



The Energy University

Universiti Tenaga Nasional, Malaysia

Research & Innovation

From Research to Reality



Issue 3 · June 2026

Engage with UNITEN Research & Innovation



We are pleased to share Issue 3 of the **UNITEN Research & Innovation Newsletter**, highlighting recent research achievements, funded projects, strategic collaborations, and high-impact publications from across the UNITEN research community. To learn more about Universiti Tenaga Nasional (UNITEN), please visit www.uniten.edu.my.

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INNOVATION ACHIEVEMENT

In Focus

UNITEN Shines at ITEX 2026 with 10 Golds, 7 Silvers and a Special International Award



UNITEN proudly celebrates an outstanding achievement at ITEX 2026, the 37th International Invention, Innovation and Technology Exhibition in Malaysia, where our researchers delivered an impressive performance on the innovation stage.

The UNITEN delegation brought home 10 Gold Medals, 7 Silver Medals and a Special Award from Saudi Arabia, reflecting the strength, creativity and real-world relevance of the university's research and innovation efforts.

This achievement stands as a proud testament to the dedication of our researchers, whose ideas continue to push boundaries and contribute meaningfully to society, industry and the nation.

[Read the full story >](#)

RESEARCH FUNDING & GLOBAL PARTNERSHIPS

Grant Successes and Strategic Research Partnerships

MALAYSIA · MINISTRY OF ECONOMY

Ministry of Economy Awards Research Grant to UNITEN Scholar



 **REC**
The Energy University Research Excellence Centre

Congratulations!

Project Leader :
Assoc. Prof. Dr. Nora Yusma Mohamed Yusop
Institute of Energy Policy & Research (IEPR)
UNITEN Business School (UBS)

Project Title :
Socio-economic Impacts of Energy Transition on Malaysia's Oil and Gas Industry: Case Study of Kerteh, Terengganu.

Allocation
MYR303,550

From 
KEMENTERIAN EKONOMI

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Assoc. Prof. Dr. Nora Yusma Mohamed Yusop, from UNITEN Business School (UBS) and the Institute of Energy Policy & Research (IEPR), has secured a research grant of RM303,550 from the Ministry of Economy (Kementerian Ekonomi), Government of Malaysia, for the project "Socio-economic Impacts of Energy Transition on Malaysia's Oil and Gas Industry: Case Study of Kerteh, Terengganu."

Using Kerteh as a case study, the project examines how the energy transition affects Malaysia's oil and gas economy, covering economic exposure, fiscal stability, and jobs across the OGSE value chain. The findings will inform policy for an orderly transition under the National Energy Transition Roadmap (NETR).

This marks UNITEN's first research grant from the Ministry of Economy, adding to the university's growing work on national energy transition and sustainability.

CHINA · JILIN PROVINCE

China-Funded Research in Biometric Payment Security

Prof. Ts. Dr. Salman Yussof, Director of the Institute of Informatics and Computing in Energy (IICE) and academic staff member of the College of Computing & Informatics, serves as a foreign expert on a project funded by Jilin Province, China, with Jilin International Studies University (JISU) as the lead institution.

The project develops a structured security evaluation and anti-spoofing framework for palmprint and palm vein biometric payment systems in intelligent retail environments.

Its focus on liveness detection, biometric template protection, and fraud risk modelling connects UNITEN to active research in trusted digital payments, fintech security, and smart retail.

JAPAN · SAGA UNIVERSITY

Ocean Wave Energy Innovation with Saga University, Japan

Ir. Dr. Azfarizal bin Mukhtar, from the College of Engineering and Institute of Sustainable Energy (ISE), has secured another research grant from the Institute of Ocean Energy (IOES), Saga University, Japan.

The 2026 project optimises small-scale Oscillating Water Column (OWC) wave energy systems through impulse turbine geometry benchmarking, building on two previous IOES-funded projects.

The work moves from earlier feasibility studies toward advanced turbine optimisation, adding to UNITEN's capability in wave energy converter technology.

JAPAN · SATREPS RTL-3D KILAT

SATREPS RTL-3D Kilat: Japan–Malaysia Research Ties



UNITEN plays an active role in the SATREPS RTL-3D Kilat Project, a Japan–Malaysia research collaboration on real-time lightning 3D imaging, forecasting, sustainable energy supply, and storm disaster early warning.

A high-level Joint Coordination Committee (JCC) meeting was held on 8 June 2026 at the Japan Science and Technology Agency (JST) Annex Building in Tokyo, bringing together UNITEN, Universiti Teknikal Malaysia Melaka (UTeM), Kindai University, JST, and partners. The session reviewed project milestones and concluded with the signing of formal documents by all participating institutions.

UNITEN was represented by Prof. Ir. Dr. Vigna Kumaran Ramachandaramurthy FASc., Deputy Vice-Chancellor (Research & Innovation), who delivered the opening address, and Assoc. Prof. Ir. Dr. Farah Hani Nordin, who presented technical updates. The collaboration expands UNITEN's work in lightning research, energy resilience, and disaster early warning.

[Read the full story >](#)

INDUSTRY AND STRATEGIC RESEARCH PROJECTS

Projects Supporting Industry and National Priorities

A selection of UNITEN projects addressing industry needs, national reporting, infrastructure compliance, and low-carbon energy.

AI-Enhanced Switchgear Monitoring

Led by Dr. Chen Chai Phing (ISE)

In partnership with TNB Research Sdn. Bhd., this project develops a Circuit Breaker Operational Monitoring System (CBOMS) with AI-based automated analysis for medium-voltage switchgears. It aims to improve condition monitoring, fault detection, and maintenance planning for critical grid assets.

Biohydrogen from Palm Oil Mills

Led by Prof. Ir. Dr. Shaliza binti Ibrahim (ISE)

Working with the Sustainable Energy Development Authority (SEDA) Malaysia, the team studies how palm oil mills can increase energy generation through biohydrogen production. The project explores low-carbon energy pathways by valorising industry by-products.

Energy Sector GHG Inventory (BTR2)

Led by Ts. Dr. Siti Indati Mustapa @ Jaafar (IEPRe)

This project prepares Malaysia's greenhouse gas inventory for the energy sector under the Second Biennial Transparency Report (BTR2). It provides robust data to support national climate reporting and energy policy decisions.

IPPU Sector GHG Inventory (BTR2)

Led by Ir. Ts. Dr. Tan Ee Sann (IEPRe)

This project focuses on the Industrial Processes and Product Use (IPPU) sector for Malaysia's BTR2 greenhouse gas inventory. It refines methodologies and post-reporting improvements to strengthen national decarbonisation planning.

EMF Studies for TRX Exchange

Led by Ts. Dr. Nazaruddin bin Abd Rahman (IPE)

In partnership with TRX City Sdn. Bhd., this project undertakes specialist studies on electromagnetic field (EMF) considerations for the TRX Exchange development. The work supports safe, compliant design for a major national infrastructure project.

ENDOWED RESEARCH GRANT

UNITEN Advances Agentic AI Research for Future Energy Systems

CONGRATULATIONS!

TSLM AGENTIC AI RESEARCH GRANT
Tan Sri Leo Moggie (TSLM) Distinguished Chair in Energy Informatics
Institute of Informatics & Computing in Energy (IICE)

Assoc. Prof. Ir. Ts. Dr. Nurul Asyikin Binti Mohamed Radzi
Project Title: An Agentic AI-Enabled Decision-Support System for Utilities to Forecast Directional Wave Energy Flux
Institute Power Engineering (IPE)
College of Engineering (COE)
Allocation: RM 95,000

Assoc. Prof. Ts. Dr. Moamin A Mahmoud
Project Title: An Agentic AI Framework for Self-Healing Fault Isolation and Service Restoration in Medium-Voltage Distribution Feeders
Institute of Informatics & Computing in Energy (IICE)
College of Computing & Informatics (CCI)
Allocation: RM 100,000

Dr. Ahmed Mubarak Ahmed Al-Haiqi
Project Title: AI Mentor: Agentic AI Tutor for Energy Infrastructure Cybersecurity
Institute of Informatics & Computing in Energy (IICE)
College of Computing & Informatics (CCI)
Allocation: RM 100,000

Assoc. Prof. Ts. Dr. Ravie Chandren A/L Muniyandi
Project Title: MARDS: Multi-Agent Decision Support for Outage Restoration
Institute of Informatics & Computing in Energy (IICE)
College of Computing & Informatics (CCI)
Allocation: RM 100,000

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The TSLM Agentic AI Research Grant is funded by the Tan Sri Leo Moggie Distinguished Chair in Energy Informatics and housed within the Institute of Informatics & Computing in Energy (IICE).

The grant supports research that applies agentic artificial intelligence to real-world energy challenges, including utility decision support, self-healing power distribution, energy infrastructure cybersecurity, and outage restoration.

The awarded projects span wave energy forecasting, fault isolation, AI-assisted cybersecurity learning, and multi-agent decision support for outage restoration, carried out by research teams across UNITEN's energy informatics community.

The grant positions UNITEN to advance applied AI solutions for grid resilience, cybersecurity, forecasting, and intelligent energy systems.

[Read the full story >](#)

RESEARCH LEADERSHIP & STRATEGIC ENGAGEMENT

Leadership, Expertise and National Engagement

ETCON26 · KLCC

UNITEN Vice Chancellor at The Energy Transition Conference 2026

Professor Ir. Dr. Khairul Salleh Mohamed Sahari, Vice Chancellor, UNITEN



Tenaga Nasional Berhad's flagship event, The Energy Transition Conference 2026 (ETCon26), was held from 3 to 5 June 2026 at the Kuala Lumpur Convention Centre (KLCC). Themed "Energy & AI: The Synergy for Energy Transition," it drew over 4,000 delegates, more than 80 speakers and 40 strategic partners.

A key highlight was the Plenary Hall dialogue "Shaping an AI-Ready Generation: The Role of Today's Leaders," featuring Professor Ir. Dr. Khairul Salleh Mohamed Sahari, Vice Chancellor of UNITEN, as a panel speaker alongside Leon Jala (Group CEO, PEMANDU Associates) and Natalie Loi (Head of Technology, UnBound Sdn. Bhd.), moderated by Danial Rahman (CEO, ASLI).

On the final day, UNITEN students led a dedicated session, "Leading from the Grid Edge: The ET Generation Speaks," sharing youth perspectives on the energy transition.

TAN SRI LEO MOGGIE (TSLM) DISTINGUISHED CHAIR IN ENERGY INFORMATICS



Emeritus Professor Dato' Dr. Halimah Badioze Zaman, FASc

Institute of Informatics and Computing in Energy (IICE), UNITEN

Emeritus Professor Dato' Dr. Halimah Badioze Zaman brings four decades of academic leadership, research excellence, and national-level digital transformation experience to UNITEN. She holds the Tan Sri Leo Moggie Distinguished Chair in Energy Informatics at IICE and serves as Founding Director and Advisor of the National Energy Centre (NEC).

A Fellow of the Academy of Sciences Malaysia (FASc), she previously served at Universiti Kebangsaan Malaysia (UKM) and was the longest-serving independent Director of the Malaysia Digital Economy Corporation (MDEC) from 2019 to 2025. She is also one of the Advisory Board Members of the Loughborough University Alumni United Kingdom. Her contributions have earned national and international recognition, including being named one of the Most Inspiring Icons in Asia by AirAsia Academy and receiving the Kesatria Malaysia award from MyCEB under the Ministry of Tourism Malaysia.

She is currently the Lead Consultant and Advisor for the National Address System (NAS) under MCMC and is also advising on the establishment of the National AI Centre (NAIC) under MOSTI. Most recently, she has been appointed as a member of the Online Safety Appeals Tribunal, or Tribunal Keselamatan dalam Talian (TRKDT), under the Ministry of Communications. This appointment will be formally published in the Government Gazette.

Few individuals have successfully bridged the worlds of academia, industrial technology, public policy, and national development as effectively as she has. Her presence strengthens UNITEN's leadership in energy informatics, AI, digital infrastructure, and national-impact projects. She stands as a distinguished scholar, visionary leader, and nation builder whose contributions will continue not only to shape UNITEN's journey but also the nation's path towards a smarter, more inclusive, and sustainable future.

PRINCIPAL FELLOW SPOTLIGHT



Dato' Ir. Ts. Dr. Zahari Hj. Dollah

Former Senior General Manager & Head of Asset Management,
TNB Distribution Network

Dato' Ir. Ts. Dr. Zahari Hj. Dollah is one of Malaysia's most accomplished energy professionals, with over 33 years of distinguished service in the power and utility industry. He holds the credentials of Professional Engineer (Ir.), Competent Engineer, Professional Technologist (Ts.), and a PhD in Engineering specialising in Sustainable Microgrid Systems. He was appointed as an Adjunct Professor at the Institute of Power Engineering (IPE), Universiti Tenaga Nasional (UNITEN), in 2023 and was subsequently elevated to Principal Fellow in August 2025.

His extensive leadership experience includes serving as former Chairman of TNB Energy Services Sdn. Bhd., Board Director of Malaysia Transformer Manufacturing Sdn. Bhd. and TNB Research Sdn. Bhd., as well as Senior General Manager (Asset Management) at Tenaga Nasional Berhad (TNB). He also contributes to research, innovation, and industry development as Principal Advisor to MIMOS Berhad and as a member of the Industrial Advisory Panel of Universiti Teknologi Malaysia (UTM). His visionary leadership in smart grid transformation, asset management, and energy transition has earned him numerous prestigious international accolades, including the Green Finance Asia Award 2026, Solar Project Asia Award 2026, AIBP Asia Innovation Award 2025, and the highly coveted Male Executive of the Year Award at the Enlit Asia Power & Energy Awards 2024.

Throughout his distinguished career, he has led several strategic national initiatives, including the development of Putrajaya's World-Class Electricity Infrastructure, achieving a System Average Interruption Duration Index (SAIDI) of less than 1 minute per customer per year, among the best electricity reliability performances globally. He also played a pivotal role in elevating Malaysia's Smart Grid Index (SGI) ranking into the global Top 11 in 2024, achieving a score of 80.4%. In addition, he has made significant contributions to Malaysia's Energy Transition Agenda through the development of the Smart Utility Masterplan 2030, intelligent asset management solutions, and Future Distribution System Operator (DSO) frameworks. His partnership with UNITEN further strengthens IPE's position as a leading hub for industry-driven research, smart utility innovation, and energy transition expertise.

LEADERSHIP APPOINTMENT

Director Appointed at the Research Excellence Centre (REC), UNITEN



Assoc. Prof. Ts. Dr. Jaspaljeet Singh, CITP

Director, Research Excellence Centre (REC)

Effective 1 June 2026

UNITEN has appointed Assoc. Prof. Ts. Dr. Jaspaljeet Singh as Director of the Research Excellence Centre (REC), effective 1 June 2026.

He brings experience in research management and institutional strategy, a background in computing and informatics, and prior leadership as Dean of the College of Computing and Informatics, UNITEN.

In this role, he will work closely with UNITEN's research institutes, colleges, and strategic units to further strengthen research support, publication excellence, external grant performance, and research visibility.

His appointment supports UNITEN's continued efforts to build a strong, collaborative, and impactful research ecosystem.

STUDENT INNOVATION

Student-Led Achievement and Applied Research

UNITEN Robotics Team Takes Third Place at the Spring City Cup in China



UNITEN's Mobile Robotics Club (MRC) secured Third Place at the 2026 Spring City Cup International Humanoid Robot Football Tournament, held from 21 to 24 May 2026 in Jinan, China.

Competing against teams from China, Thailand, Saudi Arabia, Japan, Vietnam, South Africa, and Malaysia, the team showed strong capability in autonomous robotics, AI, robot programming, calibration, and real-time decision-making. Over four intensive days, they programmed and operated the Booster K1 humanoid robot through qualification rounds, group-stage matches, and knockout fixtures to a podium finish.

The team comprised undergraduates from the College of Engineering (COE) and College of Computing and Informatics (CCI): Muhammad Yazid Ihsan, Tan Jun Siang, Isa Aslam, Asyraf Azmi, Faris Faizal, and Aida Syafiqah.

[Read the full story >](#)

FEATURED PUBLICATIONS

Research in Web of Science Q1 Journals

A selection of recent publications by UNITEN researchers in Web of Science Q1 journals.

1. Semitransparent Perovskite Solar Cells: Strategies, Prospects, and Challenges

Mohamad Noh M.F., et al. · *Nano-Micro Letters*

[View Publication >](#)

2. The rise of borophenes and their composites for optimized hydrogen production: A holistic review of material designs, properties, coordination chemistry, and catalytic performances

Husain A., et al. · *Coordination Chemistry Reviews*

[View Publication >](#)

3. Drone endurance in hydrogen fuel cell hybrid technologies: Power architectures and design strategies

Tak Y.C., et al. · *Renewable and Sustainable Energy Reviews*

[View Publication >](#)

4. Toward responsible adoption of LLMs in the energy sector: A mixed-methods study using fuzzy Delphi and cross-cultural SEM

Alkaws G., et al. · *Journal of Innovation and Knowledge*

[View Publication >](#)

5. Artificial intelligence and machine learning for distributed energy resource management systems: Applications, frameworks, and future directions

Satpathy P.R., et al. · *Applied Energy*

[View Publication >](#)

6. Application of predictive models and thermal enhancement of phase change material with multi walled carbon nanotubes–Al₂O₃ hybrid nanoparticles

Kanti P.K., et al. · *Journal of Energy Storage*

[View Publication >](#)

7. Adaptive fuzzy identification and optimization of CO₂ capture capacity of CaO-based sorbents via sonochemical method in calcium looping

Afandi N., et al. · *Renewable Energy*

[View Publication >](#)

8. A review on biohydrogen production through dark fermentation via the lactate pathway

Adnan A.I., et al. · *Bioresource Technology*

[View Publication >](#)

9. Chitosan functionalization with tin oxide nanocomposites as a biosensor for the detection of cysteine and dihydronicotinamide adenine dinucleotide biological molecules

Maruthupandy M., et al. · *International Journal of Biological Macromolecules*

[View Publication >](#)

10. Building-integrated photovoltaics forecasting: Machine learning models for irradiance and power, feasibility, and recommended directions

Mahalingam S., et al. · *Engineering Applications of Artificial Intelligence*

[View Publication >](#)

ENGAGE WITH UNITEN

Collaborate, Partner, and Study With Us

RESEARCH COLLABORATIONS & RESEARCH ATTACHMENTS

Partner With Us

UNITEN welcomes research collaborations, research attachments, and strategic engagements with universities, research institutions, industry partners, government agencies, and relevant organisations.

For collaboration or research attachment discussions, interested parties may contact Prof. Ir. Dr. Vigna Kumaran, FASc, Deputy Vice-Chancellor (Research & Innovation), at Vigna@uniten.edu.my, or Assoc. Prof. Ts. Dr. Jaspaljeet Singh, Director, Research Excellence Centre, at Jaspaljeet@uniten.edu.my.

POSTGRADUATE OPPORTUNITIES

Interested in Postgraduate Study?

UNITEN's College of Graduate Studies offers research-intensive Master's by Research and PhD programmes, with supervision from experienced academics and industry-linked researchers.

Whether you aim to advance knowledge or solve real-world challenges, UNITEN offers the environment to take your research career forward.

UNITEN Research & Innovation

Advancing research. Creating impact. Turning ideas into reality.

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