CHOOSING THE RIGHT QUALIFICATION FOR YOUR ENGINEERING CAREER

Part 1:

Why Engineering?

Presenter
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WG Applications Committee

Date: 14th February 2023
Venue: Zoom

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The Engineering Profession in Malaysia:

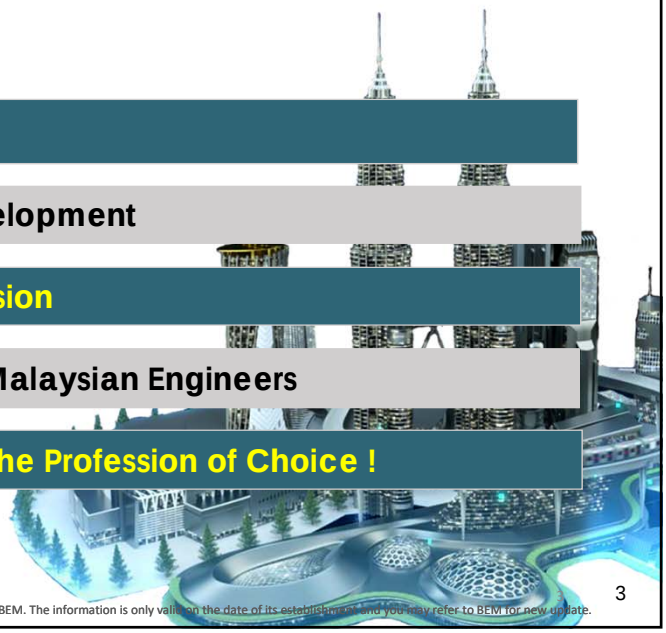
Benchmarked against the World's Best

- Recognised Internationally

It is the Profession of Choice !

Outline of Presentation

- WHAT ENGINEERS CAN DO
- Engineering for National Development
- BEM & the Engineering Profession
- International Recognition of Malaysian Engineers
- CONCLUSION: Engineering, the Profession of Choice !



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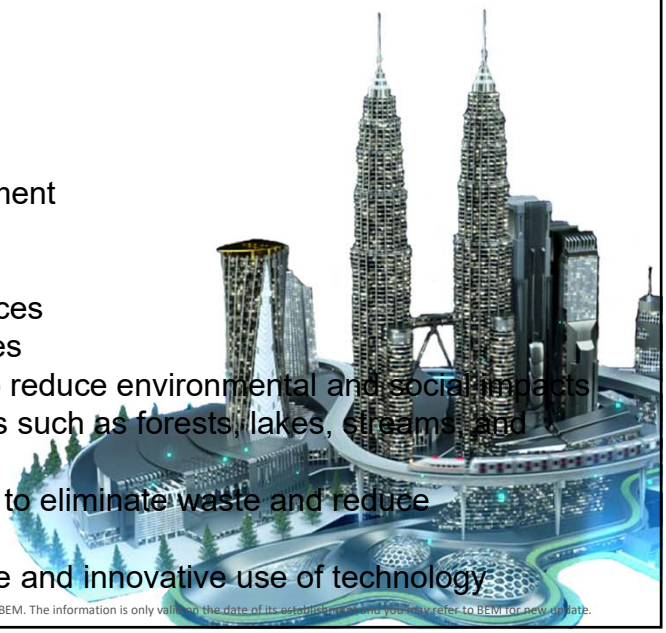
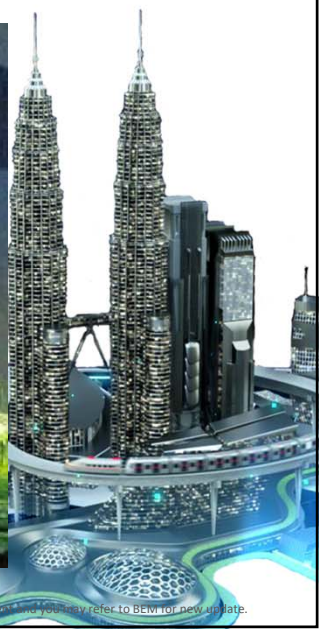
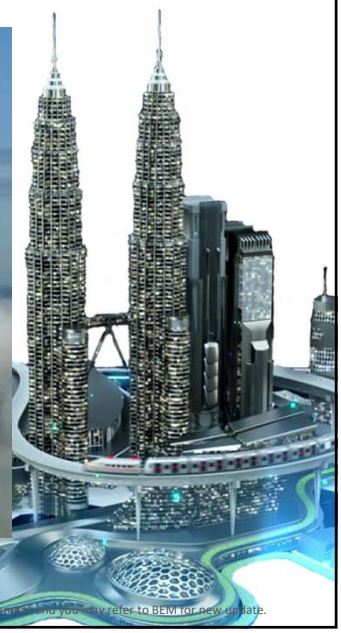
What engineers can do....

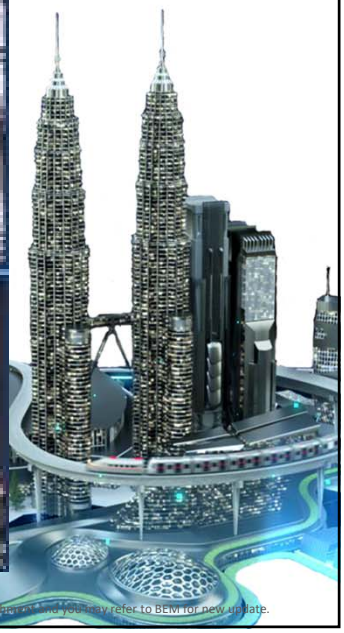
What engineers can do:

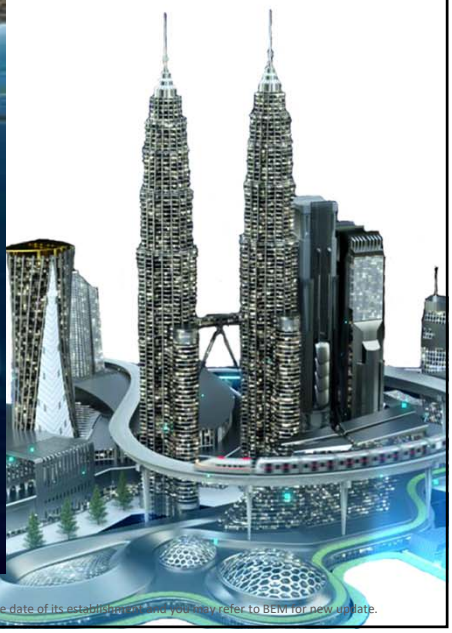
- Transportation
- Buildings & Structures
- Housing and shelter
- Water supply
- Food production
- Sanitation and waste management
- Energy development
- Industrial processing
- Development of natural resources
- Cleaning up polluted waste sites
- Sitting and planning projects to reduce environmental and social impacts
- Restoring natural environments such as forests, lakes, streams, and wetlands
- Improving industrial processes to eliminate waste and reduce consumption
- Recommending the appropriate and innovative use of technology

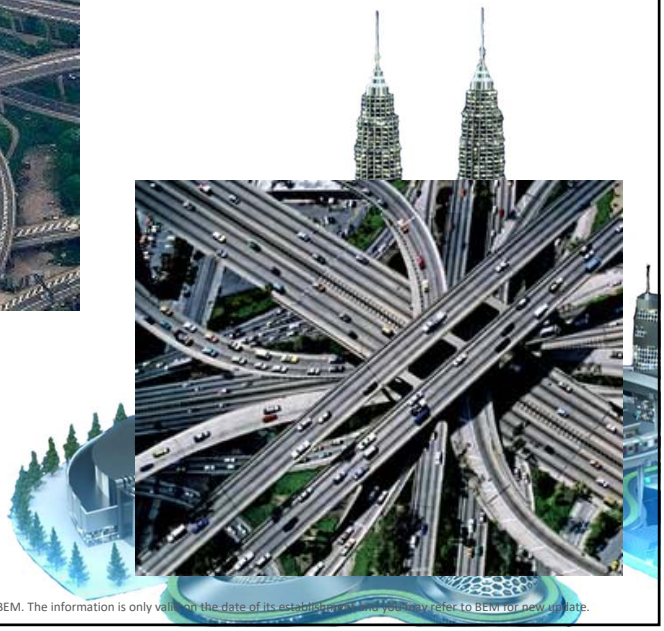












MEGA PROJECTS

1) **Pan Borneo Highway** RM30 billion
2) **Ipoh-Padang Besar Double-Track Railway** RM10 billion
3) **Extension of Existing LRT Lines in Klang Valley** RM10 billion
4) **40km KL - LRT Line** RM10 billion
5) **Trans-Peninsular Oil Pipeline** RM25 billio
6) **High-Speed Train to Singapore ?** RM8 billion
7) **Hulu Langat Water Treatment Project, Selangor** RM5 billion
8) **Pahang-Selangor Inter-state Water Transfer** RM4 billion
9) **West Coast Highway** RM3.05 billion
10) **Penang Monorail** RM1.2 billion to RM1.6 billion
11) **River Cleaning Project** RM1 billion

Engineering for National Development

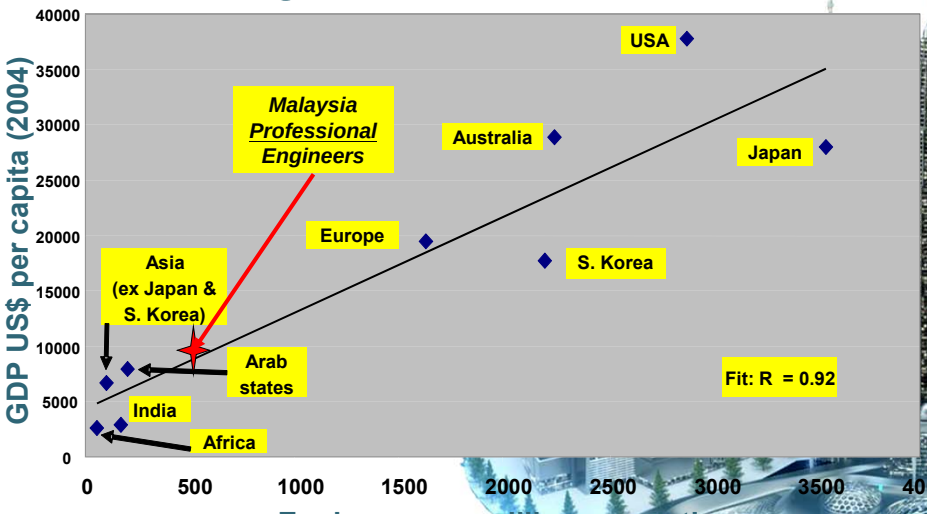
Backdrop

The increasing demand for engineers in developing countries

Case of Malaysia - typical

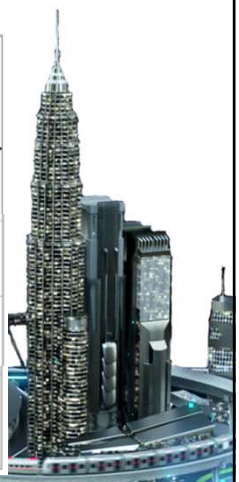
Why are Engineers Important?

Engineers and GDP



Engineer-Population ratios

	Population	Number of Registered Engineers	Engineer-Population ratio
Malaysia	32 million	146,000	1:218
Japan	126 million	2.5 million (Stats Bureau Japan 2000)	1:50
Germany	82 million	1,000,000	1:82
United Kingdom	60 million	425,000	1:141



Data includes both engineers & engineering technologists

Malaysia needs more engineering professionals for national development

The Engineering Team

Registration of Engineers Act (1967) & its Regulations - AMENDMENTS 2015

Registers & regulates

THE ENGINEERING TEAM:

1. Engineers
2. Engineering Technologists
3. Inspectors of Works (technicians)

(new in red)

Who is the Engineering Technologist?

- The Practical Oriented Engineer

THE ENGINEERING TEAM

- Entry level qualifications

1. **Engineers**

2. **Engineering Technologists**

3. **Inspectors of Works (technicians)**

WASHINGTON ACCORD Degrees (2009)

SYDNEY ACCORD Degrees (2018)

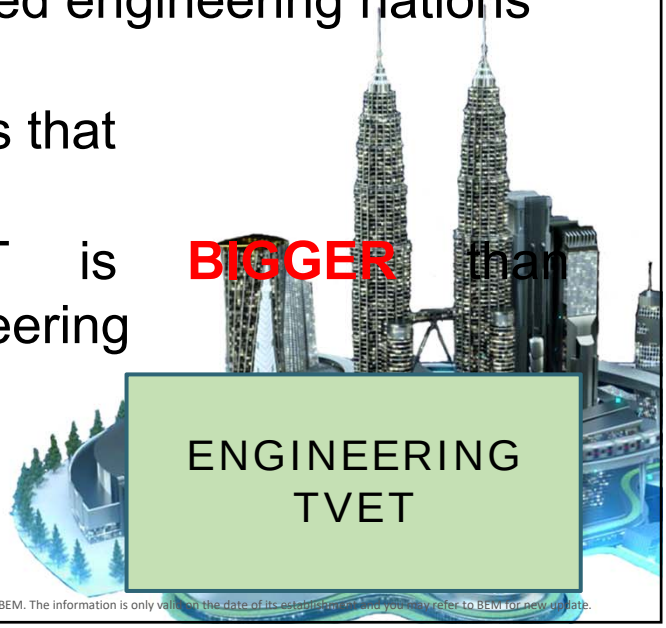
Engineering Technologist

DUBLIN ACCORD Diploma (2018)

The mark of advanced engineering nations

is that

Engineering TVET is **BIGGER** than Conventional Engineering



CONVENTIONAL ENGINEERING

ENGINEERING TVET

Engineering TVET should be bigger than conventional engineering

CONVENTIONAL ENGINEERING EDUCATION

Bachelor of Engineering at **Washingon Accord** level

ENGINEERING TVET

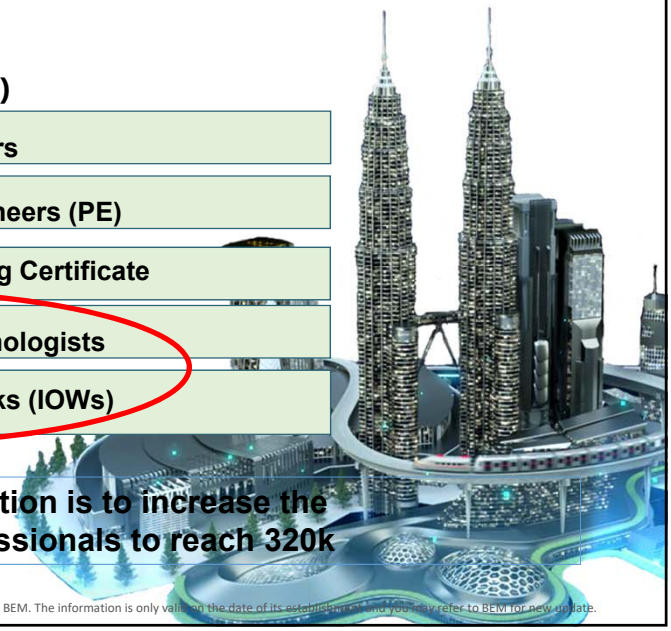
Diploma in Engineering or Engineering Technology at **Dublin Accord** level

Bachelor of Engineering Technology at **Sydney Accord** level

BEM STATISTICS
as at 23.11.2022

Registered Persons (Total: 198,026)

177,252	Graduate Engineers
22,335	Professional Engineers (PE)
10,675	PEs with Practising Certificate
12,979	Engineering Technologists
8,599	Inspectors of Works (IOWs)



The mission of BEM & the nation is to increase the number of engineering professionals to reach 320k

BEM
and the
Engineering Profession

Board of Engineers Malaysia
(BEM)
An independent statutory body by Act of Parliament

Corporate Focus

Vision

An authoritative body of international standing that regulates engineering practices.

Mission

Regulate engineering services , conforming to professional ethics and international best practices, in ensuring public safety.

COMMITTED TO ENGINEERING EXCELLENCE
BEM NEW TAGLINE

a) To keep and maintain the Register

b) To approve or reject applications for registration under this Act or to approve any such application

c) To order the issuance/imposition written warning/reprimand, fine, suspension, cancellation, removal/reinstatement of Parts III & IV

d) To fix from time to time the scale of fees to be charged by registered Engineers & ECP for professional engineering services rendered

e) To hear & determine or appoint committee/arbitrator on disputes relating to professional conduct/ethic of registered Persons

ea) To act as a stakeholder in a contract for professional engineering services, when requested

eb) To employ any person, as it deems necessary, to assist the Board in carrying out its functions/powers/duties

g) Generally, to do all as are necessary to carry out the provisions of the Act

14 Board Functions

ec) To provide facilities for promotion of learning & education and to hold/cause the professional development programmes, incl. CPD program for enhancing latest knowledge to that profession

ed) To appoint a committee to conduct PAE for the purpose of admission as PE & PCE for the purpose of issuing a Practicing Certificate to PE

ee) To appoint any person to represent the Board in any committee/panel/institution with recommendations to the Board on qualifying matters for admission to the profession

ef) To appoint a body consisting of members from the Board, PE & other persons to advise the Gov. & public on matters relating to engineering education incl the certification of such programs

eg) To cause examinations to be conducted by an institution recognized by the Board for the purpose of admission to the profession

f) To determine & regulate the conduct and ethics of the engineering profession

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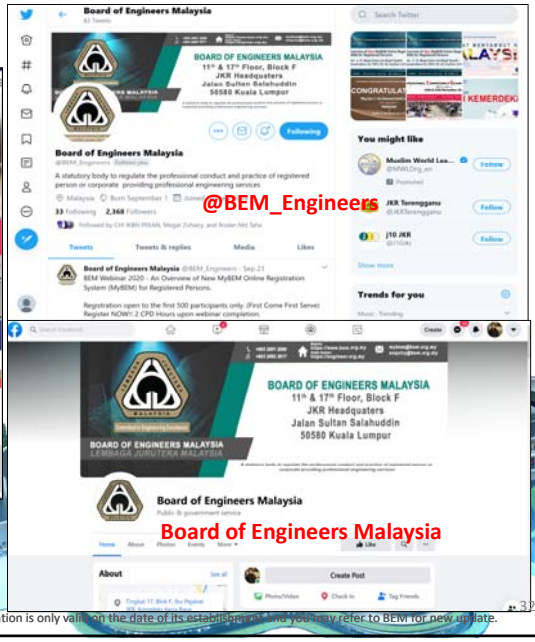
BEM Website & Social Media

www.bem.org.my



Understanding The Different Roles

Board of Engineers Malaysia (BEM)

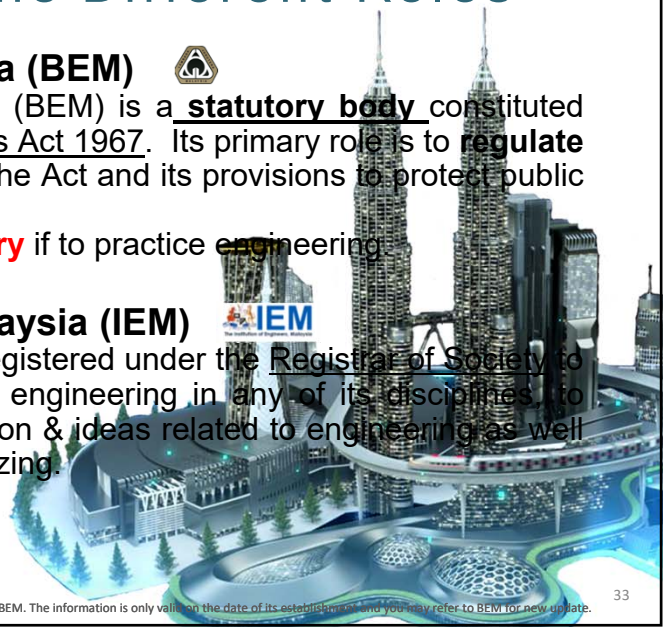
The Board of Engineers Malaysia (BEM) is a **statutory body** constituted under the Registration of Engineers Act 1967. Its primary role is to **regulate** the practice of engineering under the Act and its provisions to protect public interest.

Registration with BEM is **mandatory** if to practice engineering.

Institution of Engineers Malaysia (IEM)

A **professional & learned body** registered under the Registrar of Society to **promote** science & profession of engineering in any of its disciplines, to facilitate the exchange of information & ideas related to engineering as well as networking, learning and socializing.

Registration with IEM is voluntary.



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Understanding The Different Roles

Malaysian Board of Technologist (MBOT)

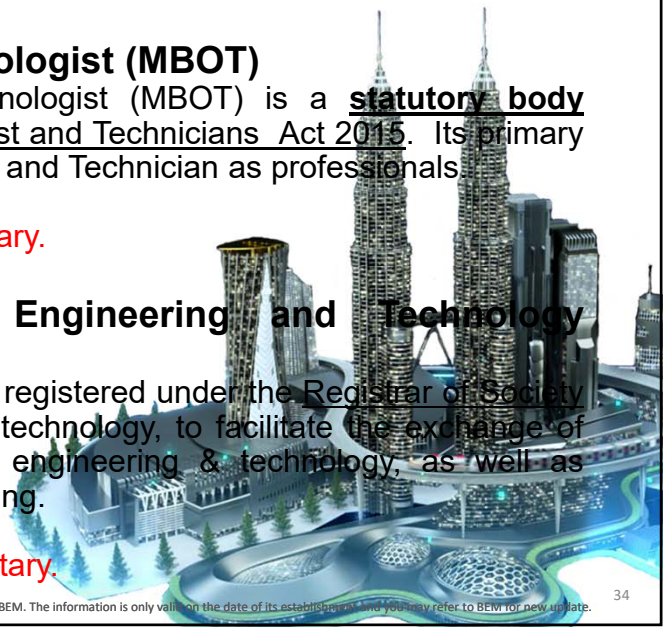
The Malaysian Board of Technologist (MBOT) is a **statutory body** constituted under the Technologist and Technicians Act 2015. Its primary role is to **recognize** Technologist and Technician as professionals.

Registration with MBOT is voluntary.

Malaysian Society for Engineering and Technology (MySET)

A **professional & learned body** registered under the Registrar of Society to **promote** of engineering and technology, to facilitate the exchange of information & ideas related to engineering & technology, as well as networking, learning and socializing.

Registration with MySET is voluntary.



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There is a need to regulate the
THE ENGINEERING TEAM

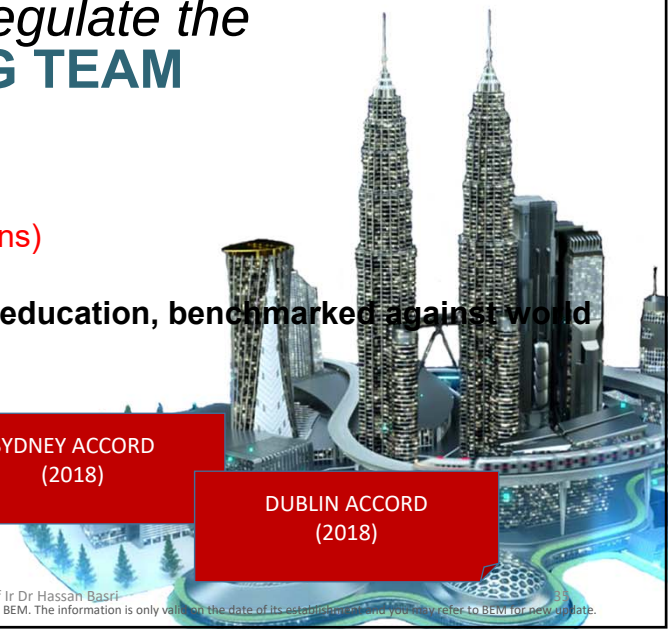
1. Engineers
2. Engineering Technologists
3. Inspectors of Works (technicians)

Including accreditation of their education, benchmarked against world standards, hence:

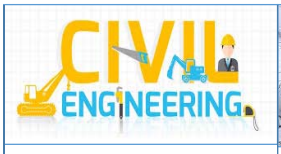
WASHINGTON ACCORD (2009)

SYDNEY ACCORD (2018)

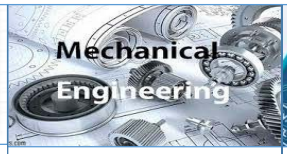
DUBLIN ACCORD (2018)



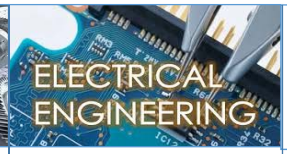
Engineering Branch/Discipline



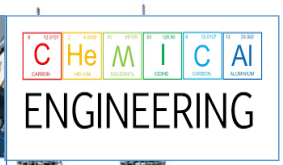
Civil
- Building
- Construction
- Environment
- Geotechnical
- Mining
- Structural
- Transportation



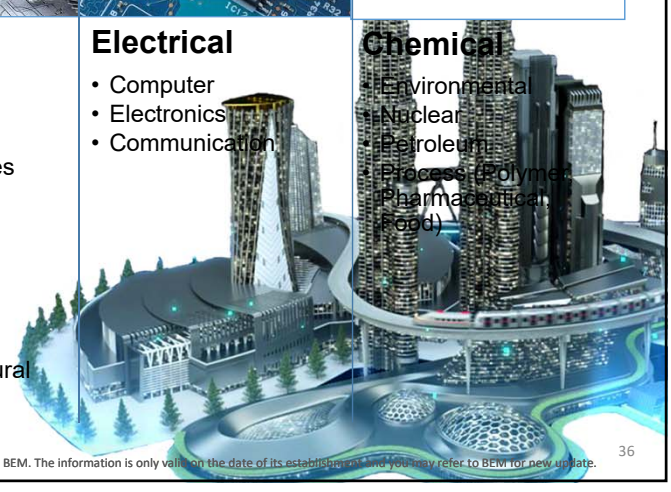
Mechanical
- Aerospace
- Agricultural
- Automotive
- Building Services
- Manufacturing
- Marine
- Material
- Mechatronic
- Metallurgy
- Mining
- Naval Architectural
- Nuclear



Electrical
- Computer
- Electronics
- Communication



Chemical
- Environmental
- Nuclear
- Petroleum
- Process (Polymer, Pharmaceutical, Food)



Mandatory Registration for Employment

Section 7(2) (a)

"a **Graduate Engineer** who is registered with the Board may subject to section 8, take up employment which requires him to perform **professional engineering services"**

Section 7(2) (aa)

"an **Engineering Technologist** who is registered with the Board may subject to section 8, take up employment which requires him to perform **professional engineering services"**

Section 7(2) (ab)

"an **Inspector of Works** who is registered with the Board may subject to section 8, take up employment which requires him to assist Professional Engineers in supervision of **engineering works**"

Interpretation

"Professional engineering services"

– means engineering services and advice in connection with any feasibility study, planning, survey, design, construction, commissioning, operation, maintenance and management of engineering works or projects and includes any other engineering services approved by the Board.

"Engineering work"

– means all works which include any publicly or privately owned public utilities, buildings, machines, equipment, processes, works or projects that require the application of engineering principles and data.

Penalty

Section 24(h)

*"**Any person**, sole proprietorship, partnership or body corporate **who contravenes** section 7 or 8, or **subsection** 7A(1), **24A(1)** or 24B(5) **shall be guilty of an offence and shall, on conviction, be liable to a fine not exceeding fifty thousand ringgit, or to imprisonment for a term not exceeding three years, or to both**."*

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International Recognition of Malaysian Engineering Graduates

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INTERNATIONAL ENGINEERING ALLIANCE (IEA)

INTERNATIONAL ENGINEERING ALLIANCE

The Engineering Profession in Malaysia: Benchmarked Against the World's Best

INTERNATIONAL ENGINEERING ALLIANCE

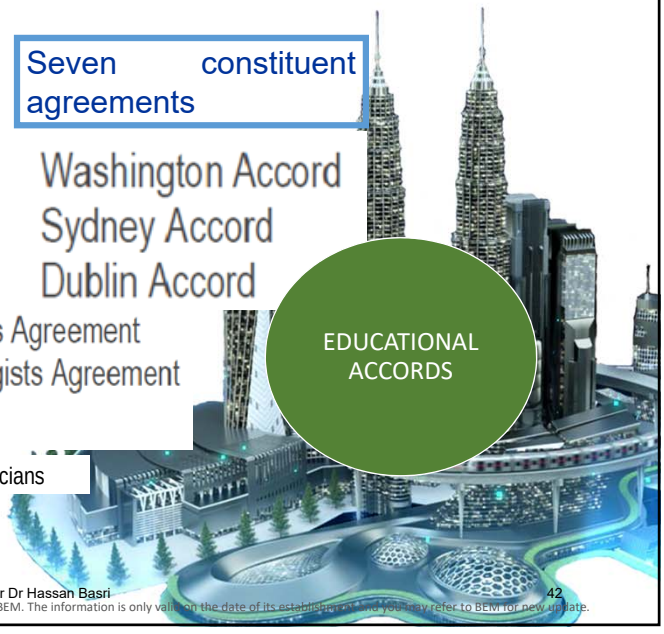
Seven constituent agreements

COMPETENCE AGREEMENTS

- International Professional Engineers Agreement
- International Engineering Technologists Agreement
- APEC Engineer Agreement
- Agreement for International Engineering Technicians

EDUCATIONAL ACCORDS

- Washington Accord
- Sydney Accord
- Dublin Accord



INTERNATIONAL ENGINEERING ALLIANCE

WASHINGTON ACCORD (2009)

SYDNEY ACCORD (2018)

DUBLIN ACCORD (2018)

MULTINATIONAL AGREEMENTS FOR THE MUTUAL RECOGNITION OF ENGINEERING, ENGINEERING TECHNOLOGY & ENGINEERING TECHNICIAN EDUCATION PROGRAMMES

Among signatory countries:

- **substantial equivalency of accreditation systems**

Washington Accord Signatories

1. Australia
2. Canada
3. China
4. Chinese Taipei - Taiwan
5. Hong Kong China
6. India
7. Ireland
8. Japan
9. Korea
10. Malaysia
11. New Zealand
12. Russia
13. Singapore
14. South Africa
15. Sri Lanka
16. Turkey
17. United States
18. United Kingdom
19. Pakistan
20. Peru
21. Costa Rica

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Sydney Accord Signatories

1. Australia
2. Canada
3. Chinese Taipei - Taiwan
4. Hong Kong China
5. Ireland
6. Korea
7. Malaysia
8. New Zealand
9. South Africa
10. United States
11. United Kingdom

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Dublin Accord Signatories

1. Australia
2. Canada
3. Ireland
4. Korea
5. Malaysia
6. New Zealand
7. South Africa
8. United States
9. United Kingdom

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Washington Accord – Signatory since 2009
Sydney & Dublin Accords – Signatories since 2018

- Accepted as a **Full Signatory** after rigorous peer review by other signatories (by USA, Australia, Hong Kong and Ireland).

- Implication:

  Mutual recognition of academic programmes that underpin the educational base for Engineering, Engineering **Technologists** and **Engineering Technicians**.

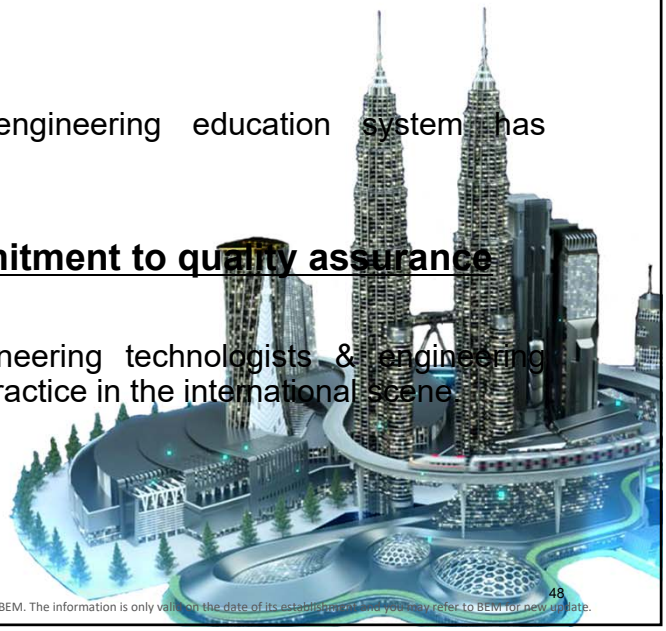
- The qualifications accredited by signatories are recognised by each other as being **substantially equivalent** for practice of engineering at the appropriate level within the engineering team.

SIGNIFICANCE OF ACCORD MEMBERSHIP

- an endorsement that the engineering education system has demonstrated a

  <u>strong, long-term commitment to quality assurance</u>

  in producing engineers, engineering technologists & engineering technicians ready for industry practice in the international scene.



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- As Malaysia needs more engineering professionals for national development, having an engineering career is an attractive option.

  - But do choose the right programme.

Accredited Engineering Degree – 329 programs at 48 IHLs

Accredited Engineering Technology Degree – 74 programs at 16 IHLs

POLITEKNIK MALAYSIA SULTAN AZLAN SHAH

UNIVERSITI KUALA LUMPUR

POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

UniMAP

LINCOLN UNIVERSITY COLLEGE

POLITEKNIK UNGKU OMAR KEKUATAN DAN KEAMANAN MELALUI TEKNOLOGI

UTeM UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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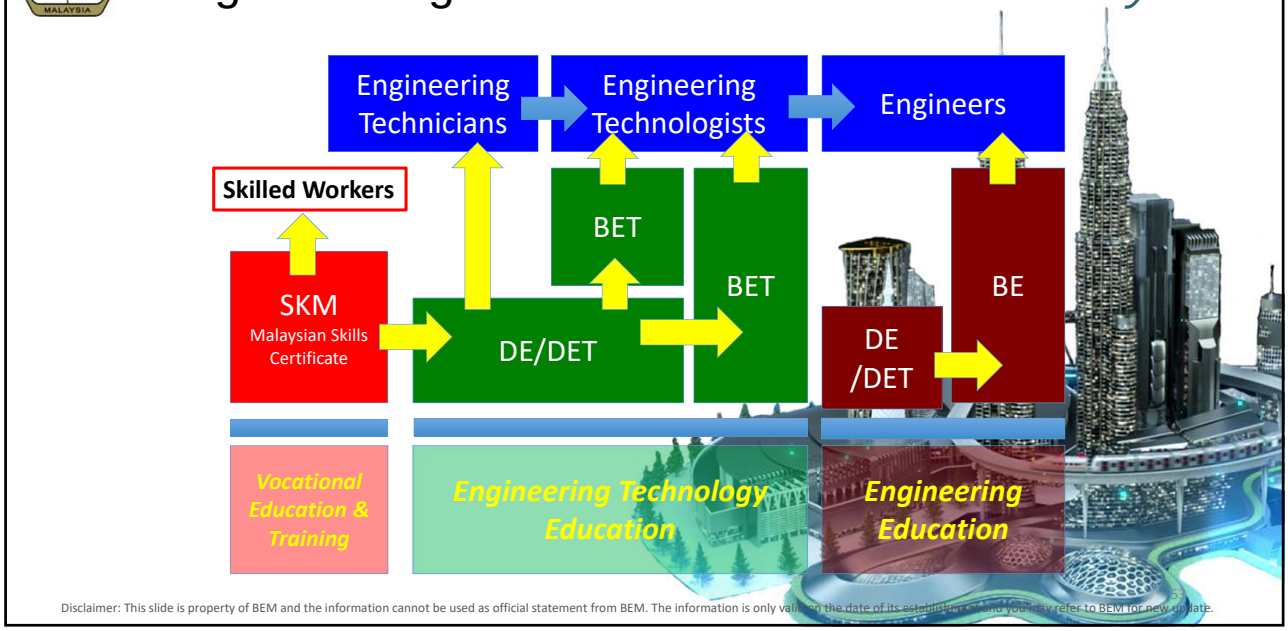
YOU WILL HAVE PATHWAYS

TO BECOME AN

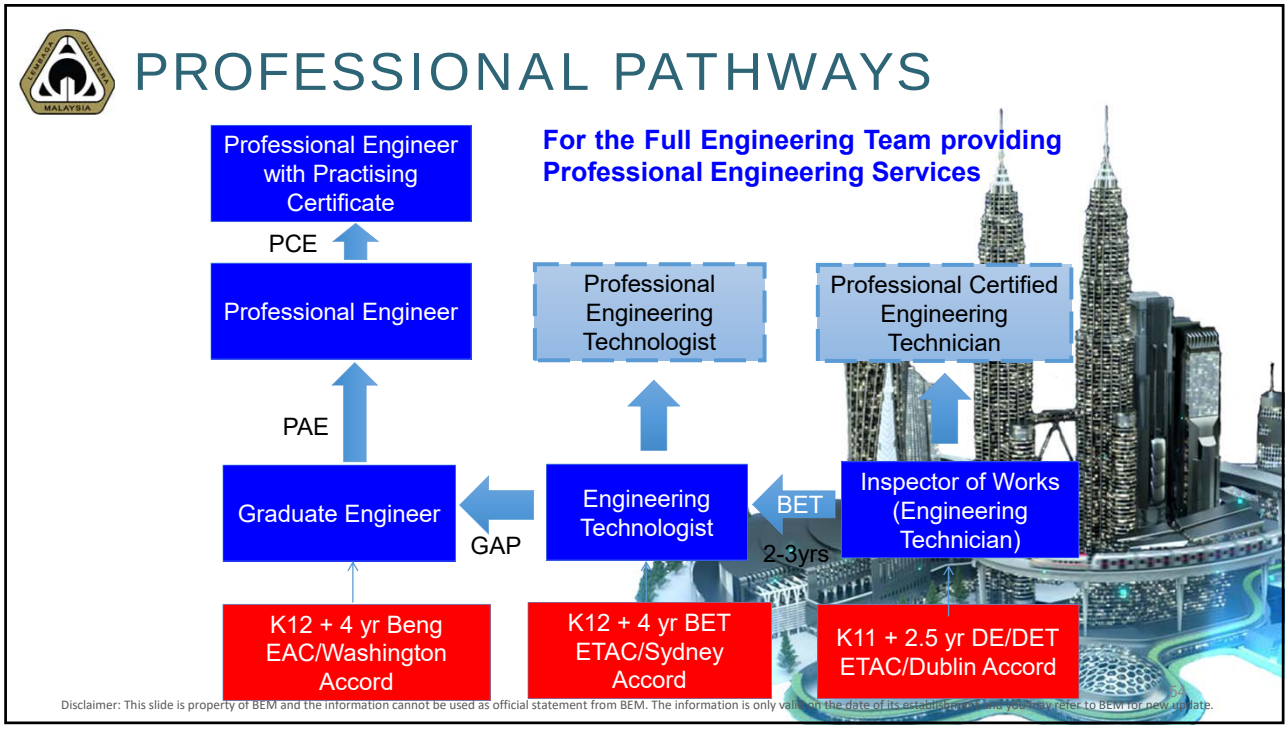
INTERNATIONALLY RECOGNISED

PROFESSIONAL ENGINEER !!

Engineering Team: *Education Pathways*



PROFESSIONAL PATHWAYS



CONCLUSION

The Engineering Profession in Malaysia is now recognized worldwide:

Benchmarked and Accredited with the International Gold Standard

It is the Profession of Choice!

THANK YOU

"Committed To Engineering Excellence"

BOARD OF ENGINEERS MALAYSIA
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