January-March 2022

IChemE 100 POPSIG

A palm oil newsletter brought to you by:

IChemE Palm Oil Processing Special Interest Group

IChemE

Palm Oil Processing
Special Interest Group

Correcting the misperception on palm oil

WHAT'S IN THIS ISSUE

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Editor's Message

2022 has marked a significant milestone to IChemE, as the institution has been established for 100 years since 1922. In the celebration of IChemE100, a programme with nine technical themes was introduced to show the impacts of chemical engineering in our modern lives. In conjunction with IChemE100, POPSIG also presented the role of palm oil industry in addressing two themes in the first quarter of the year, namely sustainability and environment, and education and technology.

Price of Malaysian crude palm oil was at record high on 2 March 2022, while the report suggested labour shortage, conflict in some part of the world, trade dispute and La Nino were among the contributing factors. These signal that chemical engineers have important roles to play to safeguard food security, overcome global crisis and achieve UN Sustainable Development Goals.

POPSIG had organised numerous talks delivered by professionals from academia and industry. Topics covered were CPO extraction, catalytic conversion of palm-based residues, industrial automation in palm oil industry, and the improvement of palm oil extraction productivity.

In January, Malaysia's Ministry of Plantation Industries and Commodities launched Malaysian Palm Oil Full of Goodness campaign to promote the scientifically proven benefits of palm oil to humankinds and the environment. In addition, numerous events had been organised to address the challenging issues, for examples, MPOC-hosted Reach and Remind Seminar, MPOB-hosted Review and Outlook Seminar, and MPOCC-hosted CSPO Forum and Launch of MSPO 2022.

In light of World Expo 2020 in Dubai, MPOC and MPOCC jointly organised Palm Oil Sustainability Debate @ Dubai in February 2022 to promote the sustainability practices that have long been exercised in Malaysian industry. Bursa Malaysia Derivatives Berhad had hosted Palm and Lauric Oils Price Outlook Conference and Exhibition (POC) 2022 in Shangri-la Hotel Kuala Lumpur to discuss the future of the industry and the ways forward to overcome pressing issues.

IChemE-UM Student Chapter-hosted National Chemical Engineering Exposure Camp 2022 was held to facilitate exposure of chemical engineering course to the pre-university students. The event, which was recognised by the Ministry of Education, Malaysia demonstrated the organisers' effort to promote an equitable, inclusive, high-quality learning opportunity to students.

POPSIG Youth Sustainable Project, which consists of POPSIG-MPOC educational roadshow and student bursaries, was named as one of the Top 20 best projects by the Delegation of EU to ASEAN, in partnership with ASEAN Secretariat. The project identifies that students could develop positive social health, build tolerance and promote greater understanding within peers through roadshow organisation. POPSIG would like to share this pride with Malaysian Palm Oil Council and Desmet Ballestra (Malaysia) Sdn Bhd.

The 2022 POPSIG awards and bursaries are open for applications. They include Best Final Year Design Award, Student Bursary (for Conference), Student Research Project Bursary and Article Honorarium. With great privilege, POPSIG greatly appreciates the support provided by Desmet Ballestra (Malaysia) Sdn Bhd and Malaysian Palm Oil Council to our activities. We look forward to great activities in 2022.

Webinar: New Extraction Technology for Crude Palm Oil Extraction

On 17 January 2022, Ts Dr Mohd Sharizan Md Sarip, Senior Lecturer at Universiti Malaysia Perlis (UNIMAP) delivered a webinar to discuss about the improvement in CPO extraction. The webinar recorded 54 online participants.

Dr Sharizan introduced that the current process reported 7-10% CPO left unextracted in palm oil pressed fibre (PPF), which is the byproduct of the screw press system. The data also showed 600 to 1000 ppm vitamin E in commercial CPO, whereas there are about 2000 to 4000 ppm vitamin E in PPF.

Hot compressed water extraction (HCWE) was selectively chosen due to its selective extraction, low polarity, and improved yield in the extraction of herbal product and environment sample. The entrainment-dominated process levelled up CPO yield.

His study was on solubility and extraction mechanism using empirical and theoretical methods. The former approach showed 7% CPO solubility in the yield, whereas no solubility was observed using theoretical method.

Overall, temperature has a significant effect on CPO yield and minor components, whereas pressure does not, however, pressure has effects on minor components. The process improved vitamin E concentration to 2204 ppm while a modest increase in β-carotene. Second order mass transfer model gave an accurate prediction. Hydrolysis of cell wall facilitates the entrainment of CPO. The solubility prediction strengthened the result of entrainment-dominated mechanism.

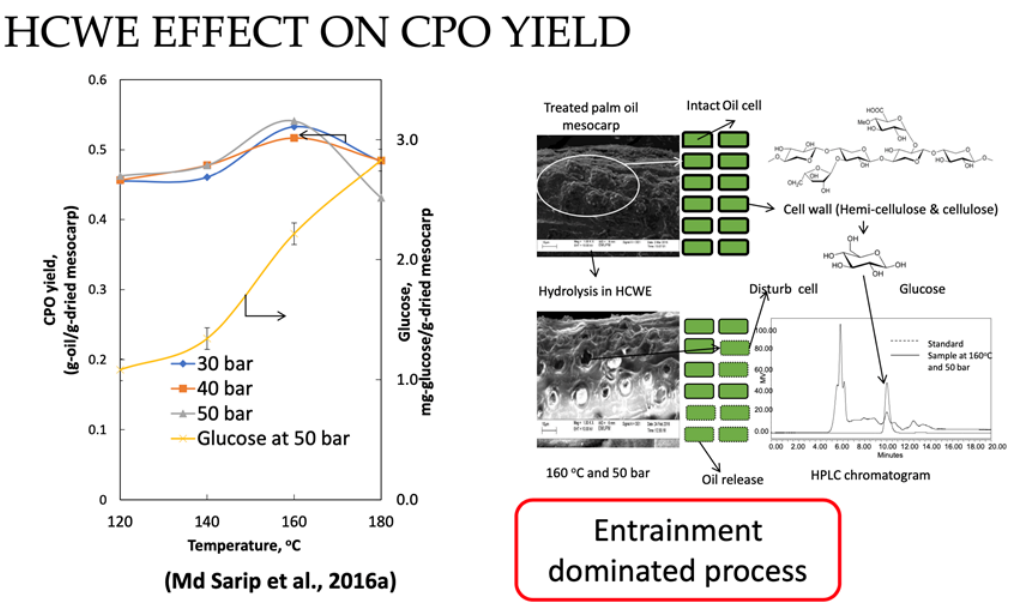


Figure 1: HCWE effect on CPO yield.

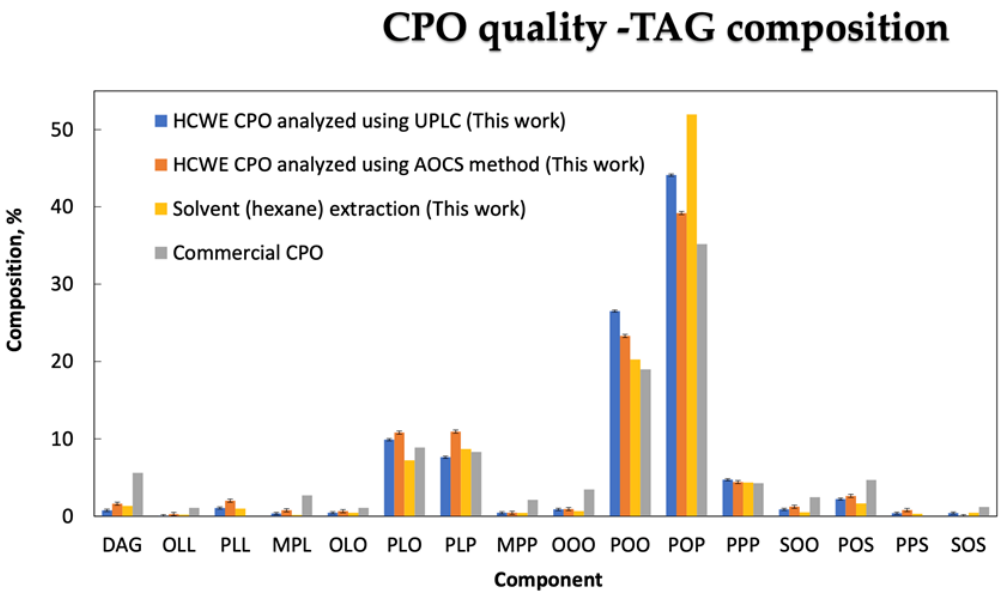


Figure 2: CPO quality was reflected on the outcome of TAG composition .

Webinar: Responsible Palm Oil Processing

IChemE Malaysia MG hosted a webinar titled “Responsible Palm Oil Processing” presented by Ir Shyam Lakshmanan, General Manager at IOI Edible Oils, Malaysia on 26 January 2022.

Shyam presented that the new chiller for dry fractionation (DF) plants would be environmentally friendly as the low electricity consumption results in low GHG emission. It will also improve the product quality through heat exchange between cooling tower water temperature with cold olein. High productivity by the installation of highly efficient centrifugal chiller increases throughput, shortens cycle time, and reduce electricity consumption by about 20%. It also uses inverter to level up the flowrate of pump without replacing new pump and motor to save costs.

Improved steam distribution could enhance the green energy generation on site. The separation of high and low pressure steam line has improved the savings by 21%, while the green energy generation increased from 6.5 MW to 9 MW. Compressed air pipeline at palm kernel DF plant saves compressed air energy by 4-25% through a reduction in artificial demand.

On digitalisation, the firm’s IT team is studying the incorporation of vibration sensor on kernel expeller press as part of the predictive maintenance. It allows the vibration reading to be analysed and displayed on the web-based system.

Figure 1: Shyam presented the significance of the new equipment for energy savings.

Webinar: Catalytic Upgrading of Palm-based Residues to Valuable Products

On 18 February 2022, Dr Lee Hwei Voon, an Associate Professor based in Nanotechnology and Catalytic Research Centre (NANOCAT) at the University of Malaya, Malaysia presented the catalysis-themed webinar. The webinar recorded 58 online participants.

Dr Lee reported that every year, about 70 million tons of biomass are discharged in Malaysia, of which 85.5% is discharged by the palm oil industry. Residues generated at plantation are fronds and trunk, while those produced at palm oil mill include EFB, fibre, shell and POME. This presentation focused on two studies to unlock the biomass chemistry. One, conversion of palm biomass into biofuels/ biochemicals. Two, conversion of solid palm biomass into nanocellulose.

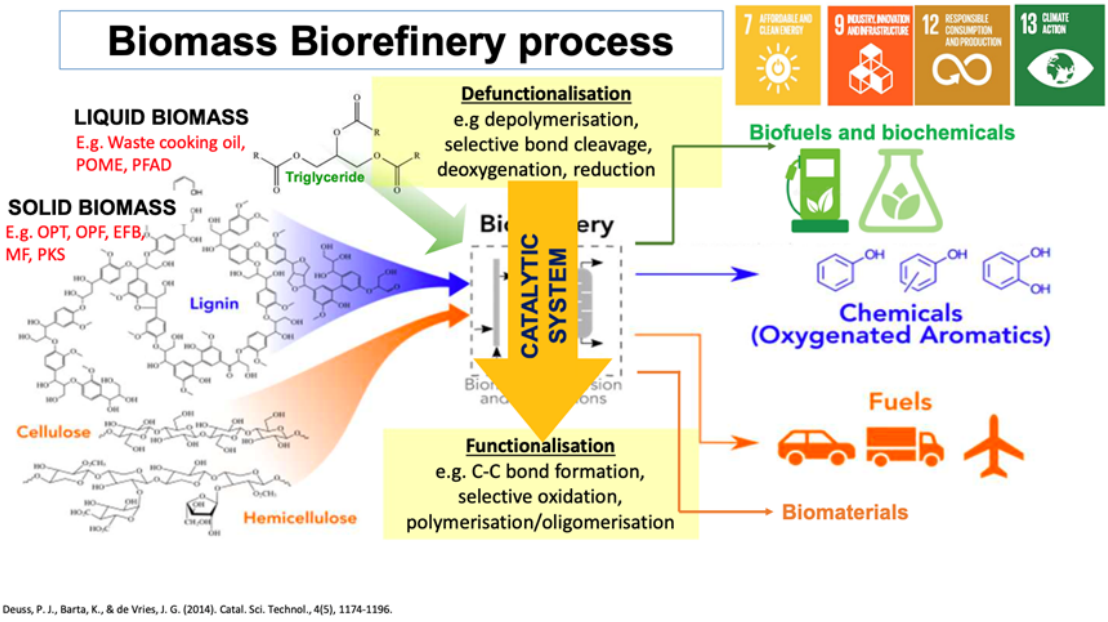


Figure 1: Biomass biorefinery process

The associate professor presented two reactions involved in the liquid biomass conversion process: transesterification and deoxygenation. The former one is economically effective but poor fuel performance, whereas the latter approach observes high fuel performance but at high operating cost. Deoxygenation of high FFA oils via the acid-base catalyst reduces undesirable side reactions and tunes product distribution by reducing oxygen content.

Nanocellulose is a cellulosic material and a versatile green platform that possesses high crystallinity, and is biodegradable and biocompatible. As opposed to low-yield conventional process, one-pot oxidative-hydrolysis process consumes shorter treatment duration and reduces multiple purification steps.

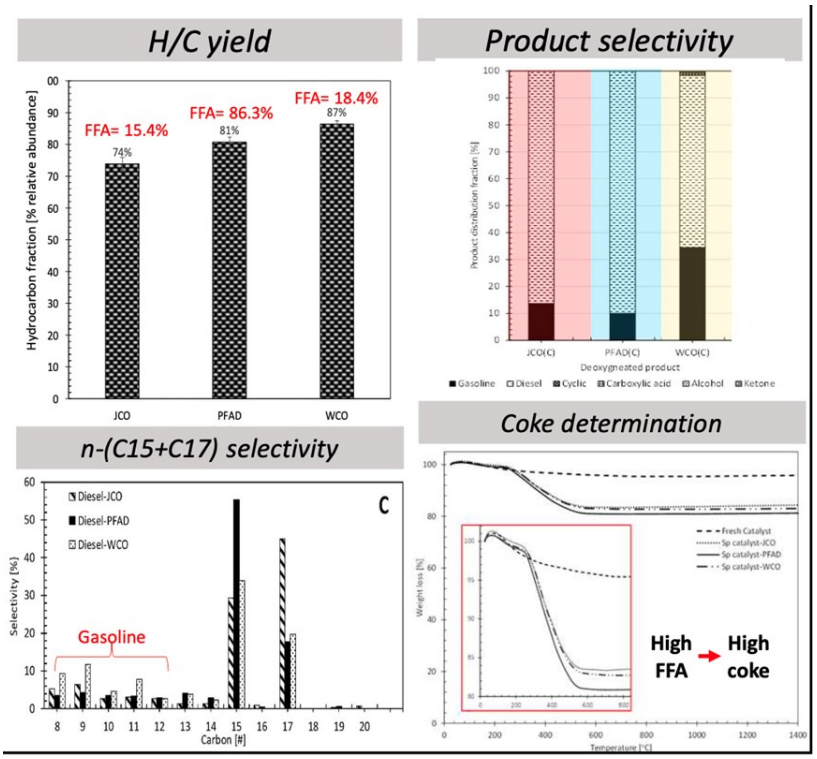


Figure 2: High FFA resulted in high coke deposition.

Webinar: Industrial Automation to Industrial Autonomy

On 15 March 2022, Jocylin Yong, a Certified Industry4WRD RA Assessor at Yokogawa Electric (Malaysia) Sdn Bhd presented the digitalisation-themed webinar. The webinar recorded 39 online participants.

Industry 4.0 refers to the smart factory, autonomous systems, IoT and machine learning. Industrial autonomy is independent and requires minimal human interaction to empower operators to perform high-level optimisation tasks.

Jocylin outlined four typical challenges on the way towards industrial autonomy: limited clarify, inadequate data and infrastructure readiness, implementation pitfalls and funding. The convergence of information technology (IT) and operation technology (OT) will bring advanced process control, interoperability, greater control and resiliency.

There are four challenges in implementation: people and organisation culture, cyber security, operational understanding, and availability of qualified partner. Digitising (sensing) equipment can measure the key parameters to maintain the equipment; digitalising (sensemaking) equipment allows the user to identify equipment condition by trend monitoring in the cloud or the on-premises to perform efficient maintenance; and, digital transformation apparatus comprehensively monitors the conditions of the whole plant to help maximise investment in equipment.

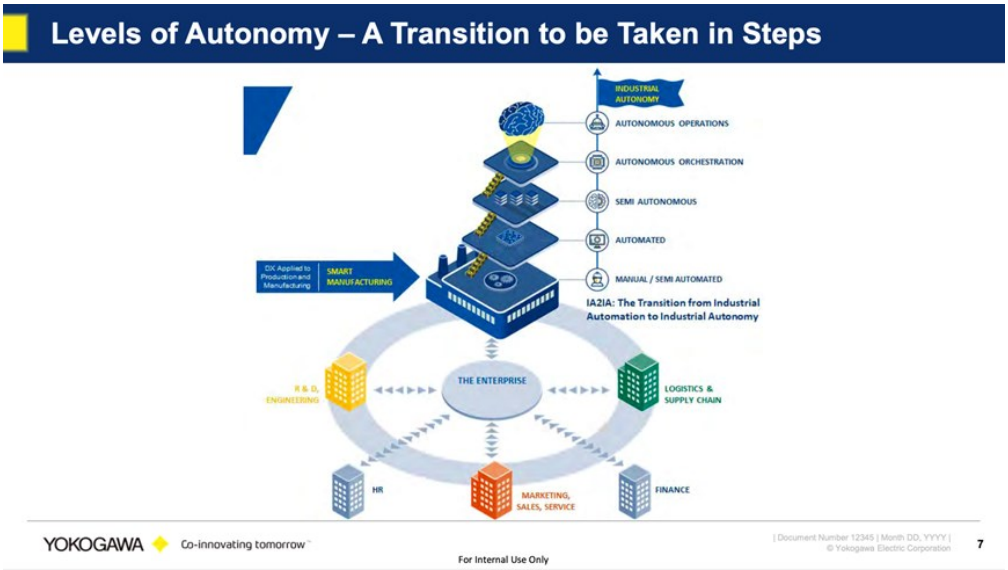


Figure 1: Transition of industrial autonomy needs to be taken in steps.

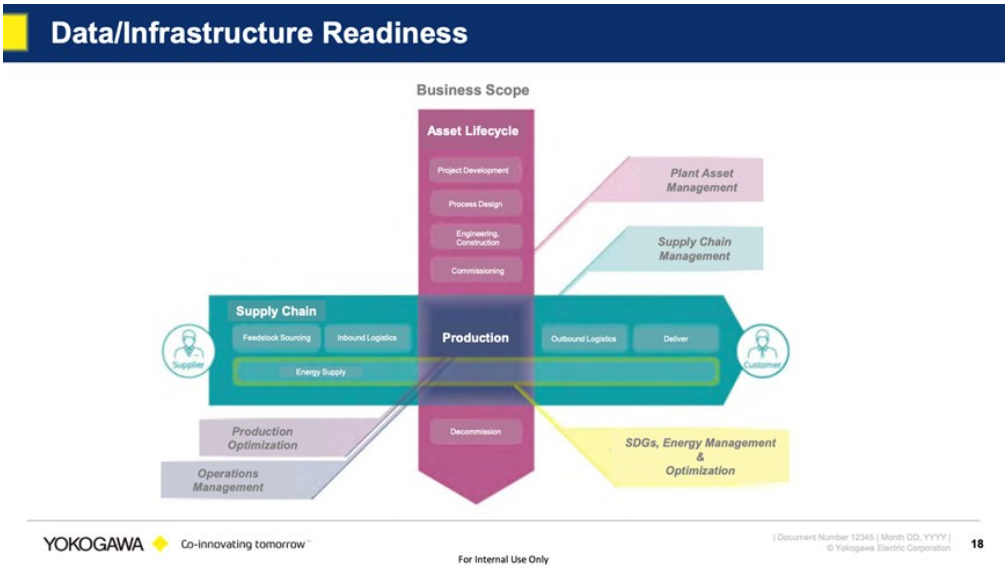


Figure 2: The impact of infrastructure readiness in supply chain and business operation

Overall, digital transformation has numerous benefits to the company:

- Increase profitability, reliability and safety
- Reduce reactive maintenance
- Reduce routine maintenance and turnaround cost
- Low-cost installation for IIoT sensor
- Reduce manual tasks and labour cost

Webinar: Improving Palm Oil Extraction Productivity and Reducing Palm Oil Losses

On 28 March 2022, Igor Temirov, Director of Business Development at Biomicrogel Group presented the extraction technology webinar. The webinar recorded 31 online participants.

Igor first introduced the value proposition of Biomicrogel Group (BMG) for palm oil. It includes increasing CPO extraction, reducing extraction time and oil content in POME, and low implementation costs. BMG effect demonstrated in a lab test with underflow sludge samples placed in a bath tub, and it achieved an additional extraction of 5-30% oil in 1 hour.

The BMG particles help to release oil that is trapped between fruits residues. During BMG injection into clarifier, increased oil extraction resulted in an increased oil content in underflow and in clarifier. BMG also reduced losses both in heavy and solid phases, with the best results after dosing in clarifier.

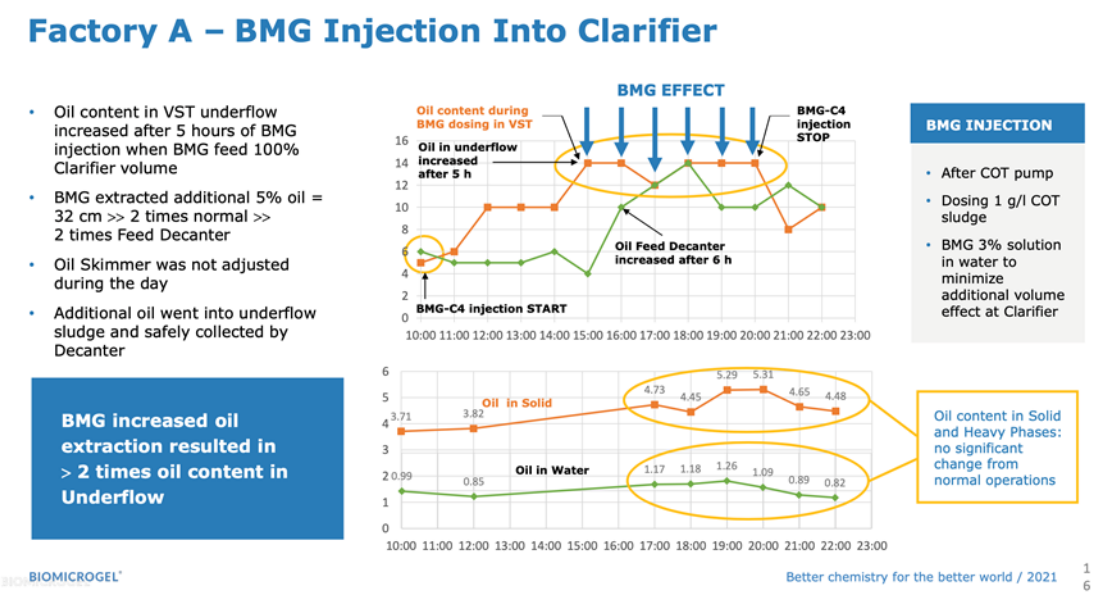


Figure 1: HCWE effect on CPO yield.

The density and viscosity of BMG solution is almost the same as water. On BOD, BMG reduces oil content in POME, in which it reduces BOD and increases biogas efficiency. BMG also reduces emulsion and stabilises process in clarifier. On safety, BMG does not affect quality and main characteristics of CPO and refined palm oil as it does not stick to oil and remains in sludge and mill effluent.

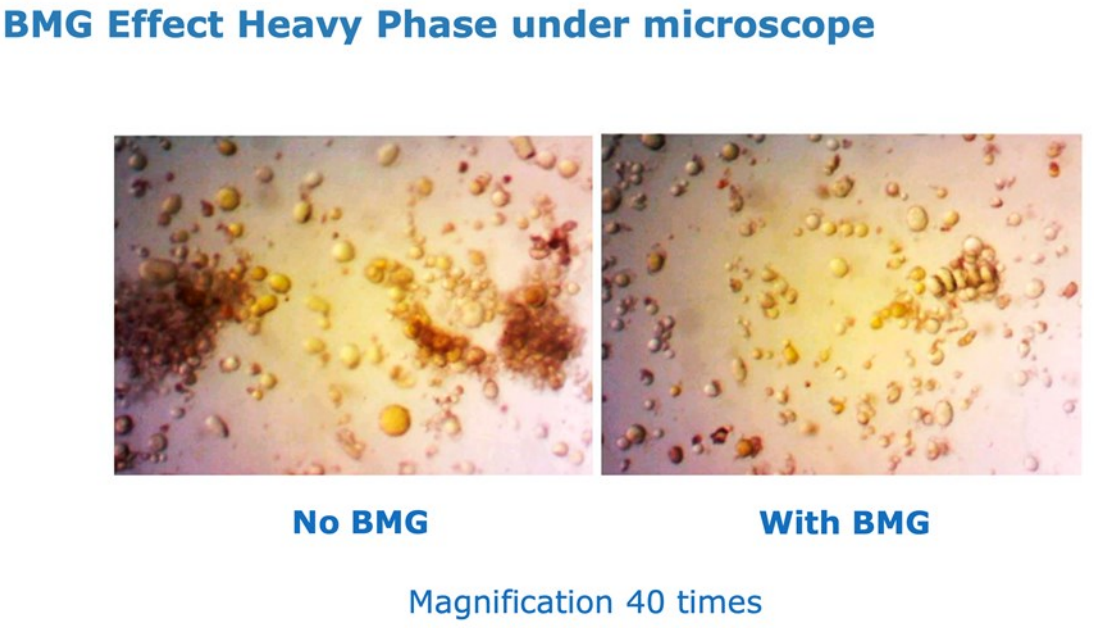


Figure 2: BMG effect on heavy phase under microscope (40x).

Event: IChemE100 — Serving Society

This year, IChemE celebrates its centenary since its establishment in 1922. ITN Production had held a studio interview with IChemE Chief Executive and President on 25 January 2022.

Chemical engineering was first established as a profession more than one century ago. With drastic evolution of the sector today, chemical engineers help to create the world from live-saving medical equipment to cooking oil that we use every day.

Chemical engineers transform raw materials into useful products, create, design and develop complex processes to resolve the problems. We look at the full picture: energy, food, water and climate change are closely knitted.

In the early 20th century, the technological advancement accelerated industrial revolution through the energy produced from fossil fuel refining. Today in the 21st century, the world is focusing on the transition towards global net zero by 2050.

Palm oil industry and POPSIG has made life-changing progresses towards net-zero palm oil that help achieving UN Sustainable Development Goals. The sector has contributed to sustainable biofuel, carbon-free hydrogen fuel, highly versatile vegetable oil and resilient circular economy.

Jon highlighted that chemical engineers help provide everything that we need in daily life. Jane pressed that climate change and sustainability are inextricably linked, and chemical engineers have to ensure that there are no unintended consequences in their design and development.

Figure 1: Serving Society — ITN studio interview with IChemE Chief Executive Jon Prichard and IChemE President Jane Cutler

Event: IChemE100: Consumption — Driving and Defining Issues of the Future. How Should Chemical Engineers Respond?

On 16 February 2022, ChemEng Evolution organised the first IChemE100 webinar with the theme of Sustainability and Environment. Palm oil industry has demonstrated commitment for ensuring sustainable environment.

Malcom Wilkinson presented the webinar about sustainable development. He underlined that chemical engineers should balance wealth creation with impacts on the environment and society.

He added that critically noting the maximising the efficiency of wealth creation was not sufficient for wealth development. Since the industrial revolution, today's economies are focusing on securing GDP growth over natural capitals.

Malcom highlighted that it is important to secure an economy that values environmental assets, to employ pricing policies and regulatory changes, and to change economy's measure of development and wealth creation.

The presenter pressed that changes are not just about technicality, they include political, economic and social elements to make a sustainable impact.

He summarised that sustainable chemical engineers should learn to develop resilient systems and apply the concepts of circular economy to meet the needs of environment, economics and society.

The webinar was contributed by speakers from various industry: Chris Hamlin (Vice Chair of the IChemE100 Future Content Working Party), Dr Mary Stewart (CEO of Energetics), Dr Pratima Rangarajan (CEO of OGCI Climate Investments), Mark Apsey (Managing Director of Ameresco), Professor Stefaan Simons (Director of Watt Tarriff Ltd, Gridport Ltd and ST8 Consulting Ltd) and Joanna Snape (Innovation Manager at E.ON).

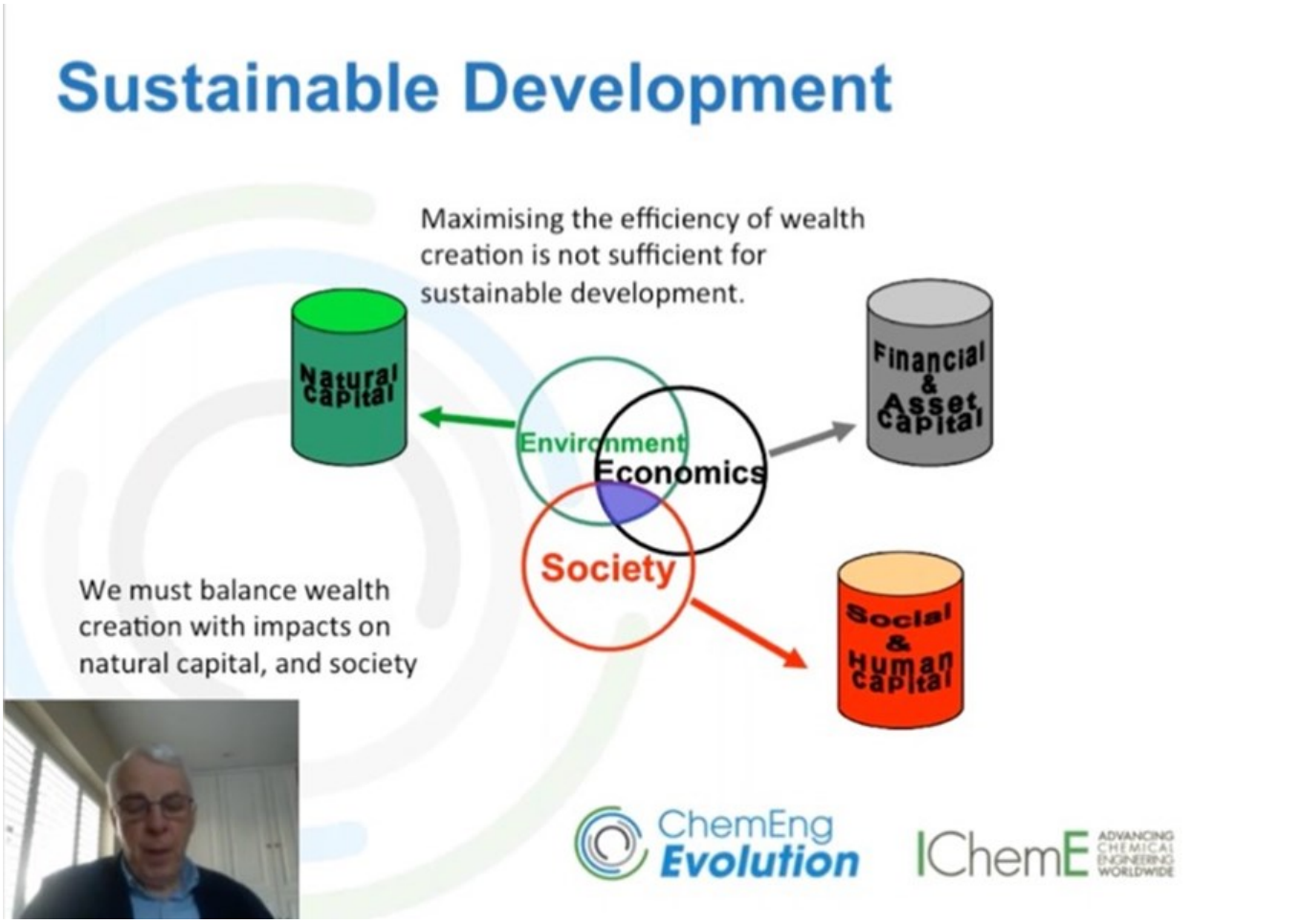


Figure 1: Malcom presented the natural capital model for sustainable development that links the three natural resources .

The panel summarised that:

- Recognise changing natural environment as average global temperature is rising
- Understand the risks of policy change and its uncertainties
- Graduates have very powerful roles to play as they understand the up-to-date researches and technologies that can make the industry more sustainable
- Apply the technologies to address energy poverty and unfair distribution
- Create a system to mitigate the problem and to improve the processing

Figure 2: Panel discussed the issues about sustainability and environment.

Event: IChemE100: Shaping the Future of Chemical Engineering Education

ChemEng Evolution organised education- and technology-themed webinar on 9 March 2022. Esther Ventura-Medina and Russell Scott were the host to the event.

The discuss panel was comprised of five speakers: Daniel Wielechowshi (Operations and Process Engineer Manager at Tesla), Sadaf Hemmani (Senior Business Developer at Carbon XBV), Titi Oliyide (Senior Safety Engineer at Siemens), Professor David Shallcross (Deputy Dean for Academic in the Faculty of Engineering and Information Technology at University of Melbourne) and Professor Jarka Glassey (Professor at the University of Newcastle and Chair of EdSIG).

The panel concluded that women were encouraged to join chemical engineering as their profession. A diverse population in this field would be challenging. It was believed that chemical engineers can widely involve in different branches of industries. The influences were very impactful to our daily life. The professional commented that the education should start early and be interesting to the children. Chemical engineers should influence the influencers, for examples, parents and teachers to bring positive impact to the society.

Palm oil industry has collaborated with academia to deliver internship trainings to develop their technical skills for their future career.

Figure 1: Panel discussed about the role of education in contributing to chemical engineering discipline.

Event: MPOC: Reach & Remind Friends of the Industry Seminar & Dialogue 2022

Overview

On 5 January 2022, Malaysian Palm Oil Council (MPOC) hosted a seminar titled “Reach and Remind Friends of the Industry Seminar and Dialogue 2022” (R&R). The 12th edition of the annual event aimed to highlight the important issues and opportunities in the Malaysian palm oil industry. The hybrid event was organised in the combination of on ground and virtual session for palm oil industry stakeholders.

Larry Sng urged supports to Malaysian palm oil

In the opening remark delivered by YB Larry Sng Wei Shien, Chairman of MPOC, he stated that MPOC was established with the mission to drive the promotion and market expansion of palm oil and its related products.

The engagements with industries were improved through the virtual Palm Oil Trade Seminar (POTS) event, several activities have been created for the year of 2022. With the purpose to strengthen the market, these events are targeted to improve awareness and technical knowledges of palm oil applications in the food and non-food industries. More initiatives and awareness programmes will be conducted to reach out to the public, professionals, academia and students.

Malaysian palm oil at Dubai EXPO 2020

The World Expo 2020, which was hosted by Dubai, United Arab Emirates, was organised from 1 October 2021 to 31 March 2022. In conjunction with the World Expo, MPOC hosted a sustainability debate in Dubai in February 2022. The objectives were to identify potential challenges, opportunities in palm oil industry especially at global level post-COP26.

Datuk Zuraida Kamaruddin welcomed women participation

In her keynote address, Minister of Plantation Industries and Commodities (MPIC), Malaysia YB Datuk Hajah Zuraida Kamaruddin stated that MPIC was the first ministry achieving over 30% women participation in the agencies under MPIC.

Sarawak, a major contributor

Zuraida said that Sarawak accounts for about 30% palm oil plantation in Malaysia. Besides reach and remind, she shared that “upscale” should be another important element to upgrade ourselves to investigate the enhancement. The minister reminded that palm oil is the top one export commodity in Malaysia.

Figure 1: YB Larry Sng Wei Shien delivered his opening remark during R&R 2022.

Research on health benefits of palm oil

The minister stated that palm oil is one of the healthiest edible oils, while MPOB conducts intensive research on palm oil, including heart disease and hair growth. She pressed that Malaysia is a developed country with policies and guidelines for deforestation.

Malaysian palm oil is sustainable

The nation has signed up for COP26 on deforestation. She stressed that circular economy and replanting has been practised in Malaysia's industries. The minister stated that more aggressive marketing strategies and debate are needed to counteract the allegations on palm oil. On GHG emission, Malaysia has signed COP26 and made pledges under Ministry of Environment and Water (KASA) to demonstrate that Malaysia is progressive on net zero development.

World-class MSPO certification

Zuraida emphasised that MSPO certification was recognised by Tokyo 2020 Olympic Organising Committee, while China has endorsed the scheme. Its quality is nearly up to world-class RSPO standard. Zuraida shared that smallholders constituted 40% of palm oil plantation in Malaysia, while 43% of them has obtained approved MSPO certification. The requirement of MSPO signatory on all exported CPO will be the new direction in 2022.

Labour demand for industry

Malaysia has also signed International Labour Organisation (ILO) Protocol 29 on forced labour, while the authorities promised to safeguard the well-being of plantation workers. Malaysia's palm oil industry can be sustained through the government-to-government (G2G) arrangement with other countries involving labour supply for plantation, as about 32,000 people is needed.

Figure 2: YB Datuk Hajah Zuraida Kamaruddin delivered her keynote speech. (Source: MPIC, 2022)

MARCOP essential for future development

Through MPOA, MPIC has launched MARCOP – a mechanisation programme – that targets to reduce labour demand and minimise financial strain to obtain labour within 5 years.

CPOPC welcomed 4 more nations

Zuraida also aimed to explore new market and to get more market shares. With Malaysia and Indonesia as the two pioneer countries of CPOPC, four more countries have been approved to join the body. She said that the ministry will approach Thailand that produces a lot of palm oil.

Malaysia as leading palm oil-producing nation

MPIC aimed to strengthen the position of Malaysian palm oil in ASEAN and neighbouring regions, while expanding its influence in Central Asia, South Asia and Middle-East. MPOC planned to launch a new office in Saudi Arabia in early 2022. Malaysia targeted to take leadership in these areas to be the leading nation for the palm oil contribution.

Malaysian Palm Oil Full of Goodness campaign

Datuk Hajah Zuraida Kamaruddin officially launched Malaysian Palm Oil Full of Goodness or *Minyak Sawit Malaysia Penuh Kebaikan* campaign.

Mari Kenali Sawit book launch

To overcome the misperception of palm oil, MPIC has launched "Mari Kenali Sawit" or "Let's Get to Know Palm Oil" books for primary and secondary school students. The materials will be distributed for free to the students to promote the strengths of the top-rated Malaysian palm oil.

Figure 3: Malaysian Palm Oil Full of Goodness campaign reflects the benefits of palm oil and palm-based products. It is wholesome in the context that it benefits almost every layer of society. It is good for health, environment, sustainability, livelihood, and prosperity.

Figure 4: MPOC promotional poster about MSPO-certified products (Source: MPOC, 2022)

Figure 5: Datuk Hajah Zuraida Kamaruddin showed the books during her keynote address at R&R 2022 (Source: MPIC, 2022).

Figure 6: MPIC introduced Mari Kenali Sawit or Let's Get to Know Palm Oil books for primary and secondary school students

Figure 7: Guests of honour presented the Mari Kenali Sawit books during the launch of the campaign and books. From left to right: Datuk Hajah Zuraida Kamaruddin (Minister of Plantation Industries and Commodities), Datuk Ravi Muthayah (Secretary General of MPIC), Larry Sng Wei Shien (Chairman of MPOC), Wan Aishah Wan Hamid (CEO of MPOC), Sarina Salim (Deputy Director, Languages and Literature Sector, Curriculum Development Division, Ministry of Education, Malaysia) (Source: MPIC, 2022).

Figure 8: The panel responded to the queries of the audiences.

Figure 9: Datuk Ravi Muthayah (Secretary General of MPIC) responded to the questions of the audience.

Figure 10: Mr Mohammad Hafezh Abdul Rahman (CEO of MPOCC) shared his view during the dialogue session.

Event: MPOB: Palm Oil Economic Review & Outlook Seminar 2022

Overview

Malaysian Palm Oil Board (MPOB) had organised Palm Oil Economic Review & Outlook (R&O) Seminar at Marriot Hotel, Malaysia on 13 January 2022.

Problems of expansion, biomass and labour supply

Managing Director of Sime Darby Plantation Sdn Bhd, Mohamad Helmy Othman Basha shared that labour shortage had led to a decline in FFB production. The problem had also caused the loss of tax revenue to the government.

MPOB Director of Economics and Industry Development Division, Fauziah Arshad highlighted that Malaysia should identify relevant policies, strengthen exports, and review bilateral trade relationship.

Deputy President of the Malaysia Biomass Industries Confederation (MBIC), Kester Chin suggested the government to create a joint venture with feedback owners, seek consultation with MBIC and search for access to funding.

YB Jugah commended MPOB's hard work

Chairman of MPOB Yang Berhormat Tuan Tambat @ Jugah anak Muyang delivered his opening address and highlighted that R&O seminar aimed to allow industrial players and organisations to share developments in palm oil industry.

He underlined MPOB played an important role in developing the wellbeing of Malaysian palm oil industry as the leading R&D institution. MPOB is entrusted in producing breakthrough scientific research findings in palm oil, and disseminate timely and accurate information to improve the competitiveness within the industry.

YB Datuk Zuraida updated the improvements in palm oil sector

Minister of MPIC Malaysia Yang Berhormat Datuk Hajah Zuraida Kamaruddin delivered her keynote address and officiated the R&O Seminar 2022.

Zuraida emphasised that the ministry has formed a government-industry platform MARCOP under MPOA. To sustain the industry, the ministry would investigate the G2G arrangement to ensure the continuous labour supply. In long term, MARCOP would identify the mechanisms to reduce the foreign labour demand.

Figure 1: Chairman of MPOB YB Jugah anak Muyang (3rd from left) presented R&O seminar souvenir to the minister YB Datuk Zuraida Kamaruddin (2nd from left). Also in picture, YB Datuk Willie anak Mongin (1st from left) and YBhg Datuk Dr Ahmad Parveez Hj Ghulam Kadir (4th from left).

Many planning is undergoing on the mechanisms to manage smallholders and small estates in order to improve the cost effectiveness of their businesses. The minister stressed that more robust marketing plan would be introduced to overcome the problems and pressures from the western bloc.

Zuraida was confident that Malaysia can champion the goodness of palm oil and become the market leader. Work on MSPO has been carried out to upgrade the certification to the standard close to RSPO. Circular economy in palm oil sector was also highlighted during the seminar.

MPOB's Chairman outlined the prospects for 2022

Chairman of MPOB YBhg Datuk Ahmad Parveez Hj Ghulam Kadir stated that the slowdown in CPO production was a key limitation to export palm oil (PO) and its products despite a consistent demand from importers. High CPO prices in record has boosted export revenue although export capacity was low.

Malaysian palm oil in numbers

Dr Parveez stated that Malaysia was the world's 5th largest producer of oils & fats and the 2nd largest exporter at 16%. At global market, PO accounted for 32% global production (largest), followed by soybean oil (SBO) at 25%, rapeseed oil (RSO) at 11% and sunflower oil (SFO). On global consumption, PO accounted for 31% (largest), followed by SBO at 25%, RSO at 11% and SFO at 8%.

MSPO and MSPO 2.0 initiatives

The agencies have conducted MSPO campaign and promotional activities, carried out enforcement actions and set up MSPO mobile counters. The new version of MSPO aimed to strengthen the requirements on HCV, SIA and GHG. It would also improve social and labour practices to support 2030 Sustainable Development Goals (SDGs). He added that Tokyo 2020 Olympics Organising Committee has recognised Malaysia's PO certification standard.

MARCOP to overcome labour shortage

MPOA underlined RM 1 billion per month worth of FFB was not harvested due to labour shortage in 2021. In addition, 6 series of industrial engagements were held in 2021 to address the issues.

Labour shortage was triggered by temporarily slashed workforce due to the pandemic, El-Nino phenomenon, and tight supply of PO. R&D at MPOB was working on the implementation of B20 for the entire country, and B30 research with 6 universities in Malaysia. Dr Parveez underlined that policy change in Indonesia would pose stiffer competition for both CPO and PPO markets.

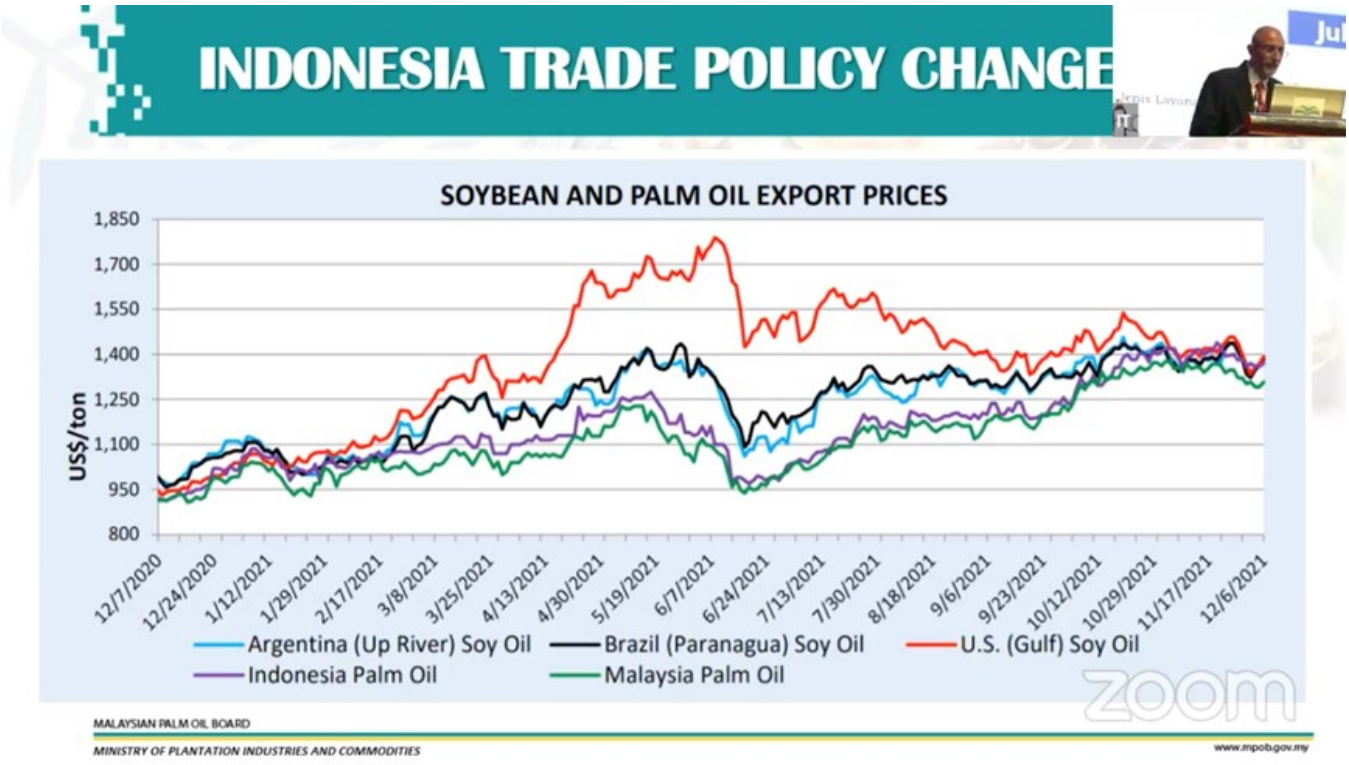


Figure 2: Datuk Dr Parveez presented the impact of Indonesia trade policy change to soybean and palm oil export prices from 2020 to 2021.

In the EU, the European Commission-proposed legislation targeted at products associated with deforestation. The importers had to prove that their global supply chain did not link to deforestation, while commodities were not grown on any land deforested after 31 December 2020.

In the US, the authority planned to impose an act namely FOREST that aimed at commodities originating from illegally forested land. Both legislations targeted at oil palm, soybean, cocoa and other commodities.

Prospects for 2022

Dr Parveez was confident that the year of 2022 would see improvements in Malaysian PO industry. He added MPIC, MPOB and other agencies would collaborate with industrial groups to overcome the challenges.

Malaysian government's commitment

At the press conference, Zuraida stated MPIC was committed to ensure a continuous labour supply to avoid the loss of FFB and consistent PO production. However, it was aimed to enhance mechanisation and cut down foreign labour. MARCOP will study 4IR technologies to overcome FFB harvesting operation issues.

Despite significant boost in export revenue in 2021 (January-November), environmental governance and sustainable production needed to be addressed. Malaysia's Budget 2022, which aims to boost growth of the agri-commodity industry in the post-pandemic era, has provided allocations for smallholders' businesses, combating international anti-palm oil campaigns, and mechanisation development.

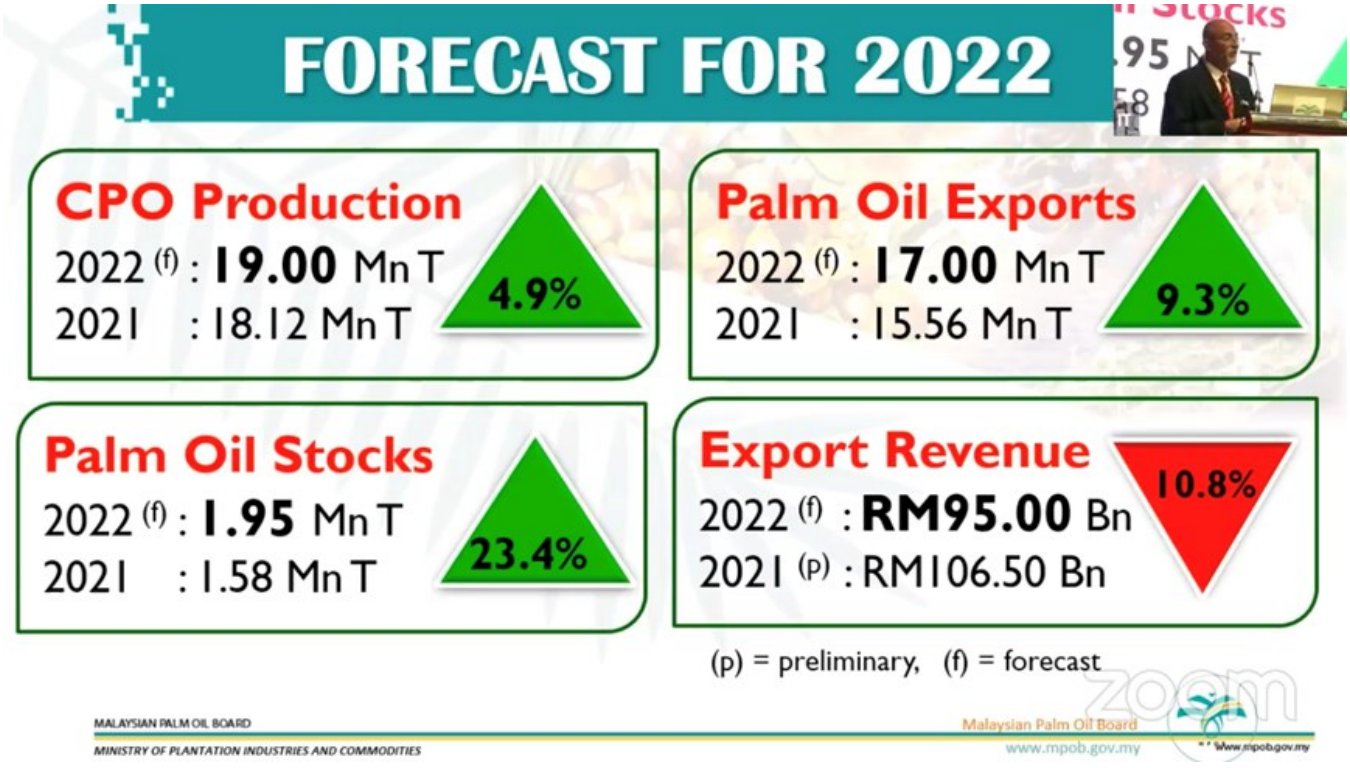


Figure 3: A positive outlook for CPO production, PO exports and stocks, but the opposite for export revenue in 2022.

Event: MPIC: Launch of Agri-commodity Tour 2022

Overview

On 19 January 2022, the launch of Agricommodity Tour 2022 was held in Hotel Marriott in Putrajaya, Malaysia. The gathering was attended by Prime Minister of Malaysia YAB Datuk Seri Ismail Sabri Yaakob, MPIC and its agencies.

YB Zuraida committed to promote agri-commodities

Minister of MPIC Malaysia, Yang Berhormat Datuk Hajah Zuraida Kamaruddin believed Malaysian agri-commodities, including palm oil, would increase revenue and bring prosperity to the nation. She had a strong determination to defend the country's agri-commodities from allegations and argue them with facts and scientific research. MPIC would explore new markets in Central Asia, South Asia, Middle East and Africa.

Budget 2022 to strengthen agri-commodity sector

The Prime Minister stated that the national poverty rate had dropped from 49.3% in 1970 to 5.6% in 2019. He was confident that it was contributed by agri-commodity sector. The government had allocated RM670 million to MPIC for management and development expenditures.

He added that the National Agricommodity Policy (DAKN) 2021-2030 would replace National Commodity Policy (DKN) 2011-2020 to boost development towards sustainability, competitive and market-oriented. DAKN would become the reference for the industry on environmental, social and governance (ESG) towards a sustainable nation.

Figure 1: Prime Minister YAB Datuk Seri Ismail Sabri Yaakob (2nd right) officiated the launch of Agri-commodity Tour 2022 .

Figure 2: Prime Minister YAB Datuk Seri Ismail Sabri Yaakob (3rd left) and YB Datuk Hajah Zuraida Kamaruddin (4th left) were at the stage with MPIC's deputy ministers and secretary-general for the launching ceremony .

CPOPC Webinar: Net-Zero Emissions: Achievements and Way Forward in the Palm Oil's Production

Overview

CPOPC had organised a net zero webinar on 26 January 2022.

Oil palm acts as net carbon sink

In the opening speech, Executive Director of CPOPC Tan Sri Dr Yusof Basiron explained that net zero was all about an overall balance between GHG produced and GHG removed from the atmosphere. Oil palm was a forest tree species that behaved as a net carbon sink or carbon remover. He added that oil palm cultivation possessed less disruption to indigenous forest and animal species than rapeseed and soya.

MEP had confident in sustainable palm oil

Member of the European Parliament Sean Kelly gave his opening remarks and stated that palm oil (PO) was economical and versatile, while he was confident that PO can be produced sustainably. He stressed that the EU must work with PO-producing countries to meet the demand without involving deforestation, and thus, it would be helpful to build an economy within the planetary boundaries and harnessing clean energy. Sean stressed the importance to discuss the sustainability progress in PO sector, and how it could be generalised to all PO production to ensure CO2 is taken out from the atmosphere than added.

Long-term plan in Indonesia

Director of Responsible Palm Oil Initiative Dr Rosediana Suharto shared that emission from POME has been actively reduced through methane capture technology, while there would be an upward trend for mix farming. The director underlined that Indonesia had different definition of forest, peatland and productivity as compared to other developed countries. As no oil palm would be planted on peatlands in the future, the industries in Indonesia would have to identify a novel route to boost production and to achieve 2050 targets. Through yield improvement and storage technology, food loss would decline from 20% in 2020 to 6% in 2060.

Figure 1: Sean Kelly MEP emphasised that palm oil could sustainably be produced to meet global demand.

Malaysia is reducing GHG emission

Director of Science, Environment and Sustainability of MPOC Dr Ruslan Abdullah outlined that Malaysia targeted at 45% reduction in GHG emission across the nation's economy in 2030. Malaysia aspired to achieve net zero as early as 2050. He also presented that a hectare of oil palm trees could absorb a net amount of 64 tons of CO2 each year and produced around 18 tons of oxygen, which is higher than a forest's net absorption. Malaysian government policies outlined that new planting of oil palm in peatland areas would be prohibited and the conversion of forest reserves for oil palm cultivation would be banned.

Finance needed for reduction

Managing Consultant at South Pole Dr Wan Yee Lam shared that net zero commitments were increasingly becoming best practice across industries. Based on Science Based Targets initiative (SBTi), achieving global net zero required ambitious reductions across all scopes. Companies should act by financing and accelerating reduction, avoidance and removal activities via compensation outside their value chain. Residual emissions had to be neutralised with CO2 removals to achieve net zero.

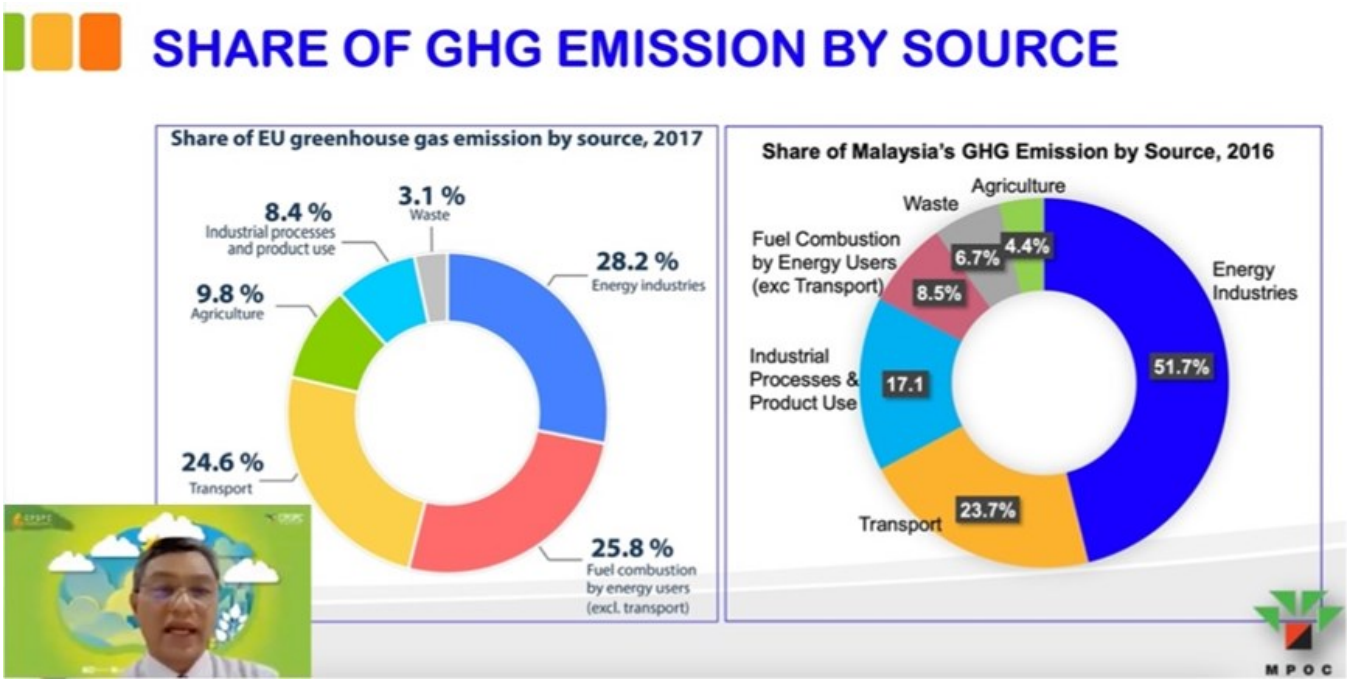


Figure 2: Dr Ruslan Abdullah compared the EU's and Malaysia's GHG emissions.

CPOPC Webinar: Artificial Intelligence: Game Changer in Palm Oil Industry

Overview

CPOPC had organised an AI-themed webinar on 27 January 2022. It was about AI, which contributes to value chain, from weather forecast to data traceability.

AI makes improvements

Executive Director of CPOPC Tan Sri Datuk Dr Yusof Basiron stated that AI has been utilised in multiple industries, however, AI was underutilised in palm oil (PO) sector and the industry remained dependent on the labour. He strengthened that PO industry should evolve fast as PO was a key component in global food security. Smart systems are implemented at every stage from seedling, planting, harvesting to packing. Regression analysis using AI has been used to predict fruit yields, harvesting time, oil yields and seasonal impacts. Remote sensing using satellite technology could reduce costs and increase accuracy to bring more economic benefits to the PO industry.

Decent, disciplined, doable and dignified palm oil sector

MPOA CEO and MARCOP Chairman Datuk Mohamad Nageeb Ahmad Abdul Wahab shared that labour shortage had caused a reduction of Malaysian PO production by 15-25%. He added that the situation during the pandemic has reflected to the industry about the extend of dependency on the foreign labour. MARCOP committee informed that there were no shortcut to this process, while the ultimate solution was to use AI. A target of five years was set to address labour problem, while introducing measures to enhance harvesters' productivity and revisiting the existing technologies. Datuk Nageeb was confident that PO industry would be labelled with redefined 4D: decent, disciplined, doable and dignified.

Computerised technologies improve operations

Head of Engineering of LintraMax Sdn Bhd Chong Yong Khong shared the specifications of AI, machine learning (ML) and deep learning (DL). Using drone imaging, palm counting with 99% accuracy was useful for fertiliser budgeting. Computer image processing-based grading could achieve unbiased FFB grading and classification in estate and PO mill. ML and DL contributed to face recognition technology that was helpful to authenticate workers and digitalise attendances. Data analytics was a visualisation technique that was useful and organised for reporting. Smart alert was a real-time operation data feedback to build notifications for harvesting.

Machine vision cut costs

Wan Siu Hong, a PhD candidate at UCSI University, presented his study on oil palm basal stem rot (BSR) disease detection using AI. Using AI technology, it could address the issues about labour, time-consuming inspection and inconsistency of the results. Electronic nose (e-nose) method used gas sensor to detect chemical profile from the tree, and feed into a data acquisition unit containing neural network to investigate the plant health. Hyperspectral imaging was about the imaging analysis based on the frequency of the wavelength, where the method could detect the tree infected with disease. Thermal imaging could analyse the image of trees to detect BSR. Terrestrial laser scanning (TLS) is an imaging technique that analyses the tree by layers. Siu Hong shared his project, which focused on machine vision (MV) that used high computational smartphone to improve cost efficiency and reduce computational requirement.

Towards digital economy

Professor Dato' Dr Ahmad Ibrahim, Professor of Chemical Engineering of UCSI University and Senior Advisor Malaysia of Fraunhofer Research Network Germany, stressed that AI could help reduce losses in plantation and industry. Robotics, automation and IoT were other digital technologies that could also contribute to the data analysis. Not only Malaysia should collaborate with palm oil-producing countries, but collaborations with technology partners also need to be implemented. It was important to create a right ecosystem to involve newly introduced technologies.

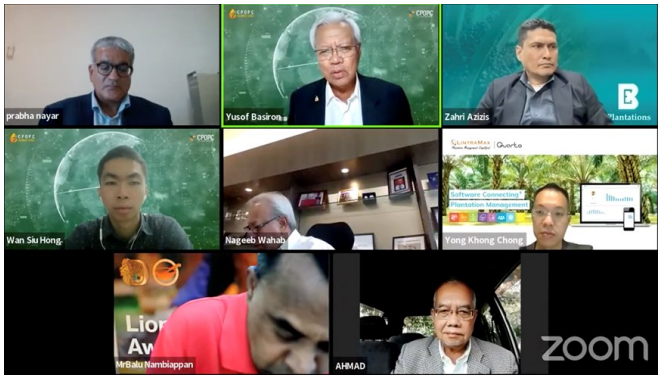


Figure 1: Panel discussed about the role of AI, ML and DL in palm oil sector.

CPOPC Webinar: Palm oil and future market trends in Bangladesh

Overview

On 2 February 2022, CPOPC organised a webinar about palm oil (PO) market in Bangladesh. The discussion forum was chaired by Yash Kansal, Deputy Managing Director, India, APCO Worldwide.

Sustainable palm oil benefits society

Executive Director of CPOPC Tan Sri Datuk Dr Yusof Basiron stated that PO was available in almost every household in Bangladesh and in hospitality industry, as the oil influences the flavour and stability of Bangladeshi foods, in addition to its health benefits. Long-term economic growth in Bangladesh had seen the significant growth in oils and fats consumption. As responsible suppliers, it is important to ensure that PO is produced sustainably to benefit the stakeholders.

SBO challenged PO market share

Senior Director of TK Group of Industries, Tariq Ahmed presented that the GDP growth in Bangladesh had been improving to 6.9% since 2020. In Bangladesh, PO imports accounted for 52% while 29.3% constituted SBO imports in 2021. Market share of PO in Bangladesh dropped by 17%, while that of SBO boosted to 46.3% in 2021. The paradigms shift was caused by the growth of poultry, dairy and meal industry, as well as increasing solvent extraction capacity in Bangladesh.

Competition with cheaper SBO

Mr A. K. M. Fakrul Alam, Former Regional Manager for Bangladesh and Nepal at MPOC, said that the society continued to use PO because of its compatibility. It was more economic to use PO in the food processing while the demand for processed foods was increasing in Bangladesh. However, the PO consumption in the rural area was declining because of the availability of cheaper SBO. Hence, he stated that it was important to maintain the price difference between PO and SBO.

Indonesian government efforts

Dr. Sachnaz Desta Oktarina, a Researcher at Indonesian Oil Palm Research Institute, Socio Techno Economy Research Group, presented that private estates were the dominant groups. To overcome the vicious cycle of smallholder, Indonesian government has made ISPO mandatory for all holding types by 2025. Good agriculture practice was also promoted among the stakeholders to level up agroforestry, diversification, yield, and use of bioreagent. Indonesian oil palm industry would have to combat COVID-19 pandemic, energy crises, climate change and tariff barriers.

Palm oil is leading oil market

Deputy Executive Director of CPOPC Dupito D. Simamora stated that the trend of PO production was not stable as reported. It was important to advocate the advantages of PO in a more targeted and continuous way with other stakeholders.

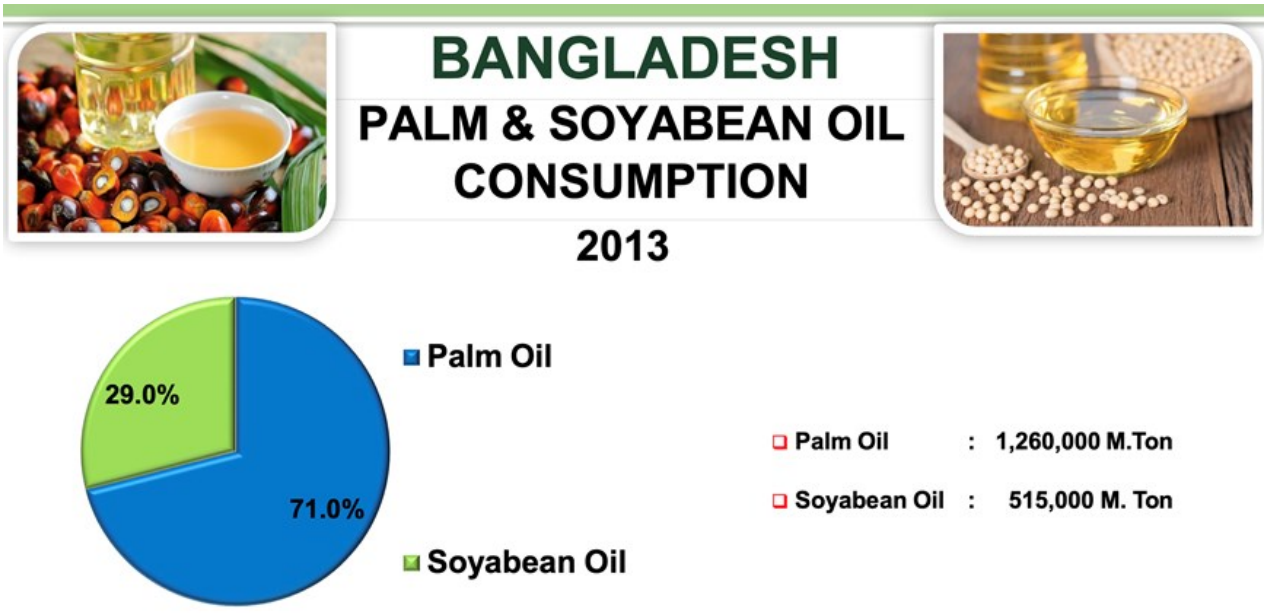


Figure 1: Consumption of PO and SBO in Bangladesh in 2013.

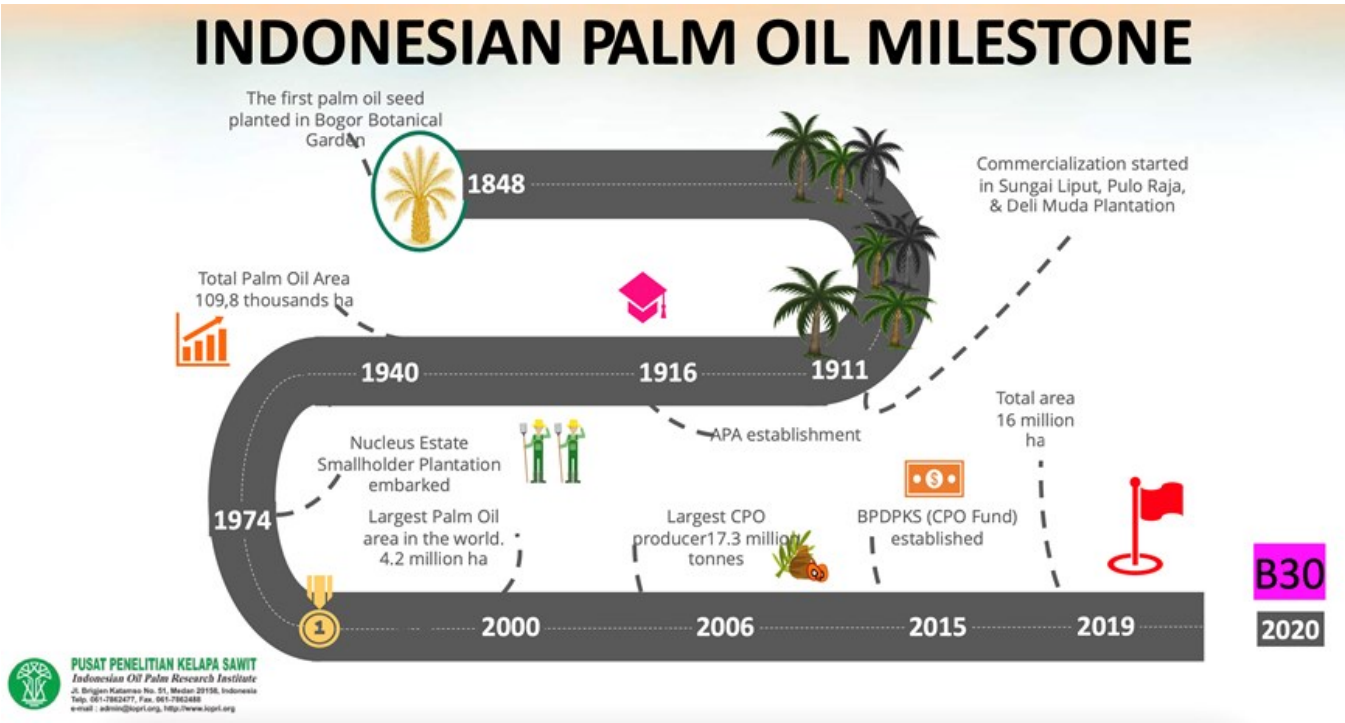


Figure 2: Indonesia set to achieve B30 in 2020.

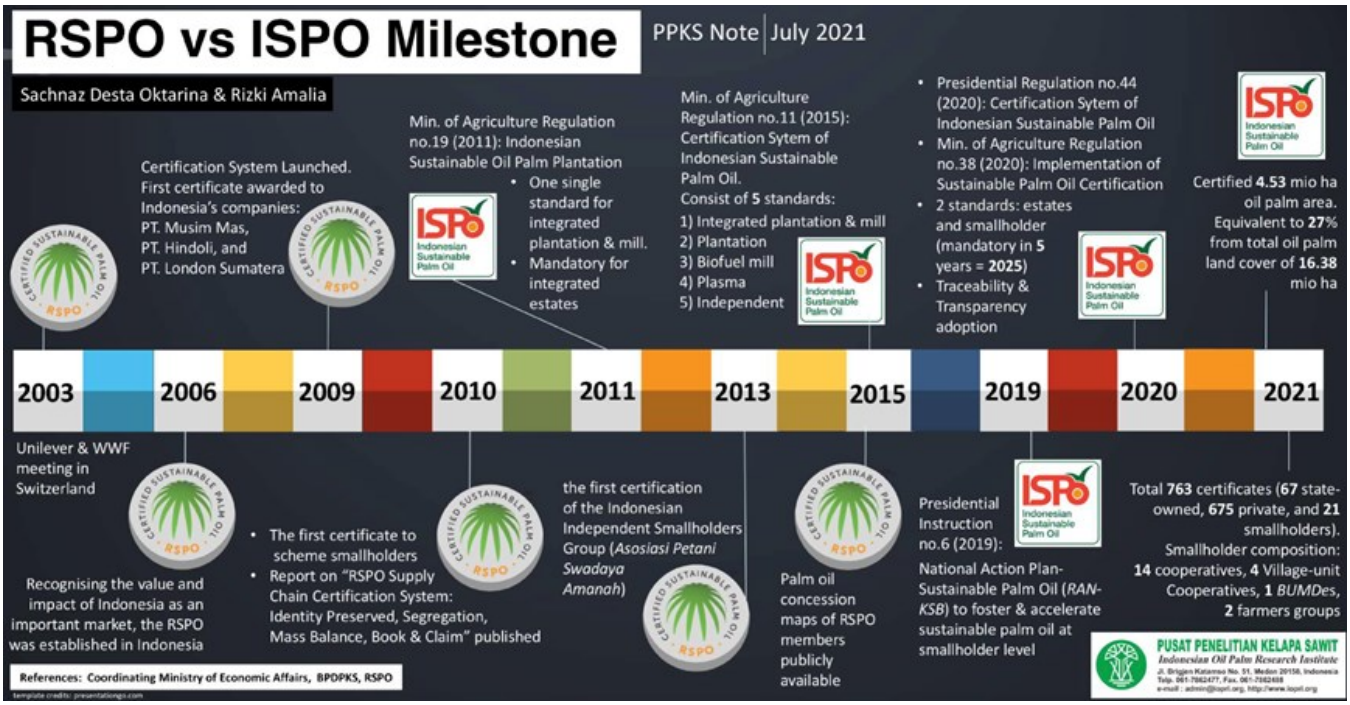


Figure 3: 763 ISPO certificates had been issued as of 2021.

Event: MPIC: Official Launch of Sustainable Agricommodity Week – World Expo 2020

Overview

On 7 February 2022, a trade and business programme, Sustainable Agricommodites (Food Agricommodities) Week, at the Malaysia Pavilion in Dubai, United Arab Emirates (UAE) was launched by Deputy Minister of MPIC Malaysia Datuk Willie Mongin.

UAE as a gateway in Middle East

Ambassador of Malaysia to the United Arab Emirates His Excellency Dato' Mohd Tarid Sufian said Malaysia's export on palm oil (PO) and PO-based agriculture products alone to the UAE recorded 100% growth. He believed Malaysia could leverage more on the UAE as the gateway to the region and beyond. These efforts showed Malaysia's renewed enthusiasm in thriving towards achieving net zero goal.

Dubai Expo 2020 provided marketing platform

Datuk Willie Mongin underlined that the concept of sustainability at Expo 2020 provided a platform for Malaysia to expand the global market for the PO export. MPOB, MPOC, MPOCC worked collaboratively in showcasing Malaysian PO industry sustainability initiatives and managements, which included mandatory certification scheme, regulatory guidelines, good agricultural practices, and edge-cutting technology developments.

Figure 1: Datuk Willie Mongin highlighted that Malaysian PO industry is implementing sustainability practices to achieve net zero goals .

Studio Expo interview with MPOCC CEO

CEO of MPOCC YBrs Mr Mohammad Hafezh Abdul Rahman pressed that more than half a million families relied on palm oil sector as their income sources. He stated that Malaysia is focusing on how to develop commodities, including palm oil and timber, in a more sustainable approach for the communities.

Figure 2: CEO of MPOCC Mr Mohammad Hafezh Abdul Rahman responded to the interview questions about palm oil industry

MPOC-MPOCC Webinar: Palm Oil Sustainability Debate @ Dubai during World Expo 2020

Overview

Jointly organised by MPOC and MPOCC, in conjunction with World Expo 2020, Palm Oil Sustainability Debate @ Dubai was held in Movenpick Hotel Jumeirah Beach, Dubai on 9 February 2022. The debate identified the current and emerging sustainability challenges and opportunities in the palm oil industry. Anthony K Veerayan was the emcee of the hybrid event.

MSPO standards are credible

Deputy Minister of Plantation Industries and Commodities (MPIC) Malaysia Yang Berhormat Datuk Willie Mongin said that the World Expo 2020 Dubai is a magnificent platform for the global communities to exchange ideas on the aspiration of sustainability. He emphasised the MSPO standards are aligned with United Nations SDGs and have been revised to increase credibility for international recognitions.

Understand challenges in industry

Mr Galau Melayong, Head of Sustainability, Sarawak Oil Palm Berhad (SOPB) presented "Challenges in Producing Sustainable Palm Oil". He outlined that stagnant yields, labour shortages, diseases, and a general lack of climate resilience were the key operational problems. Social challenges comprised land ownership disputes, supply chain and consumer issues. The company is required to comply with established pre- and post-development requirements to overcome the problem of POME deteriorating water quality. R&D on new breeding technologies, higher yielding varieties and enhanced disease resistance have been ongoing to level up crop performance. Another key challenge is to create an environment that benefits both nature and people. Galau suggested that policy makers would need to introduce peatland restoration policies. Development of the plantation could improve the accessibility to rural areas and their livelihoods. MSPO Trace is cost-effective to allow high throughput of data on traceability.

Figure 1: Speakers addressed the audiences about palm oil. Presentations by: (1) Datuk Willie Mongin; (2) Mohammad Hafezh Abdul Rahman; (3) Galau Melayong.

An improved MSPO 2.0

CEO of MPOCC YBrs Mr Mohammad Hafezh Abdul Rahman presented "Can MSPO be the Game Changer for Sustainable Palm Oil?" He stressed that MSPO acts as the sensible solution to sustainable market demand. MSPO certification scheme is impartial, transparent and independent. Hafezh reported that MSPO-certified palm oil area comprised 92% while MSPO-certified smallholders accounted for 55%. On circular economy, MSPO Standard emphasises on renewable energy optimisation and requires industry players to implement the 3R concept. The scheme improvements include improving quality management, standards revision, impact framework and satisfaction score, improved complaints, and grievances.

Indonesia performed well in conservation

Founder of Competere – Policies for Sustainable Development, Professor Pietro Paganini presented "Mainstreaming Deforestation-free Sustainable Palm Oil in Europe". The EU has set a regulation to ensure several commodities, including palm oil, are deforestation-free. These directives would incentivise nations in forest protection and governance, while they could facilitate trade and manage enforcement to help producing countries. Professor Paganini showed that the average poverty level in the regions with palm oil expansion was significantly lower than that with no expansion. Forest loss in Indonesia has been drastically reduced since 2017. He pressed that legislation should support system impact and provide guidance to the supply chain.

Sustainable management copes climate change

Professor Ibrahim Ozdemir, Dean, Faculty of Humanities & Social Sciences, Uskudar University, Turkey presented "Can the Middle East Region Move Towards Sustainable Palm Oil?" The sustainable management of resources can enhance national and global actions on climate change.

The question-and-answer session was moderated by Dr Ruslan Abdullah, Director, Science, Environment & Sustainability Division, MPOC.

Figure 2: Speakers responded to the queries by the audiences. (1) CEO of MPOC Wan Aishah Wan Hamid asked her questions during the Q&A session; (2) An audience asked his questions to the panel; (3) Dr Ruslan Abdullah moderated the Q&A session; (4) Panel responded to the audiences' questions.

CPOPC Webinar: Global Framework of Principles of Sustainable Palm Oil

Overview

Global Framework of Principles of Sustainable Palm Oil (GFP-SPO) webinar was organised on 14 February 2022. CPOPC has developed and launched the GFP-SPO that aims to be a common language across the different certification schemes being applied to palm oil (PO) production anchored in the UN SDGs as its base.

GFP helps achieve SDGs

CPOPC's Executive Director Tan Sri Datuk Dr Yusof Basiron urged everyone to support GFP-SPO towards the achievement of the SDGs. GFP could be used as a reference as its principles will expand on current ISPO and MSPO certification schemes, as well as for other vegetable oils.

A common language

Deputy Minister for Food and Agribusiness, Coordinating Ministry for Economic Affairs, the Republic of Indonesia, The Honorable Dr Musdhalifah Machmud stressed that GFP-SPO acts as a common language across systems. It would be a critical reference to the existing methods and future schemes.

Consider different level of developments

Secretary General of MPIC Malaysia Yang Berbahagia Datuk Ravi Muthayah stated that GFP-SPO was intended for CPOPC member countries to adopt the sustainability practices. The framework that aligned with SDGs also targeted at existing smallholders and their welfares. GFP-SPO could help PO to set the benchmark for vegetable oils to be produced sustainably.

SDGs form the base of framework

Sustainability Consultant Ziv Ragowsky shared that SDGs was the foundation for the GFP-SPO. Ziv underlined that the framework gave further insight as to the importance of PO towards the development of its producing countries, without replacing any of the current certification schemes, including MSPO, ISPO and RSPO.

ISPO supports GFP-SPO

Coordinator Team ISPO Secretariat Dr Herdradjat Natawidjaja presented the connection between ISPO principles and SDG goals. He added that ISPO supports the implementation of the framework set by CPOPC to cover seven principles towards achieving the SDGs.

Figure 1: Secretary General of MPIC Malaysia Datuk Ravi Muthayah underlined that GFP-SPO aligns with UN SDGs.

Framework improves sustainability requirement

Senior Manager of System Management Department at Malaysian Palm Oil Certification Council (MPOCC) Mr Simon Selvaraj stated that the GFP should function to address sustainability issues with early adoption which will significantly help everyone in the supply chain.

Support from professional bodies is needed

Deputy Executive Director of CPOPC Mr Dupito Simamora concluded that international support would be required from other PO-producing countries, relevant organisations and the UN bodies for the framework to be extrapolated to other vegetable oils.

Figure 2: Senior Manager at MPOCC Simon Selvaraj pressed that the framework is helpful to the palm oil supply chain.

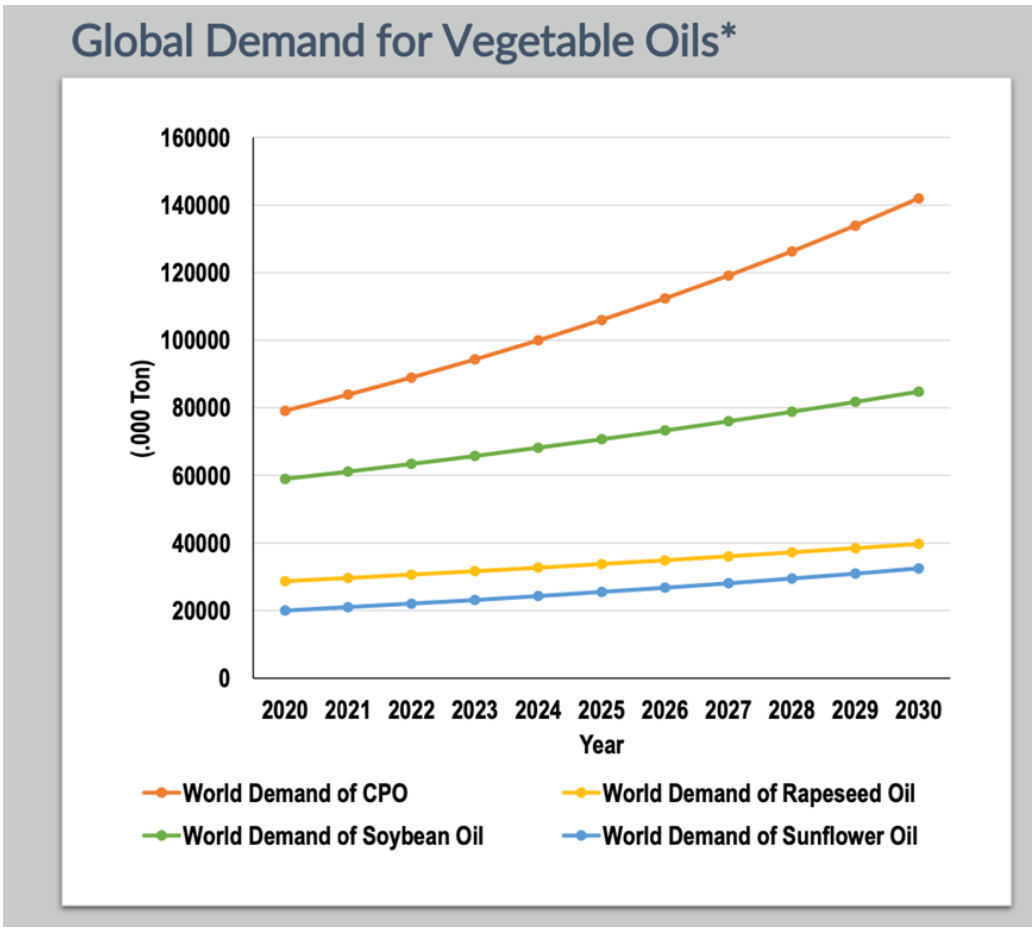


Figure 3: Ziv Ragowsky presented that the demand of CPO is projected to increase exponentially from 2020 to 2030.

Competere Webinar: Fighting illicit crops: The role of oil palm plantations in enhancing social development

Organised on 22 February 2022, the webinar provided a channel to promote policies for sustainable supply chains worldwide. The panel argued that palm oil plantations are a means to enhance social and economic conditions in areas affected by poverty, crime and social unrest.

The speakers shared that the places that have been developed with palm oil cultivation have reduced the criminal activities, improved family life, improved the education opportunities and social security. One panellist added that palm oil is transparent, clean and not dangerous for water sources.

For a municipality, 1% oil palm plantation expansion would lead to 9.7% growth in local investments, a 2.7% increase in primary education and a 2.1% increase in high school education, a 2% growth in the number of families covered by health insurance and an 8% improvement in water conditions. The rate of deforestation associated with palm oil dropped since 2020, despite a 30% increase in world production during the same period.

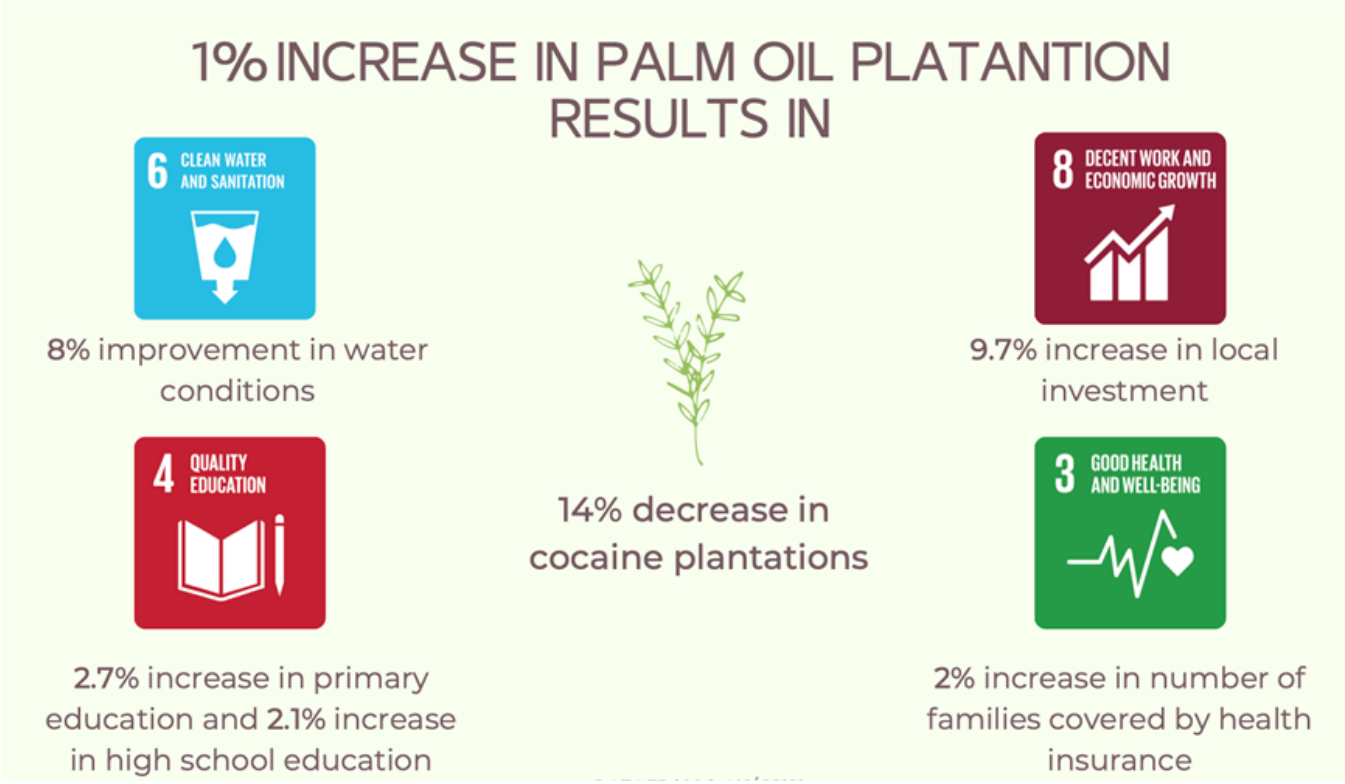


Figure 1: The benefits of oil palm expansions.

CPOPC Webinar: The Vital Role of Sustainable Palm Oil in China's Future Nutritional Needs

Overview

On 1 March 2022, CPOPC organised a webinar in partnership with APCO worldwide about sustainable palm oil (PO) for China's future needs. Managing Director of APCO Worldwide, Jeff Astle was the moderator of the discussion session.

China is a major consumer

Executive Director of CPOPC Tan Sri Datuk Dr Yusof Basiron stated that the webinar aimed to increase awareness on the positive attributes of PO so the consumers would be more confident when they consumed PO. He added that China has a significant role to play in continuously ensuring the supply of sustainable PO. PO-producing countries should foster partnership with major PO-consuming countries like China to continuously meeting the demand for sustainable PO.

Palm oil is high in palmitic acid

Professor of Nutrition in the School of Public Health at Southeast University Professor Sun Guiju presented that the fatty acid (FA) content of PO was significantly different from other vegetable oils, while its palmitic acid content was the highest as compared with rapeseed oil (RO), peanut oil (PNO) and sunflower oil (SFO). Total unsaturated FA of PO was at 49.53%, the lowest among the four vegetable oils, whereas total saturated FA of PO was at 48.77%, the highest among them. PO also contains about 1% trace components, including tocopherols, tocotrienols, carotenoids, phytosterol, coenzyme Q10, phospholipid and squalene.

Dietary fat intake causes diseases

CPOPC Consultant Datuk Dr Kalyana Sundram underlined that the existing evidences did not clearly support cardiovascular guidelines that encouraged high consumption of polyunsaturated FA and low consumption of total saturated fats. China's fat consumption was dominated by five vegetable oils: 46% soybean oil (SBO), 23% RSO, 11% PO, 6% SFO, and 5% groundnut oil. Previous studies showed evidence for adverse effects of trans fats on coronary heart disease (CHD) risk (Ascherio et al., NEJM 1999; Hu et al., NEJM 1997)

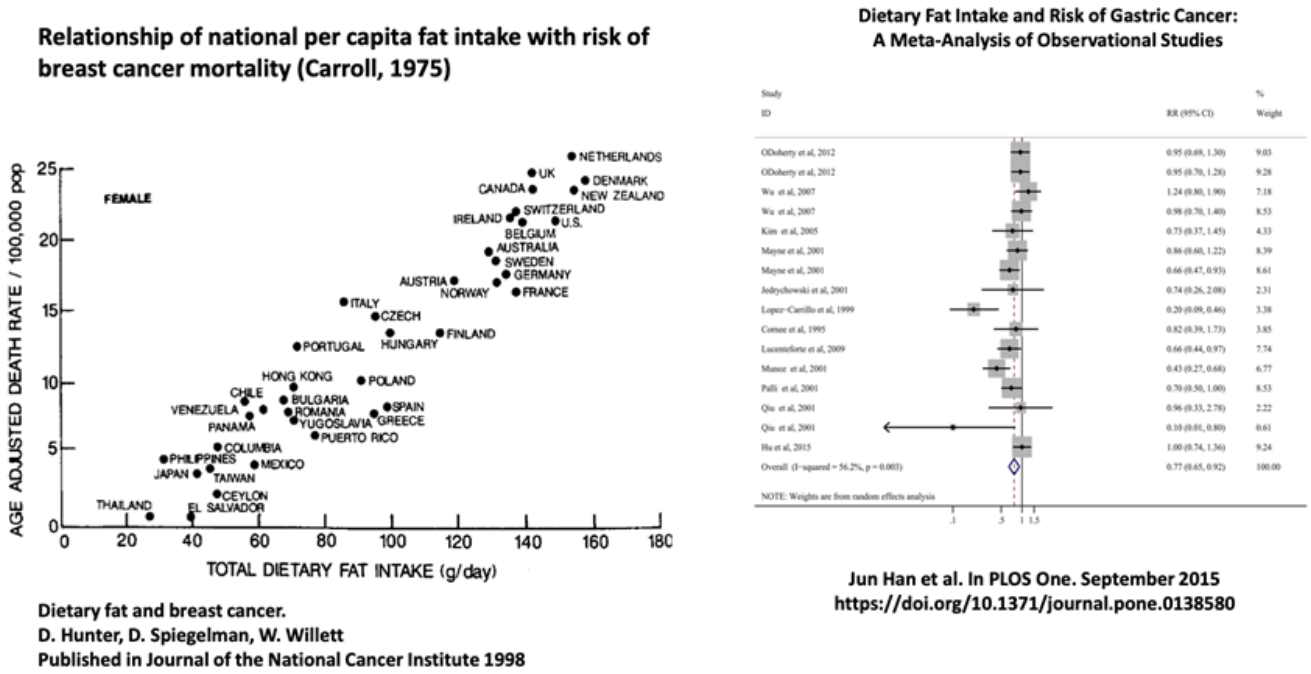


Figure 1: Datuk Dr Kalyana Sundram presented a linear relationship between total dietary fat intake and risk of breast cancer mortality.

Palm oil has unique fatty acid composition

Head of Southeast Asian Food and Agricultural Science and Technology (SEAFAST) Center in the Department of Food Science and Technology at IPB University Dr Puspo Edi Giriwono presented that PO accounted for 35% of all vegetable oils but only acquired 10% of the land. Unique FA composition makes PO essential to create lipid profile in infant formula resembling human milk.

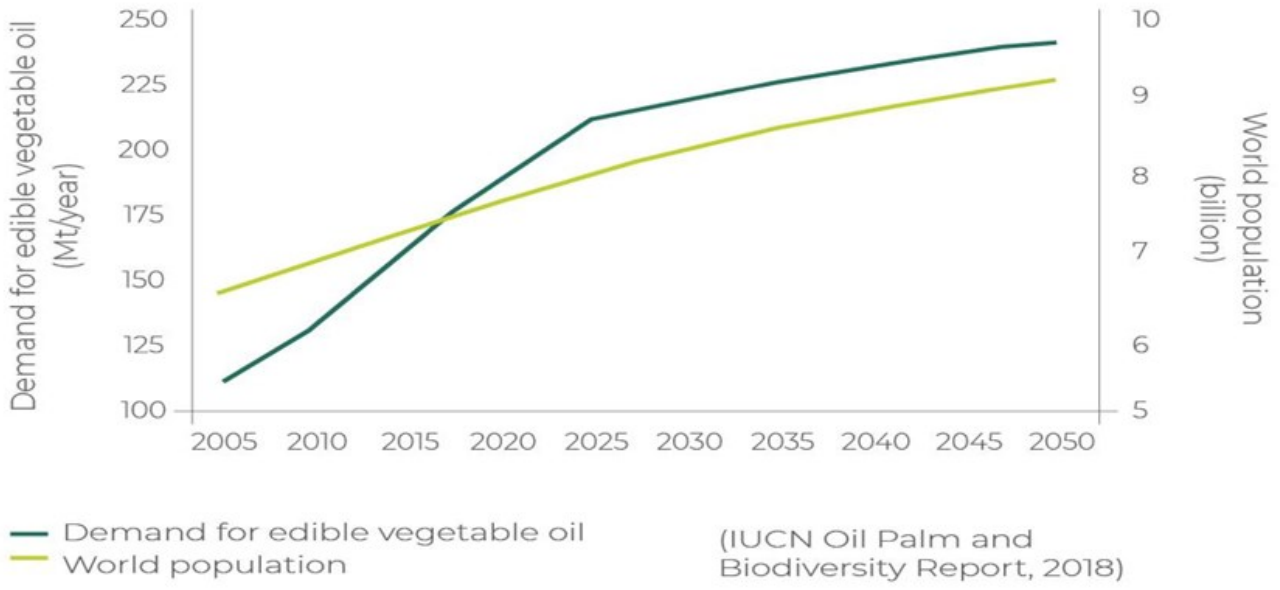


Figure 2: Dr Puspo Edi Giriwono presented the demand for edible vegetable oil from 2005 to 2050.

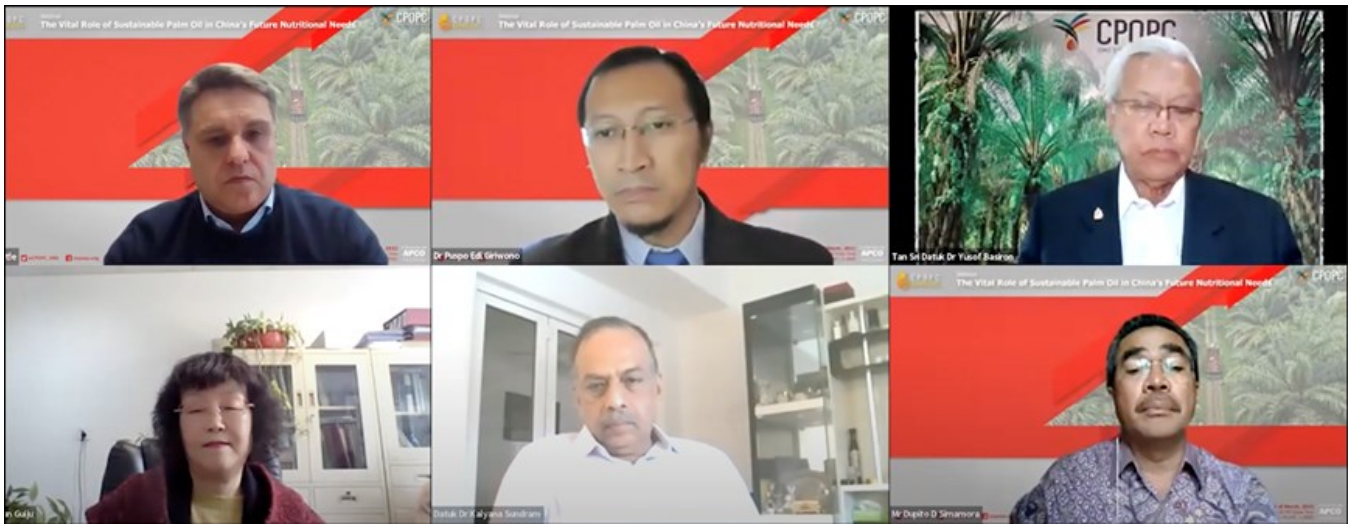


Figure 3: Panel discussed the role of sustainable palm oil in China's future nutritional needs.

CPOPC Webinar: Global Framework for Sustainable Palm Oil Sustainability Standard for all Vegetable Oils?

Overview

Following the first series of Global Framework of Principles of Sustainable Palm Oil (GFP-SPO) webinar on 14 February 2022, CPOPC had organised "GFP-SPO Sustainability Standard for all Vegetable Oils?" or GFP-SPO 2 on 2 March 2022. The moderator of the session was Witjaksana Darmosarkoro, Director of Sustainability and Development of Smallholders of CPOPC.

Palm oil achieves 13 SDGs

CPOPC's Executive Director Tan Sri Datuk Dr Yusof Basiron stated that GFP-SPO would be presented to the UN High-level Political Forum on Sustainable Development (HLPF) so the framework could be widely known and receive support from the producing countries. Palm oil (PO) has achieved 13 goals out of the 17 UN SDGs accommodating the three pillars: social, economic and environmental.

GFP-SPO as global sustainability reference

Moch. Edy Yusuf, Assistant to Deputy Minister for Estate Crops' Agribusiness Development, Coordinating Ministry for Economic Affairs, the Republic of Indonesia, underlined that this framework would be useful for developing global sustainability reference on PO as well as highlighting the leadership of PO in ensuring the sustainability of all vegetable oils.

Palm oil at the heart of food system

Senior Management Adviser and Head of Environment Unit UNDP Indonesia, Dr Agus Prabowo pressed that UNDP, an international development agency and a development partner to the Indonesian government, affirmed its position as a convener and neutral agent between stakeholders and fostering multi-stakeholder collaboration for systemic changes in food security. He added that the most powerful way to progress towards achieving SDGs was by making food systems involving PO more sustainable.

Great contribution to national GDP

Ziv Ragowsky, Sustainability Consultant and Agricultural Technology Enthusiast, stressed that PO is a significant economic driver as it stimulates agribusinesses both in the context of social and economy. From upstream in the rural areas to downstream export hubs, PO requires processing within the country itself, as opposed to other commodities. PO was also the source of income to over three million farmers and the connected ecosystems that they are driving. The price point of PO in early March 2022 was a great contribution to the GDP of producing countries.

Figure 1: Ziv Ragowsky shared that how the GFP-SPO principles were developed.

G2G and B2B options

Managing Director of Solidaridad Asia Dr Shatadru Chattopadhayay presented two potential pathways for the common framework to proceed: government to government (G2G) and business to business (B2B). For the former approach, CPOPC and EU could develop collaborations to set up a fund and joint scientific panel on PO. On B2B, Asian Palm Oil Alliance could facilitate improved trade, develop mutual recognition of the National Palm Oil standards, and create a level playing field for all oils and fats in food industry.

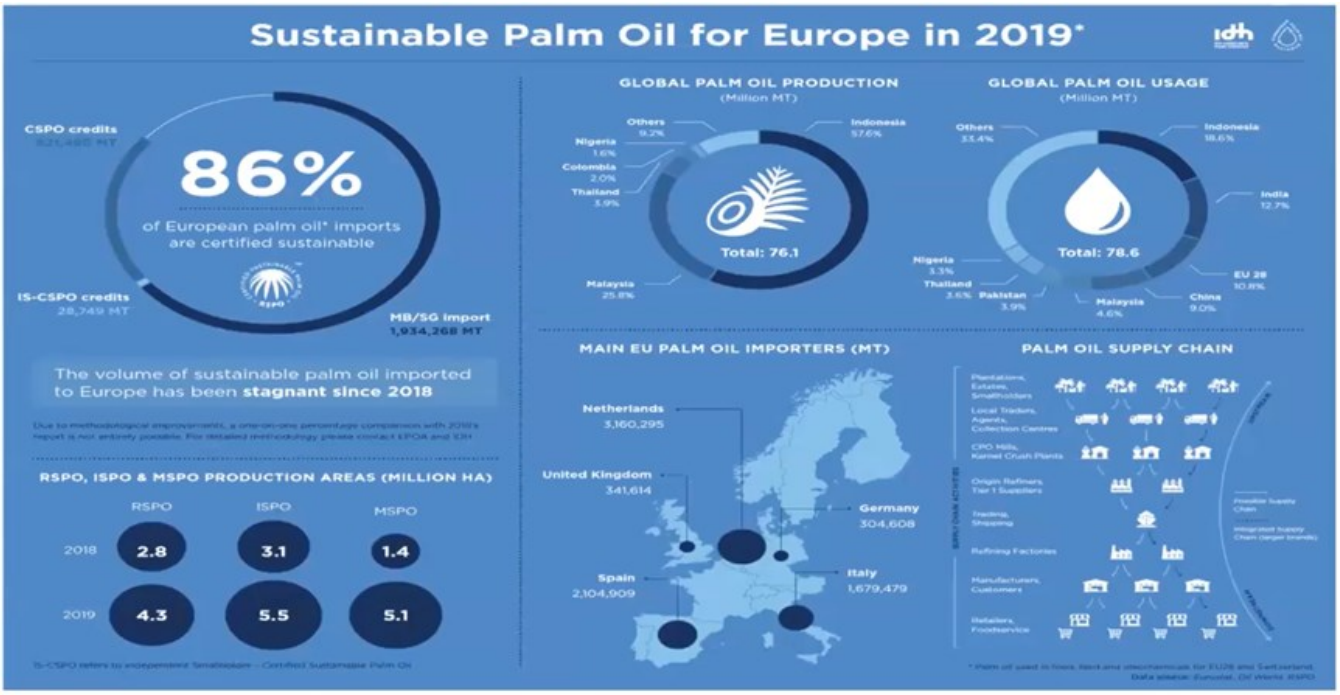


Figure 2: Dr Shatadru Chattopadhayay presented the data about sustainable PO for Europe in 2019.

Figure 3: Panel discussed the topics raised by the audiences.

Event: Bursa Malaysia Derivatives Berhad: 2022 Palm and Lauric Oils Price Outlook Conference and Exhibition

Figure 1: BMD-hosted POC 2022. Image adapted from: POC Malaysia (2022).

Overview

Organised by Bursa Malaysia Derivatives Berhad (BMD), Palm & Lauric Oils Price Outlook Conference & Exhibition (POC) 2022 was held in Shangri-la Hotel from 7 to 9 March 2022. On Day 1, the event began with a plantation tour to Sime Darby Plantation Academy, Carey Island. At the same time, BMD Workshop: Opportunities with Options on Crude Palm Oil Futures (OCPO) happened in the hotel.

Official opening

Chairman of BMD and CEO of Bursa Malaysia Berhad Datuk Muhamad Umar Swift delivered his welcome address; special exchange partner address was given by Executive Vice President of Dalian Commodity Exchange, Mr Cheng Weidong; and, strategic partner's address was delivered by Managing Director and Head of Asia Pacific, CME Group Mr Christopher Fix.

Malaysia to boost CPO production

Minister of MPIC Malaysia YB Datuk Hajah Zuraida Kamaruddin said in her address that CPO prices might correct to an average of RM4,000 per tonne once labour shortage problem was overcome, as the production would increase. This situation was solely based on supply and demand expectations, but the conflict in some region might exert an upward pressure on prices. She added that Malaysia targeted CPO production would be increased by 2 million tons from 2021 to 2022 and reach 20 million tons.

At a briefing session, the minister commented that Indonesia is setting a quota for eight million tonnes of CPO that cannot be exported, and will go to its local consumption. Hence, it will provide an opportunity to Malaysian industrial players to capture the spare market capacity.

Adjust strategies to secure palm oil position

A special paper, "Palm oil at the crossroads" was delivered by Group Managing Director and Chief Executive of IOI Corporation Berhad, and Chairman of Malaysian Palm Oil Association (MPOA) Dato' Lee Yeow Chor. He presented four overarching strategies for the palm oil (PO) industry. One, intensify mechanisation and automation efforts in smallholdings. Two, collaboration with competing seed oil producers by offering multi-oils solution for various applications. Three, regionalisation of commodity-based PO trade that fits with the global population distribution. Four, development of special applications and purpose for smaller volume of PO, for example, infant and sports nutrition, pharmaceutical ingredients and renewable fuel.

Charting the future of palm oil – perceptions & challenges

The Panel Session 1 was chaired by Chief Executive of MPOA Datuk Mohamad Nageeb bin Ahmad Abdul Wahab.

Executive Director of Council of Palm Oil Producing Countries (CPOPC) Tan Sri Datuk Dr Yusof bin Basiron highlighted that reduced expansion of oil palm plantation in recent years caused shortages leading to high prices. He pressed that only oil palm crops contribute to 13 out of 17 SDGs. He added that PO is important to balance the supply against the demand of oils and fats.

Managing Director of Sime Darby Oils Berhad Mr Mohd Haris Mohd Arshad presented that his organisation has a dedicated team to ensure food safety that is the utmost priority. Although consumer awareness is increasing and global CSPO sales boosted by 2.5-fold from 2014 to 2021, the development of CSPO supply from smallholders who contributed 40% of global PO remains a key challenge.

CEO of Malaysian Palm Oil Certification Council (MPOCC) Mr Mohammad Hafezh Abdul Rahman identified that SDG-contributing MSPO is a trust-building scheme that shows the commitment to a sustainable environment and fair trade. The future plan of the organisation includes the use of technology (Web 3.0) to improve certification process, impact framework and analysis to evaluate the impacts, and to develop continuous improvements to ensure MSPO is relevant with industry requirements.

Laurics, biodiesel & oleochemicals

Plenary Session 1 was chaired by the CEO of Malaysian Palm Oil Council Ms Wan Aishah Wan Hamid.

Director and Board Member of UIE Plc Mr Harald Sauthoff presented that laurics have marched into a higher price band with increasing volatility. He added that the PO production growth could not meet demand growth. The forecast for PO market was difficult due to several reasons: pandemic-causing restrictions, labour shortage, Indonesian government policies and La Nina impacts.

Figure 2: Datuk Muhammad Umar Swift delivered his talk on Day 2 of POC 2022.

Image adapted from: The Edge Markets (2022).

Co-Founder and CEO of DIBIZ Group Mr U.R. Unnithan outlined that the national biodiesel mandates would be impacted due to unattractive Palm Oil vs Low Sulphur Gasoil (POGO) and geopolitical tensions. He showed the DIBIZ Trustparent Marketplace powers trust and transparency through a single window trading platform.

President of IP Specialities Asia Pte Ltd Mr Norman Ellard highlighted several issues in 2021, for example, labour shortage, climate change, energy shutdowns and mechanical problems on plant. Issues on raw materials and fatty alcohols also challenged the market dynamics.

Global economics & impact on commodities

Executive Vice President, Head of International Development, Head of Product and Market Development of BMD Mr Mohd Saleem Kader Bakas was the chair of Panel Session 2. The day began with the presentation of BMD highlights by the CEO of BMD Mr Samuel Ho.

Managing Director of Agricultural Products of CME Group Mr Timothy J. Andriesen presented that the US has seen the highest consumer price inflation in the last 40 years. During the pandemic, spending shifted from services to goods, of which it has affected supply chain and caused goods inflation. He showed that the differences in total assets may become more pronounced once the US Federal Reserve Bank (Fed) terminates asset purchases and considers balance sheet shrinkage. Biodiesel was expected to occupy the major part of the overall diesel market as driven by ESG concern.

Managing Director of Datametrics Research and Information Centre Sdn Bhd Mr Pankaj Kumar Bipinchandra identified several key inflationary factors, including supply disruptions due to geopolitics and logistics, oil prices and rising wages in the US. The inflation would trigger rate hikes in 2022, while global economy growth was projected to be slower in 2022 than in 2021.

Figure 3: Minister of MPIC YB Datuk Hajah Zuraida Kamaruddin (middle) delivered her opening speech during POC 2022. Chairman of BMD Berhad and CEO of Bursa Malaysia Berhad Datuk Muhamad Umar Swift (left) and CEO of BMD Berhad Samuel Ho (right) also participated in the official opening. Image adapted from: UKK MPIC (2022).

Director of Research at Khazanah Nasional Berhad, Mr Mohamed Ridzuan Mohamed presented a common pattern of under-investment across many countries and sectors since 2015. A new global capex cycle was triggered by shifts in trading patterns, decarbonisation and deglobalisation. He also showed that price levels would remain high until there is a buffer of excess supply.

Palm & major oils

Chairman of IRGA Sdn Bhd and Advisor to RSPO Mr M. R. Chandran was the chair of Plenary Session 2.

Executive Director of ISTA Mielke GmbH - Oil World, Mr Thomas Mielke said that the recovery of production would be dependent on the labour supply. He identified that insufficient replanting, lack of new plantings, declining yield and harvest losses were among the key factors affecting the growth dynamics. Although PO exports were at 58% of the vegetable oils, PO is suffering a loss of market share.

CEO of Westbury Group Mr Abdul Rasheed Janmohammed shared that 2020-to-2022 period is challenging to PO-consuming countries. Unprecedented surge in commodity prices shows a high volatility in the market. Shipments from Black Sea would be a great impediment if the regional conflict continued.

Chairman of LMC International Ltd Dr James Fry underlined that the dispute in Eastern Europe has affected the fertiliser supply. PKO export is affected by the Indonesia's export control whereas CNO output is growing. A slump in CPO sales would worry the refinery operators.

Founder, Chairman and Managing Director of Transgraph Consulting Pvt Ltd Mr Nagaraj Meda shared that the growth of Malaysian PO industry could be stimulated by the moderate yield improvements, labour supply and the Indonesia's export policy. Strong exports in early 2022 could lead to a decline in Malaysia's stocks to its lowest since October 2003.

China CNF Business Director – Oils & Oilseeds CASC Greater China Grains, Oilseeds and Oils at Cargill Investments (China) Ltd, Mr Ryan Chen stated that decreasing availability of stock is the main problem in 2022. He also pointed that olein lost price competitiveness against animal fat in feed oil sector. Government policies have a big but difficult-to-predict impacts on prices. Hence, consumers and investors are prioritising risk management over business profitability to avoid policy uncertainty.

Vice Chairman of Indonesian Palm Oil Association/ GAPKI Mr Togar Sitanggang showed that 66% PO production goes to export market. Domestic Market Obligation (DMO) regulations have decelerated Indonesian PO export in February 2022. The market would be bullish on PO due to Indonesian policy, Black Sea conflict, and high SBO demand versus low production in South America.

Director of Godrej International Trading & Investments Pte Ltd Mr Dorab Mistry stressed that two successive La Nina in South America, Biden Green Agenda, Indonesian tax regime and low rapeseed crops were among the macro factors contributing to high prices of PO. The Black Sea conflict will make the market bullish on sunflower oil, while it also affects fertiliser availability. Dorab underlined that "2022 may be a year of Stagflation" and inflation would be a big problem.

YB Datuk Hajah Zuraida Kamaruddin
Minister of Plantation Industries and Commodities Malaysia

Datuk Muhamad Umar Swift
Chairman of Bursa Malaysia Derivatives Berhad
Chief Executive Officer of Bursa Malaysia Berhad

Mr Cheng Weidong
Executive Vice President, Dalian Commodity Exchange

Mr Christopher Fix
Managing Director & Head of Asia Pacific, CME Group

Dato' Lee Yeow Chor, DSAP
Chairman of Malaysian Palm Oil Association & Group Managing Director of IOI Corporation Berhad

Mr Samuel Ho
Chief Executive Officer, Bursa Malaysia Derivatives Berhad

Figure 4: POC 2022 Conference Speakers. Image adapted from: POC Malaysia (2022)

Datuk Mohamad Nageeb Bin Ahmad Abdul Wahab
Chief Executive
Malaysian Palm Oil Association

Tan Sri Datuk Dr Yusof Bin Basiron
Executive Director, Council of Palm Oil Producing Countries

Mr Mohd Haris Mohd Arshad
Managing Director, Sime Darby Oils

Mr Mohammad Hafezh Abdul Rahman
Chief Executive Officer, Malaysian Palm Oil Certification Council

Puan Wan Aishah Wan Hamid
Chief Executive Officer, Malaysian Palm Oil Council

Mr Harald Sauthoff
Director & Board Member, UIE Plc

Mr U.R. Unnithan
Co-Founder & CEO, DIBIZ Group

Mr Norman Ellard
President, IP Specialities Asia Pte Ltd

Mr Mohd Saleem Kader Bakas
Executive Vice President, Head of International Development, Head of Product & Market Development, Bursa Malaysia Derivatives Berhad

Mr Timothy J. Andriesen
Managing Director of Agricultural Products, CME Group

Mr Pankaj Kumar Bipinchandra
Managing Director, Datametrics Research and Information Centre Sdn Bhd

Mr Mohamed Ridzuan Mohamed
Director, Research, Khazanah Nasional Berhad

Figure 4: POC 2022 Conference Speakers (continued). Image adapted from: POC Malaysia (2022)

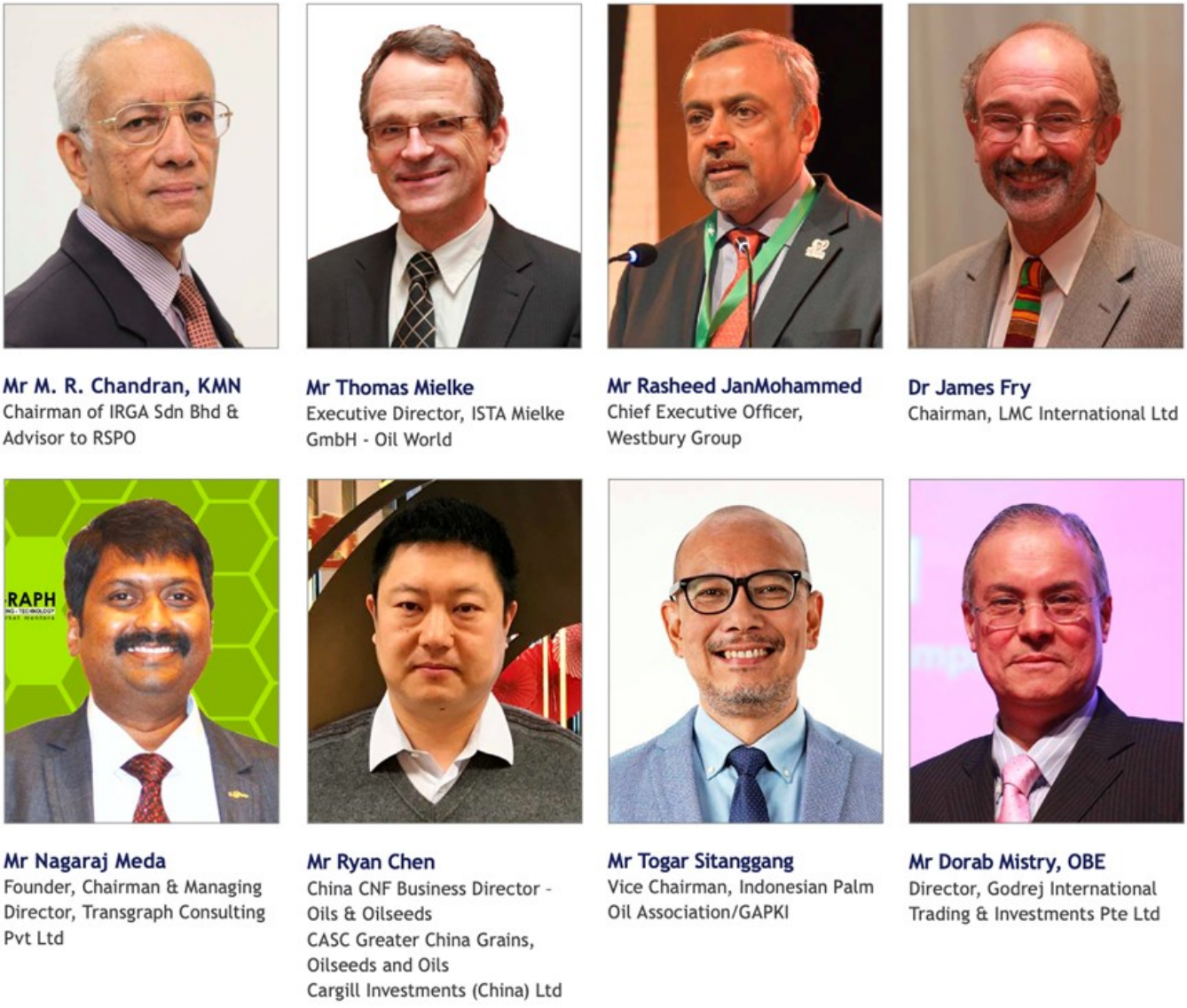


Figure 4: POC 2022 Conference Speakers (continued). Image adapted from: POC Malaysia (2022)

Event: MPOCC: CSPO Forum & Launching Ceremony of MSPO 2022

Overview

On 22 March 2022, Malaysian Palm Oil Certification Council (MPOCC) had organised Certified Sustainable Palm Oil (CSPO) Forum, in conjunction of the launching of two MSPO standards namely MS2530:2022 (or MSPO 2022) standard series and MS2751:2022 (or MSPO Chain of Custody of Oil Palm Biomass) standard. The hybrid event was held in Le Méridien Putrajaya.

Standard development on MSPO certification

In the welcoming remarks, CEO of MPOCC YBrs Mohammad Hafezh Abdul Rahman welcomed the board of trustees, representatives from Department of Standards Malaysia (Standards Malaysia), prominent palm oil agencies and associations for their attendances. Jointly organised with Standards Malaysia, CSPO Forum was held to celebrate the launch of MS2530:2022 and MS2751:2022 standards. In general, the former one only covers the oil part of the certification, while the latter one only covers the palm biomass section of it.

MSPO reviewed for all

The National Steering Committee (NSC) had directed MPOCC, the Scheme Owner, to review the MSPO Standards, together with the MSPO Standards Owner – Standards Malaysia. The review process started in August 2019 and completed in January 2022. More than 22,000 man-hours had been invested by Technical Committee (TC) and Working Group (WG) members. 19 gaps were identified and investigated during the review. In result, MSPO has been structured into five main principles while a number of new terms and definitions was also introduced.

Aim to get global recognition for Malaysian palm oil

The documents that will be developed to guide on the application of MS2530:2022 are Social Impact Assessment (SIA) guidelines, High Conservation Values (HCV) guidelines and greenhouse gas (GHG) calculator. MSPO Trace is user-friendly and provides both desktop and mobile phone views. The revised version would allow the authority to govern MSPO Scheme with accountability. MS2530:2022 is targeted to address global warming, prosperity, global recognition for Malaysian palm oil, human rights and the fulfilment of the governmental policies.

Figure 1: Mohammad Hafezh Abdul Rahman presented MS2530:2022 during the forum.

MSPO CoC Biomass commits to traceability

Senior Manager for System Management at MPOCC Mr Simon Selvaraj Subramaniam presented the development of MSPO Chain of Custody (CoC) of oil palm biomass. It aims to be used as a voluntary standard for both local and overseas entities. He outlined five principles of MSPO CoC Biomass: management commitment and responsibility; transparency; compliance to legal and other requirements; health, safety and employment conditions; and, environment, natural resources and GHG emissions.

Address critical issues

Senior Manager in the Strategic Management Department at MPOCC Mr Mohd Hasbollah Suparyono presented three key focus areas: certification process readiness, industry readiness and raising MSPO profile globally. One, MPOCC aims to overcome the "bottleneck" during certification process and activities. Two, the organisation will identify the best solution for the quantum leap to offer support and executing mandatory certification. Three, the body will embrace critics and collaborate with partners. All these efforts aim to make MSPO a game changer and a solution.

Discussion forum

The discussion session was moderated by Professor Denny K. S. Ng, Professor at Heriot-Watt University Malaysia. Chief Executive of MPOA Datuk Mohamad Nageeb Ahmad Abdul Wahab underlined that compliance and enforcement are important to address the issues revolving the certification reputation.

Figure 2: Professor Denny Ng was the moderator of the discussion session.

Figure 4: Chairman of MPOCC Dr Shathiskumar Govindaraju delivered his speech during the ceremony.

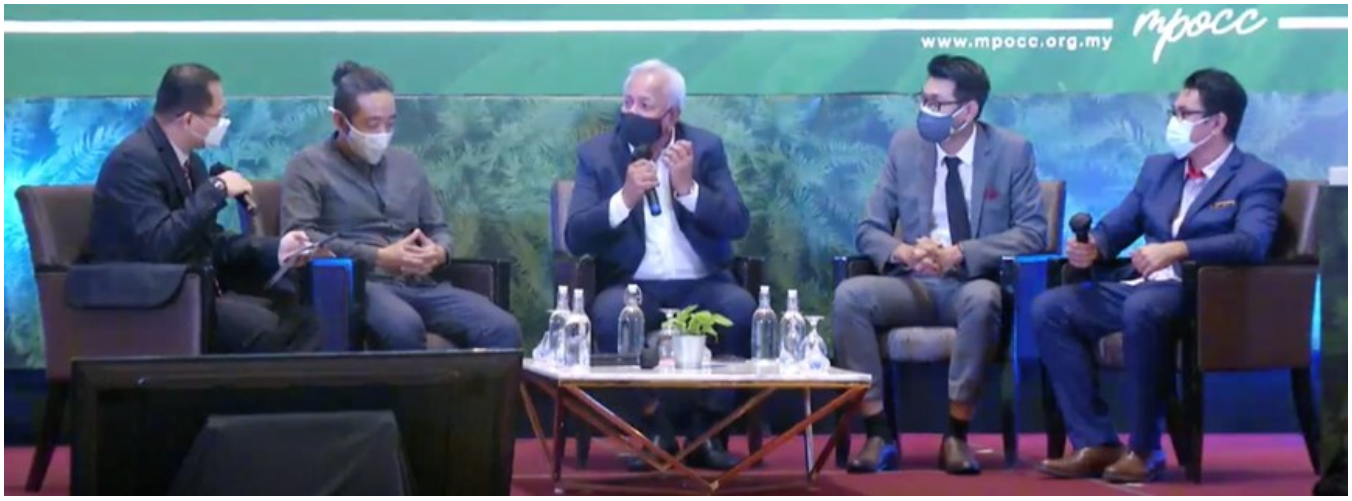


Figure 3: Datuk Mohamad Nageeb Ahmad Abdul Wahab (3rd left) answered the questions related to CSPO forum.

MPOCC Chairman's address

Chairman of MPOCC Dr Shathiskumar Govindaraju expressed his hope that sustainability practice based on the MSPO principles can be exercised in the Malaysian palm oil industry. He looked forward for MSPO to obtain recognition at both regional and global stages.

MPIC Minister's speech

YB Datuk Hajah Zuraida Kamaruddin said that the efforts for MSPO development showed that Malaysia is well prepared with the facts to confront the allegations on palm oil. Malaysia is committed to ensure that the palm oil industry is well organised and the management is well performed. She said, through the Ministry of Human Resources, Malaysia has signed ILO 29 to overcome forced labour issues. In addition, Malaysia has also agreed to COP26 pledge to limit the use of lands for oil palm plantation.

MSPO 2022 was officially launched by the Minister of MPIC YB Datuk Hajah Zuraida Kamaruddin.

Figure 5: Minister of MPIC Datuk Hajah Zuraida Kamaruddin delivered her speech during the launching ceremony of MSPO 2022.

Event: APROBI-CPOPC: 3rd Palm Biodiesel Conference

On 24 March 2022, the 3rd Palm Biodiesel Conference was organised by Indonesia Biofuel Producer Association (APROBI) and co-organised by CPOPC. The hybrid event was held in Sheraton Mustika Hotel, Yogyakarta, Indonesia.

In the keynote address, Coordinating Minister for Economic Affairs, the Republic of Indonesia, HE Airlangga Hartarto stated that the use of biodiesel was estimated to reduce GHG emissions by 24.6 tonnes of CO2 and this reached 7.8% of the target achieving renewable energy for 2030. Biodiesel production growth signalled a positive outlook for Indonesia while the biofuel consumption continues to increase.

The Minister of Plantation Industries and Commodities, Malaysia YB Datuk Hajah Zuraida Kamaruddin said that biodiesel can be produced from edible and non-edible oils. In Malaysia, palm oil is the primary feedstock for biodiesel production. MPIC has formulated a National Biofuel Policy (NBP) in 2006. Palm oil-based biodiesel is proven to be cheaper, sustainable, and locally available fuel supply.

Figure 1: HE Airlangga Hartarto delivered his keynote address.

B5 and B7 were introduced in 2011 and in 2014 for transportation sector; B10 for transportation and B7 programme for industrial were introduced in 2019; and, B20 programme for transportation was introduced in 20 February 2020 by phases. Biofuel with 20% palm oil component, which is known as B20, was rolled out in January 2020, but the event was delayed due to pandemic restriction. Zuraida added that the B20 programme constitutes a part of the Malaysia's National Agri-commodity Policy (DAKN) 2021-2030.

Figure 2: YB Datuk Hajah Zuraida Kamaruddin delivered her keynote address during the conference.

Zuraida pressed that Malaysia had been involved in the development of palm oil biodiesel since the 1980s. Using B50 and B100 biodiesel, a field trial had been conducted in Germany in collaboration with Mercedes-Benz Group AG (formerly known as Daimler-Benz) with 300 buses in the 1990s.

CPOPC Webinar: How Technology is Elevating Sustainability in the Palm Oil Industry

Overview

On 30 March 2022, a webinar was organised by CPOPC, in partnership with Palm Oil Discourse. The virtual event was moderated by Prabha Nayar.

BMP at upstream

Director General of Malaysian Palm Oil Board (MPOB) YBhg Datuk Dr Ahmad Parveez Haji Ghulam Kadir shared that best management practice (BMP) is vital to the upstream sector to maximise the efficient use of land and return on investment. It is also important to employ new breeding technologies to overcome genetic barriers and accelerate technology adoption. He added that MPOB is focusing on alleviating digital technologies and using sustainable techniques for monitoring disease.

Cost-saving biogas capture for reduce GHG emissions

Biogas can be captured during POME treatment to generate electricity for rural areas. The nation's first biogas-based rural electrification is located at KKS Umas in Tawau, Sabah, Malaysia. The cost-saving method has reduced CO2 and CH4 and benefited about 3,000 houses.

Sustainability in oleochemical processes

Datuk Dr Parveez presented three sustainable approaches for oleochemical processes. One, technology with reduced energy consumption in the production of glycerol derivatives. Two, technology with lower water footprint and waste generation using heterogeneous catalysis. Three, technology with zero contamination formation through auto-catalytic processes. Direct sulphonation of palm oil methyl esters produces methyl ester sulphonate (MES), an active ingredient in laundry detergents, with low production cost, reduced builders and eco-friendly.

Improved OER reduces land use

Ir ChM Qua Kiat Seng presented the best from technology in palm oil processing. In the mill, increased oil extraction rate (OER) will bring more revenue, use less land and reduced CO2 emission. However, the challenges at the mill include inconsistent feedstock price and quality, accessibility of grid connections and utilisation of less efficient methods for power generation.

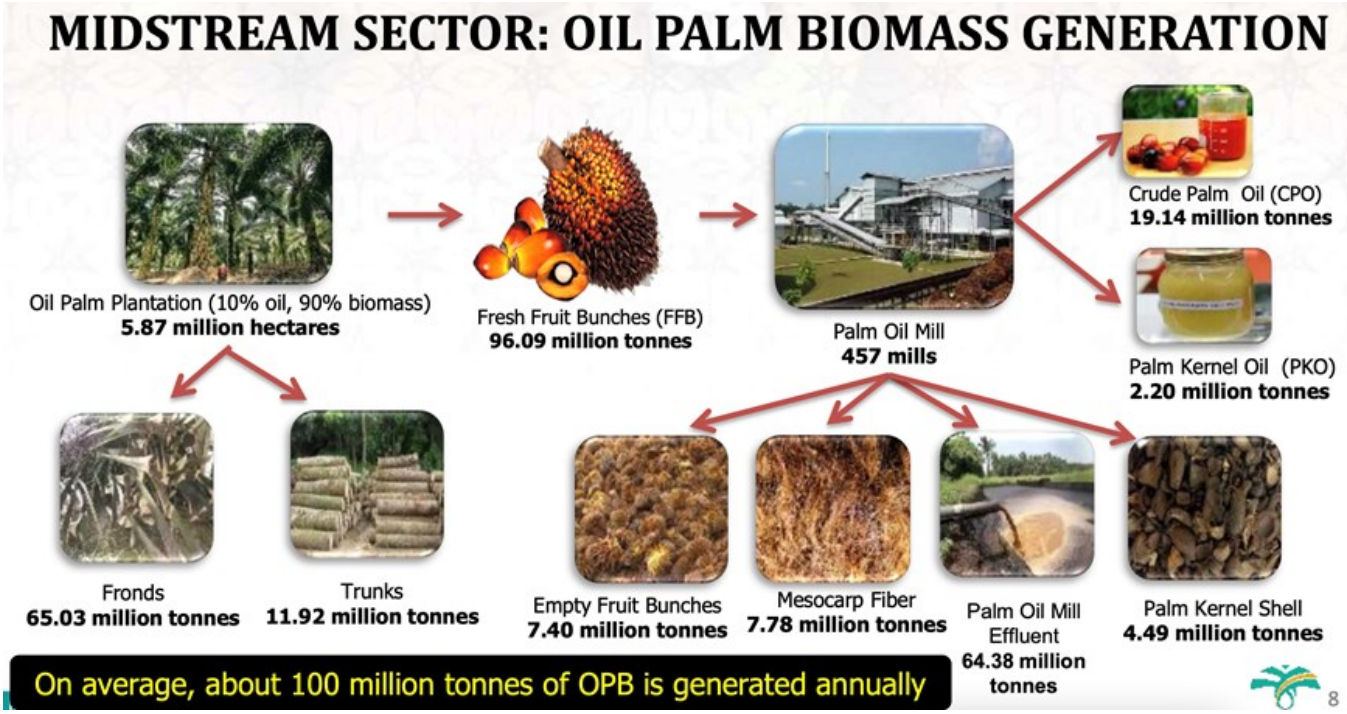


Figure 1: Datuk Dr Ahmad Parveez Hj Ghulam Kadir presented the midstream sector of palm oil production to produce CPO, PKO and oil palm biomass.

Data analytics for predictions

Ir Qua also shared that energy efficiency could be improved by an average of 20-30% through system optimisation. Energy recovery is the highest at continuous deodorisation process as it can recover up to 85-90% of the total heat input by using external heat economisers. As fouling occurs over time, data analytics is important to create a predictive model based on operating conditions to reduce production loss and allow planning for maintenance with reduced impacts on operations.

Digital technologies uplift capabilities

Chief Digital Officer of IRGA introduced that digital technologies can enhance an organisation's existing assets and capabilities to build new value. Fourth Industrial Revolution (4IR) is an overarching industrial transformation that covers every aspect of industries and economic activities, while Industry 4.0 is referred to as production- or manufacturing-based industries that involve cyber physical systems and monitor real-time performance.

Malaysia needs digital transformation

Although digital transformation is the strategic priority to the 80% of the leading European businesses, only 46% of firms in Malaysia are on a digital transformation journey while 64% of organisations in Asia Pacific and Japan are investing in cloud-native applications.

Technologies in agricommodity sector

In agricommodity sector, many technological applications have been developed, for examples, autonomous vehicles for seeding, IoT in irrigation, drones for field monitoring, e-commerce for agriculture, big data analytics, and, blockchain for traceability.

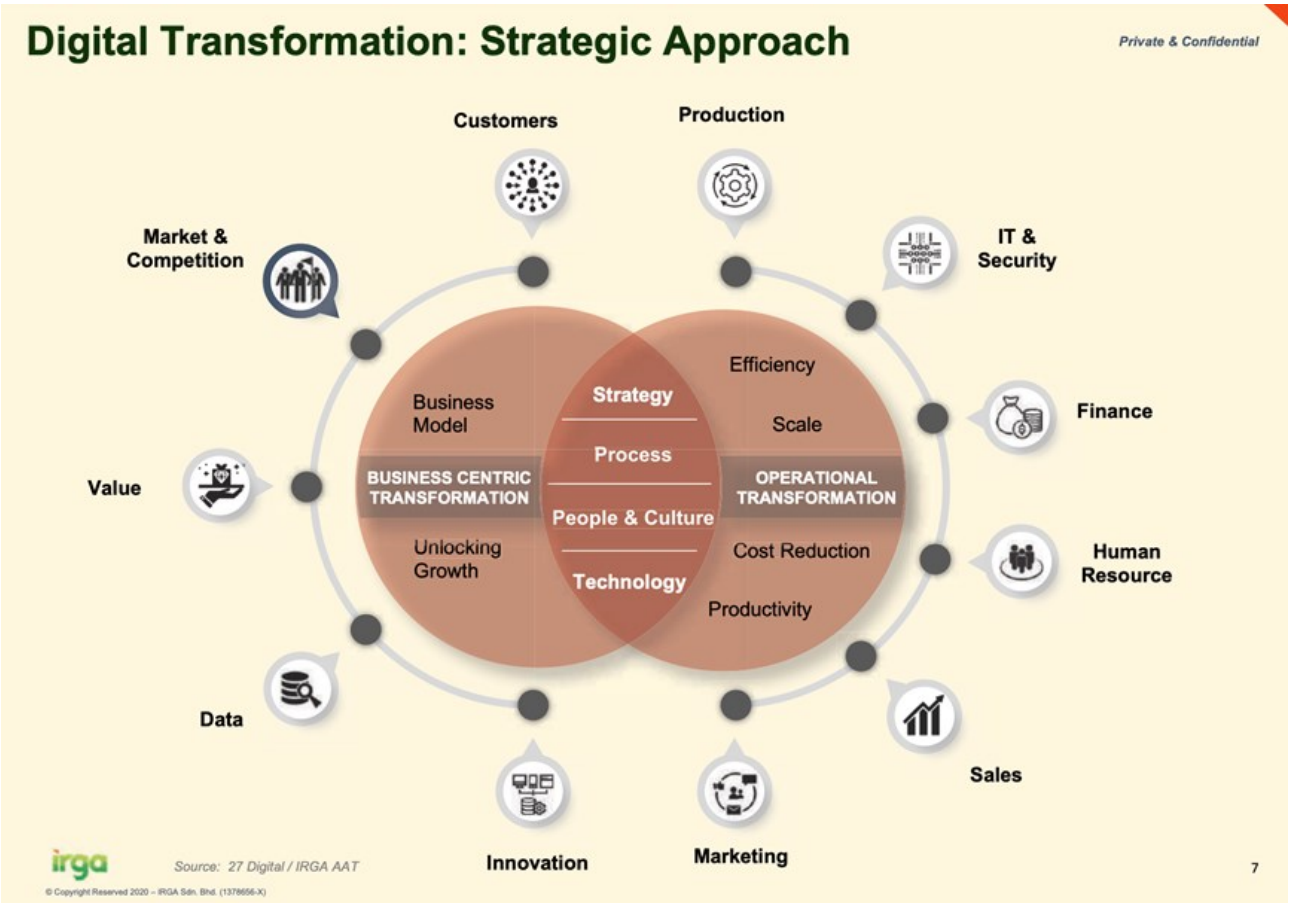


Figure 2: Chief Digital Officer of IRGA presented the strategic approach for digital transformation.

Roadshow: UM:
National Chemical Engineering Exposure Camp 2022

Written by Hong Jing Yu & Previnah A/P Loganathan
Universiti Malaya

National Chemical Engineering Exposure Camp (NCEEC) 2022 is a 2 days virtual event organised by IChemE Student Chapter Universiti Malaya in recognition of the Ministry of Education Malaysia and partnered with Palm Oil Processing Special Interest Group (POPSIG). The event aims to introduce Chemical Engineering course and professions to pre-university students nationwide. The event is placed on 5th and 6th March 2022 with a total of 177 participants from matriculation colleges and Form 6 students.

The event started with a Chemical Engineering Crash Course session by Dr Hanee Farzana Binti Hizzadin, a senior lecturer in the Chemical Engineering Department of Universiti Malaya. In this session, she introduced Chemical Engineering in an academic perspective, including the subjects learned in the course, the outcomes of the course and explaining how the course contributes to the real world.

Next session was the Career Sneak Peek Series: Manufacturing Industry. The participants were introduced to the roles of chemical engineers in the Manufacturing Industry by Mr Tan Ren Chii, a project engineer currently working in Nestle Manufacturing. He had shared his experience working in the Food and Beverage Industry and his responsibilities including managing capital expenditures and implementing improvements to production lines. He then enlightens the participants on how some prospects should be considered while choosing pathways after pre-university.

Day 1 of the event ended with a forum session by the seniors and alumni from Universiti Malaya to share about their experience studying the Chemical Engineering course. The session was featured by Mr. Gillvest Anak Mathew, a current final year student, Ms. Chiang Chin Ning, an alumnus working in semiconductor industry, and Mr. Samuel Yeoh, an alumnus working in oil and gas industry. In this session, they discussed some of the challenges faced while studying the course and the applications of chemical engineering in their career field.

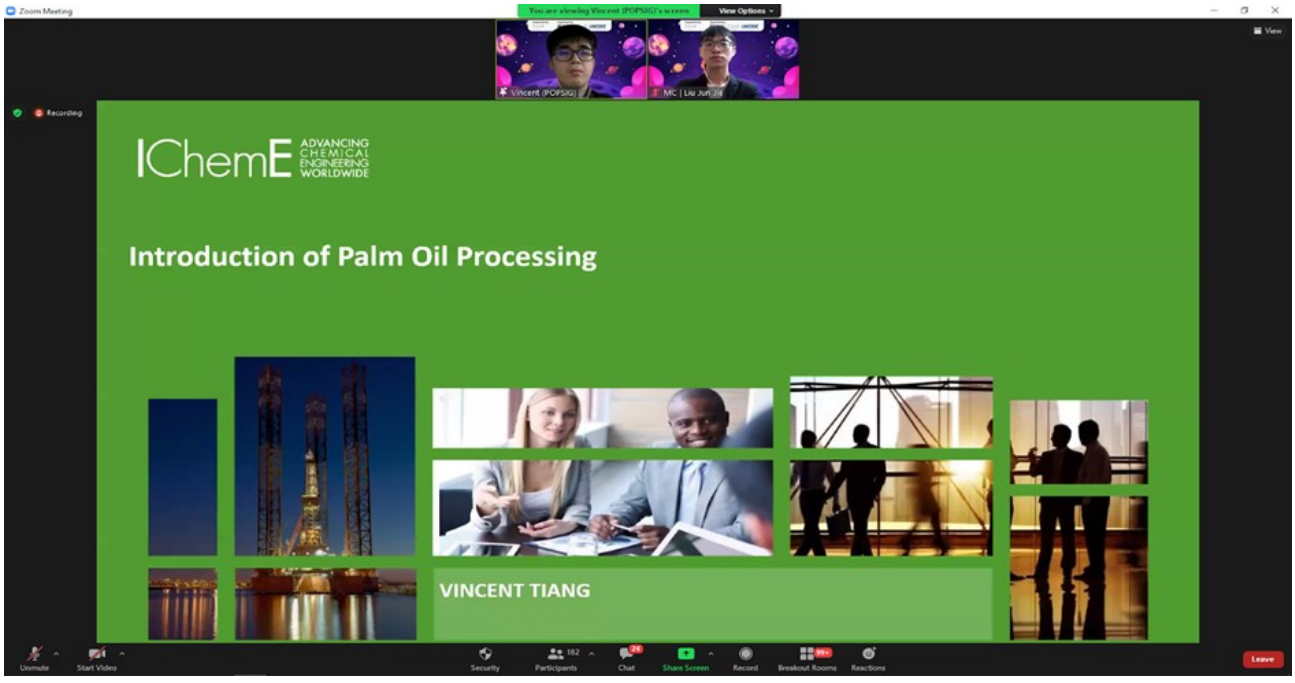


Figure 1: Mr. Vincent introduces the Palm Oil Processing Special Interest Group (POPSIG) to the participants.

Moving on to day 2, there was another sharing session, which was the Career Sneak Peek Series: Oil & Gas Industry by Madam Surabhi Nambiar from Shell to talk about her work experience in the oil & gas industry. Madam Surabhi started off explaining the industry overview which includes the upstream, midstream and downstream. Participants got a glimpse of an offshore operation, job scope of an engineer on a typical average day in the oil and gas industry as well as how the distillation process makes a huge difference in terms of extraction and efficiently maximizing the benefits within the oil and gas industry. There were a few interesting common misconceptions regarding the oil and gas industry was shared by the speaker to end her presentation. During the Question and Answer (QnA) session, Madam Surabhi highlighted that even though working in the oil rig may be known for its high risk, there are a lot of safety standards that will be adhered to. Afterall, every profession has its own risks.

Following that was the Introduction to Palm Oil Processing Talk by IChemE POPSIG. Mr. Vincent Tiang Soon Thai, the Roadshow Director at POPSIG introduced the participants to the palm oil processing value chain that is said to be not much difference with the oil and gas industry. In the upstream process, the harvested palm fruit will be sent to the palm oil mill and further to the kernel crushing plant and biogas plant. The crude palm oil produced upstream will be refined either physically or chemically in the palm oil refinery which is the midstream. Whereas the downstream section includes specialty fats, biodiesel and oleo producers for hydrogenation, interesterification and fractionation that produces oil for different usage. A brief fact was shared during the session, that the majority of the products being sold in supermarkets are made with palm oil. Mr. Vincent then described the role of chemical engineers in the palm oil processing industry. Technical knowledge of a chemical engineer such as process technologies, system analysis, mathematical modelling and many more can be put into use in many areas in this industry. He also added that despite being a high revenue industry, to a certain extent the market appetite will change depending on the raw net price.

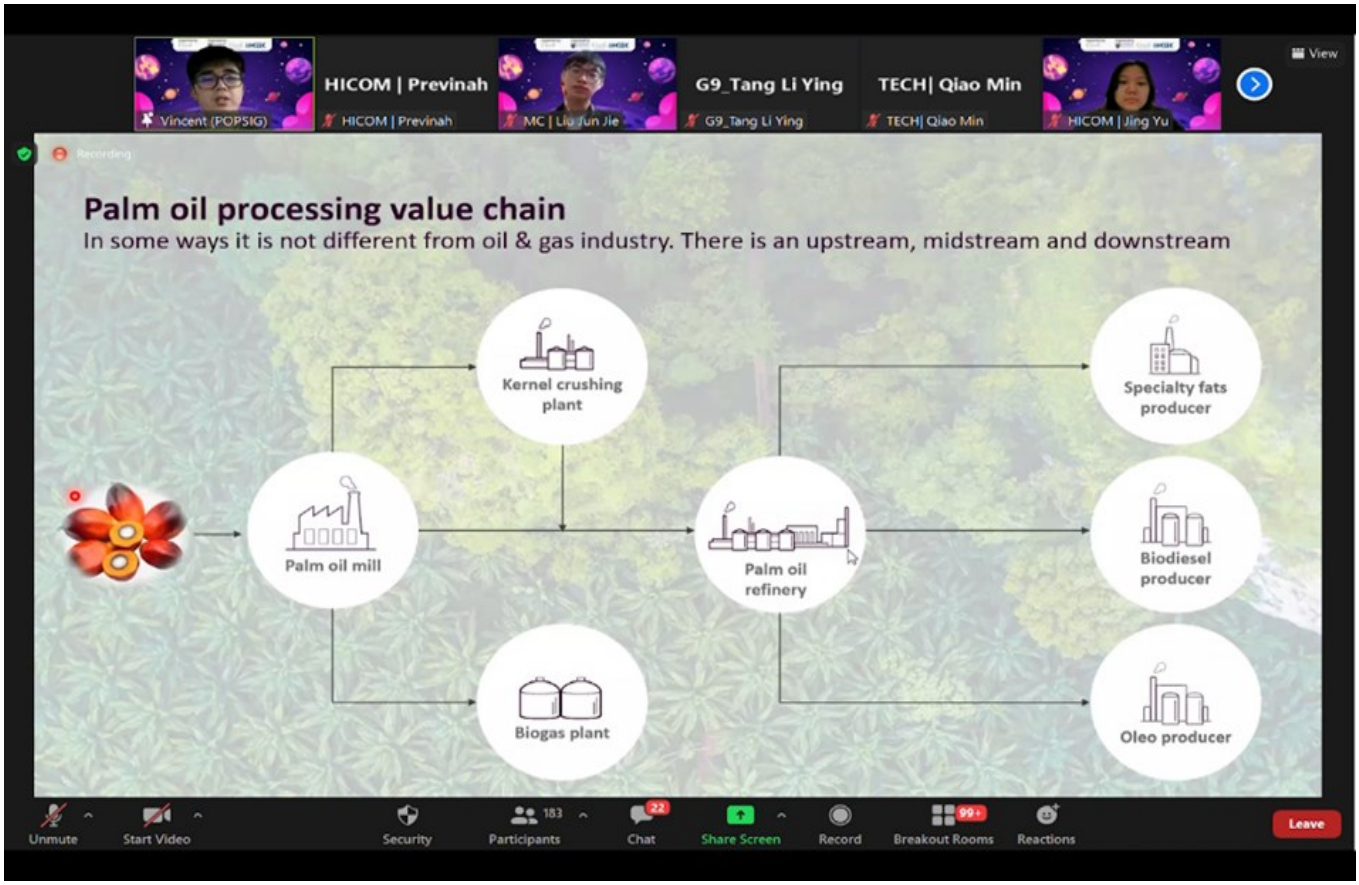


Figure 2: Mr Vincent explains the palm oil processing value chain.

For the last session of the event, participants were assigned to breakout rooms for the Speed Quiz Session to test their understanding based on all the sharings from both days of the event. Winners are awarded with cash prizes up to RM150 for answering quickly and correctly. The closing ceremony was held at 12.05 p.m. to mark the end of NCEEC 2022.

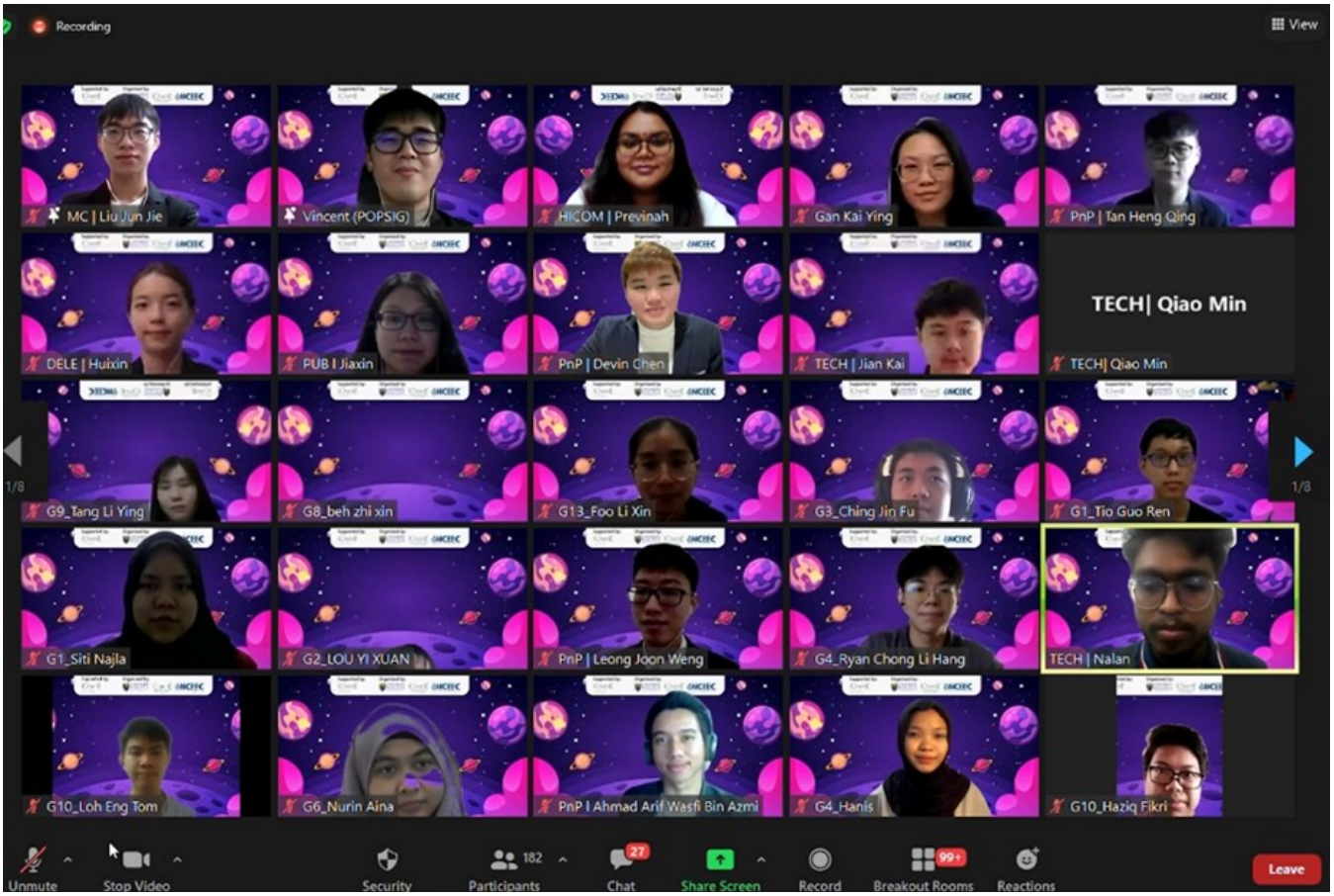


Figure 3: Group photo of participants, speakers, and organiser of this event.

Article: Utilization of palm oil waste in construction industry towards sustainable environment

Written by Goh Wee Ken
Universiti Sains Malaysia

Malaysia is one of the largest exporters of palm oil in the world [1]. Due to the production capacity of palm oil, it is estimated that millions of tons of palm oil waste will be produced every year from the oil palm fruitlet and empty fruit branches [2]. Palm Oil Fuel Ash (POFA) is an industrial by-product, which produces steam and electricity by burning palm oil shells and husks as fuel in a palm oil mill boiler. Afterwards, POFA will be sent to the landfill as it is a hazardous material without any commercial uses. Several studies [3]–[8] have proven that POFA can be utilized in the construction industry. Palm oil Fuel Ash (POFA) can be used as building materials such as concrete, bricks and stone mastic asphalt (SMA). Hence, the article will focus on utilizing palm oil in the construction industry.

According to [7], the replacement of clay with POFA (up to 5%) into fired clay brick production could enhance the properties of bricks with acceptable limitations [7]. For instance, with the incorporation of 1-10% of POFA in the fired brick production, the porosity of the brick will increase by 30% due to the organic matter will be easily get burnt during the firing process [7]. As a result of the addition of POFA in brick, the density and thermal conductivity of brick will be reduced. Moreover, the specific gravity of POFA (1.76) is lower than clay soil (2.56), suggesting that POFA contains a highly porous structure which subsequently lowers their specific density [4]. The incorporation of POFA into fired clay bricks could produce lightweight bricks. Lightweight bricks are ideal for non-loading structures or for external works that can reduce the load during the construction work as well as reduce the logistics costs [7]. In short, the utilization of POFA waste into fired clay bricks is the solution to waste disposal problems in landfills from the palm oil mill industry.

A study from [8] reported the utilization of POFA in the concrete industry. The use of POFA with optimum content enhanced the workability and compressive strength of the concrete mixture. The specific surface area of POFA is finer than Ordinary Portland Cement (OPC) to produce denser concrete which can increase the compressive strength and durability of the concrete by partially replacing the cement content in an optimum mixing [3]. A more specific approach is when the POFA, pozzolanic substance added into Ordinary Portland Cement (OPC), the fine POFA particles provide greater surface areas for the nucleation site of OPC hydration products (C-S-H). This results in an improvement in the early strength of concrete [8].

$$\text{Cement} + \text{water} \rightarrow \text{C} - \text{S} - \text{H gel} + \text{water}$$

When POFA is replaced with cement:

$$SiO_2 + Ca(OH)_2 \rightarrow C - S - H \text{ gel} + H_20$$

POFA has proven to be used as a cement replacement for building construction materials if it is ground to smaller nano size (GPOFA).

The utilization of POFA in the road construction industry is a new proposed idea in several studies [5], [6]. The study from [5] reported that the replacement of POFA as filler material in asphalt concrete mixes up to 5% does not affect its performance. The use of POFA could increase the stability, stiffness, and tensile strength of asphalt pavement. Based on the study from [6], optimum binder content (OBC) values were found to increase as the percentage of POFA up to 74% as it gradually decreased for the further addition of POFA in SMA. The asphalt mixture containing POFA is more resistant to permanent deformation. In terms of stability, the asphalt mixture can be improved by adding 3% of POFA with the optimum asphalt content of 5.1% [5]. In conclusion, the behaviour of asphalt is improved by using it as filler material in SMA as it also reduces the waste disposal from the oil palm industry.

In conclusion, the government should put more effort into the disposal of waste, considering the further utilization of waste before simply dumping waste into landfills. Although this is an alternative to building materials, it can minimize the disposal of palm oil fuel ash.

Utilization of Oil Plam Waste in Construction Industry towards Sustainable Environment

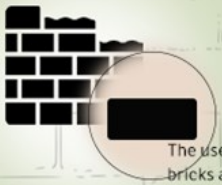
Concrete with POFA

POFA in Concrete mixture

10% concrete **Strength Durability Properties**

Due to the filling, dispersing and pozzolannic effects of fly ash.

Bricks



The use of POFA in fired bricks as a replacement

Increases 30% Porosity of bricks

Density and thermal conductivity of brick will be reduced as the organic matter easily get burnt.

Reduce the load during construction and hence reduce the logistics costs.

Asphalt Mixture

POFA as filler MIXES UP **to 5%**

*Increasing POFA content beyond 25% will decrease the strength of concrete.

Enhanced stability, stiffness and tensile strength

More resistant to permanent deformation

The government and the public could make these materials well-known so that more people will utilize them. Researchers have to work on it to keep on improving the formula in order to fully utilize palm oil waste and discover the possibilities to be used in other fields. It can reduce the amount of dumped waste to ensure a more sustainable environment.

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Article: Biogas Production through Palm Oil Mill Effluent Treatment Process

Written by Eileen Ng Li Shien, Elaine Ng Li Huey & Naveen Sunder
Universiti Teknologi PETRONAS

Palm Oil Mill Effluent (POME) is generated through the process of palm oil milling and is one of the major sources of water pollution. POME is a complex compound mixture of carbohydrates, nitrogenous compounds, free organic acids, suspended materials, fats, oils, cellulose materials, and grease. If left untreated, the high concentration of organic matter in POME can be devastating to the environment, particularly aquatic life when it is released into water bodies. This is because POME contains high levels of chemical oxygen demand (50,000 – 100,000 mg/L) and biochemical oxygen demand (25,000 – 50,000 mg/L) [1]. Through treatment of POME, biogas is produced as a sustainable source of energy and at the same time, reduce its environmental impact during in its final discharge. Some of the applications of biogas include cooking gas, transportation fuel and electricity production. Biological treatment (anaerobic digestion) is considered to be the common method to treat POME due to its economic and effective method to treat the high levels of organic carbon content in wastewater from palm oil mill industries.

Anaerobic digestion involves the application of microorganisms to break down organic compounds in the absence of oxygen to generate biogas (CH_4) as a source of renewable energy. Firstly, hydrolysis process breaks down large molecules such as carbohydrates, proteins and lipids into smaller molecules such as glucose, amino acids and fatty acids. This is followed by acidogenesis, whereby small molecules are fermented into volatile fatty acids (VFA). These VFAs are then split into hydrogen and carbon dioxide (CO_2) by acetogenesis. Finally, in methanogenesis, microorganism (methanogens) consumes the hydrogen and carbon dioxide (CO_2) to produce methane (CH_4) gas [2]. The biological treatment of POME can be carried out through anaerobic ponding system or anaerobic bioreactors [3].

Anaerobic ponding system produces excellent performance in reducing organic material and at the same time, produce a vast amount of CH_4 gas. Ponding systems are large artificial water lagoons where organic materials in wastewater are treated in the presence of sunlight, algae, water and microorganism. The use of conventional ponding system by suspended activated sludge is widely used in the majority of palm oil mills due to its simplicity of design, low maintenance and operating cost. However, this method requires a large amount of land (~30-45 acres of land), low organic loading rate (~1.4 kg COD/m3/day) and long retention time (~4 months) which can lead to environmental problems. In addition, the production of methane gas may worsen the global warming due to the lack of retrieval device in the ponding system to capture CH_4 gas efficiently. For this reason, POME treatment through anaerobic ponding system is inefficient in terms of space utilization, productivity, and environmental sustainability [2,4].

While anaerobic treatment is the most popular method in the treatment of POME, due to the inefficiencies in ponding systems, alternative treatment methods has been widely researched to improve the anaerobic treatment process. One of the alternatives is the use of anaerobic bioreactors or digestors. Anaerobic bioreactors consist of large chambers designed to break down and convert organic matter into biogas in a controlled environment. Some commonly used bioreactors are anaerobic fluidised bed reactors (AFBR), upflow anaerobic filters (UAF), up-flow anaerobic sludge blanket reactors (UASB), continuous stirred tank reactor (CSTR), anaerobic sequencing batch reactors (ASBR), and anaerobic membrane reactor (AnMBR). Despite having higher capital cost, maintenance cost, and operating cost, bioreactors are more desirable compared to conventional ponding system. This is because bioreactors have higher organic loading rate (~12 kg COD/m3/day), shorter retention time (~less than 10 days), and better biogas production and capture. In short, utilizing these bioreactors can reduce environmental pollution and fully optimize the production of CH_4 as biogas [2,4,5].

In conclusion, performing waste treatment of POME can be done through several methods such as anaerobic ponding system and anaerobic bioreactors. These biological treatment methods reduce the emissions of greenhouse gases and

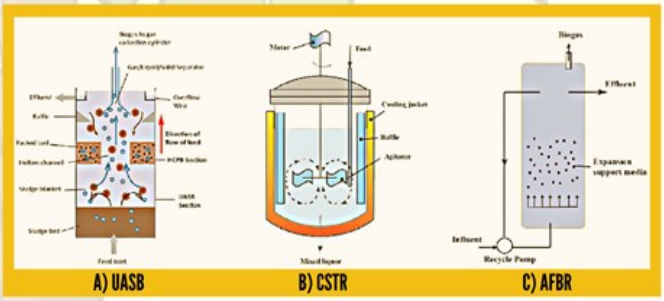
PALM OIL MILL EFFLUENT (POME) TREATMENT PROCESS

RAW PALM OIL MILL EFFLUENT

BIOLOGICAL TREATMENT

1. ANEROBIC PONDING SYSTEM

2. ANAEROBIC BIOREACTERS



IMPACTS ON ENVIROMENT, SOCIETY AND ECONOMY

BIOGAS

CIRCULAR ECONOMY

CLEAN WATER EFFLUENT

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EILEEN NG LI SHIEN, ELAINE NG LI HUEY, NAVEEN SUNDER

other pollutants into the environment while producing biogas as an end product which can be used as a renewable source of energy. Consequently, the anaerobic treatment of POME reduces Biological Oxygen Demand (BOD) and chemical oxygen demand (COD) to 50 mg/L and 1400 mg/L, respectively, hence minimizing the release of organic material into water bodies [6]. Furthermore, biogas can be re-use as raw materials for other processes in various industries, thus encouraging circular economy and striving towards zero waste. As a recommendation, several policies must be enacted by government bodies to ensure that POME is treated properly by industries. Enforcement of penalties should also be heightened on industries that do not adhere to the regulations and standards set on POME treatment.

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News: 2022 POPSIG Award Winners

(January-March)

Best Post-event Report Award — sponsored by MPOC: National Chemical Engineering Exposure Camp 2022

Hong Jing Yu

Jing Yu is a second-year Bachelor of Chemical Engineering student at Universiti Malaya in 2021/2022 session. She received Dean List Award from Semester 1 to 3 between 2020 and 2022. She is the Head of Public Relations Department in Regional Chemical Engineering Conference (RCEUC) 2022, and External Affairs Officer at IChemE UM Student Chapter session 2021/2022. She was the Vice Director of National Chemical Engineering Exposure Camp (NCEEC) 2022.

Previnah A/P Loganathan

Previnah is a second-year Bachelor of Chemical Engineering student at Universiti Malaya in 2021/2022 session. She was the Dean List Award recipient for Semester 1 session 2020/2021. She is the Head of Public Relations Department in Regional Chemical Engineering Conference (RCEUC) 2022, Industrial Coordinator at Chemical Engineering Undergraduate Club (CEUC) Universiti Malaya, and Journalism Officer at IChemE UM Student Chapter.

POPSIG Article Honorarium — sponsored by MPOC: Biogas Production through Palm Oil Mill Effluent Treatment Process

Naveen Sunder

Naveen is a second-year Master's in Chemical Engineering student at Universiti Teknologi PETRONAS (UTP) in 2021-2022. He began his undergraduate study in 2016 and obtained Bachelor of Engineering in Chemical Engineering from UTP in 2020. He was the First Class Honours recipient in Chemical Engineering. During his internship in 2019, he joined a solvent manufacturing company and was a project lead in the Production Department. Naveen was the Head of Department in Events Management at UTP IChemE in 2018. Naveen published a conference paper in Materials Today: Proceedings, and a review paper on the amine functionalization of hollow fiber mixed matrix membranes in Polymers journal in MDPI.

Elaine Ng Li Huey

Elaine is a second-year Master's in Chemical Engineering student at Universiti Teknologi PETRONAS (UTP) in 2021-2022. She began her undergraduate study in 2016 and obtained Bachelor of Engineering in Chemical Engineering from UTP in 2020. She was the First Class Honours recipient in Bachelor of Chemical Engineering with Honours. During her internship in 2019, she joined a food processing company and was a production engineer in the Production Department. Elaine was the Head of Department for the Activities Department in Science during Engineering Design Exhibition 2016 and Head of Department for the Competition Department in National Oil Rig Competition in 2018. Elaine published a review paper titled "Holistic review on the recent development in mathematical modelling and process simulation of hollow fiber membrane contactor for gas separation process" in Journal of Industrial and Engineering Chemistry.

Eileen Ng Li Shien

Eileen is a second-year Master's in Chemical Engineering student at Universiti Teknologi PETRONAS (UTP) in 2021-2022. She began her undergraduate study in 2016 and obtained Bachelor of Engineering in Chemical Engineering at UTP in 2020. She received First Class Honours in Bachelor of Chemical Engineering. During her internship in 2019, she joined poultry processing industry and was based in the Department of Primary Process. Eileen was the Assistant Head of Adjudication Department during SPE National Oil Rig Competition 2018 in UTP. She was also an organising committee of Adjudication Department during 38th Science & Engineering Design Exhibition (SEDEX) 2016 in UTP. In 2021, Eileen published a review paper titled "Selection Criteria for Antifoams Used in the Acid Gas Sweetening Process" in Industrial & Engineering Chemistry Research (I&ECR).

POPSIG Article Honorarium — sponsored by MPOC: Utilization of Oil Palm Waste in Construction Industry towards Sustainable Environment

GOH WEE KEN

Wee Ken is a third-year Bachelor of Engineering in Civil Engineering student at University Science Malaysia Engineering Campus. He worked for Customer Service Management at Genting Malaysia Berhad from 2018 to 2019. He has secured his internship at IPM Professional Services in 2022. He is the Honorary Secretary for USM IEM Student Section in 2021/2022, and Head of Department of Multimedia for USM American Society of Civil Engineers (ASCE) Student Chapter in 2021/2022. He has been consecutively awarded Dean List's for five out of five semesters at USM.

News: POPSIG Excelled in Youth Sustainable Project Competition

Written by Oscar Ting Teo Wei
IChemE Palm Oil Processing Special Interest Group

Overview

In partnership with Association of Southeast Asia Nations (ASEAN) Secretariat, the Delegation of European Union (EU) to ASEAN had organised Youth Sustainable Project competition in 2022. To bring ASEAN youth to the forefront of the future of the region, the activity aimed to encourage ASEAN youth to act and bring positive impacts to society through sustainable projects in their respective areas of interest.

Appreciation to MOSTI

At the invitation of Ministry of Science, Technology and Innovation (MOSTI) Malaysia, a delegation from POPSIG joined the competition. The members comprised Oscar Ting Teo Wei (leader), Kek Ming Xuan, Cheah He Ming and Melvin Wee Xin Jie. POPSIG has the honour to declare that our project was named as one of the top 20 best projects among 161 candidates.

POPSIG Delegation

The competition was participated by the Department of Information, Communications and Technology (ICT) at POPSIG, where the members comprise Oscar Ting Teo Wei (leader), Kek Ming Xuan, Melvin Wee Xin Jie and Cheah He Ming.

Our Passion

Palm oil is Malaysia's top agri-commodity. POPSIG aims to address factual information about palm oil to young engineers, as Malaysia contributes to about 25% of the world's palm oil production. Through POPSIG-hosted talks and forums, we provide a platform for intellectual exchange on a wide variety of topics, including net zero, mechanisation, circular economy, responsible production, digitalisation, social environment and risk management. We hope to nurture young talents and sustain the talent ecosystem.

Our Contribution

POPSIG organises regular webinars, roadshows and forums, and in addition, awards and bursaries that benefit professionals and students who are passionate to contribute to palm oil sector. We provide equal opportunities to all social classes to showcase their creative thinking and innovative work in advancing the industry. Through events and university roadshow, POPSIG and MPOC collaboratively work together to address the accurate information about palm oil.

Youth Development

POPSIG roadshow programme bridges the gaps between institutions and industry. With MPOC's unwavering support, POPSIG encourages students to play their roles in palm oil sector, particularly on upstream and downstream processing. Our project continues to nurture young talents and shape more young engineers to advance mechanisation and research into the net-zero palm oil.

Environment

Through webinars and roadshows, we disseminate the accurate information about the industrial practices towards the conservation of the environment and responsible production. It drives students to think practical solutions to improve production by reducing adverse environmental impacts. It is delighted to see students' final year design contributes innovations for improving environmental sustainability.

Education

In the projects exercised by POPSIG, roadshows are constantly delivered to the student communities at no charge, so everyone has equal opportunities to learn new knowledges about palm oil and its industry. Through roadshow, the speakers shared the advanced technologies that are used in the modern palm oil industry, and to open the views of the students. This programme has also developed critical thinking and soft skills among students, while these skills promote social health.

Health

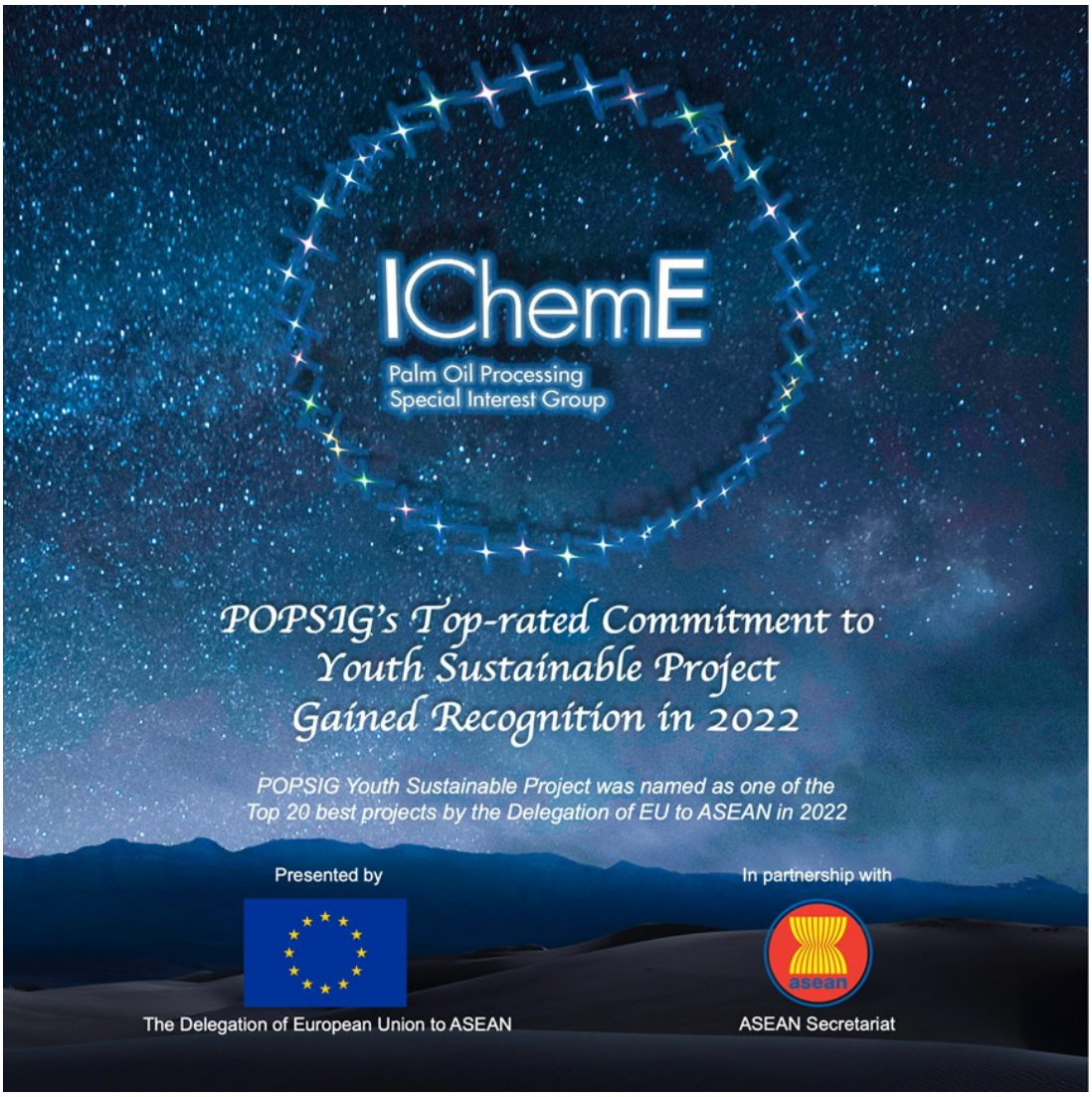
POPSIG activities play vital role in promoting positive social health among student communities. Through roadshow organisation, the youth can build rewarding and meaningful interpersonal relationships with each other to improve adaptiveness to social situations and to birth respect and acceptance with peers. Our programmes help the student groups to build a true, positive self at all times in all situations. We also promote to build tolerance and empathy among the younger generations, so they could work in a harmonious relationship with all individuals including disabled personnel at work. Through strong empathy and understanding, the young engineers could manage to reduce conflicts at work.

Gender equity

Gender equity is one of the UN's goals on the 2030 global agenda for sustainable development, as previous study showed that women carried out around three times more unpaid household work, child care, and elderly care compared to men. During POPSIG roadshow, speakers discuss and promote gender equity at work and encourage the formation of policies for the fairness in the society. Our programme has motivated many young women to contribute to palm oil production and industrial management. Besides, POPSIG also supports to put corporate social responsibility (CSR) at the heart of the businesses, where disabled personnel can also play a part to contribute to our wider community and to promote a true social equity.

Join POPSIG Commitment

POPSIG's commitments sustain the momentum for youth empowerment. It is with full confidence that our positive contributions help the region and wider world to sustain young talent ecosystem, drive regional economic growth, reduce poverties, advance sustainability practices, moderate human-wildlife conflicts, tackling climate change and safeguard the future of the generations.



News: Ausiera Rosland's Role as a Project Engineer at Sime Darby Oils in Malaysia

Published on The Chemical Engineer
11 February 2022

The Chemical Engineer (TCE) featured a chemical engineer working in palm oil sectors, Ausiera Rosland. Ausiera is a Project Engineer at Sime Darby Oils in Malaysia. It is the downstream operations of Sime Darby Plantation, the world's largest producer of certified sustainable palm oil. Ausiera started at the company as an undergraduate intern, before graduating with a Bachelor's in chemical engineering technology in bioprocess. Later, she joined the year-long trainee management programme, before officially joining the company as a Project Engineer.

Ausiera's role at Sime Darby Oils is to assist and supervise downstream engineering projects to develop, upgrade, or achieve other engineering solutions at facilities, such as plant expansions, or process upgrades to meet the latest regulations for palm oil. Her job is closely aligned with two United Nations Sustainable Development Goals, and they are to ensure access to affordable and clean energy, as well as to promote decent work and economic growth.

Ausiera stated that technology is advancing and powering economic growth and enabling more job opportunities. Through Industry 4.0, which is helping to boost productivity and optimise manufacturing processes, we are seeing advancement in artificial intelligence. Recent technologies have helped reduce the industry's dependency on labour by digitalising the operations and at the same time increasing the productivity. For example, the use of unmanned aerial vehicles (UAV) or drones which are equipped with high-tech cameras eases the imaging, mapping and data collection in palm plantations.

Palm oil has been one of the significant sectors in Malaysia's economy and contributes to the country's socio-economic development. Ausiera expressed her view that the expansion of palm oil plantations in Malaysia has been capped by the Government, and now the only area for growth and expansion in this sector is technological advancement and improving yields. According to MPOB, palm oil yield can be increased through upgrading the technology at plantations and palm oil processing sites. Fellow chemical/process engineers are very much well-equipped to realise the possibilities.

Identical to any other industry, chemical engineers can use their technical knowledge such as in process technology, heat and mass transfer, and thermodynamics to maximise the efficiency of processes and resolve technical issues, taking safety and economical aspects into consideration. Reflecting Sime Darby Oil's tagline 'Realising Possibilities, Together', Ausiera stressed that Sime Darby and other players in the industry have been dedicating time and energy to create and develop technological solutions to meet the target growth.

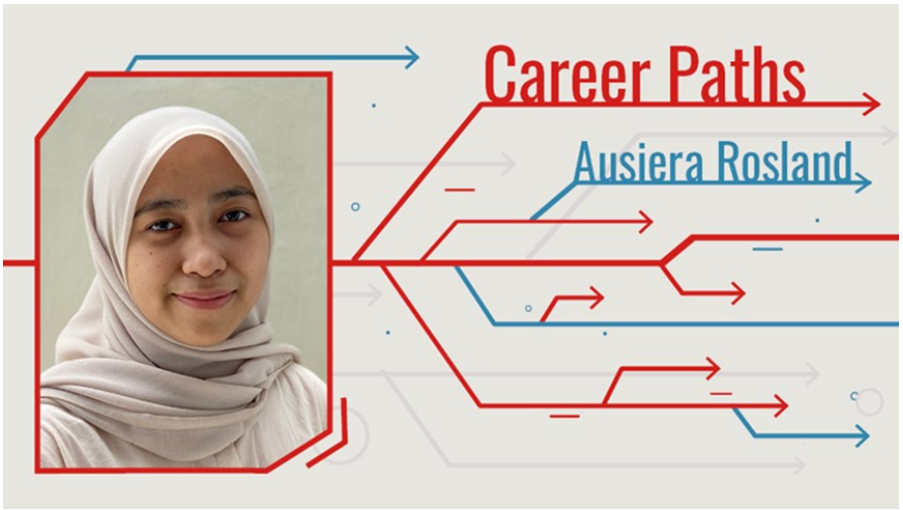


Figure 1: Ausiera Rosland shared her roles at Sime Darby Oils.
Image adapted from TCE

The news is adapted from the original article. View the full article that was published on The Chemical Engineer on 11 February 2022.

Apply for 2022 Final Year Design Award

Apply for 2022 Student Bursary

Apply for 2022 Student Research Project Bursary

IChemE
Palm Oil Processing
Special Interest Group

Sponsored by:
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2022

POPSIG Student Research Project Bursary

Award : RM3000 per project

Eligible : Undergraduate & Postgraduate students

Deadline : 15 August 2022

More info : IChemE.org/palm-research-bursary

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Apply for 2022 POPSIG Palm Oil-Themed Article

POPSIG PALM OIL-THEMED ARTICLE

2022

Call for article

Theme: Correcting the misperception on palm oil

Introduction

- Palm oil industry contributes to economy, society and environment
- The objective is to encourage the public participation in promoting palm oil sector

Scope of article

- Discuss any **myths, misinformation, misperception** or **incorrect information** about **palm oil**

Topics

- Employment, sustainability, digitalisation, circular economy, health, environment

Deadline: (Open all year round)

- Selected article will be published in **POPSIG Newsletter**
- Submission deadlines are shown at www.icheme.org/palm-article-honorarium

RM200 for selected article

For more info:
popsigmalaysia@gmail.com

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Palm Oil Processing Special Interest Group

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MORE INFO

Apply for COPO 2022 Cook with Palm Oil (3-Min Video)

UPCOMING EVENTS

DATES	EVENTS
2 April 2022	Event: IChemE Student Chapter Festival 2022
13 April 2022	Webinar: MOSTA Climate Change Webinar
18-20 April 2022	Roadshow: Monash University Malaysia
20 April 2022	Roadshow: Universiti Sains Malaysia
22 April 2022	Roadshow: Universiti Teknologi PETRONAS
10 May 2022	Webinar: Process Safety Management — An Introduction
16 May 2022	Webinar: The Sustainability of Science and Engineering in the Malaysian Palm Oil Industry
13 June 2022	Webinar: The Potential and Challenges of Industry 4.0 in the Palm Oil Industry
29 June 2022	Roadshow: Swinburne University of Technology Sarawak
4 July 2022	POPSIG-ARPOS Seminar: Roles of Palm Oil Industry in Achieving United Nations Sustainable Development Goals
8-9 August 2022	Event: 33rd Symposium of Malaysian Chemical Engineers
17-18 August 2022	Event: Regional Chemical Engineering Undergraduate Conference 2022
September 2022	POPSIG Research Seminar 2022

DEADLINE FOR APPLICATIONS

DATES	EVENTS
15 August 2022	2022 POPSIG Best Final Year Design Award
15 August 2022	2022 POPSIG Student Bursary
15 August 2022	2022 POPSIG Student Research Project Bursary

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