

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

POPSIG

IChemE

2018 Q4 POPSIG Newsletter

In the News

- 2 Message from Editor
- 3 Sustainable Palm Oil: If you Want to End Deforestation, Stick to the Facts!
- 4 Palm Oil Sector Ups Its Presence at IChemE Malaysia Awards 2018
- 6 POPSIG Goes East: To SA-BAH
- 7 IAAB Highly commended at the IChemE Global Awards 2018
- 8 RT 16—Tough Challenges Ahead
- 10 POPSIG Lands in Indonesia
- 11 United in The Appreciation of Palm Oil
- 12 Trish Kerin’s 3rd Safety Article
- 13 Young and Capable Prof Ir. Dr Denny K.S. Ng with High Appraisal Research
- 14 Q1 Diary of Events (2019)
- 15 ‘Student Bursaries’ and ‘Best Final Year Design Award’ from POPSIG



Palm Oil Processing Special Interest Group

POPSIG Committee

Chair

Hong Wai Onn MIChemE

Secretary

Assoc. Prof. Dr Wu Ta Yeong MIChemE

Treasurer

Mohan Balasingam

Event Coordinator

Liew Sin Lu AMIChemE

Chief Information, Communication and Technology Manager

Oscar Ting Teo Wei

Chief Editor

Tan Hui Min AMIChemE

Exco Members

Qua Kiat Seng FIChemE

Professor Dr. Chong Mei Fong AMIChemE

Dr Jeff Kor Yann Kae MIChemE

Editorial Board

Teoh Jay Kee

Ho Jia Lynn

IT Team

Lai Ke Qin

Victoria Gan Mee San

POPSIG gratefully acknowledges our sponsors



Excellence in Oleochemicals

desmet ballestra



MONASH University

MALAYSIA

MONASH
INDUSTRY
PALM OIL
PLATFORM

Editor's Message

As the year comes to an end, we are pleased to see the outstanding achievements by palm oil industry players throughout the year. We are proud to see continual improvement and competitiveness of participants in the IChemE Awards 2018. Safety continues to be a key aspect that the oleochemical industries strive to achieve and adhere as can be seen in Trish Kerin's 3rd article. In line with safety, we would like to congratulate our Chief Communications and IT Manager, Oscar Ting for receiving the Pfizer Niall J, Condon Process Safety Award; A member of our IT Team, Victoria Gan has been elected as the student representative of Functional College at IChemE: Your Congress. Congratulations!

Taking this opportunity, we would like to stress that Rountable on Sustainable Palm Oil (RSPO) have yet to understand the anti-palm campaigns and take appropriate measures. UK purchasers of palm oil and palm products naively believed that mitigation actions as simple as tighter standards and 'no deforestation' approach would resolve this issue. Both purchasers and Greenpeace seems to believe that slogans like 'Drop Dirty Palm Oil' is sufficient for a clear distinction to the public. Sorry to say, but this is not the case. In line with this, Sir Jonathon Porritt has given his own point of view 'Sustainable Palm Oil: If you want to end deforestation, stick to the facts!' and we would like to thank him for giving us the permission to publish the article from his blog.

POPSIG, has for the first time gone to East Malaysia and also to Indonesia. It had been our aim all along to spread our wings in Malaysia and Indonesia. Thank you for your unending support to POPSIG. It was indeed a fruitful year and we are very happy by the growing number of POPSIG members and for new members, we are glad to welcome you to our community. We wish you a great 2019 ahead.

Chief Editor
Tan Hui Min

For further information about POPSIG including how to join please contact the Secretary Assoc. Prof. Dr Wu Ta Yeong at wu.ta.yeong@monash.edu

Sustainable Palm Oil: If you Want to End Deforestation, Stick to the Facts!



I hate to have to say this, but James Corden and Bill Bailey have allowed themselves to be duped by an unholy combination of NGOs and naïve retailers.

I'm referring, of course, to the controversy over a recent film made by Greenpeace to highlight the continuing plight of orangutans in Indonesia and Malaysia, if land is cleared for new oil palm development.

It's now getting a huge amount of airtime, as Greenpeace offered the use of the film to Iceland for their Christmas advert. Greenpeace has a strong relationship with Iceland, the only UK retailer which has committed to phase out the use of palm oil in all its own products by the end of the year, on the grounds that its CEO, Richard Walker, doesn't know how to tell the difference between certified sustainable palm oil and uncertified palm oil.

(By the way, it's not difficult, Richard: you just have to pay slightly more for the certified oil than for the uncertified oil – but then your customers wouldn't like that, would they? And it would be really good if you made sure that the 500 tonnes a month you need was certified as sustainable, not least because a lot of certified oil doesn't find a buyer at the moment, and is sold as uncertified oil!)

When they checked the film, the regulator of broadcast advertising intervened to stop Iceland using the film on the grounds that it was 'too political'. And that's because it was made by Greenpeace for specifically 'political' reasons, with no requirement on them whatsoever to worry about being 'fair, decent, honest and true'. This has prompted a massive social media campaign, supported by Corden, Bailey and dozens of equally ill-advised 'celebs' calling for the Rang-tan to be 'liberated' from this wicked attempt to curtail freedom of speech.

To be honest, that's a laugh. The film is unashamedly propagandistic and emotional – as John Sauven, CEO of Greenpeace UK, has explicitly acknowledged. It focuses on a young girl discovering a baby orangutan in her bedroom after it had been driven out of his forest home. They both have huge, dark brown eyes. It's well-made, and effective – but deeply manipulative. Why?

- It implies that the oil palm industry is the biggest cause of deforestation anywhere in the world. It is NOT. Not by a long chalk.
- It implies that tens of thousands of orangutans are still being killed in Indonesia and Malaysia every year because of oil palm developments. They are NOT.
- It implies that all palm oil, whatever it's being used for and whoever produces it, is responsible for the death of thousands of orangutans. It is NOT.
- It implies that responsible consumers will inevitably have to take their share of responsibility for the death of orangutans as a consequence of purchasing products which contain palm oil. They do NOT.

Four big, fat, completely mendacious implications. Greenpeace does a lot of good work on palm oil issues, in all sorts of different ways, but the story of sustainable palm oil is a complicated one, and it is not helped by wilful misrepresentations of this kind.

Bizarrely, Greenpeace knows this as well as anyone. Earlier in November, Greenpeace UK released a video which explicitly acknowledges that boycotting palm oil is the wrong thing to do; that switching from palm oil to other oils can be the wrong thing to do, since palm oil is so much more productive per hectare; and that 'growing palm oil without deforestation is possible, and there are growers working that way.'

It then turns up the heat in its campaign against Wilmar, but does so within the kind of proper contextual background that is so seriously

absent in the Rang-tan film. Will the real Greenpeace stand up, please?!

More than a million people have signed up to the Rang-tan campaign since then. But it would be so good if we could help deepen their awareness here, bearing in mind that:

1. By any measure you choose to adopt, more deforestation today is caused today by beef, by soy, and by maize, than by palm oil. Especially beef, which is responsible for 80% of deforestation across the Amazon, and 65% of total deforestation.
2. Boycotting palm oil is purposeless, as has been recently acknowledged by the International Union for Conservation of Nature – in that the world will still need cooking oils, and all the substitutes will cause more damage than palm oil does.
3. The reason for that is simple: palm oil provides 35% of global edible oils – and yet takes up only 10% of the total global acreage devoted to edible oils. It is so much more efficient than sunflower or rapeseed oil, let alone soybean oil, which is itself a massive driver of deforestation throughout South America.
4. The RSPO has just incorporated strict 'no deforestation criteria' into its basic Principles & Criteria – so there is now no excuse to go on arguing that RSPO certification does not help reduce deforestation.

At which point, I have to make a declaration of personal and professional interest.

In the first place, Forum for the Future does a lot of work with the oil palm industry, for which we are paid. Our most important project is based in Indonesia, where we're working with five large palm oil companies, as well as a wide range of NGOs and international organisations, to address complex labour rights challenges within the sector.

But this is also personal. I act as the Independent Sustainability Advisor, on behalf of Forum for the Future, to Sime Darby Plantation, the largest producer of certified palm oil in the world. I've watched Sime Darby in particular, together with other big players in the industry, incrementally get its house in order, in order to be able to sell genuinely sustainable palm oil in Europe and elsewhere, as certified by the Roundtable on Sustainable Palm Oil.

None of these companies is perfect. Indeed, I remain a fierce critic of just how long it has taken to sort out some of the legacy issues. There are still far too many laggards in the industry, and a lot of environmental damage is still being done. But to go on vilifying and demonising such a critically important industry, which continues to move forward on challenges like deforestation and better working conditions, makes no sense whatsoever.

The process of certification through the RSPO is indeed not perfect, but it's the best way we have of sorting out the good stuff from the not good enough stuff – even if people like Richard Walker don't understand that basic reality.

(In that regard, much though I despise Piers Morgan, I couldn't help but enjoy the way he skewered Richard Walker on precisely that issue. Including his strangulated efforts to distinguish between Iceland's own brand products (now 'palm oil free') and all the other products that Iceland sells (more than 200 of them) which continue to use palm oil!)

So don't give in to emotion here – stick to the facts, difficult and messy as they inevitably are. Just as you should support the good guys in the oil palm industry, and criticise the bad guys, so you should support Greenpeace in the good work it does (including the video referred to in paragraph 8 above), but criticise them when they get it wrong.

22. 11. 2018

Palm Oil Sector Ups Its Presence at IChemE Malaysia Awards 2018

Her Royal Highness Queen of Perak Darul Ridzuan, Tuanku Zara Salim presented two promising chemical engineers with trophies at the Institution of Chemical Engineers (IChemE) Malaysia Awards on 15th October 2018. The ceremony, which took place at the InterContinental Kuala Lumpur, is held annually to celebrate the achievements of chemical engineers in Malaysia.

Tuanku is the Royal Patron of IChemE in Malaysia, and, as a chemical engineer herself, a passionate advocate of the profession. She presented Sime Darby Plantation's Chew Chien Lye (also known as Mervin) the *Young Industrialist Award*. His outstanding work in process improvement has boosted profits, while reducing energy and wastewater at the organisation.

The *Palm Oil Industry Award* was won by IOI Edible Oils Sdn Bhd from Sandakan, Sabah in East Malaysia for their project *Heat Recovery Using Vent Economisers*. Vent economisers are used to recover steam vapour in a dry fractionation plant to heat water. The project has saved 50% on steam heating costs.

Ir. Dr. Christina Phang, Chair of the IChemE Malaysia Board, welcomed everyone to the sixth Malaysia Awards. She said:

“Congratulations to all the winners of the IChemE Malaysia Awards 2018. Each year I’m encouraged by the growing support and interest from the chemical engineering community demonstrated by the high-quality entries we receive, the number of guests we host, and the generous support of our corporate sponsors.

“The IChemE Malaysia Awards provide a unique opportunity to celebrate the fantastic contribution of local chemical and process engineers, all who have demonstrated a commitment to the highest level of professional standards in their innovative and excellent work throughout Malaysia.

“This year we celebrate 12 years of IChemE in Malaysia and I thank all our members for being an integral part of our journey to this milestone. We are extremely honoured

that Her Royal Highness Queen of Perak Darul Ridzuan, Tuanku Zara Salim has joined our celebrations and made them more special.”

The Awards continue to be dominated by the oil and gas sector as Malaysia’s major oil and gas company PETRONAS scooped three wins and two-runner up prizes. However the palm oil sector has splendidly increased its presence and besides the Young Industrialist Award and the Palm Oil Industry Award there were a number of finalists, one of which was highly commended. They are
 Highly Commended Palm Oil Industry Award : Sime Darby Plantation and Monash University Malaysia - *Palm Oil Washing with Bio-based Solution*
 Sustainability : University Sains Malaysia – *Innovative Palm Oil Mill Effluent Treatment*
 Sustainability : IOI Acidchem Sdn Bhd – Waste heat recovery VAC

Interestingly there were four finalists for the Palm Oil Industry Award from the IOI Group, a leading global integrated palm oil player. Mr Tan Kean Hua FIChemE (ED at IOI Oleochemicals) encouraged submissions from Penang whilst unknown to him Ir Shyam Lakshmanan FIChemE (GM of IOI Edible Oils) encouraged submissions from Sandakan. Ir Lakshmanan said, “We have an energetic team here in Sandakan. They are always looking for ways to obtain improvement. Many measures that have been put in place to reduce energy consumption have borne fruit. Process safety and environment protection are also very important to us. These efforts are encouraged by management. Later that week we went on to win an ASEAN Energy Award.”

Mervin Chew Chien Lye AMIChemE is a mechanical engineer and a POPSIG member. He went on to compete for the Young Industrialist Award at the IChemE Global Awards 2018 where he competed with 7 other finalists in Manchester, UK on 1 November 2018. Chew who is thrilled said, “Positive action and positive thinking results in success! All my dreams, perseverance, dedication, self-discipline and effort has paid off and brought me to this great day - to be chosen as a winner in the IChemE Malaysia Awards 2018. With hard work, drive and passion, it is possible to achieve any dream!”



1. IChemE In Malaysia board members with the Queen

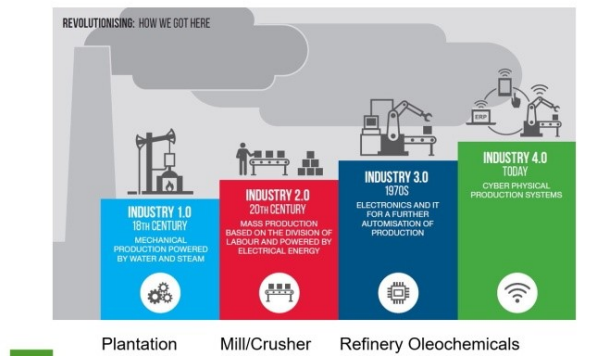


2. Winners of the IChemE Malaysia Awards 2018
3. KLK Oleo sponsored the Palm Oil Industry Award. Mr Siew Fook Ming, Project Director at KLK Oleo presented the certificate and trophy to Chong Tze Haw and Hassan Abas of IOI Edible Oils.
4. The Chemical Engineer sponsored the Young Industrialist Award. Tuanku Zara Salim presenting the award to Chew Chien Lye of Sime Darby Plantations. Looking on is Ir Dr Christina Phang.
5. Highly Commended Palm Oil Industry Award. L to R, Mr Siew Fook Ming with Chew, Yosri Mohd Siran and Rahmat Ngeri from Sime Darby Plantation.

POPSIG Goes East: To SABAH

POPSIG founder Ir Qua Kiat Seng gave a talk at Universiti Malaysia Sabah at its Kota Kinabalu campus on 13th November 2018. It was a live talk cum webinar, the first to be held in East Malaysia.

The Industrial Revolution



Qua explained what Industry Revolution 4.0 is and showed that it is already becoming part of our lives. The key now is to recognize that this development is exponential and to harness it for the benefit of society. He gave some examples of how this could be done in the palm oil industry. He also assured those present that they would not be out of a job. Instead their effectiveness as chemical engineers could be enhanced many times.

The Malaysian government is allocating more than RM5 billion in the 2019 Budget to propel industries in the wake of IR 4.0.



For his efforts Qua was presented with a letter of appreciation from Dr Tham Heng Jin, Head of Chemical Engineering, FKJ as Mohammad Fahim Inteser Alam, Vice-President of IChemE UMS student chapter looks on.



Assoc. Prof. Dr. Christopher Chu also presented Qua with POPSIG's certification of appreciation.



A webinar participant, Lai Ke Qin, an undergraduate from University of Malaya said, "This talk provided us a great insight in the exciting possibility and opportunity in applying developments from Industry Revolution 4.0 "

Sara Vinothini, who is the President of the UMS IChemE Student Chapter, summarized, "The students and lecturers of UMS benefited greatly from the session with Ir Qua sharing on cognitive computing using exponentially more data from increasingly connected plants, making process plants more efficient and safer whilst adding value to the palm oil industry."

IAAB Highly commended at the IChemE Global Awards 2018

The Institution of Chemical Engineers (IChemE) Global Awards 2018, was held on 1st November in Manchester, UK. More than 100 entries made it to the final of the Awards this year, which were held in association with Johnson Matthey. The annual IChemE Global Awards celebrates the achievements and innovations of chemical engineers around the world. IChemE President Ken Rivers said: "The IChemE Global Awards are a clear demonstration of the contribution chemical engineers are making worldwide for the benefit of society. Every finalist is living proof that chemical engineering matters."

The entry for the Biotechnology Award "A New Bioreactor for Biogas Production from POME (Palm Oil Mill Effluent)" submitted by Centre of Sustainable Palm Oil Research (CESPOR), University of Nottingham, Havys Oil Mill Sdn. Bhd., Eureka Synergy Sdn. Bhd., Nottingham Green Technologies Sdn. Bhd., Malaysia was Highly Recommended.

We are proud to note that a number of POPSIG members made their way to the Global Awards dinner. Two of them were the owners of the Highly Commended submission also know as the Integrated Anaerobic-Aerobic Reactor (IAAB) viz Prof Dr Chong Mei Fong and Assoc. Prof Dr Chan Yi Jing. The third was Mervin Chew, the Young Industrialist Finalist, from Sime Darby Plantations.

Prof Dr Chong Mei Fong said, "We submitted our entry to the Global Biotechnology Award as we felt our work application was wider than to just palm oil. At the same time we were confident enough to take it to the global level. I am honoured that our work has been highly commended."



L: Mervin Chew with Prof Dr Chong Mei Fong



R: Prof Dr Chong Mei Fong and Assoc Prof Chan Yi Jing.



RT 16—Tough Challenges Ahead

Annual Roundtable Conference on Sustainable Palm Oil (RT16) was held in Kota Kinabalu from 12 – 15 November 2018 at The Magellan Sutera Resort. Over 850 representatives from the global palm oil industry were in attendance. It was a glitzy event beginning with a welcome by the Murut headhunters and their Magunatip warrior dance.



Professor Kai Chan, University of British Columbia provided the opening keynote address. Many women took out their handphones to take a photo of this dashing personality who originally hailed from Malaysia.

The conference theme “A Renewed Commitment to Achieving Market Transformation” was apt as RSPO Chief Executive Officer, Datuk Darrel Webber in his welcome address spoke about the need for a revolution.



The RSPO Impacts Brochure 2018 given to delegates showed that in the last four years sales of CSPO is stagnating while there is increasing interest in sourcing physical CSPO. The underlying slow growth is worrying many, particularly the growers. The brochure states, “However, market commitment and uptake of CSPO will remain the defining factor when it comes to incentivising the adoption of the RSPO P&C in the near to medium term. This is critical in the case of emerging markets where most of the world’s palm oil is consumed.”

The new Principles & Criteria (P&C) 2018 standard was explained and discussed. It will halt deforestation, protect peatlands and strengthen human & labour rights. An important and new element is ‘Shared Responsibility’ where a number of criteria in the P&C are indicated to be applicable to the entire supply chain. During the conference many speakers used the term ‘Shared Responsibility’ in a wider context to include responsibility for increasing CSPO uptake. Although NGOs were present in full force, the absence of corporate leaders, in particular from FCMGs was noticed.



...Canary in the coal mine ...

- I] Shared responsibility → narrow the gap between supply and demand @ 65% uptake !!!
- II] Smallholders < 1.5% of RSPO palm today
- III] SDGs- leaving no one behind.....pursuing the strictest environmental & social standards risk eliminating 60-70% of growers
- IV] the RSPO risks becoming a niche certification.....and will not become the norm

The above Plenary Session 3 – Sustainability: What Drives the Industry and Consumers? was considered to be a key session. Observers noted the absence of any FMCGs representative on the panel to make the discussions meaningful. The audience was always treading carefully, almost invariably saying at the start, “This is a personal question or remark.” The Iceland video was referred to by the moderator as ‘the video.’ Delegates were less than satisfied.



Fortunately Datuk Carl Bek-Nielsen, co-chair of RSPO and chief executive director, United Plantations Berhad was the point in his closing address. Some described his address as motivational. Others viewed his message as an early indicator of potential danger or failure.

Clearly he has taken the wider view on ‘Shared Responsibility’, not forgotten the small holders, emphasized on SDGs and warns that RSPO might become a niche certification rather than the norm.

The General Assembly (GA) 15 voted in the new Principles and Criteria for the Production of Sustainable Palm Oil (2018) with a majority of 212 of a total of 251 votes.

In November 2019 a RSPO Smallholder Standard to support greater inclusion of smallholders via a simplification of the RSPO Standard will be due for ratification.

POPSIG Lands in Indonesia

The Bandung Institute of Technology or *Institut Teknologi Bandung*, abbreviated as ITB is a state, coeducational research university located in Bandung, Indonesia. Established in 1920, ITB is the oldest technology-oriented university in Indonesia. The Faculty of Industrial Technology (FIT) comprises chemical engineering, engineering physics, industrial engineering, engineering management and food engineering. It is the number 2 university in Indonesia after the University of Indonesia.

On 23rd October 2018, POPSIG founder, KS Qua visited the campuses at Bandung and Jatinangor. At Jatinangor he gave a talk “Preparing for IR 4.0” to nearly 200 undergraduates in their 3rd and 4th year. He gave the undergraduates guidance and assurance and shared his vision of how it could transform the palm oil industry that Indonesia has taken over from Malaysia as the global leader in production. At the Bandung campus he briefed a short high level meeting chaired by the Dean of FIT, Prof. Deddy Kurniadi on IR 4.0. After the explanation they went on to discuss how to adapt the curriculum to incorporate IR 4.0.

POPSIG is pleased to establish ties with ITB, thanks to its alumni Mr Abun Lie, Technical Manager, at PT Ecogreen Oleochemicals.



1., 2. Qua was treated by the lecturers to a sumptuous Sundanese dinner at Skyline Resto Best View which is nearly 1000 metres above sea level. From L to R Dr. Carolus Borromeus Rasrendra, Assoc. Prof. Dr. Tirto Prakoso, Mr Abun Lie and Dr. Ronny Purwadi.
 3. Qua with the enthusiastic undergraduates.
 4. The hall was so packed some had to sit on the floor.
 5. Qua receiving a token and certificate of appreciation from Dr Ronny. Looking on is Dr Helen Julian.
 6. At the meeting chaired by Prof. Deddy. To his left is Dr Suprayogi.

United in The Appreciation of Palm Oil



L to R: Prof Dr Chong Mei Fong, Mohan Balasingam, Hong Wai Onn, Datuk Dr Kalyana Sundram and Qua Kiat Seng

On Monday 3rd December 2018 POPSIG committee members met up with the CEO of the Malaysian Palm Oil Council, MPOC, Datuk Dr Kalyana Sundram. We thank Datuk Dr Kalyana for his keynote address at our successful 2nd Regional Palm Oil Processing Seminar (RPOPS) and noted his call for chemical engineers to play a bigger role in the palm oil industry. We discussed a 3rd RPOPS to inform employers about what chemical engineers can contribute to the palm oil industry.

POPSIG wanted to inform its members about the health aspects of palm oil and Datuk Dr Kalyana offered to assist by writing for its newsletter. We could also republish from the website and blog of MPOC.

POPSIG is planning to inform chemical engineering undergraduates in the 24 universities in Malaysia about palm oil including health, process safety and sustainability in 2019. Co-incidentally MPOC is launching a similar campaign and MPOC will support POPSIG's efforts and vice-versa. POPSIG members are invited to the MPOC launch of its 'Love My Palm Oil' campaign on Tuesday 8th January 2019 [http://www.mpoc.org.my/Reach and Remind Friends of the Industry Seminar 2019 and Dialogue.aspx](http://www.mpoc.org.my/Reach_and_Remind_Friends_of_the_Industry_Seminar_2019_and_Dialogue.aspx)

We look forward to a fruitful 2019 of working together.

Trish Kerin's 3rd Safety Article



Trish Kerin, Director,
Institution of Chemical Engineers Safety Centre (ISC)

Trish is a Chartered Engineer, a registered Professional Process Safety Engineer and Fellow of IChemE. She also holds a diploma of OHS and is a graduate of the Australian Institute of Company Directors (GAICD). Recent awards include the Engineers Australia – John A Brodie Medal – for best paper at the *Asian Pacific Confederation of Chemical Engineering Congress 2015* (incorporating Chemeca). The award recognises Trish's peer reviewed paper on *Process Safety Competency*.

This is my third article where I would like to discuss combustible dust hazards in the palm oil industries. We often think of chemical or oil and gas industries when thinking about process safety, and that is partly because that is where we have seen some of the most significant incidents. But there are several instances of loss of control events that have resulted in tragedy for those involved in the palm oil industries.

Let's look at what could possibly go wrong in the palm oil refining industry, and how these can be described as a process safety loss of control.

Dust is a well understood but underestimated hazard in processing industries. We often fail to realise how significant a dust explosion can be, or even that one is possible at all in our facilities. When we are planning work that can generate any kind of spark, it is vital that we take into account all flammable and combustible material, and this includes dust.

As an example, in a plant manufacturing Ethylene Bis Stearamide (EBS), a contractor was doing work on an air duct on the spray beading plant. This involved removing the cladding from the duct and tack welding on attachments to help with later removal. During the tack welding there was a dust explosion in the duct. The welder escaped the scene but was in shock. This first explosion resulted in the cladding from the building to the air blower being knocked off. A second wave dust explosion then occurred, which is often the case, as the first pressure wave dislodges more dust. As the dust is then dispersed in the air, subsequent explosions can continue. The explosions were very hot, resulting in charred pallets of EBS within the plant. Three men who were filling bags with EBS ran away from the area. Once all the dust was consumed in the explosion and flames, it died out.

There was however a second tower being built next to the one where the dust explosion took place. This second tower suffered significant damage, including melted wiring, and several workers in the second tower were injured. There was a total of 23 injuries, with one worker suffering significant burns. It was very fortunate that there were no fatalities.

When undertaking work such as welding on a plant, a safe system of work must be used. This includes items such as a hot work permit including the safe work method statement (also know as a job safety analysis, or task based risk assessment). These are fundamental process safety tools designed to identify and manage the risk associated with the work being done. The hot work permit examines the hazards associated with the task as a whole and defines required controls. It largely covers the risk to the plant from the task. The Safe Work Method Statement lists each step of the work and defines controls for them. It covers the individual risk to the worker from the plant and task.

In this instance, the permit to work system should have identified the dust explosion hazard within the ducting. This would have then required some controls to be put into place to prevent the dust exploding. This may have included the inspection and clearing of the duct to remove the dust prior to the welding taking place. Another option would have been to use mechanical attachments rather than welding brackets on the duct to facilitate later removal. This would have eliminated the hot work risk entirely. Elimination is the highest level of risk control that you can apply, as in this instance it would have removed the risk of ignition from welding. However, it would not have removed the risk of dust explosion, as dust had built up in the duct. The fact that dust had accumulated meant that an explosion was always possible if an ignition source was introduced. Therefore, management of dust is also critical to reduce the likelihood of a dust explosion.

The use of safe systems of work are critical to manage process safety hazards. People authorizing permits and workers recovering permits must be competent in the system as well as have knowledge of the hazards involved in the task.

To effectively manage process safety, it is necessary to have the right competencies in the workforce and understand how it can impact your business. The IChemE Safety Centre has developed a competency guidance document that defined what specific competencies are needed for each type of role in an organisation. There is also a document on lead process safety metrics which also covers how to monitor and evaluate your permit to work system. These documents are available as a free download from the following site www.bit.ly/ISCPubs. The Occupational Health and Safety Body of Knowledge has also released two chapters that discuss chemical hazards and management of process safety. These can be accessed free from the following site <http://bit.ly/ISCBok1> and <http://bit.ly/ISCBok2>

*As no official investigation report is available, this article is based only on information available to the author.

Young and Capable Prof Ir. Dr Denny K.S. Ng with High Appraisal Research

Palm oil mill effluent (POME) plays an important part in the industry as it not just a waste but can be made profitable too. Young and competent researcher Prof Ir. Dr Denny K.S. Ng (right) from University of Nottingham Malaysia has successfully incubated a highly recommended project in the palm oil industry after 3 years of continuous further researches on Integrated Anaerobic-Aerobic Bioreactor (IAAB) for Palm Oil Mill Effluent (POME) treatment together with his co-researchers Dr Chan Yi Jing and Ir. Dr Chong Mei Fong. Integrated Anaerobic-Aerobic Bioreactor is a combination of having both anaerobic and aerobic process instead of separating them as in the present method in industry. In his research, they were able to tackle COD and BOD removal more efficiently and also successfully produce a purer biogas compared with the current available methods in industry. It was an honour to have him sharing his knowledge at Monash University Malaysia on 26th November 2018 invited by the POPSIG Malaysia.

In this fruitful sharing session, Dr Denny started off with the originations of this project. It was initially started off as a small lab scale fermenter project by Dr Poh Phaik Eong in year 2007 which later on Dr Chan Yi Jing in 2008 continue it in bench scale prototype for UASB 5L and IAAB 20L and Ms Debra Yap Cheau Chin with the collaboration together with MPOB and Havys in 2011 as the 1st contract with MyResearch Sdn Bhd, this research on IAAB further on scale up into pilot scale prototype which accommodate up to 1000L. And in year 2014, a 2nd contract with MyResearch Sdn Bhd and collaboration with Havys, a demo scale IAAB prototype is carried out up to 3000tons.

The demo scale project successfully created a shorter hydraulic retention time as only 10 total average days are required to remove 89-99.93% of COD with average 5 days for Anaerobic process and 5 days for Aerobic and Settling process. This demo plant is also designed for high organic loading rate with smaller footprint about 70% of size reduction. Despite having challenges on building this demonstration plant, its design gives better mixing control and monitoring while most importantly, it gives better and stable methane yield in long term – about 0.22LCH₄/gCOD.

In the first phase of study, mixing intensity, mixing pattern, mixed liquor suspended solids (MLSS) and organic loading rate (OLR) is being studied. From these studies, organic loading rate at 10-12 kgCOD/m³day gives an optimal COD removal at 77.25% and better methane yield (0.22LCH₄/gCOD) and purity (63%). Dr Denny also assured that the purity of the methane yield is far better than other methods in the industry which methane is produced from treating POME. However, challenges faced were foaming issues due to over mixing, scum issues due to inadequate mixing and also maximizing BOD and COD removal. To overcome these issues, studies on seeding with anaerobic sludge, MLSS and food to microorganism ratio (F/M) were carried out in the second and third phase of studies. It was found that, dosing in Bioremove 5100 & Bioremove 3200 at a ratio of 50:50 effectively reduced the foams while being able to remove COD and BOD efficiently. MLSS at 19000mg/L together with mixing pattern of 140m³/hr intermittent mixing for 30 min every hour and 70m³/hr continuously solves the foaming issues too. Despite all hardships, promising results were rewarded as the biogas produced can power 390kw for a 40% gas engine giving biogas flow rate at 150Nm³/hr. Most importantly, the final discharge of COD and BOD were 2925ppm and 307ppm which meet the industry requirement.

As mentioned by KS Qua one of the organizer for this sharing session: “Many universities research POME treatment. This one is very successful because the divergent objectives of academics and industrialists converge with trust and understanding with long term goals beyond 3 years. Scale up is the most challenging and rewards the academic willing to spend years on the ground getting their hands dirty.”



1. Dr Christina Phang, Chair of IChemE Malaysia (left) presenting the certificate of appreciation to Prof. Ir. Denny Ng (right).
2. Group photo with some of the audience present for the talk.

'Student Bursaries' and 'Best Final Year Design Award' from POPSIG

Palm Oil Processing Special Interest Group (POPSIG) provides financial assistance in a form of student bursaries to undergraduate and postgraduate students to attend scientific conferences, workshops or forums which are related to palm oil processing. The main objectives of such assistance are to spur the students' motivation and support their research in palm oil processing. The student bursaries contribute towards the registration, travel and accommodation costs to help make the palm oil processing conferences or events more accessible to the students.

Each year, POPSIG awards Best Final Year Design Award to a group of final year students, whose final year project design revolves around palm oil processing. The main objective of this award is to encourage the universities to introduce palm oil processing design for their final year students. The selection of Best Final Year Design Award is based upon a palm oil processing design which reflects on efficiency, values inherent safety and mitigates environmental impacts, and demonstrates project viability to the palm oil industry.

The detailed requirements to apply for POPSIG 'Student Bursaries' and 'Best Final Year Design Award' are:

Student Bursaries

1. Only activities associated with palm oil processing will be supported.
2. A supervisor's report must be included with your application by a separate email, confirming your suitability to attend the conference and your status as an unsalaried member of your department/university.
3. Bursaries are awarded competitively to cover part of the cost of registration, travel and accommodation only. The decision of the POPSIG is final.
4. Bursaries are awarded up to a maximum value of RM1000 per event. A maximum of five bursaries will be offered annually.
5. Applications are reviewed throughout the year. Applications must be received before the conference starts, at least 6 months before the conference, workshop or forum. Enough time must be allowed by the applicant to meet these review dates.
6. Payment can only be authorised after the event and will only be made against receipts for the items listed above.
7. A conference report shall be submitted by the participant with the claim for expenses. The report should be 500-1000 words long and cover the key papers presented at the conference, the relevance of the conference to the participant's own work and any other points of interest. The report may be published in the POPSIG Newsletter.
8. Successful applicants are required to include the acknowledgement of the POPSIG's support.

Best Final Year Design Award

1. Only final year project design which is associated with palm oil processing will be considered.
2. The design may involve either up-stream or/and down-stream palm oil processing, including improvement of current technologies or introduction of new technologies.
3. A design lecturer's report must be included together with the application by a separate email, confirming the status of the students who have taken the final year project design from a university.
4. The design submitted shall be original and have not been previously submitted or published. POPSIG only considers one application per university.
5. Award is awarded up to RM2000 per group and only one group will be awarded per year. Each student in the winning group will be given a Design Award Winning Congratulation Certificate by POPSIG. The decision from the POPSIG is final.
6. Applications for submission are announced in 1 October each year and closed in 1 March for the following year. The winning team will be announced after two months the closing date of application.
7. In general, the design project will be evaluated based upon the structure and technical content of the proposed palm oil processing. Key criteria for the evaluation could be ranged from the comprehensiveness of the analysis until the applicability of the design to be applied in a real palm oil industry.
8. If no winning team for a particular year, the award money will be channelled and used as student bursaries.

Applications may be made by filling in and sending the form to Mr. Hong Wai Onn (email: hongwaionn@gmail.com), Mr. Qua Kiat Seng (email: ksgua@hotmail.com) and Assoc. Prof. Wu Ta Yeong (email: wu.ta.yeong@monash.edu)

Q1 Diary of Events (2019)

Evening Talk: **Application of Dividing Wall Column for Improved Oleochemical Fractionation: From Conceptual Design to Pilot Plant Validation**

Speaker: Dr Mohamad Rizza bin Othman

Date: February 2019

Time: 18:00—20:30 (GMT+8)

Location: Seminar Room 6-2-14, Monash University Malaysia, Subang Jaya, Selangor, Malaysia

Evening Talk: **Heat Recovery using Vent Economizers**

Speaker: Shyam Lakshmanan

Date: March 2019

Time: 18:00—20:30 (GMT+8)

Location: Seminar Room 6-2-14, Monash University Malaysia, Subang Jaya, Selangor, Malaysia

For further information about POPSIG including how to join our events please contact the Secretary Assoc. Prof. Dr Wu Ta Yeong at wu.ta.yeong@monash.edu

IChemE offices

Global Headquarters

UK—Rugby

Tel: + 44(0) 1788 578214

Email: info@icheme.org

Australia

Tel: +61(0) 3 9642 4494

Email: austmembers@icheme.org

Malaysia

Tel: +603 2283 1381

Email: malaysianmembers@icheme.org

Singapore

Tel: +65 6471 5043

Email: singaporemembers@icheme.org

New Zealand

Tel: +64 (4) 473 4398

Email: nzmembers@icheme.org

UK—London

Tel: +44 (0) 20 7927 8200

Email: info@icheme.org

IChemE is a registered charity in England and Wales, and a charity registered in Scotland 9SC 039661)

www.icheme.org