



اونيورسيتي مليسيا قهغ السلطان عبد الله
UNIVERSITI MALAYSIA PAHANG
AL-SULTAN ABDULLAH



Energy Security & Chemical Engineering Congress

ENERGY SECURITY AND CHEMICAL ENGINEERING CONGRESS 2023

*Green Technological Solutions
for Sustainable World*
28th – 30th August 2023

Programme Book

Organizer



اونيورسيتي مليسيا قهغ السلطان عبد الله
UNIVERSITI MALAYSIA PAHANG
AL-SULTAN ABDULLAH

Centre for Research in
Advanced Fluid & Processes

Pusat Penyelidikan Bendalir & Proses Ter maju

In partnership with



NGUYEN TAT THANH



HINDUSTAN
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CENTRE FOR RESEARCH IN ADVANCED FLUID AND PROCESSES

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CARIFF Services

- Technical services
- Consultancy
- Training
- Contract research

Track Record

- Petronas Research
- MTBE-Petronas
- BASF-Petronas
- Carsten & Ranico
- Perwaja
- Edotco

Others

1. Microwave Reactor
2. Refractometer
3. Potentiostat
4. Dissolution Tester
5. Particle Sizer
6. Automatic Titrator
7. Tubular furnace



1. Microfluidics Testing & Fabrication System
2. Channel Flow System

3. Wind Tunnel System
4. High Speed Camera Microscope

Fluid flow



1. PIV
2. Micro PIV
3. Micro Pro
4. LDV
5. High Speed Camera
6. Digital Microscope
7. Cryo-TEM
8. Tabletop SEM-EDX



LASER
DETECTOR,
Imaging &
Surface
Analysis

SAMPLE PREPARATION TOOLS

1. Nano Grinder
2. Freeze Dryer
3. Centrifuge
4. Furnace
5. Planetary Ball Mill Grinding
6. Needleless Electrospin Machine
7. Ultrasonic Processor
8. Vacuum Freeze Dryer
9. Rotary Evaporator
10. Incubator Shaker



1. Viscometer
2. Rheometer
3. Tensiometer
4. Rotating Disk Apparatus
5. DSC
6. TGA-DSC
7. Moisture Meter
8. Flash Point Analyzer

RHEOLOGY & THERMAL ANALYSIS



1. UV-vis-NIR
2. GCMS
3. LCMS Q-ToF
4. ICP-OES
5. Online GC
6. XRD
7. XRF
8. XPS
9. HPLC
10. FTIR

Spectroscopy & X-Ray ANALYSIS

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CONFERENCE BACKGROUND

The Energy Security and Chemical Engineering Congress or ESChE is a biennial conference organised by the Centre for Research in Advanced Fluid & Processes, Fluid Centre (formerly known as the Centre of Excellence for Advanced Research in Fluid Flow or CARiFF), Universiti Malaysia Pahang Al-Sultan Abdullah, Malaysia.

The centre has previously organised International Conference on Fluids and Chemical Engineering or FluidsChE, being the 1st FluidsChE in 2015 and 2nd FluidsChE in 2017. In 2019, FluidsChE was renamed as the Energy Security & Chemical Engineering Congress (ESChE) with conference theme that emphasizes on Energy Security in line with the Malaysian Government’s National Priority Area and also to support the centre’s strongest research field.

This conference with its major focus being:

1. Energy security both renewable and conventional sources
2. Sustainable development
3. Green technology and material
4. Chemical engineering with emphasize on sustainable development

ESChE2023 aims to offer opportunities towards sustainable development related to material, chemical and energy to meet the growing demands of the developing countries without compromising the environment.

Our conferences have attracted participants and researchers from all over the world to discuss the new scientific research and development on energy and chemical engineering fields. We hope this will be an event that brings together energy and chemical engineering communities from around the world to share their findings or ideas in the area of sustainable energy development.

**ASSOCIATE PROFESSOR IR. DR.
MOHD FAIRUSHAM BIN GHAZALI**

*Director,
Fluid Centre,
Universiti Malaysia Pahang Al-Sultan Abdullah*



In the Name of Allah, the Most Beneficent, the Most Merciful.

It is with great pride and pleasure that I welcome you all to the Energy Security and Chemical Engineering Congress (ESChE) 2023, organized by Centre for Research in Advanced Fluid and Processes (Fluid Centre) at Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA). This conference marks a significant milestone in our continuous efforts to foster excellence and innovation in the fields of Energy, Environment, and Chemical Engineering.

ESChE 2023 brings together academics and researchers of exceptional minds and esteemed partners from across the globe, including King Mongkut University of Technology North Bangkok, Thailand; and Hindustan University, India. Your presence and collaboration lend strength and diversity to this remarkable event, elevating it to new heights.

Our choice of location, the picturesque Langkawi island in Malaysia, provides the perfect backdrop for this gathering of brilliant minds. Langkawi's serene beauty and tropical charm offer a relaxing environment, fostering an atmosphere of creativity and intellectual exchange.

The theme for this year's congress, "Green Technological Solutions for a Sustainable World," echoes our shared commitment to addressing the pressing challenges of environmental sustainability and the pursuit of a greener, more resilient future. We believe that our collective efforts and innovative solutions can play a pivotal role in creating a world that thrives in harmony with nature.

As we convene here, I extend my heartfelt appreciation to the Faculty of Chemical and Process Engineering Technology and the Faculty of Mechanical & Automotive Engineering Technology for their invaluable contributions to making this event a resounding success. Their dedication and unwavering support have been instrumental in shaping the conference, ensuring a platform where knowledge can be shared, ideas exchanged, and collaborations forged.

To all the participants, I encourage you to seize this exceptional opportunity to network, learn from one another, and engage in meaningful dialogues that will contribute to the advancement of our disciplines. Your passion, research, and insights are the driving force behind ESChE 2023, and together, we can redefine the future of Energy, Environment, and Chemical Engineering.

Finally, I express my deepest gratitude to each one of you for joining us in this journey. Your presence embodies the spirit of camaraderie, progress, and dedication that makes ESChE 2023 an extraordinary event.

CHAIRMAN
WELCOMING ADDRESS



**PROFESSOR DATO' TS. DR.
YUSERRIE BIN ZAINUDDIN DIMP.**

*Vice Chancellor, Universiti Malaysia Pahang
Al-Sultan Abdullah*

Assalamualaikum Warahmatullahi Wabarakatuh.

In the name of Allah the Almighty, the Most Gracious and Merciful.

Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA) welcomes the delegates to the Energy Security and Chemical Engineering Congress (ESChE) 2023, organized by the Centre for Research in Advanced Fluid and Processes (Fluid Centre), UMPSA.

The third edition of ESChE 2023, with the theme “Green Technological Solution for a Better World” will be an impactful event that brings together the energy and chemical engineering communities from around the world to share their findings or ideas in the area of sustainable energy development.

With immense pleasure, I extend a heartfelt welcome to all the esteemed delegates and participants gathered here today, hailing from various corners of the globe. It is my privilege to warmly say “Selamat Datang” to each one of you. Langkawi, a gem of Southeast Asia, needs no introduction, and I trust you will relish its breathtaking beaches and enchanting sights during your stay.

Allow me to extend my heartfelt congratulations to the Fluid Centre of Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA) for their unwavering commitment and remarkable efforts in orchestrating this conference. I am confident that this event will serve as a dynamic platform in strengthening knowledge-sharing relationships, fostering collaborative research endeavors, and facilitating product commercialization within the research community. Together, we aspire to lay the foundation for a better tomorrow by nurturing and propelling new ideas forward.

As we embark on this collective journey of intellectual exchange, I encourage all of you to actively engage, network, and collaborate. Let us seize this opportune moment to forge lasting connections, drawing inspiration from the diverse expertise and perspectives represented here today.

**VICE CHANCELLOR
FOREWORD**

ORGANISING COMMITTEE

PATRON

PROFESSOR DATO' TS. DR. YUSERRIE BIN ZAINUDDIN
(VICE-CHANCELLOR, UMPSA)

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DEPUTY VICE CHANCELLOR (RESEARCH & INNOVATION), UMPSA

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ASSOCIATE PROFESSOR IR. DR. MOHD FAIRUSHAM BIN GHAZALI
(DIRECTOR, FLUID CENTRE)

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PROF. DR. CHANTARAPORN PHALAKORNKULE (THAILAND)

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PROF. DR. MOHD MUSTAFA AL BAKRI ABDULLAH (UNIVERSITI MALAYSIA PERLIS)

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PROMOTION AND PUBLICITY COMMITTEE

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NURUL AZRA BINTI BAKARUDDIN

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FARANADIA BINTI SAHARUDIN
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DR. NURUL NADIA MOHD ZAWAWI
SAIFUL ADLIZAI BIN RAMLI
MARNI ASMIDA BINTI OTHMAN
HANISAH BINTI RAZALI

WEBSITE/PORTAL ADMINISTRATOR

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NUR SYUHADA' BINTI ASMAR
SULIHAAKMA BINTI KAMARUDIN
AZINUDDIN ZULFAHMI BIN MEGAT

Embracing Energy Transition: Building Malaysia's Path to a Sustainable Future

Ir. Shaiful Khalid

Industrial Speaker

Head of Technical Delivery Excellence

Project Delivery & Technology (PD&T)

PETRONAS



ABSTRACT:

In a time of great uncertainty, with three concurrent crises in food, energy, and finance, the need to accelerate the transition towards sustainable renewable energy stands as our generation's most significant and vital challenge – one that we cannot afford to falter on. This necessitates unparalleled global collaboration, bold initiatives and innovations, and rapid transitions, all the while ensuring an undisturbed energy supply and maintaining a secure, affordable, and accessible energy landscape. This keynote speech delves into the pivotal role of governments in this transition. Governments serve as major influencers in energy policies and infrastructure development, shaping the regulatory environment, and providing necessary incentives. It highlights the government's commitment to renewable energy as a vital driver of change on a national scale, focusing particularly on Malaysia's path to a sustainable future. The speaker will also address the critical role of industries and corporations in the energy transition process. These entities hold significant influence in driving demand for renewable energy technologies, devising innovative solutions, and setting market trends. Industrial players possess the resources, technical expertise, and research capabilities needed to implement large-scale renewable energy projects, thus making substantial contributions to the sector's growth. Lastly, the keynote will tackle the challenges associated with the energy transition and propose strategies for overcoming them.

SPEAKER BIOGRAPHY:

Ir. Shaiful Khalid is an innovative and business-minded in project management & operational excellence with more than 20 years of experience domestic and international, across a broad range of upstream and downstream Oil & Gas environments from Front End to Decommissioning. Proven track record of combining vision, technical savviness and strong business decision-making with well-developed leadership qualities to support world-class project delivery and operational excellence in Egypt, Uzbekistan, Myanmar, Indonesia, Thailand, Argentina and Malaysia. He is also a qualified Professional Engineer, External Advisory Membership in International Bodies & Industry Advisor for Malaysia Universities.

PLENARY
SPEAKER 1

Low-Temperature Biochar Production from Biomass Torrefaction for Carbon-Neutral and Carbon-Negative Targets

Dr. Wei-Hsin Chen

Professor

International Bachelor Degree Program on Energy Engineering

National Cheng Kung University, Taiwan



ABSTRACT:

On account of receiving a great deal of attention on net-zero emissions lately, renewable energy development is considered an effective countermeasure to abate anthropogenic CO₂ emissions and mitigate global warming. Bioenergy plays a crucial role in developing renewable energies and currently accounts for the largest share. Unlike solar energy and wind, with the main purpose of power generation, the primary target of bioenergy is to produce biofuels to replace fossil fuels. However, biomass possesses several disadvantages: hygroscopic and biodegradable, high moisture content, low calorific value, poor grindability, large volume or low bulk density, and low homogeneity. The aforementioned biomass properties can be improved to a great extent after it undergoes torrefaction. Torrefaction is a biomass pretreatment and thermochemical conversion process to upgrade biomass and produce low-temperature biochar, making biochar similar to coal. The produced biochar is a carbon-neutral fuel because the net carbon emission from its combustion is zero. Biochar from torrefaction can be used as bioadsorbent to treat wastewater. It can also be used as sustainable materials for soil amendment, wood utilization, polymer blending, and architecture coating to achieve carbon negative. This talk addresses biomass property transformation and biochar characteristics from torrefaction. The applications of biochar for carbon-neutral fuel and carbon-negative materials will also be introduced.

SPEAKER BIOGRAPHY:

Professor Wei-Hsin Chen is a Distinguished Professor at the Department of Aeronautics and Astronautics and the Director of Energy Industry Talent Education Center, National Cheng Kung University, Taiwan. He is also the Honorary Chair Professor at Tunghai University, Chair Professor at the National Chin-Yi University of Technology, Research Fellow of the National Science and Technology Council, Taiwan, and Vice President of the Institute for Liquid Atomization and Spray Systems (ILASS)-Asia. His research topics include bioenergy (combustion, torrefaction, pyrolysis, gasification, liquefaction, bioethanol, etc.), hydrogen production and purification, clean energy (clean coal technology, wind power, thermoelectric generation, carbon capture and utilization, etc.), energy system analysis (optimization, evolutionary computation, machine learning, etc.), and atmospheric science (aerosol absorption and PM_{2.5}). He has published around 950 papers in international and domestic journals and conferences with an H-index of 78 (Web of Science). He is the Section Editor-in-Chief of Energies, the Editor of Journal of Industrial and Engineering Chemistry, the Associated Editor of Frontiers in Energy Research, and the editorial board member of Applied Energy, Scientific Reports, Chinese Chemical Letters, AIMS Environmental Science, etc. He is a seven consecutive years (2016-present) Clarivate Analytics (Web of Science) Highly Cited Researcher. His received awards include Outstanding Research Award (National Science and Technology Council, Taiwan), Highly Cited Research and Review Paper Awards (Applied Energy, Elsevier), Outstanding Engineering Professor Award (Chinese Institute of Engineers), Highly Cited Review Article Award (Bioresource Technology, Elsevier), etc.

PLENARY
SPEAKER 2

FIRST DAY

Time	28 th August 2023 (Monday)
15:00 – 17:00	Registration of Participants

SECOND DAY

Time	29 th August 2023 (Tuesday)
08:00 – 09:00	Registration
09:00 – 09:15	Arrival of Participants
09:15 – 09:30	Arrival of VIPs
09:30 – 09:35	Arrival of YBhg. Professor Ts. Dr. Mohd Rusllim bin Mohamed the Deputy of Vice Chancellor (Student and Alumni Affairs) of Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA)
09:35 – 09:45	Recitation of Du'a Safety Briefing
09:45 – 10:00	Welcoming Speech by Emcee
10:00 – 10:30	Welcoming Speech by Associate Professor Dr. Mohd Fairusham bin Ghazali, the Director of the Centre for Research in Advanced Fluid and Processes Universiti Malaysia Pahang Al-Sultan Abdullah and Chair of ESChE 2023
10:30 – 10:50	Opening Speech and Officiating the Launch of ESChE 2023 by YBhg. Professor Ts. Dr. Mohd Rusllim bin Mohamed the Deputy of Vice Chancellor (Student and Alumni Affairs) of Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA) (Montage presentation)
10:50 – 11:00	Sponsor Acknowledgment
11:00 – 11:15	Coffee Break
11:15 – 12:00	Introduction to Plenary Speaker 1 Plenary 1 <i>Title: Embracing Energy Transition: Building Malaysia's Path to a Sustainable Future</i> Plenary Speaker: Ir. Shaiful Bin Khalid Head of Technical Delivery Excellence, Project Delivery & Technology PETRONAS
12:00 – 12:05	Photo Session
12:05 – 14:00	Lunch Break

PROGRAMME TENTATIVE

SECOND DAY

Time	29 th August 2023 (Tuesday)
14:00 – 14:50	<p>Introduction to Plenary Speaker 2</p> <p>Plenary 2 Link: https://shorturl.at/euvJY</p> <p><i>Title: Low-Temperature Biochar Production from Biomass Torrefaction for Carbon-Neutral and Carbon-Negative Targets</i></p> <p>Plenary Speaker: Professor Dr. Wei-Hsin Chen National Cheng Kung University, Taiwan</p>
14:50 – 15:00	Participants to Parallel Session
15:00 – 16:30	Parallel Session 1: Room 1 Parallel Session 2: Room 2 Parallel Session 3: Room 3
15:00 – 17:00	Parallel Session 1 (Virtual) Parallel Session 2 (Virtual)
16:30 – 20:00	Tea Break and leisure
Time	HI-TEA VENUE: BALLROOM
20:00 – 20:15	Arrival of Participants and Guests
20:15 – 20:20	Recitation of Du’a
20:20 – 22:00	HiTea starts
	Video presentation
	Best Paper Award Presentation
	Photography session
	End of Day 2

PROGRAMME
TENTATIVE

THIRD DAY

30 th August 2023 (Wednesday)	
Time	Parallel Session
08:30 – 10:00	Parallel Session 1: Room 1 Parallel Session 2: Room 2 Parallel Session 3: Room 3 Parallel Session 1 (Virtual) Parallel Session 2 (Virtual)
10:00 – 10:15	Coffee Break
10:15 – 12:30	Parallel Session 1: Room 1 Parallel Session 2: Room 2 Parallel Session 3: Room 3
10:15 – 12:00	Parallel Session 1 (Virtual) Parallel Session 2 (Virtual)
12:00 – 14:00	Lunch Break
	End of Day 3

PROGRAMME
TENTATIVE

29 AUGUST 2023 (DAY 2)

PARALLEL SESSION 1: ROOM 1

ENVIRONMENTAL ENGINEERING/WASTE WATER/ADVANCED
MATERIAL/MATERIAL SCIENCE & ENGINEERING/HEAT
TRANSFER/PHARMACEUTICAL & DRUG DELIVERY
Chairman: Assoc. Prof. Muhammad Raza Ul Mustafa

- | | |
|---------------|--|
| 15.00 – 15.15 | <p>ESCE101
 Miss Nur'atiah Zaini (Universiti Tenaga Nasional)
 <i>Forecasting Air Pollutant Concentrations using Optimized Deep Learning: A Case Study for Kuala Lumpur, Malaysia</i></p> |
| 15.15 – 15.30 | <p>ESCE056
 Assoc. Prof. Muhammad Raza Ul Mustafa (Universiti Teknologi PETRONAS)
 <i>Application Of Artificial Neural Network (ANN) for Prediction of Acenaphthene (ACN) Removal in Wastewater</i></p> |
| 15.30 – 15.45 | <p>ESCE016
 Mrs. Nur Sulihatimarsyila Abd. Wafti (Malaysia Palm Oil Board)
 <i>Synthesis of Biodegradable Lubricant by Continuous Enzymatic Transesterification of High Oleic Palm Methyl Ester in Packed-Bed Reactor</i></p> |
| 15.45 – 16.00 | <p>ESCE020
 Mr. H. M. Solayman (Universiti Malaysia Pahang Al-Sultan Abdullah)
 <i>Recent Progress of CQDs Modified G-C3N4 Photocatalyst in Dye Wastewater Treatment and Hydrogen Evolution</i></p> |
| 16.00 – 16.15 | <p>ESCE105
 Assoc. Prof. Mohd Bijarimi Mat Piah (Universiti Malaysia Pahang Al-Sultan Abdullah)
 <i>Correlation Study of Glass Transition Temperature (T_g) of Polymer Blends Using Fox Equation and Experimental Values: Critical Review</i></p> |
| 16.15 – 16.30 | <p>ESCE002
 Dr. Ramani Bai Varadharajan (UCSI University Kuala Lumpur)
 <i>Enviro-chemical Appraisal on TDS, Ca²⁺, PO₄³⁻, Fe²⁺, and As³⁺ for Groundwater Supply and Irrigation in Klang Catchment of West Malaysia.</i></p> |
| 16.30 – 16.45 | <p>ESCE153
 Mr. Nasrin Abu Bakar (Malaysia Palm Oil Board)
 <i>Prospect of Methane Avoidance Technologies for Palm Oil Mills</i></p> |

DETAILED PARALLEL
TENTATIVE

29 AUGUST 2023 (DAY 2)

PARALLEL SESSION 2: ROOM 2

RENEWABLE ENERGY & BIOFUELS /REACTION ENGINEERING &
CATALYSIS/ OIL& GAS/FLOW ASSURANCE IN PIPELINES

Chairman: Ir. Dr. Sabri Bin Mahmud

- | | |
|---------------|---|
| 15.00 – 15.15 | ESCE117
Dr. Ahmad Salam Farooqi (Universiti Teknologi PETRONAS)
<i>Enhanced Syngas Production via Dry Reforming of Methane Using Ni/Zr-SBA-15 (POFA) Catalyst</i> |
| 15.15 – 15.30 | ESCE042
Dr. Santi Chuetor (King Mongkut's University of Technology North Bangkok)
<i>Investigation of Rice Straw for Energy Efficiency and Waste Generation by Different Pretreatment Methods for Bioethanol Production</i> |
| 15.30 – 15.45 | ESCE46
Dr. Alinda Samsuri (Universiti Pertahanan Nasional Malaysia)
<i>Molybdenum Oxide-Based Catalyst Towards Better Hydrogen Production: Effects of Isothermal Carburization</i> |
| 15.45 – 16.00 | ESCE051
Miss. Nur Rahimah (Universiti Malaysia Perlis)
<i>Optimization on Torrefaction of Palm Kernel Shell Using Response Surface Methodology</i> |
| 16.00 – 16.15 | ESCE164
Mr. Nik Khairul Irfan Nik Ab Lah (Universiti Teknologi MARA)
<i>Oil Sorption Effectiveness of Kenaf Fibers for Oil Spill Application</i> |
| 16.15 – 16.30 | ESCE165
Assoc. Prof. Abdul Hadi (Universiti Teknologi MARA)
<i>Epoxidation of Palm Oleic Acid Using Zeolite Catalyst: Effect of Oxygen Carrier and Donor on the Ring Opening</i> |
| 16.30 – 16.45 | ESCE169
Dr. Bidattul Zainal (Universiti Tenaga Nasional)
<i>Biochemical Methane Potential Assessment From Palm Oil Mill Wastes</i> |
| 16.45 – 17.00 | ESCE139
Dr. Arina Sauki (Universiti Teknologi MARA)
<i>CEC-Reduced Mud for Improved Interpretation of Shaly Sandstones</i> |

DETAILED PARALLEL
TENTATIVE

29 AUGUST 2023 (DAY 2)

PARALLEL SESSION 3: ROOM 3

MODELING & SIMULATION/SEPARATION

TECHNOLOGY/NANOTECHNOLOGY/FOOD SCIENCE

TECHNOLOGY/SAFETY AND HEALTH MANAGEMENT

Chairman: Assoc. Prof Dr Yew Ming Chian

- 15.00 – 15.15 **ESCE019**
Dr. Munawar Zaman Shahrudin (Universiti Teknologi MARA)
Feasibility Analysis of Heat Integrated Distillation Columns Sequence (HIDCS)
- 15.15 – 15.30 **ESCE093**
Mrs. Wan Zaiton Wan Sulaiman (Universiti Malaysia Pahang Al-Sultan Abdullah)
Dust Explosibility and Severity Study of Bayan and Tanito Coal
- 15.30 – 15.45 **ESCE146**
Miss Noor e Hira (Universiti Teknologi PETRONAS)
Dependence of Surface Orientation on Stability of Structures and Adsorption Capacity of FeOOH Adsorbent
- 15.45 – 16.00 **ESCE022**
Mr. Md. Arif Hossen (Universiti Malaysia Pahang Al-Sultan Abdullah)
Unraveling the Effect of Various Organic Solvents on the Morphology of TiO₂ Nanotubes
- 16.00 – 16.15 **ESCE023**
Miss Aamina Din Muhammad (Universiti Malaysia Pahang Al-Sultan Abdullah)
Influence of Anodizing Parameters in the Synthesis of TNT for CO₂ Reduction: A Review
- 16.15 – 16.30 **ESCE048**
Miss Nur Syakinah Abd Halim (Universiti Teknologi PETRONAS)
Surface Modification on Recycled Polyethylene Terephthalate Nanofiber Membrane via Solvent Vapor Treatment for Produced Water Filtration
- 16.30 – 16.45 **ESCE144**
Dr. Suryati Bin Salleh (Universiti Malaysia Pahang Al-Sultan Abdullah)
Enhancing Forestry Residue Utilization through Pelletization with different Binding Agents
- 16.45 – 17.00 **ESCE131**
Mr. Muhammad Irfan Khan (Universiti Teknologi PETRONAS)
Integrating Geopolymerization and Alginate Encapsulation for the Development of A High-performance Adsorbent for Methylene Blue Dye Removal from Wastewater

29 AUGUST 2023 (DAY 2) PARALLEL SESSION 1 (VIRTUAL)

Chairman: IR. TS. DR. NORAZLIANIE BINTI SAZALI

Co-chairman: DR. NURUL NADIA BINTI MOHD ZAWAWI

Microsoft Team Link: <https://shorturl.at/dqrGI>

- | | |
|---------------|---|
| 15.00 – 15.15 | ESCE099
Ir. Baiyang Jiang (Universiti Malaysia Pahang)
<i>Long-Term Trends in The Environmental Air Quality in Chengde, China</i> |
| 15.15 – 15.30 | ESCE100
Ir. Baiyang Jiang (Universiti Malaysia Pahang)
<i>Study on the Current Situation and Pathways for Promoting the Industrial Development of Atractylodes Chinensis in the Context of Rural Revitalization</i> |
| 15.30 – 15.45 | ESCE102
Miss Mehna Najeem.A (University Hindustan)
<i>Use of Industrial Sludge as a Brick Ingredient: A Review</i> |
| 15.45 – 16.00 | ESCE109
Dr. Rendra Panca Anugraha (Institut Teknologi Sepuluh Nopember)
<i>Techno-Economic Analysis of Green Ammonia with Hydropower Source in Indonesia</i> |
| 16.00 – 16.15 | ESCE113
Dr. Lee Muei Chng (Universiti Tunku Abdul Rahman)
<i>Sustainable Approach to Synthesis Carboxymethylcellulose Using Ultrasonic-Assisted Extracts from Lignocellulose Feedstock</i> |
| 16.15 – 16.30 | ESCE115
Mrs. Yang Tuo Ying (SEGi University)
<i>Micro-grid Structure Optimization and Energy Management: A Review on Techniques and Algorithms</i> |
| 16:30-16:45 | ESCE108
Mr. Ahmad Shauqi Safuan Muhamad (Universiti Malaysia Pahang)
<i>Design It Right, Maintain It Right and Operate It Right - Which Element Contributes Mostly to Process Safety Incidents?</i> |
| 16:45-17:00 | ESCE036
Dr. Nor Hazren Abdul Hamid (Universiti Tun Hussein Onn Malaysia)
<i>Performance and Fouling Assessment of Neolamarckia Cadamba Nanofibrillated Filter Paper in a Cross-Flow Filtration System for Decolorization of Methyl Orange</i> |

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29 AUGUST 2023 (DAY 2) PARALLEL SESSION 2 (VIRTUAL)

Chairman: PROF. DR. TS. JOLIUS BIN GIMBUN
Co-chairman: NURUL AZRA BINTI BAKARUDDIN
Microsoft Team Link: <https://shorturl.at/eBEQ9>

- | | |
|---------------|---|
| 15.00 – 15.15 | ESCE145
Mrs. Siti Zaharah Roslan (UiTM Shah Alam)
<i>Combustion Reactivity of Hydrochar Obtained from Hydrothermal Carbonization of Sewage Sludge through Thermogravimetric Analysis</i> |
| 15.15 – 15.30 | ESCE065
Dr. Syamimi Saadon (Universiti Putra Malaysia)
<i>Assessing Beta-type Stirling Engine Capacity to Recover Heat for Low-temperature Applications</i> |
| 15.30 – 15.45 | ESCE028
Miss Dona Petrus (Universiti Malaysia Sabah)
<i>Quality Prediction of Low Temperature Dried Food Product Using Artificial Neural Network: A Short Review</i> |
| 15.45 – 16.00 | ESCE161
Dr. Wan Zairani Wan Bakar (Universiti Teknologi MARA)
<i>Potential of Clay Mineral as Adsorption Base in Carbon Capture Storage (CCS) Technology</i> |
| 16.00 – 16.15 | ESCE110
Miss Siddhika Mohan (SIES Indian Institute of Environmental Management)
<i>Assessment of Impacts and Barriers Related to Large Scale Solar Energy Development Projects</i> |
| 16.15 – 16.30 | ESCE070
Miss Soraya Tamara (Petronas)
<i>Design Safety Requirement for Carbon Capture & Storage Facility (CCS)</i> |
| 16.30 – 16.45 | ESCE073
Dr. Bamidele Victor Ayodele (Universiti Teknologi PETRONAS)
<i>Synthesis and Characterization of Graphene Oxide Supported Co-Ni Catalyst for Valorization of Petroleum Sludge to Value-Added Products</i> |
| 16.45 – 17.00 | ESCHE 120
Mr. Umair Ishtiaq (Universiti Teknologi PETRONAS)
<i>Polyurethane Resin Incorporated Carbon-based Nanocomposites Coated Proppant for Improved Mechanical Strength and Fine Migration Control</i> |
| 17.00 – 17.15 | ESCHE 118
Dr. Shihabudheen M (Indian Institute of Technology Tirupati)
<i>Influence of Water Quality Parameters on Point-Of-use Silver-based Disinfection System: An Unrivalled Effect of Bicarbonates</i> |

30 AUGUST 2023 (DAY 3)

PARALLEL SESSION 1: ROOM 1

TRACK 1: ENVIRONMENTAL ENGINEERING/WASTE
WATER/ADVANCED MATERIAL/MATERIAL SCIENCE &
ENGINEERING/HEAT TRANSFER/PHARMACEUTICAL & DRUG
DELIVERY

Chairman: Assoc. Prof. Pang Yean Ling

- 08:30 – 08:45 **ESCE 063**
**Dr. Muhammad Rashid Shamsuddin (Universiti
Teknologi PETRONAS)**
*Metal Organic Framework (MOF) as Effective Adsorbent for
Heavy Metal Removal*
- 08:45 – 09:00 **ESCE124**
**Mr. Shaik Mahamad Allabakshi (Indian Institute of
Technology Tirupati)**
*Photo-plasma: A sustainable way to reduce the scavenging
effect of radicals by salts in textile wastewater treatment*
- 09:00 – 09:15 **ESCE116**
**Assoc. Prof. Pang Yean Ling (Universiti Tunku Abdul
Rahman)**
*Comparison of Coagulation, Fenton's and Photocatalytic
Processes for Removal of Textile Industry Wastewater*
- 09:15 – 09:30 **ESCE044**
**Mr. Prabu Rajandran (Universiti Malaysia Pahang Al-
Sultan Abdullah)**
*Column Adsorption Studies on Carbazole Removal from
Aqueous Solution Using β -Cyclodextrin Functionalized Rice
Husk Biochar*
- 09:30 – 09:45 **ESCE010**
**Assoc. Prof. Syed Mohd Saufi bin Tuan Chik (Universiti
Malaysia Pahang Al-Sultan Abdullah)**
*Comparison of Negatively and Positively Charged Thin Film
Nanocomposite Membranes for Boron Removal*
- 09:45 – 10:00 **ESCE086**
**Assoc. Prof. Yew Ming Chian (Universiti Tunku Abdul
Rahman)** *Development of Advanced Fire Rated Board for the
Fire Protection Duct System*

30 AUGUST 2023 (DAY 3)

PARALLEL SESSION 1: ROOM 1

TRACK 2: ENVIRONMENTAL ENGINEERING/WASTE WATER/ADVANCED MATERIAL/MATERIAL SCIENCE & ENGINEERING/HEAT TRANSFER/PHARMACEUTICAL & DRUG DELIVERY

Chairman: Ts. Dr. Nasratun binti Masngut

- 10:15 – 10:30 **ESCE155**
Miss Farah Nurizzati Mislar (Universiti Teknologi MARA)
Effect of Drying Methods and Crosslinking Mechanism of Calcium Chloride and Sulfuric Acid on Alginate/Carboxymethyl Cellulose Blends
- 10:30 – 10:45 **ESCE005**
Dr. Badhrulhisham Abdul Aziz (Universiti Malaysia Pahang Al-Sultan Abdullah)
Rare Earth Industry: The Game Changer in Green Technology – A Review with Bibliometric Touch
- 10:45 – 11:00 **ESCE013**
Dr. V. Ramani Bai (UCSI University Kuala Lumpur)
Constructing a Test Model of a Sustainable Greywater Drainage System for Recycling and Reuse
- 11:00 – 11:15 **ESCE103**
Prof. Sabumon Pothanakandathil Chacko (Vellore Institute of Technology (VIT))
Decolorization of High Concentrations of Azo Dye Methyl Red using Sulphidogenesis Process
- 11:15 – 11:30 **ESCE015**
Dr. Siti Maznah Kabeb (Universiti Malaysia Pahang Al-Sultan Abdullah)
Effect of Green Filler Loading on Mechanical and Thermal Properties of Epoxy Reinforced Composite
- 11:30 – 11:45 **ESCE001**
Dr. Nurul Huda binti Mudri (Agensi Nuklear Malaysia)
Physicochemical Analysis of Jatropha Oil-based Microcapsule for Self-healing Coating Application
- 11:45 – 12:00 **ESCE098**
Mr. Aftab Hussain Arain (Universiti Teknologi PETRONAS)
Development of a Novel Eco-Friendly Biodiesel-Based Drilling Fluid for Efficient Drilling in Unconventional Shale Formations
- 12:00 – 12:15 **ESCE035**
Dr Siti Fatimah Salleh (Petronas Research Sdn Bhd)
CFD Simulation of the Heat Transfer Process in a Herringbone Plate Heat Exchanger
- 12:15 – 12:30 **ESCE076**
Miss Nur Hikmah Semawi (Universiti Teknologi Mara)
Thermal Degradation Mechanism for Controlled Combustion of Rice Dusts in Malaysia

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30 AUGUST 2023 (DAY 3)

PARALLEL SESSION 2: ROOM 2

**TRACK 1: RENEWABLE ENERGY & BIOFUELS /REACTION
ENGINEERING & CATALYSIS/ OIL& GAS/FLOW ASSURANCE IN
PIPELINES**

Chairman: Assoc. Prof. Dr. Bawadi Abdullah

08:30 – 08:45	ESCE114 Assoc. Prof. Steven Lim (Universiti Tunku Abdul Rahman) <i>Synthesis of Carbon Acid Catalyst via Ultrasound-Assisted Direct Glycerol-Free Biodiesel Production</i>
08:45 – 09:00	ESCE014 Mrs. Nur Azreena Idris (Malaysian Palm Oil Board) <i>Production of Renewable Diesel from Palm Fatty Acid Distillate using Modified-zeolite Based Catalyst</i>
09:00 – 09:15	ESCE031 Mr. Pollawat Charoenkool (King Mongkut's University of Technology North Bangkok) <i>Evaluation of Integrated Hydrothermal-Organosolv Pretreatment for Lignocellulosic Biomass Fractionation</i>
09:15 – 09:30	ESCE125 Assoc. Prof. Dr. Bawadi Abdullah (Universiti Teknologi PETRONAS) <i>Techno-economic Analysis for Dry Reforming Methane Over Nickel Alumina Catalyst to Produce Syngas</i>
09:30 – 09:45	ESCE058 Dr. Mohd Zulkifli Mohamad Noor (Universiti Malaysia Pahang Al-Sultan Abdullah) <i>The Development of Nanoparticle Transport in Porous Medium for Fluid Flow Formation Movement Using CFD</i>
09:45 – 10:00	ESCE133 Mrs. Norazliza Md. Tahir (PETRONAS KLCC) <i>Flaring reduction through Flare Gas Recovery unit - Design and Operational Challenges</i>

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PARALLEL SESSION 2: ROOM 2

TRACK 2: RENEWABLE ENERGY & BIOFUELS /REACTION
ENGINEERING & CATALYSIS/ OIL& GAS/FLOW ASSURANCE IN
PIPELINES

Chairman: Assoc. Prof. Ts. Dr. Hermadina binti Setiabudi

- 10:15 – 10:30 **ESCE168**
Dr. Mohd Zaki Zainal Abidin (Universiti Teknologi MARA)
Characterizing Low Wax Content Systems Using Differential Scanning Calorimeter (DSC) and Spectroscopy
- 10:30 – 10:45 **ESCE160**
Dr. Norasyikin Ismail (Universiti Malaysia Pahang Al-Sultan Abdullah)
Enhancing Crude Oil Emulsion Separation: Investigating the Influence of Emulsion Properties on Microwave Demulsification
- 10:45 – 11:00 **ESCE072**
Miss. Siti Nur Syaza Abdul Rahman (Universiti Teknologi PETRONAS)
Study on the Preliminary Assessment of Polyhydroxyalkanoates (PHA) Extraction on the Chlorella Vulgaris sp. Microalgae using Supercritical CO₂ Fluid Extraction (sCO₂E) – Taguchi Approach
- 11:00 – 11:15 **ESCE112**
Mr. Azuan Abdul Latif (TNB Research Sdn. Bhd)
Overview and Challenges of Renewable Natural Gas Development in Malaysia from Organic Food Waste
- 11:15 – 11:30 **ESCE030**
Miss Amalia Isna Rahmawati (Universiti Teknologi PETRONAS)
Fabrication and Characterization of Fe/ZnO Photoanode Using Electrodeposition for Improved Photoelectrochemical Water Splitting Performance
- 11:30 – 11:45 **ESCE034**
Mr. Muhammad Syaamil Saad (Universiti Teknologi PETRONAS)
Study on Electrochemical Properties of TEA.PS-BF₄ Carbon Based Electrode in Proton Exchange Membrane (PEM) System
- 11:45 – 12:00 **ESCE172**
Dr. Mohd. Razali Shamsuddin (Universiti Malaysia Sabah)
Performance of NiO Doped on Alkaline Sludge From Waste Photovoltaic Industries For Catalytic Dry Reforming of Methane

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30 AUGUST 2023 (DAY 3)

PARALLEL SESSION 3: ROOM 3

TRACK 1: MODELING & SIMULATION/SEPARATION
TECHNOLOGY/NANOTECHNOLOGY/FOOD SCIENCE
TECHNOLOGY/SAFETY AND HEALTH MANAGEMENT
Chairman: Assoc Prof. Dr. Sumaiya Zainal Abidin

- 08:30 – 08:45 **ESCE054**
Prof. Chantaraporn Phalakornkule (King Mongkut University of Technology North Bangkok)
Application of Intermittent Nitrogen Purge in Vacuum Pressure Swing Adsorption Process for Biogas Upgrading with Zeolite Adsorbent
- 08:45 – 09:00 **ESCE074**
Miss Wan Nur Athirah Mazli (Universiti Teknologi PETRONAS)
Enhancing Stability of Glycerol as Surfactant for Beauty Product via Solvent-Aided Crystallization
- 09:00 – 09:15 **ESCE104**
Dr. Izni Atikah Abd Hamid (SEGi University & Colleges)
Mass Transfer Behavior of Papaya Leaves Oil in Combined Microwave and Solvent Extraction Method
- 09:15 – 09:30 **ESCE053**
Miss Yashini K.Selvanathan (Universiti Malaysia Pahang Al-Sultan Abdullah)
Isolation and Characterization of Acetic Acid Bacteria from Pineapple Peel for a Starter Culture in Acetic Acid Production
- 09:30 – 09:45 **ESCE071**
Mr. Muhammad Daniyal Lim (Universiti Teknologi MARA)
A review of efficiency, sustainability, and economic considerations of chlorogenic acid extraction methods.
- 09:45 – 10:00 **ESCE089**
Miss Nurmaryam Aini Hashim (Universiti Malaysia Pahang Al-Sultan Abdullah)
Influence of Air-Dry Flow Rate in Spray Drying Process of Commercial Fish Oil

30 AUGUST 2023 (DAY 3)

PARALLEL SESSION 3: ROOM 3

TRACK 2: MODELING & SIMULATION/SEPARATION
TECHNOLOGY/NANOTECHNOLOGY/FOOD SCIENCE
TECHNOLOGY/SAFETY AND HEALTH MANAGEMENT

Chairman: Assoc Prof. Ir. Dr. Chin Siew Choo

- 10:15 – 10:30 **ESCE159**
Dr. Fahd Alakbari (Universiti Teknologi PETRONAS)
A highly accurate machine learning model for the prediction of the uniaxial compressive strength (UCS) for sandstone rocks
- 10:30 – 10:45 **ESCE087**
Mr. Numan Abdul Hadi (Malaysian Palm Oil Board)
Experimental and Modeling Study for Continuous Extraction of Palm Oil from Sterilised Palm Fruit Using Organic Solvents
- 10:45 – 11:00 **ESCE162**
Mrs. Anis Mansor (Universiti Teknologi MARA)
Mathematical Modeling, Simulatin and Optimization of Low-Density Polyethylene (LDPE) in High Pressure Tubular Reactor
- 11:00 – 11:15 **ESCE163**
Miss Zafirah Supion (Universiti Teknologi MARA)
Modelling and Profit Maximization of Low-Density Polyethylene (LDPE) in Industrial High Pressure Tubular Reactor
- 11:15 – 11:30 **ESCE050**
Miss Aliya Nurzafira Nor Zaidi (Universiti Teknologi PETRONAS)
Study on the Effect of Choline Serine Deep Eutectic Solvents (DES) on the Solubility of CO₂
- 11:30 – 11:45 **ESCE094**
Assoc. Prof. Herma Dina Binti Setiabudi (Universiti Malaysia Pahang Al-Sultan Abdullah)
Silica-rich Waste as an Effective Scaffold for Hydrogen Storage: A Review
- 11:45 – 12:00 **ESCE081**
Ir. Dr. Mohd Sabri Bin Mahmud (Universiti Malaysia Pahang Al-Sultan Abdullah)
Dechlorination of Crude Palm Oil by using Strong Alkaline Buffer Solution
- 12:00 – 12:15 **ESCE107**
Assoc Prof. Sumaiya Zainal Abidin (Universiti Malaysia Pahang Al-Sultan Abdullah)
Optimization of Alumina Production from Aluminium Dross as a Potential Low-cost Waste-derived Adsorbent

DETAILED PARALLEL
TENTATIVE

30 AUGUST 2023 (DAY 3)

PARALLEL SESSION 1 (VIRTUAL)

Chairman: PROF. IR. TS. DR. KUMARAN A/L KADIRGAMA

Co-chairman: DR. NURUL NADIA BINTI MOHD ZAWAWI

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08:30 – 08:45	ESCE004 Dr. Fiona Ling Wang Min (Universiti Malaysia Sabah) <i>A Short Review on Flow Enhancement in Microfluidics</i>
08:45 – 09:00	ESCE011 Dr. Suzana Yusup (TNB Research) <i>Influence of Air Staging Ratio on Ash Compositions in Ammonia Co-Firing</i>
09:00 – 09:15	ESCE018 Mr. Shamsuri Rasidi (Universiti Tun Hussein Onn Malaysia) <i>Numerical Study of Curved Diffuser Performance by Means of Installing Woven Wire Mesh</i>
09:15 – 09:30	ESCE021 Mrs. Nor Asikin Awang (Universiti Teknologi Malaysia) <i>Adsorptive Removal Of Pb(II) By Layered Double Hydroxide: Effect Of Synthesis Conditions</i>
09:30 – 09:45	ESCE167 Dr. Ramnarong Wanison (Chiang Mai University) <i>Exploring the Effects of Flash Cryogenic Freezing on the Performance of Sodium-Ion Batteries</i>
09:45 – 10:00	ESCE142 Mr. Sohail Ahmed (Universiti Teknologi Petronas) <i>Screening of Amino Acid based ILs for Enhanced Solubility of Permethrin using the COSMO-RS Approach</i>

30 AUGUST 2023 (DAY 3)

PARALLEL SESSION 1 (VIRTUAL)

Chairman: PROF. IR. TS. DR. KUMARAN A/L KADIRGAMA

Co-chairman: DR. NURUL NADIA BINTI MOHD ZAWAWI

Microsoft Team Link: <https://shorturl.at/IDHMW>

- 10:15 – 10:30 **ESCE025**
Mrs. Nur Aqilah Mohd Razali (Universiti Teknologi Malaysia)
Light-driven Graphitic Carbon Nitride (G-C₃N₄) and Light-Storing Tungsten Trioxide (WO₃) for Wastewater Treatment via Photocatalytic Process
- 10:30 – 10:45 **ESCE026**
Dr. Wan Norharyati Wan Salleh (Universiti Teknologi Malaysia)
Surface Modification of Nanocomposite Membrane via Spray Coating for Oily Wastewater Treatment
- 10:45 – 11:00 **ESCE027**
Mr. Sengthong Lee (King Mongkut's University of Technology North Bangkok (KMUTNB))
Enhanced Nitrogen Removal in Anammox Process using Biochar Prepared from Sugarcane Bagasse and Earleaf Acacia Leaf
- 11:00 – 11:15 **ESCE029**
Mrs. Siti Zu Nurain Ahmad (Universiti Teknologi Malaysia)
Synthesis of Magnetic Zeolitic Imidazolate Framework-8 Modified Graphene Oxide and its Application in Lead Removal
- 11:15 – 11:30 **ESCE032**
Dr. Norshela Mohd Noh (Universiti Tun Hussein Onn Malaysia)
Quantifying the Uncertainty of the Wti Crude Oil Price in the Phase Covid -19
- 11:30 – 11:45 **ESCE033**
Mr. Syahir Mansor (Universiti Teknologi Malaysia)
A New Class of Phase Change Material Compositated with Mxene for Thermal Battery
- 11:45 – 12:00 **ESCE043**
Dr. Chiam Chel Ken (Universiti Malaysia Sabah)
Surface Modification of Meltblown Polypropylene Membrane by Titanium Dioxide for Oil/Water Separation

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30 AUGUST 2023 (DAY 3) PARALLEL SESSION 2 (VIRTUAL)

Chairman: ASSOC. PROF. IR. TS. DR. DEVARAJAN A/L
RAMASAMY

Co-chairman: NURUL AZRA BINTI BAKARUDDIN

Microsoft Team Link: <https://shorturl.at/isXY3>

- 08:30 – 08:45 **ESCE127**
Miss Nurul Izzati Mohd Noor Azli (Universiti Teknologi MARA)
Health Risk Assessment and CAMD of Electrospun Nanofiber Formulations for Diabetes Treatment
- 08:45 – 09:00 **ESCE140**
Dr. Nur Hidayah Mat Yasin (Universiti Malaysia Pahang)
Chitosan and Polyethylene Glycol Hydrophilic Plasticizer-Based Films: Preparation and Physicochemical Characterization
- 09:00 – 09:15 **ESCE147**
Miss Carla Goncalves De Oliveira Sarmiento (Universiti Malaysia Sabah)
Effect of Bamboo Biochar-coal Blend on Combustion Characteristic and CO₂ Emissions
- 09:15 – 09:30 **ESCE141**
Miss Siti Hajar Omar (Universiti Malaysia Pahang)
Study on Mechanical and Barrier Properties of Iron Cellulose/PLA Composite Film
- 09:30 – 09:45 **ESCE148**
Miss Vivian Ell Fera (Universiti Malaysia Sabah)
Synergistic and Physicochemical Effect of Blended Polymeric Drag Reducing Agent (DRA) Review on Synergistic and Physicochemical Effect on Blended Polymeric Drag Reducing Agents (DRAs)
- 09:45 – 10:00 **ESCE149**
Dr. Emma Suali (Universiti Malaysia Sabah)
Elongational Viscosity of Chitosan and its Effect on Drag Reduction

30 AUGUST 2023 (DAY 3)

PARALLEL SESSION 2 (VIRTUAL)

Chairman: ASSOC. PROF. IR. TS. DR. DEVARAJAN A/L RAMASAMY

Co-chairman: NURUL AZRA BINTI BAKARUDDIN

Microsoft Team Link: <https://shorturl.at/isXY3>

- 10:15 – 10:30 **ESCE150**
Dr. Shier Nee Saw (Universiti Malaya)
Computational Fluid Dynamics Simulation of Coughed Droplets in Tertiary Education Settings
- 10:30 – 10:45 **ESCE166**
Mrs. Nurul Aimi Ghazali (Universiti Teknologi MARA)
Improving Drilling Fluid Performance in High-Temperature Environments Through Modified Biopolymer Deflocculant Optimization
- 10:45 – 11:00 **ESCE060**
Dr. Yuttana Mona (Chiang Mai University)
Power Generation Prediction for Renewable Energy Fuel Using Multiple Linear Regression: A Case Study of Thailand
- 11:00 – 11:15 **ESCE066**
Dr. Hanizura Hassan (Universiti Teknologi MARA)
Co-Pyrolysis of Sugarcane Bagasse and Polyethylene Terephthalate Waste: Influence of Reaction Temperature on Product Distribution and Synergistic Effect
- 11:15 – 11:30 **ESCE068**
Mr. Murtaza Haider Syed (Universiti Malaysia Pahang)
Potential Applications of Nanocellulose Loaded Chitosan-PLA Based Biocomposite
- 11:30 – 11:45 **ESCE082**
Professor Renanto (Institut Teknologi Sepuluh Nopember)
Analysis of Solar Thermal Energy Integration in the Industry as An Effort To Reduce CO₂ Emission
- 11:45 – 12:00 **ESCE097**
Ir. Mohd Azahar Mohd Ariff (Universiti Teknologi MARA)
Maximizing Production of Methanol in Catalytic Reactor Using Ant Lion Based Optimization

DETAILED PARALLEL
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ACKNOWLEDGEMENT

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We would like to record a special thanks to all other organizations, committee members and individuals who had contributed their invaluable assistance, ideas, valuable time and efforts in making this conference a successful time.



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