

# IEPRe NEWSLETTER

Volume 2: Issue 2, 2022

## WELCOME

### TO ENERGY POLICY NEWSLETTER

We are pleased to provide you with Issue 2 for the year 2022.

Within this issue, IEPRe includes the most recent information from our institution from August through December 2022, as well as a variety of viewpoints for a better understanding of energy.

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### Highlights :

- International Sustainable Energy Summit (ISES) 2022
- Russia and Ukraine War: Impact to Malaysia

# 1

IEPRe



UNITEN

# International Sustainability Energy Summit (ISES) 2023

## Deep-dive Workshop - "Youth Empowerment: Save For the Future"

&

## Exhibition - UNITEN Research Projects Showcased at ISES 2022

By Dr Norsyahida Binti Mohammad

## IEPRe Past Event

**Tuesday, 30th August 2023** - A workshop titled "Youth Empowerment: Save For the Future" was successfully conducted by IEPRe as part of the 5th International Sustainable Energy Summit (ISES 2022) at the Kuala Lumpur Convention Centre. The Summit was themed "Empowering Energy Transition" and was organised by the Sustainable Energy Development Authority (SEDA) Malaysia and hosted by the Ministry of Energy and Natural Resources (KeTSA). The forum-style workshop was facilitated by Dr. Hezri Adnan, Associate Professor at UNITEN and Executive Director of the Malaysian Institute of Economic Research (MIER).



The moderator and all the five panelists as well as our former director Ts. Dr. Siti Indati Mustapa at DDW 8.

The first panellist, Mr Eqram Mustaqem Muhamad, a member of the Malaysian Youth Delegation for Climate Change, emphasised youth participation in the energy transition, while the second panellist, Ilanur Elyssa Bart Aswain, President of UNITEN's Economics, Energy, Environmental & Sustainable Club, stressed community engagement to generate youth interest. The third panellist, Prof. Ir. Dr. Izham Zainal Abidin, Dean of the University of Engineering, UNITEN, affirmed that the youth have been introduced to sustainability concepts at all levels of education

The fourth panellist, Ms Nor Shahida Razali, Research Analyst, Malaysian Industry-Government Group for High Technology (MIGHT), stated that the youth are receptive to modern technologies as their smart grid training sessions resulted in 50 percent youth participation. This was also confirmed by the last panellist, Assoc. Prof. Dr. Mohd Mursyid Arshad, research fellow at the Institute for Youth Research Malaysia (IYRES), Ministry of Youth and Sports, highlighted the four main roles of youth: agent of change, process facilitator, resource broker, and problem solver.

The 90-minute workshop attracted 400 participants of different ages and backgrounds. IEPRe is honoured to organise the youth empowerment workshop at ISES 2022. We'd like to take this opportunity to thank our Secretariat, especially the College of Energy Economics & Social Sciences (CES) representatives, UNITEN staff, and students for supporting the workshop.



The forum-style workshop was chaired by Dr. Hezri Adnan, Associate Professor at UNITEN and Executive Director of the Malaysian Institute of Economic Research (MIER).



**Monday, 29th August 2022** – As one of the co-organisers of the 5th International Sustainable Energy Summit (ISES 2022), UNITEN was invited to participate in the two-day exhibition held at the Kuala Lumpur Convention Centre from 29-30 August 2022. Visitors were able to learn about selected research projects from five UNITEN research institutes: Institute for Energy Policy and Research (IEPRe), Institute for Sustainable Energy (ISE), Institute for Energy Infrastructure (IEI), Institute for Power Engineering (IPE) and Institute for Information and Computing in Energy (IICE).

## Exhibition - UNITEN Research Projects Showcased at ISES 2022

Projects presented include "Integrity Health Index Dashboard" (IEPRe), "Indigenous Technology Producing Sustainable Bio-Aviation Fuel Via Catalytic Deoxygenation of Non-edible Oil Using Low-cost Advanced Malaysian Dolomite Catalyst" (ISE), "Remote Floated Solar Powered In-Situ Physical

Water Quality Assessment" (IEI), "Innovative Design of Foot Step Power Generation System - In House Application" and "Security System For High Voltage Substation Using Distributed Acoustic Sensing" (IPE), and "Intelligent Solutions for Electricity Theft" (IICE).

UNITEN's booth attracted various groups of visitors, including students, graduates, and the energy industry stakeholders. IEPRe is thrilled to have the opportunity to coordinate the booth during ISES 2022 and we are very grateful for the support from all the research institutes.



Booth activities were a major attraction during the exhibition. Many students including High School students participated in the fun activities which awarded them with small gifts from IEPRe (Photo at the left side)

The reserachers on duty at our UNITEN booth during ISES 2022. (Photo at the right side)



# The Ukraine Crisis and Global Energy Security: Its Implication to Malaysia

Venue : Theatrette, G Floor, BA Building  
Date : 14th September 2022  
Time : 10.30 am - 12.30 pm

**Prof. Dr. Ken Koyama**  
Chair in Energy Economics of  
Energy Commission at  
Universiti Tenaga Nasional  
(UNITEN)

## The Ukraine Crisis and Global Energy Security: Its Implication to Malaysia

By Dr. Saraswathy Kasavan



**Wednesday, 14th September 2022** – A public lecturer entitled ‘The Ukraine Crisis and Global Energy Security: Its Implication to Malaysia’ was conducted by the Institute of Energy Policy and Research (IEPR) and Universiti Tenaga Nasional (UNITEN) at Building BA, UNITEN, and streamed online via MsTeams. The speaker of this public lecture is Prof. Dr. Ken Koyama, the Chair in Energy Economics of Energy Commission at UNITEN and also the Chief Economist and Senior Managing Director of The Institute of Energy Economics, Japan (IEEJ).



*Prof. Dr. Ken Koyama giving his public lecture at Theatrettem UNITEN.*

The public lecture started with welcoming remarks from the Deputy Vice-Chancellor of UNITEN, Yang Berbahagia Prof. Dato’ Ts. Dr. Mohd Zamri Yusoff. Then, Prof. Dr. Ken Koyama highlighted that carbon neutrality and reducing carbon had already started before the Ukraine crisis.

As the situation in Ukraine worsened, energy security became a critical issue for every country in the world. Before the Ukraine crisis, there was a significant drop in energy costs due to the outbreak of COVID-19. During the pandemic, many countries around the world committed to becoming carbon neutral by 2050.

In the second half of 2021, when the effects of the pandemic started to disappear, energy prices started to go up due to the reduced surplus supply capacity. Prof. Dr. Ken Koyama claimed that after the lowest crude oil price was recorded in mid-April 2020 owing to the pandemic, OPEC Plus coordinated a production cut that increased the oil price. The entire cost of energy significantly increased in 2022, when the Ukraine issue first emerged.

Before concluding his lecture, Prof. Dr. Ken Koyama shared the challenges faced by Japan under the emerging global energy landscape. The public lecturer was held in a hybrid mode for 2 hours. The public lecturer saw the gathering attendees from various fields including academicians and representatives from public agencies and energy industries.

The questions from the attendees were addressed by Professor Dr. Ken Koyama during the Q&A session at the end of the public lecturer. The discussion during the Q&A session focused on the idea and policy for Malaysia move forward to achieve both carbon neutrality and energy security, amid the Ukraine crisis. The public lecturer ended at approximately 12.30 p.m.

# RECOGNIZING EXCELLENCE

Our heroes demonstrate their extraordinary talents every day and night, bringing remarkable skills to their work at Universiti Tenaga Nasional, where they express their commitment to the well-being of our students, staff and community.

INSTITUTE OF ENERGY POLICY AND RESEARCH (IEPR)



INSTITUTE OF ENERGY INFRASTRUCTURE (IEI)



INFORMATION



By Ahmad Khusyairi Bin Che Rosli



## Econometric Workshop

The Institute for Energy Policy and Research (IEPR) hosted a statistical and econometric workshop on time series analysis on December 5 and 6 2022. Dr. Abdul Hafiz Bin Mohd Azam of Universiti Kebangsaan Malaysia (UKM) leads this session. The purpose of this training is to introduce IEPRe members with the Eviews software for data analysis.

Several forecasting approaches, including Autoregressive Integrated Moving Average (ARIMA), Seasonal Autoregressive Integrated Moving Average (SARIMA), and Extrapolation Trend Forecasting, were covered at this workshop. Numerous sectors employ ARIMA models for a variety of purposes. It is commonly employed in demand forecasting, such as calculating electricity demand. SARIMA does the same thing with historical data, but it additionally takes into consideration any patterns related to seasonality.

We anticipate that the information presented at this workshop will prove useful to IEPRe members as they engage in the process of policy analysis and formulation.

SARIMA is substantially more powerful than ARIMA in forecasting complicated data sets incorporating cycles because it includes seasonality as a parameter, unlike ARIMA, which does not include seasonality.

Dr. Hafiz addressed basic econometrics on the first day, as well as the use of ARIMA forecasting method. On the second day, he covered the use of SARIMA forecasting method for seasonal data. Learning the Exploration Trend Forecasting method for eight-year data forecasts concluded the workshop. This method ignores short-term variations since it concentrates on the long-term trend. The usage of this forecasting approach is crucial for predicting the future outcome of a scenario. In addition, it can be used to predict future trends over time.





# AHP Workshop

By Nisaa Husnina Binti Zulkifli

On December 8th, 2022, the Institute of Energy Policy and Research (IEPR<sub>e</sub>) conducted the AHP Workshop for the project “Prioritizing Stakeholders’ Requirement (SR) in Environmental, Social, Governance, and economy (ESG) Initiatives Towards Reimagining TNB: An Application of AHP and QFD”. The workshop was consulted by an external consultant, Prof. Dr. Rafikul Islam from International Islamic University Malaysia (IIUM), and hosted by Dr. Khairul Muhammad Islam and his project team members.

Prof. Dr. Rafikul Islam has professional expertise and vast experience in the AHP which fulfills the fundamental requirement of the project in synthesizing and prioritizing the ESG requirements. The aim of the workshop was to provide practical training by developing the standard ESG criteria

required by the stakeholders based on TNB practices and feedback from various stakeholder requirements using the Analytic Hierarchy Process (AHP) of Super Decision software. Stakeholders’ requirement decisions have recognised the ESG criteria that will make the decision-making process more efficient and beneficial for environmental, social, governance and economic concerns. Prof. Dr. Rafikul stated that the AHP research objective is to prioritise a set of factors, criteria, and attributes by selecting the best option from the constructed pairwise comparison matrices.

The project will enhance TNB's reputation among its stakeholders as ESG is one of the key strategic priorities for TNB to achieve the United Nations Sustainable Development Goals (UN SDGs).



*IEPR<sub>e</sub> members with Prof. Dr. Rafikul Islam after the one full day workshop.  
From left, Ms. Nadhirah Amalina, Mrs. Nisaa Husnina, Dr. Siti Indati, Dr. Muhammad Khairul and Mr. Ahmad Khusyairi*

# Policy Recommendation to Achieve a Carbon Neutral Economy: The Case of Corporate Governance and Carbon Performance in Malaysia's Smart Cities

By Dr. Noor Raida Binti Abd Rahman

**IEPRe  
On-going  
Project**

The Institute of Energy Policy and Research (IEPRe) through the Business Development Department of UNITEN successfully signed a Memorandum of Understanding (MOU) with the Japanese Economic Foundation (JEF), a non-profit, non-government public policy research institute, and received a grant of USD27,000 from JEF for policy-oriented research.

Together with five other teams from Thailand, the Philippines, Indonesia, India and Bangladesh, IEPRe is contributing to a study on new strategies for energy transition and sustainable development in Asia. Led by Ts. Dr. Siti Indati Mustapa, the project focuses on energy and environmental issues and conducts policy-oriented research entitled "Policy Recommendation to Achieve a Carbon Neutral Economy": The Case of Corporate Governance and Carbon Performance in Malaysia's Smart Cities".

This research discusses the critical importance of corporate governance, carbon performance, and financial performance in Malaysia's smart cities and aims to investigate the adoption and challenges of corporate governance related to carbon and financial performance among firms in the Malaysia smart cities. The project has started in September 2022 and expected to complete by end of July 2023 with seminar at the Economic Research Institute for ASEAN and East Asia (ERIA) Headquarters Office in Jakarta.

***"As Malaysia has set a goal to achieve net-zero carbon emissions by 2050, achieving this goal will require significant efforts from all stakeholders, including the government, businesses, and individuals. The stakeholders need to start acting and assigning employees to mitigate carbon emissions. The industries is a significant contributor to carbon emissions, and as such, it is crucial to ensure that companies, particularly those in smart cities, adopt best practices in corporate governance and carbon performance. The adoption of these practices will not only reduce the carbon footprint of the corporate sector but also lead to increased competitiveness, innovation, and financial performance of the companies"***

***- Ts. Dr. Siti Indati, Project Leader***



Ts. Dr. Siti Indati  
Mustapa  
(Project Leader)



Dr. Noor Raida Abd  
Rahman  
(Project Co-Leader)



Ts. Dr. Amar  
Hisham Bin Jaaffar  
(Project Member)



Dr. Nor Salwati  
Othman  
(Project Member)

# Perspectives: Green Waqf Waste Management System (GWWMS)

By Mrs Fara Fadila Binti Abdul Razak

GWWMS is an electronic system specially developed for Waqf Departments, particularly throughout Malaysia, to finance Renewable Energy Projects. With the existence of the GWWMS system, it provides an alternative option to finance Renewable Energy Projects instead of maximizing SUKUK instruments. The GWWMS system was developed to maximize waste management, especially from the "Renewable Energy" project, where the results from the recycling of waste materials can be re-contributed to the approved waqf project that supports the "Renewable Energy" project.

In addition, this system is able to convince the waqf endower regarding the transparent process applied by the Waqf Department in managing the entrusted Waqf Fund. GWWMS also emphasizes the slogan "Anytime Everywhere" where this system can be accessed easily at anytime and anywhere. Thus, at the same time giving an advantage to the GWWMS system in offering various benefits and advantages starting from the aspect of responding to the government's recommendations on green initiatives through reducing the use of paper until guaranteeing a network of complex systems and reaching the specified standard level.

In terms of novelty value, GWWMS is expected to be the first application system implemented in Waqf Departments, especially throughout Malaysia, as soon as it becomes a model that can be used in every Waqf Department around the world. The GWWMS system is also enhanced with an integrated system that at the same time guarantees a process that promises usability and is protected from all forms of fraud.

The importance of GWWMS to the community and community GWWMS is very important and plays an important role and as an instrument to ensure transparency and integrity values that are practiced fairly especially in waqf fund management and waste management results as a new waqf fund instrument in every Waqf Department in Malaysia.

This value will increase the value of reliability and enhance positive relationships not only in terms of the services offered but also towards the officers who are responsible for managing the processes involved. The uniqueness of this GWWMS System is a process that can guarantee and give a high level of confidence among Muslim waqfs. There are 9 (NINE) benefits and advantages of the GWFES system to any agency that offers financial services, especially the Waqf Department in Malaysia.



*Our article was published in Tenagawan by Tenaga Nasional Berhad (TNB) titled "Kitar Semula Untuk Wakaf".*

VISIT OUR WEBSITE FOR INFO ON CURRENT NEWS AND PUBLICATION!



By Mrs Fara Fadila Binti Abdul Razak

## Advantages and Disadvantages of GWWMS

1) GWWMS become a pioneer waqf system records waste management recycling as an alternative waqf fund, cash waqf transaction and non-cash waqf. Where this system also receives waste management recycling funds as alternative waqf funds other than cash in the form of land, machinery and equipment needed for renewed project projects. For example, solar panels that have been damaged can be recycled and the proceeds can be used as waqf funds. In addition to cash waqf fund results, this system will record non-cash waqf fund results through units of numbers through the current asset value in the form of currency. For example, a machine donated for a Biomass Project, the Waqf Department will evaluate the price and value of the machine before it is accepted as a waqf transaction that will be recorded.

2) Process without involving any use of paper: In responding to the government's recommendations for the "Green Earth" campaign, the initiative for a process that does not involve any use of paper is one of the honourable and encouraged efforts.

3) A more effective organizational process with the existence of this GWWMS system, the organizational process will be more effective and transparent and can save time and reduce the error rate to empty values and at the same time save the time allocated to the process involved.

4) Reducing the Operating Expenses: The existence of the GWWMS System helps towards more effective and systematic spending where processes that would required the help of human resources are replaced by electronic processes that simultaneously save operational costs and so on.

5) Increase the value of practicality: This GWWMS system is able to improve the value of practicality where there is a function to distinguish between Islamic waqf and non-Muslim donors. At the same time, it supports the values of purity and the meaning of waqf as it is.

6) Improve the value of integrity and reliability towards the Department: Waqf Department and organizations that use the GWWMS system application with the presence of four (4) specific features namely "record, evaluate, authorize and disburse" based on sharia principles, it provides a major advantage to the GWWMS system in generating high confidence values and integrity features that are practiced in all processes involved in this system. Furthermore, every process starting from the registration process until the last process needs to go through the approval stage from the relevant Waqf Department.

7) Become a Pioneer and Primary Referral Source: GWWMS is a Waqf Evaluation Application System based on sharia principles that was first introduced in Malaysia. GWWMS will become the main source of reference among Waqf Department organizations throughout Malaysia and even the whole world as a new instrument in the evaluation of Waqf Funds that are supervised.

8) Application System Capability that is integrated and meets standard values: GWWMS is specially designed as an integrated application system that can meet the needs of users and organizations that use GWWMS. The special features available from the GWWMS Application system can meet the required standard values.

9) Evidence for Tax Exemption: The main uniqueness of this system can also be used as the main evidence for tax relief against the Inland Revenue Board (IRB). Where the waqf shall provide the proof of waqf payment for each waqf transaction carried out.

## Commercial Value

As a novelty value and a commercial factor, GWWMS will be implemented for the first time in the Waqf Department in Malaysia as an important assessment tool in increasing the integrity and reliability of this system. At the same time, it will have a high impact on the usefulness of connecting waqfs with the Inland Revenue Board and other government bodies in particular.

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By Mrs Fara Fadila Binti Abdul Razak

## Read more:

To read more of this article, please search this title on Utusan Malaysia: Tiga penyelidik bangun aplikasi biaya tenaga diperbaharui (utusan.com.my) or simply copy below link:

<https://www.utusan.com.my/nasional/2023/01/tiga-penyelidik-bangun-aplikasi-biaya-tenaga-diperbaharui/>



### Tiga penyelidik bangun aplikasi biaya tenaga diperbaharui



KUANTAN: Tiga penyelidik dari **Universiti Tenaga Nasional (Uniten)** dan Jabatan Wakaf, Zakat dan Haji (Jawhar) membangunkan Sistem Aplikasi Pengurusan Sisa Wakaf Hijau (GWWMS) berlandaskan prinsip syariah pertama di negara ini.

GWWMS bakal menjadi sumber rujukan utama dalam kalangan organisasi Jabatan Wakaf bukan sahaja di negara ini malah di seluruh dunia sebagai instrumen yang baharu dalam penilaian terhadap Tabung Dana Wakaf yang diselakikan.

Bercakap kepada Utusan Malaysia, Ketua penyelidik, Siti Fara Fadila Abd. Razak dari Uniten berkata, aplikasi itu dibangunkannya bersama dua lagi penyelidik iaitu Pengarah Jawhar, Hairolanuar Mohamad dan Pegawai Jawhar, Hafizah Muhamad.

Katanya, GWWMS adalah sistem elektronik yang dibangunkan khas untuk jabatan-jabatan wakaf khususnya di seluruh negara ini untuk membiayai projek-projek tenaga diperbaharui.

"Sistem ini memberi pilihan alternatif bagi membiayai projek-projek tenaga diperbaharui selain memaksimumkan instrumen sukur. Ia juga dapat memaksimumkan pengurusan sisa yang mana hasil daripada kitar semula bahan buangan boleh disumbang semula kepada projek wakaf terutama yang menyokong projek-projek tenaga diperbaharui.

"Selain itu, sistem ini mampu meyakinkan pewakaf berkaitan proses yang telus diterapkan oleh Jabatan Wakaf dalam menguruskan dana wakaf yang diamanahkan," katanya di sini semalam.

## Read more:

To read more of this article, please search this title on Tenagawan: Kitar Semula Untuk Wakaf.

### Ringkas



#### Kitar semula untuk wakaf

oleh Intan Adila Badrul Hisham



UNITEN berjaya membangunkan Sistem Pengurusan Sisa Wakaf Hijau (GWWMS) berlandaskan prinsip syariah pertama di negara ini, bertujuan membiayai projek-projek Tenaga Boleh Baharu (TBB).

Sistem ini memaksimumkan pengurusan sisa dan hasil kitar semula sisa buangan disumbangkan semula kepada projek wakaf terutamanya yang menyokong projek-projek TBB.

# Publication of Journal Article

By Amalia Nabilla Binti Azman

## An overview of palm oil biomass for power generation sector decarbonization in Malaysia: Progress, challenges, and prospects

Zamri M.F.M.A., Milano J., Shamsuddin A.H., Roslan M.E.M., Salleh S.F., Rahman A.A., Bahru R., Fattah I.M.R., Mahlia T.M.I.

<https://doi.org/10.1002/wene.437>

*This review provides an in-depth overview of palm oil biomass for Malaysian power production decarbonization. This article is categorized under: Sustainable Energy > Bioenergy Climate and Environment > Net Zero Planning and Decarbonization Sustainable Development > Emerging Economies.*

## Bibliometric analysis and science mapping of global scientific publications on technical vocational education training (TVET)

Abd Majid M.Z., Kasavan S., Siron R.

<https://doi.org/10.1108/LHT-12-2021-0485>

*This paper performed a bibliometric analysis to examine the global scientific literature to assess the state of the art in TVET research over the past 23 years.*

## Hydrogen-Rich Syngas and Biochar Production by Non-Catalytic Valorization of Date Palm Seeds

Sait H.H., Hussain A., Bassyouni M., Ali I., Kanthasamy R., Ayodele B.V., Elhenawy Y.

<https://doi.org/10.3390/en15082727>

*This paper is using energy-dispersive X-ray (EDX) analysis to discover that the elemental composition of biochar changes with the pyrolysis temperature. The date seeds pyrolyzed at 800 °C were found to have the maximum carbon concentration, with 97.99% of the total carbon content.*

## Comparative Analysis of Support Vector Machine Regression and Gaussian Process Regression in Modeling Hydrogen Production from Waste Effluent

Hossain S.S., Ayodele B.V., Ali S.S., Cheng C.K., Mustapa S.I.

<https://doi.org/10.3390/su14127245>

*This paper seeks to investigate on the seven models built on support vector machine (SVM) and Gaussian process regression (GPR) which were employed for the modeling of the hydrogen production from the waste sources.*

## Evaluation of Malaysia Energy Supply Security Under Three Different Scenarios

Sahid E.J.M., Manan A.A., Junior F.

<https://doi.org/10.1109/PECon54459.2022.9988784>

*This paper evaluated the energy security performance of Malaysia within the timeframe from year 2000 to year 2050. For the projected periods, an implementation of several energy security scenarios which include BAU, TGT and 2DC.*

**Performance analysis of support vector machine, Gaussian Process Regression, sequential quadratic programming algorithms in modeling hydrogen-rich syngas production from catalyzed co-gasification of biomass wastes from oil palm**

**Ayodele B.V., Mustapa S.I., Kanthasamy R., Mohammad N., AlTurki A., Babu T.S.**

<https://doi.org/10.1016/j.ijhydene.2022.05.066>

*This study explores the performance of twelve machine learning algorithms built on the support vector machine (SVM), the Gaussian process regression (GPR), and the non-linear response quadratic model (NLRQM) using Sequential quadratic programming, and the Levenberg-Marquardt algorithms.*

**Socio-Economic Assessment on Flood Risk Impact: A Methodological Review Toward Environmental Sustainability**

**Samsuddin A., Kaman Z.K., Mat Husin N.**

<https://doi.org/10.1088/1755-1315/943/1/012010>

*This paper reviewed previous articles regarding flood risk management with a specific focus on methods used for socio-economic impact assessment towards ensuring a sustainable environment.*

**The Mediating Effect of Organisational Sustainability and Employee Behaviour on the Relationship between GHRM and Sustainable Performance in Qatar**

**Alenzi M.A.S., Jaaffar A.H., Khudari M.**

<https://doi.org/10.37394/23207.2022.19.129>

*This study examined the influence of green human resource management (GHRM) practices on Sustainable Performance (SP) and how GHRM practices can help organizations improve their EP through Organisational Sustainability (OS) and Employee Behaviour (EB).*

**Water Quality Predictive Analytics Using an Artificial Neural Network with a Graphical User Interface**

**Rizal N.N.M., Hayder G., Yusof K.A.**

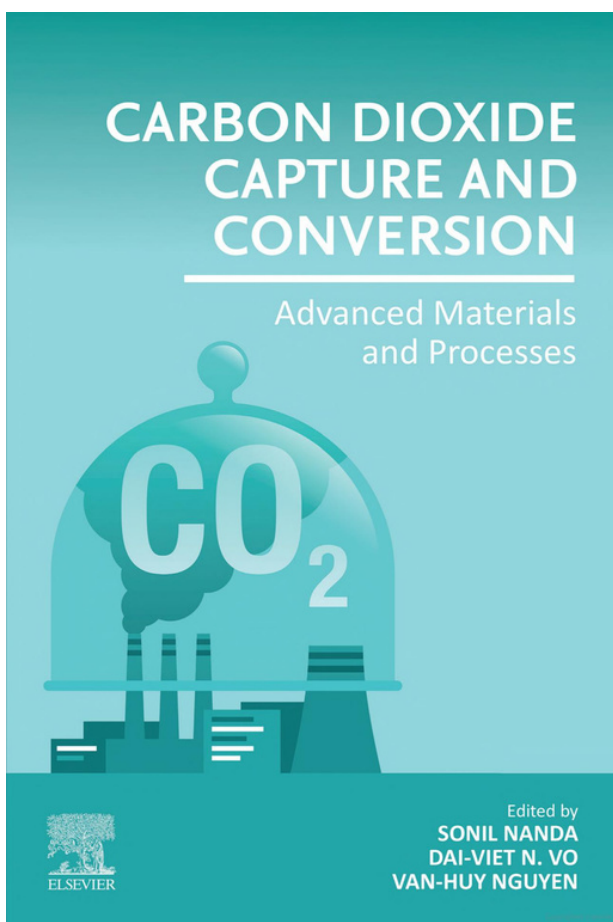
<https://doi.org/10.3390/w14081221>

*This study aims to develop artificial neural network (ANN) models to predict six different water quality parameters in the Langat River, Malaysia.*

# Publication of Book Chapter

By Amalia Nabilla Binti Azman

**Title :** Carbon Dioxide Capture and Conversion: Advanced Materials and Processes



**Chapter 2 :** Sustainable utilization of CO<sub>2</sub> toward a circular economy: Prospects, challenges, and opportunities

**Authors :** Ayodele B.V., Mustapa S.I., Alsaffar M.A., Vo D.-V.N.

**Year Published :** 2022

**ISBN :** 978-032-385-585-3

**Abstract :** The continuous utilization of fossil fuels for various processes based on the linear economic model will in no small measure constantly increase the concentration of greenhouse gases in the atmosphere. Carbon dioxide (CO<sub>2</sub>), which accounts for the largest proportion of greenhouse gases, has been a major concern globally which has prompted the calls for urgent actions that could mitigate the emissions of CO<sub>2</sub>. In this chapter, the prospects, challenges, and opportunities for sustainable utilization of CO<sub>2</sub> toward a circular economy are presented. Processes such as CO<sub>2</sub> reforming of hydrocarbons and biomass as well as CO<sub>2</sub> hydrogenation have been reported as promising technological pathways that could be employed for sustainable utilization of CO<sub>2</sub> to produce renewable fuels and value-added products. Despite the various opportunities available for sustainable CO<sub>2</sub> utilization, the scale-up of the process is still constrained with various challenges that can be overcome by technological innovations, as well as advances in research and development.

# IEPR Re Family Board

Vol 2: No 2 - Newsletter 2022

 **UNITEN MAIN CAMPUS**

## Bulletin



Appreciation



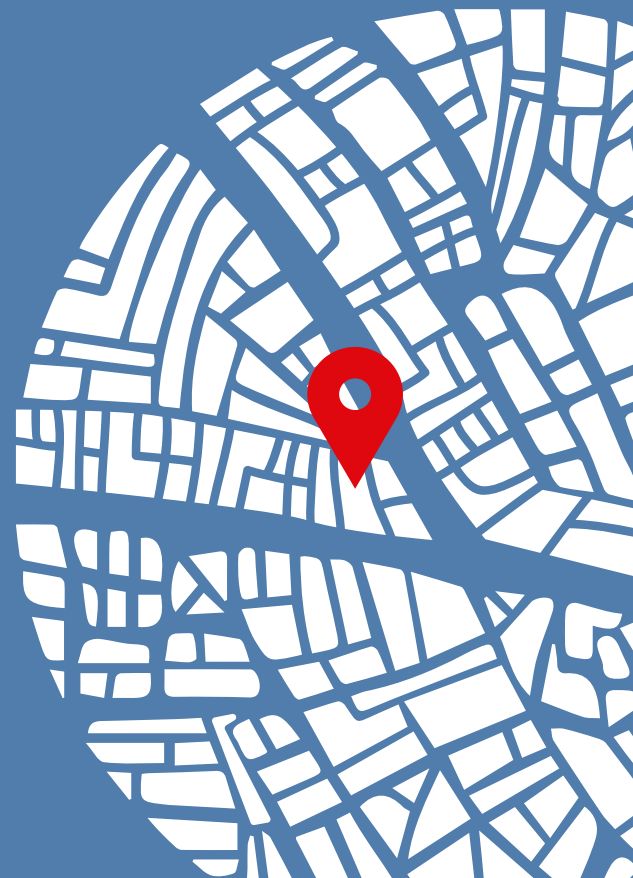
New Member



Farewell



Contact Us



# Appreciation Post



Ts. Dr. Siti Indati Binti Mustapa

## Appreciating Ts. Dr. Siti Indati's Unwavering Commitment as Director of IEPRe

Ts. Dr. Siti Indati Mustapa has been an exemplary leader, providing guidance and support to our institute, staff, and students alike. Her vision and dedication have helped shape our institute into the thriving research institute it is today.

Under Ts. Dr. Siti Indati's leadership, we have achieved many notable accomplishments, including securing RM2.24M grants for 2022, supporting activities of the Chair in Energy Economics of Energy Commission at UNITEN, organizing a youth empowerment workshop at a national-scale symposium, and kickstarting our own newsletter!

But it's not just the impressive list of accomplishments that make Ts. Dr. Siti Indati so valuable to our institute. She is also an extraordinary director, mentor, colleague, and friend. Her warmth, approachability, and willingness to listen to our concerns and ideas have helped create a culture of collaboration and innovation at our institute.

Thank you, Ts. Dr. Siti Indati for all you have done to advance our institute during your term from 1st January 2019 until 31st October 2022, and we wish you all the best in your future endeavors!



# Appreciation Post



Prof. Dr. Ken Koyama

## A Heartfelt Gratitude to Prof. Dr. Ken Koyama, Our Esteemed Chair Holder

It is with deep gratitude and admiration that we recognize the outstanding contributions of our Chair holder, Prof. Dr. Ken Koyama. For many years, Prof. Dr. Ken Koyama has been providing guidance and support to IEPRe in ensuring the success of research and activities conducted under the Chair in Energy Economics of Energy Commission at UNITEN. The Chair, co-funded by the Energy Commission and Tenaga Nasional Berhad, has been an icon to IEPRe, since IEPRe was first established in 2007.

During his tenure as the Chair holder, Prof. Dr. Ken Koyama who is also the Senior Managing Director and Chief Economist of The Institute of Energy Economics Japan (IEEJ), has been involved as a speaker for our public talks and webinars, and has also been involved in planning and executing the Chair's flagship event, International Forum on Global Energy Landscape (IFGE). Prof. Dr. Ken Koyama has been an exceptional advisor, always going above and beyond to ensure that our researchers receive the best possible support and guidance.

Thank you, Prof. Dr. Ken Koyama, for your exceptional work and dedication as our Chair holder. You have made a lasting impact on our institute and UNITEN, and wishing you continued growth and success in all your future ventures.







# Farewell *Wish*

Nurul Syuhadah Binti Yakath Ali

## Thank you Syuhadah!

Syuhadah has been with us at IEPR since December 2021. Syuhadah is an economics graduate from Universiti Sains Malaysia for both of her master's and bachelor's degree. She who is always excellent in academics and writing has recently won the best paper for International Sustainability (ISEBA) 2022 organised by COBA. The title of the paper is "Bibliometric Analysis of Energy Security Research: An Analysis of Global Geopolitics Consequences".

Syuhadah, a very soft spoken and kind-hearted girl left IEPR in September 2022, receiving offer by Lembaga Getah Malaysia (LGM) for an Economist position.

On behalf of IEPR, we are very proud of Syuhadah and thank her for all her dedication towards IEPR along her tenure. We wish her all the best for her future endeavor.

Thank you, Syuhadah for the memories we've shared. We wish you great accomplishments in your career and family

**With love and du'a, we bid our farewell  
to Nurul Syuhadah.**



# Welcome to New Family Members

## A New Chapter Begins: Welcoming Dr. Nora Yusma as Our New Director

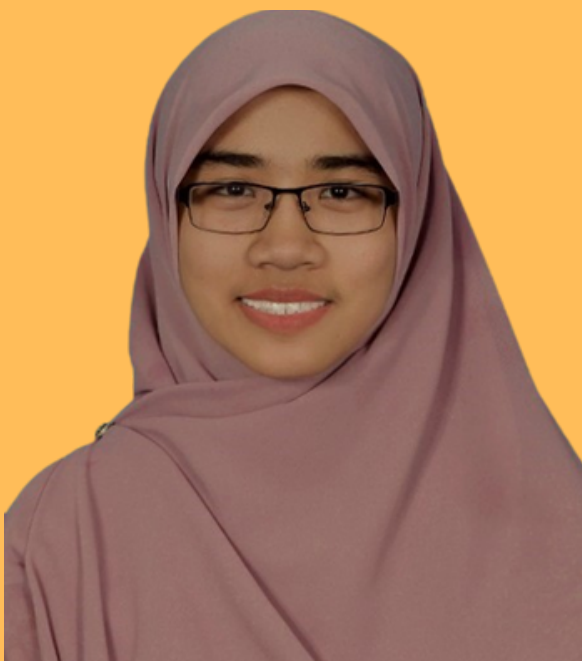
It is with great pleasure that we welcome our new Director, Dr. Nora Yusma bt Mohamed Yusop to IEPR. Prior to joining IEPR, Dr. Nora Yusma was a Deputy Dean at the College of Energy Economics and Social Sciences (CES), UNITEN.

Dr. Nora Yusma brings with her a wealth of experience, knowledge, and passion for research, and we are thrilled to have her joining us at IEPR!



### Director

Dr Nora Yusma Binti Mohamed Yusop



### Research Assistant

Asiyah Sakinah Binti Dzulkfli

Our Research Assistant, Asiyah Sakinah graduated from International Islamic University Malaysia (IIUM) for her Bachelor of Economics degree.

Doing her master's degree at UNITEN, Asiyah research interest includes an energy-related policy research, price change impact and input-output based study.

# Welcome to New Family Members

Syarifah Mardhiah is a graduate from Universiti Kebangsaan Malaysia (UKM) in Master of Development Economics. She also studied Bachelor of Economics at International Islamic University Malaysia (IIUM). Mardhiah is currently a PhD student at UNITEN.

Her research interest is the Energy Economics, International Economics, and also Econometrics.



## Graduate Research Assistant

Syarifah Mardhiah Binti Syed Salim



## Research Engineer

Erna Farina Binti Mohamed

Erna Farina is a PhD student at UNITEN, enrolling the Doctor of Philosophy in Business Management. She was graduated from International Islamic University Malaysia (IIUM) for both of her bachelor's and master's degree.

She is currently writing for her PhD thesis titled "Asymmetric Impact of Energy Efficiency on the Malaysian Economy and Its Dynamic Interaction with Carbon Emissions".

During her master's degree, she produced a significant thesis on tobacco: Tobacco Carve-Out from the Trans-Pacific Partnership Agreement (TPPA).

# CONTACT US

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