

A quarterly palm oil newsletter brought to you by
IChemE Palm Oil Processing Special Interest Group

POPSIG

IChemE

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Editor's Message

POP SIG activities in the last quarter of 2015 saw evening talks in very different areas viz in biogas and in process safety. Committee members attended major events such as the RSPO Round Table 13 and the International Biomass Conference Malaysia 2015 as well as judged entries for the new Palm Oil Industry Award at the IChemE Malaysia Awards 2015. Acidchem International headed by Executive Director Mr Tan Kean Hua FIChemE bagged the prestigious Prime Minister's Hibiscus Award. The committee will be lining up exciting activities for 2016 and we look forward to your participation as well as contribution.

Small holders see red

Felda settlers are cutting down their palm trees to allow bauxite to be mined on their land. This is very short term once off gain. Once the top soil is removed it will take 10-20 years before oil palm can be planted again so there is no income from the palm fruits until then. Simple maths for 4 hectares of palm oil planted. Once off bauxite payment is RM300,000 (if it is really paid). Loss of continuous income for years at RM50,000 per year. In addition to the social economic issues there are also serious environmental issues. What do chemical engineers think?



Climate change

The peatsmog haze is over (for 2015) and we wonder what 2016 will bring. The cost has been high. "So on the one hand US\$16bil (RM68.8bil) as cost to the public, on the other hand, US\$8bil (RM34.4bil) – lots of money – to a handful of individuals," said World Bank environmental specialist Ann Jeannette Glauber. The Indonesian economy took the US\$16bil hit whilst more than half a million people suffered acute respiratory infections in Indonesia, while many in neighbouring Singapore and Malaysia also fell ill.

On 12/12/15 at COP 21 (21st Conference of the Parties to the United Nations Framework Convention on Climate Change) 195 nations, including Malaysia, adopted an agreement that centres on a 2°C limit. The adoption of the agreement is a promising milestone, but the journey is nowhere near its end. Each of the 195 countries has to ratify the agreement. For the agreement to come into force, it must be approved by at least 55 countries accounting for at least 55% of the total global greenhouse gas emissions.

Some countries were more reluctant to accept the deal, however. The leading developing nations such as Malaysia, China, India and Saudi Arabia criticised that shifting their oil-dependent economies to a low-carbon path was crippling to them.

Malaysia also criticised plans to reduce deforestation, as its economic ambitions include expanding rice field paddies, and palm oil production, requiring large land spaces. Gurdial Singh Nijar, senior legal advisor to the Third World Network said, "We cannot accept starvation as a price for the success of this agreement."

Further down from COP 21, specifically for palm oil, the Steering Committee for High Carbon Stock (HCS) hopes to embed the outcomes of the study into RSPO guidelines. This scientific study defines and sets a threshold for HCS forests, to prevent palm oil companies from clearing land in these forests. We believe it should not be limited to the palm oil industry but to all sectors linked to deforestation.

RSPO cannot remain a market driven and voluntary initiative. If the governments of Indonesia (and Malaysia) do not drive this, RSPO alone cannot succeed in eg eliminating the annual peatsmog haze. If the governments of China, India (and Indonesia) who are the largest importers/consumers of palm oil do not make it mandatory to buy/use only sustainable palm oil, RSPO in its present form will languish when only EU which buys just 15% of palm oil is the only region that supports RSPO strongly. Already planters are complaining that the supply of sustainable palm oil far exceeds demand and they are getting 'peanuts' as a premium. In fact the administration fees are far higher than the premium.

What can chemical engineers do? Use and process only palm oil that is certified sustainable. We also propose that countries like China, India and Indonesia who import/use certified sustainable palm oil receive extra credits towards their COP 21 targets. In the meantime the POP SIG committee is reaching out to other experts eg tropical peat to find other answers. If you know of relevant expertise please invite them to join POP SIG.

We love hearing from you. Follow us on [Facebook](#) and [LinkedIn](#). You can also email us, ATan@icheme.org directly with your thought and critique.

Editor

Hong Wai Onn



Mr B P Chow, the speaker for POP SIG's second evening talk

The Dawn of the New Oil & Gas Industry – Palm Oil

The second POP SIG evening talk held on 19th October 2015 at the University Nottingham Teaching Centre in Kuala Lumpur was attended by about 30 members. Mr B P Chow, MD of Aquakimia and Immediate Past Chairman of IChemE in Malaysia spoke on the Dawn of the New O & G Industry – Palm Oil. Calling Palm Oil nature's gift to mankind Chow focused beyond the oil itself on biogas from POME (palm oil mill effluent) and biomass. Biogas plant feedstocks in the future includes decanter cake, EFB (empty fruit bunches, mesocarp fibers, PKE (palm kernel expeller cake), crude glycerine from biodiesel production and OPF (oil palm fronds). New biogas plants are digesting EFBs giving a benefit of constant output and upgrading biogas to biomethane using gas membranes. He estimates the potential of biogas to be 30% of renewable energy for Malaysia and biomethane able to provide 12-16% of the national gas utilization (400 million mmbtu).

Dr Ian Halsall, IChemE in Malaysia board member, shared that his own estimate was even more optimistic and that the digestion of biomass in Europe was already well established. Admittedly FFB has more 'wood' but Chow added that his pilot trials did not show this to be an issue.

Dr Chew Thean Yean, an environmental consultant from Sydney said that she was very glad to attend the talk. It is very relevant to chemical engineering and will be able to solve palm oil industry issues in a sustainable way.

Puan Asimi Ana Ahmad, a lecturer at UNIKL was delighted to find the talk related to her area of work in biomass research and teaching and she is considering this for her PhD research. Ir Y C Yong, a palm oil consultant felt that this is an

area where chemical engineers can make a significant contribution by introducing new technologies to a very conservative palm oil milling sector.

Ir Hong Wai Onn, chairman of POP SIG, was congratulated for his initiative in editing and publishing POP SIG's first quarterly newsletter. The 6 page newsletter was distributed to participants.



Top: Dr Ian Halsall making a point.

Right: Dr Chew in discussion with Mr Chow.



Process Safety in the Palm Oil Industry



The speaker flanked by POP SIG chair Hong Wai Onn (L) and S&LP SIG chair Karen Jacka

3. Process Safety – an ongoing journey

10/7/15 Berkasi, Indonesia



Gas pipeline failure
17 fatalities, 44 injured

6/10/15 Kundang



Dust explosion fire
23 injuries



Ir. Qua Kiat Seng delivering his presentation

The third POP SIG evening talk was held as a joint event with the S&LP SIG on Monday 30th November at the University Nottingham Teaching Centre in Kuala Lumpur. It was attended by more than 50 participants with a number from outside the palm oil industry. The speaker was Ir K S Qua who is the Advisor to the ASEAN Oleochemical Manufacturers Group and also the Industry Partnership Liaison of IChemE.

Ir Qua talked about how closed most Asian companies were in sharing information and shared how a group of such companies were able to do just that – sharing information for the past three decades. The co-operation extended to process safety amongst other activities. To plan future process safety training member companies conducted a safety survey at head of company and frontline levels. He then went on to look at recent major incidents not only in the downstream but the entire palm oil industry. Going forward he suggested a number of ways to improve process safety notable of which was that the Malaysian Department of Occupational Safety & Health (DOSH) should publish thorough investigations of incidents so that companies can learn from these without having to suffer the pain of experiencing such incidents. He concluded that senior executives were the weakest link in Process Safety Management.

During the Q&A Mr Goh Eng Choor, Executive Director of KLK Oleo, stressed the importance of going down to the factory floor to see what is actually happening rather than relying on reports sitting in the air conditioned office. Whilst there is a need to raise the standard of process safety it should be done to a level appropriate for the industry.

Ir Shahruny Mohd Akil, Regional Managing Director Asia Pacific of Emery Oleochemicals said, “An enlightening session. In my view PSM is equally important to the palm oil industry. Human life is precious whether in oil & gas, petrochemicals, chemical, mining or any industry. PSM does not make an operation more costly or complicated but merely makes it more safe by assessing the risks and implementing right measures to address the risks.”

Mr Avinash Kothari, Lead Risk & Safety Consultant, Safetec Sdn Bhd commented, “Excellent talk. There appears to be a lot of scope for consultants like myself to assist within the palm oil industry once its top management sees the value of process safety management.”

POP SIG = Palm Oil Processing Special Interest Group
S&LP SIG = Safety & Loss Prevention Special Interest Group



Fellow Ragunath Bharat (L) with Shahruny Mohd Akil



Fellow B P Chow (L) with Goh Eng Choor



The attentive audience

The Palm Oil Industry Award

A new category unique to Malaysia, *the Palm Oil Industry Award*, was introduced at IChemE Malaysia Awards 2015 held on 26 October 2015 at the Le Meridien Hotel, Kuala Lumpur. The *IChemE Malaysia Awards* celebrate excellence, innovation and achievement in the chemical, process and biochemical industries.

The President of IChemE, Dr Andrew Jamieson, a former executive from Shell delivered the first speech of the evening. The *IChemE Singapore Awards* ceremony was held on 22nd October and the winners of most categories in Malaysia will be automatically shortlisted for the IChemE Global Awards on 5 November 2015 in Birmingham, UK.

A VIP guest for the evening was Datuk Dr Choo Yuen May, the Director General, Malaysian Palm Oil Board (MPOB) to witness the ushering of the new category into the *IChemE Malaysia Awards* that is running into its third year.

The sponsor for this award is KLK OLEO which is part of Kuala Lumpur Kepong Berhad (“KLK”), a leading international plantations group. KLK OLEO is an oleochemical producer with world scale integrated oleochemical complexes in Malaysia, Indonesia, China and Germany producing a wide range of sustainable oleochemicals from natural renewable raw materials.

The Palm Oil Industry Award recognises the best project implemented and demonstrates innovation, successful delivery and a technical, commercial, safety and/or environmental benefit. The project may relate to new industrial plant or to the enhancement of existing palm oil mills, refining, oleochemicals and other related industries.

The shortlist for the award were:

- ‘Integrated recovery and regeneration system’, Eureka Synergy Sdn Bhd; University of Nottingham Malaysia Campus
- ‘Effective waste water management’, Genting Plantations Berhad
- ‘Pioneer and innovative palm oleochemical producer’, IOI Oleochemical Industry Berhad
- ‘Zero discharge treatment technology of POME’, Ronser Bio-Tech Bhd; Malaysian Palm Oil Board; Shanghai Jiao Tong University
- ‘Palm oil olein yield improvement project’, Sime Darby Plantation Sdn Bhd
- ‘High Pressure Sterilization of Fresh Fruit Bunches’, Universiti Putra Malaysia

Sime Darby Plantation triumphed in the Palm Oil Industry Award for its work to boost valuable olein yields at their palm oil refineries. On hand to present the award was Mr Siew Fook Ming, Project Director of KLK Oleo to Mr Toh Seong Hin, Asst VP, Plantation Advisory – Refinery. In second place was IOI Oleochemical for their pioneering and innovative work. On hand to receive the certificate was its Mr Lai Choon Wah, Senior General Manager.

It was an evening that brought palm oil industries players together with the opportunity to network with chemical engineers in other industries.

Mr Paul Ellis, chair of IChemE’s Malaysia board, closed the show saying: “Chemical engineering matters in Malaysia, and tonight was all about recognising some of our nation’s great achievements in the discipline.”

Datuk Dr Choo Yuen May, Director-General, Malaysian Palm Oil Board (MPOB) commented, “I am most pleased at the introduction of the Palm Oil Industry Award as it is a timely recognition of the importance of the oil palm industry which forms the economic backbone of Malaysia. The inception of this Award reflects the perceptiveness and far-sightedness of IChemE Malaysia. The chemistry sector continues to display stellar levels of talent, innovation and diversity as the awards demonstrated and it is satisfying to note that the oil palm industry is an important part of the sector.”



Toh receiving the Palm Oil Industry Award from Siew



The winners with Dr A Jamieson (back row centre) and Paul Ellis (back row 2nd from left)



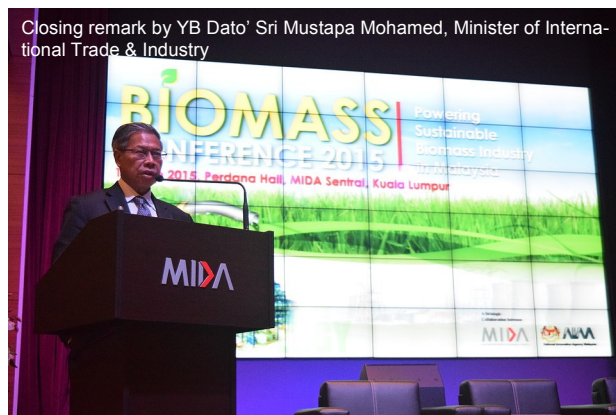
Datuk Dr Choo Yuen May, DG MPOB, the VIP guest

International Biomass Conference Malaysia 2015

The two-day conference organised by MATRADE featured 27 speakers both international and regional experts in six panel discussions featuring topics such as; *Is Biomass Industry a Threat to Environmental Sustainability, Can Malaysia be the Regional Biomass-Based Processing Hub, Gearing Towards an Advanced Bioeconomy, Is it Worth the Risk; Accelerating Commercialisation of Biomass Research, and Incentives and Funding – Ways in Achieving Bankable Biomass Projects.*

The signing of the Key Term Sheet between Brooke Renewables, a local Sarawak based consortium and Beta Renewables from Italy is to state the intentions of both parties to enter into a proposed Licensing Agreement for the utilisation of PROESA technology to convert biomass into ethanol for the Sarawak 2G Bioethanol and Biochemical Project. This signifies the certainty that Malaysia is on its way of owning the region's first of such facility. These two significant developments for Sabah and Sarawak are major leaps for accelerating the nation's progress towards achieving the goals set up in Malaysia's National Biomass Strategy (NBS) 2020.

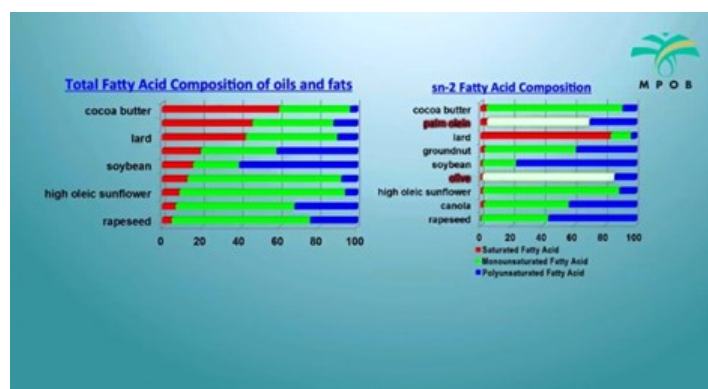
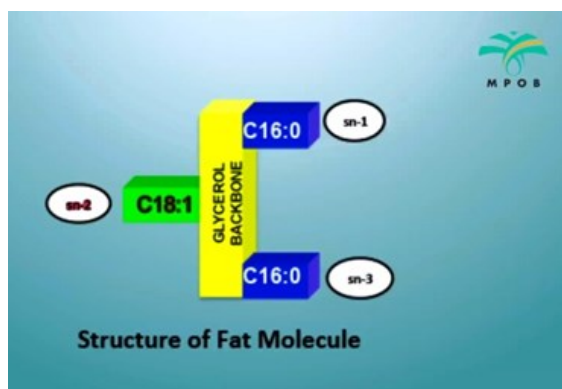
Some POP SIG members who attended the conference see a need for chemical engineers in this sector. It is however not yet totally clear how to address the utilisation of biomass for the energy sector or high value niche products.



Palm Olein Behaves More Like Olive Oil

Olive oil is currently touted as the gold standard among all edible oils today. The component of interest is the monounsaturated oleic acid content of olive oil which is on average about 70%. Palm olein on the other hand only averages 42-53% and yet has the same ability to regulate plasma cholesterol levels in humans.

Interestingly in the body, palm olein behaves more like a monounsaturated oil and has no adverse impact on cholesterol levels. Numerous human studies worldwide comparing the health effects of palm olein and monounsaturated oils such as olive and groundnut oils have shown these oils has similar beneficial effects on blood cholesterol. A very recent study carried out in China again confirmed these observations. Fatty acids situated at the second position or sn-2 of its triglyceride structure has influence on cholesterol levels.



Both palm and olive oils have more unsaturated fatty acids at this position and this may explain why palm olein behaves more like monounsaturated oils. In addition saturated fatty acids at the first and third positions tend to exhibit lower fat deposition in the body.

Interestingly this particular fat molecule structure is known as **POP** ie palmitic-oleic-palmitic.

Global Framework for Palm Oil Serves as Yardstick for Sustainable Industry

A proposed Global Framework of Principles for Sustainable Palm Oil or e+POP was declared for the sustenance of the palm oil industry during the 27th ASEAN Summit.

e+POP outlines nine principles which encapsulate the laws and regulations pertaining to sustainable development.

Plantation Industries and Commodities Minister Datuk Amar Douglas Uggah said e+POP has 9 principles based on laws and regulations of both countries and it will be benchmarked against other international standards.

e+POP is aimed to further reinforce the reputation of palm oil while promoting the positive attributes of palm oil.

Both Malaysian Plantation Industries and Commodities Minister Datuk Amar Douglas Unggah Embas and Indonesian Coordinating Minister for Maritime Affairs Dr. Rizal Ramli made the declaration on Saturday.

The declaration proceeded after both ministers signed the Charter of the Establishment of the Council of Palm Oil Producing Countries (CPOPC) which was witnessed by Prime Minister Datuk Seri Najib Razak and Indonesian President Joko Widodo.

The CPOPC is aimed at harnessing the benefits of the palm oil industry between member countries for economic development and the well-being of people.

Well, interesting to see our name of **POP** has been “borrowed”.

Diary of Events

Evening Talk : **Continuous Fractionation: Latest Development in Fractionation**
 Speaker : Khoo Kiak Kern
 Date : 29 February 2016
 Time : 18:00 - 20:30 (GMT+8)
 Location : Monash University Malaysia, Bandar Sunway, Subang Jaya, Malaysia

Evening Talk : **Palm Oil Olein Yield Improvement with Lean Six Sigma Method**
 Speaker : Toh Seong Hin
 Date : 18 April 2016
 Time : 18:00 - 20:30 (GMT+8)
 Location : Monash University Malaysia, Bandar Sunway, Subang Jaya, Malaysia

Evening Talk : **Transformation of Conventional Palm Oil Mill into Sustainable Integrated Palm Oil Mill with Palm-based Biorefinery**
 Speaker : Professor Dr. Denny K. S. Ng
 Date : 23 May 2016
 Time : 18:00 - 20:30 (GMT+8)
 Location : Monash University Malaysia, Bandar Sunway, Subang Jaya, Malaysia

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Call for Speakers

The POP SIG's evening talks and webinars are free and open to all, at the moment. Membership of POP SIG is not only for chemical engineers but for anyone interested can join as an Affiliate member. The presentations are directed towards audiences who would like to know more factual information about Palm Oil Processing industry and who would appreciate an opportunity to ask question. The committee is looking to ensure presentations cover palm oil milling, refinery as well as oleochemical. If you'd like to volunteer to give a presentation – either at a physical seminar or via an [online webinar](#) - then please get in touch, providing some details about yourself and your proposed talk. Contact Professor Dr. Chong Mei Fong, meifong.chong@nottingham.edu.my, or Avanna Tan, specialinterestgroups@icheme.org, today.

POP SIG Committee

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Secretary : Professor Dr. Chong Mei Fong AMIChemE

Committee : Qua Kiat Seng FIChemE Chow Boon Ping FIChemE Khoo Kiak Kern FIChemE Toh Seong Hing AMIChemE

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