



The Institution of Engineers, Malaysia



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Jointly Organised by Electrical Engineering Technical Division, IEM & Monash University Malaysia

TECHNICAL TALK & LAB VISIT ADVANCING HYDROGEN-FUELLED INTERNAL COMBUSTION ENGINES: FROM SMALL- TO LARGE-SCALE POWER GENERATION

HHO-Assisted Combustion, Dual-Fuel Gensets & Smart H₂ Flow Control

14 NOVEMBER 2026, SATURDAY

9AM - 12PM

**PLENARY THEATRE, MONASH UNIVERSITY MALAYSIA,
FOLLOWED BY A VISIT TO OUR ENGINE RESEARCH
LABORATORY**

SPEAKERS:

Ir. Dr. Ooi Jong Boon (Jacob)



Dr. Arulnageswaran
Aruleswaran (Arul)

FEE FOR REGISTRATION

(INCLUSIVE 8% SST)

BEM Approved CPD Hours : 3
Ref. No. : IEM26/HQ/503/T

IEM MEMBER : RM30
NON-IEM MEMBER : RM50

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SYNOPSIS:

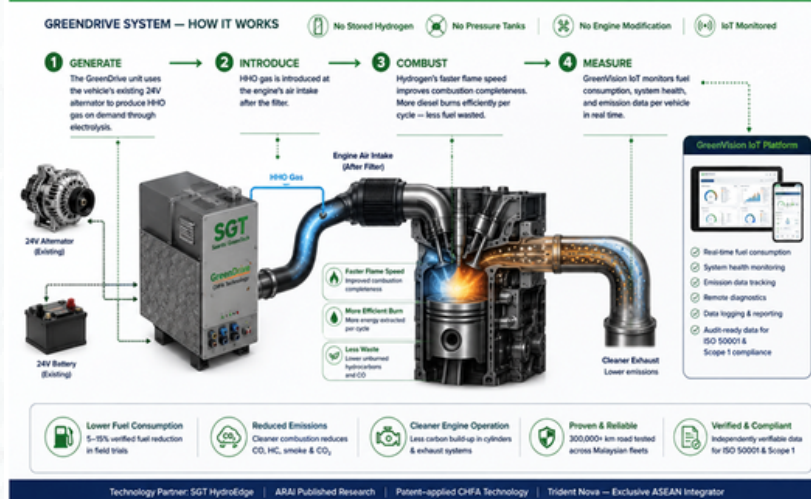
This talk presents Monash University Malaysia's ongoing hydrogen-fueled and hydrogen-assisted internal combustion engine (H_2 ICE) research, conducted in collaboration with industry partner Trident Nova Sdn. Bhd. Three current projects are covered: an HHO-assisted light-duty diesel engine; a hydrogen–diesel dual-fuel engine for stationary power generation; and a novel auto-regulating flow valve for portable H_2 gensets. Participants will gain insight into retrofit pathways, performance–emissions trade-offs, and techno-economic considerations for low-carbon power generation across both mobile and stationary applications.

Complementing the laboratory and on-going DOE runs, the second part of this talk presents lessons from live commercial fleet deployments across Malaysian long-haul and municipal operations. Field trials spanning Euro 2 to Euro 6 engine generations, across multiple makes and duty cycles, produced validated fuel efficiency improvements of 8 to 22 percent, with EGA-confirmed reductions in CO, CO_2 , hydrocarbons, and particulate matter. A zone-based analytical methodology was developed to isolate HHO performance from operational variables including load variance, route profile, and fuel allocation practices. Dose-response confirmation established directional causality.

These findings bridge the gap between controlled laboratory conditions and real-world fleet economics and outline the commercial pathway from proof of concept to verified fleet decarbonisation at scale.

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SPEAKERS' PROFILE

Ir. Dr. Ooi Jong Boon (Jacob)

Senior Lecturer, Department of Mechanical Engineering, Monash University Malaysia, and Course Director for the Bachelor of Sustainable Energy Technology. A Professional Engineer (P.Eng., CEng, MIMechE), he leads the Monash-IGNITE research platform on hydrogen-fuelled and hydrogen-assisted combustion engines and is principal investigator on related industry and internal research grants.

Dr. Arulnageswaran Aruleswaran (Arul)

Director of Trident Nova Sdn. Bhd., an industry partner supplying HHO (Hydroxy) gas generation technology for combustion research, and collaborator on the current Monash–Trident Nova hydrogen–diesel combustion project. Arul is pursuing to drive the decarbonization of the transport sector to create a greener drive and meet the compliances of CBAM, ECGT, NSRF and ISRF Reporting for Scope 1 and 3 emissions.