the framework for JGSEE's combustion research



Name	Prof. Dr. – Ing. Christoph Menke, Professor of Energy and Environmental Engineering, University of Applied Science Trier, Germany
Expertise	Renewable energy technologies, energy efficiency, energy and environmental policy, and international consulting
Tasks	Curriculum review and promotion of energy policy and management studies.
Special Events	<ul style="list-style-type: none"> - Lectured on "Electric Power Utilities Efficiency Improvement: Technical and Management Issue" at EGAT - Presented a paper at RCETCE - Authored a report on JGSEE's curriculum review and recommendations for improvement



Name	Prof. Dr. Aswani Gupta, Director of Combustion Laboratory and Professor of Mechanical Engineering, University of Maryland
Expertise	Advance Combustion, thermal treatment of waste
Tasks	Provide advice on research to the Combustion and Emission Control Group
Special Events	<ul style="list-style-type: none"> - Delivered keynote lecture on "Clean Energy from Waste Fuels Using High Temperature Air Combustion Technique" at RCETCE - Lectured on "Clean energy Conversion from Waste Fuels Using High Temperature Air Combustion Technique" at KMITNB - Visited KMUTT's Combustion Research Laboratory at Dept. of Mechanical Engineering



Name	Dr. Roger Gadiou, Senior Research Scientist in the Laboratory of Risk and Environment, University of Mulhouse, France
Expertise	Solid Fuels Combustion and Characterization, Fluidized bed combustion
Tasks	Provide advice to JGSEE management on the development acquisition of laboratory facilities for fuels and emission characterization from combustion source
Special Events	<ul style="list-style-type: none"> - Delivered lecture on "High Pressure Coal Combustion" at RCETCE - Delivered lecture on "How Fundamental Laboratory-scale Experiments can Help Improve Large Scale Operations: the Case of Solid Fuel Combustion" to JGSEE's staff and EGAT



Name	Dr. Zhang Meighen, Professor at the Institute of Atmospheric Physics, Chinese Academy of Science
Expertise	Atmospheric boundary layer physics, atmospheric chemistry and mathematical modeling of air pollution
Tasks	<ul style="list-style-type: none"> - Teach a course at JGSEE entitled "Mathematical Modeling of Air Pollution and its Applications" - Co-supervisor for JGSEE students - Advise staff and students on research
Special Events	<ul style="list-style-type: none"> - Examined a JGSEE student's thesis progress - Delivered a special lecture on "A Coupled Chemical Transport Model and its Application relating to TRACE – P and ACE – Asia campaigns" - Prepared delivery of a new course on Air Pollution Modeling.

New Affiliated Faculty Members

The following faculty members from the consortium have recently joined JGSEE as affiliated staff:

Faculty	University	Research field / topics
Assoc. Prof. Dr. Supaporn Chuaprasert	KMUTT	Food, bioprocess and process systems engineering
Asst. Prof. Dr. Chaityuth Chinnarasri	KMUTT	Modelling of dam erosion, flood forecasting
Asst. Prof. Dr. Tawatchai Laosirihongthong	KMUTT	Travel demand modelling and forecasting, traffic impact assessment
Dr. Bunyaphat Suphanit	KMUTT	Process design and synthesis especially the design of energy efficient complex distillation and heat recovery system, modelling and simulation of complex distillation column
Dr. Suthipong Sthiannopkao	KMUTT	Water and wastewater treatment, waste management and utilisation
Dr. Suwassa Pongamphai	KMUTT	Fluidisation, chemical system engineering
Asst. Prof. Dr. Praphon Kemmadamrong	CMU	Industrial wastewater treatment, water and wastewater engineering design, water quality management
Dr. Chantraporn Phalakornkule	KMITNB	Biochemical engineering, biogas and bioethanol production
Assoc. Prof. Gampon Prateepchaikul	PSU	Heat pump, drying, energy conversion, biodiesel production and utilization
Asst. Prof. Dr. Perapong Tekasakul	PSU	Fluid dynamics, aerosol mechanics
Asst. Prof. Dr. Charun Bunyakan	PSU	Chemical engineering, transport and treatment of Volatile Organic Compounds (VOCs) in waste air
Asst. Prof. Dr. Athula Dayanarth Rajapakse	SIIT-TU	Electric power quality, neural network, fuzzy logic applications, photovoltaic systems, building energy analysis and simulation
Asst. Prof. Dr. Jovitha Jerome	SIIT-TU	Computer applications to power systems planning, operation and control, power system option under deregulated competitive market

List of Publications:

To date, the accumulated number of refereed international Journal publications of the JGSEE and consortium partners is 39. The following is a list of some of the most recent ones.

KMUTT:

Wongwises, S., and Suchatawut, M. (2003). A simulation for predicting the refrigerant flow characteristics including the metastable region in adiabatic capillary tubes, *International Journal of Energy Research*, 27, 2, pp. 93-109.

Kongtragool, B., Wongwises, S. A Review of Solar Powered Stirling Engine and Low Temperature Differential Stirling Engines, *Renewable and Sustainable Energy Reviews* (in press).

Wongsangam, J., Nualboonrueng, T., Wongwises, S. Performance of smooth and micro-fin tubes in high mass flux region of R-134a during evaporation, *Heat and Mass Transfer* (in press)

Kongtragool, B., and Wongwises, S. (2003). A review of solar-powered Stirling engines and low temperature differential Stirling engines, *Renewable and Sustainable Energy Reviews*, 7, pp. 131-154

JGSEE:

Wongwises, P., and Archevarahuprok, B. (2003). A prediction of the Tropical Storm Track in the Gulf of Thailand, *Chinese Journal of Atmospheric Sciences*, 27, 1, pp. 89-100.

JGSEE is an educational and research consortium involving King Mongkut's University of Technology Thonburi, King Mongkut's Institute of Technology North Bangkok, Chiang Mai University, Prince of Songkhla University and Sirinthorn International Institute of Technology - Thammasat University. It is funded by the Thai Government under an ADB Loan Program on Higher Education Development with complementary support from the Energy Policy and Planning Office, Ministry of Energy.

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