

# RISK and RESILIENCE Day 12 MARCH 2024

## EPSRC Supergen Energy Networks Hub Risk and Resilience Day 2024

The Catalyst, Newcastle University  
Newcastle upon Tyne, UK

### Programme Overview

09:00	Registration and refreshments
09:30	Welcome and kick-off
09:35	Keynote 1   <b>Professor Liz Varga (University College London)</b> Energy resilience in the context of infrastructure resilience
10:20	Oral session 1   <b>Handling Hazards</b>
11:05	Poster introduction session (speed round)
11:25	Poster session and refreshments
12:00	Oral session 2   <b>Wild Weather</b>
12:45	Lunch and posters
13:45	Keynote 2   <b>Martin Queen (Ofgem)</b> Risk and resilience: a regulators perspective
14:30	Oral session 3   <b>Industrial Innovation</b>
15:15	Poster session and refreshments
15:40	Oral session 4   <b>System Security</b>
16:25	Closing remarks
16:30	Drinks reception
17:30	

09:30 – 09:35 Welcome and kick-off		
09:35 – 10:20 Keynote 1   Professor Liz Varga (University College London)		
Energy resilience in the context of infrastructure resilience		
10:20 – 11:05 Oral session 1   Handling Hazards		
<p>01.1 <b>Mires, Wires, and Fires: Securing the National Grid Against Future Wildfire Risks</b></p> <p><i>Joseph Preece, Daniel L. Donaldson, Nick Kettridge (University of Birmingham)</i></p>	<p>01.2 <b>Advancing the Cyber-Physical Resilience of Energy Infrastructures in Digital Era</b></p> <p><i>Mazaher Karimi, Petra Berg, Bahaa Eltahawy, Linda Turtola (University of Vaasa, Finland)</i></p>	<p>01.3 <b>Enhancing electricity network resilience to extreme windstorms in the UK</b></p> <p><i>Colin Manning, Sean Wilkinson, Hayley Fowler, Sarah Dunn (Newcastle University), Elizabeth Kendon (UK Met Office)</i></p>
11:05 – 11:35 Poster introduction session (speed round)		
See next page for a full list of all poster presentations		
11:25 – 12:00 Poster session and refreshments		
12:00 – 12:45 Oral session 2   Wild Weather		
<p>02.1 <b>“EXTRASTRONG” (Resilience Evaluation by Experimental and Theoretical Approaches in Electrical Distribution Systems with Underground Cables)</b></p> <p><i>Andrea Mazza (Politecnico di Torino, Italy), Luigi Calcara (Università di Roma “La Sapienza”, Italy), Paolo Roccatò (Istituto Nazionale per la Ricerca Metrologica – INRiM, Italy)</i></p>	<p>02.2 <b>Rethinking Reserve Power Supply: Balancing Services Value from Weather-Sensitive Surplus</b></p> <p><i>James Fallon, David Brayshaw, John Methven (University of Reading), David Greenwood (Newcastle University), Kjeld Jensen, Louise Krug (BT Group plc)</i></p>	<p>02.3 <b>Advancing Power System Resilience through Enhanced Load Forecasting considering Extreme Weather Conditions</b></p> <p><i>Jinjie Liu, Hongjian Sun (Durham University)</i></p>
12:45 – 13:45 Lunch and posters		
13:45 – 14:30 Keynote 2   Martin Queen (Ofgem)		
Risk and resilience: a regulators perspective		
14:30 – 15:15 Oral session 3   Industrial Innovation		
<p>03.1 <b>CommsConnect – Resilient communication for the electricity network through improved data sharing with mobile network operators</b></p> <p><i>Ross McPherson, Kinan Ghanem (Power Networks Demonstration Centre), Scott Flynn (UK Power Networks)</i></p>	<p>03.2 <b>Resilience assessment of offshore wind to green hydrogen production systems</b></p> <p><i>Natalia-Maria Zografou-Barredo, Sara L Walker, Kandavel Manickam (Newcastle University), James Ferguson, James Withers (Offshore Renewable Energy Catapult)</i></p>	<p>03.3 <b>Risks and resilience of demand side response systems</b></p> <p><i>Andrew Larkins (Sygensys)</i></p>
15:15 – 15:40 Poster session and refreshments		
15:40 – 16:25 Oral session 4   System Security		
<p>04.1 <b>Transforming Electricity Balancing: from proof of concept to implementation</b></p> <p><i>Waqquas Bukhsh (University of Strathclyde)</i></p>	<p>04.2 <b>Constraint-Driven Deep Learning for N-k Security Constrained Optimal Power Flow</b></p> <p><i>Bastien Giraud, Ali Rajaei, Jochen Cremer (Delft University of Technology, Netherlands)</i></p>	<p>04.3 <b>Revisiting Britain’s security standard</b></p> <p><i>Keith Bell (University of Strathclyde)</i></p>
16:25 – 16:30 Closing remarks		
16:30 – 17:30 Drinks reception		

- P1 Energy risk from a changing climate over the coming decade**  
*Ben Hutchins, David Brayshaw (University of Reading), Len Shaffrey (National Centre for Atmospheric Science), Hazel Thornton, Doug Smith (Met Office Hadley Centre)*
- P2 Uncertainty quantification and Sensitivity Analysis for Resilient Infrastructure Systems: application to national energy system modelling**  
*Hannah Bloomfield (University of Newcastle), Francesca Pianosi, Gemma Coxon, Saskia Salwey (University of Bristol)*
- P3 Online Neural Dynamic Security Assessment**  
*Mert Karacelebi, Jochen Cremer (Delft University of Technology, Netherlands)*
- P4 Quantifying the Effect of Renewable Transition on Cascading Failure Risk**  
*Yitian Dai, Robin Preece (The University of Manchester)*
- P5 Uncertainty-aware resilient investment planning in local electrical energy systems under static and dynamic islanding security constraints**  
*Agnes Marjorie Nakiganda (Technical University of Denmark), Shahab Dehghan (Newcastle University), Petros Aristidou (Cyprus University of Technology)*
- P6 Innovating substation basics, improving resilience—organising substation drawing management and facilitating easier consents for substation intrusive/non-intrusive works**  
*Tinashe E Chikohora, Jonathan Gray (National Grid Electricity Transmission)*
- P7 Brokenwire: Wireless Disruption of CCS Electric Vehicle Charging**  
*Sebastian Köhler, Richard Baker (University of Oxford), Martin Strohmeier (armasuisse S+T), Ivan Martinovic (University of Oxford)*
- P8 AI for Microgrid Resilience: A Data-Driven and Model-Free Approach**  
*Dawei Qiu, Yi Wang, Goran Strbac (Imperial College London)*
- P9 Multiport power converters for distribution network soft open point applications**  
*Sam Harrison (University of Strathclyde), Marti Dominguez Hernandez, Marc Cheah (Universitat Politècnica de Catalunya, Spain), Agusti Egea Alvarez (University of Strathclyde)*
- P10 Weather-Informed Adaptation for Grid Resilience Enhancement**  
*Misael Alpizar Santana, Hongjian Sun, Ashraf Osman (Durham University)*
- P11 Data Driven Infrastructure Planning for Offshore Wind Farms**  
*Isha Saxena, Behzad Kazemtabrizi, Matthias Troffaes, Christopher Crabtree (Durham University)*
- P12 HYDRA - Exploring co-occurring UK HYDRo-meteorological extremes that exacerbate risk**  
*John Hillier (Loughborough University), Hannah Bloomfield, Chris Kilsby (Newcastle University), Lee Chapman (University of Birmingham)*
- P13 Risk based planning for resilience enhancement in power distribution systems**  
*Abodh Poudyal, Anamika Dubey (Washington State University, USA)*
- P14 Security Digital Twin of a Distribution Network in Jordan**  
*Moath Qandil, Asma Alkhraibat, Hani Mohsen (German Jordanian University, Jordan), Adib Allahham (Northumbria University), Alaaldeen Alhalhouli (German Jordanian University, Jordan)*
- P15 Optimisation Framework for Resilient Microgrid Planning incorporating stationary and mobile energy storage systems**  
*Mahir Oumaima (University Sidi Mohamed Ben Abdellah, Morocco), Bouthaina El Barkouki (Mohammed V University, Morocco), Ghennioui Hicham (Sidi Mohamed Ben Abdellah University, Morocco)*
- P16 A Unified Cooperative Distributed Control of Inverters, Voltage Regulators, and Capacitors in Systems with High Penetration of DGs**  
*Shahrzad Mahdavi, Aleksandar Dimitrovski (University of Central Florida, USA)*
- P17 Batteries on congested “windy” networks: solution or problem? A Scottish case study**  
*Susan Brush, Graeme Hawker, Keith Bell (University of Strathclyde)*
- P18 Probabilistic forecasting of solar production using gridded numerical weather predictions**  
*Ben Griffiths, Matteo Fasiolo (University of Bristol)*
- P19 A Decentralized Investment Model for the Planning of Distribution Networks and PV Installations Considering Tariffs and Socio-Economic Constraints**  
*Miguel Sanchez-Lopez (Universidad de Chile, The university of Manchester), Andrey Churkin, Robin Preece (The University of Manchester), Rodrigo Moreno (Universidad de Chile), Eduardo A. Martinez Ceseña (The University of Manchester)*
- P20 Toward a sustainable and resilient transition: Energy management of a grid-connected microgrid based on artificial neural networks**  
*Bouthaina El Barkouki, Oumaima Mahir, Mohammed Ouassaid (Mohammed V University, Morocco)*
- P21 On the Resilience of Distribution Networks to Load-Altering Attacks**  
*Sajjad Maleki, Subhash Lakshminarayana (University of Warwick), E. Veronica Belmega (CY Cergy Paris University, France)*
- P22 Managing Risks Associated with Net Zero with a Real-time Power System Simulation Facility**  
*Fabian Moore, Colin Foote, Asif Khan (The National HVDC Centre)*
- P23 Learning latent dynamic interactions for better spatio-temporal characterisation of power system cascading events**  
*Tabia Ahmad (University of Strathclyde), Panagiotis N Papadopoulos (The University of Manchester)*
- P24 Resilient by Design: Embedding Power Electronics into Grid-Scale Energy Storage**  
*Walid Nassar, David Greenwood, Matthew Deakin (Newcastle University), Jorn Reniers (Brill Power)*
- P25 Adaptive and Resilient Electrical Grid Management with Smart Buildings**  
*Mischa Ahrens (FZI Research Centre for Information Technology, Germany)*
- P26 Optimal siting of distributed generators in renewable-based community energy system for self-sufficient operation during prolonged outages**  
*Laiz Souto (University of Bristol)*
- P27 Enhancing Cybersecurity Measures for Implementing Morello Hardware in Industrial Sectors**  
*Rabia Khan, Kinan Ghanem (Power Networks Demonstration Centre)*