



11th November 2022

Towards a Sustainable Energy Future



**Dalton Room, Core Technology Facility,
Manchester, M13 9WU**

9:00AM TO 5:00PM

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 19th 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. Earlier this 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.

Achievements:

- 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
- 2020 IEEE Darrel Chong Student Activity Award (Silver)



Programme

Opening Session

08:30 – 09:00

Registration, Tea and Coffee

09:00 – 09:10

Welcome Address by the Chair of IEEE PES Student Branch Chapter

Omoniyi Akinpelumi, University of Manchester, UK

09:10 – 09:30

Opening Address

Mike Barnes

Head of Power and Energy Division, University of Manchester, UK

Key note
Speech

09:30 – 9:55

Keynote Speech 1: Advanced Planning Tool for Future Systems

Diptargha Chakravorty

Principal Consultant, TNEI, UK

9:55 – 10:10

Enhancing Power System Resilience by Distributed Energy Resources (DERs) Deployment as Black Start Units

Ye-Obong Udoakah, University of Cardiff, UK

10:10 – 10:25

Electricity Generation and Demands: Do GB network pricing and charging signals work?

Susan Brush, University of Strathclyde, UK

Oral Presentation I

10:25 – 10:40

A Comparison Model for High Power Wind and Unconventional Turbine Generators

Sophie Draper, University of Durham, UK

10:40 – 10:55

A Partial Processing Converters Scheme for Mitigating Losses Incurred by Partially Shaded Photovoltaic Array

Mohammed Etarhooni, University of Teeside, UK

10:55 – 11:10

Designing a Probabilistic Base Case for Grid Impact Studies on an actual Grid Model of Southern Sweden

Alice Jansson, University of Lund, Sweden

11:10 – 11:30

Tea Break

IEEE Women-in-Power (WiP) Session

Theme: *Cross-cutting Technologies Towards a Net-Zero world*

IEEE WiP Session

11:30 – 12:00

Talk 1

Siva Kaviya, Trichy Siva Raman
Power System Software Engineer, TNEI, UK

12:00 – 12:30

Talk 2

Angeliki Loukatou
Energy Insight Lead, National Grid ESO, UK

12:30 – 13:20

Lunch Break

13:20 – 14:30

Data needs for Load Forecasting at different Aggregation using LSTM networks

Poster 1 – Shengye Qi, University of Manchester, UK

Surface Discharge Characteristics at Different Solid-Liquid Insulation Materials in Power Transformers

Poster 2 – Thirumurugan Chandrasekaran, Vellore Institute of Technology, India

Electric Vehicles Under Low Temperatures: A Review on Battery Performance, Charging Needs, and Power Grid Impacts

Poster 3 – Murat Senol, University of Strathclyde, UK

The Impact of the Phase-Locked-Loop (PLL) on the Stability of VSC-HVDC systems

Poster 4 – Shuai, Wang, University of Manchester, UK

Review on the Control Schemes for Active Equalization on Li-ion Batteries

Poster 5 – Jackson Williams, University of Leeds, UK

Investigate the Features of EV Penetrations into the Distribution Network on the Dynamic Load Model Aspect

Poster 6 – Hengqing Tian, University of Strathclyde, UK

An Online Power System Voltage Stability Index for LCC HVDC using Local Measurements

Poster 7 – David Li, University of Birmingham, UK

Poster Session

Poster Session

Understanding the Cooling demands in the UK

Poster 8 – Lloyds Corcoran, Cardiff University, UK

Creating Future Energy Scenario Considering Stakeholders' Preferences

Poster 9 – Owen Smith, University of Manchester, UK

The Interaction between the Scottish Government Transport Network Vision and Electrical Networks

Poster 10 – Kathleen Davies, University of Strathclyde, UK

Mechanism of Fast Frequency Response Affecting Power System Transient Stability

Poster 11 – Zaichun Zhang, University of Manchester, UK

One Shot Learning of Low Voltages Network Load Profiles

Poster 12 – Junyi Lu, University of Strathclyde, UK

Machine Learning for Nuclear Safety

Poster 13 – Huw Jones, University of Manchester, UK

14:30 – 14:40

Tea Break

14:40 – 15:05

Keynote Speech 2: Towards a Sustainable Energy Future

David Botterill

General Manager, Weidmann Whiteley Ltd, UK

15:05 – 15:30

Keynote Speech 3: HVDC Voltage Sourced Converters – Station Operations and Control

Pablo Briff

HVDC R&D Manager, GE Renewables, UK

15:30 – 15:45

Investigation of the Effect of the Envelop on Building Heating Energy Flexibility Under MPC Control Strategy

Zhichen Wei, University of Nottingham, UK

15:45 – 16:00

Impact of Active Distribution Networks on Transient Stability

Ifigeneia Lamprianidou, University of Strathclyde, UK

16:00 – 16:40

Awards Presentation, with Closing Remarks from Robin Preece

Key note Speech

Oral Presentations II

Closing

Speakers



Angeliki (Kelly) Loukatou

Energy Insight Lead, National Grid ESO, UK

Angeliki Loukatou holds a PhD from the University of Manchester in the area of energy storage co-located with wind farms. She worked as a lead research engineer in the R&D department of EDF Energy in the UK, where she examined the business models of energy storage via participation in multiple electricity markets. Prior to this, Angeliki was a modelling analyst at Energy Systems Catapult, specialising in second-life batteries and grid-connected energy storage. Currently, she leads the Future Energy Scenarios team at National Grid ESO. She is also very interested in inclusion and diversity matters, open data and best software practices.



David Botterill

General Manager, Weidmann Whiteley Ltd., UK

David Botterill is a Paper Science graduate from the University of Manchester, with over 25 years of experience working in the Paper industry. At Arjo Wiggins R&D in France, he was able to develop and patent a novel process of tracing paper manufacture by harnessing the power of biotechnology. He is the currently the General Manager of Weidmann Whiteley Ltd which specializes in making insulation papers and boards used in building electrical transformers since the 1920s. David, who has always been passionate about the sustainability of paper is now excited to see his novel speciality paper contribute to Net Zero efforts in the electrification industry.



Diptargha Chakravorty

Principal Consultant, TNEI, UK

Diptargha Chakravorty is a received his PhD degree from Imperial College London in 2017. He is currently the Principal Consultant with TNEI and leads the Network and Innovation team in Manchester. His core expertise includes power system stability analysis, grid integration of renewable energy and dynamic demand response. He is an electrical engineer with over 10 years of experience in the power industry and has been involved in several innovation projects within the UK as a technical lead working closely with National Grid Electricity System Operator (ESO) and UK Distribution Network Operators (DNO).



Mike Barnes

Head of Division Power and Energy, The University of Manchester, UK

Mike Barnes is a Professor of Power Electronics Systems at the University of Manchester. He has investigated power electronic interfaces for advanced drives and grid connection for over 20 years, working with industry and on research council projects. He has served on the management committee for Supergen Wind (EP/H018662/1, 2010-4) and formed and led a consortium of 5 universities and 16 academics in the 'HOME Offshore' project (2017-20) investigating operation and maintenance of offshore wind farms. He has also served on two IEEE workgroups on HVDC, and on power electronics CIGRE workgroups/taskforces. He is currently lead investigator of the EPSRC project 'Interfacing Next-Generation Grid-Scale Storage to the Electrical Power Network (Inter-Storage)'.



Pablo Briff

HVDC R&D Manager, GE Renewables, UK

Pablo Briff received the M.Sc. and Ph.D. degrees in electronic engineering from the University of Buenos Aires, Buenos Aires, Argentina, in 2006 and 2015, respectively. He has a total of 18 years of industrial experience, with 10 years of experience in the HVDC industry. Pablo joined GE's HVDC business in 2012 where he currently is the HVDC R&D manager in the HVDC Centre of Excellence in Stafford, United Kingdom. He has published 19 scientific papers in the field of electrical engineering, and he has 16 patents in the field of HVDC. His interests include modern control, power electronics, and signal processing.



Robin Preece

Senior Lecturer in Future Power Systems, The University of Manchester

Robin Preece received his PhD degree from the University of Manchester in 2013 with thesis published by Springer. Following 18 months of post-doctoral work as a Research Associate, he became a Lecturer in July 2014. He has experience of DNOs and TSOs - primarily on the dynamic impact of integrating new technologies into large systems. He is an active member of the IET, IEEE and Cigre and regularly review papers for conferences and leading academic journals. He is also doubles as our IEEE PES Student Branch Chapter Advisor



Siva Kaviya, Trichy Siva Raman

Power System Software Engineer, TNEI

Siva Kaviya, Trichy Siva Raman completed her master's degree from TU Delft, Netherlands specializing in smart grids. She has over 2+ years of professional work experience in Java Development followed by six years of Academics Experience in the field of Power Systems and Smart Grids with a good understanding of the European Energy Markets. She also has significant years of experience developing software tools and scripts in the realms of power system in the domains of data integration, energy integration, analysis modules. Siva works as a Power System Software Engineer under the IPSA Software & Solution Team of TNEI, based in Manchester. In the area of volunteering, she is the CIGRE UK NGN's Events Committee Co-ordinator & International Representative.

Prizes

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

- **£150** for the Best oral presentation
- **£100** for the Best poster presentation
- **£100** for the Research for Industry Award
- **£50** for the Best Essay Award
- IEEE Region 8 Poster Contest Award (for University of Manchester Students only)

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