NEFES 2025

The 10th International Conference on New Energy and Future Energy System

July 21-24, 2025 Matsue, Japan

Conference Program

HongKong Bosen Academic Research Institute

Table of Contents

Part I Conference Schedule Summary **1**

Part II Keynote Speeches **3**

Keynote Speech 1: Hybrid Energy with Hydrogen Deployment Strategies for the Transition to Zero Carbon Communities 3

Keynote Speech 2: Energy from Renewable Sources - Who Knows How Much Its Harvesting Cost? 4

Keynote Speech 3: Nitinol as Versatile Materials for Applications from Biomedical to Solid State Refrigeration 5

Keynote Speech 4: Development of an Experimental Elastocaloric Heat Pump for Solid-State Cooling Applications 6

Part III Poster Presentations **7**

Part IV Oral Presentations **10**

Oral Session 1: Advanced Energy Systems, Materials and Urban Sustainability 12

Oral Session 2: Smart Grids, Energy Storage and Fault Analysis 14

Part V Conference Venue **16**

Part VI Acknowledgements **18**

Scan the QR Code to Download the Abstract Proceedings

<u>* This Program and abstract proceedings are used for NEFES 2025 academic exchange only</u>

Part I Conference Schedule Summary

July 21, 2025 / Japan Standard Time (UTC+9)	
14:00-18:00	On-site Registration In front of Small Hall, Kunibiki Messe
17:00-18:00	MS Teams Online Conference Testing and Ice Breaking *MS Teams Link: http://www.academicconf.com/teamslink?confname=nefes2025*

*** Note for offline registration:**

- Please show us your name or paper ID for registration;
- Please pick up all the conference materials at the registration desk (Name Card, Conference Program, Lunch & Dinner Tickets, etc.).

July 22, 2025 / Japan Standard Time (UTC+9) **Location: Meeting Room 401, Kunibiki Messe** ***MS Teams Link: http://www.academicconf.com/teamslink?confname=nefes2025***	
Opening Ceremony and Keynote Speeches are chaired by: ***Prof. Hossam A. Gabbar,*** *Director of Smart Energy Systems Lab, Ontario Tech University, Canada*	
08:40-08:50	**Opening & Welcome Speech** ***Prof. Mikihisa Umehara****, Toyo University, Japan*
08:50-09:25	**Keynote Speech 1:** Hybrid Energy with Hydrogen Deployment Strategies for the Transition to Zero Carbon Communities ***Prof. Hossam A. Gabbar,*** *Director of Smart Energy Systems Lab, Ontario Tech University, Canada*
09:25-10:00	**Keynote Speech 2:** Energy from Renewable Sources - Who Knows How Much Its Harvesting Cost? ***Prof. Leszek S. Czarnecki,*** *Department of Electrical Engineering and Computer Science, Louisiana State University, USA*
10:00-10:25	**Group Photo (At the entrance of Kunibiki Messe)**
10:25-10:45	**Coffee Break**
10:45-11:20	**Keynote Speech 3:** Nitinol as Versatile Materials for Applications from Biomedical to Solid State Refrigeration ***Dr. Assunta Borzacchiello,*** *Institute of Polymers, Composites and Biomaterials, National Research Council, Italy*
11:20-11:55	**Keynote Speech 4:** Development of an Experimental Elastocaloric Heat Pump for Solid-State Cooling Applications ***Prof. Adriana Greco,*** *Department of Industrial Engineering, University of Naples Federico II, Italy*

11:55-13:30	**Lunch Break**
13:30-17:35	**Oral Session 1: Advanced Energy Systems, Materials and Urban Sustainability**

July 23, 2025 / Japan Standard Time (UTC+9) **Location: Meeting Room 401, Kunibiki Messe** ***MS Teams Link: http://www.academicconf.com/teamslink?confname=nefes2025***	
08:50-12:00	**Oral Session 2: Smart Grids, Energy Storage and Fault Analysis**
16:15-17:15	**Poster Session (**Meeting Room 501**)**
17:30-20:30	**Awarding Banquet at YUUSHIEN Garden in Daikonshima** (Please gather at the entrance of Kunibiki Messe)

July 24, 2025 / Japan Standard Time (UTC+9)	
09:10	**Departure from Kunibiki Messe** (Please gather at the entrance of Kunibiki Messe)
09:30-10:30	**Visit Matsue Castle**
10:40-11:40	**Horikawa Sightseeing Boat Ride**
11:50-12:40	**Lunch Break**
13:00-15:00	**Matsue Vogel Park**
15:30	**Arrival at JR Matsue Station at 15:30** (Subject to no traffic delays)

Notes: Please note that the itinerary, including the order of visits and time spent at each location, is subject to change based on actual circumstances.

Part II Keynote Speeches

Keynote Speech 1: Hybrid Energy with Hydrogen Deployment Strategies for the Transition to Zero Carbon Communities

Prof. Hossam A. Gabbar
P.Eng, Fellow IET, Distinguished Lecturer-IEEE NPSS;
Director of Smart Energy Systems Lab, Ontario Tech University, Canada

Biography: Dr. Gabbar is a full Professor in the Department of Energy and Nuclear Engineering, the Faculty of Engineering and Applied Science, at Ontario Tech University (UOIT), where he has established the Energy Safety and Control Lab (ESCL), Smart Energy Systems Lab, and Advanced Plasma Engineering Lab. He is the recipient of the Senior Research Excellence Aware for 2016, UOIT. He is recognized among the top 2% of worldwide scientists with high citation in the area of energy. He is a Fellow IET (FIET) and a Distinguished Lecturer – IEEE NPSS on Nuclear-Renewable Hybrid Energy Systems and Plasma-based Waste-to-Energy. He is leading national and international research in the areas of smart energy grids, energy safety and control systems, and waste-to-energy using advanced plasma technologies. Dr. Gabbar obtained his B.Sc. degree in 1988 with first class of honor from the Faculty of Engineering, Alexandria University (Egypt). In 2001, he obtained his Ph.D. degree from Okayama University (Japan). From 2001 till 2004, he joined Tokyo Institute of Technology (Japan), as a research associate. From 2004 till 2008, he joined Okayama University (Japan) as an Associate Professor, in the Division of Industrial Innovation Sciences. From 2007 till 2008, he was a Visiting Professor at the University of Toronto. He also worked as process control, safety, and automation specialist in energy and oil & gas industries. Dr. Gabbar has more than 230 publications, including patents, books / chapters, journal and conference papers.

Abstract: In this talk, hybrid energy with hydrogen deployments strategies are analyzed, modeled using collaborative simulation. The different modeling levels of hybrid energy systems and hydrogen technologies will be presented as interconnected with community infrastructures. Collaborative simulation approaches are used to evaluate the utilization of planning hydrogen deployment in municipalities and community applications. The concept of energy semantic network is utilized to model energy networks and interconnected infrastructures while defining key performance indicators. The collaborative simulation will enable the definition of different strategies and scenarios and optimize based on performance, risks, and transactive energy. Case studies will be presented with energy, nuclear, transportation, hydrogen, and water networks as interfaced with infrastructures.

Keynote Speech 2: Energy from Renewable Sources - Who Knows How Much Its Harvesting Cost?

Prof. Leszek S. Czarnecki
Department of Electrical Engineering and Computer Science, Louisiana State University, USA

Biography: Leszek S. Czarnecki, IEEE Life Fellow and Distinguished Professor at Louisiana State University, is a Titled Professor of Technological Sciences in Poland. He earned Ph.D. and D.Sc. degrees in electrical engineering from Poland's Silesian University of Technology, worked at Canada's National Research Council, and joined LSU's Electrical and Computer Engineering Department in 1989.
In 1996, he became an IEEE Fellow for developing power theory for nonsinusoidal/asymmetrical three-phase systems and compensation methods. His major contribution, the Currents' Physical Components (CPC)-based power theory, earned him a nomination for the IEEE Proteus Charles Steinmetz Award. Stanford University named him among the world's top 2% faculty in 2019, and Oxford University Press published his book *Powers in Compensation in Circuits with Nonsinusoidal Currents*.
Decorated by Poland's President with the Knight Cross for promoting Poland's NATO accession, he is an avid adventurer: he climbed Lhotse (8,350m) without oxygen, traversed the Rwenzori Mountains, skied 500km across Spitsbergen, and summited Denali, among other feats.

Abstract: The authors of this Keynote study on compensation, meaning reduction of excessive currents in electrical systems, are motivated by the need to lower the cost of electric energy delivery. This motivation strongly fits the power systems strategy of lowering, by power dispatch, the costs of energy delivery, as well as reducing the impact of electric energy production upon the environment. The development of renewable energy sources seems to be in sharp contrast to this optimization-oriented motivation. Optimization requires that the cost of harvesting such sources is known. It is a compound of various factors, such as the environmental impact, the use of the Earth's resources, development, maintenance, and profits, to finally include social and political implications. Unfortunately, the latest seems to be the dominating ones. Renewable sources are supported by various economic incentives from states' budgets. This support disturbs free market mechanisms, so economic optimization is losing its sense. Wind and solar energy do not cost, so in public perception, their use as electricity sources should reduce energy bills. However, the former president of the European Union (EU) Council said recently that bills for electricity in the EU are 2.5 times higher than in the US. He blamed EU policy towards reducing CO2 emissions for that. Government subsidies are not visible, moreover, in bills for electricity. Their increase could be only the tip of a huge iceberg. Consequently, the question: "Who knows how much harvesting renewable sources costs?" is legitimate and deserves investigation.

Keynote Speech 3: Nitinol as Versatile Materials for Applications from Biomedical to Solid State Refrigeration

Dr. Assunta Borzacchiello
Institute of Polymers, Composites and Biomaterials, National Research Council, Italy

Biography: Dr. Assunta Borzacchiello has served as Senior Researcher and Research Director at the Institute of Polymers, Composites and Biomaterials (IPCB) of the National Research Council (CNR) since 2001. Her research focuses on polymeric materials, biomaterials, smart materials, tissue engineering, controlled drug release, microfluidic techniques and rheology/microreology of complex fluids for biomedical applications.

She earned a summa cum laude M.S. in Chemical Engineering (1994) and a PhD in Materials Technologies (1998) from the University of Naples "Federico II". Notable academic roles include Visiting Scientist positions at Queen Mary and Westfield College (London, 1996) and the University of Connecticut (USA, 1997), Professor of Biomaterials at the University of Naples (2002–2011), and Visiting Professor at McGill University (Canada, 2018–2019).

With extensive international collaborations across leading research institutes and biomedical industries, she has authored over 120 peer-reviewed articles, 16 book chapters, and edited Wiley's *Encyclopedia of Composites* (H-index 43, 6,559 citations). She has been Principal Investigator of many research projects among which MIUR-PON ARS01 for medical biotechnological products, POR Campania's ADViSE on marine antitumor drugs, and bilateral programs with Egypt and Quebec. She has supervised 10 postdocs, 9 PhDs (including Marie Curie fellows), over 50 undergraduate students, and organized 6 international conferences.

Abstract: Nickel-titanium alloys commonly called as nitinol, a Shape Memory Alloy (SMA), is recognized as next generation alloy. Nitinol is a family of titanium based intermetallic materials that contain nearly equal amount of nickel and titanium, has been widely employed in many applications such as biomedical, actuators, aerospace and automotive devices. In near-equiatomic NiTi alloys, shape memory effect and superelasticity are due to thermoelastic martensitic transformation from parent austenite phase with B2 structure to the monoclinic (M) or rhombohedral (R) martensitic phase transformation. The biocompatibility, and exquisite properties of nitinol SMA have gained a lot of popularity among these several combinations, and allow to obtain smart material with shape memory effect and superelastic properties. Due to the functional properties of nitinol SMAs, their biomedical application has proven to be more successful by increasing the possibility as well as the performance of minimally invasive surgeries. The combination of nickel-titanium SMA is highly biocompatible which makes them useful as orthopedic implants, surgical instruments, cardiovascular devices, and orthodontic devices. The reversible austenite-to-martensite solid state transition under stress that occurs in Nitinol is associated to a release of heat, and this phenomenon is widely investigated in literature for the application in solid-state cooling devices. Elastocaloric cooling based on NiTi SMA exhibits excellent cooling capabilities. Due to the high specific latent heats activated by mechanical loading/unloading, large temperature changes can be generated in the material. The small required work input enables a high coefficient of performance. Solid-state cooling is an environmentally friendly, no global warming potential alternative to vapor compression-based systems.

Keynote Speech 4: Development of an Experimental Elastocaloric Heat Pump for Solid-State Cooling Applications

Prof. Adriana Greco

Department of Industrial Engineering, University of Naples Federico II, Italy

Biography: Adriana Greco is Full Professor of Applied Thermodynamics and Heat Transfer at the University of Naples Federico II, where she coordinates the research group on refrigeration and heat transfer. She holds a cum laude degree in Chemical Engineering (1994) and a PhD in Thermo-Mechanical Systems Engineering (1997) from the same university. Her research focuses on applied thermodynamics, convective heat transfer, refrigerants, and solid-state refrigeration, with particular expertise in elastocaloric cooling.

She has authored over 140 scientific publications, including more than 50 on caloric cooling technologies, and has an h-index of 40 with 3055 citations (Scopus, 2025). She was Principal Investigator of the SUSSTAINEBLE project, funded by the Italian Ministry of University, and leads the Italian unit of the EIC Pathfinder Challenge 2023 project SMACOOL.

Prof. Greco collaborates internationally with institutions in China, Spain, Germany, and India. She is Editor-in-Chief of *Journal of Sustainability for Energy*, Associate Editor of *International Journal of Heat and Technology*, and serves on editorial boards of several journals. She is a reviewer for over 100 international journals and an active member of IIF-IIR, IES, and AIGE. She was listed among the World's Top 2% Scientists in both 2020 and 2022 for career impact and annual output.

Abstract: This study presents the development of an experimental heat pump prototype based on the elastocaloric effect—a promising solid-state cooling mechanism that leverages the reversible thermal response of Shape Memory Alloys (SMAs) under mechanical loading and unloading. Unlike conventional vapor-compression systems, elastocaloric cooling offers a potentially more energy-efficient and environmentally friendly alternative, as it eliminates the need for refrigerants with high Global Warming Potential. The research is part of the project SUSSTAINEBLE (a Solution Using Solid-STate cooling: An INvestment Eco-compatiBLE) funded by the Ministry of University and Research (MUR) of Italy. The aim of this research, carried out by the group of the University of Naples Federico II, is the developing of a demonstrative prototype of the first Italian elastocaloric device for air conditioning. Air is the auxiliary fluid that will be used to avoid an intermediate heat exchanger. The operation of the device based on the AeR cycle uses a rotary mechanism that ensures a continuous flow of hot and cold air. A 2D rotative numerical model has been developed through COMSOL to attain the device's potential cooling and heating capacities and to optimize the geometrical parameters and the operative conditions of the device. The experimental setup utilizes nickel-titanium (NiTi) alloy elements, selected for their significant latent heat and mechanical resilience. The results of numerical simulations carried out following the optimization of the geometric parameters of the device are presented to analyze its potential in terms of energy performance. This work contributes to the growing body of research on solid-state cooling technologies and provides insights into the engineering and operational considerations necessary for scaling elastocaloric systems toward commercial viability.

Part III Poster Presentations

Poster Presentation Guidelines

Materials Provided by the Conference Organizer:

- X Racks & Base Fabric Canvases
- Adhesive Tapes or Clamps

Materials Provided by the Presenters:

- Home-Made Posters
- Posters Printed by Conference

Requirements for the Posters:

- Material: not limited
- **Size: W1200*H2100**

Display Rack

Best Poster Presentation Selection Procedure

Selection Criteria:

- Research Quality
- Presentation Skill
- Design

Samples of Stickers

Selection Procedure:

- 6-8 volunteers will be invited from the participants to serve as the judges to review the posters. (Note: A judge would not have a poster or know the participant exhibiting a poster.)
- 2 red stickers and 2 green stickers will be provided for the judges. The red sticker stands for "Research Quality" with a value of 2 points; the green sticker stands for "Presentation Skill and Design" with a value of 1 point.
- Each judge will go around the poster session and give the stickers to the poster which he/she thinks is of high quality or well designed and well presented, please be notified that the judge cannot give 2 red or 2 green stickers to the same poster (one red and one green sticker is acceptable).
- After the poster session, the conference secretary will count the points from each poster and ONE best poster presentation with more points will be selected. If there is a tie, the one with more red (Research Quality) stickers wins.

Nature of the Award

- This award consists of free registration for the NEFES 2026 and a certificate.
- **One Best Poster Presenter** will be selected and honored with a certificate during the award ceremony. The winner will be announced at the banquet and featured on the NEFES 2026 official website.

List of Posters

Time: 16:15-17:15, July 23rd, 2025 **Location: Meeting Room 501, Kunibiki Messe**

FES3153	**Optimization of Porous Media with Tailored Pore Size and Thermal Conductivity Distributions for Enhanced Phase-change Heat Transfer in Loop Heat Pipes** *Asst. Prof. Yixue Zhang, College of Electromechanical Engineering, Qingdao University of Science and Technology, China*
FES3155	**Aluminium's Potential as A Metal Fuel and the Cogeneration of Heat and Hydrogen from the Aluminium-water Reaction** *Mr. Muhammad Zahid, National Institute of Chemistry, University of Ljubljana, Slovenia*
FES3178	**Design of Dichroic Filter for Side-absorption Concentrated Photovoltaics** *Dr. Jyh-Rou Sze, National Center for Instrumentation Research, National Institutes of Applied Research*
FES3204	**Study on Optimization Design of Fracturing Parameters for Hot Dry Rock Geothermal Reservoirs Based on Integrated Simulation of Fracture Propagation and Heat Extraction Performance** *Prof. Ming Chen, School of Petroleum Engineering, China University of Petroleum (East China), China*
FES3208	**3D Printing Combined with Biochar Doped with Fe and Co to Fabricate the Cathode of the Bioelectro-Fenton System to Enhance Power Production and Remove a Bisphenol A** *Dr. Chi-Wen Lin, Department of Safety, Health and Environmental Engineering, Graduate School of Engineering Science and Technology, National Yunlin University of Science and Technology*
FES3210	**Athlete Development Pathways - An Artificial Intelligence Applications and Data Governance of Grassroots Athletes Training Stations in Taipei City** *Prof. Wenbin Lin, Physical Education Center, Taipei National University of the Arts*
FES3212	**Insect Waste and Melanin Composite Biochar for Proton Exchange Membranes to Improve Performance and Power Production in Bioelectrochemical Systems** *Prof. Shu-Hui Liu, Department of Safety, Health and Environmental Engineering, National Yunlin University of Science and Technology*
FES3214	**The Impact of the Degradation of the Critical Current Value of the HTS Tape in a Superconducting Fault Current Limiter on the Coordination of the Power System Protection** *Dr. Sylwia Hajdasz, Institute of Automation, Electronics and Electrical Engineering, University of Zielona Gora, Poland*
FES3215	**Algorithm for Identifying Short Circuits and Overloads in Medium Voltage Lines** *Dr. Beata Zieba, Institute of Automatic Control, Electronics and Electrical Engineering, University of Zielona Gora, Poland*
FES3236	**Near-infrared Emission Characteristics by Solar Pumping Using Rare-earth Doped Materials** *Mr. Takuma Nomura, Faculty of Engineering, Kitami Institute of Technology, Japan*
FES3238	**Mid-infrared Supercontinuum Generation Using Tapered Ge-As-Se Glass Fiber**

	Mr. Shuyang Zheng, Faculty of Engineering, Kitami Institute of Technology, Japan
FES3240	**Mid-infrared Supercontinuum Generation Using Cascaded Bidirectionally Tapered Indium Fluoride Fibers** *Mr. Musashi Nitta, Faculty of Engineering, Kitami Institute of Technology, Japan*
FES3252	**Iron Phthalocyanine Grafted MXene Nanosheets as Single Atom Catalyst for Degradation of Organic Pollutants via Solar Photothermal Enhanced Persulfate Activation** *Prof. Dong-Hwang Chen, Department of Chemical Engineering, National Cheng Kung University*
FES3254	**Compositional Engineering of Hybrid Perovskite for High-Efficiency Indoor Photovoltaics** *Dr. Mijoung Kim, Kunsan National University, Republic of Korea*

Part IV Oral Presentations

General Guidelines

- **All presentation times are shown in Japan Standard Time (UTC+9).**
- Duration for invited oral presentation: 20 minutes of presentation, including 3-5 Minutes of Q&A.
- Duration for regular oral presentation: 15 minutes of presentation, including 2-3 Minutes of Q&A.
- All presenters are requested to reach the Session Room prior to the scheduled time and complete their presentations on time.
- Presenters should prepare Power Pointer or PDF Files for Presentation with Paper ID (**FES******) marked on the last page.
- A signed and stamped presentation certificate will be issued after the presentation.

Offline Oral Presentation Guidelines

Devices Provided by the Conference Organizer:

- Laptops (with MS-Office & Adobe Reader) & Projectors & Screen
- Laser Sticks
- Microphones
- Please send us the PowerPoint once it is ready and have the PPT back up in a U-disk. For presenters who do not send the PowerPoint, please save it in the laptop of the corresponding session 15 min in advance. Kindly tell the Session Chair (before the start of your session) that you are present.

Online Oral Presentation Guidelines

- Online Oral Presentation will be conducted via Microsoft Teams Meeting.
- If a presenter is not able to show up via Teams, the session chair/conference secretary will play the pre-recorded video presentation during his/her scheduled presentation time. If listeners have questions about the presentation, please contact the conference secretary to forward the questions.
- If a presenter cannot show up on time or has a problem with the internet connection, the session chair has the right to rearrange his/her presentation and let the next presentation start.

Best Oral Presentation Selection Procedure

ONE best presentation will be selected from EACH session based on the following criteria:

- ✓ Research Quality
- ✓ Presentation Performance
- ✓ Presentation Language
- ✓ PowerPoint Design
- ✓ Effective Communications

Selection Procedure

- An assessment sheet (see picture) will be delivered to listeners before the session starts;
- When the session finishes, each listener is required to fill out the sheet (he/she can vote for two excellent presentations) and give it to the Session Chair;
- For the online presenters, the assessment sheet would be sent in advance via e-mail. Kindly send us the filled form in electronic version within ONE HOUR after the session is completed;
- The Session Chair will count the votes and select the best oral presentation with the most votes. If there is a tie, the Session Chair will make the final decision.

Best Oral Presentations Award

The Best Oral Presenter from each session will receive an official certificate and a complimentary registration to the NEFES 2026.

Sample of Assessment Sheet

NEFES 2025 Oral Presentation Assessment

Dear participants,

After carefully listening to the presentations of this session, please kindly recommend two excellent Oral Presentations with reference to the following evaluation criteria.

The Session Chair will count the votes from each presentation and select ONE Best Oral Presentation in this session. If there is a tie, the Session Chair will make the final decision.

The winner will be announced at the official website after the conference.

You can refer to the following criteria for best oral selection:

Items	Assessment
Content	Right, Logical, Original, Well-Structured
Language	Standard, Clear, Fluent, Natural
Performance	Spirited Appearance, Dress Appropriately, Behaves Naturally
PowerPoint	Layout, Structure, Typeset, Animation, Multimedia
Reaction	Build a Good Atmosphere, Speech Time Control Properly

Please write down the paper ID and give reasons for your recommendation:

Paper ID	Reasons

Evaluated by:_____

Paper ID: _____

Note: Please fill it out and give it to the Session Chair or assistant so that the Best Oral Presentation could be selected.

Oral Session 1: Advanced Energy Systems, Materials and Urban Sustainability

Time: 13:30-17:35, July 22, 2025 (Japan Standard Time UTC+9)
Location: Meeting Room 401, Kunibiki Messe
Session Room Link: http://www.academicconf.com/teamslink?confname=nefes2025
Session Chair:
13:30-15:10 ***Dr. Jianhua Shen, East China University of Science and Technology, China***
15:30-17:35 ***Dr. Daniel F. Hollenbach, C S Engineering, Inc., USA***

13:30-13:50	**FES3175 (Invited)**	**Reliable Large-scale Simulation of Energy Materials Based on Machine Learning Potential** *Prof. Sang Uck Lee, School of Chemical Engineering, Sungkyunkwan University, Republic of Korea*
13:50-14:10	**FES3245 (Invited)**	**Intelligent Mine Designs for Controlled Subsidence and Seismicity in the United States Operations** *Dr. Hamid Maleki, Maleki Technologies, Inc., USA*
14:10-14:30	**FES3203 (Invited)**	**Preparation of Highly Efficient Electrocatalysts Based on the Concept of Frustrated Lewis Pairs (FLP) for the Reduction of Nitrate to Synthesize Ammonia** *Prof. Yihua Zhu, School of Materials Science and Engineering, East China University of Science and Technology, China*
14:30-14:50	**FES3187 (Invited)**	**Adaptive Defense Plan to Optimize Anticipated Islanding of Critical Microgrids** *Dr. M. A. Mohammed Manaz, Department of Electrical Engineering, National Sun Yat-sen University*
14:50-15:10	**FES3258 (Invited) Online**	**Thermo-Mechanical Performance Enhancement Mechanisms in Nano-Modified Phase Change Cementitious Energy-Storage Materials** *Prof. Yushi Liu, School of Civil Engineering, Harbin Institute of Technology, China*
15:10-15:30		**Coffee Break**
15:30-15:50	**FES3247 (Invited)**	**Coking Behaviours during the Steam Reforming or Thermal Decomposition of Ethanol over A Nickel/silica-alumina-beta (SBA-15) Catalyst** *Dr. Félix Mérimé Bkangmo Kontchouo, Department of Energy and Power Engineering, Faculty of Materials Science and Engineering, Nanjing Forestry University, China*
15:50-16:05	**FES3233**	**Techno-Economic Assessment of Converting Municipal Solid Waste (Plastic and Tyre) into Standard Automobile Fuel** *Dr. Md Jahirul Islam, Centre for Hydrogen and Renewable Energy, School of Engineering and Technology, Central Queensland University, Australia*
16:05-16:20	**FES3154**	**Transforming Power Plant Dispatch: Integrating Environmental Costs to Prioritize Clean Energy and Address Climate Change**

		Dr. Arif S. Malik, Department of Electrical and Computer Engineering, Sultan Qaboos University, Oman
16:20-16:35	**FES3156**	**Improved Heat Transfer Efficiency by Surface Patterning in Developing Laminar Channel Flow** *Dr. Are Simonsen, Flow Technology Group, Process Technology Department, SINTEF Industry, Norway*
16:35-16:50	**FES3160**	**Electrical Conductivity Measurements for Monitoring State of Charge in Latent Thermal Energy Storage Systems** *Dr. Galina Simonsen, Multiphase Flow Laboratory, Process Technology Department, SINTEF Industry, Norway*
16:50-17:05	**FES3167**	**New Morphology Modifier Enables the Preparation of Ultra-long Platinum Nanowires Excluding Mo Component for Efficient Oxygen Reduction Reaction Performance** *Dr. Jianhua Shen, School of Materials Science and Engineering, East China University of Science and Technology, China*
17:05-17:20	**FES3218**	**An Adaptive Lithium-Ion Battery SOC Estimation Method for a Wide Temperature Range** *Prof. Xiong Shu, Hunan Provincial Key Laboratory of Vehicle Power and Transmission System, Hunan Institute of Engineering, China*
17:20-17:35	**FES3244**	**Operating Characteristics of a Sub-Core Planetary Reactor** *Dr. Daniel F. Hollenbach, C S Engineering, Inc., USA*

Oral Session 2: Smart Grids, Energy Storage and Fault Analysis

Time: 08:50-12:00, July 23, 2025 (Japan Standard Time UTC+9)
Location: Meeting Room 401, Kunibiki Messe
Session Room Link: http://www.academicconf.com/teamslink?confname=nefes2025
Session Chair:
Prof. Shogo Nishikawa, College of Science and Technology, Nihon University, Japan

08:50-09:10	**FES3164 (Invited)**	**Removal Technology of Reflective Disturbance for Detecting Open Fault of Bypass Circuit of PV Module with IR Camera** *Prof. Shogo Nishikawa, College of Science and Technology, Nihon University, Japan*
09:10-09:25	**FES3185**	**Influence of Partial Discharging in a Latent Heat Thermal Energy Storage Unit: 3D Numerical Study** *Dr. Soumaya Sokakini, IMT Nord Europe, Institut Mines-Telecom, Centre for Energy and Environment, University of Lille, France*
09:25-09:40	**FES3206**	**Optimization Study of Steam Power System in Iron and Steel Mills Considering Waste Heat Utilization** *Dr. Tingting Xu, School of Energy and Power Engineering, Dalian University of Technology, China*
09:40-09:55	**FES3207**	**Hydrothermal Characteristic of Pulsating Heat Pipe Arranged in Tubular Loop** *Prof. Shyy Woei Chang, Department of Systems and Naval Mechatronic Engineering, National Cheng Kung University*
09:55-10:10	**FES3223 Online**	**Sustainable Electrodes for a Greener Future: Materials and Applications in Microbial Fuel Cells** *Dr. Segundo Jonathan Rojas Flores, Vicerrectorado de Investigación, Universidad Autónoma del Perú, Peru*
10:10-10:25	**FES3225 Online**	**Bioelectrochemical Valorization of Mango Waste: A Sustainable Approach for Renewable Energy Generation in Microbial Fuel Cells** *Dr. Segundo Jonathan Rojas Flores, Vicerrectorado de Investigación, Universidad Autónoma del Perú, Peru*
10:25-10:45		**Coffee Break**
10:45-11:00	**FES3168**	**Optically Design of Beam-down Heliostats Plants** *Dr. Daniela Fontani, Italian National Council of Research, National Institute of Optics (CNR-INO), Italy*
11:00-11:15	**FES3229**	**Fault Analysis of SCR Denitrification System Based on Big Data** *Ms. Yawen Wang, College of Energy Power, Nanjing University of Aeronautics and Astronautics, China*
11:15-11:30	**FES3230**	**AI-Enabled Energy Management Device for Sustainable QoL** *Dr. Husam S. Samkari, Dept. of Electrical Engineering, University of Tabuk, Saudi Arabia; Artificial Intelligence and Sensing Technologies Research Center, University of Tabuk, Saudi Arabia*

11:30-11:45	**FES3255**	**Decoupling Analysis between CO_2 Emissions and Economic Growth in Manufacturing Sector Across Selected Indonesian Provinces** *Ms. Naomi Ratrianti, Graduate School of Humanities and Social Sciences, Hiroshima University, Japan; Department of Economics, Faculty of Economics and Business, Universitas Gadjah Mada, Indonesia*
11:45-12:00	**FES3226** **Online**	**Bibliometric Analysis of the Application of Artificial Intelligence and Machine Learning in Microbial Fuel Cell Optimization: Emerging Trends and Research Opportunities** *Dr. Segundo Jonathan Rojas Flores, Vicerrectorado de Investigación, Universidad Autónoma del Perú, Peru*

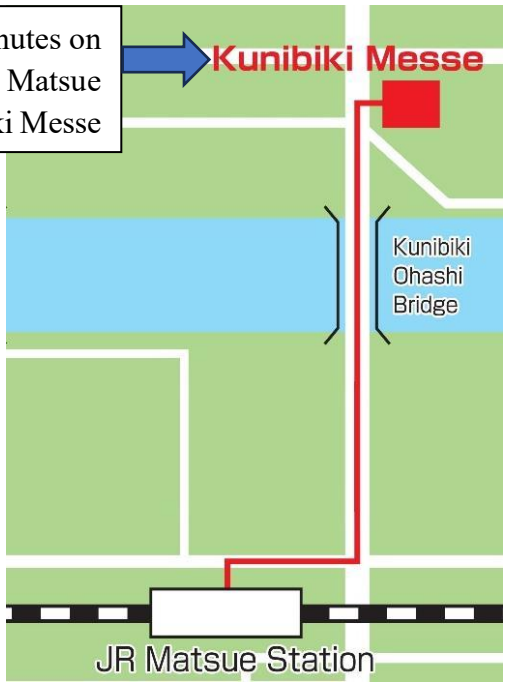
Video Presentations:	
FES3196	**Framework for Sustainable Building Design – Utilizing Parametric Design and BIM in the Conceptual Design Phase** *Dr. Kitti Ajtayné Károlyfi, Department of Structural and Geotechnical Engineering, Széchenyi István University, Hungary*
FES3221	**Bibliometric analysis: On the Use of Microbial Fuel Cells in Reducing Antibiotic Concentration and Generating Electricity Simultaneously** *Dr. Santiago M. Benites, Vicerrectorado de Investigación, Universidad Autónoma del Perú, Lima, Peru*
FES3222	**Bioenergy from Agriculture: Converting Rice Waste into Green Electricity** *Dr. Santiago M. Benites, Vicerrectorado de Investigación, Universidad Autónoma del Perú, Lima, Peru*

Part V Conference Venue

Kunibiki Messe
(Shimane Prefectural Convention Center)

The biggest convention center in Shimane prefecture, Kunibiki Messe, is located in the center of Matsue City. There are Exhibition Hall (4,018 sqm), Multipurpose Hall (686 sqm), International Conference Hall (510 sheets), and 19 meeting rooms.
Free Wi-Fi is available in building.

It takes only 7 minutes on foot from JR Matsue Station to Kunibiki Messe



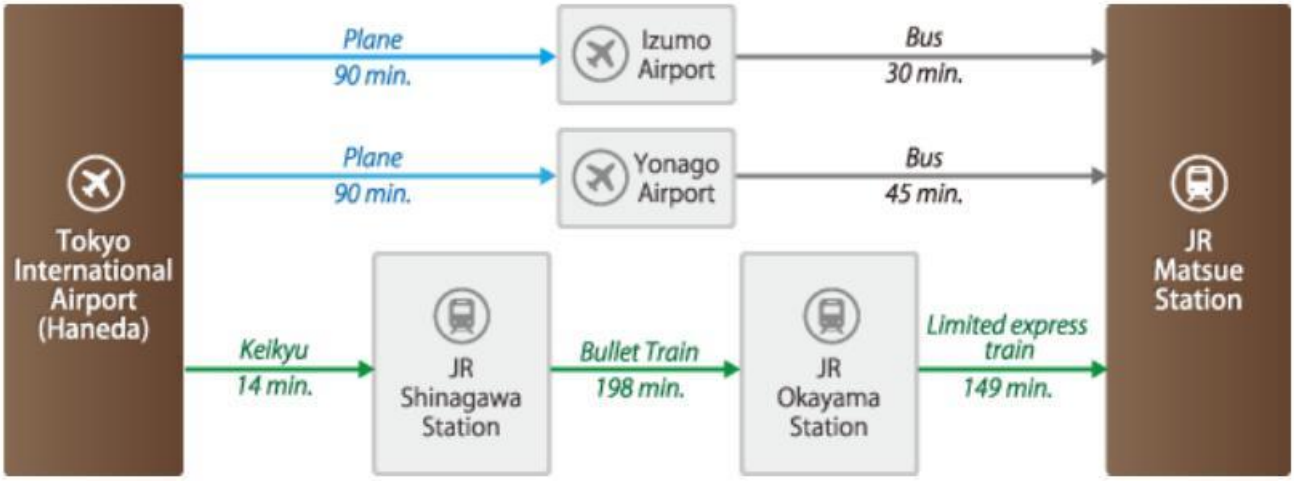
Kunibiki Messe
Address: 1-2-1 Gakuen Minami Matsue City, Shimane, JAPAN 690-0826
Tel: +81-852-24-1111
Fax: +81-852-22-9219
E-mail: kunibiki@kunibikimesse.jp

Access to JR Matsue Station:

Train Bus Plane

1. From Narita International Airport

2. From Tokyo International Airport



3. From Kansai International Airport

Part VI Acknowledgements

On behalf of the NEFES 2025 Organizing Committee, we would like to take this opportunity to express our sincere gratitude to our participants. We would also like to express our acknowledgements to the Technical Program Committee members who have given their professional guidance and valuable advice as reviewers. For those who contribute to the success of the conference organization without listing the name below, we would love to say thanks as well.

Conference General Chair

Prof. Hossam A. Gabbar, Professor, Director of Smart Energy Systems Lab, Ontario Tech University, Canada

Technical Program Committee Chairs

Prof. Emeritus Hisayoshi Hayashi, University of Tsukuba, Japan

Dr. Grigorios L. Kyriakopoulos, School of Electrical and Computer Engineering, National Technical University of Athens (NTUA), Greece

Prof. Mikihisa Umehara, Toyo University, Japan

Prof. Shunli Wang, Executive Vice President of Smart Energy Storage Institute, China

Prof. Fuqiang Wang, Department of New Energy, Harbin Institute of Technology (Weihai), China

Committee Member

Prof. Muslum Arici, Mechanical Engineering Department, Kocaeli University, Turkey

Dr. Tushar Anand, National Institute of Technology (NIT) Silchar (Institute of National Importance), India

Assoc. Prof. Bashir Ahmmad Arima, Department of Informatics and Electronics Faculty of Engineering, Yamagata University, Japan

Dr. Iman Bagherpour, Islamic Azad University, Iran

Dr. J. Pradeep Bhasker, Hindustan Institute of Technology & Science, India

Dr. Mingjie Chen, Hydrogeologist, Water Research Center, Sultan Qaboos University, Oman

Dr. Richao Cong, Department of Regional Cultural Policy and Management, Shizuoka University of Art and Culture, Japan

Dr. Ahmed M Daabo, College of Petroleum and Mining Engineering, University of Mosul, Iraq

Assoc. Prof. Maciej Dzikuć, Department of Energy Transformation, University of Zielona Gora, Poland

Assoc. Prof. Diana Enescu, Department of Electronics, Telecommunications and Energy, VALAHIA University of Targoviste, Romania; Physical Thermodynamics Unit, INRiM, Torino, Italy

Dr. S. HARIKRISHNAN, Kings Engineering College, India

Assoc. Prof. Kumaran Kannaiyan, Mechanical Engineering, Guangdong Technion-Israel Institute of Technology, China

Dr. Tomasz Kisielewicz, Warsaw University of Technology, Poland

Prof. Sang Uck Lee, School of Chemical Engineering, Sungkyunkwan University, Republic of Korea

Prof. Cheng-I Lin, Department of Fire Science, WuFeng University

Dr. Yushi Liu, School of Civil Engineering, Harbin Institute of Technology, Harbin, China

Dr. Claudia Masselli, University of Naples Federico II, Italy

Dr. Ebrahim Navid Sadjadi, Department of Informatics, Universidad Carlos III de Madrid, Spain

Assoc. Prof. Katarzyna Turoń, Faculty of Transport and Avition Engineering, Silesian University of Technology, Poland
Dr. Baiju V, Department of Mechanical Engineering, TKM College of Engineering, India
Prof. Sheng-Hung Wu, Research Center for Energy Technology and Strategy, National Cheng Kung University

Memo