# POPSIG

## Greener Future with Palm Oil

**A palm oil newsletter brought to you by:**

**IChemE Palm Oil Processing Special Interest Group**

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## WHAT'S IN THIS ISSUE



***Beyond Palm Oil: Connecting Life***

# Table of Contents

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Palm Oil Processing Special Interest Group

## Leadership Team



# Editor's Message

2023 has been filled with a broad range of POPSIG events. POPSIG takes this great opportunity to thank our stakeholders and members for supporting us.

On the 7th—9th November 2023, Malaysian Palm Oil Board (MPOB) had hosted the International Palm Oil Congress and Exhibition (PIPOC) 2023 in November 2023. The congress features four concurrent conferences covering upstream, midstream, downstream and value addition; processing, food safety and nutrition and global economics and marketing. A Four distinct conferences - Agriculture, Biotechnology, and Sustainability; Downstream and Value Addition; Processing, Food Safety & Nutrition; and Global Economics & Marketing - featured over 100 prominent speakers, enhancing the industry in our ever-changing global landscape.

On the 20th November 2023, the University Roadshow was organised by Swinburne University of Technology Sarawak, and co-organised by Curtin University Malaysia and UiTM Kota Samarahan. It is supported by POPSIG in conjunction with MPOC. The roadshow aims to share the innovations in sustainable palm oil development through a series of interactive events. The theme of this University Roadshow is 'Building Innovation Ecosystem for Futuristic Palm Oil Industry' . The goal is to address current challenges in the palm oil industry, fostering critical thinking and creative problem-solving among students. The focus is on educating students about sustainability concepts, offering in-depth exposure to the subject. Ultimately, the aim is to enhance understanding and explore possibilities for a sustainable economy, environment, and society. The two keynote speakers for this event are Ir Shyam Lakshmanan, General Manager at IOI Edible Oils Sdn Bhd, and Mr. Tan Chee Yong, Manager at the Malaysian Palm Oil Certification Council,

POPSIG would like to express our sincere gratitude to the outstanding contributions to Prof Ir Chong Mei Fong and Ir Dr Chew Jiuan Jing as the past Chairperson and Treasurer for the year 2023. Your dedication and hard work have played a pivotal role in the success and growth of our interest group. Your leadership has been instrumental in guiding us through various initiatives and ensuring the continued success of the group. We are truly thankful for your commitment to excellence and the positive impact you have made on our community.

Additionally, we would like to extend heartfelt congratulations to the newly appointed chairman, secretary, and treasurer for year 2024. We look forward to working collaboratively with Ir Dr Viknesh Andiappan Murugappan as the new Chairman, Ir Dr How Bing Shen as the Secretary, and Ir Dr Edwin Lim Chun Hsion as the new Treasurer. Your wealth of experience and expertise will undoubtedly contribute to the continued success and advancement of our interest group.

POPSIG would like to express our sincere appreciation to Desmet Malaysia Sdn Bhd, Malaysian Palm Oil Council (MPOC), Kuala Lumpur-Kepong (KLK) Oleomas Sdn Bhd, and Malaysian Oleochemical Manufacturers Group (MOMG) for their support to POPSIG. We wish everyone a very Happy New Year !

# Event: International Palm Oil Congress and Exhibition (PIPOC) 2023

Malaysian Palm Oil Board (MPOB) had hosted the International Palm Oil Congress and Exhibition (PIPOC) 2023 on 7-9 November 2023. The congress features four concurrent conferences covering upstream, midstream, downstream and value addition; processing, food safety and nutrition and global economics and marketing. The Prime Minister of Malaysia Yang Amat Berhormat Dato' Seri Anwar Ibrahim and the Deputy Prime Minister of Malaysia Yang Amat Berhormat Dato' Seri Fadillah Yusof officiated the event.

The Prime Minister said that the allocation of incentives for oil palm replanting programmes may be increased if companies working in the industry can prove that they will work with smallholders.

Four distinct conferences - Agriculture, Biotechnology, and Sustainability; Downstream and Value Addition; Processing, Food Safety & Nutrition; and Global Economics & Marketing - featured over 100 prominent speakers, enhancing the industry in our ever-changing global landscape.

The objective is to engage in discussions concerning strategic research and development (R&D) findings across the global oil palm and palm oil industry. The focus is on unveiling recent technological advancements aimed at enhancing the industry. Additionally, the aim is to develop strategies that foster sustainability, competitiveness, automation, and policies related to trade, market trends, and challenges in the oil palm and palm oil sector.

POPSIG's booth at the International Palm Oil Congress was a dynamic showcase, welcoming over 200 visitors and igniting enthusiasm among industry stakeholders. The vibrant space left an indelible mark, spotlighting a compelling commitment to revolutionize palm oil practices.

Featuring interactive displays, POPSIG's exhibition became a hub of innovation. Notably, they showcased impressive winning infographics from the MPOC Infographic Competitions, visually communicating the intricacies of sustainable palm oil practices. The captivating presentations of the POPSIG-KLK OLEO Palm Oil Video Competition underscored the power of visual storytelling in conveying the journey towards responsible palm oil production.

Amidst the bustling congress, POPSIG strategically networked with industry leaders, policymakers, and fellow NGOs. Their discussions emphasized the imperative need for a collective commitment to sustainable palm oil practices, resonating with a call to action that inspired others to join the movement for a greener, healthier palm oil industry.

As the curtains draw on this year's International Palm Oil Congress and Exhibition, POPSIG leaves a lasting impression, turning the vision of a sustainable future for the palm oil industry into a tangible reality. Their participation serves as a catalyst for change, urging stakeholders to reevaluate practices and embrace a new era of responsible palm oil production.

The success of the event owes much to the dedicated efforts of the exhibition project team, including Professor Chong Mei Fong, Oscar Ting Teo Wei, Ng Wai Lun, Dr. Chew Jiuan Jing, Yap Feng Ming, Leiu Yu Xuan, Wong Khai Jie, Jocelyn Lim Jean Yi, and Dr. Wendy Ng Pei Qin, whose contributions were instrumental in creating an impactful and successful event.


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# Event: POPSIG-MPOC Palm Oil Educational Roadshow at Swinburne 2023

On the 20th November 2023, the University Roadshow was successfully organised by Swinburne University of Technology Sarawak, and co-organised by Curtin University Malaysia and UiTM Kota Samarahan. It is supported by POPSIG in conjunction with MPOC. The roadshow aims to share the innovations in sustainable palm oil development through a series of interactive events.

The theme of this University Roadshow is ‘Building Innovation Ecosystem for Futuristic Palm Oil Industry’ . The goal is to address current challenges in the palm oil industry, fostering critical thinking and creative problem-solving among students. The focus is on educating students about sustainability concepts, offering in-depth exposure to the subject. Ultimately, the aim is to enhance understanding and explore possibilities for a sustainable economy, environment, and society.

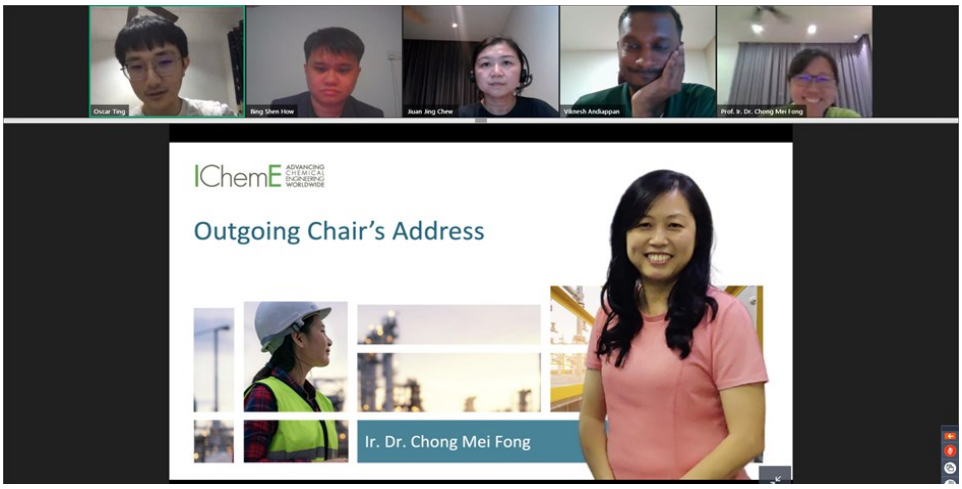
Ir Shyam Lakshmanan, General Manager at IOI Edible Oils Sdn Bhd, brings a wealth of experience in chemical engineering and palm oil processing. Notably, his team successfully installed a biomass-fueled cogeneration boiler in 2019, significantly reducing emissions and generating both steam for the refinery's needs and 7MW of power. Under his leadership, the R&D department achieved milestones such as contaminant reduction in processed palm oil and improving Fractionation plant yield. Currently, they are working on a Glycidyl Ester mitigation plant designed through their own R&D efforts, showcasing their commitment to sustainability and innovation.

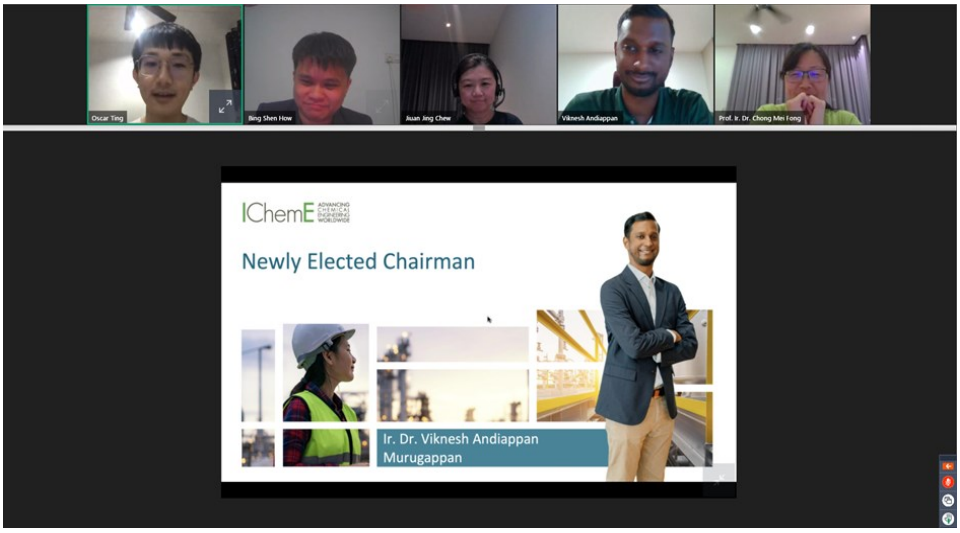
Mr. Tan Chee Yong, Manager at the Malaysian Palm Oil Certification Council, plays a crucial role in providing technical support for MSPO certification in the palm oil industry. With a background in Biotechnology and experience in policy development, industry-government relations, and project management, Tan has been a key figure in shaping and implementing Malaysian Biofuel policy, particularly in palm biodiesel, during his tenure at the Ministry of Plantation Industries and Commodities. His expertise contributes to the industry's adherence to certification standards and sustainable practices.


# Event: Palm Oil Processing Special Interest Group Annual Meeting

On the 22nd December 2023, IChemE POPSIG had hosted the annual meeting which covers the illustration of the important achievements attained in 2023 and outline the future prospect and planning of the group. It also serves as a platform for two-way dialogue between the group chair/committees and the members.

The group conducted elections for Chair, Treasurer and Secretary prior to the annual meeting. The annual meeting started at 6pm. The welcoming address was conducted by Mr Oscar Ting followed by the outgoing chair's address by Prof Ir Chong Mei Fong, secretary's report by Ir Dr How Bing Shen, and treasurer's report by Ir Dr Chew Jiuan Jing. IChemE and POPSIG members have nominated and decided the new POPSIG leadership via IChemE formal platform. The newly appointed chairman is Ir Dr Viknesh Andiappan Murugappan, newly appointed secretary, Ir Dr How Bing Shen, and newly appointed treasurer by Ir Dr Edwin Lim Chun Hsion. POPSIG would like to express our sincere gratitude to the outstanding contributions to Prof Ir Chong Mei Fong and Ir Dr Chew Jiuan Jing as the past Chairperson and Treasurer for the year 2023. Your dedication and hard work have played a pivotal role in the success and growth of our interest group. Your leadership has been instrumental in guiding us through various initiatives and ensuring the continued success of the group. Currently, the appointment on the vacant roles such as vice chair and other roles will be done in due course.  The meeting adjourned at 6.40pm.



# Article: From Misperception to Realities: Unraveling the Circular Economic Potential of Malaysian Oil Palm Industry

*Written by Wong Jung Lin*

*(Swinburne University of Technology Sarawak campus)*

Malaysia is recognised as the second top global crude palm oil producer after Indonesia, contributing to the production of 18.45 million metric tons in 2022 [1]. The palm oil industry is the backbone of Malaysia's economy, producing a revenue of around RM102 billion in 2021 [2]. As the most cultivated plant in Malaysia, the total oil palm plantation area soared to 5.67 million hectares in 2022, with the majority situated in Sarawak (1.62 million hectares) and Sabah (1.51 million hectares) [3]. Compared to other types of vegetable-derived oils (e.g. soybean-, sunflower-, and corn-derived oil), palm oil is competitive in terms of its low price, preeminent shelf life, and high oxidation stability [4]. As such, palm oil is widely used in various industries, such as cosmetics, food, and bioenergy sectors, contributing to the production of various value-added products [5].

During the processing of fresh oil palm fruit bunches, approximately 70% are converted into wastes, such as EFB, PKS, and POME [4, 6]. This raises the issues of managing and disposing of the biomass, which are significant concerns. For example, the disposal of EFB without treatment to remove the remnant oil in the plantation leads to the oil spill issue [7]. The disposal of POME, i.e. an acidic, hazardous waste liquid generated during palm oil production) causes pollution to the watercourse and soil [8]. The traditional waste management strategies, e.g. open-burning and landfilling, lead to the wastage of substantial amounts of precious biomass resources and cause significant environmental issues. The open burning leads to environmental concerns, e.g. greenhouse gas emissions, air pollution, and wildfires. Landfilling the biomass without proper treatments will result in methane (a greenhouse gas) emissions, soil pollution, and potentially cause pollution to nearby water sources. This leads to the public's misperception that the palm oil industry cannot achieve a circular economy, which is untrue.

As illustrated in Figure 1, the circular economy of biomass refers to an approach in which biomass is adequately managed in a closed-loop system to minimise waste generation and efficiently utilise biomass resources. The circular economy approach is viable via comprehensive oil palm residue valorisation in the context of the palm oil industry. From the aspect of the second principle of circular economy (i.e. circulate products and materials), this is essential to fully exploit the potential of the palm oil industry more sustainably, as the wastes are efficiently utilised at the highest level of effectiveness [9]. For instance, EFB, PKS, and MSF can be incinerated to provide heat and energy to the reboiler in oil palm mills [7]. POME is a promising feedstock for synthesising biogas, which can later be used in power generation [10]. Some research reveals the potential of PKS as an environmentally friendly road-hardening material [11]. Apart from the direct utilisation of the oil palm biomass, tremendous research has been conducted on the pretreatment of the oil palm biomass to increase its value in downstream applications. Figure 2 depicts the wide range of processing methods for oil palm biomass and their potential usage. Abnisa et al. [12] studied the slow pyrolysis of PKS and obtained a high biochar yield with a higher heating value (HHV) comparable to coal and coke, indicating the potential of PKS-derived biochar as a promising renewable energy source. In a pilot-scale study, Sudiyani et al. [10] converted EFB into bio-ethanol. The study involved the pretreatment of EFB using alkali (to deconstruct EFB), saccharification of pretreated EFB (to convert EFB into simple sugars), and fermentation of EFB (to convert simple sugars into bioethanol). Kabir et al. [13] pyrolysed MSF (catalysed by steel slag-derived zeolite) under 550 °C and obtained acid-rich carbonyl- aromatic-rich biomass, a promising feedstock for chemical synthesis. Isa et al. [14] studied the anaerobic digestion of POME coupled with ultrasonic pretreatment. The resultant biogas collected from the ultrasonic pretreated specimen demonstrated an improved methane content of 21.5% compared to the untreated specimen. These studies revealed the potential of different oil palm biomass to be converted into various high-value products via different processing methods.

Additionally, applying closed-loop agricultural practices, e.g. EFB mulching significantly contributes to developing a circular economy in the palm oil industry. The EFB mulching practice returns the remaining nutrients in the EFB to the plantation, improving the soil properties (i.e., higher soil organic carbon content) and increasing oil palm yield [15]. This approach reduces the reliance of oil palm plantations on artificial fertilisers, ensuring the sustainability of the palm oil industry. On the other hand, developing sustainable supply chain management is also a crucial part of the circular economy of the palm oil industry to achieve environmental, economic, and social sustainability. The Malaysia Sustainable Palm Oil (MSPO), i.e. a national certification body, promotes the sustainability of the local palm oil industry by establishing standards and criteria for oil palm management and supply chain [16]. Every Malaysian palm oil producer must apply for MSPO certification to demonstrate their obligation to responsible and sustainable practices throughout the palm oil supply chain [17]. According to the latest transition plan for using the MSPO standard, the most updated MSPO scheme (i.e. MS2530:2022) is planned to be implemented across the industry starting 1st August 2023, with a transition period of 17 months [18]. With compliance to the MSPO standard, issues confronted by Malaysian oil palm industries, including waste generation issues, labour shortage, and banning palm oil applications, could be addressed [19]. Despite the potential advantages that MSPO could bring, the efficient popularisation of MSPO certification to the palm mill holders is still an issue. This is attributed to the long period and high cost required to fulfil the criteria in MSPO regulations [20]. In short, MSPO certification serves as a promising approach for the palm oil industry to achieve sustainable environment, economic, and social.

The Malaysian palm oil industry is on a transformative journey, paving the way for a more sustainable future. The circular economy concept in the palm oil industry involves minimising and valorising oil palm biomass, applying closed-loop agricultural practices, and participating in sustainable supply chain management to enhance environmental, social, and economic sustainability. Through these practices, Malaysian oil palm industries could redefine their misrepresented image in public as re-

sponsible palm oil producers. Thus, people could gain confidence that the Malaysian palm oil industry is actively working towards achieving a circular economy.

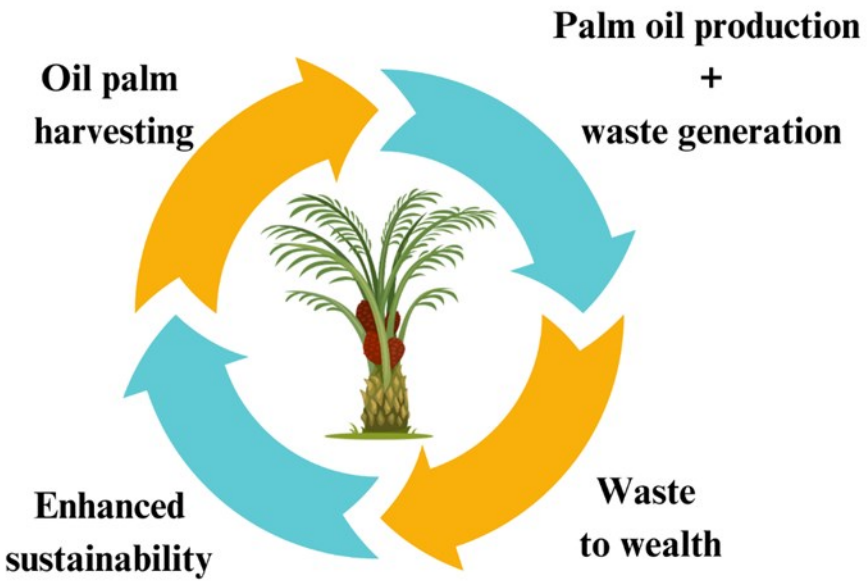



Figure 1. Circular economy concept in the palm oil industry.

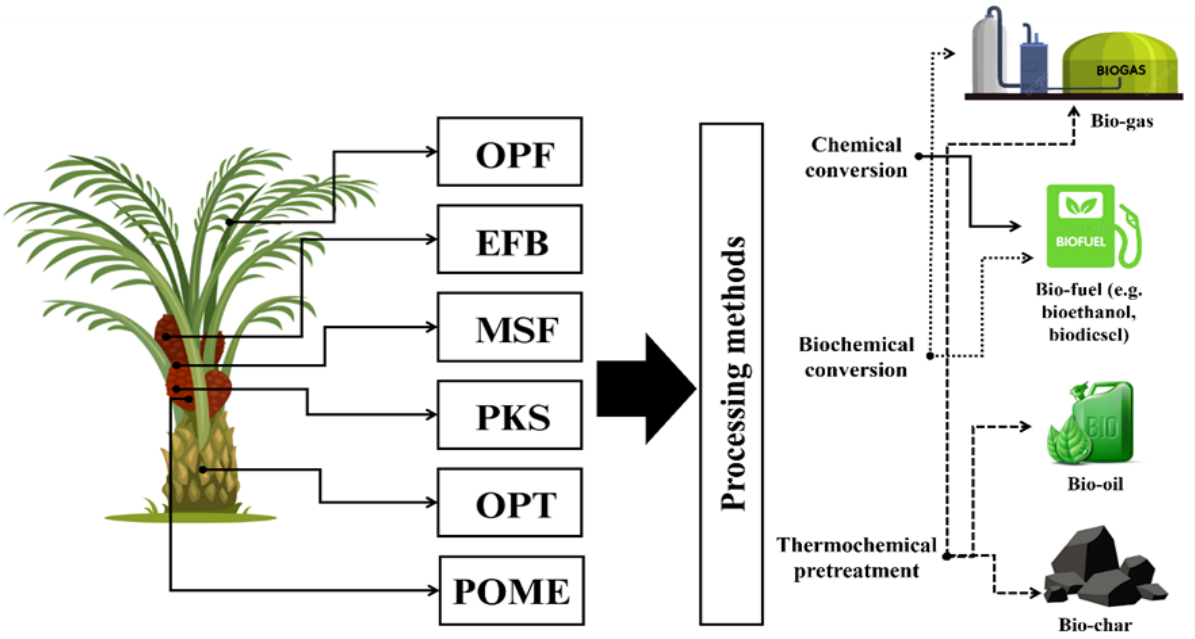



Figure 2. Potential application of oil palm biomass after pretreatment. The solid, dotted, and dashed lines refer to chemical conversion, biochemical conversion, and thermochemical pretreatment processes, respectively.

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### 2.2 Palm oil applications in food products

#### 2.2.1 Bakery products

Palm oil is one of the primary baking oils. Palm stearin enabled bakery products to remain pliable even without hydrogenation, thereby significantly reducing trans-fat intake in diets(Kellens et al. 2007). When approximately 10% of palm oil shortening was added during the bread baking process, the bread's volume was increased to the optimum level of 4%(Chin et al. 2010). It displayed that palm oil positively impacted the texture and filling capacity of bakery products, and their commercial value could be improved.

#### 2.2.2 Fried food

Palm oil is the preferred frying oil due to its high stability. Palm oil was evaluated by the score for taste of the product that had been fried five times. The fried product in palm oil and soybean oil received similar high score (8.5 and 8.6), but low score (7.8) in mustard oil. Sensory evaluation revealed that the palatability of food items fried in palm oil was comparable to soybean oil, while food items fried in mustard oil exhibited poor palatability(Rashid et al. 2023). Nile tilapia is typically fried before consumption, with palm oil being the usual choice(Tadesse Zula et al. 2021). It is common that palm oil is used in fried food.

#### 2.2.3 Chocolate

Palm oil is frequently used as a substitute for cocoa butter in chocolate products. Substituting palm oil for cocoa butter in the chocolate bar-making process resulted in an increase of unsaturated fats content and a decrease in the melting point and hardness of chocolate bars(Limbardo et al. 2017). Chocolate products derived from a blend of coconut fat and palm oil shortening exhibited physical properties similar to those from cocoa butter(Limphapayom 2013).

#### 2.2.4 Plant protein drinks

In addition, palm oil-based soy milk can enhance the emulsion stability of vegetable protein drinks. Higher storage stability in palm oil-based compared to traditional plant protein drinks (Pan et al. 2017). Better viscosity, stability and sensory of red palm oil emulsion drink can be obtained by adding different concentrations of Carbon Methyl Cellulose (CMC) and mango flavor (Silsia et al. 2021).

## 3. Sustainable strategies for palm oil applied in the food industry

### 3.1 Sustainability in strengthening institutions and systems improvement.

Roundtable on Sustainable Palm Oil (RSPO) has been developing and implementing global standards for sustainable palm oil. Numerous regions have also established organizations and robust systems to drive the uptake of more sustainable palm oil in the world. Malaysian Sustainable Palm Oil (MSPO) was established in 2013, launching a certification scheme for sustainable oil palm. Food safety requirements of palm oil products can be reasonably addressed by the Malaysian Palm Oil Board (MPOB). European Sustainable Palm Oil (ESPO) was established in 2015 and the Indonesia Sustainable Palm Oil (ISPO) standard was introduced in 2011. All of them are committed to sustainable economic, social and environmental objectives. Furthermore, promoting sustainability necessitates the development of market mechanisms, particularly in the oil palm sector (Omar et al. 2012).

### 3.2 Sustainability on innovative palm oil applications in food products

Development on the sustainability of palm oil in the food industry is possible by improving the quality of palm oil-used food products and devoting to its diversification and innovation. The pendawa chocolate with mixing ratio of palm oil and coconut oil had the same nutrition as the original and better texture(Harahap et al. 2023). In addition, palm oil and monoglyceride stearate were used as a base oil and oleogelator separately, and produced oleogels which can partially substitute for cocoa butter (30% w/w) to make chocolate with heat-stable and bloom-resistant(Chen et al. 2022). Hence, focusing on innovation to improve nutritional and practical value could inspire larger production capacity of palm oil-used food products.

### 3.3 Sustainability in valorization of biomass waste from palm oil

Biomass production from empty fruit bunch (EFB) after extraction of palm oil can be reduced and utilized into gas fuel production which can be considered as a renewable energy resource by gasification technology(Aktawan et al. 2020). Converting biomass waste into energy not only solved energy crisis, but also benefited environmental conservation. Furthermore, oil palm male inflorescence organic waste can be used to synthesis carboxymethyl cellulose, which is regarded as an ice cream stabilizer(Jainal et al. 2023). Therefore, it is possible that the sustainability of oil palm can be realized by converting biomass waste into energy and making new food additives.

### 3.4 Sustainability in optimization process and equipment advancement

Optimization of palm oil extraction process and advancing equipment for its production can improve its security in the food industry. Converging on lower production costs could significantly improve economic returns. Both aluminum and 316 stainless steel were chosen as storage tank for palm oil in terms of equipment advancement(Nizam & Mahmud 2021). Prior to

palm oil extraction, fresh fruit bunches undergone sterilization process in boiler and sterilizer. An integrated design combined the boiler and sterilizer for fresh fruit bunches, resulting in significantly reduced specific water consumption compared to conventional methods(Wae-Hayee et al. 2022). Consequently, enhancement of security and lower production costs from palm oil applications can be applied to promote the sustainability of palm oil in food products.

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# News: POPSIG Presented at PIPOC 2023

Malaysian Palm Oil Board (MPOB) is a government agency established under the jurisdiction of the Ministry of Plantation and Commodities (KPK). MPOB organised the 7th International Palm Oil Congress and Exhibition (PIPOC) in Kuala Lumpur Convection Centre, 7-9 November 2023.

The Prime Minister of Malaysia Yang Amat Berhormat Dato' Seri Anwar Ibrahim and the Deputy Prime Minister of Malaysia Yang Amat Berhormat Dato' Seri Fadillah Yusof officiated the event.

The Prime Minister said that the allocation of incentives for oil palm replanting programmes may be increased if companies working in the industry can prove that they will work with smallholders.

The Prime Minister said this was because smallholders account for 28% of the total area used for palm oil production and there is a need for better synergy between the more successful and the lesser-performing stakeholders.

Recognising the smallholders' vital role, YAB Dato' Seri Anwar Ibrahim had announced the incentive for oil palm replanting programmes with an allocation of RM100 million in Budget 2024. He hoped this incentive will enable smallholders to increase productivity by replanting old trees with new breeds, including clonal materials, with high yield potential of fresh fruit bunches.

The Prime Minister would be willing to increase the financial allocation to enhance the synergy between the ones who have better technologies and the smallholders. He pointed out that the MADANI concept upholds equality and such cooperation would make for a more equal field for all stakeholders in the industry to ensure all can reap profits.

The Prime Minister said the palm oil industry was one of the key drivers of the economy. YAB Dato' Seri Anwar Ibrahim said that the palm oil industry provided employment to more than three million people along its supply chain, including around half a million smallholders.

YAB Dato' Seri Anwar Ibrahim said that the palm oil industry stands out as a robust cornerstone in the pursuit of the MADANI Economy, propelling Malaysia towards its aspiration of becoming one of the world's top 30 economies.

YAB Dato' Seri Anwar Ibrahim said that globally, palm oil is the largest produced vegetable oil which accounts for 32% of the 246 million tonnes of global oils and fats in 2022. Global production of palm oil is expected to reach 81.44 million tonnes in 2023, increasing by almost 3%. This can be achieved by using only about 6% of the total land used by oil crops.

The Prime Minister said that palm oil is the most productive oil which yield yields at least four to five times more oil per hectare as compared to other vegetable oils. He further stated that Malaysia takes pride as the world's second largest palm oil producer, accounting for 31% of the 87.39 million tonnes produced globally last year. This accounted for 49% of the world's palm oil exports.

The Prime Minister said Malaysia managed to achieve this with only about 5.67 million hectares of planted area. This also accounted for less than 2% of the total 312 million hectares of area for oilseed crops production globally.

The Deputy Prime Minister said that environmental sustainability must be upheld when using advanced technologies in the palm oil industry. Malaysia must commit to sustainable energy without compromising industry development.

Since the 1980s, Malaysia has been committed to sustainable energy, pioneering the development of palm-based biodiesel technology, contributing to environmental sustainability and energy efficiency.

Malaysia has made significant strides in breeding and biotechnology research, resulting in successfully developing clonal palm series; and its genome programmes aimed at enhancing yields and reducing contamination risks.

The Deputy Prime Minister was proud to say that Malaysia has achieved significant milestones by successfully sequencing the oil palm genome, leading to ground breaking discoveries that enhance the efficiency of breeding practices.

The opening ceremony was attended by Prime Minister of Malaysia, Yang Amat Berhormat Dato' Seri Anwar Ibrahim; Deputy Prime Minister of Malaysia cum the Minister of Plantation and Commodities, Yang Amat Berhormat Dato' Seri Fadillah Yusof; Minister of Agriculture and Food Security, Yang Berhormat Menteri Datuk Seri Haji Mohamad Bin Sabu; Secretary General of Ministry of Plantation and Commodities, Yang Berbahagia Dato' Haji Mad Zaidi Bin Mohd Karli; Chairman of Malaysian Palm Oil Board, Yang Berbahagia Datuk Mohamad Helmy Othman Basha; and Director General of Malaysian Palm Oil Board, Yang Berbahagia Datuk Ahmad Parveez Haji Bin Ghulam Kadir.

Eur. Ing. Hong Wai Onn, Learned Society Committee at IChemE and the Founder of POPSIG presented at the Global Economics & Marketing Conference during PIPOC 2023.

He presented "Economic and Environmental Impact of Using Palm Kernel Expeller for Feed Meal Production" on 9th November 2023, which was chaired by Yang Berbahagia Datuk Mohamad Helmy Othman Basha, Chairman of MPOB.

The finest palm oil videos and top 20 infographics of 2023 were presented to the government agencies, industrial professionals, research groups and international communities during PIPOC 2023.

PIPOC 2023
MPOB International Palm Oil Congress and Exhibition
NAVIGATING UNCERTAINTIES BUILDING RESILIENCE

## HENRI FAUCONNIER LECTURE

NAVIGATING UNCERTAINTIES BUILDING RESILIENCE

**Tan Sri Datuk Dr. Yusof Basiron,**
DIBIZ Global, Malaysia

PIPOC 2023
MPOB International Palm Oil Congress and Exhibition
NAVIGATING UNCERTAINTIES BUILDING RESILIENCE

## PLENARY SESSION

IMPACTS OF CLIMATE CHANGE TO OIL PALM

**PROF. ALAIN RIVAL**
French Agricultural Research Centre for International Development (CIRAD), Indonesia

THE POWER OF PALM OIL: HOW IT BOOST SUSTAINABLE NUTRITION

**Dr. Pietro Paganini**
Competere European Union

VALUE ADDITION FROM WASTE BIOMASS: A CIRCULAR ECONOMY APPROACH

**Prof. Dr. Jonathan Wong Woon Chung**
Hong Kong University, Hong Kong

STRENGHTHENING PALM OIL RESILIENCE IN FACING GLOBAL ECONOMIC UNCERTAINTIES

**YBhg. Datuk Mohamad Helmy Othman Basha**
Sime Darby Plantation Berhad, Malaysia

# News: Thank You Yang Amat Berhormat Dato' Sri Hadillah Bin Haji Yusof

# News: Congratulations Yang Berbahagia Dato' Carl Bek-Nielsen

# News: Congratulations Yang Berhormat Datuk Seri Johari Bin Abdul Ghani

IChemE

Palm Oil Processing
Special Interest Group

*Congratulations*

**Yang Berhormat**
**Datuk Seri**
**Johari Bin Abdul Ghani**

*on his appointment as*

**Minister of**
**Plantation and Commodities**

*effective 12 December 2023*

*Sincere wishes from*

POPSIG

*Top Management & Executive Team*

WWW.ICHEME.ORG/PALM

# News: Congratulations Yang Berhormat Datuk Chan Foong Hin

IChemE

Palm Oil Processing
Special Interest Group

*Congratulations*

**Yang Berhormat**
**Datuk Chan Foong Hin**

*on his appointment as*

**Deputy Minister of**
**Plantation and Commodities**

*effective 12 December 2023*


*Sincere wishes from*

POPSIG

*Top Management & Executive Team*

WWW.ICHEME.ORG/PALM

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