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The Institution of Engineers, Malaysia

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THE MONTHLY BULLETIN OF THE INSTITUTION OF ENGINEERS, MALAYSIA

JUNE 2023

Environmental, Social & Governance (ESG)

& Engineering Digital Transformation

KDN PP 1050/12/2012 (030192) ISSN 0126-9909

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by Ir. Prof. Dr Tan Chee Fai
Chairman, CESIG (Consulting Engineering Special Interest Group)

COVER NOTE

ESG & Engineering Digital Transformation

In recent years, the business world underwent a profound transformation with the emergence of digital technologies and the growing importance of Environmental, Social & Governance (ESG) issues. The integration of digital technology into all areas of a business had resulted in fundamental changes in how companies operated and delivered value to their customers, while a commitment to ESG had become essential for businesses to address their impact on the environment, society and stakeholders.

In this issue of *JURUTERA*, we will explore the intersection of digital transformation and ESG as well as the ways in which businesses are leveraging digital technology to drive sustainable practices and better manage their ESG impact. We speak with industry experts and thought leaders from UNESCO and the various NGOs to gain insights into the challenges and opportunities presented by this transformative trend.

We take a deep dive into the ways in which digital transformation is being used to improve sustainability, reduce waste and emissions as well as optimise supply chain operations. We also examine how ESG is being integrated into business strategies and its impact on financial performance and reputation. Join us as we explore the cutting-edge of digital transformation and ESG and the ways in which businesses are creating value for their stakeholders while making a positive impact on the world at the same time. ■

EDITOR'S NOTE

by Ir. Razmahwata Mohamad Razalli
Principal Bulletin Editor

Hard Work Behind Publications

"*Life is not a solo act. It's a huge collaboration and we all need to assemble around us the people who care about us and support us in times of strife.*" – Tim Gunn.

I present an ongoing series, highlighting various IEM roles, keeping IEM shipshape and Bristol fashion.

First, we introduce the backbone of the Standing Committee on Information & Publications. They are responsible for the coordination and timely publication of the IEM Journal and *JURUTERA*. The Assistant Manager for this department is Puan Nurul Aida Mustafa, who joined IEM in 2000 and worked through the ranks from Assistant Librarian to Assistant Manager. She is a very thorough and meticulous person who combs through the publications to ensure they are free of errors.

Nurul Aida binti Mustafa

Nur Illyarnie binti Rosman

She is assisted by Cik Nur Illyarnie Rosman who joined IEM last year to beef up the department which was originally shouldered by only one employee. Cik Illyarnie is specifically responsible for the publication of *JURUTERA*. ■

Environmental, Social & Governance

The United Nations Educational, Scientific & Cultural Organisation (UNESCO) focuses primarily on promoting international collaboration in the fields of education, science, culture and communication. UNESCO plays a significant role in Environmental, Social & Governance (ESG) initiatives by leveraging on its expertise, networks and global reach to contribute to sustainable development and to address pressing global challenges. Ir. Prof. Dr Tan Chee Fai, Chairman of Consulting Engineering Special Interest Group, IEM, interviewed Prof. Dr Shahbaz Khan, Director of UNESCO Multisectoral Regional Office for East Asia in Beijing, regarding the role of UNESCO in ESG. The following is the reply by Prof. Dr Shahbaz Khan.

Prof. Dr Shahbaz Khan

The Director of UNESCO Mutisectoral Regional Office for East Asia in Beijing, was previously Director of UNESCO Regional Science Bureau for Asia & Pacific, Jakarta, Indonesia. He joined UNESCO in 2008 as Chief of Water & Sustainable Development Section in the Division of Water Sciences and coordinated programmes such as Water Education for Sustainable Development, Hydrology for Environment, Life and Policy (HELP), Ecohydrology, MAB and Water and Energy Nexus.

How does UNESCO incorporate Environmental, Social & Governance (ESG) principles into its policies and practices?

UNESCO recognises the importance of ESG and has taken steps to incorporate it into its policies and practices. UNESCO incorporates ESG basically by combining ESG with governmental strategies, industrial innovations and local projects. Here are some examples:

UNESCO's Man & the Biosphere Programme (MAB) is a global network of sites designed to promote sustainable development practices. The programme seeks to reconcile the conservation of natural resources with the socioeconomic development of local communities and encourages sustainable land use practices as well as promotes the conservation of biodiversity.

UNESCO promotes sustainable tourism through its World Heritage Sites programme. It works with governments and other stakeholders to ensure tourism activities are carried out in a way that protects the natural and cultural heritage of these sites. This includes developing sustainable tourism strategies and promoting responsible tourism practices.

UNESCO advocates the inclusion of sustainability education in the curricula and promotes research and development in sustainable development practices. Its Sustainable Development Goals (SDGs) Education 2030 Framework for Action aims to ensure that all learners acquire the knowledge and skills needed to promote sustainable development.

UNESCO is promoting Science, Technology, Engineering and Mathematics (STEM) education as the pathway for innovation and technology advancements and economic growth and sustainable development. Countries with higher levels of STEM skills tend to have higher economic growth rates. A 1% increase in the number of people with STEM skills can lead to an increase in GDP of 0.2%. (OECD).

UNESCO is placing greater emphasis on STEM at all levels of education as these skills are key to sustainable water management, environmental stewardship, sustainable energy solutions, innovative food production or advanced technical skills in data analysis and computer science. They can drive social well-being, inclusive growth and sustainable development as well as help address global challenges such as climate change, water, food and energy security, biodiversity loss, health and poverty.

What are some examples of UNESCO's efforts to promote ESG practices in different countries and regions?

People living in and near the Bio Biosphere Reserve in Ghana are highly dependent on forest resources for their livelihood. Most are cocoa farmers who harvest wild honey, mushroom and other non-timber forest products during the lean season to supplement their income. This practice, combined with population growth in the area, has put a strain on the biosphere reserve and led to alarming rates of depletion. The UNESCO MAB programme and the Korea International Cooperation Agency (KOICA) worked with the local community to implement green economy initiatives in the area to provide income alternatives that can reduce over-reliance on forest resources, including mushroom production, bee-keeping, snail rearing and palm oil production.

Jeju Island Biosphere Reserve in South Korea was selected as a testbed for clean energy solutions. The project is implemented in 3 interrelated phases. The first phase consists of experiments with wind and solar power generation conducted on the smaller Gapa Island. The second phase explores ways to raise the share of renewables in the energy market. The third phase focuses on transforming Jeju into a carbon-free island and a green growth city by 2030.

UNESCO also promotes environmentally sustainable job opportunities like integrated farming in India, sustainable tourisms based on biosphere reserves, etc.

How does UNESCO work with companies and other organisations to promote ESG principles and sustainability?

UNESCO has developed a set of sustainability guidelines for companies that operate in the tourism industry. These guidelines provide a framework for companies to adopt sustainable practices and reduce their ecological impact.

UNESCO also works with the private sector to develop sustainable business practices. For example, it works with companies to develop sustainable supply chains and to reduce their carbon footprint.

As an important partner of UNESCO, Mercedes-Benz Star Fund, established in 2010, is a joint charity fund created by Mercedes-Benz and China Youth Development Foundation. In the past years, Star Fund has fulfilled Mercedes-Benz's corporate social responsibility mainly in the areas of environment protection, driving culture, education support, culture & arts and social care.

UNESCO continues to partner with civil society organisations, academic institutions, and other stakeholders to promote sustainable development. It facilitates dialogues and discussions on sustainable development issues and works to build consensus and to mobilise action.

UNESCO also supports research and development on sustainable development issues, working with academic institutions and other research organisations to advance knowledge and understanding of sustainable development.

UNESCO also provides technical assistance and capacity building to countries and organisations to help them develop and implement sustainable development policies and programmes; for example, we compile the UNESCO Country Strategy for governments' reference.

In all these efforts, UNESCO seeks to promote collaborations and partnerships between different stakeholders, including governments, civil society organisations, private sector actors and academic institutions to promote ESG and sustainability.

How can UNESCO's work in education and culture contribute to the promotion of ESG practices?

Education for Sustainable Development (ESD): UNESCO promotes ESD to encourage changes in behaviour, attitudes and values which promote sustainable development. By integrating sustainability themes into education systems, UNESCO aims to create a generation of environment conscious individuals who understand the importance of sustainable practices.

Cultural Heritage Preservation: UNESCO works to protect and preserve cultural heritage sites and practices that are essential to the identity and well-being of local communities. This includes natural and cultural heritage sites that promote sustainable development practices and can serve as a source of inspiration for sustainable development efforts.

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Communication and Advocacy: UNESCO uses its communication and advocacy channels to raise awareness of environmental issues and to promote sustainable development practices. Through its partnerships with media outlets, social media platforms and other communication channels, UNESCO can reach a wide audience and influence public opinion towards sustainable practices.

Capacity Building: UNESCO provides training and capacity-building programmes to support the implementation of sustainable development policies and practices. This includes training on sustainable agriculture, renewable energy and other sustainable practices that can help communities transition to a more sustainable way of life.

Overall, UNESCO's work in education and culture can help promote ESG practices by building awareness, promoting sustainable behaviours, preserving cultural and natural heritage sites and building capacity for sustainable development efforts.

What role does UNESCO play in raising awareness about ESG issues and promoting sustainable development at a global level?

Advocacy: UNESCO advocates for the integration of sustainable development practices into policies, plans and programmes at the global level. This includes advocating for the inclusion of sustainability in the United Nations' SDGs and supporting the development of international agreements, such as the Paris Agreement on climate change.

Education for Sustainable Development (ESD): UNESCO promotes ESD as a means to raise awareness and understanding of sustainability issues among learners and educators.

Capacity Building: UNESCO provides capacity-building programmes to support the development of skills and knowledge related to sustainable development practices.

Cultural Heritage Preservation: UNESCO works to protect and preserve cultural heritage sites and practices which are essential to the identity and well-being of local communities.

Communication: UNESCO uses its communication channels to raise awareness of environmental issues and to promote sustainable development practices.

How does UNESCO ensure that its initiatives and programmes are aligned with ESG principles and the SDGs?

Policy frameworks: UNESCO has developed policy frameworks to guide its work towards the implementation of the SDGs and the promotion of ESG. For example, the ESD Framework and Culture Sector Strategy for Sustainable Development both explicitly link UNESCO's work to the SDGs and sustainable development principles.

Collaboration and partnerships: UNESCO collaborates with various stakeholders, including governments, civil society organisations and the private sector to ensure that its initiatives and programmes are aligned with ESG

principles and the SDGs. Through partnerships, UNESCO can leverage expertise and resources from a range of sectors to enhance the impact of its work.

Monitoring and evaluation: UNESCO monitors and evaluates the impact of its initiatives and programmes against established sustainability indicators, such as those set out in the SDGs. This helps to ensure that its work contributes to the achievement of the SDGs and ESG.

Capacity building: UNESCO provides capacity-building programmes to support the development of skills and knowledge related to sustainable development practices. This includes training programmes on sustainable agriculture, renewable energy and other sustainable practices that can help communities transition to a more sustainable way of life.

Awareness raising and communication: UNESCO uses its communication channels to raise awareness of environmental issues and to promote sustainable development practices. This includes partnerships with media outlets, social media platforms and other communication channels to reach a wide audience and influence public opinion towards sustainable practices.

What are the biggest challenges UNESCO faces in promoting ESG practices and sustainability and how is the organisation addressing these?

UNESCO faces several challenges in promoting ESG practices and sustainability, including:

Short-term political focus: One of the biggest challenges is short-term political focus which can be a barrier to implementing longer term sustainable policies and practices. Many governments prioritise immediate economic growth needs over environment protection and this can make it difficult for UNESCO to promote sustainability initiatives.

Limited resources: UNESCO faces limited resources for implementing sustainability initiatives, particularly in developing countries where resources are often scarce. This can make it challenging to implement sustainability projects at scale and to achieve significant impact.

Lack of public awareness: Another challenge is the lack of public awareness and understanding of the importance of sustainability practices in all aspects of life. Many people are not aware of the negative impact of unsustainable practices on the environment and so do not prioritise sustainability in their daily lives.

Climate change: Climate change is a major challenge that threatens the sustainability of ecosystems and communities beyond political boundaries. Addressing this challenge requires urgent collective action and coordinated efforts by all actors and at all levels.

To address these challenges, UNESCO is taking several actions such as:

Advocacy and awareness-raising: UNESCO is engaging in advocacy efforts to raise awareness of the importance of sustainability and to encourage governments and communities to prioritise sustainability initiatives.

Capacity-building: UNESCO is providing capacity-building support to communities and governments to help them implement sustainable practices and policies.

Research and knowledge-sharing: UNESCO is conducting research and sharing knowledge on best practices for promoting sustainability and addressing environmental challenges.

Partnerships: UNESCO is working in partnership with other organisations, including private sector entities, to mobilise resources and to collaborate on sustainability initiatives.

Policy development: UNESCO is working with governments and other stakeholders to develop policies and frameworks that promote sustainability and protect the environment.

How can engineering communities contribute to UNESCO's efforts to promote ESG practices and sustainability?

Designing sustainable infrastructure: Engineers can help promote ESG practices by designing infrastructure that reduces energy consumption, minimises waste and promotes the use of renewable resources. This includes designing buildings which are energy-efficient and use green materials as well as developing sustainable transportation systems that reduce emissions and promote active transportation.

Developing sustainable energy systems: Engineers can help promote sustainability by developing and implementing sustainable energy systems which utilise renewable energy sources like solar, wind and hydropower. They can also focus on improving energy storage technology to make renewable energy more reliable.

Promoting sustainable agriculture: Engineers can play a critical role in promoting sustainable agriculture by designing and implementing systems that conserve water, reduce fertiliser use and promote soil health. This includes developing precision irrigation systems, implementing precision agriculture techniques and utilising technologies like hydroponics.

Advancing sustainable manufacturing: Engineers can promote sustainability in manufacturing by designing processes and products which use less energy and resources, reduce waste and minimise the use of toxic materials. They can also focus on improving the efficiency of manufacturing processes to reduce the environmental impact.

Encouraging sustainable practices in communities: Engineers can help promote ESG practices in communities by developing educational programmes and public awareness campaigns that promote sustainable practices, such as recycling, composting and reducing energy consumption. They can also work with local governments and community organisations to implement sustainable policies and programmes.

What is UNESCO's vision for the future of ESG practices and sustainability and how can other organisations and stakeholders support this vision?

UNESCO's vision for the future of ESG practices and sustainability is one in which societies prioritise environment protection and sustainability as a core element of their economic and social development. This vision is based on the recognition that the environment is a critical foundation for human well-being and that sustainable practices are necessary to ensure a sustainable future for all.

To achieve this vision, UNESCO has identified several key priorities, including:

Advancing sustainable development goals: UNESCO is committed to advancing the UN SDGs, particularly those related to sustainability and to working with governments and stakeholders to promote sustainable development.

Promoting education for sustainability: UNESCO sees education as a key tool for promoting sustainable development and is working to integrate sustainability education into school curricula and to promote education for sustainability at all levels.

Supporting climate action: UNESCO is committed to supporting climate action initiatives, including through its work on sustainable ocean management, biodiversity conservation and other initiatives aimed at mitigating and adapting to climate change.

Fostering partnerships: UNESCO recognises the importance of partnerships in achieving its sustainability goals and is working with governments, civil society organisations, private sector entities and other stakeholders to mobilise resources and to collaborate on sustainability initiatives.

To support UNESCO's vision for the future of ESG practices and sustainability, other organisations and stakeholders can take several actions, including:

Prioritising sustainability: Organisations and individuals can prioritise sustainability in their decision-making and operations and work to promote sustainable practices in their communities and sectors.

Collaboration: Organisations and stakeholders can collaborate with UNESCO and other organisations working on sustainability initiatives to share knowledge, resources and expertise.

Advocacy: Organisations and individuals can advocate for sustainable policies and practices at local, national and international levels and can work to raise awareness of the importance of sustainability.

Investment: Private sector entities can invest in sustainable technologies and practices, and work to develop sustainable business models that prioritise environment protection and social responsibility.

Overall, supporting UNESCO's vision for the future of ESG practices and sustainability requires a coordinated effort across different sectors and stakeholders as well as a commitment to prioritising sustainability as a core element of economic and social development. ■

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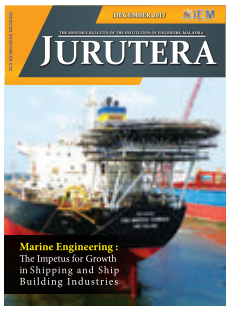

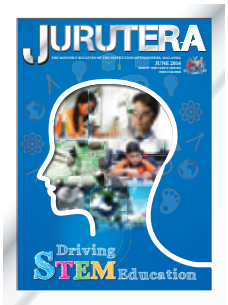

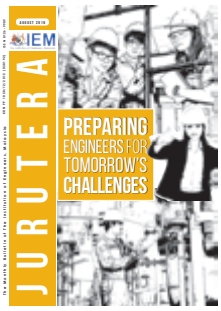

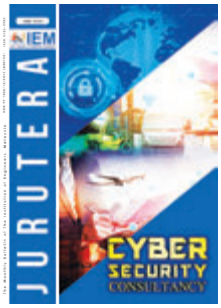

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Page 1	6,650	6,150	5,850	5,550	5,250
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Centre Spread	11,200	9,500	9,000	8,500	8,000
ROP Full Page	4,900	4,500	4,300	4,100	3,900
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ASEAN Engineering Digital Transformation Series

Written and Prepared by:

Ir. Prof. Dr Tan Chee Fai

Vice President of The Institution of Engineers Malaysia. Currently, he is the Deputy Vice-Chancellor of Infrastructure University Kuala Lumpur. He is the Malaysia Productivity Corporation recognised National Productivity Champion and Digital Transformation subject expert.

The first ASEAN Engineering Digital Transformation (ASEAN EDX) Summit, held on 18 March 2022, was a 1-day initiative and a by-invitation-only event. The virtual summit, curated by engineering and technology experts from various industries from across the region, discussed topics on digital transformation that were currently at the top of the enterprise's agenda as well as offered networking opportunities.

It started with an introduction speech by the Organising Chairman, Ir. Prof. Dr Tan Chee Fai, after which the then-IEM President, Ir. Ong Ching Loon, made his welcome speech and congratulated the Organising Committee for its efforts in arranging the event. He said ASEAN EDX 2022 was held in conjunction with ENGINEER 2022, the first and only trade exhibition that covered all disciplines of engineering. The event had promised to deliver fresh and relevant insights through though-provoking digital broadcasts. He added that it was also a platform where we could see how digital transformation could create enterprise value and empower greater worker productivity which would definitely make the world a better place.

Following this was a keynote presentation by Prof. Dr Shahbaz Khan, Director and UNESCO representative to the People's Republic of China, the Democratic People's Republic of Korea, Japan, Mongolia and the Republic of Korea. He spoke on the role that engineers played in transforming the world through inventions and the development of new technologies, which had a significant impact on economic growth and quality of life.

The United Nations Sustainable Development Goals (SDGs) seeks an integrated approach to development that addresses the needs of all people by calling for equitable opportunities and economic prosperity for all, while mitigating its deleterious effects on the planet. Engineering is crucial for the advancement of each one of the 17 SDGs which requires solutions rooted in science, technology and engineering.

The talk provided snapshots of digital innovations in engineering which addressed key challenges such as leveraging emerging technologies including big data, Artificial Intelligence (AI) and the concept of smart cities for sustainable development. All these show concretely that engineering can help promote the SDGs and improve the quality of human life. These engineering solutions consist of not only technological means but are also accompanied by ethical codes, norms and standards to ensure that engineering practices are conducted responsibly.

He said UNESCO worked continuously alongside engineering societies and supported engineering solutions for implementing the SDGs with an emphasis on engineering capacity-building in developing countries. Although significant progress has been made in terms of engineering innovations, gaps remain between current engineering capability and what is required to achieve the SDGs and leave no one behind. A set of recommendations is proposed to fill in the gaps. These call for the combined efforts of government, academic and education institutions, industry and engineering societies.

The Presentation by Prof. Dr Shahbaz Khan

Prof. Dr Gong Ke, the Immediate Past President of the World Federation of Engineering Organisations (WFEO), then spoke on the world landscape, touching on the

pandemic effect and the trends set up to work on the SDGs. He hoped to unite the world engineering profession to advance the UN SDGs through international joint efforts such as World Engineering Day for Sustainable Development and the UNESCO Engineering Report, Engineering for Sustainable Development.

The Presentation by Prof. Dr Gong Ke

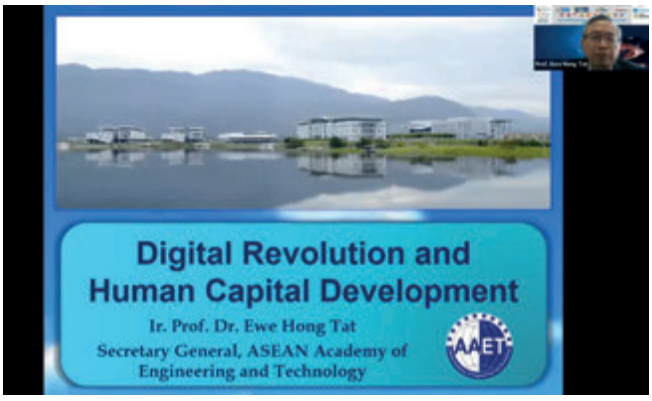
Prof. Dr Huang Wei, President of the Federation of Engineering Organisations of Asia & The Pacific (FEIAP) also congratulated the Organising Committee and said FEIAP (also a set up engineering organisation) was able to support the event and had its working committee to help ASEAN work on this issue. It was noted that the online virtual session recorded a total 196 participants zooming in from all over ASEAN, Asia Pacific and other parts of the world, including Africa.

The Presentation by Prof. Dr Huang Wei

Another distinguished speaker for the morning was academician Dato' Ir. Dr Lee Yee Cheong, Honorary Chairman, Governing Council, International Science Technology and Innovation Centre for South-South Co-operation under the auspices of UNESCO (ISTIC). Dato Ir. Dr Lee shared his many interesting ideas in moving forward with the new digital technology and new trends. He outlined the intimate relationship between all the topics on UN SDGs, Comprehensive Infrastructure, Engineering and Engineers, South-South Cooperation, China and Digital Technologies, based on his personal experience as a world engineering leader and his working relations with the UN, UNESCO and the UN Broadband Commission for Sustainable Development. He also described his current initiatives with respect to the above topics.

The Presentation by Dato' Ir. Dr Lee Yee Cheong

Ir. Prof. Dr Ewe Hong Tat, Secretary General of the ASEAN Academy of Engineering & Technology (AAET) and President of Universiti Tunku Abdul Rahman, Malaysia, kick-started the second morning session by speaking on the era of digital revolution. He said it was necessary to take a second look at the challenges of human capital development. The demand for engineering education goes beyond normal curriculum and extends to capacity development, character building, transferable skills and lifelong learning. This latest development is also aligned with rapid development and convergence of technologies as well as challenges of AI-driven algorithms and technologies with increased focus on humanity and sustainable growth. His paper on Digital Revolution & Human Capital Development was indeed very informative.



The Presentation by Ir. Prof. Dr Ewe Hong Tat

The session continued with speeches from sponsors who provided useful information on the set-up of their organisations, the people, culture and collaboration, leadership efforts, empowerment and values. The speakers were Mr. Alex Eng Chee San, Director of DigitalTC Asia Sdn. Bhd. and Mr. Veerendran Munirathinam, Prudent Aire Engineering Sdn. Bhd.

Other speakers for this session were Dr Mohamad Norjayadi Tamam, Deputy Director of the Malaysia Productivity Corporation (MPC), Ministry of International

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Trade and Industry (MITI) and Dr Thomas Ooi Wei Min, Solutions Enabling Manager at Intel Corporation.

Speakers for the afternoon session on issues of digital transformation embracing transformation and sustainability were Ts. Shamsul Kamar Abu Samah, Head of National Aerospace Industry Coordinating office (NAICO), Ministry of International Trade and Industry (MITI), Ir. Abdul Fattah Yatim, Chairman of the Malaysia's Standards Committee on Blockchain & DLT (TC/G/15) and Prof. Ir. Dr Tan Chee Fai, Deputy Vice-Chancellor (Research)/ Infrastructure University Kuala Lumpur.

The speakers for this afternoon session who spoke on Policy, Incentives and the Driving Mechanism towards Digital Transformation were Datuk Sri Wong Siew Hai, President of the Malaysia Semiconductor Industry Association, Engr. Federico A. Monsada, President of the Philippine Technological Council and Dr Jing Peng, Chair of the WFEO Committee on Engineering for Innovative Technologies, World Federation of Engineering Organisation.

The Presentation by Datuk Sri Wong Siew Hai

Dr Jing Peng said the world needed rules for AI to benefit humanity. Following the Recommendation on the Ethics of Artificial Intelligence (UNESCO, 2021), WFEO released Big Data and AI Principles in engineering to promote responsible conduct of big data and AI innovation and application in engineering. For this purpose, 7 Principles were introduced herein to raise the awareness of ethics for digital transformation. There were also mind-blowing digital technologies implemented at the Beijing 2022 Winter Olympics, such as digital twinning of the opening ceremony, cloud-powered broadcasting system, Lie Bao (cheetah) high-speed cameras, etc. Robots powered by AI played a key role in anti-epidemic check-up, cooking, food delivery and keeping venues clean. These technologies ensured the successful running and participation of the event and showed the charm of digital transformation.

She added that digital transformation in the water sector was gaining impetus as well and positive attempts were being made in areas such as basin-wide flood control and water resources management. In China, an innovative digital twin for water is under construction in efforts to support integrated water resources management and decision-making in a targeted manner. This presentation

elaborated on the digital application in water infrastructure engineering and management. Digital transformation is changing the way of governance, yet many challenges we face call for further practice sharing and collaboration.

The session then continued with speakers as follows:

- Ir. Assoc. Prof. Dr David Chuah Joon Huang spoke on Digital Transformation in Education: The Insights & Global Trends, touching on Digital Transformation which had changed every aspect of our lives, including education. He said the Covid-19 pandemic had accelerated the rate of adoption of digitisation in teaching and learning and that education worldwide quickly altered its form from traditional classroom learning to online learning, i.e. teaching and learning conducted remotely and on digital platforms. Recent technologies such as AI, virtual reality, augmented reality, big data analytics, 5G network and others have also been employed to enhance the teaching and learning experience. Many believe the acceptance of online learning with the seamless implementation of latest technologies will continue to expand even after the pandemic and will impact the worldwide education market and trend. The global online learning market has presented immense business opportunities and is expected to reach a tremendous market size of over US$370 billion before 2026.
- Ir. Rusnida Talib spoke on the Role of Women in Digital Transformation – Where Are We Now?. She said that Digital Transformation touched every aspect of our lives. Everything that can be digitised is being digitised and, to survive in the digital world, every individual needs to respond in an accelerated fashion to stay relevant. However, various studies show an imbalance in the contribution from men and women in honing digital skills or leading digital initiatives. Globally, according to research by KPMG, only 48% of female leaders are comfortable with cutting edge technologies such as AI, machine learning and Blockchain. It is baffling that women hold only 5% of leadership positions in the technology industry. She ended her presentation with probing questions such as "What does it take to develop female digital leaders?" and "What is insight, the MyDigital initiated by the government?".
- Mr. Lim Seng Tat's presentation was on As Product Complexity Increases, Making Smarter, Faster & More Informed Decisions to Deliver Exceptional Results is Critical. He said his company had the product to help and, by using CAE, IoT, machine learning and data intelligence, one could "twin" products to help optimise product performance and reliability as well as extend its lifecycle and improve on next-generation technologies.

The last session continued with the following speakers on Disruptive Technologies on Digital Transformation Enablers:

- Ts. Dr Ong Chong Yong, Executive Committee Member of ASEAN Engineering Register (AER)
- Dato' Prof. Dr Noor Inayah Ya'akub, President & Vice Chancellor of Infrastructure University Kuala Lumpur (IUKL)
- Prof. Dr Prachuab Klomjit, Associate Professor of the Department of Industrial Engineering & Management, Silpakorn University, Thailand
- Ir. Ade Irfan, Vice-Chairman of Mechanical Engineering Section, Persatuan Insinyur Indonesia (PII).

The Presentation by Dato' Prof. Dr Noor Inayah Ya'akub

Indeed, it was a long, fruitful day that ended with closing remarks from Ir. Yau Chau Fong, Head Commissioner of the ASEAN Engineering Register (AER) who spoke on Outreaching Future Engineering: Through the Kaleidoscope of an ASEAN Engineer.

The ASEAN Engineering Digital Transformation series will be continued at the Engineers Convention 2023. The Organising Committee has announced that ASEAN EDX will be continued at the Malaysia-China ASEAN Engineering Digital Transformation Summit 2023. Malaysia-China ASEAN EDX will be held on 8 September 2023, 9.00 a.m.-5.00 p.m., at KL Convention Centre. There will be 5 themes: ESG, Technology, Infrastructure & Construction, RCEP and Talent. The guest of honour will be Y.Bhg. Dato' Sri Alexander Nanta Linggi, the Minister of Works, Malaysia.

So mark your calendar for the 1st Malaysia-China Engineering Digital Transformation Summit 2023 on 8 September 2023 at KL Convention Centre. ■

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Enhanced ESG Requirements on Electrical Power Cable Sizing due to Globalisation

Written and Prepared by:

Ir. S. Vignaeswaran

Has over 30 years' experience in electrical, computer, IT, SCADA, tendering and project management. He is currently involved in the research of a new approach, methodology and calculations to the electrical power cable design/selection.

Environmental, Social and Governance (ESG) are interrelated factors which, together, create a holistic approach to sustainable and responsible business practices. ESG factors are also increasingly important to investors who recognise that companies with strong ESG practices are more likely to be financially sustainable in the long term. This has led to a growing emphasis on ESG investing, which seeks to identify companies that prioritise ESG in their operations. Similarly, a company that prioritises social factors, such as fair labour practices, is more likely to have a stable and engaged workforce which can contribute to its long-term success.

Therefore, talking about ESG without considering asset return-on-investment (ROI) management or vice versa in the boardroom, will have very little effect. This is because ESG is the superset of lifespan asset management, long-term ROI, non-destructive design approaches etc, all of which are part of power cable sizing activities.

Often, the blame game in power cable sizing occurs when there is disagreement among stakeholders over who is responsible for the outcome of the sizing calculation. Power cable sizing is a complex process that involves several stakeholders, including electrical engineers, contractors, suppliers and manufacturers. Unfortunately, the same is true for ESG. To avoid blaming each other, stakeholders should work together to identify the root cause of the problem and to develop a solution to address it. This may involve revising the design specifications, selecting a different supplier or manufacturer or implementing new maintenance procedures. Fortunately, the same approach can be applied to ESG.

In the discussion below, the environmental issue affects everyone almost equally and therefore, is treated with an outside-in approach. Meanwhile, social and governance requirements which are an internal decision-making process, take on an inside-out approach. As such, environmental issues are vertically dissected into the grouped activities that need to be addressed, while the social and governance issues are addressed along the horizontal stakeholder lines.

ESG Stakeholders in Power Cable Sizing Activities

Power cable sizing is a fundamental aspect of the electrical engineering design. It involves selecting the appropriate cable size to carry electrical power safely from the source to the load. However, in addition to these technical considerations, there is also growing emphasis on incorporating ESG factors into the process. These considerations manifest themselves as an intricate, complex and tedious concern over time, one that is understood only by the direct stakeholders and the relevant subject matter experts. A Control Process modelling of the ESG dynamics for power cable sizing, as shown in Figure 1, reflects the complexities involved.

Asset management, lifespan and ROI of the power cable, include a diverse range of concerns from the various stakeholders (client, consultant, contractor, vendor/supplier, manufacturer, government and the public) as they will affect all their business objectives over time and throughout the use of the power cable.

Environmental Considerations

One way to incorporate environmental considerations in power cable sizing is to select cables made from environmentally friendly materials, such as low-carbon footprint materials or biodegradable materials. For example, companies can opt for cables made from renewable materials such as bio-based polymers, which have lower carbon emissions compared to traditional PVC cables. Another approach is to design cables with improved thermal properties, such as better heat dissipation or

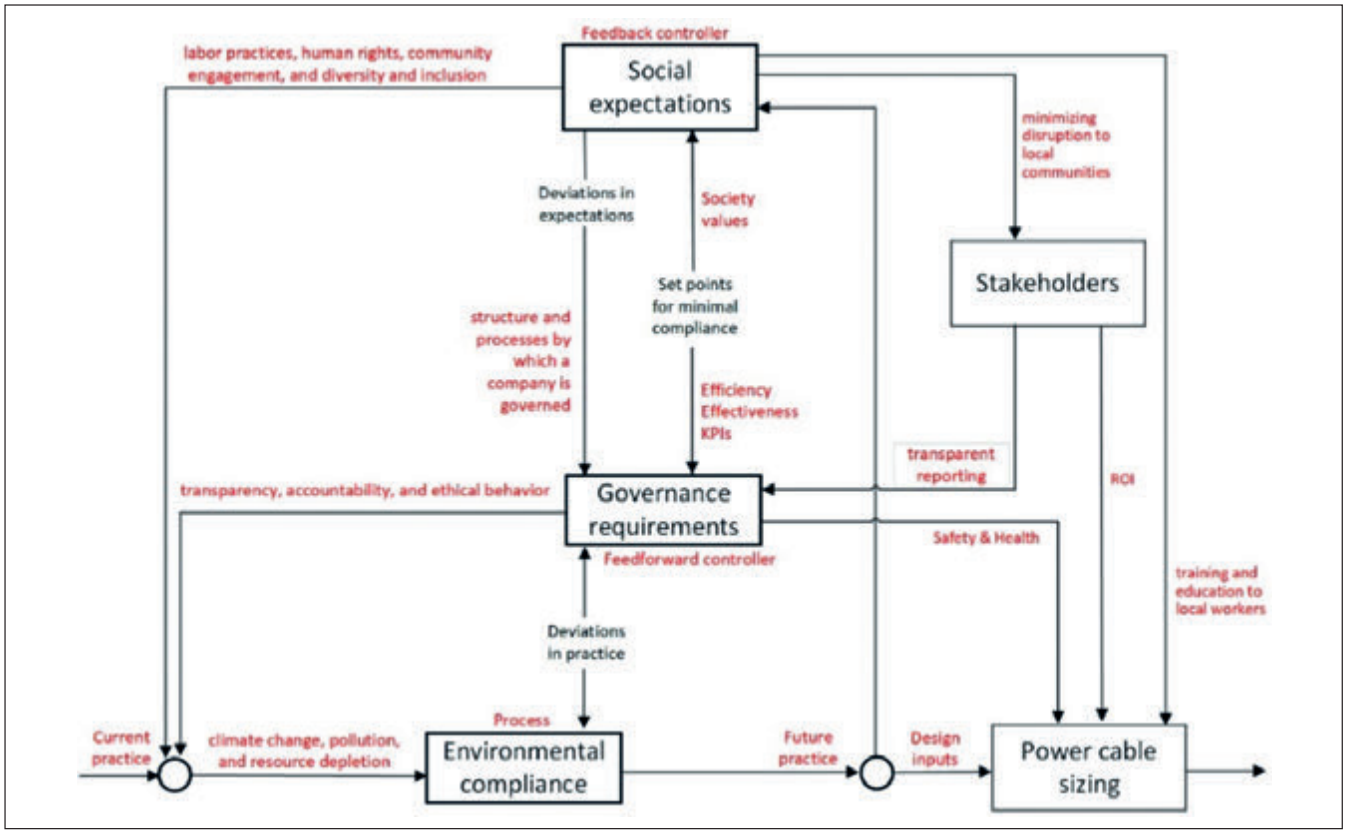

Figure 1: A Control Process Modelling of the ESG Dynamics for the Power Cable Sizing Activities

reduced thermal expansion, to ensure the cables can withstand high temperatures and reduce energy losses. All the stakeholders stated previously must internalise, implement and monitor the following in a multitude of ways to holistically achieve their ESG objectives:

1. **Energy Efficiency:** One of the most important environmental considerations is energy efficiency. Choosing the right sized cable will help minimise energy losses during transmission, which in turn will reduce the amount of power generation required to meet the client's needs.
2. **Material Selection:** It is essential to select materials which have minimal environmental impact, including those sourced sustainably and which can be recycled or reused. Material selection is important because different materials have different properties and characteristics which can affect the performance, durability and cost-effectiveness of the product.
3. **Life-cycle Assessment (LCA):** When conducting an environmental LCA on power cables, manufacturers and other industry players will identify opportunities to reduce the environmental impact of their products. This can help guide decisions related to raw material sourcing, manufacturing processes and end-of-life management which will lead to more sustainable practices and products.
4. **Compliance with Environmental Regulations:** Manufacturers must ensure that their power cables comply with environmental regulations. This will cover a range of issues, including air and water pollution, hazardous wastes and the conservation of natural resources.
5. **Environmental Impact Assessments (EIAs):** EIAs are usually required by law and their purpose is to provide decision-makers with the information they need to make informed choices about whether to approve or reject a project. This can be considered as part of the project risk management that is being increasingly demanded by investors.
6. **Sustainability Standards:** Sustainability standards help ensure cables meet certain environmental criteria, such as reducing energy consumption, minimising environmental impact and are made of re-cyclable materials.
7. **Sustainable Infrastructure Development:** Sustainable infrastructure development is essential for promoting long-term economic growth, protecting the environment and enhancing social well-being. By incorporating sustainability principles into infrastructure development, governments can build infrastructure that meets their requirements while ensuring a sustainable future for future generations at the same time.
8. **Recycling Programmes:** The public can participate in recycling programmes for power cables which will help reduce waste generation and promote the reuse of materials. This can help reduce the need for raw material extraction and promote a circular economy.


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Social Considerations

Social considerations in power cable sizing are primarily concerned with ensuring that the cable selection process takes into account the social impact on workers, local communities and other stakeholders. For instance, selecting cables made from materials associated with human rights violations, such as conflict minerals, can have negative social impacts. Additionally, using cables manufactured in countries with poor labour standards or exploitative working conditions can also harm workers and contribute to social injustice. To support ESG, companies can work with local communities to ensure that cable installation and maintenance activities are conducted in a socially responsible manner, such as hiring of local labour, minimising disruption to local communities and providing training and education to local workers. Stakeholders' contribution includes:

1. **Client:** Clients also have a social obligation to consider the impact their power cable installations have on the health and safety of the people who live or work in the vicinity. For example, they may need to take measures to mitigate electromagnetic fields (EMFs) generated by high-voltage cables as these have been linked to health concerns such as cancer and neurological disorders.
2. **Consultant:** Consultants sizing power cables have a social obligation to provide their clients with expert advice and guidance which are safe, efficient and socially responsible. This includes ensuring that the power cables recommended are compliant with applicable regulations and industry standards. The cables should be designed and installed in a way that minimises the impact on the environment and surrounding communities, i.e. to be sustainable as much as possible.
3. **Contractor:** Contractors should provide adequate training and supervision to their employees to ensure they have the necessary skills and knowledge to perform their work safely and efficiently. This training could include adhering to applicable regulations and industry standards, using re-cyclable materials and using field practices that minimise the environmental impact of their work.
4. **Vendor/Supplier:** By sourcing from nearby or local suppliers, the vendor/supplier can help reduce the carbon footprint of their operations. Shipping products over long distances requires transportation which contributes to greenhouse gas emissions. Additionally, by sourcing power cables from nearby suppliers, vendors can support local businesses which will help stimulate the local economy.
5. **Manufacturers:** Power cable manufacturers have a social obligation to provide transparent and accurate information about the performance and characteristics of their products, including electrical conductivity, temperature resistance and the environmental impact.
6. **Government:** The government has a significant social obligation to develop and enforce regulations and standards which promote public interest, encourage sustainability and have socially responsible practices throughout the power cable (and associated) industries.
7. **Public:** The public can assist the power cable industry by promoting sustainable and socially responsible practices, advocating for public health and a clean environment as well as supporting policies/practices which align with overall public concerns.

Governance Considerations

Governance considerations involve selecting cables from suppliers that demonstrate strong governance practices and adherence to ethical business principles. Additionally, selecting cables from suppliers which have a robust quality assurance system will ensure that the cables meet the required safety standards and have a low failure rate. To incorporate governance

considerations into power cable sizing, companies can opt for cables from suppliers which are certified to comply with ISO 9001 (quality management), ISO 14001 (environmental management) and other relevant international standards.

The contributions from the various stakeholders are as follows:

1. **Client:** This includes ensuring that power cable sizing and installation practices are consistent with an organisation's values and ethical principles and that they align with the broader social and environmental responsibilities. Incorporating ESG KPIs into tenders can help clients meet stakeholder expectations, mitigate risks, drive innovation and improve performances. This facilitates a smart business strategy for companies that are committed to sustainability and responsible business practices.
2. **Consultant:** Consultants can contribute in the ESG context by setting ESG goals and targets, integrating ESG considerations into project design, developing ESG metrics monitoring mechanisms as well as evaluating and reporting on ESG performances. This way, consultants can help clients meet their ESG goals and improve on their overall corporate sustainability performances.
3. **Contractor:** Contractors should include establishing clear policies and procedures for power cable installation and ensuring that these are communicated effectively to all relevant project/site stakeholders. An ESG contractor may also provide expertise and guidance to clients on ESG issues, regulations and standards. They could advise clients on how to integrate ESG considerations into their overall project management activities and deliverables.
4. **Vendor/Supplier:** Vendors and suppliers can do this by complying with applicable regulations and industry standards, providing clear and accurate information to their clients, maintaining quality control processes and collaborating with others in the industry. Vendors may also conduct research and analysis on ESG issues as well as provide clients with insights on emerging trends, risks and regulatory requirements.
5. **Manufacturer:** Power cable manufacturers can play a key role in the development of industry standards for the design, production and testing of power cables. By participating in industry organisations and working groups, manufacturers can help shape the standards that govern their industry and ensure that these are both effective and practical. This can include developing eco-friendly products, reducing energy and resource use as well as adopting new production techniques. The very process of doing so should be part of a company's ever-changing operational philosophy documentation.
6. **Government:** The government can promote good governance practices by implementing regulations and policies which promote transparency, accountability and ethical behaviour. This collaboration could include policy, regulatory and standards on design related processes of power cable sizing and installation. Additionally, it can also include measures such as anti-corruption laws, public disclosure requirements and stakeholder engagement. Providing tax relief and incentives to proven ESG-based products will go a long way in promoting ESG effectively and efficiently in Malaysia.
7. **Public:** Public governance demands towards the power cable industry also includes transparency and accountability. Companies must be transparent about their operations and supply chains as well as be accountable for any negative impact that they may have. This includes reporting on environmental and social impacts as well as engaging with stakeholders to address concerns. An ESG rating system will allow for informed consumer decision-making. An example would be the Malaysian energy rating system for electrical equipment which is being currently practised.

Ensuring ESG Implementations

Incorporating ESG considerations into power cable sizing activities is essential to ensure that the selected cables are sustainable, socially responsible and governed ethically. So far, all that have been said, have been qualitative. However, these qualitative ambitions require a quantitative approach to ensure traceability, monitoring and compliance levels. The followings KPIs are being evaluated along the lines of ESG for the appropriateness of the power cable sizing approaches, methodology and calculations:

1. Power loss KPI to track power loss and to ensure that the selected cable is appropriately sized for the electrical load.
2. Material cost KPI to track material costs and to ensure that the selected cable is cost-effective, reducing overall project costs.
3. Environmental impact KPI to track the environmental impact of the selected cable, ensuring that it is made from environmentally friendly materials and has minimal environmental impact.
4. Social impact KPI to track the social impact of the selected cable, ensuring that it is made from conflict-free materials, manufactured in socially responsible factories, and installed and maintained in a socially responsible manner.
5. Governance compliance KPI to track the compliance of the selected cable supplier with international standards, ensuring that they adhere to ethical business practices.

All these considerations are being included in the power cable design/sizing methodology that is being carried out currently with associated stakeholders, the objective being that the ESG considerations are implemented as part of quality assurance at the design stages rather than as a quality control activity, post decisions. ■

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What Engineering Leaders are Saying about ESG

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Tan Sri Dato' Ir. Prof. Emeritus Dr Chuah Hean Teik
UTAR Council Member and Member of Civil Aviation Authority, Malaysia. He was past President of UTAR, IEM and the Federation of Engineering Institutions of Asia & the Pacific.

As the world grapples with pressing environmental, social and governance (ESG) challenges, engineering leaders have emerged as pivotal figures in driving sustainable change. ESG factors have moved beyond being mere buzzwords to become integral considerations for businesses across industries. In this article, the Chairman of Consulting Engineering Special Interest Group (CESIG), Ir. Prof. Dr Tan Chee Fai, explores what engineering leaders are saying about ESG and how they are incorporating these principles into their organisations. Through their insights and experiences, we aim to shed light on the transformative power of ESG in shaping engineering practices and building a more sustainable future.

Ir. Sundraraj A. Krishnasamy
President, Association of Consulting Engineer Malaysia (ACEM)

What does ESG mean to you and why do you think it's important for consulting engineers to consider ESG issues?

ESG encompasses a holistic ecosystem framework that affects both micro and macro levels for various stakeholders. Categories are in place to provide guidelines for us to determine the areas of focus. These diligent measures to safeguard the environment and well-being of the people (employees and local community), continue to comply with industry standards and adhere to best practices to drive growth and productivity of the nation.

For example, environmental criteria look into areas such as carbon emission, energy consumption and waste management. Social criteria look into measurements which impact local communities in the area, such as safety, health and education. Governance focuses on areas such as transparency, structure and systems. All these factors are tools or guidance as a means for us, as a collective unit, to optimise finite resources without risking overindulgence that compromises the needs of future generations.

As consultants, we provide expertise to create viable, cost-effective projects which are environment-friendly, socially responsible and assist corporations to achieve good governance practices.

For instance, we can promote innovation through design and implementing infrastructure either by introducing new concepts or advising our client on energy efficient elements of the projects. We also believe it is pertinent for our stakeholders such as our clients and contractors to have good governance practices for proper implementation of all projects.

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Dato' Abdul Latif bin Haji Abu Seman
Director General, Malaysia Productivity Corporation (MPC)

What strategies do you use to ensure that a company's productivity goals align with its ESG priorities and values?

To ensure that a company's productivity goals align with its ESG priorities and values, several strategies can be employed. Here are some strategies that can be used:

1. Establish clear ESG priorities. The first step is to establish clear ESG priorities that align with the company's values and long-term goals. This can be done by conducting a materiality assessment to identify ESG issues that are most relevant to the company's operations and stakeholders.
2. Set measurable targets. Once the ESG priorities have been established, the company should set measurable targets for improving its performance on those issues. These targets should be specific, time-bound and aligned with the company's overall strategy.
3. Integrate ESG into decision-making. ESG considerations should be integrated into the company's decision-making processes, including its investment decisions, supply chain management and product development. This will ensure the company's productivity goals are aligned with its ESG priorities and values.
4. Monitor and report progress. The company should monitor and report on its progress towards achieving its ESG targets. This will enable the company to identify areas where it needs to improve and demonstrate its commitment to balancing productivity with ESG considerations.
5. Engage stakeholders. Finally, the company should engage with its stakeholders, including employees, customers, investors and local communities, to understand their expectations and incorporate their feedback into its ESG priorities and targets. This will help the company align its productivity goals with its ESG priorities and values, while also building trust and goodwill with its stakeholders.

Overall, by establishing clear ESG priorities, setting measurable targets, integrating ESG into decision-making, monitoring and reporting progress and engaging with stakeholders, companies can ensure their productivity goals align with their ESG priorities and values. This will enable them to improve their competitiveness, reduce risks and contribute to a more sustainable future.

Ir. Chin Lee Tuck
Vice President (Engineering Division), Persatuan Ukur, Jurutera & Arkitek (PUJA)

How do you see the role of a Bruneian authority in ensuring environmental sustainability in projects?

The authority is very active in its role to ensure environmental sustainability for the entire country. The Department of Environment, Parks & Recreation, under the Ministry of Development, is in charge of environmental aspects and aspires to sustain a good environment to enhance quality living and the country economic competitiveness with vision for Brunei Darussalam as an Environmentally Sustainable Nation and with a mission to protect and conserve the environment to ensure it remains clean, green and safe.

It was established in 1993 as the Environment Unit under the Ministry of Development to serve as secretariat to the National Committee on the Environment to coordinate matters relating to the environment.

On 1 May 2002, the Prime Minister's Office announced that His Majesty, the Sultan and Yang Di-Pertuan Brunei Darussalam, had consented to the formation of the Department of Environment, Parks & Recreation under the Ministry of Development which will be responsible for landscape and maintenance of recreational areas in the country.

Currently, the department handles matters pertaining to waste management, environmental conservation and management, management of landscape and recreational areas and environmental cooperation at national, bilateral and international level.

Ir. Yau Chau Fong
Head Commissioner, ASEAN Engineering Register

What does ESG mean to you and why do you think it's important for ASEAN engineers to consider ESG issues?

ESG has been much talked about in the last few years since the launch of the United Nation's 17 Sustainable Goals (SDGs) in 2015 as well as the annual UN Climate Change Conference – Conference of the Parties (COP). ESG will definitely be a part of the engineering field now and in the future. It will definitely be impacting the way the engineering fraternity contributes, directly or indirectly. ESG will not only be a point to be discussed by engineers but also for engineers to contribute to society as a whole. For example, in the Environmental element, engineers will play a pivotal role in ensuring and protecting the environment through engineering contributions and knowledge. The same goes for the Social & Governance element. It is important that ASEAN engineers be involved in ESG and it is hoped that they will be well versed and knowledgeable in this global agenda.

Dato' Ir. Prof. Dr Ewe Hong Tat
President, ASEAN Academy of Engineering & Technology (AAET)

What role should organisations like AAET play in addressing global ESG challenges such as climate change, social justice and economic inequality? How can engineers and technologists use their expertise and resources to make a positive impact in these areas?

AAET Fellows comprise engineering and technological experts from ASEAN countries. Many of them are active in the technology frontlines such as Artificial Intelligence

(AI), digital economy, electronic systems, mechatronic engineering, chemical process, civil construction, biotechnology and renewable energy, which are the core technologies for the sustainable development of ASEAN region under Industry 4.0 transformation. AAET can be an effective platform for recommending ESG solutions across ASEAN countries which are customised for various scenarios according to development levels, socio-economic conditions, technological adaptation capabilities and management cultures.

Engineers and technologists are problem-solving oriented. By working closely with experts from various disciplines, policy makers and industrialists, they contribute significantly to poverty eradication, improvement of living environment, sustainable resource management, biodiversity conservation and value creation activities in little developed and rural areas.

Tan Sri Dato' Ir. Prof. Emeritus Dr Chuah Hean Teik
Chairman, Standing Committee on Engineering Education, Federation of Engineering Institutions of Asia & Pacific (FEIAP)

What roles do FEIAP Engineering Education Guidelines play in promoting sustainable development and addressing ESG concerns?

FEIAP Engineering Education Guidelines for engineers (first approved in December 2010 and updated in July 2018), engineering technologists (approved in July 2018) and engineering technicians (approved in July 2018) contain an accreditation system model framework for engineers, technologists and technicians. These spell out the accreditation criteria based on an Outcome-based Education approach. The aim is to provide sufficient benchmarks for FEIAP member economies so that substantial equivalence can be achieved across various member economies for mutual recognition and mobility of the engineering workforce. For example, engineering degree programmes accredited by accreditation bodies which are reviewed by FEIAP to be of substantial equivalence, will be deemed to have fulfilled the basic academic requirements for registration as APEC engineers.

In the Education Guidelines, which are patterned after the relevant education accords in International Engineering Alliance IEA, there are certain references to engineering knowledge profiles and graduate attributes. Graduates are expected to be trained with high ethics and professionalism and with the ability to provide safe and cost-effective engineering solutions which are environmentally friendly and sustainable, as well as take into consideration the interests of all stakeholders. In this sense, ESG has been incorporated in the balanced curriculum for engineering education.

In my opinion, ESG should be inculcated in students in all courses rather than in a single subject. All students should be expected to be aware of and naturally practise ESG in whatever they do.

Prof. Gong Ke
Immediate Past President, World Federation of Engineering Organisations (WFEO)

What role should WFEO play to address global ESG challenges such as climate change, social justice and economic inequality? How can engineering organisations use their expertise and resources to make a positive impact in these areas?

Organisations such as WFEO should function as organiser, participant, promoter and problem solver in addressing global ESG challenges. WFEO is an internationally-recognised and chosen leader of the engineering profession, which not only enables it to exert a huge influence worldwide but also requires it to shoulder greater responsibilities in uniting the engineering community and moving towards a more sustainable future.

WFEO led the proposal to declare 4 March as World Engineering Day for Sustainable Development. The resolution was adopted at the 40th General Conference of UNESCO in November 2019, which greatly increased people's awareness of the crucial role of engineers and engineering in promoting sustainable development and encouraged engineering innovations in addressing ESG issues. WFEO also leads global engineering education reform and engineering capacity building. In recent years, WFEO and the International Engineering Alliance, with the support of UNESCO, have jointly worked on the updating of the Graduates Attributes & Professional Competencies (GAPC) Framework. Both parties organised teams to carry out the detailed work of the project started in July 2018 and communicated with engineering partners worldwide. After discussions and research, the revised GAPC Framework was approved on 21 June 2021 and offers guidance on the implementation of international mutual recognition agreements on engineering education, such as the Washington Accord, Sydney Accord and Dublin Accord.

WFEO has actively partnered UNESCO in developing recommendations on AI ethics. In 2020, the WFEO Committee on Engineering for Innovative Technologies (CEIT), hosted by China, drafted and advocated the principles of Big Data and AI applications in engineering, to guide and enhance governance capabilities in the international engineering field. WFEO actively fulfills its responsibilities and has issued important documents, such as WFEO Engineering 2030 Plan, WFEO Statement on Inclusive Engineering for all, WFEO Statement for 2020 International Women in Engineering Day, WFEO position to the build-back-better call for arms, WFEO Declaration on Climate Emergency 2019, Declaration on Global Engineering Education Standards and Capacity Building for Sustainable Development 2019, The Paris Declaration: Advancing the UN Sustainable Development Goals through Engineering, which have made a great difference.

WFEO is serious about promoting women in engineering. It encourages girls to choose engineering as a career and makes every effort to raise awareness of the significance of gender balance in the profession. With donations from GREE Electrics and the support of UNESCO, WFEO set the Award for Women in Engineering to build a role model for women engineers and to show contributions made by women engineers to the global sustainable development.

In building engineering capacity to address global ESG challenges, engineering organisations should act as promoters, especially in Africa and Small Island Developing States (SIDS). Since 2014, WFEO and UNESCO have jointly organised the African Engineering Week every year, focusing on engineering and sustainable development in Africa. WFEO works with its member organisations to hold activities including the Conference on Engineering & Food Security in Africa, African Women Engineers Forum (AWEF) and engineering capacity building in Africa. WFEO is committed to capacity building efforts in engineering in SIDS through its national members from Fiji, Mauritius and the Caribbean among others, calling for resilient infrastructure in SIDS for sustainable development and to withstand natural disasters which are increasing as a result of climate change.

Confronted with global ESG challenges such as climate change, social justice and economic inequality, engineering organisations should also be problem solvers. For instance, WFEO national members, committees and working groups provide collective and professional engineering wisdom to address global challenges. Its committees and working groups constantly hold activities to promote sustainable development, including webinars on Energy Transition and Covid-19 Crisis: The Role Of Engineers, Engineering in Poverty Alleviation, Side events and statements on COP23/24/25/26/27, and so on. WFEO also works with UNESCO to organise side events: Role of Women in STEM in Addressing Climate Change, as part of the discussions at the UN Women Commission on the Status of Women (CSW66) in March 2022, and Utilising Open Science Principles for Quality Engineering Education to advance the UN Sustainable Development Goals during the UN High-level Political Forum on Sustainable Development (HLPF) on 6 July 2022. ■

ANNOUNCEMENT

NEWLY-ELECTED IEM BRANCH OFFICE BEARERS

IEM PERAK BRANCH SESSION 2023/2024

We are pleased to inform you that the 39th Annual General Meeting of The Institution of Engineers, Malaysia, Perak Branch was held at IEM Perak, 60B, Jalan Lapangan Siber 1, Bandar Cyber, 31350 Ipoh, Perak on Saturday, 11th March 2023. The new elected office bearers for the key positions in the IEM, Perak Branch for session 2023/2024 comprise of:

Chairman	Ir. Assoc. Prof. Dr Nursyarizal bin Mohd Nor
Vice Chairman 1	Ir. Tiah Oon Han
Vice Chairman 2	Ir. Mohd Nasharuddin bin Hashim
Hon. Secretary	Ir. Prof. Dr Ts. Leong Kah Hon
Hon. Treasurer	Ir. Ts. Darren Chin Woon Kheong
Committee Members	Ir. Dr Chan Seong Phun Ir. Bryan Ng Horng Heng Ir. Suhaini bin Ahmad Ir. Toh Leong Soon Ir. Dr Patrick Sebastian
Advisor	Ir. Lau Win Sang
Internal Auditor	Ir. Dr Irraivan Elamvazuthi Ir. Surain a/l Kanaparan
Immediate Post Chairman	Dato' Sri' Ir. Dr Liew Mun Hon

IEM MELAKA BRANCH SESSION 2023/2024

We are pleased to inform you that the 36th Annual General Meeting of The Institution of Engineers, Malaysia, Melaka Branch was held at the Swan Garden Hotel on Saturday, 18th March 2023. The new elected office bearers for the key positions in the IEM, Melaka Branch for session 2023/2024 comprise of:

Chairman	Ir. Ong Yee Pinn
Vice Chairman 1	Ir. Lim Su Hian
Vice Chairman 2	Ir. Lam Choon Kay
Hon. Secretary	Ir. Ho Choon Kwang, William
Hon. Treasurer	Ir. Sures Kumar a/l Ganesan
Committee Members	Ir. Ronnie Neo Hai Fun Ir. Harmidi bin Ali Ir. Sh. Jaafar bin Sh. Ismail Ir. Lam Ah Hang
Advisor	Ir. Ooi Kah Huat
Auditor	Datuk Ir. Mohamed Salleh bin Yunos Ir. Vellan V. Perumal
Immediate Post Chairman	Ir. Prof. Dr Puvanasvaran a/l A. Perumal

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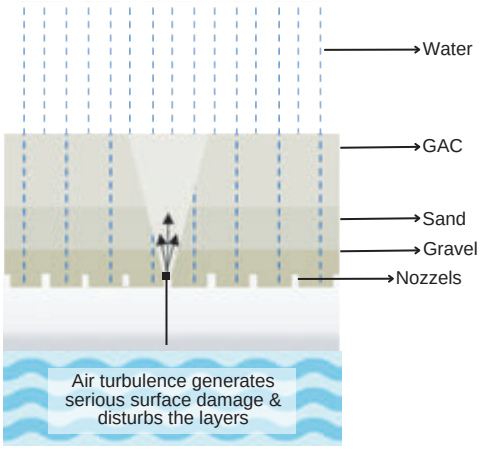
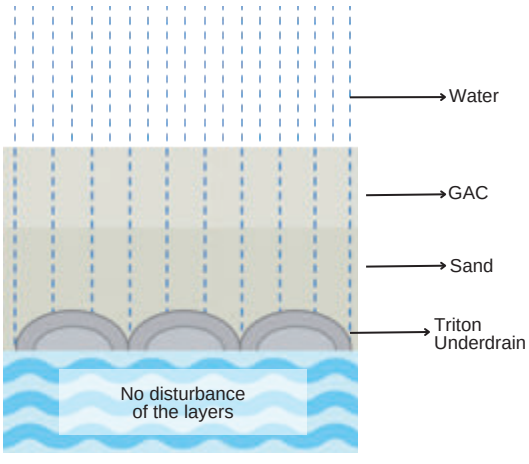
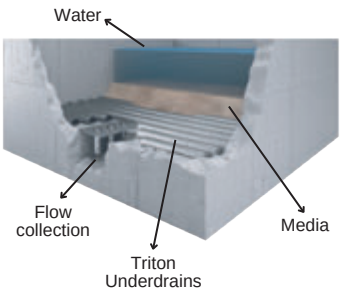
Comparison between Conventional System and Triton Underdrain System



Example of Conventional System



Example of Triton Underdrain System



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Convergence of Digital Transformation & Environmental, Social & Governance for Malaysia Engineering Enterprises

Written and Prepared by:

Ir. Prof. Dr Tan Chee Fai

Dato' Prof. Dr Noor Inayah Ya'akub

Ir. Associate Prof. Dr David Chuah Joon Huang

Mr. Vincent Oh Kok Loon

Engineering digital transformation refers to the integration of digital technologies and processes into engineering practices to optimise and enhance engineering processes and outcomes. This involves the use of technologies such as Artificial Intelligence (AI), Internet of Things (IoT), automation, robotics and data analytics to improve design, development, manufacturing, testing and maintenance of engineering products and systems.

Engineering digital transformation can bring about significant benefits such as increased efficiency, reduced costs, improved quality and "faster time to market". It can also enable engineers to collaborate more effectively across teams and geographies, facilitates remote work and improves the customer experience.

Environmental, Social & Governance (ESG) refers to a set of criteria that investors and companies use to evaluate the sustainability and ethical impact of a company's operations and practices.

Environmental criteria focus on a company's impact on the natural environment, including factors such as carbon emission, water usage, waste management and overall approach to sustainability.

Social criteria consider a company's impact on society, including its relationships with employees, customers, suppliers and the wider community. This may include factors such as labour practices, human rights, diversity and inclusion as well as community involvement.

Governance criteria refer to a company's internal management and control structures. This includes factors such as executive compensation, board diversity and independence, shareholder rights and overall corporate governance.

The concept of ESG has its roots in socially responsible investing (SRI), which emerged in the 1960s as a way for investors to express their values and beliefs through their investment decisions. The first SRI funds were established in the United States in the 1970s, with a focus on avoiding investments in companies involved in controversial activities such as tobacco and weapons as well as apartheid South Africa.

In the 1990s, the concept of ESG began to take shape as investors and companies began to focus on the broader issues of sustainability and social responsibility. In 2004, the United Nations launched the Principles for Responsible Investment (PRI), a set of guidelines for institutional investors to incorporate ESG factors into their investment decision-making.

Since then, the importance of ESG criteria has continued to grow, with increasing recognition for the need to address issues related to climate change, social justice and ethical business practices. In recent years, there has been a surge in demand for ESG investment products as investors seek to align their investments with their values and beliefs.

Today, ESG has become a mainstream consideration for investors and companies alike, with many investors and asset managers incorporating ESG criteria into their investment strategies and many companies adopting ESG reporting frameworks to demonstrate their commitment to sustainability and social responsibility.

Engineering digital transformation and ESG are interconnected and can have a significant impact on each other. Engineering digital transformation involves leveraging digital technologies to transform traditional engineering practices, including design, manufacturing and maintenance. This transformation can result in increased efficiency, reduced costs and improved sustainability, among other benefits. ESG, on the other hand, refers to a set of criteria which investors use to evaluate a company's environmental, social and governance performance. Companies that

perform well on ESG criteria are generally considered more sustainable and responsible.

ESG consultants with expertise in digital transformation can help companies identify opportunities to leverage digital technologies to improve their ESG performance. They can help companies implement digital solutions that reduce energy consumption, increase resource efficiency and minimise waste.

They can also help companies use digital technologies to improve social responsibility by enhancing supply chain transparency, improving labour practices and enhancing stakeholder engagement. In addition, consultants can assist companies adopt digital tools to improve corporate governance by increasing transparency, accountability and data security.

Consultants in this area can help companies identify the most effective digital solutions for their specific ESG goals and priorities. They can conduct assessments of existing technologies and processes, evaluate potential digital solutions, and provide guidance on implementation and adoption.

There are several ways in which engineering digital transformation can contribute to ESG performance, including:

1. **Environmental:** Digital technologies can help companies reduce their environmental impact by optimising energy consumption, reducing waste and improving the sustainability of their products and services.
2. **Social:** Engineering digital transformation can improve working conditions and safety in manufacturing plants, reduce labour costs and enable more flexible and remote work arrangements.
3. **Governance:** Digital technologies can enhance transparency and accountability in corporate governance by providing real-time data and analytics to stakeholders.
4. **Product Innovation:** Digital technologies can help companies design and develop more sustainable products by enabling simulations and digital prototyping, reducing the need for physical prototypes and minimising waste.
5. **Supply Chain Management:** Digital technologies can improve supply chain transparency, enabling companies to monitor the ESG performance of their suppliers and to identify areas for improvement.
6. **Customer Engagement:** Digital technologies can help companies engage with customers on ESG issues, for example, by providing product sustainability information or facilitating recycling and waste reduction initiatives.
7. **Risk Management:** Digital technologies can help companies identify and mitigate ESG-related risks, such as supply chain disruptions or regulatory compliance issues.
8. **Reporting & Disclosure:** Digital technologies can help companies track and report on their ESG performance more accurately and efficiently, providing stakeholders with greater transparency and accountability.
9. **Renewable Energy:** Engineering digital transformation can help companies develop and deploy renewable energy technologies such as solar panels or wind turbines, to reduce their carbon footprint and reliance on non-renewable energy sources.
10. **Circular Economy:** Digital technologies can enable companies implement circular economy practices such as closed-loop supply chains or product take-back programmes which can help reduce waste and promote resource efficiency.
11. **Carbon Management:** Digital technologies can help companies measure and manage their carbon emissions, including tracking emissions throughout their supply chains and identifying opportunities for emissions reductions.

12. **Employee Engagement:** Digital technologies can help companies engage their employees on ESG issues, for example, by providing training and education on sustainability or facilitating employee-led sustainability initiatives.
13. **Water Management:** Digital technologies can help companies manage water use and reduce their water footprint, for example, by optimising water use in manufacturing processes or implementing water-saving technologies.
14. **Health & Safety:** Engineering digital transformation can improve health and safety outcomes for employees and communities by enabling better monitoring and control of workplace hazards, for example, by using sensors to detect and respond to dangerous conditions.
15. **Community Engagement:** Digital technologies can help companies engage with and support local communities, for example, by providing access to education and training opportunities or supporting local economic development initiatives.
16. **Ethical Sourcing:** Digital technologies can enable companies to track and trace the origin of raw materials and ensure that they are ethically sourced, for example, by using blockchain technology to create a transparent and auditable supply chain.
17. **Resource Efficiency:** Digital technologies can help companies optimise the use of resources, such as energy, water and raw materials, by enabling more efficient processes and reducing waste.
18. **Climate Adaptation:** Engineering digital transformation can help companies adapt to the impacts of climate change, such as extreme weather events or sea-level rise, by enabling better monitoring and response to these risks.
19. **Diversity & Inclusion:** Digital technologies can help companies promote diversity and inclusion by removing biases in hiring and decision-making processes, for example, by using algorithms to screen job candidates.
20. **Human Rights:** Digital technologies can help companies ensure that their operations and supply chains respect human rights, for example, by monitoring labour conditions in factories or identifying and addressing instances of forced labour.
21. **Stakeholder Engagement:** Digital technologies can help companies engage with their stakeholders, including investors, customers and communities, on ESG issues, for example, by providing platforms for feedback and collaboration.
22. **Data Analytics:** Engineering digital transformation can help companies analyse and interpret ESG data, enabling better decision-making and more effective management of sustainability and responsibility risks.
23. **Governance:** Digital technologies can help companies improve their governance structures and processes, for example, by enabling more transparent and accountable reporting on ESG issues or facilitating shareholder engagement.
24. **Innovation:** Digital technologies can drive innovation in sustainable products and services, enabling companies to create new business models and capture value from emerging ESG trends.

Engineering digital transformation can play a vital role in supporting a company's ESG goals by enabling sustainable, responsible and efficient operations. As companies increasingly focus on ESG performance, digital transformation will likely become even more important as a means of achieving these goals. In addition, engineering digital transformation and ESG are closely intertwined, with digital technologies playing an increasingly important role in enabling companies to meet their sustainability and responsibility goals. The convergence of digital

transformation and ESG can also lead to the development of innovative solutions that address societal challenges such as climate change, social inequality and resource scarcity. Malaysian engineering firms can collaborate with other stakeholders such as governments, communities and NGOs to co-create and implement sustainable solutions which benefit society and the environment. The role of a consultant in engineering digital transformation and ESG is to help companies harness the power of digital technologies to improve their ESG performance, enhance their reputation and meet the growing demand for sustainable and socially responsible business practices. As companies continue to focus on ESG performance, we can expect to see further innovations and advancements in digital transformation to support these efforts. ■

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Introduction to Mechanical Design in Building Services

Written and Prepared by:

Encik Muhd Ashiq Marecan bin Hamid Marecan, *Grad. IEM*

The Consulting Engineering Special Interest Group (CESIG) of The Institution of Engineers, Malaysia (IEM) organised a one-day virtual workshop titled Introduction to Mechanical Design in Building Services on 26 November 2022 which attracted more than 60 participants.

It was conducted by Ir. Ts. Mohd Kamal Haziq, a Professional Engineer with Practising Certificate (PEPC) in the Mechanical & Electrical (M&E) consulting field. He has vast experience and knowledge in the design of M&E services with core focus on mechanical discipline for various types of projects including high rise buildings, hospitals, mixed commercial developments, apartment blocks, factories and other such facilities.

The aim of the workshop was to provide in-depth coverage of topics directly related to mechanical design theory, with more exposure on practical experience sharing by the speaker to show the differences in application based on site conditions and owner's preferences, the regulatory provisions that such designs must comply with, practical implementation guidelines in the design and construction of such projects and good engineering practice in accordance with Malaysian Standards to benefit participating electrical and mechanical engineers, contractors, consultants, project managers, facility managers etc. who wish to enhance their professional experience and competence.

The 6 workshop topics were:

- Introduction to the scope of Mechanical Building Services
- Regulations, Standards & Codes in force in Malaysia
- Cold Water and Sanitary Plumbing System
- Air Conditioning and Mechanical Ventilation (ACMV)
- Fire Protection Systems
- Lift and Escalator Systems

Participants were provided with a learning module and a certificate of attendance in digital format. This was in line with the new practice of going paperless during the pandemic period so as to reduce pollution of the environment. ■

Upcoming Activities

Technical Talk on Safety Culture: Nuclear Accidents, Safety Philosophies, and Engineered Reactions

Date	: 10 June 2023 (Saturday)
Time	: 10.00 a.m. - 12.00 p.m.
Venue	: Wisma IEM
Approved CPD	: 2
Speaker	: Dr Azrudi Mustapha

5-Day IEM Energy Manager Training Course (EMTC) - A Preparation Course for Registration as a Registered Electrical Energy Manager (REEM) with Suruhanjaya Tenaga

Date	: 12 - 16 June 2023 (Monday - Friday)
Time	: 8.30 a.m. - 5.30 p.m.
Venue	: Wisma IEM
Approved CPD	: 33
Speakers	: Ir. Francis Xavier Jacob : Ir. Assoc. Prof. Dr Gobbi Ramasamy : Ir. Luk Chau Beng : Ir. Gopal Narian Kutty : Ir. KT Lim : Ir. Chong Chew Fan : Ir. Al Khairi Mohd Daud : Ir. Tan Jin Kiong

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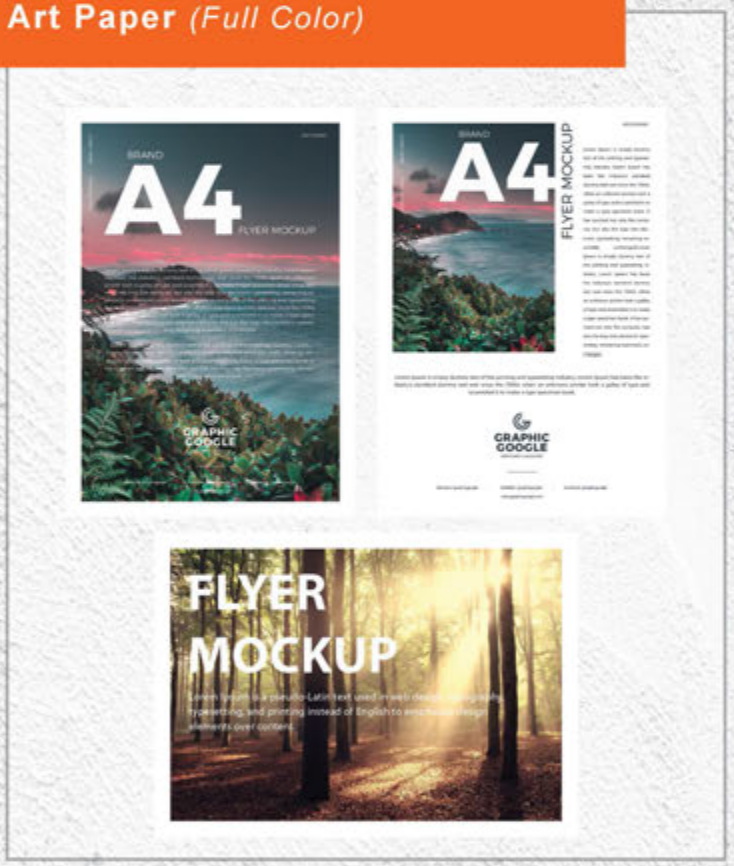

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Tarikh: 24 Mei 2023

Kepada Semua Ahli,

SENARAI CALON-CALON YANG LAYAK MENDUDUKI TEMUDUGA PROFESIONAL TAHUN 2023

Berikut adalah senarai calon yang layak untuk menduduki Temuduga Profesional bagi tahun 2023.

Mengikut Undang-Undang Kecil IEM, Seksyen 3.8, nama-nama seperti tersenarai berikut diterbitkan sebagai calon-calon yang layak untuk menjadi Ahli Institusi, dengan syarat bahawa mereka lulus Temuduga Profesional tahun 2023.

Sekiranya terdapat Ahli Korporat yang mempunyai bantahan terhadap mana-mana calon yang didapati tidak sesuai untuk menduduki Temuduga Profesional, surat bantahan boleh dikemukakan kepada Setiausaha Kehormat, IEM. Surat bantahan hendaklah dikemukakan sebulan dari tarikh penerbitan dikeluarkan.

Ir. Prof. Dr Zuhaina binti Zakaria
Setiausaha Kehormat, IEM

PERMOHONAN BARU

Nama	Kelayakan
KEJURUTERAAN AWAM	
MICHELLE JEAN MICHAEL	BE HONS (UMS) (CIVIL, 2016)
MOHD RIDHUAN BIN ABDULLAH DIN	BE HONS (UNITEN) (CIVIL, 2007)
NOOR MAZIANA BINTI MAZLAM	BE HONS (UTM) (CIVIL, 2018)
KEJURUTERAAN ELEKTRIKAL	
ISMAILY BIN MOHAMAT SULAIMAN	BE HONS (UTM) (ELECTRICAL, 2008)
KEJURUTERAAN ELEKTRONIK	
MOHD HARIS BIN MD AFANDI	BE HONS (UTM) (ELECTRICAL - INSTRUMENTATION & CONTROL, 2008)
KEJURUTERAAN PEMBUATAN	
TAN CHAN SIN	BE HONS (UniMAP) (MANUFACTURING, 2012) PhD (UniMAP) (2015)

PERMOHONAN MENJADI AHLI KORPORAT

Nama	Kelayakan
KEJURUTERAAN ELEKTRIKAL	
MOHD AZRI BIN AZMAN ROSLAN PETRA	BE HONS (UTHM) (ELECTRICAL, 2009)
MOKHZANI BIN ABDULLAH	BE HONS (UTM) (ELECTRICAL, 2015)
KEJURUTERAAN ELEKTRONIK	
HARITH DANIAL BIN SHAIK MOHD SHERIFF	BE HONS (UMS) (ELECTRONICS AND TELECOMMUNICATION, 2012)

PERPINDAHAN AHLI

No. Ahli	Nama	Kelayakan
KEJURUTERAAN ELEKTRIKAL		
116840	AKHMAL HAFIZ BIN ZOLKEPLE	BE HONS (QUEENSLAND) (ELECTRICAL, 2016)
48157	LAI LEE WEE	BE HONS (IUKL) (ELECTRONICS, 2012) CONVERSION (UNITEN) (2017)
116173	MOHD ZULFADLI BIN OTHMAN	BE HONS (UNITEN) (ELECTRICAL & ELECTRONICS, 2009)
KEJURUTERAAN ELEKTRONIK		
114372	SASHINDRAN A/L VILIAM	BE HONS (UTHM) (ELECTRICAL, 2010)
KEJURUTERAAN MEKANIKAL		
114765	FAUZI BIN ASLAN	BE HONS (WESTERN AUSTRALIA) (MECHANICAL, 2015)

PERPINDAHAN MENJADI AHLI KORPORAT

No. Ahli	Nama	Kelayakan
KEJURUTERAAN KIMIA		
85371	DEBORAH ANNE A/P JOHN PHILIP	BE HONS (MANIPAL INTERNATIONAL UNIVERSITY) (CHEMICAL, 2016)
KEJURUTERAAN AWAM		
19324	LING NGEE LEH, FELIX	BE HONS (UTM) (CIVIL, 2001) ME (UTM) (CIVIL - GEOTECHNICS, 2004) PhD (UTM) (CIVIL, 2016)
51320	ROSTAM BIN OMAR	BE HONS (UTHM) (CIVIL, 2006)
30122	SHEIKH AHMAD FARHAN BIN KAMAL HAZARI	BE HONS (UNITEN) (CIVIL, 2011)
KEJURUTERAAN ELEKTRIKAL		
102254	NORADZIM BIN MANAN	BE HONS (USM) (ELECTRICAL, 2009)
KEJURUTERAAN ELEKTRONIK		
75391	VIVEGAN A/L NADARAJAI	BE HONS (MULTIMEDIA UNIVERSITY) (ELECTRONICS MAJORING IN TELECOMMUNICATION, 2005)
KEJURUTERAAN MEKANIKAL		
80271	WONG WEI HOE	BE HONS (UTAR) (MECHANICAL, 2017)

Upcoming Activities

Webinar Talk on "Green Financing for Environment, Social and Governance (ESG) Goals"

Date : 13 June 2023 (Tuesday)
Time : 10.00 a.m. – 12.00 p.m.
Venue : Digital Platform
Approved CPD : 2
Speaker : Dr Hari Ramalu Ragavan

Physical Two Day Course on "Plumbing - Professional Competency Examination (PCE) on the Syllabus of Hydraulics - Design Consideration"

Date : 14 - 15 June 2023 (Wednesday - Thursday)
Time : 9.00 a.m. – 6.00 p.m.
Venue : Wisma IEM
Approved CPD : 14
Speaker : Ir. Gary Lim Eng Hwa

12th Marine Engineering and Naval Architecture Technical Division AGM

Date : 17 June 2023 (Saturday)
Time : 9.00 a.m. – 11.00 a.m.
Venue : Digital Platform
Approved CPD : 2

Technical Talk on My Life in Safety - Lessons in Performance Improvement

Date : 17 June 2023 (Saturday)
Time : 9.00 a.m. – 11.00 a.m.
Venue : Wisma IEM
Approved CPD : 2
Speaker : Dr Krishna Bala

Webinar Talk on Controlling and Managing Sand Production from Oil and Gas Wells

Date : 17 June 2023 (Saturday)
Time : 9.00 a.m. – 11.00 a.m.
Venue : Digital Platform
Approved CPD : 2
Speaker : Pak Latief Riyanto

CONTINUATION FROM MAY ISSUE 2023

PERMOHONAN MENJADI AHLI SISWAZAH

No. Ahli	Nama	Kelayakan
KEJURUTERAAN MEKATRONIK		
116169	ABDUL HAFIZ BIN ABD HALIN	BE HONS (UTeM) (MECHATRONICS, 2012) MSc (UNIMAP)(MECHATRONINCS, 2020)
116175	TSOU CHIH NING	BSc (MINGCHI UNI. OF TECH.) (MECHANICAL, 2016) MSc (NATIONAL TAIWAN OCEAN UNI.)(MECHANICAL & MANUFACTURING, 2014)
KEJURUTERAAN PEMBUATAN		
116615	MUHAMED SAIFUL HAIRI BIN KHARUDDIN	BE HONS (UM)(MANUFACTURING, 2016)
116658	NUR SHERIL AINI LOKE BINTI IZWAN	BSC HONS (TEXAS A&M UNI.) (INDUSTRIAL, 2016)
KEJURUTERAAN PERLOMBONGAN		
116650	MUHAMMAD IRFAN BIN MOHD AZMI	BE HONS (USM)(MINERAL RESOURCES, 2017)
KEJURUTERAAN PETROLEUM		
116198	SITI NOOR SYUHAIDAH HAFIZAH	BE HONS (UNI. OF NEW SOUTH WALES)(PETROLEUM, 2020)
116229	YUHARAJAN BASKARAN	BE HONS (UTP)(PETROLEUM, 2020)
116144	AMIRUL HAKKIM BIN MOHD AZIZ	BSc (UNI. OF ALBERTA) (PETROLEUM, 2018)
KEJURUTERAAN TELEKOMUNIKASI		
116145	RAZLAN BIN ABDUL RAHIM	BE HONS (UM) (TELECOMMUNICATION, 2010)

PEMINDAHAN/PENUKARAN KEPADA AHLI "ENGINEERING TECHNOLOGIST GRADUATE MEMBER"

No. Ahli	Nama	Kelayakan
KEJURUTERAAN ELEKTRONIK		
43454	AZIM AKMAL BIN ABDUL WAHAB	B TECH HONS (UNIKL BMI) (ELECTRONICS, 2011)
KEJURUTERAAN MEKANIKAL		
114682	MOHD FUAD BIN ZAMRI	B AIRCRAFT ENGINEERING TECH HONS (UNIKL MIAT) (MECHANICAL, 2019)
KEJURUTERAAN MEKATRONIK		
87165	WAN ALEEMI BIN WAN ZAINI	B TECH HONS (UNIKL MFI) (MECHATRONICS, 2011)

PERMOHONAN MENJADI AHLI 'INCORPORATED'

No. Ahli	Nama	Kelayakan
KEJURUTERAAN AWAM		
116120	CHEONG KING YEE	BSc HONS (UNI. OF PLYMOUTH) (CIVIL & COASTAL, 2007)
116323	KANG LEN HWE	BSc HONS (NATIONAL CHENG KUNG UNI.)(CIVIL, 1978)
KEJURUTERAAN ELEKTRONIK		
116461	LLOYD DONOVAN VICTOR	BE HONS (UNI. OF EAST LONDON)(ELECTRICAL & ELECTRONIC, 2008)
KEJURUTERAAN ALAM SEKITAR		
116479	JONG MIN TZE	BE HONS (TSINGHUA UNI.) (ENVIRONMENTAL, 2013)

PERMOHONAN MENJADI AHLI 'AFFILIATE'

No. Ahli	Nama	Kelayakan
KEJURUTERAAN ARKITEK		
116459	MUHAMMAD AMIRRUDDIN SHAH BIN AHMAD NIZAM	BSc (UTHM)(ARCHITETURE, 2013)

PERMOHONAN MENJADI AHLI 'ASSOCIATE'

No. Ahli	Nama	Kelayakan
KEJURUTERAAN AWAM		
116119	PETDRAL CARLOS ANAK RINGIN	DIPLOMA (POLITEKNIK MUKAH) (CIVIL, 2019)
116460	JAGEN JEYARAMAN	DIPLOMA (PUO)(CIVIL, 2004)
KEJURUTERAAN ELEKTRIKAL		
116322	RHITISHWARAAN A/L THAYALAN	DIPL. TECH. HONS (UNIKL) (ELECTRICAL & ELECTRONICS (MARINE), 2017)

Note: *Continuation would be published in July 2023. For the list of approved "ADMISSION TO THE GRADE OF STUDENT", please refer to IEM web portal at http://www.myiem.org.my.*

Pengumuman yang ke-175

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Institusi mengucapkan terima kasih kepada semua yang telah memberikan sumbangan kepada tabung Bangunan Wisma IEM. Ahli-ahli IEM dan pembaca yang ingin memberikan sumbangan boleh berbuat demikian dengan memuat turun borang di laman web IEM http://www.myiem.org.my atau menghubungi secretariat di +603-7968 4001 / 5518 untuk maklumat lanjut. Senarai penyumbang untuk bulan April 2023 adalah seperti jadual di bawah:

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2	36347	MR. HIEW FONG POH
3	15583	Ir. LIM CHIAU WU
4	100762	MR. GANESAN A/L KADIRGAMA
5	06686	Ir. A. LETCHUMANAN S/O ALAGAPPAN

Upcoming Activities

Introduction on GPR for Structural Application

Date : 17 June 2023 (Saturday)
Time : 9.00 a.m. – 1.30 p.m.
Venue : Wisma IEM
Approved CPD : 4
Speaker : Dr Muhd Nurhasri Muhd. Sidek

The CIBD 2022 'Boon or Bane' Critically Compared, for the Engineers

Date : 15 June 2023 (Thursday)
Time : 5.00 p.m. – 7.00 p.m.
Venue : Digital Platform
Approved CPD : 2
Speaker : Ar. David Yek Tak Wai

2-Day Course on Advanced Strucutural Engineering with particular Reference to the Chartered Membership Examination of the Institution of strucutral Engineers, United Kingdom

Date : 21 - 22 June 2023 (Wednesday - Thursday)
Time : 8.00 a.m. – 5.00 p.m.
Venue : Wisma IEM
Approved CPD : 13
Speaker : Mr. Rajavel Inbarajan

Technical Visit to SDG Centre

Date : 21 June 2023 (Wednesday)
Time : 10.00 a.m. – 12.30 p.m.
Venue : SDG Centre Kuala Lumpur
Approved CPD : 2

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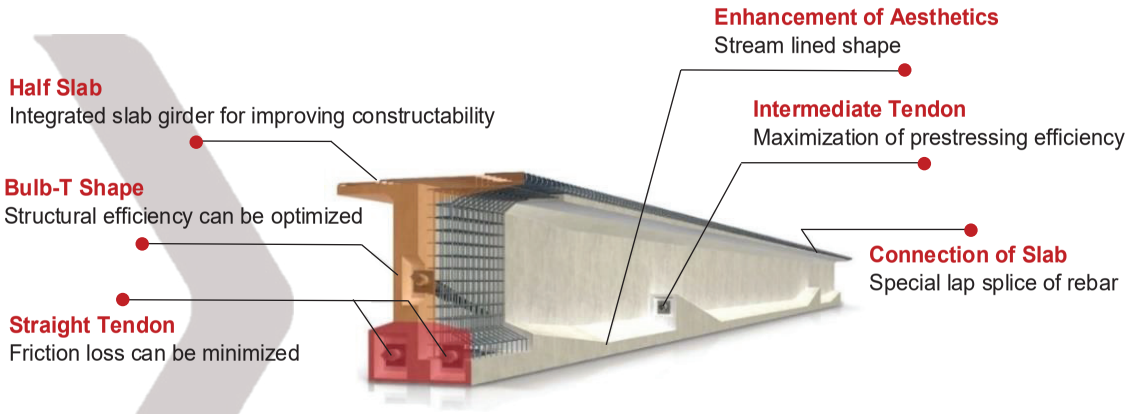

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