IN-HOUSE TRAININGS

Optimise

OPTIMAL SYSTEMS ENGINEERING SDN BHD

ENGINEERING SUSTAINABILITY

OPTIMAL SYSTEMS ENGINEERING SDN BHD (1111742-H)

A spin-off company of Universiti Teknologi Malaysia (UTM)

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TRAINING CATEGORIES

MANAGEMENT (MC)

MC1 Energy Manager Training Course (EMTC)

This course aims to train certified energy managers who will help establish and implement a sustainable energy management system in an enterprise, in preparation for AEMAS Energy Management Gold Standard certification.

MC2 Establishment of an Energy Management System (EnMS)

This course is for the top management, energy manager, energy committee as well as technical and managerial staff that are involved in energy management to appreciate the importance of EnMS, understand the concepts of EnMS and be familiar with the basic procedure for establishing an EnMS for an organisation in line with the ISO 50001 standards.

MC3 Building Organisational Resilience via a Sustainable Energy Management Program

This training session highlights the experience of Universiti Teknologi Malaysia (UTM) in driving reforms through a sustainable energy management program. The key highlight of the presentation is the UTM 6P Energy Sustainability Transformation (Energy-STAR) Program that created a competitive edge and built a resilient ecosystem of innovation-driven best practices in energy sustainability.

TECHNICAL (TC)

TC1 Thermal Energy Recovery Technologist (TERT)

The Thermal Energy Recovery Technologist (TERT) course aims to develop professionals and certified experts in thermal energy recovery system using Pinch Technology. Successful participants of this course shall be awarded competency certification based on the level of completion. More than 7000 successful applications worldwide, including our own project experiences show that implementation of pinch technology typically provides an attractive payback period of less than three years.

TC2 Industrial Thermal Energy Audit and Analysis (ITEA)

This course aims to equip participants with practical concepts, principles, tools and systematic techniques to analyse thermal energy systems, and effectively apply them for thermal energy cost saving measures. This course will cover energy generation and distribution equipment system such as boiler and steam system, thermal oil, furnace, cogeneration system and solar thermal; process equipment such as reactor, flash, evaporator and distillation column, heat exchanger and dryer. The course utilizes pinch analysis as a tool to maximise energy efficiency, heat recovery and energy cost savings.

TC3 Energy Audit on Electrical System

This course provides insights on the importance of selecting the right electricity tariff, to improve power factor and to manage electricity load demand. Participants will also learn how to improve energy efficiencies for lighting, motor and transformer.

TRAINING CATEGORIES

TECHNICAL (TC)

TC4 Energy Efficiency Improvement of Mechanical Equipment

In this course, participants will learn how to perform analysis and energy efficiency improvement measures on key mechanical equipment including chiller, fans, pumps and compressed air systems. Participants will also be able to identify the typical energy losses and apply a systematic approach to account for the energy efficiency of the mechanical equipment and implement measures to save energy costs.

TC5 Energy Conservation for Air-Conditioning Systems

This course will provide participants with an understanding of the fundamentals of the operation of various types of air-conditioning systems. Participants shall be able to appreciate the thermodynamic properties of moist air and its application in coil load calculations and the determination of the performance indicators of air-conditioning systems. Various strategies for energy conservation and cost-saving measures will be discussed.

TC6 GHG Emissions Accounting and Management

This course highlights the concept and principles of GHG accounting and reporting, including the inventory boundary, GHG emission identification and methodologies and GHG reporting format. The approach shall enable organisations to quantify GHG that are related to initiatives to reduce GHG emissions toward low carbon and sustainable manufacturing.

TC7 Chiller Plant Energy Efficiency

This training provides an opportunity for participants to be exposed to an in-depth energy analysis of chiller plants as well as methods for evaluating the plant's energy performance. This training is designed to give participants a learning experience in carrying out energy audit measurements and to identify possible savings through selected energy conservation measures and the return of investment for chiller plants and cooling towers.

AWARENESS (AC)

AC1 Now, Everyone Can Contribute Toward Energy Efficiency and Conservation!

This awareness course focuses on empowering all staff in an organization to implement simple and practical energy efficiency and conservation measures and green practices at the office buildings and at home.

AC2 Non-structural Energy Management: Energy Saving Through Behavior Change

This course provides an approach for energy managers to systematically integrate behavioural tools in the planning and implementation of energy efficiency and conservation practices among building users.

Optimise
Optimal Systems Engineering Sdn Bhd
Engineering Sustainability

Advancing Sustainable Consumption and Production

OPTIMISE is a leading provider of cutting-edge *sustainable systems engineering* solutions in ASEAN. It is a spin-off company of Universiti Teknologi Malaysia (UTM), a registered Energy Services Company (ESCO) under Malaysia Energy Commission and a MyHijau-registered company. OPTIMISE provides training, consultancy, and smart system solutions in sustainable engineering and optimization of industrial processes and building facilities, and in sustainable enterprise planning and management. We guide organisations to achieve multiple bottomline benefits of improved profitability and governance via energy, resource, and environmental sustainability.

OPTIMISE differentiations and value-added offerings. OPTIMISE provides consultancy services, signature training programs and award-winning smart IoT systems, technologies, solutions and products. Our offerings that are backed by world-class, internationally validated, and referenced research and innovations in sustainable systems engineering for energy, ESG and resource sustainability. OPTIMISE's proven track records of over 30 years of mentoring, coaching, and providing consultancy services to over 500 organizations enable its clients to deliver performance, embrace sustainability and build resilience in their people, culture, process, and systems. Our cutting-edge smart systems engineering technologies and solutions have been used in building facilities and numerous industries including oil and gas, petrochemical, power generation, food and beverages, fine-chemical, oleochemical, palm oil, chloral-kali, pulp and paper, medical glove, and semiconductors.

OPTIMISE approach to empower organisational resilience and sustainability. We call our approach the *Global Cafe Hi-5 (High-impact-Sustainability)* for widening access to energy, ESG and resources sustainability solutions. *Hi-1* is our mission to produce competent, future-ready energy sustainability change makers through our unique recipe. *Hi-2* is our customised and personalised recipes for organisations and professionals. *Hi-3* are our great chefs, who are certified and competent pros to deliver our innovative recipes. *Hi-4* is our uberised delivery via technology and partnership to enable access to anyone from anywhere at any time. *Hi-5* is our data-driven quality control, monitoring, and improvement that leverages digital technology, analytics, and platforms.

OUR VISION

A society practicing sustainable consumption and production.

OUR MISSION

Advancing circular economy through innovative process integration and smart systems engineering solutions.

OUR PEOPLE

Professional engineers and experienced certified practitioners in Process and Systems Engineering for energy, ESG and resource sustainability. World's Top 2% Scientists (ranked by Stanford University, USA). Social entrepreneurs and advocates

MC1

Certification

Management Category Training

Energy Manager Training Course (EMTC)

5 days workshop

Workshop Overview

Energy security and sustainability are the key challenges facing enterprises and policy makers across the globe. Prudent management of energy allows enterprises to abide by the Efficient Management of Electrical Energy Regulation 2008 and to support the commitment of Malaysia to contribute to a greener world by reducing the carbon emission intensity by 40% by the year 2020. AEMAS Workshop on Energy manager Certification is recognized by the Malaysia Energy Commission.

This course also help participant to establish and implement a sustainable energy management system in the enterprise, in compliance with the ISO 50001 standard, and in preparation for AEMAS Energy Management Gold Standard certification. The course is taught by certified energy managers who are also certified trainers from industry and from Universiti Teknologi Malaysia (UTM), and are among those who have successfully implemented the Sustainable Energy Management System. Get the first-hand insights from certified Energy Managers/Trainers from University Teknologi Malaysia (UTM).

Course Objective

The EMTC certification program is designed to

1. provide knowledge, skills and competency for participants to establish and implement an SEMP.
2. empower professionals to drive organisations to comply with regional energy management system standards such as AEMAS and international standard such as ISO 50001

Learning Benefits

Enabler For the Trainee Energy Managers

1. Understand the context of energy use, laws and regulations related to energy management.
2. Be able to establish and implement sustainable energy management program in organisation.
3. Improve professional standing and provide potential employment opportunity with a certification recognised in 10 ASEAN countries.

Enabler For Businesses

1. Establish a systematic and holistic approach for organization-wide energy management.
2. Minimise energy wastage and save energy costs to become economically competitive.
3. Ease the application of other quality systems like ISO 50001 and ISO14001
4. Pave the way to achieve Energy Management Gold Standard certification.
5. Improve organisation's image as a sustainable and efficient business.
6. Raise international competitiveness with a certification recognized in 10 ASEAN countries.

Who Should Attend

Future energy managers, professionals from any discipline, quality assurance managers, facility/maintenance managers or engineers and industry personnels.

MC1

Certification

Management Category Training

Energy Manager Training Course (EMTC) *- cont.*

5 days workshop

Course Outline

1. Global & Local Energy Trends

2. Energy Efficiency Standard & Labeling

3. Energy Policies & Legislations

- Energy Policies and Legislations Related to Energy Management.

4. Introduction to Sustainable Energy Management

- Introduction to AEMAS & Sustainable Energy Management; Definition and role of Energy Manager; Responsibilities of Energy Manager; Recommended Code of Practice for Energy Manager.

5. Setting up a Sustainable Energy Management System

- Effective Tool for Appraising Energy Management Performance or Organization; Methodology for Preparation of Energy Management System; Setting of Energy Target and Plan; Integration of Energy Management System into Business Practice.

6. Managing Activities in Sustainable Energy Management

- Project Management & Controlling; Energy Management & Performance Review.

7. Fundamental of Electrical System

- Overview of Energy; Electrical Energy Basics; Electrical Loads and Maximum Demand; Power Factor and Capacitors; Transformer; Electricity generation; Transmission and Distribution Structures and Classifications; Electricity Unit and Conversion.

8. Understanding of Energy Pricing and Electricity Bills

- Structure of Energy Pricing Related to Electricity Supply; Understanding of Electricity Billing System and Electricity Bills.

9. Introduction to Energy Audit

- Need and Approaches in Energy Auditing; Methods and Approaches in Energy Auditing; Criteria of an Effective Energy Audit and Report; Measuring and Monitoring Equipment; Energy Management Monitoring and Control Equip mentor System.

10. Energy Efficiency and Conservation Potentials

- Electric Motors; Compressed Air System; HVAC and Refrigeration System. Cooling Tower; Fans and Blowers; Pumps and Pumping System. Lighting System; Office Equipment; Control and Variables Speed Drives; Energy Efficient Technologies and Application in Electrical System. Boiler.

Trainers

1. Prof. Ir. Ts. Dr. Zainuddin Abdul Manan
2. Prof. Ir. Ts. Dr. Sharifah Rafidah Wan Alwi
3. Assoc. Prof. Ir. Dr. Lim Jeng Shiun
4. Prof. Ir. Dr. Mohammad Yusri Hassan
5. Prof. Ir. Dr. Haslenda Hashim
6. Ir. Al-Khairi Mohd Daud

MC2

Management Category Training

Establishment of an Energy Management System (EnMS)

2 days workshop

Workshop Overview

Energy Management System Standards (EnMS) such as ISO 50001:2018 has been a globally proven tool for the systematic, efficient and sustainable management of energy use in an organisation. EnMS has enabled many organisations to achieve multiple bottom line benefits of reduced energy cost, minimised GHG emissions, improved profitability and enhanced its public image. This workshop is designed to empower organisations to establish and implement the ISO 50001:2018 Energy Management System Standards (EnMS) as an integral part of a company's environmental and social governance (ESG) initiative.

Workshop Benefits

1. Customise EnMS establishment in line with organisational needs.
2. Implement a systematic, holistic and sustainable energy management program.
3. Improve energy efficiency, profitability and minimise GHG emissions.
4. Raise organisation's image and competitiveness via EnMS.

Workshop Learning Outcomes

At the end of the workshop participants are expected to be able to:

1. Describe the importance and benefits of EnMS for an organization.
2. Communicate real-life success stories, and make a strong case for EnMS establishment.
3. Establish EnMS context, needs, scope and structure based on elements of ISO50001:2018.
4. Plan the EnMS actions, resources, activities, programs and set improvement targets.
5. Implement operational control, design and procurement requirements.
6. Perform energy monitoring and evaluate implementation performance.
7. Conduct EnMS continual improvement program.

Course Outline

1) Introduction
2) Context of Energy Management System
3) Leadership
4) Planning
5) Support
6) Operation and Evaluation
7) Improvement
8) Checklist for EnMS

Who Should Attend

Top management representative, the energy manager as champion of the initiative, key members of an organisation's energy committee which typically comprise of quality assurance/control manager, technical personnel such as the facility, operation, and maintenance manager

Trainers

1. Prof. Ir. Ts. Dr. Zainuddin Abdul Manan
2. Prof. Ir. Ts. Dr. Sharifah Rafidah Wan Alwi
3. Assoc. Prof. Ir. Dr. Lim Jeng Shiun

MC3

Management Category Training

Building Organisational Resilience via a Sustainable Energy Management Program

2 hours workshop

Workshop Overview

Organisations across the world face massive challenges amidst COVID19 crisis that has cost lives, threatened livelihoods, disrupted businesses and caused widespread unemployment at an unprecedented scale. There is the need for organisations to rapidly adapt, drive innovation and build resilience in order to continue to survive and eventually thrive beyond the epic crisis.

This training session highlights the experience of Universiti Teknologi Malaysia (UTM) in driving reforms through a sustainable energy management program. The key highlight of the presentation is the UTM 6P Energy Sustainability Transformation (Energy-STAR) Program that created a competitive edge and built a resilient ecosystem of innovation-driven best practices in energy sustainability.

UTM 6P Energy STAR strategy to drive reform and innovation began by getting the commitment of UTM top management. Doing so entailed pinpointing the specific and major pains experienced by UTM management and community. Understanding the pains allowed the team to build the definite purpose for the reform initiative. Driven by this purpose, an inclusive SEM Program was established. A key component of the program involves upskilling the people as program champions. The team is responsible for mobilising the commitment of staff and students, drafting policies and action plans, monitoring implementation, conducting energy audits and undertaking measures for continuous performance improvement. Successful results of the SEM initiative have been widely promoted to over 1000 organisations regionally, in close partnership with stakeholders from industry and policy makers.

Learning Outcome

At the end of the course, it is expected that participants will be able to describe the UTM 6P Energy Sustainability Transformation (Energy-STAR) Program components consisting of Purpose, Program, People, Performance, Promotion and Partnership.

Learning Benefit

Understand the key steps for transforming an organisation towards energy sustainability via the 6P Energy Sustainability Transformation (Energy-STAR) Program.

Targeted Participants

Energy Managers, Top Management, Energy Management Committee, and Utilities Manager.

Trainers

1. Prof. Ir. Ts. Dr. Zainuddin Abdul Manan

TC1

Certification

Technical Category Training

Thermal Energy Recovery Technologist (TERT)

6 days workshop

Certification Overview

Thermal Energy Recovery Technologist (TERT) is a professional training to develop more global experts in thermal energy recovery system based on Pinch Technology. Participants from this course are awarded competency certification based on the level of completion. Be among the pioneers and expert in thermal energy for processes, differentiating yourself from other energy auditors which focusses only on utility system audit. Pinch Technology is known to save energy between 15 to 90%, in comparison to utility audit which only saves up to 30%. The technology also commonly provides an attractive payback period of fewer than three years, as compared to the renewable energy system.

There are four levels of the Thermal Energy Recovery Technologist (TERT) Certification program. TERT Level 1 is a workshop session aimed at providing participants with the 'Thermal Energy Recovery Technologist "User Level"' recognition upon successful completion of the module.

Next, TERT Level 2 is aimed at upskilling participants on the advanced Process Integration based on Pinch Analysis techniques to maximise energy savings. Level 2 modules include integration of combined heat and power systems, implementing process changes, manufacturing site-wide analysis and retrofit of existing heat exchanger networks. Passing this module will qualify participants for the 'Thermal Energy Recovery Technologist – Level 2: Advanced' expertise.

Participants who completed the Advanced TERT module will have the chance to be a Certified TERT Expert by completing TERT Level 3. Participants shall need to complete a set of assignment and pass a qualifying exam for the 'Thermal Energy Recovery Technologist – Level 3: Professional' certification.

Finally, participants will have the chance to promote themselves to the level of an industrial practitioner by completing a real-life industrial process integration project. Upon successful completion of the project, participants are required to submit the project report to be verified by the company manager. Participants will finally undergo a competency-based interview to communicate their experiences as a proof the acquired competency. Successful completion of this level will earn them 'Thermal Energy Recovery Technologist – TERT Level 4: Expert Certification.

Certification Level Overview

1)Thermal Energy Recovery Technologist – Level 1: User
2)Thermal Energy Recovery Technologist – Level 2: Advanced
3)Thermal Energy Recovery Technologist – Level 3: Professional Certification
4)Thermal Energy Recovery Technologist – Level 4: Expert Certification

TC1

Certification

Technical Category Training

Thermal Energy Recovery Technologist (TERT)

6 days workshop

Learning Benefit

If you are an energy manager, energy auditor, or energy service company.

1. Equip yourself as a TERT to manage thermal energy. The anticipated enactment of the Malaysia Energy Efficiency & Conservation Act (EECA) shall unlock opportunities for energy managers with the competency to audit, manage, and optimize thermal energy systems apart from electrical energy.
2. Gain competency to perform practical retrofit of existing facilities. Learn from certified experts and practitioners on how to perform optimal thermal energy recovery analysis to retrofit existing facilities practically, and gain the support of top management to achieve triple bottom-line benefits.
3. Offer value-added energy audit services for the ASEAN community. If you are an energy auditor, you will be able to offer value-added energy audit services to your customer by incorporating thermal energy recovery of the process. You can also offer energy audit services under the newly announced Energy Audit Conditional Grant (EACG) which supports energy auditing of both electrical and thermal energy. Widespread and holistic implementation of Energy Management System cover ing thermal and electrical energy in the region is expected to significantly increase the demand for thermal energy analysis experts in Malaysia and across ASEAN.

If thermal energy is the leading energy cost in your manufacturing site.

1. ***Huge potential reduction in energy bills from thermal heat recovery.***
    a. Over 7000 successful process integration applications worldwide, including our project experiences have resulted in thermal energy savings of between 10 to 50%, and a payback period of less than 3 years. Our recent petroleum refinery retrofit project for example amassed an annual savings of USD 12 Million.
2. ***"We already have heat recovery systems in place. How could we benefit more?"***
    a. Our experience shows that plant renovation, plant expansion, the addition of new product lines, consideration of total site, and area-wide integration could lead to ample energy cost-saving potentials.

Targeted Participants

1. Consultants working on plant design and retrofit projects
2. Energy auditors
3. Energy managers
4. Engineers and researchers looking to maximize plant and process heat recovery
5. Professional trainers and lecturers teaching heat integration or plant design
6. Students who will be working in process industries

TC1

Certification

Technical Category Training

Thermal Energy Recovery Technologist (TERT)

6 days workshop

TC1a Thermal Energy Recovery Technologist – Level 1 *(3 days)*

For TERT Level 1 competency, participants will be equipped with the basics of heat recovery, analysing thermal energy losses from the processes, energy-saving potentials, and the tools to target and design the maximum energy recovery system based on Pinch Technology. Participants will be trained by using excel tools for calculations and is also introduced to our proprietary Optimal Heat software. Participants need to submit the completed excel calculation as proof they have mastered the competency.

Learning Outcomes

1. Understand the benefits and application of heat integration.
2. Understand the basic concept on heat integration and Pinch Analysis.
3. Target maximum energy recovery by using Composite Curves and Problem Table Algorithm.
4. Extract correct stream data for heat integration analysis.
5. Design heat exchanger network that achieves the maximum energy recovery target.
6. Design heat exchanger network that achieves the maximum energy recovery target with stream splitting.
7. Determine the minimum number of units.
8. Design heat exchanger network that achieves the minimum number of units.
9. Make the correct placement for multiple utilities.
10. Familiarise with Optimal Heat software for heat integration.

Course Outline

1. Maximising Energy and Resource Cost Savings in Industry using Pinch Analysis.
2. Process Integration based on Pinch Analysis - The Basic Concepts.
3. Setting the Minimum Energy Targets (Energy Targeting) using Composite Curves.
4. Significance of Composite Curves.
5. Energy Targeting using Problem Table Approach (PTA) with working session.
6. Stream Data Extraction (SDE).
7. Stream Data Extraction (SDE) Working Session.
8. Design of Heat Recovery Network (HRN) by using Grid Diagram.
9. Transferring Grid Diagram back to Flowsheet.
10. Design of Complex HRN (with Stream Splitting).
11. Minimum Units Targets.
12. Reducing Number of Units.
13. Economic Analysis.
14. Multiple Utility Targeting and Optimisation using Grand Composite Curve (GCC).

TC1b Thermal Energy Recovery Technologist – Level 2 *(2 days)*

For TERT Level 2 competency, participants are exposed to more advanced Pinch Technology techniques to optimise capital and operating cost of the thermal energy recovery system, further recovery potential from process modification analysis, combined heat and power system integration and analysis, retrofit analysis and exploring multiple sites energy exchange potential. Participants need to submit the completed excel calculation as proof they have mastered the competency.

TC1

Certification

Technical Category Training

Thermal Energy Recovery Technologist (TERT)

6 days workshop

Learning Outcomes

1. Understand the importance of heat exchanger network retrofit.
2. Apply the steps to perform heat exchanger network retrofit.
3. Perform economic analysis and cost-benefit analysis for heat exchanger network design.
4. Perform retrofit case study.
5. Understand the basic concept of process modification.
6. Understand the combined heat & power system.
7. Understand the concept of total site heat integration.

Course Outline

1. Advanced Process Integration – Optimum DTmin.
2. Advanced Process Integration – Process Modification.
3. Advanced Process Integration – Combined Heat & Power.
4. Advanced Process Integration – Total Site Heat Integration.
5. Optimal Heat Demo.
6. Step-wise retrofit procedure.
7. Retrofit Analysis.
8. Economic Analysis and Cost Benefit Analysis.
9. Retrofit Case Study.

TC1c Thermal Energy Recovery Technologist – Level 3 *(1 day)*

Certification

For TERT Level 3 competency, participants are required to demonstrate they can apply the knowledge of Level 1 and 2 to an industrial case study. They are required to complete an industrial case study assignment. In addition, they also need to take an examination to test their knowledge.

Learning Outcomes

1. Apply knowledge of TERT Level 1 and 2 to solve industrial case study.
2. Examine participants' TERT knowledge via examination.

Course Outline

1. Online Exam.
2. Industrial Project Case Study Presentation.

TC1d Thermal Energy Recovery Technologist – Level 4 *(By application)*

Certification

For TERT Level 4 competency, participants need to demonstrate they have applied the TERT Level 1 to 3 knowledge to a real industrial case study. The participant needs to submit the project report. An evaluation committee will be appointed, which will vet the report in detail. There will be an evaluation session between the candidate and the evaluation committee. Upon satisfactory evaluation by the committee, the candidate will be awarded TERT Level 4.

TC1

Certification

Technical Category Training

Thermal Energy Recovery Technologist (TERT)

6 days workshop

TERT (Bundle Packages)

Special Offer! Get our limited time Bundle Package: Levels 1 to 3 Training + Optimal Heat Software

TERT Bundle A:

- This bundle contains Thermal Energy Recovery Technologist level 1-3 (Physical (TERT 1 & 2) & Online (TERT 3) training method with instructors).

TERT Bundle B:

- This bundle contains Thermal Energy Recovery Technologist level 1-3 + (Physical (TERT 1 & 2) & Online (TERT 3 training method with instructors). + Optimal Heat Software *(Licence for 1 computer).*

OPTIMAL HEAT

ANALYSIS AND SOLUTION OF MAXIMUM THERMAL WASTE HEAT RECOVERY POTENTIAL

- Maximum energy recovery (MER) target
- Design the heat exchanger network (HEN) that achieves the MER target
- Alternative HEN design manipulation
- Determine the multiple utilities level targets to minimise cost
- Determine the system economics
- Determine the right minimum temperature difference.

Trainers

1. Prof. Ir. Ts. Dr. Zainuddin Abdul Manan
2. Prof. Ir. Ts. Dr. Sharifah Rafidah Wan Alwi
3. Assoc. Prof. Ir. Dr. Lim Jeng Shiun
4. Dr. Lai Yee Qing

TC2

Technical Category Training

Industrial Thermal Energy Audit and Analysis (ITEA)

3 days workshop

Workshop Overview

Up to 50% of industrial thermal energy input are finally lost as waste heat in exhaust gases, cooling water, heated surfaces and in products/byproducts (US-DoE). Thermal energy efficiency improvement typically offers among the biggest scope for energy cost saving in industry. By benchmarking process and equipment performances, identifying inefficiencies and implementing targeted measures involving optimization of operating parameters and equipment upgrades, significant cost savings and emission reduction can be achieved. Regular monitoring and maintenance of optimal operations ensure sustained energy cost savings, GHG emission reduction and compliance with regulations.

Workshop Objective

This course aims to equip participants with practical concepts, principles, tools and systematic techniques to conduct energy audit, benchmark and analyse the thermal energy efficiency of industrial processes and utility systems, and effectively apply the tools and techniques for thermal energy cost saving measures.

Learning Outcomes

1. Holistically perform energy audit involving process as well as the utility areas.
2. Conduct process/equipment energy accounting using energy balances & Sankey diagram.
3. Apply systematic procedure for macro and technical-level energy audit and analysis.
4. Utilise Pinch Analysis benchmarking tool to establish energy recovery targets for process and utilities and to assess potential to maximise energy savings.
5. Gain awareness on Pinch Analysis Optimal-Heat software for maximising heat recovery.
6. Identify, analyse and evaluate energy savings measures covering thermal utility system such as boiler and steam system, combined heat and power (cogeneration); and processes and such as reactor, ovens, dryers, separator and heat exchangers.

Learning Outline

1. Industrial Thermal Energy Audit (ITEA) – Premise and The Big Picture
2. Industrial Energy Audit and Analysis – The 10 Key Steps – Part 1
3. Industrial Energy Audit and Analysis – The 10 Key Steps – Part 2
4. Process and Equipment Thermal Energy Accounting – Part 1
5. Process and Equipment Thermal Energy Accounting – Part 2
6. Thermal Energy Pinch Benchmarking and Targeting
7. Maximum Thermal Energy Targeting
8. Heat Recovery Systems – Analysis, Design and Retrofit
9. Fuels & Combustion
10. Thermal Utility Analysis & Improvements
11. Combined Heat and Power (Cogeneration) Systems
12. Thermal Utility Analysis & Improvements

Trainers

1. Prof. Ir. Ts. Dr. Zainuddin Abdul Manan
2. Prof. Ir. Ts. Dr. Sharifah Rafidah Wan Alwi
3. Assoc. Prof. Ir. Dr. Lim Jeng Shiun

TC3

Technical Category Training

Energy Audit on Electrical System

2 days workshop

Workshop Overview

Technical energy audits are detailed evaluations of the actual performance of a facility's energy using systematic approach and equipment, benchmark against the designed performance level or the industry. Trainees will gain insight on the importance of selecting the right electricity tariff, power factor improvement and how to manage the electrical load. Trainees will also learn how to improve the energy efficiency for lighting, motor and transformer. This training will also provide demonstration on the use of electrical energy audit equipment.

Learning Outcomes

1. Learn to select the best electricity tariff.
2. Reduce your Energy Costs Improve Energy Efficiency of your Facilities.
3. How to improve the power factor to reduce the electrical energy consumption.
4. How to manage the electrical load.
5. The important aspects of improving the energy efficiency of transformer.
6. Lighting and motor energy improvement measures.

Learning Benefits

1. Reduce your Energy Costs.
2. Improve Energy Efficiency of your Facilities.

Course Outline

1. Electricity Tariff
2. Power Factor Correction
3. Electric Motor
4. Transformer
5. Lighting
6. Electrical Load Management
7. Electrical Energy Audit
8. Methodology

Targeted Participants

Energy manager, Professionals from any discipline, Facility/maintenance managers or engineers and Industry personnel who wish to learn more on electrical system.

Trainer Profile

1. Prof. Ir. Dr. Mohammad Yusri Hassan

TC4

Technical Category Training

Energy Efficiency Improvement of Mechanical Equipment

2.5 days workshop

Workshop Overview

In this course, participants will learn the technical energy efficiency improvement measures for mechanical equipment including chillers, fans, pumps and compressed air systems. Participants will also be exposed to the systematic approach to analyze the energy efficiency of these equipment and understand the typical energy losses, and gain insights on how to improve the energy efficiency.

Learning Outcomes

1. Determine the current energy efficiency of your mechanical equipment.
2. Identify energy improvement opportunities.

Learning Benefits

1. Reduce your facilities' energy costs.
2. Improve the energy efficiency of the mechanical equipment in your facilities.
3. Gain professional recognition.
4. Prepare your organisation for setting up an energy management system.

Course Outline

Fundamentals, efficiency calculations, energy improvement oppurtunities

1. Chiller
2. Fluid Pumps
3. Fans
4. Compressed Air System

Targeted Participants

Energy manager, Professionals from any discipline, Facility/maintenance managers or engineers and Industry personnel who wish to learn more on electrical system.

Trainer Profile

1. Assoc. Prof. Ir. Dr. Hayati Abdullah

TC5

Technical Category Training

Energy Conservation for Air-Conditioning Systems

2 days workshop

Workshop Overview

This course is designed to provide building operators, maintenance personnel, energy managers and executives working in commercial buildings and industries with the necessary skills to improve energy efficiency of air-conditioning systems through enhanced operations.

This course provides participants with an understanding of the fundamentals of the operation of various types of air-conditioning systems. Participants shall be able to appreciate the thermodynamic properties of moist air and its application in coil load calculation and the determination of the performance indicators of air-conditioning systems. Various strategies for energy conservation and cost-saving measures will be discussed. This training emphasizes on interactive learning.

Learning Outcomes

1. Describe various types of air-conditioning systems used in commercial buildings and industries.
2. Explain the working operations of the basic refrigeration cycle.
3. Analyse air properties using the psychrometric chart and how they relate to thermal comfort.
4. Determine performance indicators for air-conditioning systems.
5. Identify energy conservation measures and savings.

Learning Benefits

Participants will gain knowledge in the area of air-conditioning and be able to improve energy efficiency of air-conditioning systems in their plants or buildings.

Course Outline

1. Introduction to Air-Conditioning Systems.
2. Air-Conditioning Fundamentals.
3. Energy Efficiency of Air-Conditioning Systems.
4. Efficient operation and maintenance of air-conditioning systems.
5. Air-Conditioning Energy Audit.
6. Case Study - M&V of Air-Conditioning System.
7. Summary - Energy Conservation Measures.

Targeted Participants

Energy Managers, Building Operators and Facility/Maintenance Personnel.

Trainer Profile

1. Assoc. Prof. Ir. Dr. Hayati Abdullah

TC6

Technical Category Training

GHG Emissions Accounting and Management

2 days workshop

Workshop Overview

Are you ready to take your organization's sustainability and ESG efforts to the next level? Join our upcoming training on GHG accounting and energy-emissions management with a 3-in-1 package of training, software demonstration and use of real-time monitoring and optimisation tools.

Over the course of two days, you'll have the chance to learn and apply the techniques for GHG accounting and reporting, from principles and inventory boundaries to emission quantification and reporting based on the ISO 14064-1:2018 standards. We will also demonstrate how to use a GHG accounting software to streamline your reporting process.

Wait, there are more. You will also be exposed to tools for energy-emissions management, including real-time monitoring of energy systems and optimization of chiller efficiency to help reduce energy wastage and cut down emissions. Don't miss out on this valuable opportunity to gain the knowledge and skills you need to transform your organization's sustainability and ESG efforts. Register today and join our 3-in-1 training program!

Learning Outcomes

1. **Drive and plan**
   a. Gain awareness and drive to synergise energy and emissions management.
   b. Pave the way toward net-zero carbon emissions.
2. **Identify, quantify, analyse and report**
   a. Understand the concept and principles of GHG accounting and reporting, including the inventory boundary, GHG emission identification and reporting.
   b. Quantify GHG emissions.
   c. Use LCOS GHG accounting software.
   d. Report the results based on ISO 14064 standards.
3. **Monitor and mitigate**
   a. Apply smart systems for real-time monitoring and control of energy consumption.
   b. Optimize the delta-T to improve energy efficiency of chiller systems

Targeted Participants

Sustainability or ESG managers, energy and environmental engineers and managers, consultants and professionals interested in implementing sustainable practices.

Trainers

1. Assoc. Prof. Ir. Dr. Lim Jeng Shiun
2. Prof. Ir. Ts. Dr. Zainuddin Abdul Manan
3. Prof. Ir. Ts. Dr. Sharifah Rafidah Wan Alwi
4. Saiful Adib bin Abdul Munaff

TC7

Technical Category Training

Chiller Plant Energy Efficiency

1 day workshop

Workshop Overview

This training provides an opportunity for participants to be exposed to an in-depth energy analysis of chiller plants as well as methods for evaluating the plant's energy performance. This training is designed to give participants a learning experience in carrying out energy audit measurements and to identify possible savings through selected energy conservation measures and the return of investment for chiller plants and cooling towers.

Learning Benefits

1. Able to carry out energy audit of chiller plants and cooling towers.
2. Able to identify energy saving measures for chiller plants.
3. Able to improve energy efficiency of existing chiller plants in building/industry.

Course Outline

1. Introduction Chiller Fundamentals & Thermal Comfort
2. Basic Refrigeration Cycle.
3. Chiller Plant Operations.
4. Chiller Plant Audit & Performance Assessment.
5. Cooling Tower Performance Assessment.
6. Energy Efficiency Opportunities.

Targeted Participants

Energy managers, Facility/maintenance managers or engineers, and Academicians.

Trainer Profile

1. Assoc. Professor Ir. Dr. Hayati Abdullah

AC1

Awareness Category Training

Now, Everyone Can Contribute Toward Energy Efficiency and Conservation!

4 hours workshop

Workshop Overview

This awareness course focuses on empowering an organisation and its staff to embrace sustainability culture. It emphasises on sustainable energy management as a key element of an Environmental, Social and Governance (ESG) program, and guides staff of an organisation to implement practical energy efficiency and conservation (EE&C) measures to achieve cost-efficiency and to build organizational excellence and resilience.

Learning Outcomes

1. Appreciate the key drivers and impacts of energy use on the organization, society, climate and the environment.
2. Be able to apply systematic, practical steps to implement energy efficiency and conservation (EE&C) measures and manage GHG emissions for an organisation.
3. Understand the cost-benefits of implementing EE&C measures via simple cost-savings analysis.

Course Outline

1. Energy use and impact on the GHG emissions, climate, environment and organisations.
2. Energy and emissions management.
3. Practical EE&C measures in an organization.
4. Cost-benefit analysis of implementing EE&C measures.

Targeted Participants

All staff of an organisation.

Trainer Profile

1. Prof. Ir. Ts. Dr. Zainuddin Abdul Manan
2. Assoc. Prof. Ts. Dr. Jasrul Jamani Bin Jamian

AC2

Awareness Category Training

Non-structural Energy Management: Energy Saving Through Behavior Change

1 day workshop

Workshop Overview

Building users contribute to the energy usage of a building. Their energy-using habits affect the building energy performance. The non-structural energy management approach provides non-technical solutions and low-cost approach for the organization to achieve better energy savings by improving building user's energy practices. Such goal can be achieved by applying emerging behavioural tools

This course provides an approach for energy managers to systematically integrate behavioural tools in the planning and implementation of energy efficiency and conservation practices among building users.

Learning Outcomes

1. Will understand the concept of non-structural energy management.
2. Will learn to plan and foster behaviour change among building users in systematic way.
3. Will understand the integration of behavioural tools in energy management for fostering energy practices among building users.

Learning Benefits

1. Understand the importance and concept of non-structural energy management.
2. Understand the systematic approach to foster energy saving behaviour among building users.
3. Comprehend behaviour changing tool and understand the concept in applying them for energy saving purpose.
4. Understand MEL (Monitoring, Evaluation and Learning) framework for non-structural energy management.

Course Outline

1. Introduction of non-structural energy management.
2. Systematic approach to foster energy saving behaviour among building users.
3. Energy behaviour changing tools.
4. MEL (Monitoring, Evaluation and Learning) framework for energy management .

Targeted Participants

Registered Electrical Energy Managers, Energy/sustainability managers, Facility & asset managers, Asset owners, Administrators & facility management companies, Lecturers, Researchers, Academicians & post-graduate students and Energy saving campaign planners.

Trainer Profile

1. Associate Professor Dr. Choong Weng Wai
2. Dr Low Sheau Ting
3. Dr. Wee Siaw Chui

Trainers Profile

PROF. IR. TS. DR. ZAINUDDIN ABDUL MANAN

FASc, FIChemE, PEng, Professional Technologists, CEng, CEM, REEM, Certified CEM Trainer, Certified HRD Trainer

Prof Ts Ir Dr Zainuddin Abdul Manan FASc, PEng, CEng, Technologist, FIChemE, CEM, REEM is a professor of chemical and energy engineering of Universiti Teknologi Malaysia (UTM). He is the founding director of UTM Process Systems Engineering Centre (PROSPECT), founding Dean of the UTM Faculty of Chemical and Energy Engineering, founder of the UTM spin-off, OPTIMISE, the founder of UTM Sustainable Energy Management Program and the founder of COPE-BEST. He began his career as an engineer at 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, has numerous patents and over 500 publications that include 20 books/chapters, over 250 refereed journals and 270 conference proceedings on sustainable resource planning and engineering (energy, water, emissions).

Zain is a UK/EU chartered engineer, a Fellow IChemE (UK/EU), a professional engineer (PEng), a professional technologist, a certified energy manager, a registered electrical energy manager and a certified trainer for ASEAN energy managers. Zain was the winner of Saudi's Prince Sultan International Prize for Water and was awarded as a Top Research Scientist of Malaysia. In 2014, he was awarded UTM Top Researcher and UTM Top Academician. He has been listed in Stanford University's World's Top 2% scientists. Zain has been a coach of professionals from over 600 organisations and delivered over 400 invited talks in professional courses, conferences and seminars worldwide.

Prof Zain is a Fellow, and was the chair of the of the ASM (Academy of Sciences Malaysia) Energy Committee (2021-2023) and chair of ASM Net Zero Task Force. He is also a chair of the Malaysia's EECA (Energy Efficiency and Conservation Act - Thermal Energy) Drafting committee. He was a member, and the Vice Chairman of the Board of Judges of ASEAN Energy Awards. In 2014, he was appointed as the Project Director for the Green Technology Blueprint for 57 OIC Countries, and as the OIC Ambassador for the World Green Growth Summit. He founded and spearheaded the UTM Sustainable Energy Management initiative that led UTM to achieve over USD 7 million energy savings between 2011 and 2021, to win the ASEAN Energy Awards in 2012, the National Energy Award 2022, the first AEMAS 3-Star ASEAN Certified Energy-Efficient organisation, and UTM to be ranked 1st globally by Times Higher Education on SDG7 – Affordable and Clean Energy.

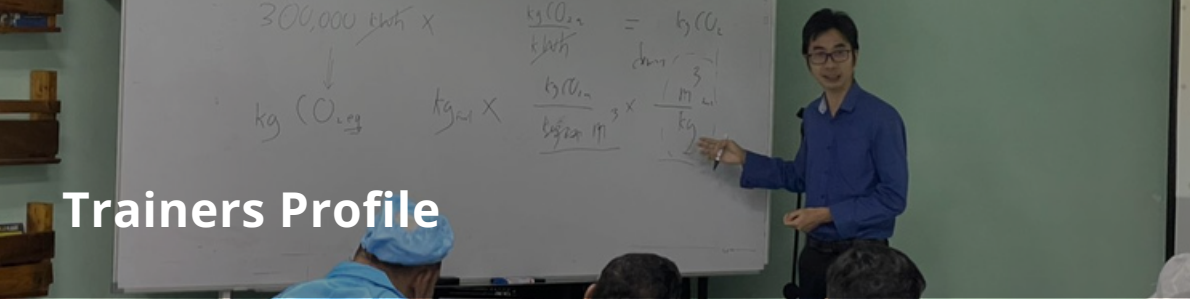
Trainers Profile

PROF. IR. TS. DR. SHARIFAH RAFIDAH WAN ALWI

PEng, MIEM, CEng, MIChemE, Professional Technologists, REEM, CEM, Certified CEM Trainer, Certified HRD Trainer

Prof. Ir. Ts. Dr. Sharifah Rafidah Wan Alwi is a Fellow and R&D Manager of Process Systems Engineering Centre (UTM-PROSPECT), and Professor in Faculty of Chemical and Energy Engineering in Universiti Teknologi Malaysia (UTM). She previously helmed as the Director of UTM-PROSPECT 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 and World Top 2% Scientist 2022 (Single Year and Career Long). 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 electrical energy manager and a certified trainer for ASEAN energy managers.



Trainers Profile

ASSOC. PROF. IR. DR. LIM JENG SHIUN

PEng, CEng, MIChemE, CEM, REEM, CEA, AEMVP, Certified CEM Trainer, Certified HRD Trainer

Assoc. Prof. 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 research fellow 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. Stanford University recognised him as one of the World's Top 2% Scientists. Dr Lim is the Associate Editor for Journal of Cleaner Production, an international high-impact journal focusing on reporting the state-of-the-art related to GHG emissions reductions. He is also the technical secretariat and guest editor for the International Conference of Low Carbon Asia and Beyond. He is also a professionally Certified Energy Manager, Certified Energy Auditor, Accredited Energy Measurement & Verification Professional and a Registered Electrical 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 GHG emissions accounting and mitigation strategy.

Dr Lim is a key research team member for the project on the Development of Low Carbon Society (LCS) Scenarios for Asian Regions, an international joint research program between Japan and Malaysia. One of the key outputs of this project is the development of Energy Chapter of LCS Blueprint for Iskandar Malaysia 2025, which is endorsed by the Prime Minister of Malaysia during the COP 18 Doha Climate Change Conference. 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.

Trainers Profile

ASSOC. PROF. TS. DR. JASRUL JAMANI BIN JAMIAN

Dr. Jasrul Jamani Bin Jamian received the Bachelor of Engineering (B. Eng. (Hons)) degree, Master of Engineering (M. Eng.) and Ph.D degree in electrical (power) engineering from Universiti Teknologi Malaysia in 2008, 2010 and 2013 respectively. He is currently director for Power Engineering Division, School of Electrical Engineering, Universiti Teknologi Malaysia. Dr Jasrul is actively involved in research as a principal investigator as well as leader in consultancy projects with several companies such as Petronas and Tenaga Nasional Berhad, which focuses on relay coordination projects and off grid solar PV design. He is the author and co-author of more than 80 publications in international journals and proceedings in the area of Power Systems and Energy. His expertise includes Network Reconfiguration, Optimization technique, and Renewable Energy.

ASSOC. PROFESSOR IR. DR. HAYATI ABDULLAH

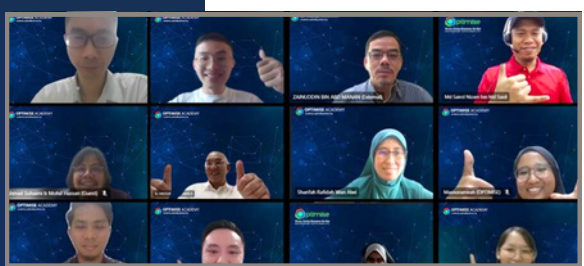
Ir. Dr. Hayati is an Associate Professor at the School of Mechanical Engineering, UTM. She specializes in Thermodynamics, more particularly in the area of Air-Conditioning and Energy Management. She was trained in Energy Management in Sweden and is a Certified Energy Manager (AEMAS). Ir. Dr. Hayati is a Professional Engineer registered with The Board of Engineers Malaysia, Chartered Engineer registered with The Engineering Council United Kingdom and Past Chairman of The Institution of Engineers Malaysia (Southern Branch). She has experience working as an Energy Management consultant for over 25 years & has worked in National Energy Conservation & Auditing projects including with international consultants such as ADEME from France.

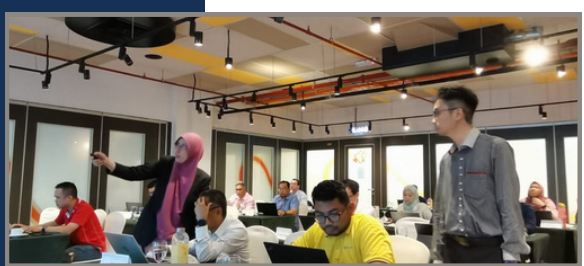
PROF. IR. DR. MOHAMMAD YUSRI HASSAN

Prof. Ir. Dr. Mohammad Yusri Hassan is a Professor at Faculty of Electrical Engineering, Universiti Teknologi Malaysia (UTM). He was the Director of Centre of Electrical Energy Systems (CEES), UTM. He has wide experiences in the area of energy consultancy. He is also a Working Group Member of Energy Efficiency of SIRIM and member of SIRIM Technical Committee on Energy Management. He is a Certified Energy Manager under ASEAN Energy Management Scheme (AEMAS) and a Registered Electrical Energy Manager under the Energy Commission of Malaysia.

DR. LAI YEE QING

Dr. Lai Yee Qing is the Assistant Manager of Optimal Systems Engineering. She has been involved in industrial energy audit projects, specialize in industrial processes and thermal energy recovery. She has helped industries to reduce energy bills and carbon dioxide emissions. She has been awarded the Green Talents Award 2019 by the German Federal Ministry of Education and Research for her contribution in inventing a practical method to increase thermal efficiency of manufacturing processes. Yee Qing is also a Certified Energy Manager recognized under AEMAS.





WORKSHOP TESTIMONY

★★★★★

This is an opportunity to learn from and to build network with established pinch practitioners in Malaysia. With the increasing energy prices, it is wise for companies to further improve and optimize their processes to stay competitive and profitable. - ***Md Sairol Nizam Bin Md Saidi (Participant of TERT)***

★★★★★

This course has practical work sessions which allow participants to apply what they learn, and by doing so, reinforces their understanding and helps to retain knowledge. You don't know if you truly understand the concept until you've been asked to apply them.- ***Lau Zheng Zhou (Participant of GHG Emissions Accounting and Management)***

★★★★★

This training provided up-to-date information and know-how; It is a fruitful sharing delivered by a team of high-level professionals. I shall continue participating with this organisation to gain more. - ***Wong Tien Yi (Participant of EnMS)***

★★★★★

The course provides a very good understanding on how, by selecting the right equipment, we tend to save the power consumption which eventually helps the environment and sustainability as well. - ***Mera Jane (Participant of In-house Training for Now, Everyone Can Contribute to Energy Efficiency and Conservation)***

★★★★★

The ITEA Training was very useful for companies aiming to enhance energy efficiency of plant operations. From theory to in-depth methodology, participants learnt many new methods from OPTIMISE experienced professors and educators. I recommend those who are going for sustainability to join this training. Well done OPTIMISE! - ***Azree Hazwan (Participant of ITEA)***

WORKSHOP TESTIMONY

★★★★★

I think what is great about this training is that we get to practice almost immediately the details shared. This way the understanding of the subject is immediately applied and clarified if not understood especially since the training is done online. - ***Tharmaswaran (Participant of Introduction to GHG Accounting)***

★★★★★

This course is tremendously helpful for me to implement the energy management system in my organisation. The syllabus is well explained and full of examples to follow. - ***Ts Mohd Mawardi bin Hussain (Participant of EnMS)***

★★★★★

Good learning phase to covered all the topics with good practical activity along the training. - ***Ismail Azmi (Participant of Data Review and Gap Analysis)***

★★★★★

I'm gained additional information about GHG, some emission factor. Trainers demonstrate competence and effectiveness communication skills. - ***Muhammad Faiz Bin Abd Rahman (Participant of Introduction to Inventory Accounting and Reporting)***

★★★★★

It really contributes to personal skills growth and helps participant qualities to be equipped with current industry needs. It delivers what it offers and gives some eye-opening theory and understanding on how energy conservation should be analyzed and done rather than just to commit to renewable energy or conventionally resources to newer or better equipment by relooking into plant design. - ***Nur Hidayat Purdiono (Participant of TERT)***

Physical Workshop

With years of experience in training professionals, we offer company-specific solutions that targets to help business upskill and develop their employee capabilities with relevant knowledge.

Online Workshop

We have successfully organised virtual trainings with participants throughout Malaysia and abroad, bridging the gap of social distance during the pandemic.

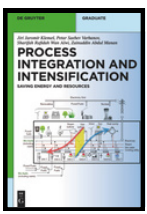
On-demand Workshop

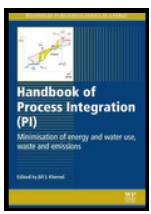
Our latest launch of self-paced learning program caters to industrial professionals to learn flexibly for continuous development.

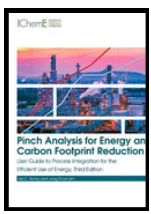
ENERGY, WATER & RESOURCE SUSTAINABILITY LEADERSHIP

- Chair of ASM Energy Committee (2021-2023).
- Chair, ASM MyNet Zero Task Force(2021-2023).
- Chair, Energy Efficiency & Conservation Act (EECA) - Thermal Energy Drafting Committee
- Technical Advisor of KETSA Energy Blueprint, ST, SEDA, MGTC.
- Over 500 Companies Outreached, End-Users Advised & Certified.
- ASEAN EMS 1st ASEAN Certified 3-Star EnMS

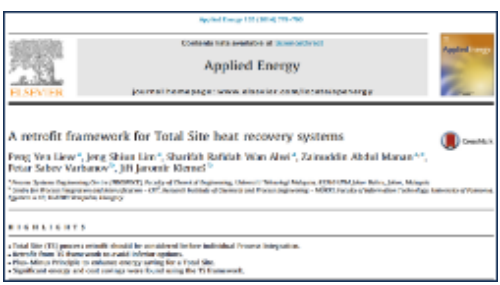
Highlights of Global Publications on Energy, Water, Resource Savings and Emission Reduction







Book 1: **Process Integration and Intensification**
Book 2: **Handbook of Process Integration (PI)**
Book 3: **Pinch Analysis for Energy and Carbon Footprint Reduction**



Research Publication Highlight: **A retrofit framework for Total Site heat recovery systems**

Research Publication Highlight: **Centralised utility system planning for a Total Site Heat Integration Network**

We spearheaded the UTM Sustainable Energy Management Programme toward national and international recognitions

- Ranked No. 1 Globally by THE on SDG-7
- 1st ASEAN-EMGS 3* Energy-Efficient Facility
- Winner of ASEAN Energy Award 2012, 2022
- RM30 Million Energy Savings 2011-2020
- 10 Registered Electrical Energy Managers
- 50 Certified Energy Managers (CEMs)
- A Centre for Energy Managers Certification
- Centre for Continuing Education in SEM
- Certified ASEAN/ISO50001 Trainers/Auditor
- RDCC Leader in Thermal Energy Efficiency

CEO Insights Asia

Industrial Retrofit Project

Reported in Chemical Engineering (Global) Magazine for Engineering Practitioner with evidence of FW reduction up to 85.1%, WW reduction to 97.7% and an extremely short payback period of 4 months only.

Real Examples of our Triple-Bottom Line Benefits for companies that utilizes waste heat recovery.

Reference Energy Minimisation Projects

56 mil./year — **Refinery Project**
Energy savings by Retrofit of Heat Recovery System

18 mil./year — **Middle Distillate**
Energy savings by Total Site Heat Integration Retrofit Study

3.3 mil./year — **Oleochemical**
Energy and Water Recovery Savings

Reference Water Minimisation Projects

4 months — **Semi-Conductor Plant**
85.1% freshwater reduction
97.7% wastewater reduction
4 months payback period

22 months — **Chlor Alkali Plant**
35.8% freshwater reduction
100% wastewater reduction
1.87 years payback period

60 months — **Mosque**
95.3% freshwater reduction
67.7% wastewater reduction
5 years payback period

18 months — **Paper Mill Plant**
14% freshwater reduction
14% wastewater reduction
1.5 years payback period

In-house Training Overview (Form A)				
Management Category		**Total Days**	**Certification**	**(✓)**
MC1	Energy Manager Training Course (EMTC)	5 days	Yes	
MC2	Establishment of an Energy Management System (EnMS)	2 days		
MC3	Building Organisational Resilience via a Sustainable Energy Management Program	1/3 day		
Technical Category				
TC1	**Thermal Energy Recovery Technologist (TERT) – Level 1-3 (Bundle Packages)**	**6 days**	Yes	
TC1	**Thermal Energy Recovery Technologist (TERT) – Level 1-3 (Bundle Packages + Optimal Heat Software)**	**6 days**	Yes	
TC1a	Thermal Energy Recovery Technologist (TERT) – Level 1	3 days		
TC1b	Thermal Energy Recovery Technologist (TERT) – Level 2 *(*Prerequisite: TC1a)*	2 days		
TC1c	Thermal Energy Recovery Technologist (TERT) – Level 3 *(*Prerequisite: TC1a and TC1b)*	1 day	Yes	
TC2	Industrial Thermal Energy Audit and Analysis (ITEA)	3 days		
TC3	Energy Audit on Electrical System	2 days		
TC4	Energy Efficiency Improvement of Electrical and Equipment	2.5 days		
TC5	Energy Conservation for Air-Conditioning Systems	2 days		
TC6	GHG Emissions Accounting and Management	2 days		
TC7	Chiller Plant Energy Efficiency	1 day		
Awareness Category				
AC1	Now, Everyone Can Contribute Toward Energy Efficiency and Conservation!	1/3 day		
AC2	Non-structural Energy Management: Energy Saving Through Behavior Change	1 day		

Kindly **tick (✓)** on the right side column of the **Form A** for selection of your training title. After filling up **From A** and **Form B**, kindly send both pages to us via email to training@optimalsystems.my.

***** For training code: MC3 and AC2, maximum participant per session is at 50pax.***

Request for In-House Training Quotation

Kindly fill up and submit to **training@optimalsystems.my**

Registration Information (Form B)			
Title (Dr/Mr/Mrs/Ms)			
Person In-Charge Name			
Person In-Charge Mobile No.		**Person In-Charge Position**	
Email			
Organization Name			
Organization Address			
In-house Training Address (Physical)			

Application Information			
Training Title			
Training Mode	☐ Physical	☐ Online	
Expected Date for In-house Training	Date 1:	Date 2:	Date 3:
Expected Number of Pax			
Payment Type	☐ HRDC	☐ Non-HRDC	
Additional Remarks			

☐ I agree to all terms & conditions on In-house Training Policy

For training workshops:
All training fee listed are standard arrangement only. For special arrangement, kindly consult with our staff to inquire more on the final figure. **For selection of more than 1 title for in-house training, you are entitled to exclusive rates per pax.**

1) Maximum number of person per session is 30 pax.
2) Minimum number of person per session is at 20 pax.

For F2F inhouse training outside Johor Bahru, cost of accommodation and travel for trainers and secretariat will be borne by client.

The Client has to provide: (for Face-to-face only)
1) Training Venue and/or Facilities
2) Meal for Participants, Trainer(s) and Secretariat(s)

For Special Arrangement:
Office Tel : (+60)7-570 4842
Phone : **Ms Famieza** (+60)16-7167248
Email : inquiry@optimalsystems.my

Organization Stamp / Signature*