

## WEBINAR TALK

# Minimise Industrial Thermal and Electrical Energy, Waste, Resources and Cost using Pinch Analysis

Organised by: Oil, Gas and Mining Technical Division, IEM

BEM Approved CPD/PDP Hours: 2.0 Hours

Ref No: IEM20/HQ/287/T(w)

**13 MARCH 2021 | 9.00 AM – 11.00 AM**

## SYNOPSIS

The Efficient Management of Electrical Energy Regulations 2008 (EMEER 2008) in Malaysia requires companies consuming 3,000,000 kWh of electricity for six consecutive months to appoint a registered electrical energy manager (REEM) and to submit report on energy reduction initiatives every six months. In the upcoming Energy Efficiency Conservation Act (EECA), thermal energy which could yield the most energy saving potential in industry will be part of the regulation. Under EECA, energy managers will have to manage and reduce both electrical and thermal energy in their facilities.

In many energy audits, thermal energy efficiency measures are typically confined to improvement of service/utility facilities involving boilers and steam systems. Few companies are willing to venture into the heart of utility-guzzling process operations and address the core of energy efficiency problems involving reactors, separators, heat exchanger networks, to maximise energy cost savings.

The benefits that can be derived from an energy audit exercise focused on service facilities can be rather limited, typically around 10%. In contrast, reported energy savings from Pinch Analysis applications worldwide is in the range of between 10 to 60%, with payback periods of less than 2 years.

This lecture demonstrates how Process Integration using Pinch Analysis (PI-PA) can be used to effectively address the core of energy efficiency problems so that energy and utilities demanded from service facilities by energy-guzzling equipment at the core processes, could be inherently minimised. The lecture highlights how simple, insight-based graphical tools built on the fundamentals of resource balances enable Pinch analysts to set the *minimum energy and resource consumption targets* across processes and industrial sites. The minimum targets is then used to guide energy managers to achieve a step-change in process improvement to maximise thermal and electrical energy

## SPEAKER



**Prof. Ir. Ts Dr Sharifah Rafidah Wan Alwi, PEng, MIEM, CEng, MChemE**, is a Professor in the School 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). Sharifah is currently the co-founder and Director of Optimal Systems Engineering Sdn Bhd, a UTM Spin-off company. She holds a BEng in Chemical Engineering from UMIST, UK and PhD from UTM. Sharifah has been extensively involved in 80 research projects (worth RM7.54Million), 17 industrial based projects for various companies and government agencies and has trained engineers from more than 200 companies in sustainable engineering design and management. She is a certified ASEAN Energy Management Scheme (AEMAS) Energy Manager trainer and a Registered

Electrical Energy Manager under Malaysia Energy Commission. Dr Sharifah is an expert in various Pinch Analysis techniques to recover heat, water, mass, CO<sub>2</sub>, waste gases and hybrid power system. She is an expert Pinch consultant for multiple industries and is among the leading researchers in Pinch Analysis technique development. Her work has been filed for patents and featured in leading national and international chemical and engineering journals, magazines and conferences. Together with her team, they have developed various Pinch software, including Optimal Heat, Optimal Water and Optimal Audit. 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 and Top Research Scientists Malaysia 2018. Due to her various contributions globally and locally, she was promoted as Professor in 2016 at the age of 34 years old by Universiti Teknologi Malaysia. Dr Sharifah is also the Associate Editor for Journal of Cleaner Production, Chair for the Science Leadership Working Group under Young Scientist Network, Academy of Sciences Malaysia (YSN-ASM) and UTM Sustainable Energy Management System advisor. She has also served as the Chair for Malaysia IChemE Young Engineer Group (YEG).



### Registration fees

(Effective 1st August 2020)

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