

# Preface: The 4th Annual Conference Solar and Wind Power <sup>†</sup>

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<sup>†</sup> Presented at the 4th Annual Conference Solar And Wind Power, Edinburgh, UK, 4–6 June 2024.

## 1. Introduction

### *Conference Introduction*

The 4th Annual Conference on Solar and Wind Power, organised by the School of Computing, Engineering, and the Built Environment at Edinburgh Napier University, took place on the 5th of June, 2024. Due to unforeseen issues with the venue, the conference was successfully facilitated online, allowing for free attendance and promoting the widespread dissemination of knowledge and scientific advancements.

This year's conference highlighted the latest research findings in solar and wind power, with a theme focusing on the "Next Generation of Energy Solutions". Since its foundation by the Edinburgh Napier University in 2021, the Solar and Wind Power Conference has championed the free exchange of cutting-edge research in renewable energy, with an emphasis on solar and wind technologies.

The conference invited submissions related to the central theme, but also welcomed a broad range of topics within solar and wind power. The aim was to comprehensively cover various aspects of these sustainable energy sources, including, but not limited to, harvesting and generation technologies, innovative designs, system advancements, distribution and storage solutions, materials science, social implications, and economic considerations. Eighty percent of the participants were from universities in the UK, with international representation from India and Malaysia. The conference commenced with two keynote talks.

The first keynote speaker, Professor Tariq Muneer, a renowned expert in solar energy research, discussed various solar energy projects at Edinburgh Napier University. The second keynote speaker, Mr. Neh Sharma, presented the renewable energy initiatives of SWECO, the company he represents.

The morning session covered diverse topics in solar energy research, including power generation, operational cybersecurity for power plants, PV installation designs for heritage buildings, and customised solar cell appearances for building-integrated photovoltaics (BIPV). The afternoon session focused on wind energy, discussing material designs for large wind turbines, the development of vertical axis wind turbines, and predictive tools for energy storage.

## 2. Presenters and Their Topics

The presenters and their respective topics were as follows:

**Anusha Wijewardane (University of Dundee, UK)**, "Power Generation Strategies to Convert the Energy Intensive Campuses in the UK Higher Education Institutions to Low Emission Facilities: Case Study based Analysis".

**Bhuvaneshwari A J (Sri Sivasubramaniya Nadar College of Engineering, India)**, "Enhanced Cryptosystem for Smart Solar Power Plant Operational Cybersecurity".

**Nurfadzilah Ahmad (Universiti Teknologi MARA (UiTM), Malaysia)**, "Empowering Sustainable Futures: A Comprehensive Study on AC Power Generation Analysis in the Eastern Coast Region of Malaysia Using Artificial Neural Network (ANN)".



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**Rasheed O Shobande (Edinburgh Napier University, UK)**, “Design of solar photovoltaic system for listed (heritage) building”.

**Samuel Amo Awuku (Robert Gordon University, UK)**, “Nexus between Building Integrated Photovoltaic (BIPV) and Cultural Heritage; Characterisation of Screen-Printed Traditional Symbols on Solar Cells”.

**Bhuvaneshwari A J (Sri Sivasubramaniya Nadar College of Engineering, India)**, “Securing the Breeze: ASCON and Lightweight Cryptography in Wind Energy Cybersecurity”.

**Daniel Gonzalez-Delgado (Edinburgh Napier University, UK)**, “Generative design and additive manufacturing techniques on the optimisation of multi-MW offshore direct-drive wind turbine electrical generators”.

**Natalia-Maria Zografou-Barredo (Newcastle University, UK)**, “Resilience assessment of offshore wind to hydrogen systems”.

**Taimoor Asim (Robert Gordon University, UK)**, “Startup Dynamics of Drag-based Multibladed Vertical Axis Wind Turbine”.

**Magnus Bichan (Edinburgh Napier University, UK)**, “Aero-Servo-Elastic Simulation of the IEA 15MW Reference Wind Turbine Using Validated Wind Speed Data”.

**Robert J Barthorpe (The University of Sheffield, UK)**, “Maximising solar and wind utilisation through distributed thermal storage and predictive control”.

**Patrick Verdin (Cranfield University, UK)**, “Development of a novel J-shape Vertical Axis Wind Turbine”.

### 3. Committee Members and Reviewers

The success of the conference was greatly supported by the scientific committee and reviewers, whose expertise and dedication were invaluable:

Dr. Nazmi Sellami, Edinburgh Napier University, UK.

Dr. Firdaus Muhammad Sukki, Edinburgh Napier University, UK.

Dr. Mehreen Gul, Heriot-Watt University, UK.

Dr. Leonardo Micheli, Sapienza University of Rome, Italy.

Dr. Pablo Jaen Sola, Edinburgh Napier University, UK.

Professor Mehdi Nazarinia, Heriot-Watt University, UAE.

Dr. Elham Tolouei, Emirates Aviation University, EAU.

Dr. Sendhil Kumar Natarajan, NIT Puducherry, India.

Dr. Kamyab Givaki, WSP.

Dr. Sheikh Islam, Robert Gordon University, UK.

Dr. Romans Kazacocks, Renewable Energy Certification Department in DNV, Germany.

Dr. Nurfadzilah Ahmad, Universiti Teknologi MARA (UiTM).

Dr. Nurul Aini Bani, Razak Faculty of Technology and Informatics.

Dr. Wan Abd Al Qadr Imad Wan-Mohtar, the University of Malaya’s Functional Omics and Bioprocess Development Laboratory, Malaysia.

The conference Chair, Dr. Nazmi Sellami, would like to extend profound thanks to Yvonne Lawrie and Gary Wright for their significant efforts and assistance in organising the conference and communicating with participants.

**Conflicts of Interest:** The authors declare no conflict of interest.

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