



22nd International Conference on

Sustainable Energy Technologies

*Advancing Sustainable Energy Technologies
for Climate Resilience and Digital Innovation*

13–15 August 2026

Premiera Hotel, Kuala Lumpur

www.set2026.org

Contents

Essential Information

Venue, rooms, theme key

Day 1 • Thursday 13 Aug

Opening, keynotes 1–3, sessions A–C

Day 2 • Friday 14 Aug

Keynotes 4–7, Research Spark, D–E, gala

Day 3 • Saturday 15 Aug

Keynotes 8–9, sessions F, closing

Keynote Speakers

All nine, with biographies

Parallel Sessions

Every paper, in full

Poster Exhibition

48 posters

Reading this on a phone. Tap any line above to jump. Your PDF reader's outline or bookmarks button lists every section, and the search tool finds any paper number, author or room.

WELCOME

Essential Information

Keynotes & plenary

Ballroom 2, Level 6

Parallel rooms

Ballroom 2 (Level 6) and ER2–ER4 (Level 8) on Days 1 and 3; Hall and ER2–ER4 (Level 8), plus MR4 (Level 7), on Day 2

Posters & social

Poster Sessions: Exhibition Area, Level 6 · Gala Dinner: Ballroom 1

Early registration

Wednesday 12 August, 15:00–17:00 — Level 7

Research themes

-  **Energy Storage & Conversion**
-  **Low-Carbon Buildings**
-  **AI & Renewable Systems**
-  **Policy & Management**
-  **Urban & Environment**

PROGRAMME AT A GLANCE

Day 1

Thursday 13 August

Pre-conference — Wednesday 12 August 2026, 15:00–17:00.

Early registration and badge / conference
material collection — Level 7, Premiera Hotel

08:00

Registration opens — Level 6 Foyer · Poster
display opens — Exhibition Area, Level 6

08:50–09:20

OPENING CEREMONY — Ballroom 2 (Level 6)

Opening remarks: Professor Saffa Riffat
(Conference Chair, President of WSSET) and
Professor Ir. Ts. Dr Azli Abd Razak (SET2026 Co-
Chair, Dean FKM, UiTM) · Group photograph

09:20–10:05

KEYNOTE 1

From Zero to Negative: The Technological Breakthrough under Double-Carbon Strategy

Professor Xudong Zhao — Harbin Institute of Technology, Shenzhen, China

Chair. Professor Saffa Riffat

10:05–10:50

KEYNOTE 2

From Engagement to Transformation: Co-Creating a Sustainability Strategy for Organisational Resilience and Stakeholder Value

Professor AbuBakr Bahaj — University of Southampton, United Kingdom

Chair. Professor Ir. Ts. Dr Azli Abd Razak

10:50–11:15

POSTER SESSION 1 and refreshments — Exhibition Area, Level 6

Posters: #38 · #56 · #138 · #146 · #195 · #196 · #220 · #229 · #238 · #260 · #262 · #263 · #269 · #288 · #344

11:15–12:30 · parallel sessions

A1 Energy Storage & Conversion

Solar Photovoltaic Materials and Applications

Ballroom 2 (Level 6)

Chair: Professor K. Srinivas Reddy (Indian Institute of Technology Madras, India)

11:15–11:30 **Origin and Suppression
#57 Engineering of Non-radiative
Recombination in Inorganic
Halide Perovskite**

*Qun Ji — Southeast of University,
China*

**11:30–
11:45** **Cable-supported single-axis
#159 solar tracker for agrivoltaic
application**

*Donato Vincenzi — University of
Ferrara and Consorzio Futuro in
Ricerca, Italy*

**11:45–
12:00** **Unmasking the Intrinsic
#134 Formation Mechanism of
Dominant Point Defects in
Epitaxial MoS₂**

Jie Ji — Southeast University, China

**12:00–
12:15** **Design and Optimization of
#218 Light-Diffusing Glass Plates for
PV Agriculture**

*Peizhou Tan — Hubei University of
Technology, China*

12:15–
12:30
Q&A

*Panel Q&A and discussion with
all session speakers*

A2 Energy Storage & Conversion

Electrochemical Conversion and Green Hydrogen

ER2 (Level 8)

Chair: Professor Yuanlong Cui (Shandong
Jianzhu University, China)

11:15–11:30 **Biomimetic Interfacial
#62 Microenvironment Engineering
for High-Performance Alkaline
Water Electrolysis**

*Jiawei Zhu — Southeast University,
China*

**11:30–
11:45** **Advanced Electrocatalyst
#253 Design for Water Splitting
toward Sustainable Energy
Storage and Conversion
Technologies**

*Dilmurod Sayfiddinov — Jeonbuk
National University, South Korea*

**11:45–
12:00** **Fluorine-Modulated RuO₂
#77 Enables Selective Chlorine
Evolution and Simultaneous
Resource Recovery from High-
Salinity Water**

Rui Cui — Southeast University, China

12:00–
12:15
#254

**High-Performance Anion
Exchange Membranes with
Superior Hydroxide Conductivity
for Sustainable Energy Systems**

*Jeevitha Arunkumar — Jeonbuk
National University, South Korea*

12:15–
12:30
Q&A

***Panel Q&A and discussion with
all session speakers***

A3 **Low-Carbon Buildings**

**Bio-Based and Low-Carbon Building
Materials**

ER3 (Level 8)

Chair: Professor Fatang Jiang (Wuhan Donghu
University, China)

11:15–11:30 **#107** **Development of Bio-Based Rice
Husk Thermal Insulation Panels
for Low-Carbon Architectural
Applications**

*Junfeng Zhu — Universiti Sains
Malaysia, Malaysia*

11:30–
11:45
#168

**Experiment and Simulation
Study of a Novel
Diatomite/MPCM Composite
Gypsum Boards for Building
Thermal Management**

*Yi Fan — Shanghai University of
Electric Power, China*

11:45–
12:00
#224

**Acrylic–Particle Composite
Paints for Passive Radiative
Cooling in Building Applications**

*Taghreed Al-Gunaid — Hamad Bin
Khalifa University, Qatar*

12:00–
12:15
#108

**Bio–Based Insulation Panels
from Pine Wood Waste Fiber and
Press Mud for Low–Carbon
Building Applications**

*Mengtian Liu — Universiti Sains
Malaysia, China*

12:15–
12:30
Q&A

***Panel Q&A and discussion with
all session speakers***

A4 **AI & Renewable Systems**

**Artificial Intelligence for Materials,
Energy and Environmental Modelling**

ER4 (Level 8)

Chair: Professor Bilsay Pastakkaya (Bursa
Uludag University, Türkiye)

11:15–11:30
#53

**Active learning guides the
synthesis of two–dimensional
organic–inorganic hybrid rare–
earth double perovskites with
potential multifunctional
ferroelectric properties**

*Rong Guo — Southeast University,
China*

11:30–
11:45
#174

Evidential Ensemble Technique Integrated with Explainable Artificial Intelligence (XAI) for Microplastic Concentration Modelling from a Tropical River: a First Application of Evidential Neural Network Ensemble Approach in Microplastic Pollution

Abdullahi Garba Usman — Near East University, Türkiye

11:45–
12:00
#40

Human-Centred AI for Thermal Comfort Optimisation in Smart Buildings

Tajul Rosli Razak — Universiti Teknologi MARA, Malaysia

12:00–
12:15
#180

Mechanism of large vibration for bladeless wind energy harvesters with a plate for circular cylinder

Guanbin Chen — Harbin Institute of Technology, China

12:15–
12:30
Q&A

Panel Q&A and discussion with all session speakers

12:30–13:30

Lunch

13:30–14:15

KEYNOTE 3

Advancements of solar heating and cooling research and its application in buildings

Professor Yanjun Dai — Shanghai Jiao Tong University, China

Chair: Professor Jie Ji

14:15–14:25

Transition to parallel rooms

14:25–16:10 · parallel sessions

B1 Energy Storage & Conversion

Solar Thermal and Photovoltaic-Thermal Systems

Ballroom 2 (Level 6)

Chair: Professor Ashmore Mawire (North-West University, South Africa)

14:25–14:55 #52 Invited Speaker: Preliminary investigations on the evacuated PVT-driven methanol electrolysis for enhanced solar hydrogen production

Professor Qiliang Wang — University of Science and Technology of China, China

14:55–
15:10
#143

**Supercritical CO₂ Nanofluids for
Solar Thermal Applications:
Dispersion, Deposition, and
Photothermal Performance**

*Ning Zhao — Southeast University,
China*

15:10–
15:25
#43

**Thermal and Electrical
Performance of Passive STFPV–
VIG Systems under Different
Installation Orientations and
Ventilation Conditions**

*Adam Samsudin — Universiti
Teknikal Malaysia Melaka, Malaysia*

15:25–
15:40
#147

**Effects of optical filtration layers
on the performance of MXene–
based solar PV/T module: an
experimental analysis**

*Yuanlong Cui — Shandong Jianzhu
University, China*

15:40–
15:55
#299

**Optimizing Photovoltaic
Bandgaps for Efficient
Underwater Solar Energy
Harvesting**

*Haoliang Bai — Wuhan University of
Technology, China*

15:55–
16:10
Q&A

***Panel Q&A and discussion with
all session speakers***

B2 Energy Storage & Conversion

Thermochemical Energy Storage: Materials, Reactors and Seasonal Systems

ER2 (Level 8)

Chair: Dr Zhiwei Ma (Durham University, United Kingdom)

14:25–14:55
#85 **Invited Speaker: Advances in Reactor Design and Renewable Integration Strategies for Low-Grade Thermochemical Energy Storage**

Dr Devrim Aydin — Eastern Mediterranean University, Cyprus

14:55–15:10
#170 **Development and Validation of a Packed-Bed Reactor Discharging Performance Model for Salt Hydrate Thermochemical Energy Storage**

Jianbin Chen — University of Nottingham, United Kingdom

15:10–15:25
#191 **Effects of Zonal Design for Seasonal Thermal Energy Storage Systems**

Mengying Cui — Southeast University, China

15:25–
15:40
#166

**Coupled Effects of
Thermodynamic Conditions, Bed
Configuration and Airflow
Characteristics on the
Performance of an Open-Loop
Thermochemical Energy Storage
Reactor**

*Zhuo Chang — University of Ferrara,
Italy*

15:40–
15:55
#330

**Study on the Thermal Evolution
Mechanism and Temperature
Distribution of Solid-State
Batteries**

*Zhehui Zhang — Wuhan University of
Technology, China*

15:55–
16:10
Q&A

***Panel Q&A and discussion with
all session speakers***

B3 **Energy Storage & Conversion**

Sustainable Heating, Cooling and Refrigeration

ER3 (Level 8)

Chair: Dr Yi Fan (Shanghai University of Electric Power, China)

**14:25–
14:55
#26** **Invited Speaker: Experimental Energy Analysis of a Trigeneration System Based on Outdoor Air Temperature: A Case Study at Fatsa State Hospital, Türkiye**

Professor Ali Kilicarslan — Hitit University, Türkiye

**14:55–
15:10
#35** **Ultrasonic Oscillation Enhanced Mass Transfer in Ammonia-Water Generation Process: Design and Performance Analysis of a Novel Generator**

Chuang Pan — Southeast University, China

**15:10–
15:25
#175** **Decarbonization of Residential Buildings Using Low-Charge R290 Heat Pumps: Experimental and Numerical Approach**

Mohammad Salman — Korea Institute of Energy Research, South Korea

15:25–
15:40
#90

Design and performance analysis of a CO₂ heat pump thermal storage system decoupled from a coal-fired power plant

Tengjiao Jia — Central South University, China

15:40–
15:55
#19

Zonal control of a heat-pipe system for long-duration lunar habitats

Jingyu Cao — Hunan University, China

15:55–
16:10
Q&A

Panel Q&A and discussion with all session speakers

B4 AI & Renewable Systems

Intelligent Ventilation and Low-Carbon Building Control

ER4 (Level 8)

Chair: Professor Beatrice Bonfanti Pulvirenti
(University of Bologna, Italy)

14:25–
14:55
#29

Invited Speaker: Vision-Assisted Event-Triggered Ventilation for Indoor Pollution Control in Low-Carbon Buildings

Dr John Kaiser Calautit — University College London, United Kingdom

14:55–
15:10
#23

An integrated surrogate and optimisation framework for PCM-enhanced energy piles using energy-consistency-enhanced deep operator learning

Chaokai Zhang — Southeast University, China

15:10–
15:25
#215

A Replicable Community Greenhouse Optimisation System for Low-Energy Year-Round Tomato Production

Yanyue Tong — University of Nottingham, United Kingdom

15:25–
15:40
#289

Investigation of influential variations among variables in Semi-Transparent Perovskite Photovoltaic glazing glare metrics using machine learning and SHAP

Li Zhang — China University of Mining and Technology, China

15:40–
15:55
#311

Environmental and economic impact of using IoT sensors combined with IA on the energy efficiency of smart buildings: A comparative econometric assessment of developed and developing countries

Oumaima Bel Hadj Salah — Chouaib Doukkali University, Morocco

15:55–
16:10
Q&A

*Panel Q&A and discussion with
all session speakers*

16:10–16:40

POSTER SESSION 1 and refreshments – Exhibition Area, Level 6

Posters: #38 · #56 · #138 · #146 · #195 · #196 ·
#220 · #229 · #238 · #260 · #262 · #263 · #269
· #288 · #344

16:40–18:25 · parallel sessions

C1 Energy Storage & Conversion

Hydrogen Energy Systems, Electrolysers and Fuel Cells

Ballroom 2 (Level 6)

Chair: Dr Arif Karabuga (Istanbul Aydin
University, Türkiye)

16:40–
16:55
#98

Ce-Doped Ru/RuO₂ Heterojunction for Efficient Alkaline Hydrogen Evolution

*Dunyuan Jin — University of Science
and Technology of China, China*

16:55–
17:10
#270

**A Study on High Current Density
SOECs for Sustainable Power-to-
Hydrogen Conversion**

*Syed Shaheryar Ali Shamsi — Korea
Institute of Energy Research, South
Korea*

17:10–
17:25
#111

**Enhanced Performance of
proton-conducting solid oxide
fuel cells Enabled by a Novel Ce-
Doped YBaCo₄O₇ Cathode**

*Xin Zhou — Southeast University,
China*

17:25–
17:40
#115

**Advanced Electrode Design for
Renewable Hydrogen Production
Using Solid Oxide Electrolysis
Cells**

*Qiyue Wang — Shanghai University
of Electric Power, China*

17:40–
17:55
#329

**Amino-Functionalized UiO-
66/Cellulose Nanofiber
Membranes for Sustainable
Proton Exchange Membrane Fuel
Cells**

*Zhengyan Bao — Southeast
University, China*

17:55–
18:10
#328

**Proximity-Enhanced Synergy
between FeN₄ and Co₂C
Nanoclusters in MOF-Derived
Carbon for Spin-Dependent
Oxygen Electrocatalysis**

*Baolong Qin — Southeast University,
China*

18:10–
18:25
Q&A

***Panel Q&A and discussion with
all session speakers***

C2 **Energy Storage & Conversion**

**Carbon Capture, Conversion and
Catalytic Processes**

ER2 (Level 8)

Chair: Dr Devrim Aydin (Eastern Mediterranean
University, Cyprus)

16:40–
16:55
#217

**Amine-Based Materials for
Renewable-Energy-Driven
Direct Air Capture and CO₂
Utilization: A Short Review**

*Jiheng Luan — Shanghai Jiao Tong
University, China*

16:55–
17:10
#164

**Effect of light stress on designed
algae-bacteria model for
amelioration of fuel worthy lipids**

*Sana Parveen — Central University of
Rajasthan, India*

17:10–
17:25
#171

Preparation of High-Efficiency Zirconium-Based Solid Solution Catalysts for CO₂ Hydrogenation to Methanol and Their Performance Study

Yu Zhou — Southeast University, China

17:25–
17:40
#230

Composite Interface Engineering of Tin-Based Electrocatalysts for Highly Selective CO₂ Reduction to Formate

Yaling Jia — Taiyuan University of Technology, China

17:40–
17:55
#186

Tuning the Surface Electronic Structure of Pt/TiO₂ for Enhanced CO Oxidation and SO₂ Resistance: The Roles of Pt Surface States

Chao Yu — Southeast University, China

17:55–
18:10
#11

Nature of Single Atom Catalysts for Electrocatalytic CO₂ Reduction

Yuxiao Meng — Southeast University, China

18:10–
18:25
Q&A

Panel Q&A and discussion with all session speakers

C3 Low-Carbon Buildings

Indoor Environment, Building Services and Low-Carbon Cooling

ER3 (Level 8)

Chair: Assoc. Professor Mardiana Idayu
Ahmad (Universiti Sains Malaysia, Malaysia)

**16:40–
16:55
#104** **Inverse design of multi-source heterogeneous HVAC terminals using gradient-partitioned level set method**

Xin Chen — Southeast University, China

**16:55–
17:10
#271** **Sustainable Heating and Cooling of a Hotel Building in Kuala Lumpur Using a Solar-Powered Absorption Heat Pump System**

Bilsay Pastakkaya — Bursa Uludag University, Türkiye

**17:10–
17:25
#70** **Numerical study of an indirect evaporative cooler using porous fiber with intermittent water distribution**

Yi Chen — Jimei University, China

**17:25–
17:40
#205** **Dynamic parameter control of temperature-vacuum swing adsorption for energy-efficient direct air capture**

Kuihua Wang — Shanghai Jiao Tong University, China

17:40–
17:55
#173

**A Photothermally Driven
Moisture-Pumping Aerogel for
Continuous and Directional
Building Humidity Regulation**

*Yingying Yang — University of
Shanghai for Science and
Technology, China*

17:55–
18:10
#208

**Rapid Temperature Swing
Adsorption with Low-Grade Heat
for Direct Air Capture**

*Yanlin Chen — Shanghai Jiao Tong
University, China*

18:10–
18:25
Q&A

***Panel Q&A and discussion with
all session speakers***

C4 **AI & Renewable Systems**

**Digital Twins, Simulation and
Optimisation for Energy Systems**

ER4 (Level 8)

Chair: Professor Amin Al-Habaibeh
(Nottingham Trent University, United Kingdom)

16:40–
16:55
#194

**Design and Simulation of a UHF
Microstrip Patch Antenna for
Partial Discharge Detection in
Power Transformers**

*Nur Azura Noor Azhuan — Universiti
Teknikal Malaysia Melaka, Malaysia*

16:55–
17:10
#244

A Physics-Augmented Machine Learning Digital Twin for Multi-Regime Performance Prediction and Dry-Out Detection in Geometrically Modified Thermosyphons

*Sanjay J K and Sakthivadivel D —
Vellore Institute of Engineering, India*

17:10–
17:25
#268

Investigation of a Pioneering LSMHS-ACO Algorithm for Control Optimization of Building Energy System

Yunhai Li — Harbin Institute of Technology, Shenzhen, China

17:25–
17:40
#59

Study on Droplet Dynamics and Heat Transfer Characteristics of HFE-7100 Impacting Porous Copper Foam

Shaolin Zhang — Southeast University, China

17:40–
17:55
#124

Artificial intelligence-aided transition from deterministic to robust wind farm co-design with wake steering

Yu Tu — Shanghai Jiao Tong University, China

17:55–
18:10
#74

**An Active Learning-Driven
Optimization Framework for
Flow Field Design in
Electrochemical Energy Devices**

*Changjiang Wang — Southeast
University, China*

18:10–
18:25
Q&A

***Panel Q&A and discussion with
all session speakers***

18:25

End of Day 1 programme

PROGRAMME AT A GLANCE

Day 2

Friday 14 August

08:20–08:30

Welcome and daily announcements —
Ballroom 2 (Level 6)

08:30–09:15

KEYNOTE 4

Construction and Research of Self-Powered, Self-Purifying Buildings

Professor Jie Ji — University of Science and Technology of China, China

Chair: Professor Hongxing Yang

09:15–10:00

KEYNOTE 5

From Biomass to Built Environment: Innovating Bio-Based Solutions for Smart and Resilient Energy Future

Assoc. Professor Mardiana Idayu Ahmad — Universiti Sains Malaysia, Malaysia

Chair: Professor Xudong Zhao

10:00–10:20

**POSTER SESSION 2 and refreshments —
Exhibition Area, Level 6**

Posters: #83 · #73 · #126 · #177 · #192 · #200 ·
#227 · #242 · #255 · #283 · #304 · #305 · #307
· #121 · #266 · #248 · #319

10:20–11:55

SET2026 RESEARCH SPARK: FIVE-MINUTE STUDENT INNOVATION SHOWCASE

Ballroom 2 (Level 6) & middot; Chair: Dr Hasila Jarimi (Universiti Kebangsaan Malaysia, Malaysia)

Sixteen registered five-minute presentations followed by a shared 15-minute panel Q&A. Judged for the Best 5-Minute Presentation Award (Gala Dinner).

- #366 Near-Field Thermophotovoltaic Energy Conversion Using a TiN/HfO₂ Nanowire Hyperbolic Metamaterial Emitter**
Jining He — Zhejiang University, China
- #12 Dynamically Reconfigurable Series-Parallel Photovoltaic Module to Enhance Energy Generation During Shadow Effects in Solar Vehicles**
Pradyum Kaneria — Indian Institute of Technology Madras, India
- #297 Topology-Optimized Liquid-Cooled Cold Plates for Solar Thermoelectric Generators under Non-Uniform Heat Flux**
Jinghong Zhang — Harbin Institute of Technology, Shenzhen, China
- #367 Experimental Study on Solar-Driven Catalytic Steam Gasification of Biomass Char**

Shizhun Liu — Zhejiang University,
China

#272 **CFD-Informed Acoustic Regime
Classification in a Hydrogen Gas
Turbine Combustor: A
Comparative Machine Learning
Study**

Oyinbonogha Agonga — Universiti
Teknologi Malaysia, Malaysia

#155 **A novel salt hydrate
thermochemical Rankine-Carnot
battery: system design, heat
exchanger network integration,
and thermodynamic assessment**

Xianmin Zeng — Guangdong University
of Technology, China

#363 **Climate-Based Predictive Energy
Modelling of Residential Air
Conditioning Electricity
Consumption**

Norasikin Hussin — Universiti Teknologi
MARA Pulau Pinang Branch, Malaysia

#256 **Passive Radiative Cooling for
Urban Heat and Building
Resilience Under Future Climates**

Yiying Zhou — City University of Hong
Kong, Hong Kong

#293 **The Carbon within Campus
Buildings: Revealing Hidden
Hotspots through Embodied
Carbon Assessment**

Najah Md Alwi — Universiti Malaya,
Malaysia

#364 **Multi-Stage PV-TPV Conversion:
Decoupling Solar Concentration**

and Spectral Allocation

Jialu Tian — Zhejiang University, China

#332 Enhancing Outdoor Comfort in Delhi –Urban Heat Island Mitigation with Future Climate Projections

Het Parikh — School of Planning and Architecture, New Delhi, India

#290 Multi-field Coupled Optimization of an Air-Purifying BIPVT System with Thermal–UV Synergistic Disinfection: A CFD–Bayesian Optimization Approach

Yu Qian — University of Science and Technology of China, China

#128 An IPMVP–Based Framework for Establishing Energy Baselines in Higher Education Facilities

Muhammad Adib Affandi Ahmad Nazren — Universiti Teknologi MARA, Malaysia

#298 A Solar–Driven Fibrous Humidity Pump for Continuous Indoor Dehumidification

Yu Zhang — Harbin Institute of Technology, Shenzhen, China

#172 Urban Requalification and Sustainability, using the energy efficient and Ambiental parameters.

Karla Cavallari — University of Ferrara, Italy

#365 Energy Conversion Analysis of a Metamaterial Absorber for Efficient Solar Energy Harvesting

*Ziying Cheng – Zhejiang University,
China*

11:55–12:30

FUNDING FUTURES FORUM

Marie Skłodowska-Curie Actions Fellowship Insights, Research Mobility and International Collaboration A focused exchange on successful fellowship experience, application lessons, host-partner connections, researcher mobility and collaborative funding opportunities, shared by previous successful Marie Curie fellows. Open discussion with the audience on exchange and funding pathways. All delegates welcome – early-career researchers especially encouraged.

10:20–12:30 · parallel sessions

D2 **Energy Storage & Conversion**

Photocatalysis, Solar Fuels and Renewable Hydrogen

Hall (Level 8)

Chair: Dr Jingyu Cao (Hunan University, China)

**10:20–
10:35
#95** **Preparation of Ferromagnetic Heterogeneous Photocatalysts and Magnetic-Field Coupling Method For Enhanced Photocatalytic Hydrogen Generation**

Linyi Wu — University of Science and Technology of China, China

**10:35–
10:50
#326** **Facet-Engineered BaTiO₃ Single Crystals for Enhanced Photocatalytic Hydrogen Evolution from Water**

Bashir Ahmmad — Yamagata University, Japan

**10:50–
11:05
#61** **Construction of Cu₂O Facet Junction Coupled with Schottky Junction and Its Performance in Selective PEC CO₂ Reduction to Methanol**

Kai Zhang — Southeast University, China

**11:05–
11:20
#197** **Multiscale Science of Hydrocyclone-Enhanced Photocatalytic Hydrogen Production**

Fanghe Zhou — East China University of Science and Technology, China

11:20–
11:30

Q&A

Q&A with Part I speakers

11:30–
11:40

Refreshment break

11:40–
11:55

#189

Synergistic Promotion of Photocatalytic Hydrogen Peroxide Production in 2D Covalent Organic Frameworks via Topological Effect and Linkage Engineering

Xing Su — Southeast University, China

11:55–
12:10

#210

Highly Active Ni-Based Catalysts for Low-Temperature CO₂ Methanation via Stepwise Fe and Mg Regulation

Ruwei Yao — Taiyuan University of Technology, China

12:10–
12:25

#321

Easily synthesized self-nitrogen doped carbon-supported nickel bio-based sustainable catalyst for hydrogenation of benzylamine from benzonitrile

Weidong Liu — Southeast University, China

12:25–
12:30

Q&A

Q&A with Part II speakers

D3 Energy Storage & Conversion

Thermal Energy Storage, Heat Pumps, Refrigeration and System Integration

ER2 (Level 8)

Chair: Professor Shuli Liu (Beijing Institute of Technology, China)

**10:20–
10:35
#181** **Passive thermal management of multi-elevation energy storage systems using gravity-driven two-phase loops**

Lu Wang — Tsinghua University, China

**10:35–
10:50
#67** **Multiphysics modeling and performance evaluation of thermocells**

Yingyin Sha — University of Science and Technology of China, China

**10:50–
11:05
#137** **Numerical Investigation of PCM Capsule Relocation in a TES-Integrated Solar Dryer for Enhanced Melting Performance and Continuous Drying**

Shine Win Naung — University of the West of England, United Kingdom

**11:05–
11:20
#198** **A reliability-oriented energy storage sizing assessment method for PV systems based on energy decomposition**

Xingzhi Yuan — The Hong Kong Polytechnic University, Hong Kong

11:20–
11:25

Q&A

Q&A with Part I speakers

11:25–
11:30

Refreshment break

11:30–
11:50

#24 & 25

Energy Analysis of a Two-Stage Cascade Refrigeration System Using R-1234yf and R-404A Refrigerant Couple & Investigation of Exergy Efficiencies of the Components of a Two-Stage Vapor Compression Refrigeration System for Different Refrigerants

Ali Kilicarslan — Hitit University, Türkiye

11:50–
12:05

#39

Numerical Investigation of a Small-Scale Centrifugal Refrigeration Compressor Using Natural Refrigerants

Xiang Qiu — Shanghai Jiao Tong University, China

12:05–
12:20

#222

PVT Cascade High-Temperature Heat Pump System for High-Temperature Industrial Heating: Thermodynamic Analysis and Performance Evaluation

Teng Jia — Nanjing University, China

12:20–

Q&A with Part II speakers

12:30

Q&A

D4 Low-Carbon Buildings

Building Envelopes, Passive Design and Natural Ventilation

ER3 (Level 8)

Chair: Dr John Kaiser Calautit (University College London, United Kingdom)

10:20–

Invited Speaker: Zephyr City: An Energy-Efficient Solution for Urban Microclimate Enhancement

10:45

#370

Professor Cruz Li — Chongqing University, China

10:45–

Experimental and Numerical Analysis of a Bifacial Photovoltaic Wall-Thermochromic Composite System for Low-Carbon Buildings

11:00

#130

Sai Xu — Hefei University of Technology, China

11:00–11:15 **Cleaner Energy Envelope systems for High rise Residential Buildings – An energy analysis and design with BIPV and Micro wind turbines**

#223

Abhilash Suryan R – College of Engineering Trivandrum, India

11:15–11:20 **Q&A with Part I speakers**

Q&A

11:20–11:25 **Refreshment break**

11:25–11:40 **Application of solar photovoltaic vacuum glazing in skylight**

#281

Wenhao Zhu – The Hong Kong Polytechnic University, Hong Kong

11:40–11:55 **Performance analysis and design optimization of a novel Trombe wall system using CFD and response surface method**

#131

Kaijie Li – Hefei University of Technology, China

11:55–12:10 **A Bilayer $\text{TiO}_2/\text{ZrO}_2$ Radiative Cooling Powder Coating via Electrostatic Spraying for High-Performance Zero-Carbon Cooling**

#314

Cheng Jin – University of Science and Technology of China, China

12:10–
12:25
#350

**Pore-Scale Simulation of
Gradient-Distributed
Thermochromic Hydrogels for
Adaptive Building Envelopes and
Smart Window Applications**

*Wenyan Chen — Southeast
University, China*

12:25–
12:30
Q&A

Q&A with Part II speakers

D5 AI & Renewable Systems

**Digital Planning and Forecasting for
Renewable Energy Systems**

ER4 (Level 8)

Chair: Associate Professor Ir. Ts. Dr. Nik
Normunira binti Mat Hassan

10:20–
10:50
#100

**Invited Speaker: Optimising a
Solar-Powered Intercontinental
Energy Network for the One Sun
One World One Grid Initiative: A
Linear Programming Approach**

*Professor K. Srinivas Reddy — Indian
Institute of Technology Madras, India*

10:50–
11:05
#41

**Blockchain-Enabled
Traceability: Bridging the
Hydrogen Trade Gap between
Europe and China**

*Sofya Morozova — Haliç University,
Türkiye*

11:05–
11:20
#226

**Comprehensive Assessment of
Wind and Solar Energy Potential
Toward a Sustainable Future: A
Case Study of the GMMR, Libya**

*Djamal Hissein Didane — Universiti
Tun Hussein Onn Malaysia*

11:20–
11:30
Q&A

Q&A with Part I speakers

11:30–
11:40

Refreshment break

11:40–
11:55
#265

**Machine-Learning-Assisted
Design and Analysis of an
Integrated Allam Cycle-CO₂
Energy Storage System**

*Yingzong Liang — Guangdong
University of Technology, China*

11:55–
12:10
#246

**Techno-Economic Assessment
of Hybrid Renewable-Powered
Hydrogen Refuelling Station: A
Case Study in Sumba Island,
Indonesia**

*Taurista Perdana Syawitri — National
Research and Innovation Agency
Republic of Indonesia*

12:10–
12:25
#133

**Explainable GA-Optimized
Random Forest for Station-
Based Solar Irradiance
Prediction**

*Abubakar D. Maiwada — University
Sains Malaysia, Malaysia*

12:25–
12:30
Q&A

Q&A with Part II speakers

12:30–13:30

Lunch

13:30–14:15

KEYNOTE 6

**Low-Resistance Fluid Transport
Piping Systems: Theory, Methods, and
Engineering Applications**

**Professor Angui Li — Xi'an University of
Architecture and Technology, China**

Chair: Professor Yap Pow Seng

14:15–15:00

KEYNOTE 7

**Thermal Energy Storage: unlocking
the energy transition**

**Professor Michele Bottarelli — University
of Ferrara, Italy**

Chair: Professor AbuBakr Bahaj

15:00–15:20

Coffee break

15:20–18:15 · parallel sessions

E1 Energy Storage & Conversion

**Phase Change, Thermochemical and
Adaptive Thermal Storage Materials**

Hall (Level 8)

Chair: Professor Guiqiang Li (University of

Science and Technology of China, China)

**15:20–
15:50
#94** **Invited Speaker: Research of
Photothermal-Driven Composite
Phase Change Materials**

*Professor Shuli Liu — Beijing Institute
of Technology, China*

**15:50–
16:05
#75** **Development of Novel Salt
Sorbent Material for
Thermochemical Energy Storage**

*Zhiwei Ma — Durham University,
United Kingdom*

**16:05–
16:20
#221** **Novel closed loop
thermochemical reactor for
Thermal Energy Storage**

*Eleonora Baccega — University of
Ferrara, Italy*

**16:20–
16:35
#201** **Effect of Cement Incorporation
on the Stability and
Thermochemical Performance
of Vermiculite- CaCl_2
Composites**

*Ismail Kaan Keskin — University of
Nottingham, United Kingdom*

**16:35–
16:45
Q&A** **Q&A with Part I speakers**

**16:45–
17:05** **Refreshment break**

17:05–
17:20
#144

**Machine Learning–Guided
Optimization of Mean
Carbonation in Solar–Driven
Calcium Looping for
Thermochemical Energy Storage**

*Ming Lin — Southeast University,
China*

17:20–
17:35
#241

**Design and System–Level
Analysis of a Thermochemical
Energy Storage Unit for Peak–
Load Reduction in Residential
Heating**

*Arvin Sohrabi — Beijing Institute of
Technology, China*

17:35–
17:50
#16

**Climatic Adaptability of
Customized Phase Change
Energy Piles Based on the
Random Aggregate Method**

*Zhengheng Gan — Southeast
University, China*

17:50–
18:05
#184

**Enhancing Medium–Deep
Geothermal Energy Extraction
Using Phase Change Material
Working Fluids**

*Aizheng Li — Southeast University,
China*

18:05–
18:15
Q&A

Q&A with Part II speakers

E2 Energy Storage & Conversion

Bioenergy, Renewable Fuels and Sustainable Solar Materials

ER2 (Level 8)

Chair: Ir. Dr. Fauziah Jerai@Junaidi (Universiti Teknologi MARA, Malaysia)

**15:20–
15:35
#261** **Effect of Using Supercooled
Sugar Alcohol-Based PCMs on
Operating Duration and Heat
Source Temperature Fluctuation
in a Solar Organic Rankine Cycle**

*Ze Liu — University of Nottingham,
United Kingdom*

**15:35–
15:50
#71** **Mechanistic Study of On-Line
Electrochemical Upgrading of
Biomass Pyrolysis Vapors in a
Solid Oxide Electrolysis Cell**

*Xian Pan — Southeast University,
China*

**15:50–
16:05
#160** **Innovative tunable and modular
UV aging light source and
accelerated aging results of
downshifting layers for
photovoltaic applications**

*Leonardo Sollazzo — University of
Ferrara, Italy*

16:05–
16:20
#213

**Pilot trial, performance study
and economic assessment of
enriched-oxy and steam
biomass gasification: towards
sustainable, clean and efficient
energy conversion and
hydrogen production**

*Hao Shi — Southeast University,
China*

16:20–
16:35
#318

**Thermodynamic simulation,
energy, and emission
assessment of rice husk co-
combustion system**

*Muhamad Taufiq Irsyad — Kyoto
University, Japan*

16:35–
16:45
Q&A

Q&A with Part I speakers

16:45–
17:05

Refreshment break

17:05–
17:20
#21

**Comparison of food cooking
tests in a solar box cooker with
and without heat transfer
enhancement using positive
temperature coefficient (PTC)
heating fans**

*Ashmore Mawire — North-West
University, South Africa*

17:20–
17:35
#308

Selective C–O Bond Cleavage in Biomass Furans to Biofuels via Tailored Catalyst Acidity and Metal–Support Interactions

Qunfeng Chen — Southeast University, China

17:35–
17:50
#156

Performance Analysis of PV/T Collectors with Spectrally Selective Cover

Ken Chen — University of Science and Technology of China, China

17:50–
18:05
#306

Single-Atom Ni–NAC Catalysts with Ultra-Low Nickel Loading for Selective Reductive Catalytic Fractionation of Lignocellulosic Feedstocks

Yongtong Zhang — Southeast University, China

18:05–
18:15
Q&A

Q&A with Part II speakers

E3

Energy Storage & Conversion

Combustion, Thermal Power and Low-Carbon Fuel Conversion

ER3 (Level 8)

Chair: Professor Ali Kilicarslan (Hitit University, Türkiye)

**15:20–
15:50
#89** **Invited Speaker: Experimental Performance Study of Diesel Generator Using 40% Renewable Fuel Blends: FAME and Hydrotreated Vegetable Oil (HVO)**

*Professor Berkah Fajar Tamtomo
Kiono — Diponegoro University,
Indonesia*

**15:50–
16:05
#188** **Experimental Study on Combustion Characteristics in the Dense Phase Zone of Circulating Fluidized Bed Ultra-Low NO_x Coal-Fired Boilers**

*Liye Wang — Southeast University,
China*

**16:05–
16:20
#267** **An Economically Viable Catalytic Co-Pyrolysis System for High-Yield Drop-in Gas Turbine Fuel from Polypropylene and Yellow Grease Oil**

*Muhammad Syahiran Abdul Malik —
Universiti Teknologi Malaysia,
Malaysia*

16:20–
16:35
#120

Sustainable High-Temperature Bond-Coat Materials for Efficient Heavy-Duty Gas Turbines: Microstructure and Oxidation Behavior of LPBF-Fabricated ODS NiCoCrAlTaY Alloys

Yuwen Qiu — Southeast University, China

16:35–
16:50
#225

Ligand-Stabilized Synthesis of Zeolite-Encapsulated-Metal Composite Materials for Alkane Dehydrogenation

Shaojia Song — Taiyuan University of Technology, China

16:50–
17:00
Q&A

Q&A with Part I speakers

17:00–
17:10

Refreshment break

17:10–
17:25
#178

Structure-Activity Relationship of NH₃-Treated Spherical KNbO₃ in Catalytic Carbonyl Sulfide Hydrolysis: Oxygen Vacancy Engineering vs. Nitrogen Doping

Jian Gao — Southeast University, China

17:25–
17:40
#235

Asymmetric Carnot Battery Configurations for Solar PV–CSP Hybrid Systems: Integration, Performance, and Techno-Economic Analysis

Jin Yu — Shanghai Jiao Tong University, China

17:40–
17:55
#294

Non-Adiabatic CFD Simulation of Ammonia–Coal Co-Firing in a Generic Burner: Control of Fuel–Nitrogen Conversion Pathways for Low-Carbon Power Generation

Nik Siti Hasniati Nik Leh — Universiti Teknologi Malaysia, Malaysia

17:55–
18:10
#179

Performance study of a solid oxide fuel cell (SOFC) –CO₂ combined cycle energy storage and power generation system

Jingkui Zhang — Shanghai University of Electric Power, China

18:10–
18:15
Q&A

Panel Q&A and discussion with all session speakers

E4 **Energy Storage & Conversion**

Thermal Management, Heat Recovery and Cooling Technologies

ER4 (Level 8)

Chair: Professor Qiliang Wang (University of Science and Technology of China, China)

**15:20–
15:50
#259** **Invited Speaker: Advanced Thermal Management and Energy Recovery Strategies for Sustainable High-Performance Computing Infrastructures**

*Professor Beatrice Bonfanti Pulvirenti
— University of Bologna, Italy*

**15:50–
16:05
#207** **Gradient composite structures for suppressing the propagation of thermal runaway in high-capacity LiFePO₄ batteries**

*Chengcheng Zhang — Wuhan
University of Technology, China*

**16:05–
16:20
#113** **Rational design of hydrogels with improved evaporative cooling performance for high heat flux thermal management**

*Mingyang Ma — Southeast
University, China*

**16:20–
16:35
#251** **Investigation on zonal topology optimization enabled direct cooling thermal management in full scale lithium-ion battery packs**

*Junlong Kong — Shanghai Jiao Tong
University, China*

16:35–
16:50
#276

Development and Validation of a One-Dimensional Transient Model for High-Temperature Alkali Metal Heat Pipes in Decay Heat Removal

Peng Ju — Harbin Institute of Technology, Shenzhen, China

16:50–
16:55
Q&A

Q&A with Part I speakers

16:55–
17:05

Refreshment break

17:05–
17:20
#190

Power Enhancement of Thin Film Thermoelectric Generator through Cationic Doping

Ubaidah Syafiq — Universiti Kebangsaan Malaysia, Malaysia

17:20–
17:35
#320

Directional capillary-driven liquid transport on magnetically responsive micropillar array surfaces

Bokai Yang — Shanghai Jiao Tong University, China

17:35–
17:50
#182

Electrolyte Engineering of Liquid Thermocells for Low-Grade Heat Harvest at Sub-Zero Temperatures

Xin Lu — Southeast University, China

17:50–
18:05
#176

Asymmetric configuration and electrolyte engineering for high-performance ultrathin ionic thermoelectric cells

Haofei Meng — Southeast University, China

18:05–
18:15
Q&A

Q&A with Part II speakers

E5 **Policy & Management**

Energy Policy, Techno-Economics and Sustainable Communities

MR4 (Level 7)

Chair: Dr Tajul Rosli Razak (Universiti Teknologi MARA, Malaysia)

15:20–
15:35
#20

Economic and environmental impact of different scenarios for the green hydrogen market in Chile – An intersectoral approach

Cristian Mardones — University of Concepción, Chile

15:35–
15:50
#44

**Thermodynamic analysis of
geothermal energy systems
with different design
configurations for sustainable
hydrogen production**

*Arif Karabuga — Istanbul Aydin
University, Türkiye*

15:50–
16:05
#82

**Designing a Three-Track
Internal Carbon Pricing
Governance Mechanism in the
Real Estate Service Industry**

*Wan-Yu Weng — National Chengchi
University, Taiwan*

16:05–
16:20
#148

**E-Ratiba, the Energy Timetable:
a planning tool for Energy Use
and Revenue in Solar-Powered
Schools in Nairobi**

*Vincenzo Rossi — University of
Nottingham, United Kingdom*

16:20–
16:35
#336

**Repurposing Wave-Energy
Absorption Technologies for
Coastal Erosion Adaptation**

*Brathikan VM — Kumaraguru College
of Technology, India*

16:35–
16:45
Q&A

Q&A with Part I speakers

16:45–
16:55

Refreshment break

16:55–
17:10
#349

**Advancing Applied Renewable
Energy Education through
Makerspace-Based Learning: A
Longitudinal Case Study**

*Rafat Al Afif — University of Natural
Resources and Life Sciences, Austria*

17:10–
17:25
#199

**Validation of an Adaptive
Outdoor Thermal Comfort
Questionnaire for Therapeutic
Parks in Hospital Environments**

*Noraishah Mohammad Sham —
Institute for Medical Research,
Malaysia*

17:25–
17:40
#317

**Developing Facility
Management Guidelines for Safe
and Inclusive Public Transport
for All in a World Heritage
Tourism City: The Case of
Ayutthaya, Thailand**

*Wiruj Somsopon — Thammasat
University, Thailand*

17:40–
17:55
#233

**ENVI-met Microclimate
Simulation in Tropical Hospital
Therapeutic Gardens: A Multi-
Site Validation Study**

*Farah Nurhanis — Universiti
Teknologi MARA, Malaysia*

17:55–
18:10
#287

**Assessing the Impact of
Transportation Infrastructure
Development on Land Use/Land
Cover Change and Urban Heat
Island Dynamics in Benin City,
Nigeria**

*Geraldine Nkechinyere Okeudo—
Abia State University Uturu, Nigeria*

18:10–
18:15
Q&A

Q&A with Part II speakers

19:00–22:00

**★ GALA DINNER — Ballroom 1 (doors
open 18:30)**

Dinner and cultural programme · WSSET
Innovation Awards · WSSET Award of Scientific
Excellence · Best Paper & Poster Awards · Best
5-Minute Presentation Award

PROGRAMME AT A GLANCE

Day 3

Saturday 15 August

08:20–08:30

Welcome and daily announcements —
Ballroom 2 (Level 6)

08:30–09:15

KEYNOTE 8

Maximising power output from wind farms through yaw controls and wind turbine layout optimisation

Professor Hongxing Yang — Southwest Jiaotong University, China

Chair: Professor Yanjun Dai

09:15–11:45 · parallel sessions

F1

AI & Renewable Systems

Machine Learning for Thermal Systems and Energy Technologies

Ballroom 2 (Level 6)

Chair: Ts. Dr. Nur Atiqah binti Ramlan
(Universiti Teknologi MARA, Malaysia)

**09:15–
09:40
#37** **Invited Speaker: Enabling
Electrification of Heating
Through SuperThermalBattery**

*Dr Hasila Jarimi — Universiti
Kebangsaan Malaysia, Malaysia*

**09:40–
09:55
#109** **Topology Optimization of a
High-Performance Cold Plate
Operating in the Turbulent
Regime for BTMS Applications**

*Zexu Wang — Southeast University,
China*

**09:55–
10:10
#69** **Numerical investigation of the
aeroelastic performance of a
wind turbine operating under
yaw misalignment**

*Shine Win Naung — The University of
the West of England, United Kingdom*

**10:10–
10:25
#295** **A Residual-Corrected Dual-
State Surrogate Modelling
Framework for Thermoeconomic
Optimization of Concentrated
Thermoelectric Generators
under Nonuniform Irradiation**

*Haowen Liu — Harbin Institute of
Technology, China*

10:25–
10:30

Q&A

Q&A with Part I speakers

10:30–
10:40

Refreshment break

10:40–
10:55

#125

**Performance Analysis of
Photovoltaic-Thermal Systems
with In-Situ Lunar Water Ice
Thermal Storage**

*Kongfu Hu— University of Science
and Technology of China, China*

10:55–
11:10

#219

**Robust Predictive Control for
Energy-Aware Data Center
Cooling with Online Disturbance
Compensation**

*Tiexiao Xu — Tsinghua University,
China*

11:10–11:25

#234

**Experimental and Numerical
Evaluation of Surface Integrity
and Mechanical Performance of
Finished STS 316L Rod Bars:
Integrated AI Image Processing**

*Chanchamnan Sieb — Jeonbuk
National University, South Korea*

11:25–
11:40
#110

**Experimental Investigation on
the Thermal-Hydraulic
Performance of TPMS-Based Air-
Cooling Heat Exchangers for
High-Altitude Applications**

*Xinyue Zhang — Southeast
University, China*

11:40–
11:45
Q&A

Q&A with Part II speakers

F2 **Low-Carbon Buildings**

**Building Performance, Heritage and
Community Energy**

ER2 (Level 8)

Chair: Professor Cruz Li (Chongqing University,
China)

09:15–
09:45
#101

**Invited Speaker: SENSE-AI: A
Sensor-Enabled, Mixed-Methods
AI Framework for Heritage
Housing Performance Evaluation**

*Professor Amin Al-Habaibeh —
Nottingham Trent University, United
Kingdom*

09:45–
10:00
#250

Reframing Universal Design as a Spatial-Governance Framework for Sustainable Heritage Tourism Management: Evidence from Sukhothai Historical Park, Thailand

Satitaporn Lubkosa and Choomket Sawangjaroen — Thammasat University, Thailand

10:00–
10:15
#351

Year-Round Field Assessment and Economic Feasibility of a Polymer-Core Indirect Evaporative Cooler in Hot and Humid Climates

Xiaochen Ma — China University of Petroleum (East China), China

10:15–
10:30
#68

City-to-Facade Multi-Scale Assessment of a Flap-Fin Dual-Channel Windcatcher for Stable Natural Ventilation under Low-Wind, Directional Urban Flows in Chongqing

Jiaxiang Li — Chongqing University, China

10:30–
10:35
Q&A

Q&A with Part I speakers

10:35–
10:40

Refreshment break

10:40–
10:55
#310

From Quantity Take-Off to Carbon Take-Off: Benchmarking Material Intensity and Embodied Carbon in Malaysian Mosque Projects

Farah Shahrin— Nottingham Trent University, United Kingdom

10:55–
11:10
#132

A Short-Term Building Energy Consumption Forecasting Framework Based on Decomposition and Adaptive Grouping

Kejun Tao — Hefei University of Technology, China

11:10–11:25
#292

Overheating Risk and Future Climate Adaptation in Loft Conversions of Older UK Housing: Optimisation of Roof Fenestration Design Using a Victorian / Early 20th-Century Terraced House

Ke Qu — CarbonFutureX Group Ltd, United Kingdom

11:25–
11:40
#315

Ultra-white, Lightweight and Thermally Insulating Hollow Glass Microsphere Ceramics for Zero-carbon Passive Radiative Cooling

Jiahao Ni — University of Science and Technology of China, China

11:40–

Q&A

11:45

Q&A

F3 Energy Storage & Conversion

Advanced Heat Transfer, Thermal Systems and Sustainable Building Materials

ER3 (Level 8)

Chair: Professor Berkah Fajar Tamtomo Kiono
(Diponegoro University, Indonesia)

09:15–
09:30
#334 **Pressure-dependent pool boiling characteristics of liquid oxygen Implications for cryogenic thermal management in sustainable energy systems**

Jiashi Wang — Shanghai Jiao Tong University, China

09:30–
09:45
#145 **Lignin-Based Reinforcement of HDPE–EPDM Blends for Low-Carbon and Energy-Efficient Applications**

Muhammad Khatami — Universiti Sains Malaysia, Malaysia

09:45–
10:00
#118

Enhancement of mass transfer in ammonia–water distillation utilizing a novel packed column with integrated ultrasonic atomization
Subtitle: Effects of atomization rate and initial droplet diameter

Shenghao Huang — Southeast University, China

10:00–
10:15
#150

Coupling Interfacial Molecular Engineering and Rayleigh–Bénard Convection in BNNS@PDA Nanofluids for High-Performance Direct Absorption Solar Collectors

Hao Wang — Southeast University, China

10:15–
10:20
Q&A

Q&A with Part I speakers

10:20–
10:25

Refreshment break

10:25–
10:40
#114

A novel LPBF MoCu40 alloy for Energy-Efficient Thermal Management in High-Power Electronic Systems

Jie Liu — Southeast University, China

10:40–
10:55
#324

**Green Inhibitors for Steel
Corrosion in Concrete:
Poly(acrylic acid) and Tannic
Acid through Electrochemical,
Surface, and Molecular-Level
Characterization**

*Ismail Mudhaffar — King Fahd
University of Petroleum and Minerals,
Saudi Arabia*

10:55–
11:10
#285

**Influence of Sodium Metasilicate
Dosage on the Fresh Properties
of Saudi Calcined Clay-Based
One-Part Geopolymer Binder**

*Amin Al-Fakih — King Fahd University
of Petroleum & Minerals, Saudi
Arabia*

11:10–11:25
#204

**Effect of Synergistic NaOH and
Ammonium Polyphosphate
Treatment on Fire Retardancy of
Kenaf–Cotton Non-Woven
Insulation**

*Muhammad Ibrahim Salahuddin
Tengku — JKR Centre of Excellence
for Engineering and Technology
(CREaTE), Malaysia*

11:25–
11:40
#88

**Regulating Heat and Mass
Transfer in Porous Materials
Enabling Sustainable Electricity–
Water Cogeneration**

*Zhengyi Mao — Harbin Institute of
Technology, Shenzhen, China*

11:40–

Q&A with Part II speakers

11:45

Q&A

F4 **Urban & Environment**

Urban Sustainability, Water and Inclusive City Planning

ER4 (Level 8)

Chair: Dr Norhayati Mat Wajid (Universiti Teknologi MARA, Malaysia)

09:15–

09:30

#157

Office Greywater Influent: Variability and Impact on Decentralised Treatment in Sustainable Building Systems

*George Milev — Nottingham Trent
University, United Kingdom*

09:30–

09:45

#243

Flow Reduction Technique in a Novel Gravity Driven Rainwater Harvesting System Collection Tank with Natural Filtration for Clean Water Supply

*Zainal Abidin Kamarul Baharin —
MEC Engineering Resources,
Malaysia*

09:45–
10:00
#183

**Pressurized Injection-Enhanced
Bioaugmentation for
Sustainable Groundwater
Remediation: Field Evidence
from Chlorinated Methane-
Contaminated Urban Aquifers**

*Qinjun Liang — Southeast University,
China*

10:00–
10:15
#247

**An evaluation framework to
assess of pedestrian comfort in
relation to street design along
Indira Gandhi Road corridor,
Kozhikode**

*Deepa Rani R — College of
Engineering Trivandrum, India*

10:15–
10:20
Q&A

Q&A with Part I speakers

10:20–
10:25

Refreshment break

10:25–
10:40
#316

**From Participatory Planning to
Implementation Readiness:
Evaluating the Smart Ayutthaya
Heritage Public Transport for All
Master Plan Against
International Principles**

*Alita Chaladdee — Thammasat
University, Thailand*

10:40–
10:55
#331

Comparison of the electrical and thermal performances for different urban solar photovoltaic installation types

Yijie Zhang — Tongji University, China

10:55–
11:10
#264

Exploring Adaption Strategies and Perceptions of Thermal Comfort Among Students and Staff in Tropical Urban

Muhammad Zhafri Andzar Zaharudin — UNIVERSITI TEKNOLOGI MARA (UITM), Malaysia

11:10–11:25
#252

Accessible Learning Districts as Urban Social Infrastructure for Inclusive Cities: From Fragmented Welfare Facilities to a Connected Learning District in Pakkred, Thailand

Choomket Sawangjaroen — Thammasat University, Thailand

11:25–
11:40
#286

Mapping Urban Heat Island Dynamics in Osijek, Croatia: Integrating Landsat Thermal Data with GIS-Based Land Cover Analysis

Francis Ezinwanne Onuegbu — Abia State University Uturu, Nigeria

11:40–
11:45
Q&A

Q&A with Part II speakers

11:45–12:15

**POSTER SESSION 3 and refreshments —
Exhibition Area, Level 6**

Posters: #119 · #152 · #162 · #163 · #169 · #206 ·
#231 · #301 · #309 · #323 · #361 · #362 · #312 ·
#54 · #284 · #273

12:15–12:45

CLOSING CEREMONY — Ballroom 2

Closing remarks by the Conference Chairs
and announcement of SET2027

12:45

End of conference and departures

MEET THE SPEAKERS

Keynote Speakers



Professor Xudong Zhao

**Harbin Institute of
Technology, Shenzhen, China**

Thu 13 Aug · 09:20–10:05 ·
Ballroom 2

KEYNOTE LECTURE

From Zero to Negative: The Technological Breakthrough under Double-Carbon Strategy

SESSION CHAIR

Professor Saffa Riffat

BIOGRAPHY

Professor Xudong Zhao is a leading authority in decarbonised heating, cooling, and power systems, with innovations like dew point air cooling and hybrid solar heat & power systems transforming engineering practices. Backed by £28m in research funding and 323 highly-cited papers, he has supervised 31 post-doctoral fellows and 41 PhD students. Recognised by the UN Climate Change Congress and BBC, his work has earned multiple international innovation awards. A fellow of several prestigious institutions, he continues to shape the future of sustainable energy technologies.



Professor AbuBakr Bahaj

**University of Southampton,
United Kingdom**

Thu 13 Aug · 10:05–10:50 ·
Ballroom 2

KEYNOTE LECTURE

From Engagement to Transformation: Co-Creating a Sustainability Strategy for Organisational Resilience and Stakeholder Value

SESSION CHAIR

Professor Ir. Ts. Dr Azli Abd Razak

BIOGRAPHY

Professor AbuBakr Bahaj is a globally recognised expert in sustainable energy, leading the Energy and Climate Change Division at the University of Southampton. With over 30 years of experience and more than 300 publications, he is a pioneer in renewable energy and environmental research. As Editor-in-Chief of the International Marine Energy Journal and Chief Scientific Advisor to the City of Southampton, he blends academic and practical insights to shape energy policy and innovation. His contributions have

earned him recognition as one of the UK's
100 leading practising scientists.



Professor Yanjun Dai

**Shanghai Jiao Tong
University, China**

Thu 13 Aug · 13:30–14:15 ·
Ballroom 2

KEYNOTE LECTURE

**Advancements of solar heating and
cooling research and its application in
buildings**

SESSION CHAIR

Professor Jie Ji

BIOGRAPHY

Professor Yanjun Dai is a Distinguished Professor and Head of the Department of Power and Energy Engineering at Shanghai Jiao Tong University, China, and Vice Director of the Engineering Research Center of Solar Energy. He has also held several international academic positions, including Visiting Professorships at the National University of Singapore (2012–2024) and North Dakota State University, and earlier research experience at the University of Hong Kong. His research focuses on solar energy conversion and utilisation, desiccant dehumidification, and sustainable energy systems for buildings, with particular contributions to solar

heating and cooling technologies and green building energy systems, significantly advancing renewable heating and cooling and their application in low-carbon buildings. He has published over 210 peer-reviewed journal papers, authored several books, and holds more than 30 patents. He has led over 40 research projects as Principal Investigator, including major national and international programmes, and his work has received national-level recognition including the National Innovation Award and the National Natural Science Award. His h-index is approximately 75.



Professor Jie Ji

**University of Science and
Technology of China, China**

Fri 14 Aug · 08:30–09:15 ·

Ballroom 2

KEYNOTE LECTURE

Construction and Research of Self- Powered, Self-Purifying Buildings

SESSION CHAIR

Professor Hongxing Yang

BIOGRAPHY

Professor Jie Ji, Chair Professor at the University of Science and Technology of China, is a leading expert in solar energy utilisation. Known for his work in full-spectrum cascade utilisation and photoelectric technology, he has published over 380 papers with 14,000 citations, earning him recognition as an “Elsevier China Highly Cited Scholar”. A recipient of the WSSET Innovation Award, he continues to drive innovation in solar and thermal power technologies.



**Assoc. Professor
Mardiana Idayu
Ahmad**

**Universiti Sains Malaysia,
Malaysia**

Fri 14 Aug · 09:15–10:00 · Ballroom
2

KEYNOTE LECTURE

**From Biomass to Built Environment:
Innovating Bio-Based Solutions for
Smart and Resilient Energy Future**

SESSION CHAIR

Professor Xudong Zhao

BIOGRAPHY

Mardiana Idayu Ahmad is an Associate Professor at Universiti Sains Malaysia and an internationally recognised researcher in renewable and sustainable energy technologies, environmental management, and bio-based materials for environmental applications. She holds a PhD in Sustainable Energy Technologies from the University of Nottingham, United Kingdom. She leads multidisciplinary research in sustainable energy systems, energy recovery technologies, and bio-based materials for environmental protection. Her work has secured over RM10 million in

competitive research funding and resulted in more than 200 scholarly publications, including research books and high-impact journals. Her research bridges academia, industry, and policy, contributing practical solutions to global sustainability and energy challenges.



Professor Angui Li
**Xi'an University of
Architecture and Technology,
China**

Fri 14 Aug · 13:30–14:15 · Ballroom
2

KEYNOTE LECTURE

**Low-Resistance Fluid Transport Piping
Systems: Theory, Methods, and
Engineering Applications**

SESSION CHAIR

Professor Yap Pow Seng

BIOGRAPHY

Professor Angui Li is the Dean of the School of Building Services Science and Engineering at Xi'an University of Architecture and Technology, China, and Director of the International Joint Laboratory for Low-Carbon Built Environment (Ministry of Education). His research focuses on underground space environments and building environmental technologies. He has led over 80 major national and international projects and published more than 200 SCI-indexed papers. He is a recipient of two National Technology Invention Awards (Second Class, ranked first) and has been

recognised among Elsevier's Highly Cited
Chinese Researchers.



Professor Michele Bottarelli

University of Ferrara, Italy

Fri 14 Aug · 14:15–15:00 · Ballroom
2

KEYNOTE LECTURE

Thermal Energy Storage: unlocking the energy transition

SESSION CHAIR

Professor AbuBakr Bahaj

BIOGRAPHY

Michele Bottarelli is a Professor of Applied Physics at the University of Ferrara, specialising in thermal sciences, energy technology and building physics. He is an award-winning researcher and frequent keynote speaker, with publications in leading low-carbon and energy journals. Founder of the RELY laboratory at the UNIFE Technopole, he leads research on renewable energy conversion, thermal storage and advanced building systems, holds multiple patents, and has coordinated major European projects under the Horizon and LIFE programmes.



Professor Hongxing Yang

Southwest Jiaotong University, China

Sat 15 Aug · 08:30–09:15 ·
Ballroom 2

KEYNOTE LECTURE

Maximising power output from wind farms through yaw controls and wind turbine layout optimisation

SESSION CHAIR

Professor Yanjun Dai

BIOGRAPHY

Professor Hongxing Yang, leader of the Renewable Energy Research Group (RERG) at The Hong Kong Polytechnic University, specialises in renewable energy applications and energy-saving technologies in buildings. His work spans solar photovoltaics, wind power, evaporative cooling, ground-coupled heat pumps, and hybrid renewable systems. Author of over 500 academic works, including 300+ peer-reviewed papers and seven books, he was recognised as a “Highly Cited Researcher” by Elsevier (2016–2020) and ranked 15th among most-cited Chinese scientists in Mechanical and

Aerospace Engineering in 2022. An award-winning researcher, Professor Yang is Senior Editor of the International Journal of Applied Energy and serves on the editorial boards of Low Carbon Technologies and Future Cities and Environment.

PART 2

Parallel Sessions

Every paper, with room and chair

Day 1 • Sessions A

A1 Energy Storage & Conversion

Solar Photovoltaic Materials and Applications

Ballroom 2 (Level 6)

Chair: Professor K. Srinivas Reddy (Indian Institute of Technology Madras, India)

11:15–11:30 **Origin and Suppression**
#57 **Engineering of Non-radiative**
Recombination in Inorganic
Halide Perovskite

*Qun Ji — Southeast of University,
China*

11:30–
11:45 **Cable-supported single-axis**
#159 **solar tracker for agrivoltaic**
application

*Donato Vincenzi — University of
Ferrara and Consorzio Futuro in
Ricerca, Italy*

11:45–
12:00 **Unmasking the Intrinsic**
#134 **Formation Mechanism of**
Dominant Point Defects in
Epitaxial MoS₂

Jie Ji — Southeast University, China

12:00–
12:15
#218

**Design and Optimization of
Light-Diffusing Glass Plates for
PV Agriculture**

*Peizhou Tan — Hubei University of
Technology, China*

12:15–
12:30
Q&A

***Panel Q&A and discussion with
all session speakers***

A2 **Energy Storage & Conversion**

**Electrochemical Conversion and Green
Hydrogen**

ER2 (Level 8)

Chair: Professor Yuanlong Cui (Shandong
Jianzhu University, China)

11:15–11:30

#62

**Biomimetic Interfacial
Microenvironment Engineering
for High-Performance Alkaline
Water Electrolysis**

*Jiawei Zhu — Southeast University,
China*

11:30–
11:45
#253

**Advanced Electrocatalyst
Design for Water Splitting
toward Sustainable Energy
Storage and Conversion
Technologies**

*Dilmurod Sayfiddinov — Jeonbuk
National University, South Korea*

11:45–
12:00
#77

**Fluorine-Modulated RuO₂
Enables Selective Chlorine
Evolution and Simultaneous
Resource Recovery from High-
Salinity Water**

Rui Cui — Southeast University, China

12:00–
12:15
#254

**High-Performance Anion
Exchange Membranes with
Superior Hydroxide Conductivity
for Sustainable Energy Systems**

*Jeevitha Arunkumar — Jeonbuk
National University, South Korea*

12:15–
12:30
Q&A

***Panel Q&A and discussion with
all session speakers***

A3 **Low-Carbon Buildings**

**Bio-Based and Low-Carbon Building
Materials**

ER3 (Level 8)

Chair: Professor Fatang Jiang (Wuhan Donghu
University, China)

11:15–11:30 **#107** **Development of Bio-Based Rice
Husk Thermal Insulation Panels
for Low-Carbon Architectural
Applications**

*Junfeng Zhu — Universiti Sains
Malaysia, Malaysia*

11:30–
11:45
#168

**Experiment and Simulation
Study of a Novel
Diatomite/MPCM Composite
Gypsum Boards for Building
Thermal Management**

*Yi Fan — Shanghai University of
Electric Power, China*

11:45–
12:00
#224

**Acrylic-Particle Composite
Paints for Passive Radiative
Cooling in Building Applications**

*Taghreed Al-Gunaid — Hamad Bin
Khalifa University, Qatar*

12:00–
12:15
#108

**Bio-Based Insulation Panels
from Pine Wood Waste Fiber and
Press Mud for Low-Carbon
Building Applications**

*Mengtian Liu — Universiti Sains
Malaysia, China*

12:15–
12:30
Q&A

***Panel Q&A and discussion with
all session speakers***

A4 **AI & Renewable Systems**

Artificial Intelligence for Materials, Energy and Environmental Modelling

ER4 (Level 8)

Chair: Professor Bilsay Pastakkaya (Bursa Uludag University, Türkiye)

11:15–11:30 **#53** **Active learning guides the synthesis of two-dimensional organic-inorganic hybrid rare-earth double perovskites with potential multifunctional ferroelectric properties**

Rong Guo — Southeast University, China

11:30–11:45 **#174** **Evidential Ensemble Technique Integrated with Explainable Artificial Intelligence (XAI) for Microplastic Concentration Modelling from a Tropical River: a First Application of Evidential Neural Network Ensemble Approach in Microplastic Pollution**

Abdullahi Garba Usman — Near East University, Türkiye

11:45–12:00 **#40** **Human-Centred AI for Thermal Comfort Optimisation in Smart Buildings**

Tajul Rosli Razak — Universiti Teknologi MARA, Malaysia

12:00–
12:15
#180

Mechanism of large vibration for bladeless wind energy harvesters with a plate for circular cylinder

Guanbin Chen — Harbin Institute of Technology, China

12:15–
12:30
Q&A

Panel Q&A and discussion with all session speakers

Day 1 • Sessions B

B1

Energy Storage & Conversion

Solar Thermal and Photovoltaic-Thermal Systems

Ballroom 2 (Level 6)

Chair: Professor Ashmore Mawire (North-West University, South Africa)

14:25–
14:55
#52

Invited Speaker: Preliminary investigations on the evacuated PVT-driven methanol electrolysis for enhanced solar hydrogen production

Professor Qiliang Wang — University of Science and Technology of China, China

14:55–
15:10
#143

**Supercritical CO₂ Nanofluids for
Solar Thermal Applications:
Dispersion, Deposition, and
Photothermal Performance**

*Ning Zhao — Southeast University,
China*

15:10–
15:25
#43

**Thermal and Electrical
Performance of Passive STFPV–
VIG Systems under Different
Installation Orientations and
Ventilation Conditions**

*Adam Samsudin — Universiti
Teknikal Malaysia Melaka, Malaysia*

15:25–
15:40
#147

**Effects of optical filtration layers
on the performance of MXene–
based solar PV/T module: an
experimental analysis**

*Yuanlong Cui — Shandong Jianzhu
University, China*

15:40–
15:55
#299

**Optimizing Photovoltaic
Bandgaps for Efficient
Underwater Solar Energy
Harvesting**

*Haoliang Bai — Wuhan University of
Technology, China*

15:55–
16:10
Q&A

***Panel Q&A and discussion with
all session speakers***

B2 Energy Storage & Conversion

Thermochemical Energy Storage: Materials, Reactors and Seasonal Systems

ER2 (Level 8)

Chair: Dr Zhiwei Ma (Durham University, United Kingdom)

14:25–14:55
#85 **Invited Speaker: Advances in Reactor Design and Renewable Integration Strategies for Low-Grade Thermochemical Energy Storage**

Dr Devrim Aydin — Eastern Mediterranean University, Cyprus

14:55–15:10
#170 **Development and Validation of a Packed-Bed Reactor Discharging Performance Model for Salt Hydrate Thermochemical Energy Storage**

Jianbin Chen — University of Nottingham, United Kingdom

15:10–15:25
#191 **Effects of Zonal Design for Seasonal Thermal Energy Storage Systems**

Mengying Cui — Southeast University, China

15:25–
15:40
#166

**Coupled Effects of
Thermodynamic Conditions, Bed
Configuration and Airflow
Characteristics on the
Performance of an Open-Loop
Thermochemical Energy Storage
Reactor**

*Zhuo Chang — University of Ferrara,
Italy*

15:40–
15:55
#330

**Study on the Thermal Evolution
Mechanism and Temperature
Distribution of Solid-State
Batteries**

*Zhehui Zhang — Wuhan University of
Technology, China*

15:55–
16:10
Q&A

***Panel Q&A and discussion with
all session speakers***

B3 **Energy Storage & Conversion**

Sustainable Heating, Cooling and Refrigeration

ER3 (Level 8)

Chair: Dr Yi Fan (Shanghai University of Electric Power, China)

**14:25–
14:55
#26** **Invited Speaker: Experimental Energy Analysis of a Trigeneration System Based on Outdoor Air Temperature: A Case Study at Fatsa State Hospital, Türkiye**

Professor Ali Kilicarslan — Hitit University, Türkiye

**14:55–
15:10
#35** **Ultrasonic Oscillation Enhanced Mass Transfer in Ammonia-Water Generation Process: Design and Performance Analysis of a Novel Generator**

Chuang Pan — Southeast University, China

**15:10–
15:25
#175** **Decarbonization of Residential Buildings Using Low-Charge R290 Heat Pumps: Experimental and Numerical Approach**

Mohammad Salman — Korea Institute of Energy Research, South Korea

15:25–
15:40
#90

Design and performance analysis of a CO₂ heat pump thermal storage system decoupled from a coal-fired power plant

Tengjiao Jia — Central South University, China

15:40–
15:55
#19

Zonal control of a heat-pipe system for long-duration lunar habitats

Jingyu Cao — Hunan University, China

15:55–
16:10
Q&A

Panel Q&A and discussion with all session speakers

B4 AI & Renewable Systems

Intelligent Ventilation and Low-Carbon Building Control

ER4 (Level 8)

Chair: Professor Beatrice Bonfanti Pulvirenti
(University of Bologna, Italy)

14:25–
14:55
#29

Invited Speaker: Vision-Assisted Event-Triggered Ventilation for Indoor Pollution Control in Low-Carbon Buildings

Dr John Kaiser Calautit — University College London, United Kingdom

14:55–
15:10
#23

An integrated surrogate and optimisation framework for PCM-enhanced energy piles using energy-consistency-enhanced deep operator learning

Chaokai Zhang — Southeast University, China

15:10–
15:25
#215

A Replicable Community Greenhouse Optimisation System for Low-Energy Year-Round Tomato Production

Yanyue Tong — University of Nottingham, United Kingdom

15:25–
15:40
#289

Investigation of influential variations among variables in Semi-Transparent Perovskite Photovoltaic glazing glare metrics using machine learning and SHAP

Li Zhang — China University of Mining and Technology, China

15:40–
15:55
#311

Environmental and economic impact of using IoT sensors combined with IA on the energy efficiency of smart buildings: A comparative econometric assessment of developed and developing countries

Oumaima Bel Hadj Salah — Chouaib Doukkali University, Morocco

15:55–
16:10
Q&A

**Panel Q&A and discussion with
all session speakers**

Day 1 • Sessions C

C1 Energy Storage & Conversion

Hydrogen Energy Systems, Electrolysers and Fuel Cells

Ballroom 2 (Level 6)

Chair: Dr Arif Karabuga (Istanbul Aydin
University, Türkiye)

16:40–
16:55
#98

Ce-Doped Ru/RuO₂ Heterojunction for Efficient Alkaline Hydrogen Evolution

*Dunyuan Jin — University of Science
and Technology of China, China*

16:55–
17:10
#270

A Study on High Current Density SOECs for Sustainable Power-to- Hydrogen Conversion

*Syed Shaheryar Ali Shamsi — Korea
Institute of Energy Research, South
Korea*

17:10–
17:25
#111

Enhanced Performance of proton-conducting solid oxide fuel cells Enabled by a Novel Ce- Doped YBaCo₄O₇ Cathode

*Xin Zhou — Southeast University,
China*

17:25–
17:40
#115

**Advanced Electrode Design for
Renewable Hydrogen Production
Using Solid Oxide Electrolysis
Cells**

*Qiyue Wang — Shanghai University
of Electric Power, China*

17:40–
17:55
#329

**Amino-Functionalized UiO-
66/Cellulose Nanofiber
Membranes for Sustainable
Proton Exchange Membrane Fuel
Cells**

*Zhengyan Bao — Southeast
University, China*

17:55–
18:10
#328

**Proximity-Enhanced Synergy
between FeN₄ and Co₂C
Nanoclusters in MOF-Derived
Carbon for Spin-Dependent
Oxygen Electrocatalysis**

*Baolong Qin — Southeast University,
China*

18:10–
18:25
Q&A

***Panel Q&A and discussion with
all session speakers***

C2 **Energy Storage & Conversion**

**Carbon Capture, Conversion and
Catalytic Processes**

ER2 (Level 8)

Chair: Dr Devrim Aydin (Eastern Mediterranean

University, Cyprus)

16:40–

16:55

#217

**Amine-Based Materials for
Renewable-Energy-Driven
Direct Air Capture and CO₂
Utilization: A Short Review**

*Jiheng Luan — Shanghai Jiao Tong
University, China*

16:55–

17:10

#164

**Effect of light stress on designed
algae-bacteria model for
amelioration of fuel worthy lipids**

*Sana Parveen — Central University of
Rajasthan, India*

17:10–

17:25

#171

**Preparation of High-Efficiency
Zirconium-Based Solid Solution
Catalysts for CO₂ Hydrogenation
to Methanol and Their
Performance Study**

*Yu Zhou — Southeast University,
China*

17:25–

17:40

#230

**Composite Interface Engineering
of Tin-Based Electrocatalysts for
Highly Selective CO₂ Reduction
to Formate**

*Yaling Jia — Taiyuan University of
Technology, China*

17:40–
17:55
#186

Tuning the Surface Electronic Structure of Pt/TiO₂ for Enhanced CO Oxidation and SO₂ Resistance: The Roles of Pt Surface States

Chao Yu — Southeast University, China

17:55–
18:10
#11

Nature of Single Atom Catalysts for Electrocatalytic CO₂ Reduction

Yuxiao Meng — Southeast University, China

18:10–
18:25
Q&A

Panel Q&A and discussion with all session speakers

C3 Low-Carbon Buildings

Indoor Environment, Building Services and Low-Carbon Cooling

ER3 (Level 8)

Chair: Assoc. Professor Mardiana Idayu Ahmad (Universiti Sains Malaysia, Malaysia)

16:40–
16:55
#104

Inverse design of multi-source heterogeneous HVAC terminals using gradient-partitioned level set method

Xin Chen — Southeast University, China

16:55–
17:10
#271

**Sustainable Heating and Cooling
of a Hotel Building in Kuala
Lumpur Using a Solar-Powered
Absorption Heat Pump System**

*Bilsay Pastakkaya — Bursa Uludag
University, Türkiye*

17:10–
17:25
#70

**Numerical study of an indirect
evaporative cooler using porous
fiber with intermittent water
distribution**

Yi Chen — Jimei University, China

17:25–
17:40
#205

**Dynamic parameter control of
temperature–vacuum swing
adsorption for energy-efficient
direct air capture**

*Kuihua Wang — Shanghai Jiao Tong
University, China*

17:40–
17:55
#173

**A Photothermally Driven
Moisture-Pumping Aerogel for
Continuous and Directional
Building Humidity Regulation**

*Yingying Yang — University of
Shanghai for Science and
Technology, China*

17:55–
18:10
#208

**Rapid Temperature Swing
Adsorption with Low-Grade Heat
for Direct Air Capture**

*Yanlin Chen — Shanghai Jiao Tong
University, China*

18:10–
18:25
Q&A

***Panel Q&A and discussion with
all session speakers***

C4 **AI & Renewable Systems**

Digital Twins, Simulation and Optimisation for Energy Systems

ER4 (Level 8)

Chair: Professor Amin Al-Habaibeh
(Nottingham Trent University, United Kingdom)

16:40–
16:55
#194

**Design and Simulation of a UHF
Microstrip Patch Antenna for
Partial Discharge Detection in
Power Transformers**

*Nur Azura Noor Azhuan — Universiti
Teknikal Malaysia Melaka, Malaysia*

16:55–
17:10
#244

**A Physics-Augmented Machine
Learning Digital Twin for Multi-
Regime Performance Prediction
and Dry-Out Detection in
Geometrically Modified
Thermosyphons**

*Sanjay J K and Sakthivadivel D —
Vellore Institute of Engineering, India*

17:10–
17:25
#268

**Investigation of a Pioneering
LSMHS-ACO Algorithm for
Control Optimization of Building
Energy System**

*Yunhai Li — Harbin Institute of
Technology, Shenzhen, China*

17:25–
17:40
#59

**Study on Droplet Dynamics and
Heat Transfer Characteristics of
HFE-7100 Impacting Porous
Copper Foam**

*Shaolin Zhang — Southeast
University, China*

17:40–
17:55
#124

**Artificial intelligence-aided
transition from deterministic to
robust wind farm co-design with
wake steering**

*Yu Tu — Shanghai Jiao Tong
University, China*

17:55–
18:10
#74

**An Active Learning-Driven
Optimization Framework for
Flow Field Design in
Electrochemical Energy Devices**

*Changjiang Wang — Southeast
University, China*

18:10–
18:25
Q&A

***Panel Q&A and discussion with
all session speakers***

Day 2 · Sessions D

D2 Energy Storage & Conversion

Photocatalysis, Solar Fuels and Renewable Hydrogen

Hall (Level 8)

Chair: Dr Jingyu Cao (Hunan University, China)

**10:20–
10:35
#95** **Preparation of Ferromagnetic
Heterogeneous Photocatalysts
and Magnetic-Field Coupling
Method For Enhanced
Photocatalytic Hydrogen
Generation**

*Linyi Wu — University of Science and
Technology of China, China*

**10:35–
10:50
#326** **Facet-Engineered BaTiO₃ Single
Crystals for Enhanced
Photocatalytic Hydrogen
Evolution from Water**

*Bashir Ahmmad — Yamagata
University, Japan*

**10:50–
11:05
#61** **Construction of Cu₂O Facet
Junction Coupled with Schottky
Junction and Its Performance in
Selective PEC CO₂ Reduction to
Methanol**

*Kai Zhang — Southeast University,
China*

11:05–
11:20
#197

**Multiscale Science of
Hydrocyclone-Enhanced
Photocatalytic Hydrogen
Production**

*Fanghe Zhou — East China University
of Science and Technology, China*

11:20–
11:30
Q&A

Q&A with Part I speakers

11:30–
11:40

Refreshment break

11:40–
11:55
#189

**Synergistic Promotion of
Photocatalytic Hydrogen
Peroxide Production in 2D
Covalent Organic Frameworks
via Topological Effect and
Linkage Engineering**

*Xing Su — Southeast University,
China*

11:55–
12:10
#210

**Highly Active Ni-Based
Catalysts for Low-Temperature
CO₂ Methanation via Stepwise
Fe and Mg Regulation**

*Ruwei Yao — Taiyuan University of
Technology, China*

12:10–
12:25
#321

Easily synthesized self-nitrogen doped carbon-supported nickel bio-based sustainable catalyst for hydrogenation of benzylamine from benzonitrile

Weidong Liu — Southeast University, China

12:25–
12:30
Q&A

Q&A with Part II speakers

D3 **Energy Storage & Conversion**

Thermal Energy Storage, Heat Pumps, Refrigeration and System Integration

ER2 (Level 8)

Chair: Professor Shuli Liu (Beijing Institute of Technology, China)

10:20–
10:35
#181

Passive thermal management of multi-elevation energy storage systems using gravity-driven two-phase loops

Lu Wang — Tsinghua University, China

10:35–
10:50
#67

Multiphysics modeling and performance evaluation of thermocells

Yingyin Sha — University of Science and Technology of China, China

10:50–
11:05
#137

Numerical Investigation of PCM Capsule Relocation in a TES-Integrated Solar Dryer for Enhanced Melting Performance and Continuous Drying

Shine Win Naung — University of the West of England, United Kingdom

11:05–
11:20
#198

A reliability-oriented energy storage sizing assessment method for PV systems based on energy decomposition

Xingzhi Yuan — The Hong Kong Polytechnic University, Hong Kong

11:20–
11:25
Q&A

Q&A with Part I speakers

11:25–
11:30

Refreshment break

11:30–
11:50
#24 & 25

Energy Analysis of a Two-Stage Cascade Refrigeration System Using R-1234yf and R-404A Refrigerant Couple & Investigation of Exergy Efficiencies of the Components of a Two-Stage Vapor Compression Refrigeration System for Different Refrigerants

Ali Kilicarslan — Hitit University, Türkiye

11:50–
12:05
#39

**Numerical Investigation of a
Small-Scale Centrifugal
Refrigeration Compressor Using
Natural Refrigerants**

*Xiang Qiu — Shanghai Jiao Tong
University, China*

12:05–
12:20
#222

**PVT Cascade High-Temperature
Heat Pump System for High-
Temperature Industrial Heating:
Thermodynamic Analysis and
Performance Evaluation**

Teng Jia — Nanjing University, China

12:20–
12:30
Q&A

Q&A with Part II speakers

D4 **Low-Carbon Buildings**

**Building Envelopes, Passive Design and
Natural Ventilation**

ER3 (Level 8)

Chair: Dr John Kaiser Calautit (University
College London, United Kingdom)

10:20–
10:45
#370

**Invited Speaker: Zephyr City: An
Energy-Efficient Solution for
Urban Microclimate
Enhancement**

*Professor Cruz Li — Chongqing
University, China*

10:45–
11:00
#130

**Experimental and Numerical
Analysis of a Bifacial
Photovoltaic Wall–
Thermochromic Composite
System for Low-Carbon
Buildings**

*Sai Xu — Hefei University of
Technology, China*

11:00–11:15
#223

**Cleaner Energy Envelope
systems for High rise Residential
Buildings – An energy analysis
and design with BIPV and Micro
wind turbines**

*Abhilash Suryan R — College of
Engineering Trivandrum, India*

11:15–11:20
Q&A

Q&A with Part I speakers

11:20–
11:25

Refreshment break

11:25–
11:40
#281

**Application of solar photovoltaic
vacuum glazing in skylight**

*Wenhao Zhu — The Hong Kong
Polytechnic University, Hong Kong*

11:40–
11:55
#131

**Performance analysis and
design optimization of a novel
Trombe wall system using CFD
and response surface method**

*Kaijie Li — Hefei University of
Technology, China*

11:55–
12:10
#314

A Bilayer $\text{TiO}_2/\text{ZrO}_2$ Radiative Cooling Powder Coating via Electrostatic Spraying for High-Performance Zero-Carbon Cooling

Cheng Jin — University of Science and Technology of China, China

12:10–
12:25
#350

Pore-Scale Simulation of Gradient-Distributed Thermochromic Hydrogels for Adaptive Building Envelopes and Smart Window Applications

Wenyan Chen — Southeast University, China

12:25–
12:30
Q&A

Q&A with Part II speakers

D5

AI & Renewable Systems

Digital Planning and Forecasting for Renewable Energy Systems

ER4 (Level 8)

Chair: Associate Professor Ir. Ts. Dr. Nik
Normunira binti Mat Hassan

**10:20–
10:50
#100** **Invited Speaker: Optimising a
Solar-Powered Intercontinental
Energy Network for the One Sun
One World One Grid Initiative: A
Linear Programming Approach**
*Professor K. Srinivas Reddy — Indian
Institute of Technology Madras, India*

**10:50–
11:05
#41** **Blockchain-Enabled
Traceability: Bridging the
Hydrogen Trade Gap between
Europe and China**
*Sofya Morozova — Haliç University,
Türkiye*

**11:05–
11:20
#226** **Comprehensive Assessment of
Wind and Solar Energy Potential
Toward a Sustainable Future: A
Case Study of the GMMR, Libya**
*Djamal Hissein Didane — Universiti
Tun Hussein Onn Malaysia*

**11:20–
11:30
Q&A** **Q&A with Part I speakers**

**11:30–
11:40** **Refreshment break**

11:40–
11:55
#265

**Machine-Learning-Assisted
Design and Analysis of an
Integrated Allam Cycle-CO₂
Energy Storage System**

*Yingzong Liang — Guangdong
University of Technology, China*

11:55–
12:10
#246

**Techno-Economic Assessment
of Hybrid Renewable-Powered
Hydrogen Refuelling Station: A
Case Study in Sumba Island,
Indonesia**

*Taurista Perdana Syawitri — National
Research and Innovation Agency
Republic of Indonesia*

12:10–
12:25
#133

**Explainable GA-Optimized
Random Forest for Station-
Based Solar Irradiance
Prediction**

*Abubakar D. Maiwada — University
Sains Malaysia, Malaysia*

12:25–
12:30
Q&A

Q&A with Part II speakers

Day 2 · Sessions E

E1

Energy Storage & Conversion

Phase Change, Thermochemical and Adaptive Thermal Storage Materials

Hall (Level 8)

Chair: Professor Guiqiang Li (University of Science and Technology of China, China)

**15:20–
15:50
#94** **Invited Speaker: Research of Photothermal-Driven Composite Phase Change Materials**

Professor Shuli Liu — Beijing Institute of Technology, China

**15:50–
16:05
#75** **Development of Novel Salt Sorbent Material for Thermochemical Energy Storage**

Zhiwei Ma — Durham University, United Kingdom

**16:05–
16:20
#221** **Novel closed loop thermochemical reactor for Thermal Energy Storage**

Eleonora Baccega — University of Ferrara, Italy

**16:20–
16:35
#201** **Effect of Cement Incorporation on the Stability and Thermochemical Performance of Vermiculite- CaCl_2 Composites**

Ismail Kaan Keskin — University of Nottingham, United Kingdom

**16:35–
16:45
Q&A** **Q&A with Part I speakers**

16:45–
17:05

Refreshment break

17:05–
17:20

#144

**Machine Learning–Guided
Optimization of Mean
Carbonation in Solar–Driven
Calcium Looping for
Thermochemical Energy Storage**

*Ming Lin — Southeast University,
China*

17:20–
17:35

#241

**Design and System–Level
Analysis of a Thermochemical
Energy Storage Unit for Peak–
Load Reduction in Residential
Heating**

*Arvin Sohrabi — Beijing Institute of
Technology, China*

17:35–
17:50

#16

**Climatic Adaptability of
Customized Phase Change
Energy Piles Based on the
Random Aggregate Method**

*Zhengheng Gan — Southeast
University, China*

17:50–
18:05

#184

**Enhancing Medium–Deep
Geothermal Energy Extraction
Using Phase Change Material
Working Fluids**

*Aizheng Li — Southeast University,
China*

18:05–
18:15
Q&A

Q&A with Part II speakers

E2 Energy Storage & Conversion

Bioenergy, Renewable Fuels and Sustainable Solar Materials

ER2 (Level 8)

Chair: Ir. Dr. Fauziah Jerai@Junaidi (Universiti Teknologi MARA, Malaysia)

15:20–
15:35
#261

Effect of Using Supercooled Sugar Alcohol-Based PCMs on Operating Duration and Heat Source Temperature Fluctuation in a Solar Organic Rankine Cycle

Ze Liu — University of Nottingham, United Kingdom

15:35–
15:50
#71

Mechanistic Study of On-Line Electrochemical Upgrading of Biomass Pyrolysis Vapors in a Solid Oxide Electrolysis Cell

Xian Pan — Southeast University, China

15:50–
16:05
#160

**Innovative tunable and modular
UV aging light source and
accelerated aging results of
downshifting layers for
photovoltaic applications**

*Leonardo Sollazzo — University of
Ferrara, Italy*

16:05–
16:20
#213

**Pilot trial, performance study
and economic assessment of
enriched-oxy and steam
biomass gasification: towards
sustainable, clean and efficient
energy conversion and
hydrogen production**

*Hao Shi — Southeast University,
China*

16:20–
16:35
#318

**Thermodynamic simulation,
energy, and emission
assessment of rice husk co-
combustion system**

*Muhamad Taufiq Irsyad — Kyoto
University, Japan*

16:35–
16:45
Q&A

Q&A with Part I speakers

16:45–
17:05

Refreshment break

17:05–
17:20
#21

Comparison of food cooking tests in a solar box cooker with and without heat transfer enhancement using positive temperature coefficient (PTC) heating fans

Ashmore Mawire — North-West University, South Africa

17:20–
17:35
#308

Selective C–O Bond Cleavage in Biomass Furans to Biofuels via Tailored Catalyst Acidity and Metal–Support Interactions

Qunfeng Chen — Southeast University, China

17:35–
17:50
#156

Performance Analysis of PV/T Collectors with Spectrally Selective Cover

Ken Chen — University of Science and Technology of China, China

17:50–
18:05
#306

Single-Atom Ni–NAC Catalysts with Ultra-Low Nickel Loading for Selective Reductive Catalytic Fractionation of Lignocellulosic Feedstocks

Yongtong Zhang — Southeast University, China

18:05–
18:15
Q&A

Q&A with Part II speakers

E3**Energy Storage & Conversion**

Combustion, Thermal Power and Low-Carbon Fuel Conversion

ER3 (Level 8)

Chair: Professor Ali Kilicarslan (Hitit University, Türkiye)

**15:20–
15:50
#89** **Invited Speaker: Experimental Performance Study of Diesel Generator Using 40% Renewable Fuel Blends: FAME and Hydrotreated Vegetable Oil (HVO)**

*Professor Berkah Fajar Tamtomo
Kiono — Diponegoro University,
Indonesia*

**15:50–
16:05
#188** **Experimental Study on Combustion Characteristics in the Dense Phase Zone of Circulating Fluidized Bed Ultra-Low NO_x Coal-Fired Boilers**

*Liye Wang — Southeast University,
China*

**16:05–
16:20
#267** **An Economically Viable Catalytic Co-Pyrolysis System for High-Yield Drop-in Gas Turbine Fuel from Polypropylene and Yellow Grease Oil**

*Muhammad Syahiran Abdul Malik —
Universiti Teknologi Malaysia,
Malaysia*

16:20–
16:35
#120

Sustainable High-Temperature Bond-Coat Materials for Efficient Heavy-Duty Gas Turbines: Microstructure and Oxidation Behavior of LPBF-Fabricated ODS NiCoCrAlTaY Alloys

Yuwen Qiu — Southeast University, China

16:35–
16:50
#225

Ligand-Stabilized Synthesis of Zeolite-Encapsulated-Metal Composite Materials for Alkane Dehydrogenation

Shaojia Song — Taiyuan University of Technology, China

16:50–
17:00
Q&A

Q&A with Part I speakers

17:00–
17:10

Refreshment break

17:10–
17:25
#178

Structure-Activity Relationship of NH₃-Treated Spherical KNbO₃ in Catalytic Carbonyl Sulfide Hydrolysis: Oxygen Vacancy Engineering vs. Nitrogen Doping

Jian Gao — Southeast University, China

17:25–
17:40
#235

Asymmetric Carnot Battery Configurations for Solar PV–CSP Hybrid Systems: Integration, Performance, and Techno-Economic Analysis

Jin Yu — Shanghai Jiao Tong University, China

17:40–
17:55
#294

Non-Adiabatic CFD Simulation of Ammonia–Coal Co-Firing in a Generic Burner: Control of Fuel–Nitrogen Conversion Pathways for Low-Carbon Power Generation

Nik Siti Hasniati Nik Leh — Universiti Teknologi Malaysia, Malaysia

17:55–
18:10
#179

Performance study of a solid oxide fuel cell (SOFC) –CO₂ combined cycle energy storage and power generation system

Jingkui Zhang — Shanghai University of Electric Power, China

18:10–
18:15
Q&A

Panel Q&A and discussion with all session speakers

E4 **Energy Storage & Conversion**

Thermal Management, Heat Recovery and Cooling Technologies

ER4 (Level 8)

Chair: Professor Qiliang Wang (University of Science and Technology of China, China)

**15:20–
15:50
#259** **Invited Speaker: Advanced Thermal Management and Energy Recovery Strategies for Sustainable High-Performance Computing Infrastructures**

*Professor Beatrice Bonfanti Pulvirenti
– University of Bologna, Italy*

**15:50–
16:05
#207** **Gradient composite structures for suppressing the propagation of thermal runaway in high-capacity LiFePO₄ batteries**

*Chengcheng Zhang – Wuhan
University of Technology, China*

**16:05–
16:20
#113** **Rational design of hydrogels with improved evaporative cooling performance for high heat flux thermal management**

*Mingyang Ma – Southeast
University, China*

**16:20–
16:35
#251** **Investigation on zonal topology optimization enabled direct cooling thermal management in full scale lithium-ion battery packs**

*Junlong Kong – Shanghai Jiao Tong
University, China*

16:35–
16:50
#276

Development and Validation of a One-Dimensional Transient Model for High-Temperature Alkali Metal Heat Pipes in Decay Heat Removal

Peng Ju — Harbin Institute of Technology, Shenzhen, China

16:50–
16:55
Q&A

Q&A with Part I speakers

16:55–
17:05

Refreshment break

17:05–
17:20
#190

Power Enhancement of Thin Film Thermoelectric Generator through Cationic Doping

Ubaidah Syafiq — Universiti Kebangsaan Malaysia, Malaysia

17:20–
17:35
#320

Directional capillary-driven liquid transport on magnetically responsive micropillar array surfaces

Bokai Yang — Shanghai Jiao Tong University, China

17:35–
17:50
#182

Electrolyte Engineering of Liquid Thermocells for Low-Grade Heat Harvest at Sub-Zero Temperatures

Xin Lu — Southeast University, China

17:50–
18:05
#176

Asymmetric configuration and electrolyte engineering for high-performance ultrathin ionic thermoelectric cells

Haofei Meng — Southeast University, China

18:05–
18:15
Q&A

Q&A with Part II speakers

E5 **Policy & Management**

Energy Policy, Techno-Economics and Sustainable Communities

MR4 (Level 7)

Chair: Dr Tajul Rosli Razak (Universiti Teknologi MARA, Malaysia)

15:20–
15:35
#20

Economic and environmental impact of different scenarios for the green hydrogen market in Chile – An intersectoral approach

Cristian Mardones — University of Concepción, Chile

15:35–
15:50
#44

Thermodynamic analysis of geothermal energy systems with different design configurations for sustainable hydrogen production

Arif Karabuga — Istanbul Aydin University, Türkiye

15:50–
16:05
#82

Designing a Three-Track Internal Carbon Pricing Governance Mechanism in the Real Estate Service Industry

Wan-Yu Weng — National Chengchi University, Taiwan

16:05–
16:20
#148

E-Ratiba, the Energy Timetable: a planning tool for Energy Use and Revenue in Solar-Powered Schools in Nairobi

Vincenzo Rossi — University of Nottingham, United Kingdom

16:20–
16:35
#336

Repurposing Wave-Energy Absorption Technologies for Coastal Erosion Adaptation

Brathikan VM — Kumaraguru College of Technology, India

16:35–
16:45
Q&A

Q&A with Part I speakers

16:45–
16:55

Refreshment break

16:55–
17:10
#349

**Advancing Applied Renewable
Energy Education through
Makerspace-Based Learning: A
Longitudinal Case Study**

*Rafat Al Afif — University of Natural
Resources and Life Sciences, Austria*

17:10–
17:25
#199

**Validation of an Adaptive
Outdoor Thermal Comfort
Questionnaire for Therapeutic
Parks in Hospital Environments**

*Noraishah Mohammad Sham —
Institute for Medical Research,
Malaysia*

17:25–
17:40
#317

**Developing Facility
Management Guidelines for Safe
and Inclusive Public Transport
for All in a World Heritage
Tourism City: The Case of
Ayutthaya, Thailand**

*Wiruj Somsopon — Thammasat
University, Thailand*

17:40–
17:55
#233

**ENVI-met Microclimate
Simulation in Tropical Hospital
Therapeutic Gardens: A Multi-
Site Validation Study**

*Farah Nurhanis — Universiti
Teknologi MARA, Malaysia*

17:55–
18:10
#287

**Assessing the Impact of
Transportation Infrastructure
Development on Land Use/Land
Cover Change and Urban Heat
Island Dynamics in Benin City,
Nigeria**

*Geraldine Nkechinyere Okeudo—
Abia State University Uturu, Nigeria*

18:10–
18:15
Q&A

Q&A with Part II speakers

Day 3 • Sessions F

F1 **AI & Renewable Systems**

Machine Learning for Thermal Systems and Energy Technologies

Ballroom 2 (Level 6)

Chair: Ts. Dr. Nur Atiqah binti Ramlan
(Universiti Teknologi MARA, Malaysia)

09:15–
09:40
#37

**Invited Speaker: Enabling
Electrification of Heating
Through SuperThermalBattery**

*Dr Hasila Jarimi — Universiti
Kebangsaan Malaysia, Malaysia*

09:40–
09:55
#109

Topology Optimization of a High-Performance Cold Plate Operating in the Turbulent Regime for BTMS Applications

Zexu Wang — Southeast University, China

09:55–
10:10
#69

Numerical investigation of the aeroelastic performance of a wind turbine operating under yaw misalignment

Shine Win Naung — The University of the West of England, United Kingdom

10:10–
10:25
#295

A Residual-Corrected Dual-State Surrogate Modelling Framework for Thermoeconomic Optimization of Concentrated Thermoelectric Generators under Nonuniform Irradiation

Haowen Liu — Harbin Institute of Technology, China

10:25–
10:30
Q&A

Q&A with Part I speakers

10:30–
10:40

Refreshment break

10:40–
10:55
#125

**Performance Analysis of
Photovoltaic–Thermal Systems
with In-Situ Lunar Water Ice
Thermal Storage**

*Kongfu Hu— University of Science
and Technology of China, China*

10:55–
11:10
#219

**Robust Predictive Control for
Energy–Aware Data Center
Cooling with Online Disturbance
Compensation**

*Tiexiao Xu — Tsinghua University,
China*

11:10–11:25
#234

**Experimental and Numerical
Evaluation of Surface Integrity
and Mechanical Performance of
Finished STS 316L Rod Bars:
Integrated AI Image Processing**

*Chanchamnan Sieb — Jeonbuk
National University, South Korea*

11:25–
11:40
#110

**Experimental Investigation on
the Thermal–Hydraulic
Performance of TPMS–Based Air–
Cooling Heat Exchangers for
High–Altitude Applications**

*Xinyue Zhang — Southeast
University, China*

11:40–
11:45
Q&A

Q&A with Part II speakers

F2 Low-Carbon Buildings

Building Performance, Heritage and Community Energy

ER2 (Level 8)

Chair: Professor Cruz Li (Chongqing University, China)

**09:15–
09:45
#101** **Invited Speaker: SENSE-AI: A
Sensor-Enabled, Mixed-Methods
AI Framework for Heritage
Housing Performance Evaluation**

*Professor Amin Al-Habaibeh –
Nottingham Trent University, United
Kingdom*

**09:45–
10:00
#250** **Reframing Universal Design as a
Spatial-Governance Framework
for Sustainable Heritage Tourism
Management: Evidence from
Sukhothai Historical Park,
Thailand**

*Satitaporn Lubkosa and Choomket
Sawangjaroen – Thammasat
University, Thailand*

**10:00–
10:15
#351** **Year-Round Field Assessment
and Economic Feasibility of a
Polymer-Core Indirect
Evaporative Cooler in Hot and
Humid Climates**

*Xiaochen Ma – China University of
Petroleum (East China), China*

10:15–
10:30
#68

**City-to-Facade Multi-Scale
Assessment of a Flap-Fin Dual-
Channel Windcatcher for Stable
Natural Ventilation under Low-
Wind, Directional Urban Flows in
Chongqing**

*Jiaxiang Li — Chongqing University,
China*

10:30–
10:35
Q&A

Q&A with Part I speakers

10:35–
10:40

Refreshment break

10:40–
10:55
#310

**From Quantity Take-Off to
Carbon Take-Off: Benchmarking
Material Intensity and Embodied
Carbon in Malaysian Mosque
Projects**

*Farah Shahrin — Nottingham Trent
University, United Kingdom*

10:55–
11:10
#132

**A Short-Term Building Energy
Consumption Forecasting
Framework Based on
Decomposition and Adaptive
Grouping**

*Kejun Tao — Hefei University of
Technology, China*

11:10–11:25 **Overheating Risk and Future Climate Adaptation in Loft Conversions of Older UK Housing: Optimisation of Roof Fenestration Design Using a Victorian / Early 20th-Century Terraced House**

#292

Ke Qu — CarbonFutureX Group Ltd, United Kingdom

11:25–11:40 **Ultra-white, Lightweight and Thermally Insulating Hollow Glass Microsphere Ceramics for Zero-carbon Passive Radiative Cooling**

#315

Jiahao Ni — University of Science and Technology of China, China

11:40–11:45 **Q&A**

Q&A

F3 **Energy Storage & Conversion**

Advanced Heat Transfer, Thermal Systems and Sustainable Building Materials

ER3 (Level 8)

Chair: Professor Berkah Fajar Tamtomo Kiono
(Diponegoro University, Indonesia)

**09:15–
09:30
#334** **Pressure-dependent pool boiling characteristics of liquid oxygen
Implications for cryogenic thermal management in sustainable energy systems**

Jiashi Wang — Shanghai Jiao Tong University, China

**09:30–
09:45
#145** **Lignin-Based Reinforcement of HDPE–EPDM Blends for Low-Carbon and Energy-Efficient Applications**

Muhammad Khatami — Universiti Sains Malaysia, Malaysia

**09:45–
10:00
#118** **Enhancement of mass transfer in ammonia-water distillation utilizing a novel packed column with integrated ultrasonic atomization Subtitle: Effects of atomization rate and initial droplet diameter**

Shenghao Huang — Southeast University, China

10:00–
10:15
#150

Coupling Interfacial Molecular Engineering and Rayleigh–Bénard Convection in BNNS@PDA Nanofluids for High-Performance Direct Absorption Solar Collectors

Hao Wang — Southeast University, China

10:15–
10:20
Q&A

Q&A with Part I speakers

10:20–
10:25

Refreshment break

10:25–
10:40
#114

A novel LPBF MoCu40 alloy for Energy-Efficient Thermal Management in High-Power Electronic Systems

Jie Liu — Southeast University, China

10:40–
10:55
#324

Green Inhibitors for Steel Corrosion in Concrete: Poly(acrylic acid) and Tannic Acid through Electrochemical, Surface, and Molecular-Level Characterization

Ismail Mudhaffar — King Fahd University of Petroleum and Minerals, Saudi Arabia

10:55–
11:10
#285

Influence of Sodium Metasilicate Dosage on the Fresh Properties of Saudi Calcined Clay-Based One-Part Geopolymer Binder

Amin Al-Fakih — King Fahd University of Petroleum & Minerals, Saudi Arabia

11:10–11:25
#204

Effect of Synergistic NaOH and Ammonium Polyphosphate Treatment on Fire Retardancy of Kenaf-Cotton Non-Woven Insulation

Muhammad Ibrahim Salahuddin Tengku — JKR Centre of Excellence for Engineering and Technology (CREaTE), Malaysia

11:25–
11:40
#88

Regulating Heat and Mass Transfer in Porous Materials Enabling Sustainable Electricity-Water Cogeneration

Zhengyi Mao — Harbin Institute of Technology, Shenzhen, China

11:40–
11:45
Q&A

Q&A with Part II speakers

F4 **Urban & Environment**

Urban Sustainability, Water and Inclusive City Planning

ER4 (Level 8)

Chair: Dr Norhayati Mat Wajid (Universiti Teknologi MARA, Malaysia)

**09:15–
09:30
#157** **Office Greywater Influent:
Variability and Impact on
Decentralised Treatment in
Sustainable Building Systems**

*George Milev — Nottingham Trent
University, United Kingdom*

**09:30–
09:45
#243** **Flow Reduction Technique in a
Novel Gravity Driven Rainwater
Harvesting System Collection
Tank with Natural Filtration for
Clean Water Supply**

*Zainal Abidin Kamarul Baharin —
MEC Engineering Resources,
Malaysia*

**09:45–
10:00
#183** **Pressurized Injection-Enhanced
Bioaugmentation for
Sustainable Groundwater
Remediation: Field Evidence
from Chlorinated Methane-
Contaminated Urban Aquifers**

*Qinjun Liang — Southeast University,
China*

10:00–
10:15

#247

An evaluation framework to assess of pedestrian comfort in relation to street design along Indira Gandhi Road corridor, Kozhikode

Deepa Rani R — College of Engineering Trivandrum, India

10:15–
10:20

Q&A

Q&A with Part I speakers

10:20–
10:25

Refreshment break

10:25–
10:40

#316

From Participatory Planning to Implementation Readiness: Evaluating the Smart Ayutthaya Heritage Public Transport for All Master Plan Against International Principles

Alita Chaladdee — Thammasat University, Thailand

10:40–
10:55

#331

Comparison of the electrical and thermal performances for different urban solar photovoltaic installation types

Yijie Zhang — Tongji University, China

10:55–
11:10
#264

**Exploring Adaption Strategies
and Perceptions of Thermal
Comfort Among Students and
Staff in Tropical Urban**

*Muhammad Zhafri Andzar Zaharudin
— UNIVERSITI TEKNOLOGI MARA
(UITM), Malaysia*

11:10–11:25
#252

**Accessible Learning Districts as
Urban Social Infrastructure for
Inclusive Cities: From
Fragmented Welfare Facilities to
a Connected Learning District in
Pakkred, Thailand**

*Choomket Sawangjaroen —
Thammasat University, Thailand*

11:25–
11:40
#286

**Mapping Urban Heat Island
Dynamics in Osijek, Croatia:
Integrating Landsat Thermal
Data with GIS-Based Land Cover
Analysis**

*Francis Ezinwanne Onuegbu— Abia
State University Uturu, Nigeria*

11:40–
11:45
Q&A

Q&A with Part II speakers

EXHIBITION AREA, LEVEL 6

Poster Exhibition

On display throughout the conference

POSTER SESSION 1

Energy Storage & Thermal Systems

Day 1, 16:10–16:40

#38

Standalone PV-powered air-conditioning system with PCM ice-gel cold storage: a case study in a Malaysian healthcare facility

Amiruddin Abdullah — Universiti Kebangsaan Malaysia; Hasila Jarimi — University of Nottingham, Malaysia; Muhamad Fadhli Ramlee — Universiti Kebangsaan Malaysia; Noor Muhammad Abd. Rahman — Engineering Services Division, Ministry of Health Malaysia; Mohd Haikal Jamaludin — Engineering Services Division, Ministry of Health Malaysia; Emy Zairah Ahmad — Universiti Teknikal Malaysia; Tajul Rosli Razak — Universiti Teknologi MARA, Malaysia; Saffa Riffat — University of Nottingham, United Kingdom

#56

Design and experimental investigation of a direct contact phase change packed bed heat exchanger

Xiaoqiang Zhai — Shanghai Jiao Tong University, China; Zhaokai Yu — Shanghai Jiao Tong University, China; Hanze Wei — Shanghai Jiao Tong University, China; Kunlong Xin — Shanghai Jiao Tong University, China

#138

Cobalt-doped MnO₂ Nanowires Fabricated By Electrodeposition for Enhanced Aqueous Zinc-Ion Batteries

Bayan Baatiyah — King Fahad University, Saudi Arabia

#146

Laser-Patterned Cu-Supported NiCoRh Bifunctional Electrocatalyst for Efficient Hydrogen and Oxygen Evolution

Samavia Rafiq — King Fahd University of Petroleum and Minerals, Saudi Arabia; Muhammad Ashraf Gondal — King Fahd University of Petroleum and Minerals, Saudi Arabia; Farhan Arshad — King Fahd University of Petroleum and Minerals, Saudi Arabia

**#195 Operation Optimization Framework
for Hydrogen Cogeneration
Systems Under Supply and
Demand Uncertainties**

Chengyun Li — Southeast University,
China; Qingsong Hua — Beijing Normal
University, China; Li Sun — Southeast
University, China

**#220 A Novel Combined Power and
Steam System Based on Deep
Recovery of Waste Energy:
Modelling, Optimization, and
Evaluation**

Jiawen Yang — Southeast University,
China; Yefan Wang — Southeast
University, China; Qihao Feng — Southeast
University, China; Liu Yang — Southeast
University, China

**#229 A Novel CaCl_2 /Graphite Felt-Based
Thermochemical System for Solar-
Driven Thermal Energy Storage and
Heat Release**

Jian Zhang — Beijing Institute of
Technology, China; Shuli Liu — Beijing
Institute of Technology, China

#238 Numerical analysis of support columns in vapor chambers

Haojiang Ran — Key Laboratory for Thermal Science and Power Engineering of Ministry of Education, Tsinghua University, China; Zhen Li — Key Laboratory for Thermal Science and Power Engineering of Ministry of Education, Tsinghua University, China

#260 Cross-Linking Strategies for Enhancing Reproducibility and Morphological Stability in Organic Solar Cells

Shafidah Shafian — Solar Energy Research Institute (SERI), Universiti Kebangsaan Malaysia, Malaysia; Kyungkon Kim — Ewha Womans University, South Korea

#262 Numerical Analysis of Structural Configuration Effects on the Cooling Performance of a Compound Parabolic Concentrator-Based Radiative Cooling Device

Ya Dan — Southwest Jiaotong University, China; Kexi Mi — Southwest Petroleum University, China; Yixin Guo — Southwest Jiaotong University, China; Yuehong Su — University of Nottingham, United Kingdom; Mingke Hu — Southwest Jiaotong University, China

#263 Exploring a novel reactor with pea-stem-inspired flow channels for thermochemical energy storage

Yong Zhang — School of Mechanical Engineering, Southwest Jiaotong University, China; Hua Li — School of Mechanical Engineering, Southwest Jiaotong University, China; Jianbin Chen — University of Nottingham, United Kingdom; Ziwei Chen — University of Nottingham, United Kingdom; Yuehong Su — University of Nottingham, United Kingdom; Yanping Yuan — Southwest Jiaotong University, China; Mingke Hu — Southwest Jiaotong University, China

#269 Evaluation of Choline Chloride/Lactic Acid-Based Deep Eutectic Nanofluids for Broadband Solar Thermal Management

Chongjie Xiong — Beijing Institute of Technology, China; Shuli Liu — Beijing Institute of Technology, China; Zhiqi Xu — Beijing Institute Of Technology, China

#288 Efficient Thermal Management for Sustainable Energy Storage via Simplified Converging Channels

Jun-Hong Wang — National Chin-Yi University of Technology, Taiwan; Chien-Lin Tsai — National Chin-Yi University of Technology, Taiwan; **Jyun-Hong Chen** — National Chin-Yi University of Technology, Taiwan

**#196 Research on Air Flow Organization
and Thermal Environment
Simulation of Data Center Dry
Cooler**

Ke Cui — Alibaba Group Holding Limited, China; Mingyang Wang — Alibaba Group Holding Limited, China; Lu Wang — Tsinghua University, China; Kang Yuan — Tsinghua university, China; **Zhen Li** — Tsinghua university, China

**#344 Investigation of a Liquid Piston Air
Compressor for Near-Isothermal
Compression and Enhanced Energy
Efficiency**

Krisnan K — Kumaraguru College of Technology, India; Brathikan Vijayamohan Mankayakarasi — Kumaraguru College of Technology, India; Rukaiya Beevi M — Kumaraguru College of Technology, India

POSTER SESSION 2

Buildings, AI & Smart Energy Systems
Day 2, 10:00–10:20

**#83 Managing Scope 3 Category 1
Emissions through Supplier
Engagement in the Real Estate
Service Industry**

Han Sen Teng — National Chengchi University, Taiwan; Yun-Sheng Hsu — Sinyi Group, Taiwan

#73

**The Energy Paradox of Edge AI:
Evaluating the Net Efficiency of
Occupancy-Based HVAC Control
on Heterogeneous Edge Platforms**

Zhe Wang — Zhengzhou University of Light Industry, China; Hao Sun — University of Surrey, United Kingdom; John Kaiser Calautit — University of Nottingham, United Kingdom

#126

**Engineering Single-Phase Spinel
High-Entropy Oxides for
Sustainable Green Hydrogen
Production**

Shaheryar Malik — King Fahd University of Petroleum and Minerals, Saudi Arabia

#177

**Development of a Sustainable One-
Part Alkali-Activated Binder**

Mehtab Ahmad — Civil and Environmental Engineering KFUPM, Saudi Arabia; Amin Al Fakih — Assistant Professor, Department of Civil and Environmental Engineering, Saudi Arabia

#192

Influence of Ceramic Polishing Sludge on the Compressive and Flexural Strength of Ultra-High-Performance Concrete

Moneef Qaid — King Fahd University of Petroleum & Minerals, Saudi Arabia; Amin Al-Fakih — King Fahd University of Petroleum & Minerals, Saudi Arabia; Rida Assaggaf — King Fahd University of Petroleum & Minerals, Saudi Arabia

#200

Parametric Characterization and Operating Boundaries of Air and Liquid Cooling Architectures in High-Density Data Centers

Xinyi Wang — Tsinghua, China; Lu Wang — Tsinghua University, China; Haojiang Ran — Tsinghua University, China; Tiexiao Xu — Tsinghua University, China; Bo Zhang — Tsinghua University, China; Zhen Li — Tsinghua University, China

#227

Thermal-moisture transfer characteristics and configuration optimization of PCM-integrated wall

Ziyu Leng — Southwest Jiaotong University, China; Xiaoling Cao — Southwest Jiaotong University, China; Yanping Yuan — Southwest Jiaotong University, China; Yong Zhang — Southwest Jiaotong University, China

#242 Data-Driven Optimization Control of HVAC Chilled Water Systems in Sustainable Buildings

Anyu Zhao — Tianjin University, China

#255 Smart Indoor Environmental Monitoring and Control Using a Residential Digital Twin with Vision-Language Derived Scene States

Mohammad Hafiz bin Ismail — Universiti Teknologi MARA, Malaysia; Tajul Rosli Razak — Faculty of Computer and Mathematical Science, Universiti Teknologi MARA (UiTM), Shah Alam, 40450, Malaysia; Hasila Jarimi — Solar Energy Research Institute. The National University of Malaysia, Bangi, 43600, Malaysia

#283 Reinforcement Learning Based Load Frequency Control in Renewable-Integrated Hybrid Power Systems

Amil Daraz — Center for Sustainable Energy Systems, King Fahd University of Petroleum and Minerals, Saudi Arabia

#304 Spectrally selective Cs_xWO_3 -enabled semi-transparent photovoltaic facade for solar-driven thermal disinfection

Yifei Gao — Department of Thermal Science and Energy Engineering, University of Science and Technology of China, Hefei ,China.; Jie Ji — Department of Thermal Science and Energy Engineering, University of Science and Technology of China, Hefei ,China.; Yuzhe Zhang — Department of Thermal Science and Energy Engineering, University of Science and Technology of China, Hefei ,China.

#305 Comprehensive performance prediction of a semi-transparent PV-PCM ventilated curtain wall system coupled with an air handling unit

Xinran Wang — School of Engineering Science, University of Science and Technology of China; Jie Ji — School of Engineering Science, University of Science and Technology of China; Yayun Tang — Institute for Carbon Neutrality, Tsinghua University, China; Wei Ke — School of Engineering Science, University of Science and Technology of China

#307 Development and validation of an MS2-based thermal inactivation model for viral aerosols in an air-purifying Trombe wall

Suyue Xu — Department of Thermal Science and Energy Engineering, University of Science and Technology of China, Hefei, China.; Jie Ji — Department of Thermal Science and Energy Engineering, University of Science and Technology of China, Hefei, China.

#121 Data-driven Model Predictive Control for Intelligent Natural Ventilation in Office Buildings

Lingqian Wu — Tongji University, China;
Hangyue Zhang — Tongji University, China;
Tianxin Chang — Tongji University, China;
Zhi Zhuang — Tongji University, China

**#266 A Digital Twin Framework for
Intelligent Air Quality Monitoring
and Sustainable Urban
Environmental Management in
Malaysia**

Hasila Jarimi — Universiti Kebangsaan Malaysia; Xiao Li — University of Aberdeen, United Kingdom; Yanan Zhang — Calling Bridge Limited, United Kingdom; Tajul Rosli Razak — Universiti Teknologi MARA, Malaysia; Nurfarhana Alyssa Ahmad Affandi — Universiti Kebangsaan Malaysia; Muhammad Amir Aziat Ishak — Universiti Kebangsaan Malaysia; Adnan Ibrahim — Universiti Kebangsaan Malaysia; Ahmad Fazlizan — Universiti Kebangsaan Malaysia; Norasikin Ahmad Ludin — Universiti Kebangsaan Malaysia; **Ubaidah Syafiq** — Universiti Kebangsaan Malaysia; Mohammad Hafiz bin Ismail — Universiti Teknologi MARA, Malaysia

**#248 Characterisation of Bedroom
thermal microclimates influencing
Sleep quality in diverse Residential
settings in Kerala.**

Anagha Ashok — Department of Architecture and Planning, College of Engineering Trivandrum, Kerala, India; **Deepa Rani R** — Department of Architecture and Planning, College of Engineering Trivandrum, Kerala, India

#319

**Development of a GFM/GFL-based
Microgrid Platform and
Assessment of Microgrid Resilience
Under Different GFL Penetration
Rates**

Po-Yuan Wu — National Sun Yat-sen
University, Taiwan; Yi-Quan Liao —
National Sun Yat-sen University, Taiwan;
Ting-Yue Chen — National Sun Yat-sen
University, Taiwan; **Sei Zhen Khong** —
National Sun Yat-sen University, Taiwan;
Kuo-Sheng Hsieh — Taiwan Power
Research Institute, Taiwan; Wen-Zhuang
Jiang — Taiwan Power Research Institute,
Taiwan; Hung-Wei Chen — Taiwan Power
Research Institute, Taiwan; Ching-Jung
Liao — Taiwan Power Research Institute,
Taiwan

POSTER SESSION 3

Materials, Environment & Applications
Day 3, 11:45–12:05

#119

Sustainable Waste-Derived Carbon Material for Supercapacitor Applications

Muhammad Aftab — King Fahd University of Petroleum and Minerals, Saudi Arabia; Zahid Manzoor Bhat — King Fahd University of Petroleum and Minerals, Saudi Arabia; Mohammad Furquan — King Fahd University of Petroleum and Minerals, Saudi Arabia; Dr. Mohammad Qamar — King Fahd University of Petroleum and Minerals, Saudi Arabia

#152

Numerical Analysis and the Impact of Phase Change Material on Semi-Transparent CdTe Photovoltaic Thermal (PVT) for Building Application

Farhana Razali — Solar Energy Research Institute, Universiti Kebangsaan Malaysia; Hasila Jarimi — Department of Architecture and Built Environment, The University of Nottingham, University Park, Nottingham, United Kingdom; Emy Zairah Ahmad — Faculty of Electrical Technology and Engineering, Universiti Teknikal Malaysia Melaka; Shafidah Shafian — Solar Energy Research Institute (SERI), Universiti Kebangsaan Malaysia; Wardah Fatimah Mohammad Yusoff — Architecture Department, Faculty of Engineering, Universiti Kebangsaan Malaysia; Muaz Mohd Zaini Makhtar — School of Industrial Technology, Bioprocess Technology Division, Universiti Sains Malaysia; Ubaidah Syafiq — Solar Energy Research Institute (SERI), Universiti Kebangsaan Malaysia; Muslizainun Mustapha — Department of Applied Physics, Faculty of Science and Technology, Universiti Kebangsaan Malaysia

#162

**Sustainable Composite
Polyelectrolyte Complex
Membranes for Environmentally
Friendly Water Desalination**

Abdullah Sani — Material Science and Engineering KFUPM, Saudi Arabia; Dr M. Irshad Baig — Material Science and Engineering KFUPM, Saudi Arabia

#163

**Phase-Field Benchmark Study of
Quartic and Sixth-Order Free
Energies with Applications to
Sustainable Energy Materials**

Abdul Wahab — King Fahd University of Petroleum and Minerals, Saudi Arabia; Abdullah Shah — King Fahd University of Petroleum and Minerals, Saudi Arabia

#169

**Ash Particle Interactions with High-
Temperature Walls: Effects of
Ammonium Bisulfate and Collision
Parameters**

Jiakai Zhang — School of Energy and Mechanical Engineering, Shanghai University of Electric Power, China; Haorui Yu — School of Energy and Mechanical Engineering, Shanghai University of Electric Power, China; Weiguo Pan — School of Energy and Mechanical Engineering, Shanghai University of Electric Power, China

#206 Synergistic Effects of Nano-Natural Pozzolan and ZIF-67 on the Mechanical Performance and Microstructure of Cement Composites

Saeed Bablghoom — King Fahd University of Petroleum and Minerals, Saudi Arabia; Ashraf Bahraq — King Fahd University of Petroleum and Minerals, Saudi Arabia; Mohammed Alostta — King Fahd University of Petroleum and Minerals, Saudi Arabia

#231 Molecular-Descriptor-Based Machine Learning Analysis of Functional Group Structure-Property Relationships in Composite Phase Change Materials

Yuhang Chen — Beijing Institute of Technology, China; Shuli Liu — Beijing Institute of Technology, China

#301 Integrated Catalytic Upgrading of Biomass-Derived Furfural into High-Density Sustainable Aviation Fuel Components

Wuyu Wang — Southeast University, China; Xinghua Zhang — Southeast University, China; Longlong Ma — Southeast University, China

#309 **Efficient Production of Biofuels from Lignocellulosic Biomass: Transforming Furfural Derivatives into Sustainable Fuels**

Peng Zheng — Southeast University, China; Qi Zhang — Southeast University, China

#323 **Efficient Hydrodeoxygenation of biomass-derived oxygenates to sustainable aviation fuel over highly dispersed Ni-supported hierarchical HZSM-5 catalyst**

Luying Lu — Southeast University, China; Xinghua Zhang — Southeast University, China; Longlong Ma — Southeast University, China

#361 **Fabrication of Continuous Catalyst Coating at Low Iridium Loading for PEM Water Electrolysis**

Yifan Wang — University of Science and Technology of China

#362 **Bioinspired self-adaptive thermoelectric device with hydrogen bonding-enhanced robustness**

Fengqi Xu — university of science and technology of china

#312 **Transparent wood for next-generation windows: An evaluation of thermal transmittance, solar heat gain coefficient, and energy performance**

Ahmad Fadel Alkahlout — Universiti Sains Malaysia (USM)

#54 **Rethinking Green Appeals for Generation Z Electric Vehicle Adoption in Taiwan**

Cheng-Feng Wu — Department of Business Administration, National Taipei University, Taiwan; Meng-Chen Lin — School of Business, Wuchang University of Technology, China; **Chei-Chang Chiou** — National Changhua University of Education, Taiwan; Keng Sheng Ting — Bachelor Degree Program of Artificial Intelligence Applications Engineering, Minsh University of Science and Technology, Taiwan; Jian-Ji Huang — Department of Multimedia Game Development and Application, Hungkuang University, Taiwan.

#284 **Potential Application of Passivhaus Standards in Hot Climates of Saudi Arabian Residential Buildings**

Siddig Omer — University of Nottingham, United Kingdom

#273

**Hyperchaotic Map-Based
Cryptographic Cybersecurity
Framework for Artificial
Intelligence-Enhanced Renewable
Energy Systems**

Naveed Hussain — King Fahd University of
Petroleum and Minerals, Saudi Arabia