

Environment Division

No.	Potential Thesis topic	Short description of thesis	Research Lab	Level of degree	Qualification of student	Research project support	special requirement	Remark/Co advisor
<u>Name of Advisor : Asscoc. Prof .Dr. Kasemsan Manomaipiboon</u>								
1	Modeling and Analysis of Regional Climate	Assess and investigate how regional climate has changed in the past and would change in the future	TCSM	PhD and MS	Engineering or Science	EGAT, NSTDA	Ability to adapt to computational environment	
2	Modeling and Analysis of Regional Air Quality	Assess and investigate how regional quality is impacted due to different natural and anthropogenic factors	TCSM	PhD and MS	Engineering or Science	EGAT, NSTDA	Ability to adapt to computational environment	
<u>Name of Advisor : Assoc. Prof. Dr. Sirintornthep Towprayoon</u>								
3	Application of Biochar on low land crop	Investigation of relationship of biochar and compst and fertilizer when implement in low land agricultural crop (rice) . Various types of Biochar will be applied into the soil. GHG emission and soil carbon balance will be mornitor. Soil carbonstock chnage will be estimatte using DNDC model.	AGAR	PhD	Master of Science/Engineer on Environmental science, Environmental Engineer, Agriculture, Soil science and relevance background upon interview	IRM and project with CIRAD	Ability to work in the field	
4	Potential of energy production from landfill mining	Estimate RDF production from old landfill mining in Thialand and analyze its energy potential , economic and social cost .	AGAR/EEP	Master on Envi Tech or T and M	BSc/B En on Science, ,Technology , Environmental Engineering, Chemical Engineering	Not yet but can be adjusted form MBT project	Experience/keen on solid waste disposal is appreciate.	Co-Advisor: Dr. Kompsil Wangyao

I. Development of small/medium scale biomass gasification for heat and power production

Research theme	Topic	Contact person
Biomass pretreatment	<ul style="list-style-type: none"> • Production of low cost activated carbon • Torrefaction of mixed agricultural waste • Effect of pyrolysis conditions for biochar quality 	Dr.Patric Rousset patrick.rousset@cirad.fr
	<ul style="list-style-type: none"> • Design and optimisation for biomass torrefaction process • Study of biomass torrefaction under pressure 	Assoc. Prof. Dr. Nakorn Worasuwanarak nakorn@jgsee.kmutt.ac.th
Gasification process	<ul style="list-style-type: none"> • Comparing gasification of torrefied and raw biomass: the effect of minerals 	Dr.Patric Rousset patrick.rousset@cirad.fr
	<ul style="list-style-type: none"> • Development of pilot-scale tar removal process: design and optimisation testing • Investigating co-combustion of coal and biomass in a lab-scale test rig simulating conditions in CFB boiler • Performance testing of newly developed tar removal process under different conditions 	Assoc. Prof. Dr. Suneerat Fukuda suneerat@jgsee.kmutt.ac.th

I. Development of small/medium scale biomass gasification for heat and power production

Research theme	Topic	Contact person
End-use utilization i.e. of product gas, treated biomass	<ul style="list-style-type: none"> • Development of syngas fuelled engine for small scale biomass gasifier • Improving combustion characteristics of syngas under engine conditions 	Asst.Prof.Dr.Yossapong Laonual yossapong.lao@kmutt.ac.th
Policy	<ul style="list-style-type: none"> • A Study of Impact of External cost, Wheeling charges, and Transmission Losses on Electricity Cost 	patrick.rousset@cirad.fr
	<ul style="list-style-type: none"> • Economic model to compare centralized and decentralized biomass pellet production 	Dr.Patric Rousset patrick.rousset@cirad.fr
	<ul style="list-style-type: none"> • Assessment of biomass value chain for sustainable utilization in Thailand: proposed alternative development scenarios (collaboration with KIT & STIPI) • Techno-economic assessment of biomass gasification for heat application in ceramic industry: a selected case study 	Assoc. Prof. Dr. Suneerat Fukuda suneerat@jgsee.kmutt.ac.th

II. Development of high-rate biogas technology and utilization

Research theme	Topic	Contact person
High-rate biogas technology	<ul style="list-style-type: none"> Dry fermentation 	Assoc. Prof. Dr. Sirintornthep Towprayoon sirin@jgsee.kmutt.ac.th
	<ul style="list-style-type: none"> การเพิ่มประสิทธิภาพระบบบำบัดแบบไม่ใช้อากาศสำหรับน้ำเสียจากกระบวนการผลิตน้ำยางชั้นด้วย Zero valent iron 	Assoc Prof. Dr. Chantaraporn Phalakornkule cphalak21@yahoo.com Dr.Warinthorn Songkasiri warinthorn@biotec.or.th
	<ul style="list-style-type: none"> การพัฒนากระบวนการบำบัดแบบไม่ใช้อากาศสำหรับน้ำเสียจากกระบวนการผลิตน้ำยางชั้น (Sulthane) 	Pornpan Panichnumsin opormsin@kmutt.ac.th
	<ul style="list-style-type: none"> การศึกษากลุ่มเชื้อจุลินทรีย์ในการบำบัดน้ำเสียจากปาล์ม ที่มีผลต่อการกำจัด S กับ N พร้อมกัน 	Assoc.Prof.Dr.Pawinee Chaiprasert Pawinee.cha@kmutt.ac.th
	<ul style="list-style-type: none"> Improvement of pretreatment and dry fermentation of Napier grass for biogas production Energy efficient wastewater treatment using anaerobic membrane bioreactor 	Sumate

II. Development of high-rate biogas technology and utilization

Research theme	Topic	Contact person
High-rate biogas technology (Cont'd)	<ul style="list-style-type: none"> Cultivation of microalgae for methane purification and biodiesel production 	Benjamas/Sumate
	<ul style="list-style-type: none"> Optimization of oxidation state to enhance biogas production of rubber industry wastewater 	Sumate/Piyarat
	<ul style="list-style-type: none"> Production of long chain fatty acids in anaerobic environment 	Sumate/Duangporn
	<ul style="list-style-type: none"> Improvement of element recovery and anaerobic digestibility of oil palm empty fruit bunch for biogas production 	Sumate/Boonya
	<ul style="list-style-type: none"> Effect of antibiotics on mechanisms of anaerobic digestion 	Sumate/Piyarat
	<ul style="list-style-type: none"> Enhancing biogas production from palm oil mill effluent by disturbing phenolic compound inhibition 	Sumate/Oramas

II. Development of high-rate biogas technology and utilization

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High-rate biogas technology (Cont'd)	<ul style="list-style-type: none"> Hydrogen production from microalgal cells 	Sumate/Benjamas
	<ul style="list-style-type: none"> Pretreatment of Para wood sawdust to enhance hydrolysis and anaerobic digestibility for biogas production 	Boonya/Sumate
Advanced Anaerobic Microbiological Center	<ul style="list-style-type: none"> Effective Anaerobic Granulation 	Pawinee/Benjaphon
	<ul style="list-style-type: none"> จุลินทรีย์ anaerobic microorganisms 	Pawinee/Thanaporn/ Benjaphon
Biogas upgrade and utilization technology	<ul style="list-style-type: none"> Pressure Swing Adsorption Technology for Biogas Upgrade 	Assoc Prof. Dr. Chantaraporn Phalakornkule cphalak21@yahoo.com
	<ul style="list-style-type: none"> H₂S bio-scrubber 	Annop

II. Development of high-rate biogas technology and utilization

Research theme	Topic	Contact person
Policy	<ul style="list-style-type: none">Development of Decision Support System for Biogas Technology of Cellulosic Materials	Dr.Warinthorn Songkasiri warinthorn@biotec.or.th Assoc Prof. Dr. Chantaraporn Phalakornkule cphalak21@yahoo.com
	<ul style="list-style-type: none">Biogas Industry Strategies in Thailand	Annop/Warinthorn
	<ul style="list-style-type: none">LCA/Carbon footprint/Water Footprint	

III. JGSEE-NSTDA Integrative Biorefinery Laboratory (IBL)

Research theme	Topic	Contact person
Biomass pretreatment and fractionation	<ul style="list-style-type: none">• Characteristics of isolated cellulose and lignin from the clean fractionation of various biomasses (e.g. agricultural residues, soft and hard woods, woody biomass)• Determination of suitable pretreatment/fractionation approaches and conditions for different applications and utilizations of biomasses (e.g. for fuel, chemical, bio-material productions)• Separation/precipitation of lignin from waste black liquor in paper industries by various processes (e.g. acidification, sub- or super-critical CO₂, oxidation)• Process intensification and scaling up of biomass clean fractionation	Prof.Dr.Navadol Laosiripojana navadol@jgsee.kmutt.ac.th Dr.Verawat Champreda verawat@biotec.or.th

III. JGSEE-NSTDA Integrative Biorefinery Laboratory (IBL)

Research theme	Topic	Contact person
<ul style="list-style-type: none">• Development of biomass-degrading enzymes• Conversion of sugar to fuels and chemicals	<ul style="list-style-type: none">• Development of suitable enzymes for proper hydrolysis of pretreated and fractionated biomasses to sugar• Development of suitable and low-cost catalysts (i.e. thermo-chemical and photo-catalysts) for converting isolated cellulosic compounds to fuels and value-added products• Process and reaction optimization (e.g. hydrolysis, dehydration, deoxygenation, photo-catalysis) to maximize the yield and selectivity of specific products from the conversion of isolated cellulosic compounds• Process intensification and scaling up of isolated cellulosic compound conversion to specific products	<p>Prof.Dr.Navadol Laosiripojana navadol@jgsee.kmutt.ac.th</p> <p>Dr.Verawat Champreda verawat@biotec.or.th</p>

III. JGSEE-NSTDA Integrative Biorefinery Laboratory (IBL)

Research theme	Topic	Contact person
<ul style="list-style-type: none">Conversion of lignin and bio-wastes to fuels	<ul style="list-style-type: none">Investigation of catalyst and solvent systems for depolymerization of isolated lignin to specific productsProcess and reaction optimization (e.g. depolymerization, deoxygenation, photocatalysis) to maximize the yield and selectivity of specific products from the conversion of isolated ligninPurification of products from lignin conversionProcess intensification and scaling up of isolated lignin conversion to specific products	Prof.Dr.Navadol Laosiripojana navadol@jgsee.kmutt.ac.th Dr.Verawat Champreda verawat@biotec.or.th
First and second generation biodiesel production	<ul style="list-style-type: none">Investigation of solid catalyst and for deoxygenation of palm feedstocks to long-chain alkane compoundsDevelopment of continuous operation FAME production from palm feedstocks	Prof.Dr.Navadol Laosiripojana navadol@jgsee.kmutt.ac.th Dr.Verawat Champreda verawat@biotec.or.th

5	Dry fermentation of MSW	Experimental study on process and change of key parameters during dry fermentation process of Fresh MSW	AGAR/AFPL	Master or Ph.D.	Master of Engineering: Environmental, Chemical; Master of Science and Technology : Environmental Science or Environmental Technology; Other degree upon interview	Not yet but to be integrate in the RDF KETEP project	Experience in bioreactor	Co-Advisor: Dr. Kompil Wangyao
6	Emission from RDF gasification	Monitoring and measurement of GHG and pollution gases from gasifier applied with various type of RDF . Optimization of the process to reduce emission	AFPL	PhD	M.Sc or M. Eng on Environment, Chemical Eng. Envi Tech.	Under negotiation with SCG	Experience in reactor and analysis equipment	Co-Advisor; Dr. Awassada Phonpiphat

Name of Advisor : Asst. Prof. Dr. Sebastien Bonnet

7	Environmental sustainability of biochar production	GHG implications associated to the production and use of biochar as soil amendment	LCSAL	Master	Master of Science/Engineer in Environmental science	EU-FP8 Biochar Loop (proposal submitted not yet accepted)	Knowledge of LCA and agricultural production systems	
8	Economic sustainability of biochar production	Cost implications (CBA) associated to the production of biochar under various scenarios of production	LCSAL	Master	Master of Science/Engineer in Environmental science	EU-FP8 Biochar Loop (proposal submitted not yet accepted)	Knowledge of LCA and agricultural production systems	

Name of Advisor : Prof. Dr. Shabbir H. Gheewala

9	Sustainability evaluation of bio-based materials	Several types of bio-based materials (PLA, PHB, etc.) to be evaluated from many possible feedstocks relevant to Thailand (cassava, sugarcane, agricultural residues, etc.)	LCSAL	MSc/PhD	Bachelor or Master of Science/Engineering on Environmental science, Environmental Engineering, Agriculture, and relevant background upon interview	Two different NSTDA projects	Knowledge of LCA and agricultural production systems	Ability to work in the field and have initiative in critical thinking
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