Optimise
Optimal Systems Engineering Sdn Bhd
ENGINEERING SUSTAINABILITY

24 CDP Hours Approved under Mandatory REM Type - 2

THERMAL ENERGY RECOVERY TECHNOLOGIST

LEVEL 1: BASIC OF HEAT RECOVERY OPTIMISATION

29 - 31 March 2027 (Online via Microsoft)
Time: 8:30 am - 5:00 pm
*Date subject to changes. For latest date, refer to website.

RM4,050 per pax
**Price excluding 8% SST charges*







Register Now!
https://shorturl.at/XqicA

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MyHS00015/22-E002

HRD CORP CLAIMABLE

WORKSHOP OVERVIEW

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.

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 BENEFITS

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 heat recovery optimisation. Learn from certified experts and practitioners on how to perform optimal thermal energy recovery analysis 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 covering 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.

CERTIFICATION LEVEL OVERVIEW

1)Thermal Energy Recovery Technologist –LEVEL 1: Basic Of Heat Recovery Optimisation

2)Thermal Energy Recovery Technologist – Level 2: Heat Recovery Optimisation for Retrofit Design

3)Thermal Energy Recovery Technologist – Level 3: Professional *Certification*

4)Thermal Energy Recovery Technologist – Level 4: Expert *Certification*

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).

WORKSHOP SCHEDULE

Day 1	
08.30 am - 09.00 am	Registration
09.15 am - 10.15 am	Maximising Energy and Resource Cost Savings in Industry using Pinch Analysis
10.15 am - 10.45 am	Process Integration based on Pinch Analysis - The Basic Concepts
10.45 am - 11.00 am	Break
11.00 am - 01.00 pm	Setting the Minimum Energy Targets (Energy Targeting) using Composite Curves with working session
01.00 pm - 02.15 pm	Lunch Break
02.15 pm - 03.15 pm	Significance of Composite Curves
03.15 pm - 03.30 pm	Break
03.30 pm - 05.00 pm	Energy Targeting using Problem Table Approach (PTA) with working session

Day 2	
09.00 am - 10.30 am	Stream Data Extraction (SDE)
10.30 am - 10.45 am	Break
10.45 am - 11.15 am	Stream Data Extraction (SDE) Working Session
11.15 am - 01.00 pm	Design of Heat Recovery Network (HRN) by using Grid Diagram + Working Session
01.00 pm - 02.15 pm	Lunch Break
02.15 pm - 03.15 pm	Transferring Grid Diagram back to Flowsheet + Working Session
03.15 pm - 03.30 pm	Break
03.30 pm - 05.00 pm	Design of Complex HRN (with Stream Splitting) + Working Session

WORKSHOP SCHEDULE

Day 3	
09.00 am - 11.00 am	Minimum Units Targets
11.00 am - 11.15 am	Break
11.15 am - 12.15 pm	Reducing Number of Units + Working Session
12.15 pm - 01.00 pm	Economic Analysis + Working Session
01.00 pm - 02.15 pm	Lunch Break
02.15 pm - 03.15 pm	Multiple Utility Targeting and Optimisation using Grand Composite Curve (GCC)
03.15 pm - 03.30 pm	Break
03.30 pm - 05:00 pm	Working Session & Closing

TRAINERS' PROFILES



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' PROFILES



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.

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

WHAT OUR TRAINEES Said



TERT 1 provides insights and practicality tools for industrial practitioners to discover thermal energy saving, by maximizing potential heat recovery while minimizing external cooling and heating duty requirement through pinch analysis.

MOHAMAD FIRDAUS BIN AZIZAN
SE (TECHNOLOGY & PROCESS OPTIMIZATION)
BASF PETRONAS CHEMICALS SDN. BHD
Thermal Energy Recovery Technologist (TERT)
- Level 1: User participant

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 SAID
SENIOR MANAGER (TECHNOLOGY & PROCESS OPTIMIZATION)
BASF PETRONAS CHEMICALS SDN. BHD
Thermal Energy Recovery Technologist (TERT)
- Level 1: User participant



Pinch Analysis is about understanding and optimizing the heat integration potential of a process. It's like a puzzle where different temperature streams need heating or cooling. The "pinch point", the critical temperature difference, shall be minimized to allow for energy-saving opportunities. Pinch Analysis can also be extended to optimize power consumption in addition to heat integration. While the foundational principles of Pinch Analysis were initially developed for heat exchange systems, the methodology's concepts and techniques can be adapted to address power integration and optimization within industrial processes.

AUSTIN LIM
CONSULTANT
IEN CONSULTANTS SDN BHD
Thermal Energy Recovery Technologist (TERT)
- Level 1: User participant