Optimise
Optimal Systems Engineering Sdn Bhd
ENGINEERING SUSTAINABILITY

REGISTERED TRAINING INSTITUTION
REM TYPE 1
Approval Code: REMT/35C
IL1-2025-0002
EECA 2024

HRD CORP CLAIMABLE

MALAYSIA MyHIJAU

MyHS00015/22-E002

5 Days Workshop

Registered Energy Manager

(REM) - Type 1

11 - 15 January 2027 (Johor Bahru)
3 - 7 May 2027 (Bangi/Cyberjaya)
19 - 23 July 2027 (Bangi/Cyberjaya)
6 - 10 September 2027 (Bangi/Cyberjaya)
8 - 12 November 2027 (Bangi/Cyberjaya)

9.00am - 5.00pm

**Date subject to changes. For latest date, refer to website.*

RM 4,860.00 (per pax)
RM 4,760.00 (Register 30 days before workshop, or Group of 3)
**Price excluding 8% SST charges*

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Workshop **Overview**

The Registered Energy Manager (REM) - Type 1 workshop is a focused 5-day training program designed to equip participants with the essential skills and knowledge required to achieve REM certification under **Malaysia's Energy Efficiency and Conservation Act (EECA 2024)**. This certification targets professionals managing facilities with energy consumption between **21,600 GJ/year and 50,000 GJ/year**, ensuring that the facilities comply with the regulatory requirements and promote sustainable energy practices.

The course covers a comprehensive range of topics, providing theoretical understanding and practical skills on energy management principles, energy efficiency strategies, and regulatory compliance. Participants will complete a certification examination on the final day to formally assess their readiness for REM Type 1 certification.

Workshop **Objectives**

- Equip participants with the knowledge and skills needed to manage energy resources effectively in facilities consuming between 21,600 GJ and 50,000 GJ energy annually.
- Prepare participants for the REM Type 1 certification under the Malaysia's Energy Efficiency and Conservation Act (EECA 2024).
- Enhance understanding of the governance and regulatory framework of the energy sector in Malaysia.
- Build competence in conducting energy audits and implementing energy-saving measures (ESM).
- Develop the ability to analyze and manage financial aspects of energy projects.
- Enable participants to prepare, present and execute energy management projects.
- Promote compliance with Malaysian energy regulations and policies.

Who **Should Attend?**

This workshop is designed for:

- Facility managers and engineers responsible for energy management of facilities with annual energy consumption between 21,600 GJ/year and 50,000 GJ/year.
- Professionals seeking REM certification to comply with the EECA 2024.
- Energy auditors/consultants seeking to enhance their energy management expertises.
- Professionals involved in energy management, policy development, and implementation for commercial buildings, industrial facilities and educational institutions.

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Certification **Level Overview**

The REM Type 1 certification is designed for energy professionals managing facilities with energy consumption between 21,600 GJ/year and 50,000 GJ/year. This certification validates a professional's ability to oversee energy efficiency projects, implement energy-saving measures, and ensure compliance with the EECA regulations. Certification is awarded upon successful completion of the workshop and passing the REM Type 1 examination, covering key areas of energy management, energy audit processes, financial analysis, and regulatory compliance. Upon passing the REM Type 1 training, participants can apply to become REM Type 1 with the Energy Commission (EC) provided they satisfy other requirements by EC (see the next page for the details). The REM Type 1 certificate will be valid for 5 years from the date of certification.

Course **Outline**

- Overview of Energy Scenario and The Governance of Energy Sector in Malaysia Legislation In Malaysia
- Fundamentals As Energy Manager (Safety)
- Fundamentals As Energy Manager (Technical)
- Fundamentals As Energy Manager (Financial)
- Energy Management System (EnMS)
- Energy Audit (as per ST Guideline)
- Common Energy Saving Measures (ESM)
  - ESM for Lighting System
  - ESM for Compressed Air System
  - ESM for Air Conditioning System
  - ESM for Motors, Pumps and Fans
- Assessment
  - Theoretical Test
  - Individual Project Presentation

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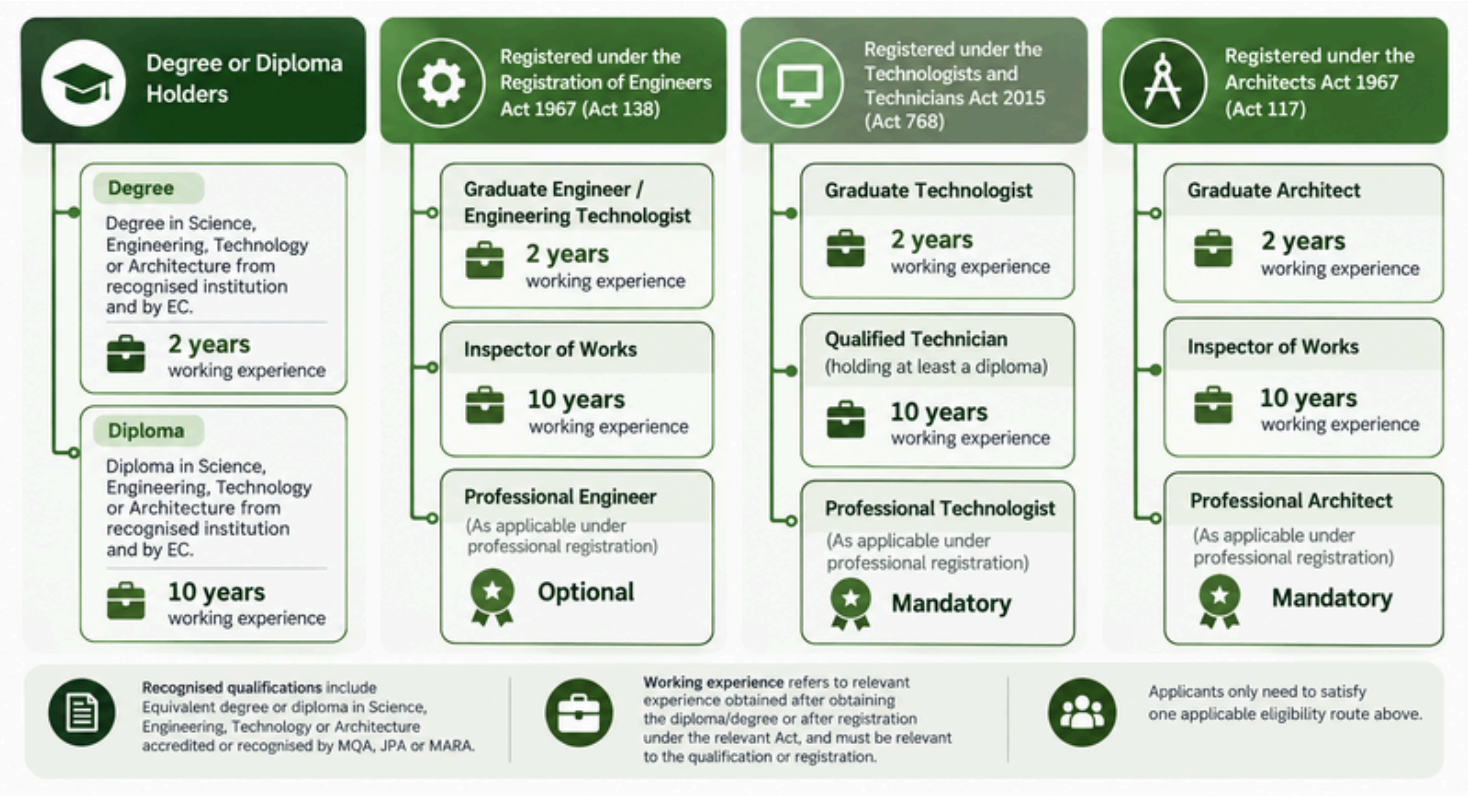
Requirement
REM Type 1 Application

The requirements to become a REM First Type are as follows:
(a) A Malaysian citizen.
(b) Holds any qualification as may be prescribed in the Regulations.
(c) Fulfils other prerequisite requirements as may be determined by the Commission, including requirement for training.
(d) Demonstrates knowledge of the requirements of the Act and the Regulations that satisfies the Commission.
(e) Has not been convicted of an offence involving fraud, dishonesty, or corruption.

The training requirement shall be as follows:
(a) The applicant must successfully complete REM First Type training before applying for REM Second Type training.
(b) The training certificate for REM First Type or REM Second Type is valid for only five (5) years from the date of the training completed.

Qualifications Prescribed in the Regulations
REM Type 1 Application



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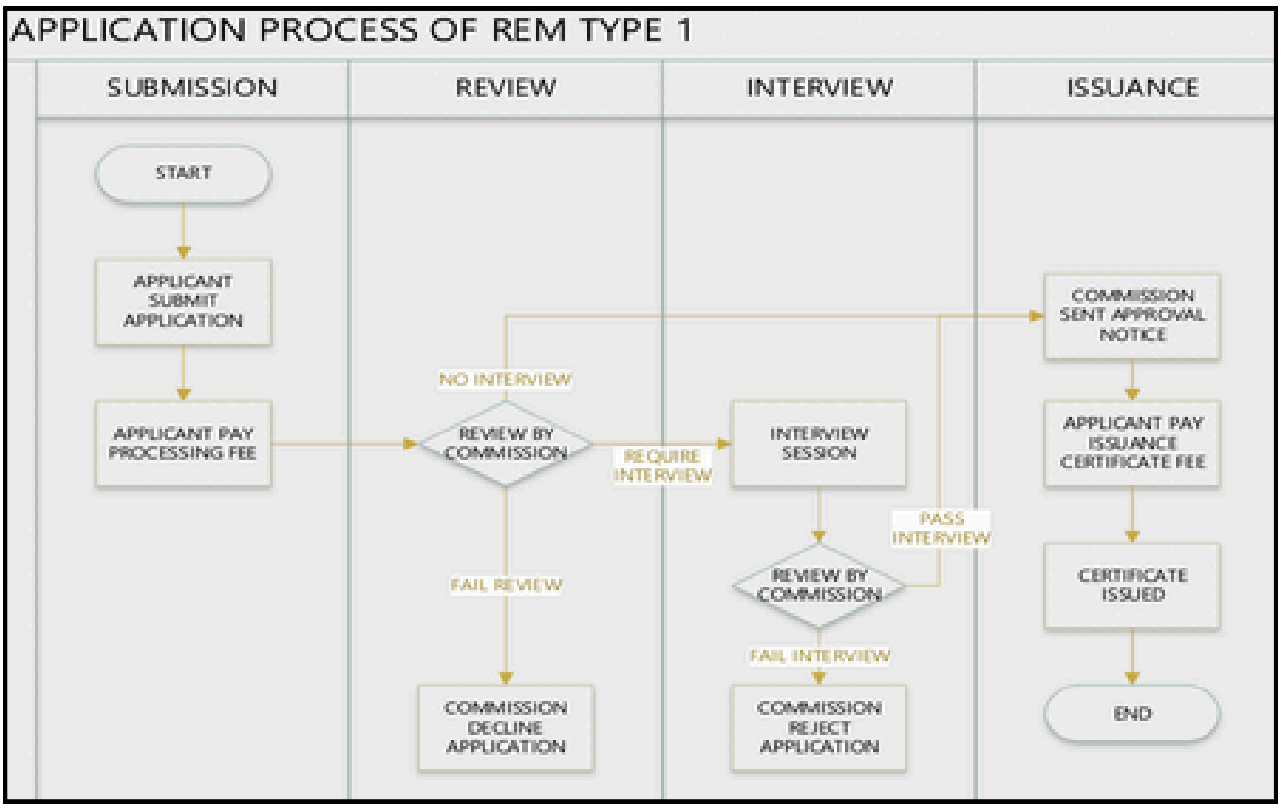
How to apply after workshop completion?

REM Type 1 Application



Guidelines for Re-sitting

Failed Assessment

In the event that a candidate fails the examination on the first attempt (as defined under Conditions 3a and 3b in Section 3), they will be granted the opportunity to re-sit the assessment without the need to undergo the full training programme again.

The candidate will only be required to retake the specific part of the examination that was not passed. For example, if the candidate fails Part 1, they will only be required to retake the assessment for Part 1, and not for Part 2.

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Trainers' **Profile**

TRAINER 1

PROF IR TS DR ZAINUDDIN ABDUL MANAN

Zainuddin Abdul Manan is a professor of chemical and energy engineering, the founding director of UTM Process Systems Engineering Centre (PROSPECT), founding Dean of UTM Faculty of Chemical and Energy Engineering, founder of UTM Sustainable Energy Management Program and the CEO and founder of the UTM spin-off company OPTIMISE Sdn Bhd. He began his career as an engineer in PETRONAS and Hume Industries and has been an academic leader, educator, researcher, consultant and professional coach for over 25 years. He completed over 100 R&D & consultancy projects serving local and multinational companies, has numerous patents and over 450 publications that include 20 books/ chapters, 230 refereed journals and 250 conference proceedings on energy and resource conservation using process integration techniques. He is a co-author of the globally referred Book on Process Integration and Intensification – Saving Energy, Water and Resources. Zain is a UK/EU chartered engineer, a Fellow IChemE (UK), Fellow of Academy of Sciences Malaysia, a professional engineer, a professional technologist, a certified energy manager, a Type 1 Type 2 REM (Registered Energy Manager) and a certified trainer for ASEAN energy managers. He has coached professionals from over 500 organisations and delivered over 400 invited talks in professional courses, conferences and seminars worldwide. Zain chaired the Academy of Sciences (ASM) Energy Committee, the ASM Net Zero Task Force and the Energy Efficiency and Conservation Act (Thermal Energy) Drafting Committee under the Malaysian Ministry of Energy. He founded and spearheaded the UTM Sustainable Energy Management initiative that led UTM to save over USD 7 million energy costs (2011-2022), to win the National & ASEAN Energy Awards, and to be ranked 1st globally by Time Higher Education on SDG7.

TRAINER 2

PROF IR TS DR SHARIFAH RAFIDAH WAN ALWI

Prof Ir Ts Dr Sharifah Rafidah Wan Alwi is a Professor in the Faculty of Chemical and Energy Engineering, Universiti Teknologi Malaysia. She previously helmed as the Director of Process Systems Engineering Centre for ten years (2011 to 2021). She is an expert resource minimisation consultant for multiple industries and is among the leading researchers in resource integration technique development. Prof Sharifah is also the co- founder and Director of Optimal Systems Engineering Sdn Bhd, a UTM Spin-off company. She has been extensively involved in 80 research projects, 17 industrial based projects for various companies and government agencies and has trained engineers from more than 300 companies in the field of sustainable engineering design and management. Together with her team, they have developed 7 resource minimisation software. Sharifah has won various international and national awards such as Green Talents 2009 (Germany), IChemE Highly Commended Sir Frederick Warner Prize 2011 (UK), ASEAN Young Scientist and Technologist Award 2014, National Young Scientist Award 2015, ASEAN-US Science Prize for Women 2016 in Energy Sustainability, Malaysia Research Star Award 2016, 2018, 2019, Top Research Scientists Malaysia 2018 and Sarawak State - International Women Award 2021. She was listed as 'Asian Scientist 100' in 2017 and 'Asia's Rising Scientists' in 2020, and '8 Women Scientists from Asia You Should Know' in 2021 by AsianScientist.com. Sharifah is also the Associate Editor for Journal of Cleaner Production and UTM Sustainable Energy Management System advisor. She has also served as the Chair for the Science Leadership Working Group under Young Scientist Network, Academy of Sciences Malaysia (YSN-ASM) and Chair for Malaysia IChemE Young Engineer Group (YEG). Sharifah is also a professional engineer, a professional technologist, a UK/EU chartered engineer, a certified energy manager, a Type 1 Type 2 REM (Registered Energy Manager) and a certified trainer for ASEAN energy managers.

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Trainers' **Profile**

TRAINER 3

ASSOCIATE PROF IR DR LIM JENG SHIUN

Associate Professor Ir Dr Lim Jeng Shiun is the Director of Products and Service, Optimal Systems Engineering Sdn Bhd, a UTM spin-off company specialising in providing solutions related to energy conservation and GHG emissions reduction. He is also the Deputy Director of Process Systems Engineering Centre (PROSPECT), Universiti Teknologi Malaysia. His core expertise is in the area of innovative development and application of process systems engineering techniques for resource conservation, and energy and carbon planning. He is also a professionally Certified Energy Manager, Certified Energy Auditor, Accredited Energy Measurement & Verification Professional and a Type 1 Type 2 REM (Registered Energy Manager) certified by the Energy Commission of Malaysia. He is the trainer of the Energy Management Trainer Course conducted by MGTC to certify the Energy Manager. He is also the instructor for MSc Energy Management in UTM, sharing knowledge related to energy efficiency and energy management. As an engineer in practice, he has applied the output of his research work to consultancy projects for the industrial community. He has been extensively involved in more than 35 industrial-based projects for various companies and government agencies. The key clients include local industries and multinational companies such as BERNAS, FABER MEDISERVE, SHELL, OLEON in Malaysia and PERTAMINA in Indonesia. He has assisted those companies to identify energy-saving opportunities worth millions of dollars and GHG reduction opportunities through the use of process integration and process systems engineering approaches in the energy audit and GHG emissions accounting projects. He has shared his project experience in his co-authored book titled Pinch Analysis for Energy and Carbon Footprint Reduction, published by the Institution of Chemical Engineers (IChemE). He has been invited to share his experience on Net Zero carbon for industry and facilities, including on Net Zero Carbon for Palm Oil Industry organised by IChemE.

TRAINER 4

IR. DR. HAYATI ABDULLAH

Ir. Dr. Hayati Abdullah is a specialist in thermodynamics, and her professional focus centerson energymanagement and on improving the performance of chiller and air-conditioningsystems, togetherwith the broader family of mechanical systems that support them,including pumps, compressors,blowers, and fans. She received formal training in EnergyManagement in Sweden, and she holds twoprofessional credentials in the field: she is aRegistered Energy Manager (REM) and a CertifiedProfessional in Measurement andVerification (CPMV). In addition, Ir. Dr. Hayati is a ProfessionalEngineerwith Practicing Certificate (PEPC) registered with the Board of Engineers Malaysia,reflectingher standing within the engineering profession and her authorization to practise.She is also a Fellowof the Institution of Engineers, Malaysia, and has served as the PastChairman of its Southern Branch,a role that underscores her leadership within theengineering community.

Bringing more than 25 years of experience as an Energy Management Consultant, Ir. Dr.Hayati hascontributed to national energy conservation and energy auditing projects. Herwork in theseprograms has included collaborations with international consultants fromFrance and Japan, aligninglocal initiatives with global expertise and standards whilemaintaining her core emphasis onthermodynamics, energy management, and theoptimization of chillers, air-conditioning installations,and related mechanical systems such aspumps, compressors, blowers, and fans.

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Workshop **Schedule**

Day 1:

Time	Module
8.00 to 8.30	Registration
8.30 to 9.15	Theoretical Test and Individual Project Briefing
9.15 to 11.00	Energy Scenario, Energy Policies, Standards, And Incentives • World Energy Scenario • Malaysia Energy Scenario • Energy Policies in Malaysia • Key Energy Efficiency Programs in Malaysia
11.00 to 11.15	Break
11.15 to 13.00	Legislation in Malaysia (Part 1) • Electricity Supply Act 1990 (ESA) • Electricity Regulation 1994 • Energy Commission Act 2001 (EC) • Energy Efficiency and Conversation Act (EECA) • EEC Regulation
13.00 - 14.00	Lunch Break
14.00 to 16.00	Legislation in Malaysia (Part 2) • Introduction On Guide and Guideline Under EECA (Part 1)
16.00 to 16.15	Break
16.15 to 17.00	Legislation in Malaysia (Part 3) • Introduction On Guide and Guideline Under EECA (Part 2)

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Workshop
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Day 2:

Time	Module
9.00 to 10.00	Fundamentals As Energy Manager (Safety) • Safety requirement under the Act • Types of competent person • Competent person vs energy manager
10.00 to 10.30	Fundamentals As Energy Manager (Technical) - Part 1 • Overview of energy • Electricity Generation, Transmission, Distribution and Classification
10.30 to 10.45	Break
10.45 to 12.15	Fundamentals As Energy Manager (Technical) - Part 2 • Energy unit conversion factors
12.15 to 13.00	Fundamentals As Energy Manager (Financial) - Part 1 • Introduction on MESI (IBR, ICPT) • Structure of Energy Pricing
13.00 to 14.00	Lunch
14.00 to 14.45	Fundamentals As Energy Manager (Financial) - Part 2 • Calculation of energy saving • Common financial analysis for energy efficiency projects
14.45 to 15.45	Energy Management System – Part 1 1. Type of Energy Management System (EnMS) 2. Introduction to energy management and key definitions 3. Best practices and standards related to energy management
15.45 to 16.00	Break
16.00 to 17.00	Energy Management System – Part 2 4. Overview of Energy Management System (EnMS) concept (PDCA cycle) and its key elements

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Workshop **Schedule**

Day 3:

Time	Module
9.00 to 10.00	Energy Management System – Part 3 5. Establishment of suitable energy performance indicators and energy baselines for energy performance measurements
10.00 to 10.30	Project/Case Study – Part 1
10.30 to 10.45	Break
10.45 to 13.00	Energy Audit – Part 1 • Definition and types of energy audit • Steps for energy audit
13.00 to 14.00	Lunch
14.00 to 14.45	Energy Audit – Part 2 •Energy audit measurement •Concept of Measurement & Verification
14.45 to 15.00	Break
15.00 to 17.00	Common ESM 1 – ESM for Lighting System

Day 4:

Time	Module
9.00 to 10.30	Common ESM 1 – ESM for Compressed Air System
10.30 to 10.45	Break
10.45 to 13.15	Common ESM 2 – ESM for Air Conditioning System
13.15 to 14.15	Lunch
14.15 to 16.15	Common ESM 2 – ESM for Motors, Pumps and Fans
16.15 to 16.30	Break Break
16.30 to 17.00	Project/Case Study – Part 2

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Workshop
Schedule

Day 5:

Time	Module
8.30 to 9.00	Examination Attendance and Briefing
9.00 to 12.00	Theoretical Test (3 hours)
12.00 to 12.15	Break
12.15 to 13.00	Individual Project Presentation (Part 1): 8 mins present, 7 mins Q&A
13.00 to 14.30	Lunch
14.30 to 16.00	Individual Project Presentation (Part 2)
16.00 to 16.15	Break
16.15 to 17.30	Individual Project Presentation (Part 3)

WHAT OUR TRAINEES Said

Very effective and well-structured EECA training. The trainers are highly experienced and explained the requirements clearly with practical, real-world examples. Their guidance made the concepts easy to understand and apply. Strong support throughout the session, making it a very valuable and insightful learning experience

NUR MUHAMMAD BIN PAJARU RAHMAN
Senior Engineer
Nestle Products Sdn Bhd

OPTIMISE trainers are subject matter experts with current, relevant industry experience. Their comments and explanation throughout classes and project presentation had given insights on area to improve in implementating the EnMS.

NORSAIDAH MOHAMAD
Assistant Manager
SD Guthrie berhad

Very effective and well-structured EECA training. The trainers are highly experienced and explained the requirements clearly with practical, real-world examples. Their guidance made the concepts easy to understand and apply. Strong support throughout the session, making it a very valuable and insightful learning experience

NUR MUHAMMAD BIN PAJARU RAHMAN
Senior Engineer
Nestle Products Sdn Bhd

One of the strongest points of the Registered Energy Manager (REM) training was its ability to translate complex energy management concepts into practical, real-world applications. The course provided valuable insights into energy efficiency strategies, regulatory compliance, and effective monitoring techniques that can be immediately applied at the workplace

KHAIRUL AKMAL BIN MOHD KASRAN
Assistant Manager
Advance Industrial Solutions Sdn Bhd

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OPTIMISE Energy Audit, GHG Accounting and EnMS Track Records

- Led UTM to be globally ranked 1st on SDG 7 - Affordable and Clean Energy
- Co-developer of ASEAN EMGS Energy Management System Standards with MGTC.
- Led UTM to win the ASEAN Energy Award and EMGS 3 Star EMGS Gold Standard.
- Involved in certification of energy managers and energy end users for 15 years.
- Developer of award-winning energy audit and energy monitoring software.
- Led UTM to achieve over RM 30 million energy savings between 2011-2023.
- Over 20 years experience in energy audit and optimisation consultancy, R&D and professional training for over 500 national/multinational companies.
- Certified trainer, auditors & centre for training & certification of energy managers.

Selected References

- Shell, Middle Distillate Synthesis
- BP – Amoco
- MLNG
- Felda Proctor and Gamble
- MIMOS Semiconductor
- Riau Pulp and Paper Mill
- Qatar LNG
- Pertamina Engineering Group
- PT Titan Petrokimia Interindo
- Pan Century, IOI Oleochemicals
- BASF – Petronas
- MTBE – Petronas
- Huntsman Tioxide
- Ansell Malaysia
- Hershey Malaysia
- Malaysia Newsprint Industries
- Malaysia Palm Oil Board
- Malaysia Energy Commission
- Technip (M) Sdn Bhd
- PT Chandra Asri
- Petronas Penapisan (M) Sdn Bhd
- Petronas Gas Sdn Bhd
- Kaneka Malaysia
- UKM, UPM, USM, UM, UNIKL

20+

Years Experience in Energy Audit and Optimisation

#1

Global Rank in R&D on 'Heat Exchanger. Retrofitting and Design' Elsevier Scival 2014

700+

National & Multinational Companies Benefitted from our Energy Trainings and Consultancy Services