

# Future of Energy Networks 2017

including the HubNet Smart Grid and Infrastructure Symposiums

**University of Bath**

19<sup>th</sup> – 20<sup>th</sup> September 2017

## **Purpose**

HubNet has run a symposium to showcase UK research in Smart Grids every year for the last seven years. We have featured work on a wide range of topics including decentralised control, communications technology, whole-system modelling, self-organising and self-healing systems, and the analysis of behaviours of consumers in such environments. This year we will run an event that not only covers Smart Grids but also deals with infrastructure showcasing research on high voltage plant, power electronics, HVDC and multi-vector systems. We also explore the market mechanisms necessary to drive the changes envisaged. Alongside presentations from leading experts there are debates and discussions and poster sessions; all of this aimed at providing varied opportunities for researchers, research users and other stakeholders to network and share ideas. Note that, as a new approach, some presentations run in parallel allowing both a wider programme and attendees to choose those of most interest to them

We are delighted to have keynote addresses from John McElroy, Advisory Board member of UKERC (and formerly Director of Policy & Public Affairs, RWE npower) and Nigel Turvey, Design and Development Manager, Western Power Distribution.

## **Who would benefit from attending**

The event is for anyone interested in the future of energy networks, including network planners and operators, policy makers including regulators and government, energy suppliers, generators, investors, those involved in innovatory technology or business models, equipment manufacturers and information technology providers.

The event is designed to cover a broad range of topics that can help inform researchers and others about their own interests plus many other related topics and also serve as a broad overview of the UK research capability for those looking for the innovations that will mature in the near future and set the direction of the future energy network.

## **Registration**

For more information, please visit the events page of the HubNet website at [http://www.hubnet.org.uk/events/future\\_of\\_energy\\_networks\\_2017](http://www.hubnet.org.uk/events/future_of_energy_networks_2017)

Or go straight to the registration page at <https://www.eventbrite.co.uk/e/future-of-energy-networks-2017-tickets-33991908714>

The registration fee of £95 covers attendance for both days, lunches and an informal dinner on the evening of 19<sup>th</sup> September.

We invite attendees to also submit a poster on their own research in the field of energy networks for display during the poster sessions. The registration page asks for a brief abstract of the intended poster.

## Day 1: 19th September

Time	Activity		
9:15	Registration / Refreshments		
9:45	Welcome and Overview of Symposium Prof Bernie Morley (Deputy Vice-Chancellor and Provost, University of Bath) and Prof Tim Green (Imperial College)		
10:00	<b>Plenary Session</b> <i>Future energy retail markets: putting the customer in control</i> Dr John McElroy, UKERC Advisory Board Member		
10:45	<i>Coffee Break</i>		
11:00	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Smart Grids Symposium Session 1 – Risk and Uncertainty in Network Operation</b> Chair – Dr Robin Preece (University of Manchester)</p> <ul style="list-style-type: none"> <li>• Dr Mathaios Pantelli (University of Manchester) - <i>Resilience and Adaptation of Power Systems to High Impact Low Probability Events</i></li> <li>• Dr Simon Orr (National Grid) – <i>Understanding Risk in System Operation and Planning</i></li> <li>• Dr Petros Aristidou (University of Leeds) - <i>Mitigating operational risk through increased real-time system awareness</i></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Network Infrastructure Symposium Session 1 – High Voltage DC and FACTS</b> Chair – Dr Adrià Junyent Ferré (Imperial College London)</p> <ul style="list-style-type: none"> <li>• Prof Mike Barnes (University of Manchester) – <i>HVDC circuit breakers</i></li> <li>• Prof Steve Finney (University of Edinburgh) – <i>HVDC converters</i></li> <li>• Dr Christian-Eric Bruzek (Nexans) – <i>GW class superconducting HVDC cables</i></li> </ul> </td> </tr> </table>	<p><b>Smart Grids Symposium Session 1 – Risk and Uncertainty in Network Operation</b> Chair – Dr Robin Preece (University of Manchester)</p> <ul style="list-style-type: none"> <li>• Dr Mathaios Pantelli (University of Manchester) - <i>Resilience and Adaptation of Power Systems to High Impact Low Probability Events</i></li> <li>• Dr Simon Orr (National Grid) – <i>Understanding Risk in System Operation and Planning</i></li> <li>• Dr Petros Aristidou (University of Leeds) - <i>Mitigating operational risk through increased real-time system awareness</i></li> </ul>	<p><b>Network Infrastructure Symposium Session 1 – High Voltage DC and FACTS</b> Chair – Dr Adrià Junyent Ferré (Imperial College London)</p> <ul style="list-style-type: none"> <li>• Prof Mike Barnes (University of Manchester) – <i>HVDC circuit breakers</i></li> <li>• Prof Steve Finney (University of Edinburgh) – <i>HVDC converters</i></li> <li>• Dr Christian-Eric Bruzek (Nexans) – <i>GW class superconducting HVDC cables</i></li> </ul>
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12:30	<i>Lunch</i>		
13:15	<b>Debate – What form should the system architect take?</b> Chair - Tim Green (imperial College) Panellists: Damitha Adikaari (Dept. Business, Energy & Industrial Strategy), Sarah Carter (Ricardo Energy & Environment), Graham Ault (Smarter Grid Solutions), Jim Cardwell (Northern Powergrid)		
14:30	<b>Plans for the Next Networks Hub</b> – Prof Phil Taylor (Newcastle University)		
14:45	<b>Poster Session</b> We encourage attendees to submit proposals for posters when registering to attend. Posters can address outcomes from research on any topic in energy networks. A prize will be awarded for the best poster across the two sessions.		

15:45	<p><b>Smart Grids Symposium Session 2 – Control</b></p> <p>Chair – Dr David Angeli</p> <ul style="list-style-type: none"> <li>• Dr Ioannis Lestas (University of Cambridge) - <i>Stability and optimality of distributed frequency control schemes in power networks</i></li> <li>• Dr Paul Trodden (University of Sheffield) - <i>Smart grid applications of distributed predictive control</i></li> <li>• Prof Bikash Pal (Imperial College London) – <i>Control system interactions in wind farms</i></li> </ul>	<p><b>Network Infrastructure Symposium Session 2 – High Voltage Plant</b></p> <p>Chair - Prof Zhongdong Wang (University of Manchester)</p> <ul style="list-style-type: none"> <li>• Prof George Chen (University of Southampton) and Dr Qiang Liu (University of Manchester) - <i>Recent development on fundamental understanding of dielectric liquids for AC and DC</i></li> <li>• Prof Ian Cotton (University of Manchester) – <i>Deeside high voltage test facility development for power plant</i></li> <li>• Paul Barnfather (EA technology) – <i>Asset management for distribution networks</i></li> </ul>
17:15	<b>Close for Day One</b>	
19:30	<p><b>Conference dinner at Jimmy's Restaurant</b>  <a href="http://jimmysrestaurants.com/restaurants/bath/">http://jimmysrestaurants.com/restaurants/bath/</a></p>	

## Day 2: 20th September

Time	Activity		
09:00	<p><b>Plenary Session</b></p> <p><i>Why do we need a DSO?</i></p> <p>Nigel Turvey, Design and Development Manager, Western Power Distribution</p>		
09:40	<p><b>Smart Grids Symposium Session 3 – Data Analytics for Energy System Markets for Smart Grids</b></p> <p>Chair – Prof Stephen McArthur (University of Strathclyde)</p> <ul style="list-style-type: none"> <li>• Prof Gary Taylor (Brunel University) - <i>Parallel detrended fluctuation analysis for fast event detection on massive PMU data</i></li> <li>• Dr Ran Li (University Of Bath) – <i>Big Data analytics for load profiling and forecasting – from smart grid to smart energy system</i></li> <li>• Prof Brian Stewart (University of Strathclyde) – <i>New Approaches to data analytics for improved high voltage asset management</i></li> </ul>		
11:00	<i>Coffee Break</i>		
11:15	<p><b>Network Infrastructure Symposium Session 3 – Multi-vector Energy Systems</b></p> <p>Chair – Prof Jianzhong Wu (Cardiff University)</p> <ul style="list-style-type: none"> <li>• Prof Goran Strbac (Imperial College London) – <i>Whole-system value assessment</i></li> <li>• Bethan Winter (Wales and West Utilities) - <i>Future of energy networks</i></li> <li>• Dr Muditha Abeysekera (Cardiff University) - <i>Landscape of multi-vector energy system research and innovation</i></li> </ul>		
12:45	<i>Lunch</i>		
13:15	<p><b>Poster Session</b></p> <p>As mentioned on the agenda for Day 1 we encourage attendees to submit proposals for posters. A prize will be awarded for the best poster across the two sessions.</p>		
14:15	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Smart Grids Symposium Session 4 – Smart Markets for Smart Grids</b></p> <p>Chair – Prof Furong Li (University of Bath)</p> <ul style="list-style-type: none"> <li>• Prof Michael Pollitt (University of Cambridge) – <i>Market integration between whole-sale and retail</i></li> <li>• Prof Petri Ahokangas (University of Oulu, Finland) – <i>New generations of business models for network operators – learnings from communication networks</i></li> <li>• Lewis Dale (National Grid) – <i>Challenges and Opportunities in Transmission Network Regulation and Pricing</i></li> </ul> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Network Infrastructure Symposium Session 4 – Power Electronics</b></p> <p>Chair – Dr Olayiwola Alatise (University of Warwick)</p> <ul style="list-style-type: none"> <li>• Prof Li Ran (University of Warwick) - <i>Power Electronics for revolutionizing the distribution system</i></li> <li>• Dr Saeed Jahdi (GE Grid Solutions) - <i>Power device considerations for MMC implementation (to be confirmed)</i></li> <li>• Dr Alberto Castellazzi (University of Nottingham) – <i>6.5 kV power IGBTs for grid applications</i></li> </ul> </td> </tr> </table>	<p><b>Smart Grids Symposium Session 4 – Smart Markets for Smart Grids</b></p> <p>Chair – Prof Furong Li (University of Bath)</p> <ul style="list-style-type: none"> <li>• Prof Michael Pollitt (University of Cambridge) – <i>Market integration between whole-sale and retail</i></li> <li>• Prof Petri Ahokangas (University of Oulu, Finland) – <i>New generations of business models for network operators – learnings from communication networks</i></li> <li>• Lewis Dale (National Grid) – <i>Challenges and Opportunities in Transmission Network Regulation and Pricing</i></li> </ul>	<p><b>Network Infrastructure Symposium Session 4 – Power Electronics</b></p> <p>Chair – Dr Olayiwola Alatise (University of Warwick)</p> <ul style="list-style-type: none"> <li>• Prof Li Ran (University of Warwick) - <i>Power Electronics for revolutionizing the distribution system</i></li> <li>• Dr Saeed Jahdi (GE Grid Solutions) - <i>Power device considerations for MMC implementation (to be confirmed)</i></li> <li>• Dr Alberto Castellazzi (University of Nottingham) – <i>6.5 kV power IGBTs for grid applications</i></li> </ul>
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15:45	<b>Closing Remarks</b>		
16:00	<b>Close of Event</b>		

## Venue Information

**Symposium Venue is The Chancellor's Building, University of Bath,  
Bath, BA2 7AY**

### Travel to Bath



#### Travel by train:

Regular trains from London Paddington and Cardiff Central to Bath Spa. Tickets can be pre-booked at <http://www.thetrainline.com> or <https://www.firstgreatwestern.co.uk>.

#### Travel by coach:

Regular National Express coach from London Victoria and Cardiff to Bath. Tickets can be pre-booked at <http://www.nationalexpress.com>

#### Travel by air:

The nearest airports are London Heathrow Airport (LHR) and Bristol Airport (BRS).

- London Heathrow Airport

Take Heathrow Express to London Paddington, then take First Great Western train to Bath Spa.

Or take National Express coach to Bath (Look for Central Bus Station after arrival.)

- Bristol Airport

The Bath Bus Company run regular "A4" airport services from Bristol Airport to Bath. Tickets can be purchased on board.

Taxi from Bristol Airport to Bath University costs about £40.

#### Travel by Car:

The post-code of the university is BA2 7AY. Car parking on the university campus is limited and costs £1 per hour between 8am-5pm (Pay and display is limited to six hours on Monday to Friday between 8am and 5pm. After this, an additional ticket can be bought from the machines to extend your stay).

## Symposium Dinner

The HubNet Future Energy Networks dinner takes place on the evening of 19th September 2017.

The dinner is included in your registration fee. The dinner is a buffet at **Jimmy's Restaurant**

<http://jimmysrestaurants.com/restaurants/bath/>

## Hotel Accommodation

There are many hotels in Bath catering to different budgets but the city is popular with tourists and accommodation books up at popular times of year. Several hotels are shown on the map below and contact details are as shown. For reference the conference venue is marked ★

**Please note that, as mentioned above, the city of Bath is very popular and has a large number of visitors. Hence suitable accommodation can be scarce. It is strongly recommended that you quickly identify your requirements and book them as early as possible.**



- A. Macdonald Bath Spa Hotel** £159 per night (varies by season), 5-star hotel  
Address: Sydney Road, Bath, BA2 6NS    Tel: 01225 444424  
<http://www.macdonaldhotels.co.uk/our-hotels/macdonald-bath-spa-hotel/>
- B. Hilton Bath City Hotel** £108 per night (varies by season), 4-star hotel  
Address: Walcot Street, Bath, BA1 5BJ    Tel: 01225 463411  
<http://www3.hilton.com/en/hotels/united-kingdom/hilton-bath-city-BATHNHN/index.html>
- C. Premier Inn Bath City Centre Hotel** £92 per night ((varies by season)  
Address: 4 James Street West, Bath, BA1 2BX    Tel: 0871 5279454  
<http://www.premierinn.com/en/hotel/BATJAM/bath-city-centre?cmp=GLBC>
- D. The Pratts Hotel** £110 per night, 3-star hotel (might quote Bath University for a discount)  
Address: 4-8 South Parade, Bath, BA2 4AB    Tel: 01225 460441  
<http://www.sjhotels.co.uk/bath>
- E. Travelodge Bath Central** £56 per night  
Address: 1 York Buildings, George Street, Bath BA1 2EB    Tel: 0871 984 6219  
<https://www.travelodge.co.uk/hotels/75/Bath-Central-hotel>
- F. Travelodge Bath Waterside** £56 per night  
Address: Widcombe Basin, Rossiter Rd, Bath BA2 4JP    Tel: 0871 984 6407  
<https://www.travelodge.co.uk/hotels/361/Bath-Waterside-hotel>

## WiFi Access

### Eduroam:

If you are visiting Bath University from an institution that participates in the **eduroam** scheme, you can connect to the “**eduroam**” SSID to gain basic Internet connectivity. Your device will require to be configured in advance before you arrive. To log in you should use the credentials supplied by your home institution.

### WiFi Guest:

This network is for visitors and guests who cannot use eduroam. You will need to register to use ‘WiFi Guest’. You do not need a University email address to connect. WiFi Guest is provided by The Cloud. If you already have an account with The Cloud you can use that to log in.

### Connect to WiFi Guest

1. Open the Wi-Fi setting on your device.
2. Select ‘WiFi Guest’ from the list.
3. Once you are connected, open your web browser and refresh the page. Your browser may open automatically.
4. You will be taken to The Cloud website, where you can log in or register a new account.