Optimise
Optimal Systems Engineering Sdn Bhd
ENGINEERING SUSTAINABILITY

5- Days Workshop

REGISTERED ENERGY MANAGER (REM) - TYPE 2

16 - 20 November 2026 (Bangi Resort Hotel)
5 - 6 April 2027
14 - 18 June 2027
2 - 6 August 2027
4 - 8 October 2027
6 - 10 December 2027
Bangi/Cyberjaya Area
9.00am - 5.00pm

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

RM 5,000.00 (per pax)
RM4,900.00 (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 2 workshop is tailored for professionals responsible for managing facilities with energy consumption >50,000 GJ/year under Malaysia's Energy Efficiency and Conservation Act (EECA). This workshop provides advanced training in managing energy resources, optimizing energy systems, and ensuring compliance with stringent regulations. Participants will gain knowledge on thermal energy systems, energy audits, and energy-saving measures, all necessary for REM Type 2 certification.

Workshop **Objective**

- Equip participants with advanced knowledge and skills required for managing large energy-consuming facilities.
- Prepare participants for REM Type 2 certification under the Energy Efficiency and Conservation Act (EECA).
- Enhance understanding of governance and regulatory frameworks impacting energy management in high-energy-use facilities.
- Build competence in thermal energy systems, including energy-saving technologies and waste heat recovery.
- Develop expertise in conducting thermal energy audits and implementing energy performance indicators.
- Enable participants to effectively prepare and present energy management projects and findings.
- Promote compliance with EECA and energy management systems standards.

Who Should **Attend**

This workshop is ideal for:

- Facility managers and engineers managing large energy-consuming facilities with consumption >50,000 GJ/year.
- Professionals seeking REM Type 2 certification under the EECA.
- Energy consultants and auditors specializing in high-energy-use facilities.
- Senior energy managers, sustainability officers, and strategic planners in commercial, industrial, and public sector organizations.
- Individuals involved in developing and managing energy for large-scale facilities.

Workshop
Learning Outcome

By the end of the **REM Type 2** workshop, participants will be able to:

1. **Understand the energy scenario and governance** affecting the energy sector in Malaysia.
2. **Revise the legislative frameworks** impacting high-energy-use facilities in Malaysia.
3. **Identify fundamental safety, technical, and financial aspects** relevant to managing energy-consuming facilities.
4. **Apply common energy-saving measures (ESMs)** for thermal energy systems, such as fuel and combustion technologies, boilers, steam distribution systems, thermal oil heaters, and waste heat recovery.
5. **Conduct thermal energy audits** in line with ST guidelines.
6. **Utilize energy performance indicators** to evaluate energy system performance.
7. **Prepare for the REM Type 2 certification** by understanding the requirements for managing large energy-consuming facilities under the Energy Efficiency and Conservation Act (EECA).
8. **Participate in discussions** and present project findings effectively to peers and stakeholders, demonstrating a basic understanding of energy management concepts.

Certification
Level Overview

REM Type 2 certification is intended for professionals managing facilities with significant energy consumption (>50,000 GJ/year). This certification validates the manager's ability to oversee complex energy management systems, conduct detailed energy audits, and implement thermal energy efficiency measures. Certified REM Type 2 professionals will be equipped to lead and manage initiatives to achieve compliance with Malaysia's energy regulations, including the Energy Efficiency and Conservation Act (EECA) and energy management systems.

Requirement
REM Type 2 Application

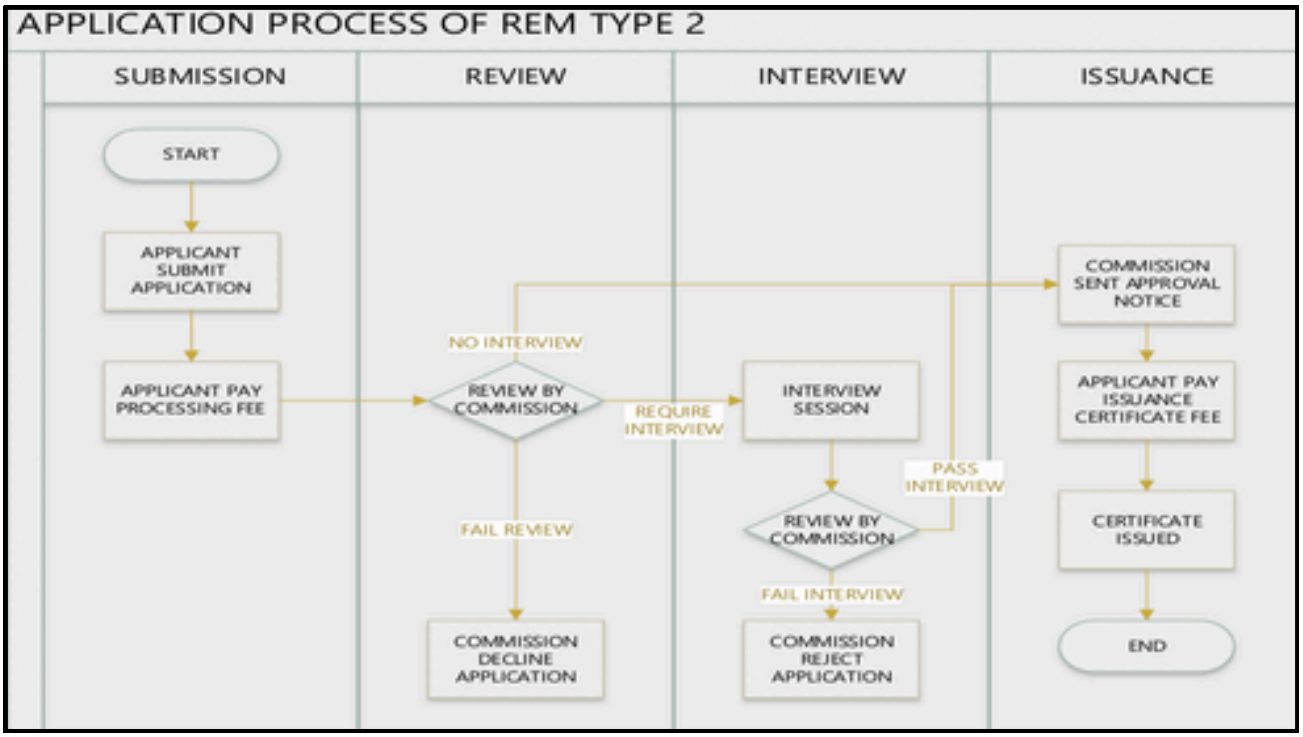
- The requirements to become a REM Second Type are as follows:

(a) He has been a Registered Energy Manager First Type for a period of no less than one year and holds a valid practising certificate.
(b) He demonstrates knowledge of the requirements of the Act and Regulations that satisfies the Commission.
(c) He successfully completed REM Second Type training course and assessment recognized by the Commission.

- The training requirement for REM Second Type shall be as follows:

(a) The applicant shall be an existing REM First Type or has successfully complete REM First Type training before completing REM Second Type training; and
(b) The training certificate for REM First Type or REM Second Type shall be valid for only five (5) years from the date of the training completed.

How to apply after workshop completion?
REM Type 2 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.

Course **Outline**

- Revision on Overview of Energy Scenario and The Governance of Energy Sector in Malaysia
- Revision on Legislation In Malaysia
- Revision on Fundamentals As Energy Manager (Safety)
- Revision on Fundamentals As Energy Manager (Technical)
- Revision on Fundamentals As Energy Manager (Financial)
- Overview Of Thermal Energy Systems
- Key Principles And Concepts In Thermal Energy System Applications
- Common Energy Saving Measure III
  - Fuel And Combustion (Furnace)
  - Boilers and Steam Distribution Systems
  - Thermal Oil Heaters
  - Insulation
  - Waste Heat Recovery
  - Co-Generation
- Thermal Energy Audit
  - Energy Performance Indicator And Reporting
  - Measurement & Verification
- Assessment
  - Theoretical Test
  - Individual Project Presentation

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 registered energy manager (Type 1 and 2) and a certified trainer for ASEAN energy managers.

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. HAJI AHMAD FATANI HAJI ABDUL RAHMAN

Ir. Haji Ahmad Fatani Haji Abdul Rahman is a consultant and has more than 25 years working experience energy management, project management, process control and building automation, waste water treatment plant, waste management, stack monitoring of incinerator, hot oil burners, scrubber, and dust collectors, project execution, plant start-up and commissioning, maintenance, process safety, safety & risk management and auditing in multi-disciplined of plant, plant turnaround, upgrade and new plant plus energy management system and facilities management system plus waterproofing, painting and flooring specialist. Ir. Haji Ahmad Fatani Haji Abdul Rahman experience as trainer and lead assessor for ENERGY MANAGEMENT SYSTEM (AEMAS Standard – MGTC)

Ir. Haji Ahmad Fatani Haji Abdul Rahman as internal auditor, developing and implementing ISO 9001, ISO 14001, OHSAS 18001, ISO 45001, RC 14001, PROCESS SAFETY MANAGEMENT SYSTEM (PSM), Facility Set-Up (PASS 55 @ ISO 55001).

Ir. Haji Ahmad Fatani Haji Abdul Rahman is certified with REM TYPE I, REM TYPE II, AEMAS Trainer, AEMAS Lead Assessor, SHASSIC Tier 3, Waterproofing Applicator, Automation Control Trainer and TTT Trainer. Ir. Haji Ahmad Fatani is excellent capabilities in both Safety Hazard Operation (HAZOP) and Hazard Design (HAZID), Process Hazard Analysis (PHA), Mechanical Hazard Analysis (MHA), Mechanical Integrity (MI), Safety Interlock Level (SIL) calculation, Process Alarm Management (PAS)-the critical safety elements in manufacturing plant and deep experience in "MANAGEMENT OF CHANGE (MOC), a systematic troubleshooting data handling to ensure (continuous) plant's efficiency

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 10.00	Revision on Legislation in Malaysia (Part 1) • Electricity Supply Act 1990 (ESA) • Electricity Regulation 1994 • Energy Commission Act 2001 (EC)
10.00 to 11.00	Revision on Legislation in Malaysia (Part 2) • Energy Efficiency and Conversation Act (EECA) • EEC Regulation
11.00 to 11.15	Break
11.15 to 12.15	Revision on Legislation in Malaysia (Part 3) • Introduction On Guide and Guideline Under EECA
12.15 to 13.00	Revision on Legislation in Malaysia (Part 4) • Introduction On Guide and Guideline Under EECA
13.00 to 14.00	Lunch
14.00 to 15.00	Revision on Fundamentals As Energy Manager (Safety)
15.00 to 15.45	Revision on Fundamentals As Energy Manager (Technical)
15.45 to 16.00	Break
16.00 to 17.00	Revision on Fundamentals As Energy Manager (Financial)

Workshop **Schedule**

Day 2:

Time	Module
9.00 to 10.15	Energy Scenario, Energy Policies, Standards, And Incentives Overview of Thermal Energy Systems
10.15 to 10.30	Break
10.30 to 11.45	Key Principles and Applications In Thermal Energy Systems (Part 1)
11:45 to 13.00	Key Principles and Applications In Thermal Energy Systems (Part 2)
13.00 to 14.00	Lunch
14.00 to 15.30	Key Principles and Applications In Thermal Energy Systems (Part 3)
15.30 to 15.45	Break
15.45 to 17.00	Thermal Energy Audit and Reporting

Day 3:

Time	Module
9.00 to 10.30	Fuels and Combustion
10.30 to 10.45	Break
10.45 to 12.00	Furnace
12.00 to 13.00	Boiler and Steam System (Part 1)
13.00 to 14.00	Lunch Break
14.00 to 15.30	Boiler and Steam System (Part 2)
15.30 to 15.45	Break
15.45 to 17.00	Boiler and Steam System (Part 3)

Workshop **Schedule**

Day 4:

Time	Module
9.00 to 10.15	Thermal Oil Heater
10.15 to 10.30	Break
10.30 to 11.30	Insulation
11.30 to 13.00	Waste Heat Recovery
13.00 to 14.00	Lunch Break
14.00 to 15.45	Cogeneration (part 1)
15.45 to 16.00	Tea break
16.00 to 17.00	Cogeneration (Part 2)

Day 5:

Time	Module
8.30 to 9.00	Briefing
9.00 to 11.00	Theoretical Test (2 hours)
11.00 to 12.15	Break
12.15 to 13.00	Individual Project Presentation (Part 1): 10 mins present, 10 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)

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

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