



**3<sup>rd</sup> November 2023**

# *Navigating the Energy Transition: Challenges and Solutions*



**Engineering Building A, Manchester Engineering Campus  
Manchester, M13 9PL**

**9:00 AM TO 5:00 PM**

*Organised by*



**The IEEE PES  
Student Branch Chapter**  
The University of Manchester

## **PROGRAMME**

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# Welcome



The history of Manchester began with a civilian settlement by the Romans about AD 79. In the early 19<sup>th</sup> century, Manchester began to expand rapidly following the boom brought by textile manufacturing, with the Port of Manchester became the third-busiest in the UK.

After the Second World War, deindustrialisation hit the city hard, but extensive investment and regeneration following the IRA bombing in 1996 gave the city new strength, and it has been named the most liveable city in the UK in 2018.

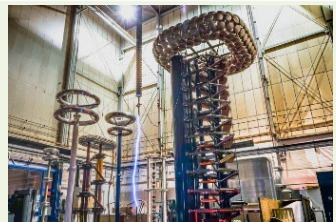


**Manchester**, known throughout the world as the birthplace of the industrial revolution, has a proud history in science, politics, music, arts and sport. The city combines this heritage with a progressive vision to be a city that delivers surprise and delight in equal measures

The **University of Manchester** traces its roots to the formation of the Mechanics' Institute in 1824. The university is now the second largest in the UK, with more than 40,000 students and 10,000 staff. 25 Nobel laureates are among its past and present members.

We are proud to have one of the largest **Electrical and Electronic Engineering (EEE)** departments in the UK. Last year, we gladly move into our new home – Manchester Engineering Campus Development (**MECD**). Our migration to MECD has allowed us attain our sustainability objectives and meet up with increasing demand for our educational expertise.

The power and energy research group within the EEE works closely with industry experts, government policy makers and the wider society at large in solving energy challenges by providing technical solutions in achieving a more sustainable energy industry



The **IEEE PES Student Branch Chapter at The University of Manchester** was officially launched on 28 June 2012. The Chapter is driven by PhD students in EEE and an academic advisor. It is the first IEEE PES Student Chapter in the UKRI Section and boasts more members than any other UK university-based student branch.

#### Latest achievements:

- 2023 IEEE High Performance Student Branch Chapter of the Year Award
- 2022 IEEE High Performance Student Branch Chapter of the Year Award
- 2022 IEEE Women in Power (WiP) Funding Award
- 2021 IEEE Region 8 Chapter of the Year Award



# Programme

Opening Session	08:30 – 09:00	<b>Registration, Tea and Coffee</b>
	09:00 – 09:10	<b>Welcome Address by the Chair of IEEE PES Student Branch Chapter</b> Airam Perez Guillen, University of Manchester, UK
	09:10 – 09:30	<b>Opening Address</b> Prof. Simon Rowland Former Head of Department - Dept. EEE The University of Manchester
Keynotes I	09:30 – 10:00	<b>Asset management and System design factors</b> Alexandra Campbell and Rebecca Threlfall Scottish Power Energy Networks, UK Platinum sponsors
Oral Presentation – Block I	10:00 – 10:15	<b>Trusted and Fully-distributed Coordination of Flexible Resources in Distribution Systems</b> Hongyi Li, University of Cardiff, UK
	10:15 – 10:30	<b>Managing the Future Electricity System with High Penetrations of Wind Capacity: a 14-zone disaggregated model of the GB power system</b> Shanay Skellern, University of Strathclyde, UK
	10:30 – 10:45	<b>Regulation of Disturbance Magnitude for Locational Frequency Stability Using Machine Learning</b> Alinane Kilembe, Vellore Institute of technology, India.
	10:45 – 11:00	<b>Investigations on Surface Discharges at Oil-pressboard Interface of Insulation Used in Power Transformers</b> Thirumurugan Chandrasekaran, University of Strathclyde, UK
	11:00 – 11:25	<b>Tea Break</b>
Women-in-Power (WiP)	11:25 – 12:40	<b>Talk 1</b> Dr Aoife Foley Chair in Net Zero, The University of Manchester, UK
	11:40 – 11:55	<b>Talk 2</b> Olivia Del Pino Herrera Product owner, Silicon Grid, UK.
	11:55 – 12:15	<b>WiP Question and Answers – WiP Panel</b>

12:15 – 14:00

## Lunch Break

12:45 – 13:45

### **The Role of Ambient Gas and Pressure on the Electrical Treeing Mechanism for Epoxy**

Poster 1 – Maria Oancea, University of Manchester, UK

### **Solar shading design and implementation in UK housing as a Tool for advancing sustainable**

Poster 2 – Claire Brown, University of Manchester, UK

### **Improving Damping of Oscillations In utility Grid using V2G: A Game theoretic approach**

Poster 3 – Faheem UI Haq , University of Strathclyde, UK

### **Batteries in wind-dominated areas of network: solution or problem? A Scottish case study**

Poster 4 – Susan Brush, University of Strathclyde, UK

### **Quantitative Circularity Analysis on Geothermal Power Plant in Indonesia**

Poster 5 – Vinsensius Hansen, University of Manchester, UK

### **Feasibility study of a PV/biogas/grid system for the Micro-grid supply at Ashesi University**

Poster 6 – Timothy Asare, Ashesi University, Ghana

### **Data analysis and blackout modelling for assessing climate change impacts on the resilience of the polish electricity networks**

Poster 7 – Hammed Shekoni, University of Sussex, UK

### **Experimental and Thermal Impact of Eruca Sativa oil as dielectric fluid for Power Transformers**

Poster 8 – Muhammad Furqan Hameed, University of Engineering and Technology Lahore, Pakistan

### **Data-driven Machine Learning Model for Accurate Voltage Calculation and Distribution System Optimization**

Poster 9 – Muhammad Usman, Robert Gordon University, UK



Poster Session

**Techno-Economic Evaluation of Nuclear Microreactors for Sustainable Off-Grid Energy Development: A Comparative Analysis with Conventional Energy Sources.**

Poster 10 – Maciej Turyk , University of Manchester, UK

**Dual Polarity Multi-Level DC-DC Converter**

Poster 11 –Dax Blackhorse-Hull , Durham University, UK

**Load-shaping Strategies for Residential Households with Privacy-Cost Trade-offs based on Deep Reinforcement Learning**

Poster 12– Ruichang Zhang, University of Manchester, UK

**Using Eigenvectors to Understand Voltage and Frequency Variability for Power systems with Converter-Interfaced Generation**

Poster 13– Luke Benedetti, University of Strathclyde, UK

Tours

13:45 – 14:15

- High Voltage laboratory
- Manchester Engineering Campus

Oral Presentations - Block II

14:15 – 14:30

**Subsurface Electrochemical Energy Storage, an Initiative for the Future**

Camilo Salazar, University of Manchester, UK

14:30 – 14:45

**Interpreting the Value of Flexibility in Security-Constrained Transmission Expansion Planning**

Andrey Churkin, University of Manchester, UK

14:45 – 15:00

**Tea Break**

15:00 – 15:30

**Sub-Synchronous Oscillations: Navigating Challenges in Renewable Integration**

Jaime Trivino, TNEI, UK

15:30 – 16:00

**From Grey to Green; Roadmap for Sustainable Energy Transition**

Joel Osarumwense Egwaile, University of Benin, Nigeria

Keynotes II

Closing

16:00 – 16:40

**Awards Presentation, Closing Remarks**

Airam Perez Guillen

## Keynote speakers



### **Alexandra Campbell**

Senior Engineer at SP Energy Networks, UK

Alex is a Senior Engineer at SP Energy Networks and has been with the company for 5 years. Her main focuses are investment governance, asset management and engineering justification, as after helping to build the company's five year business plan she is now ensuring it is delivered in line with regulatory conditions whilst achieving the expected outputs.



### **Aoife Foley**

Chair in Net Zero Infrastructure, University of Manchester, UK

Aoife is Chair in Net Zero Infrastructure and a joint appointment to Mechanical, Aerospace and Civil Engineering (MACE) and Electrical and Electronic Engineering (EEE) in the School of Engineering at The University of Manchester. She is also Executive Managing Editor of Elsevier's Renewable and Sustainable Energy Reviews, a member of the Editorial Board of Nature Scientific Reports (Mechanical Engineering) and an Editorial Panel Member of the Proc. She is a Chartered Engineer and Senior Member of the IEEE.



### **Jaime Trivino**

Position, TNEI, UK

Jaime Trivino is an electronic engineer with a Master's degree in IT from UTFSM (Chile) and a Ph.D. in Electrical and Electronic Engineering from The University of Manchester, UK, awarded in 2022. Currently serving as a Technical Consultant at TNEI Services, Jaime specializes in power system studies, particularly focusing on dynamical modelling and assessment of Inverter-Based Resources (IBRs) integration using frequency domain techniques. As a postgraduate researcher, his academic journey involved an investigation of network topology's influence on power system transient stability, integrating software tools and optimization techniques. With prior roles as an IT Manager and extensive experience in project management, Jaime has also successfully led the development and implementation of mission-critical systems.



### **Joel Osarumwense Egwaile**

Professor Electrical/Electronic Engineering, University of Benin, Nigeria.

Professor Joel Osarumwense is a Professor in the Department of Electrical/Electronic Engineering at the University of Benin, Nigeria. He obtained his B.Eng., M.Eng., and Ph.D. degrees in Electrical/Electronic Engineering from the University of Benin, Benin Nigeria. He joined the University of Benin as a lecturer in 2007 and has since risen to the rank of Professor. Professor Joel has an impressive publication record, with over 42 publications in high-impact journals and conferences, both internationally and nationally. His research focuses on enhancing the performance of electrical power distribution networks through the application of smart grid technology, as well as exploring demand-side flexibility.



### **Simon Rowland,**

**Former Head of Department, Electrical/Electronic Engineering, University of Manchester, UK.**

Simon Rowland is a Professor of Electrical Materials in the Department of Electrical and Electronic Engineering and was Head of Department from 2015-19. He joined Manchester University in 2003 having spent 20 years in industrial Research and Development. Working for STC, BICC, and Corning Cables, he progressed through the management of R&D and moved into manufacturing and business management before joining academia. He has over 200 refereed Journal and Conference publications and 13 patents, most of which are focused on overhead line technology. He was also a founding Director of the award-winning spinout company Arago Technology. Prof Rowland is a Fellow of the IEEE and the IET. He was elected President of the IEEE Dielectrics and Electrical Insulation Society in 2011 and 2012, and now serves as Treasurer.



### **Olivia Del Pino Herrera**

**Product owner, Silicon Grid, UK**

Olivia was born and raised in the small island of Tenerife, Spain. She has been interested in science and having a positive impact since childhood. She obtained her MEng in Electrical and Electronic Engineering at the University of Manchester in 2022. Shortly after, she started working at a small tech startup called Silicon Grid in Manchester City Centre. Nowadays she is a product owner, working close with their product line, Constellation.



### **Rebecca Threlfall**

**Lead Engineer at SP Energy Networks, UK**

Becky is a Lead Engineer at SP Energy Networks. She joined the company 2.5 years ago to help build the company's five-year business plan, following nine years working as a consultant across multiple industrial sectors. Her background is in numerical and whole systems modelling, and she is now working in the System Development team to develop forecasts that inform the transition of our network to support Net Zero.

## **IEEE PES SBC UoM Organising Committee**

Airam Perez Guilen (Chair)

Lois Efe (Vice-Chair)

Akansha Garg (Secretary)

Ester Thomas Marcel (Treasurer)

Avinash Powar (Industrial Liaison Officer)

Meichen Wang (Industrial Liaison Officer)

Samvit Mavinkurve (Event Coordinator)

Shuai Wang (Website Coordinator)

Xuanming Jin (Social Media Officer)

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Omoniyi Akinpelumi (Past Chair)



Dr. Robin Preece (Academic Advisor)

## Prizes

The prizes will be judged by a panel made up of academics and engineers from industry::

- **£150** for the Best Oral Presentation
- **£100** for the Best Poster Presentation

Sponsored awards:

- **£100** for the  **Research for Industry Award**
- **£70 + (IEEE + PES) 1 year membership** for the  **Best Essay Award**

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