CLEANPOWER SMART GRIDS 2019

1-2 JULY #CPSG19 CAMBRIDGE SUMMIT

GUIDE & BOOKING

10th anniversary Clean Energy Growth Innovation Conference Showcase, Dinner (sold out)
Tech Briefing Day

INTRODUCTION - 1-2 July 2019, Cambridge, UK

This conference & showcase will be a top-level, grand challenges 10th anniversary international annual conference summit on innovation for clean energy growth. Come and enjoy beautiful Cambridge this summer! Tickets (8 types) are in the **multi-ticket shop here**.

CORPORATE TECHNOLOGY EXECUTIVE BRIEFING DAY 1:

- Global technologies & strategy for smart grids, storage & power (a brief overview of where the different technologies stand and what the consensus is regarding their future potential; trends & drivers; energy, operation, analytics)
- Technology Cases in ML, data analytics, cybersecurity, grids, generation
- Markets - how to unleash the potential for clean energy deployment fast

EXHIBITION OF TECHNOLOGIES BOTH DAYS - technology suppliers in energy & materials will show their products + services over the 2 days at executive Robinson Wordsworth venue

DINNER DAY 1 EVENING for booking delegates, sponsors and invited speakers and VIPs. There will be a fine dinner at Christ's College, Cambridge on the evening of 1st July.

INNOVATION BUSINESS CONFERENCE DAY 2 - the Conference summit takes place all day on 2nd July. Top lineup of corporate & commercial speakers. Topics for the entire conference are participant-informed through a panel of five energy, grids and storage experts. There is strong interest from exhibitors, speakers, sponsors.

BENEFITS

This set of innovation-meets-large-project events is designed for corporate smart grids and power executives and scale-up entrepreneurs, led by CIR & key sponsors. A must for those in technology business with R&D labs, launches, products or services; on a technology watching brief & learning & anyone with an interest in this sector. The event is unique & valuable.

TRACK RECORD SINCE 2002 - CONFERENCES

CIR, the independent business strategy methods & validation company, has run 50 high quality tech event days since 2002, with over 4,250 delegates. We are always listening and learning, increasingly market-demand led. Based in Cambridge, Oxford and London, Cambridge Investment Research welcomes you all to our events.

2019 Advisory Committee to #CPSG19

Dr Justin Hayward MBA, CIR (Executive Chair); Maxine Frerk, Grid Edge Policy; Gavin Jones; Jeremy Nicholson, Alfa Energy & VP Chair IFIEC Europe; Professor Vasant Kumar, Cambridge University; Ian Ellerington, Head of Tech Transfer, Faraday Institution

Cambridge 10th anniversary Cleanpower & Smart Grids Conference

Innovations to the Grand Challenge of Clean Energy Growth

Connectivity, battery materials, ML and data & cybersecurity

are the key themes for 2019's anniversary celebration.

Join us to network and learn about the latest advances in commercialising energy and related products in sectors such as energy markets; energy storage & battery tech; grids of all types; power generation; software, devices, industrial internet; demand-side response, management & distribution; cyber-resilience & security and sustainability.

Introduction from Justin Hayward

Director of CIR

It is an honour to have the chance to bring together international industrial and entrepreneurial clean growth companies in the grids and energy sector in Cambridge and its new business cluster hub on this 10th year since the inaugural series event Cleanpower 2009.

I look forward to another inspiring, challenging and productive two days of events in this lovely growing city at our conference venue near the historic centre of the city.

jhayward@cir-strategy.com +44 (0)1223 303500

EVENT OUTLINE AGENDA

1st July 2019 Technology Executive Briefing Day

Robinson Wordsworth Crausaz Building, Cambridge

10:30am Executive Tech Briefing Day

Insightful pedagogical high-level talks & in-depth discussions.

Meeting spaces | All-day Showcase

5:00pm Close

6:30 for 7:00pm Dinner in Cambridge

2nd July, 2019 Innovation Conference Summit

Robinson Wordsworth Crausaz Building, Cambridge

09:00am 10th anniversary international conference
4 Sessions with expert moderator, registration, coffee, networking lunch, tea, final drinks networking | Meeting spaces | All-day showcase

5:00pm Event Close

Sponsors:

Select Participants:

Day 1: Technology Executive Briefing, 1 July

10.30-11.00 Registration and networking
Session 1 11.00-13.00 Introduction to clean power and smart grid energy systems
11.00 - 11.15 Gavin Jones - Chair's Opening Remarks
11.15 - 11.45 Dr Erwin Frank-Schultz, IBM, CTO Energy, Environment and Utilities "Energy Systems and Digital Twins"
11.45 - 12.00 Mash-Hud Iqbal, Partner, Marks and Clerk "IPR and Energy innovation"
12.00 - 12.10 Matt Hastings, Innovation Lead - Energy Systems, InnovateUK "PFER Programme and smart local energy systems design"
12.10 - 12.35 Sylvain Vittecoq, CTO, CyanConnode "The benefits of RF mesh networks for smart metering, smart grid and IoT"
12.35 - 13.00 Discussion & Q&A
led by Gavin Jones

13.00 - 14.00 Lunch

Session 2 14.00 - 15.15 Energy storage & battery technologies
14.00 - 14.20 Professor Vasant Kumar, Cambridge University "A brief sprint through battery science"
14.20 - 14.40 Dr Rumen Tomov, CJET Ltd "Novel storage and battery materials"
14.40 - 15.00 Dr Daniela Sanchez Lopez, Cambridge University Research Fellow, "The case of lithium, its geopolitics and the low-carbon energy transition"
15.00 - 15.15 Panel moderated by Ian Ellerington, The Faraday Institution

Tea break 15.15 - 15.45

Session 3 15.45 - 16.55 Data, ML & security technology
15.45 – 15.55 Mike Handley, PolyChord, "A grounding in ML"
15.55 - 16.05 Eric Topham, Data Science Director, T-DAB "The ML Use Case for Energy Optimisation"
16.05 – 16.20 Dr Natalie Lowery, Energy Systems Catapult "Local area energy planning"
16.20 – 16.40 Simon Fellows, Technical Director, Darktrace Industrial, "Using AI for Real-Time Threat Detection across IT"
16.40 -17.00 Session Q&A led by Gavin Jones
17.00 Close for Day

6:30pm for 7:00pm Dinner
(by invitation and RSVP)

Day 2: Innovation Conference, 2 July

09.00 - 09.30 Registration and networking
Session 1 09.30 - 11.00 **Introduction: energy system futures and innovation and threats**
09.40 - 09.50 Conference Introduction & Chair's Introduction: Jeremy Nicholson, Alfa Energy Corporate Affairs & VP/Chair IFIEC Europe
09.50 - 10.10 Dr Richard Smith, Head of Commercial, National Grid ESO - "Operating the GB transmission system, carbon free, by 2025"
10.10 - 10.30 Anser Shakoor, ABB, "Economic insights of the shifting European electricity markets"
10.30 - 10.50 Victoria Doherty, QinetiQ, "Power, storage and human factors in cybersecurity"
10.50 - 11.10 Emily Orton, CMO, Darktrace, "Cyber AI : a new era of defence" Keynote
11.10 - 11.30 Panel with moderator Pamela Taylor, Taylor Macpherson

Coffee break 11.30 - 12.00

Session 2 12.00 - 13.00 **Grids, connectivity and innovation**
12.00 - 12.15 Dr Sean Cochrane, Head of Technical Sales, CyanConnode, "Commercialising an IoT communication platform"
12.15 - 12.30 Nick Merricks, Landis+Gyr, "Grid edge intelligence in the smart grid, securely."
12.30- 12.45 Jon Horsley, Technical Lead - Energy Systems Catapult " Smart local energy systems & PfER"
12.45 - 13.00 Panel with moderator Pamela Taylor

13.00 - 14.00 Lunch Networking in showcase area

Session 3 14.00 - 15.20 **Storage & battery innovation**
14.00 - 14.05 Ian Ellerington, Head of Tech Transfer, The Faraday Institution - "Introduction & the importance of storage"
14.05 - 14.20 Richard Druce, Director, Energy, Environment & Infrastructure, NERA "Distributed energy resources and how to monetise them"
14.20 - 14.35 Georgina Dingley, Director of Innovation and Business Strategy, Anesco, "Utility scale energy storage"
14.35 - 14.50 Simon Daniel, CEO Moixa Energy "Local grid balancing from aggregated storage and electric vehicles"
14.50 - 15.05 Dr Athan Fox, CTIO, Aurelius Environmental "Out of the furnace and into the leaching tank"
15.00 - 15.20 Panel moderated by Isobel Sheldon, UK Battery Industrialisation Centre

Tea break 15.20 - 15.45

Session 4 15.45 - 17.00 **Clean energy policy & strategy - final panel**
15.45 - 16.00 James Moat, CEO Box Energi "A more flexible and adaptable electricity system"
16.00 - 16.15 Sally Fenton MA, Innovation Manager, Dept of BEIS, "Delivering innovation to the Grand Challenge of Clean Growth"
16.15 - 16.30 Louise van Rensburg, Deputy Director, Energy Systems Transition, Ofgem "Regulation enabling the energy transition"
16.30 - 16.55 Panel with moderator Judith Ward, Sustainability First
16.55 - 17.00 Chair closing remarks by Jeremy Nicholson, Alfa Energy and Gavin Jones

17.00 Summit Close

5:00pm CONFERENCE CLOSES - SEE YOU 6-7 NOV 2019!

Sample Attendee Titles

Director | CEO | Business Development Director | Energy Strategy | Partner | Technical Consultant | Lead Technologist Energy Generation & Supply | Investment Manager | General Director | Regional Facilitator | Managing Director | Analyst | Head of Business Development | Regulatory Compliance Manager | Knowledge Exchange Associate | Associate | Strategy Planning Manager | Marketing Director | Research Director | Director of Transmission | Chief of Staff | Government Affairs | Head of Future Networks | Head of Energy Strategy | Head of Network Policy | Senior Customer Insights Manager | Positioning & Strategy | Legal, Investments & M&A | Comms and Investor Relations | Tech R&D | CTO | Director - VP Embedded Segment | Head of Marketing & Business Development | Innovation Lead | Research Leader | Research Associate | Strategy Director | Whole Energy Systems Program Manager | Head of Strategic Partnerships | Group Leader | Principal Research Engineer | Principal Engineer | Director - Energy and Installation Sectors | Head of Marketing | Owner | Founder | Director - Energy and Environmental Services | Senior Director Corporate Technologies | Department Head | Head of Energy Markets | Head of Grids Products Engineering | Grids Resourcing Manager | CIO | VP Marketing | Professor | Senior Advisor | Marketing | Principal Consultant | Manager Application Creation | Buyer | Head of Procurement | COO | SVP/VP | Head of R&D | Director R&D | Director of Technology

Example Past Companies Attending | Invited

IBM | BEIS | National Grid | OfGem | CyanConnode plc | Darktrace | UK BIC | FLEXIS | Farady Institution | RWE | EON | ABB | ARM | Dyson | NERA | Cambridge Consultants | BP Ventures | Willmott Dixon | Smart DCC | Mitsui | Arrowhead Smart Grids | Labrador Energy | Landis & Gyr | Cambridge Enterprise | EDF Capula | AMT Sybex | UK Power Networks | Electron Blockchain | InnovateUK | Device Pilot | UtilityWise | Electron DLT | Autodesk | BASEC | Sentec Sensus | EO Charging | Synergy Energy | Energenie | Xsilon | Iotic Labs | Arkessa | Huawei | Honeywell | Schneider Electric | Siemens | London Stock Exchange | Softbank Vision Fund | HSBC Markets | Hitachi Europe | UK Power Networks | SAP World | Vodafone IOT | Earth Capital Partners | EEF | Electralink | CGI | Tesco | Moixa | Airbus | Digital and Energy Systems Catapult | BP | Cambridge Consultants | San Leon Energy | Innovate UK | GE | Intelligent Networks | GEO | Oracle | Infosys | Renesola | UKERC | PodSystem Gp | Smartest Energy | Cambridge Innovation Capital | Solar Century | NPL | Nuclear Futures | Green Energy UK | Basck | IQ Capital | SILK Ventures | Schneider Electric | Cisco | Buro Happold | Polysolar | OSI Electronics | Quiet Revolution | Cabinet Office | Flexi-Solar | Deloitte | PwC | Bain | EDW Technology | Poyry | Synergy Devices | SET Ventures | Zouk Capital | MidVen Ventures | Smart Grids Forum | Infrared Capital | ARU | Cambridge University | Nuclear Futures UK | Siemens Energy | Pan European Networks | Horizon2020 | KTN | Oxford University | TTP | IOP | SunAmp | Analysys Mason | Open Energi | LAVI Turbines | EWT Direct Wind | Renewable Energy Systems | Norvento Enerxia | Sustainability First | RAE | IET | Energy Inst

Industries of Focus

Energy Market & Flexibility DSR DSM AI | Energy Storage (large scale, distributed) | IIOT & M2M Connectivity | Intelligence | Big Data, Data Analytics | Process, Industrial Automation | Pattern Recognition, Machine Learning & Robotics | Electronics, Sensors, Devices | Power Generation | Electrification | Security | Shale Gas, Oil & Gas | Nuclear | Renewables | IPR issues | New tech e.g. blockchain

Exhibition | Suppliers & Providers to the above product and service markets

Expo examples: Product demos | Screen software systems | Kit, Research & Lab Equipment | Services | Experiences | Public Sector | Advisory | IPR

Who should attend?

1. Anyone with an interest in business involving solving Grand Challenges of Clean Energy Growth through ML and data, connectivity and cybersecurity via technology and innovation in their organisation and ecosystem

2. Anyone wishing to understand barriers to adoption and use of smart grids, energy storage & battery technology & renewables & other deep energy technologies

3. Those on a science and technology watching brief for clean power and smart grids

4. Anyone with a startup or entrepreneurial idea applicable to smart grids & power or energy storage

5. Anyone with business problems to solve that might be influenced or helped by new state-of-the-art solutions in clean power and grids

6. Those wishing to understand the full up-to-date and prioritised range of applications and those nearer to and further from market & key market actors

7. Anyone wanting to get a regulatory, standards, government affairs, trade & investment update for power generation, storage and smart grids

8. Anyone wanting to meet new industrial and business entrants into the smart grids & generation and storage

9. People wanting to build quality networks or ecosystems in this set of fields

10. Sector specific players seeking to access solution providers

11. Solutions providers seeking to understand customer pull in a range of sectors

12. Those in related areas of technology and applications who wish to see the potential and synergies with clean growth technologies

Tickets (11 options) can be secured quickly via our **multi-ticket shop here**.

Top 10 Reasons to Attend Cambridge Cleanpower Smart Grids 2019

1. **Network** with 125+ executives, leading applied academics and policy makers and in sectors such as software, AI, data analytics, electronics, batteries & energy storage, sensors, automation, IOT/M2M connectivity, power generation and smart grids

2. **Visit** leading international exhibitors to see the latest in smart grids and clean power technology. Form and enhance relationships with buyers, suppliers and other key players in the grids and clean power network

3. **Be among the first** to see how to overcome the barriers in the network in order for your company to thrive. Attend the executive briefing day alongside industry leaders which is led by expert facilitators

4. **Gain media exposure** via all events and media presence over the 2 days

5. **Keep up to date** on the latest topics in the industry at the business conference. Listen to over 16 market-led talks that have been requested by past delegates through over 50 detailed surveys and recent research

6. **Dine** in beautiful Cambridge this summer with decision makers and leaders. Continue your conversations and further expand your network

7. **Receive full updates** on the key business transactions, projects, investment, regulation and markets

8. **Cambridge** is not only home to one of the most historic and successful universities in the world, but is also one of the most well established science & technology clusters in the UK. There are over 5000 knowledge-intensive companies based in the area. 15 are worth over £1bn!

9. **CIR**, the strategic consulting firm, has 17 years' experience organising 50 high-quality, market demand led tech conference days - leverage these conferences in your own context, themes and global settings

10. **The race is on** – attend this unique and highly valuable event to make sure you build your knowledge and network. Don't get left behind!

Tickets (11 options) can be secured quickly via our **multi-ticket shop here**.

Internal and media partner reach is now over 325K people in relevant technologies. Further media partners encouraged to apply below.

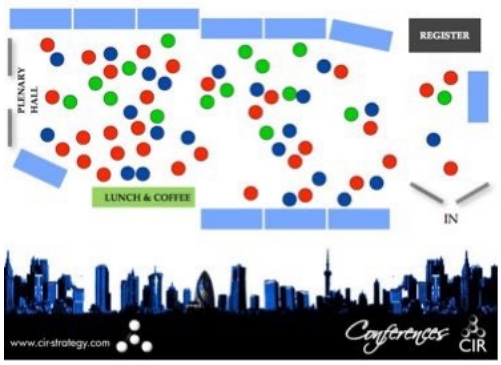
Sponsorship & exhibition pricing

Promote your brand, showcase your knowledge and expertise, your thought leadership, products and services. To secure your marketing and stand at these very exciting event days, please contact Maya and Justin at the top of this page directly now. First come, first served!

Lead Sponsors: £neg (**Darktrace co-lead in 2019, we seek additional leader**. Top level coverage, influence, moderator, speaking+, exhibition key location, access to lists, multiple delegates as required, masterclass, dinner+, dedicated newletters programme & marketing)

Platinum Sponsors: £GBP 4.95k neg. (influence, speaking, multiple delegates, exhibition, masterclass, dinner, top digital marketing)

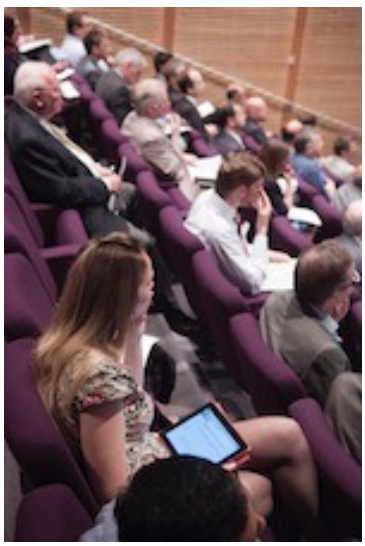
Gold Sponsors: £GBP3.5k (speaking slot, exhibition, multiple delegates, masterclass, dinner, marketing) | also **Dinner Sponsors (FLEXIS)**



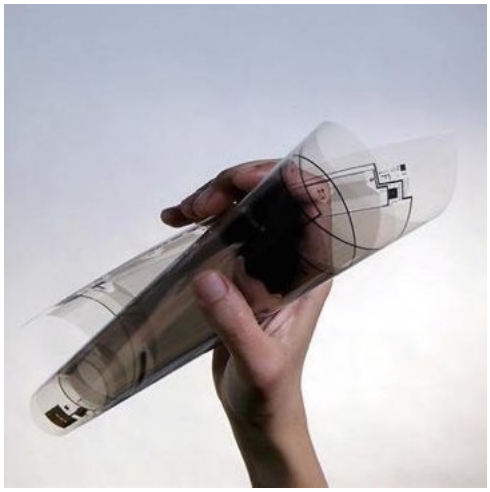
Silver Sponsors: (£2k (pitch slot, exhibition, 2 delegates, presence in e-shots/backdrop)

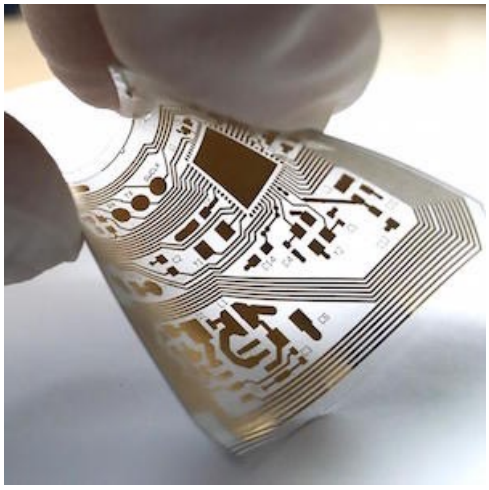
Exhibition (large 3m wide stand): £2k (£1k per 1.5 m width)

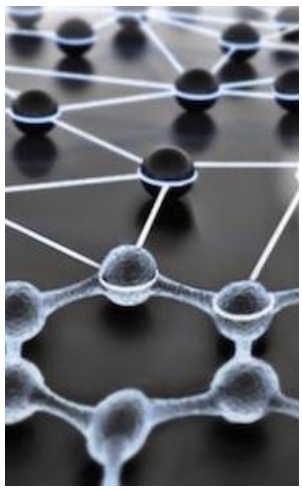
Delegates (2 days access to all events tickets are recommended for learning and full networking): see below on next page - Tickets (11 options) can be secured quickly via our **multi-ticket shop here**.



	SPONSORSHIP & EXHIBITION					DELEGATE			
	Diamond /Event Sponsors	Platinum /Session Sponsors	Gold Sponsors	Dinner Sponsor	Exhibition	Full All Event Pass with hotel	Full All Event Pass no accomm	Exec Briefing Day only	Conference Summit Day only
Business Conference	✓	✓	✓	✓	✓	✓	✓	✗	✓
Masterclass/Exec Briefing	✓	✓	✓	✓	✗	✓	✗	✓	✗
E-shot marketing	✓	✓	✓	✓	✗	✗	✗	✗	✗
Dedicated Newsletter	✓	✓	✗	✗	✗	✗	✗	✗	✗
Programme Influence	✓	✓	✗	at dinner	✗	✗	✗	✗	✗
Moderator	✓	✓	✗	✗	✗	✗	✗	✗	✗
Access to lists	✓	✗	✗	✗	✗	✗	✗	✗	✗
Dinner no. seats	4+	2	1	3	✗	1	✗	1	✗
Speaking	Lead	20 min	15 min	at dinner	✗	✗	✗	✗	✗
Exhibition Stand	6m	3m	3m	3m	1.5m/ 3m	✗	✗	✗	✗
No. of Complementary Delegates	As req	4	3	3	1/2	✗	1	✗	✗
Price	£neg	£5k	£3.5k	£2.5k	£1k or £2k	£725	£470	£245	£245







Delegate Booking & pricing (see online form for more options)

Date	Venue	Fee per delegate	Total fee (incl VAT)
1 & 2 July 2019	Cambridge, UK	_____	_____
- Smart Grids 2019 Event with Hotel (CPSG19)			£870 **incl VAT**
- Smart Grids 2019 Event no Hotel (CPSG19)			£564 incl VAT

Circle the number of attendees 1 2 3 4 Total_____

Registration instructions

Participant details:

Personal Title:_____
Last Name:_____
Email:_____
Mobile/Cell:_____
Address:_____
Post Code:_____
Accounts Contact:_____

First Name: _____
Job Title: _____
Direct Tel: _____
Company Affiliation: _____
City: _____
Switchboard number: _____
Accounts Tel: _____

Please tick one of the following options, complete the details where required and return the form with your application form as soon as possible. Please ensure you sign the bottom of the form indicating that you allow us to take payment and accept your place/s at this CIR Event.

Option 1 **Please send me an Invoice____** **Option 2** **I wish to pay by credit card____**

Type of card: Visa MasterCard AMEX

Name on card: _____

Billing address of cardholder:

_____

_____

Credit card number: ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
Issue number (if applicable): ___ Security number: _ _ _
(last three digits of the long number at the back of the card)

Valid from date: - - M M Y Y Valid to date: - - M M Y Y

Print name: ……

Signature: …… **Date:** ……

Contact information
In order to confirm attendance, simply email a picture or scan of this page to events@cir-strategy.com or call us on +44 7720047402 to book over the phone.

Participation gives you
Access to event activities | All materials digital/printed| All hosted lunches, dinners, receptions | Accreditations

Payment terms
One calendar month from the date of invoice, but prior to event, participant substitutions allowed at any time. The booking conforms to CIR's Terms and Conditions of bookings, which are available on request & on website.

Data Protection: Tick here if you do not want your participants' details given to any other organisation____

2019 SPEAKERS

Gavin Jones: Chairman's Profile

Gavin - confirmed in 2019 - is a senior executive who has worked in industries going through technological change. He has been in leadership positions in companies seeking to exploit the changes in Energy and Utilities focusing on smart metering, smart grids and the use of data in the industry.

CIR TECHNOLOGY BRIEFING LEADER & INNOVATION CONFERENCE CO-CHAIR: Gavin Jones

Professional expertise

Gavin is one of 20 experts invited to be members of BEIS and Ofgem's Smart Grid Forum. Alongside helping BEIS and Ofgem formulate their implementation of Smart Grids, and has been involved in the following SGF publications:

- Smart Grid Vision and Routemap
- Transform Model – A mathematical model of the likely future impact of smart grid technology on the various types of distribution networks in the country.
- Workstream 6 – A report giving specific recommendations to overcome the commercial, regulatory and technical barriers to realising an efficient smart grid in Great Britain.

At the start of 2016, Gavin set up a consulting business making use of his knowledge and networks within the energy industry and his understanding of the policy directions of Government and Regulators.

Gavin has been techUK's chairman of Smart Energy and Utilities group since it was created in 2005. techUK is the UK's technology industry association and under his chairmanship the group has grown to have significant influence in the design and implementation of government policies. This is a policy-influenced industry.

Previous Experience

In 2011, Gavin joined ElectraLink as Business Development Director, primarily to create a business exploiting the energy industry data carried across their network.

Prior to joining ElectraLink, Gavin was part of IBM's Global Energy and Utilities team, where responsible for growing IBM's activities in Europe and Africa by focusing on creating a business around the emerging Smart Energy solutions of Smart Grid and Smart Meters.

In 2010 he helped create a new organization, Smart Grid GB, with membership from utilities, technology companies, consumer organisations and many others with representation from government and regulators and Gavin was elected its first chairman. Under his leadership Smart Grid GB became the British representative in the Global Smart Grid Federation, the global organization of national smart grid associations.

Prior to working in Energy and Utilities, Gavin was a leader within IBM's Emerging Business Organisation which focused on exploiting the early days of the Internet of Things.

2019 SPEAKERS Emily Orton: Speaker Profile

CIR KEYNOTE: Emily Orton, CMO, Darktrace

Summary

Emily is one of the founding members of Darktrace and has worked in technology marketing and communications for ten years.

Her commentary on the cyber security challenge has been reported in leading media outlets including BBC News, Sky News and Channel 4, and she was named in the 'Maserati 100' index of British entrepreneurs in The Sunday Times in 2018.

Educational background

Emily holds an MA in Modern Languages from the University of Cambridge.

Talk synopsis

Cyber AI: A New Era of Defence

We are entering a new era of sophisticated, powerful attacks. How do businesses keep up? Self-learning cyber AI is able to learn a pattern of life for each user, device and system of any digital environment, including cloud, industrial, IoT and email. Find out how Cyber AI puts the advantage back in the hands of the defenders.

2019 SPEAKERS

Jeremy Nicholson: Chairman's Profile

Jeremy Nicholson Corporate Affairs Officer at Alfa Energy Group & Vice President/Chair of Management Committee at IFIEC Europe.

Jeremy is oft seen on BBC News covering industrial energy and utility related issues as an expert industry commentator.

Jeremy will chair the cleanpower streams at this conference covering power generation, energy mix and energy outlook issues.

CIR CONFERENCE CO-CHAIR: Jeremy Nicholson, VP/Chair of Mgmt Committee, IFIEC Europe

He has expertise in energy policy, renewable energy, energy efficiency and stakeholder engagement.

Professional expertise & boards

He was Senior Adviser to the Engineering Employer's Federation and a member of the Energy Intensive User's Group with which he was employed for 18 years and has received the nPower award for Outstanding Contributions to Industry.

In other previous roles Jeremy has experience as an auditor and analyst with Three Valleys Water, General Utilities Partnership, Sir William Halcrow & Partners .

Jeremy has been a Board Member / Vice President of IFIEC Europe since 2003.

Jeremy is a Fellow of the Energy Institute since 2004. Jeremy is a member of the Ofgem Advisory Groups on Sustainable Development and on Environmental issues.

Publications

Jeremy is a co-author of the Civets report: British Energy Policy and the Threat to Manufacturing Industry.

Education & skills

Jeremy was educated at the University of East London.

2019 Speakers Victoria Doherty: Speaker Profile

CIR SPEAKER: Victoria Doherty, Power Sources, Energy storage & Distribution, QintetiQ

Summary

Victoria provides business development leadership for the newly combined QinetiQ Power Sources, Energy Storage and Energy Distribution team. She was previously chief of staff for the QinetiQ Cyber, Information & Training business, and co-led the employee engagement group. Victoria is a chartered Human Factors professional with a focus on organisational resilience, security culture and insider threat prevention. She enjoys coaching individuals and teams. Victoria brings an emphasis on collaboration and co-creation as essential to all our success.

Specialisms

Energy storage innovation and testing

Performance coaching

Human factors in cyber security

Talk Synopsis

Energy Resilience is a necessity. Victoria will consider power storage and human factors in cyber security as she summarises the need for innovation in energy and both the power and vulnerabilities of connectivity.

2019 SPEAKERS Erwin Frank-Schultz: Tech Executive Briefing Day Session Leader Profile

Erwin is IBM's Industry CTO for Energy, Environment & Utilities in the UK and Ireland, an IBM Executive IT Architect.

Key Focus Areas

Key focus areas are: Smart grids (including electric vehicles), generation, asset management and changes in the water industry, Smart Metering.

Specialisms

Erwin specialises in the use of data to improve decision making in asset management (e.g. predictive maintenance), operations and customer management.

Experience

Erwin also has experience in the public sector (in asset management, maintenance management and logistics) and the financial services sector (in payments, settlement, retail banking and insurance).

Erwin is a Certified IBM Executive Architect with over 27 years of experience in architecting IT systems, leading design authorities on large complex programmes and providing High Availability consultancy. He is a member of the following industry bodies:

- Fellow of the Institution of Engineering and Technology (IET)

- British Computer Society (BCS): Chartered IT Professional

- OpenGroup: Distinguished IT Architect.

Talk Synopsis

CIR CORPORATE TECHNOLOGY BRIEFING DAY LEADER & IBM EXECUTIVE ARCHITECT: Erwin Frank-Schultz

This session will explore the impact of technology areas (Energy generation and storage and digital connectivity) on the future energy market at a high level, laying the groundwork for subsequent technology briefing sessions II and III on energy storage & battery technology and digital connectivity and security.

2019 SPEAKERS Eleanor Weaver: Global Director, Darktrace Industrial

Eleanor Weaver is the Division Director for Darktrace Industrial, focusing on the defense of OT, IT and IoT environments. She joined Darktrace shortly after the company was founded in 2013 and helped it to grow the client base that now includes over 8000 deployments worldwide. Having successfully established Darktrace in Africa, and managed the region for three years, Eleanor now heads up industrial efforts globally for Darktrace. She has spoken internationally at events, with her specialism lying in the application of AI and machine learning to futureproof and protect core infrastructures and operational technologies.

CIR SPEAKER KEYNOTES: Eleanor Weaver, Division Director, Darktrace Industrial

Talk Synopsis

Using AI for Real-Time Threat Detection across OT & IT

In this Day 1 technology executive briefing day session, learn:

- How to use artificial intelligence to detect emerging threats and latent vulnerabilities
- Achieving 100% visibility across OT, IT and Industrial IoT
- Real-world case studies of stealthy cyber-threats identified in industrial environments

2019 Speakers
Louise van Rensburg: Speaker Profile

Louise is the Interim Deputy Director of the SO and Whole Systems portfolio at Ofgem. She is in charge of a number of Ofgem's work areas that support the evolution in the energy system, including system operator regulation, flexibility and whole system coordination issues.

Experience & background

Louise is an economist with a Master's Degree in Economics and her 13 years in energy regulation spans retail, smart metering, wholesale and network issues. She engages regularly in GB and European forums.

Talk Synopsis

Regulation enabling the energy transition

Details to be published

CIR Speakers: Louise van Rensburg, Interim Deputy Director, Energy Transition, Ofgem

2019 SPEAKERS Dr Richard Smith, Head of Commercial, National Grid ESO: Speaker Profile

Richard Smith is Head of Commercial at National Grid ESO.

With nearly 20 years experience in the energy sector, Richard has led the development of future energy scenarios, the strategic development of the GB electricity transmission system, its market frameworks and is currently Head of Commercial in National Grid Electricity System Operator. Richard previously worked in the Space industry, is a chartered engineer and an IET Fellow.

CIR SPEAKER: Dr Richard Smith, Head of Commercial, National Grid ESO

Other interests

His other interests include his work as a Pension Trustee, Charity Trustee and Parish Councillor.

He is motivated to leverage these skills & experience to improve societal outcomes at a National or local level.

Talk synopsis

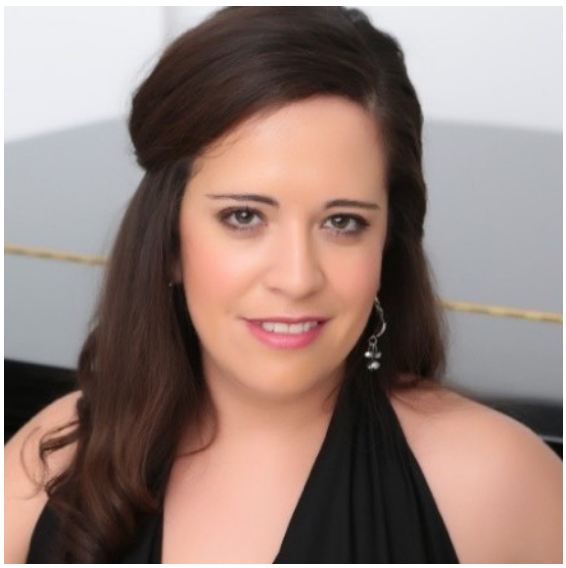
Operating the GB transmission system, carbon free, by 2025

Richard will cover opportunities and challenges around we will operate the GB transmission system, carbon free, by 2025.

Decarbonisation, decentralisation and digitalisation are driving significant change across the electricity network. These changes are impacting how we operate the system now and into the future. By 2025, we will have transformed the operation of Great Britain's electricity system and put in place the innovative systems, products and services to ensure that the network is ready to handle zero carbon energy. This means a fundamental change in how our system is operated – integrating newer technologies right across the system – from large scale off-shore wind, to domestic scale solar panels, to increased demand side participation. Our operability strategy is key to ensuring system operability and aims to improve safety and reliability of the network; drive lower bills by changing the way we operate; and reduce our reliance on services from carbon emitting sources.

2019 SPEAKERS Daniela Sanchez-Lopez, Research Fellow, Cambridge: Tech Executive Briefing Day Session Speaker Profile

Dr Daniela Sanchez-Lopez is a Research Fellow at the Margaret Anstee Centre for Global Studies, Newnham College, Cambridge.



CIR speakers: Dr Daniela Sanchez-Lopez

Key Focus Area

Geopolitics and novel strategic resources for the low carbon transition.

Talk title and synopsis

Towards a geopolitical ecology of lithium in the South American Triangle

Renewable energies are now firmly at the centre of global debate requiring novel strategic resources such as lithium for new technologies leading to the low-carbon energy transition. Lithium has become a coveted resource in high global demand for its uses in Lithium-ion batteries in Electric Vehicles (EV) and energy storage systems. The South American lithium triangle in Chile, Argentina and Bolivia accounts for 55% of the world reserves and more than half of the lithium production sourced from brines worldwide. This makes the region the scenario of fundamental geopolitical and socio-economic transformations. This presentation seeks to explore the different governance frameworks of lithium in South America and the geopolitical implications for renewable energies and the low-carbon energy transition.

2019 Speakers
Justin Hayward: Speaker Profile

CIR: Dr Justin Hayward

Justin is Director of Cambridge Investment Research Ltd, a company founded in 2002 to provide methods for business strategy to small, medium and large technology companies and diligence for investors. CIR developed the High Value Manufacturing Reports for East England and South East England in 2002 and 2005, and has run 50 conference days in high value manufacturing, energy, smart tech and materials technologies 2002 - 2017.

Focus Sectors

Energy efficiency, market ecosystems, digital printing, electronics, materials, smart systems, ML, quantum technologies.

Specialties

Justin specialises in the management of technology and ecosystem business development.

Experience

Justin worked from 1996 - 2000 in London as a quantitative analyst for Deutsche Bank's relative value research group, contributing models for implied probabilities of FX rates; European bond and money market convergence; global bond market portfolio analysis for institutional investor clients.

Notable CIR projects have been: Empower's smart energy & city strategy; Akvaterm's accumulator tank energy strategy; the three generations of printheads roadmap for Xaar plc; key customer analysis for Bluegnome, a Cambridge startup that was later sold to Illumina Inc; M&A Investment research for Domino Printing plc; Value Network Analysis for the Innovation Team at HQ in Lund, Sweden, for TetraPak (2015) & for Plessey.

Education

Justin received a PhD in theoretical physics and applied mathematics from Cambridge's relativity group under the direct supervision of Stephen Hawking in 1995. His PhD covered the Formation and Evaporation of model black holes.

Since then Justin has taken a Cambridge Judge Business School MBA in 2001 on the strategic management of technology and entrepreneurship, pioneering the "influential people networks" studies of the Cambridge tech cluster initiated around that time with his MBA dissertation.

Talk Synopsis

Justin will give an introduction to the conference and introduce the audiences to themselves.

2019 SPEAKERS Anser Shakoor: Speaker Profile

CIR SPEAKER: Anser Shakoor

Dr Anser Shakoor is Head Energy Market Advisory Business (EMEA), Energy portfolio Management atABB.

Dr Anser Shakoor leads the firm's market advisory business in EMEA. He has over 18 years of experience in providing strategic advice on investments in the electricity sector and assessing market risks and opportunities.

His industry experience spans electricity generation with special focus on renewable generation and emerging technologies, wholesale markets and asset evaluations.

Recent projects

Anser's recent client engagements have been on optimizing operations and strategic investments, assessing market risks and opportunities based on in-depth analysis of electricity markets in Europe and North America.

His clients include investors (banks, lenders, investment funds, etc), utilities and developers of renewable energy across Europe and North America.

Academic

He holds a PhD in Power System Economics with a special focus on integration of renewables.

Talk synopsis

Anser will cover a recent market intelligence report he has led into the future of energy markets to a long term horizon.

Talk title

Economic Insights of the Shifting European Electricity Markets

The European energy landscape has changed dramatically over the last decade. This is expected to evolve significantly in the coming years, driven by:

- Recent update of 2030 targets for renewable energy by several European countries alongside rapidly declining costs of renewables;
- Coal phase-out plans in major European economies; and
- The uncertainty in the future price of carbon in Europe.

These emerging energy and regulatory changes and quantifies the impact of these changes on electricity markets are reviewed.

2019 SPEAKERS

Isobel Sheldon: Moderator Profile

Isobel Sheldon is Head of Business Development at the UK Battery Industrialisation Centre, an organisation which is part of the UK government's the Faraday battery challenge initiative.

Professional specialties

Isobel is a seasoned technical, commercial and business professional and leader, with 16 year's experience in the Lithium Ion Battery development market.

Experience

Isobel has over 25 years experience working in the automotive sector in technical, commercial and managerial roles within tier 1's, started career with Marconi Electronic Devices Ltd as an apprentice electronics technician in the military and defence industries.

Isobel has worked at a number of leading companies such as Cummins Inc, Johnson Matthey and Ricardo.

Isobel has a attended a leadership masterclass from McKinsey in Senior Management.

Participation

At the Cleanpower Smart Grids Conference 2019, Isobel with chair the battery industrialisation session.

CIR MODERATOR: Isobel Sheldon, UK Battery Industrialisation Centre

2019 SPEAKERS Professor Vasant Kumar, Cambridge University: Moderator & Speaker Profile

Professor Kumar is the Chair & the Head of Materials Chemistry Group and a Fellow of Trinity Hall in University of Cambridge, and a Fellow of the Energy Institute (FEI) and of the Institute of Materials, Mining and Metallurgy-IOM3 (FIMMM).

Professor Kumar has been recognised internationally for his work relating to developing new sustainable energy technologies, recycling and recovery of strategic materials, advancing new sensors and instruments for environmental monitoring and pollution mitigation and optimizing redox reactions in energy devices such as batteries, fuel cells and photocatalytic reactors. He has published over 350 papers, 17 patents, 5 Chapters in Handbooks and 1 edited book (High energy density Li batteries, Wiley-VCH). He has supervised over 40 PhD students, 35 post-doctoral researchers, 20 visiting students and hosted 15 visiting professors.

Commercial Projects

Founder and Director of

CAMJET GROUP/ CJET Ltd for commercialising printing technologies for functional and smart materials and devices such as batteries, fuel cells, supercapacitors, sensors and other energy/ environmental materials, 2019;

Green PB Ltd in 2008, in order to advance an eco-friendly process for recycling batteries developed in our group, evaluation license in 2013 to Johnson Control Solutions, world's largest automotive battery manufacturer; global license to Aurelius Environmental Group Ltd, UK in 2015;

Solutions for Hydrogen Sensing Ltd., (S4H) in India, making instruments for safety, process control and environmental monitoring from 2008- Absorbed by MNST Ltd;

Cambridge Nano Sensors Ltd (CNS Ltd), for technology development of semiconductor MEMS chip based platform sensors technology for gaseous and dust (PM2.5) monitoring from Jan 2015, sub-licensed to MNST Ltd;

CIR SPEAKER: Vasant Kumar, Energy@Cam, Cambridge University

Environmental Monitoring & Control Ltd., a start-up company in Stafford, UK, producing solid state sensors and sensing instruments from 2004

Academic and boards

Professor Kumar has obtained his PhD from McMaster University, Canada and B.Tech (Hons) from IIT-Bombay in Materials Science & Metallurgy. He is Honorary/Guest Professor in four Universities in China (2008, 2012, 2016 and 2019). Has received Honorary Engineering Degree in University of Malaysia (2011), Kroll Medal from IOM3 for translating research into industrial applications (2014). He is the Editor-in-Chief of IOM3 journal, "Mineral Processing & Extractive Metallurgy" from 2004, Editorial Board Member of 4 other journals, a Board Member of IOM3's Technical Division, Advisory Board Member of TECHMET Ltd, London, operating in the lithium battery- supply chain and of Majico – a social enterprise focussing on low-cost water treatment by photocatalysis in trials in Tanzania & Ghana.

Talk title and synopsis

A brief sprint through battery science

A snapshot of scientific challenges, technological innovations and materials development in batteries – widely seen as a critical enabling technology in energy storage & clean energy growth – is highlighted in very broad terms.

2019 SPEAKERS

Richard Druce: Executive Briefing & Conference Speaker Profile

CIR Conference Speaker: Richard Druce, Director, NERA

Summary Profile

Mr. Druce is a Director in NERA's Global Energy, Environment, Communications and Infrastructure Practice. He specializes in the economic and statistical analysis of gas and electricity markets, applied to regulation, valuation and due diligence, competition policy, litigation, and public policy.

Recent work

Richard's recent work has covered electricity transmission charging, gas infrastructure access charging, power market modelling exercises, willingness to pay studies for regulated network companies, and work on power market design issues. In the last several years, he also has managed several power sector due diligence assignments, and advised energy companies in the course of their periodic reviews.

Industry background

Besides energy, Mr. Druce has worked in other regulated network industries, including water and rail. His work has spanned a wide range of geographies, including the UK and Ireland, much of Western, Central, and Eastern Europe, as well as Turkey, the Middle East, Africa, and Asia.

Educational background

Richard Druce holds an MPhil degree in economics from St. Catharine's College, Cambridge, where he specialized in microeconometrics and industrial organization.

He also holds a first class degree in economics and econometrics from the University of Bristol.

Talk Synopsis

In the face of decarbonisation, the emergence of variable and intermittent generation technologies, and technological change in the electricity industry such as the emergence of smart grids, traditional regulatory are coming under stress.

Traditional sources of generation revenue, such as the sale of energy, are being eroded, with increasing emphasis on subsidy, grid services and capacity mechanisms. Grid companies are also facing challenges associated with significant investment requirements to accommodate new technologies, grid bypass and defection facilitated by growth in Distributed Energy Resources, and pressure from regulators to innovate to adopt new technologies.

Richard will explain the economic value that Distributed Energy Resources, such as storage, can bring to the system, and the regulatory reforms that may be necessary to realise it. In particular, he will discuss Ofgem's "RIIO" approach to regulating networks, and how this may need to evolve in the next round of price control reviews to encourage and enable electricity network companies to support their deployment.

2019 SPEAKERS Georgina Dingley: Speaker Profile

CIR SPEAKER: Georgina (Davies) Dingley, Anesco

Summary

Georgina is Director of Innovation and Business Strategy at Anesco. She is also a former speaker with this conference series some three years ago.

Previous Experience

Georgina was formerly Business Development Consultant with AMT Sybex (part of Capita plc) looking at Smart Grid and Smart Networks business development.

Georgina has been in roles in research science, R&D, consumer engagement and design with DNOs and energy suppliers such as UK Power Networks and EDF and with product companies such as Unilever.

Academic background

Georgina has taken from Brunel University an MSc, Sustainable Electrical Power and prior to that from the University of Leeds, a BSc in Physics.

Talk on Utility-scale battery storage on the grid

SPEAKERS 2019

Nick Merricks: Speaker Profile

Nick Merricks is Head of Electricity Products at Landis+Gyr UK where he is responsible for the portfolio of SMETS1 and SMETS2 smart electricity meters currently being rolled out across Great Britain. He also works to define the next generation of Landis+Gyr smart devices and services that will help the UK's transition to the future energy system.

CIR SPEAKERS: Nick Merricks, Head of Electricity Products, Landis+Gyr UK (Gold Sponsors)

Past Experience

Prior to joining Landis+Gyr, Nick worked in product marketing and engineering roles for major aerospace and security firms providing air traffic control, radio communications and radar systems for government and industrial customers around the world.

He also spent many years in the audio industry, delivering high performance sound systems for the world's leading recording studios and professional musicians.

Talk Synopsis

Grid Edge Intelligence in the Future Energy System

The future energy system will be more decentralised and distributed than we have today. In this talk I will discuss how decentralisation and electrification at scale demands a shift in the way we think about our future energy assets such as electric vehicles, solar PV and battery storage. Our learnings from the smart meter roll-out can help us to realise this decentralised electric future.

2019 SPEAKERS

Simon Daniel: Speaker Profile

CIR SPEAKER: Simon Daniel, CEO Moixa Energy

Simon has 25 years of experience in technology and business innovation.

He leads Moixa's overall strategy and growth plans, and market relations across government, industry, investors – and has raised £10m into the business.

Inventor entrepreneur

He is a serial inventor, with numerous patents in energy and mobile devices – e.g. he invented and licensed a folding PDA keyboard which sold 2m units.

He founded Moixa for smart energy R&D and launched USBCELL in 2006, gaining numerous awards.

Professional specialties

Simon is a member of the Smart Systems Forum, as part of BEIS/Ofgem, reviewing UK flexibility strategy.

Experience

Simon spent 8 years in Accenture's Technology practice, where as a Senior Manager he helped co-create a Financial eCommerce new business unit, working with new ventures and start-ups.

Simon has taken gap years at IBM Research and Defence research agency.

Academic background & research interests

Simon has a background in AI and computing, e.g. 2009 Singularity University, MA in Natural Sciences, Theoretical Physics from Cambridge University (91-93).

Talk synopsis *Local grid balancing from aggregated storage and electric vehicles*

2019 SPEAKERS

Judith Ward: Moderators Profiles

Summary

Judith Ward is a long-standing associate of the environment think tank Sustainability First - and was director for 5 years. She has researched and published extensively on the electricity and energy demand-sides. She is an energy policy professional with practical experience of both the utility and consumer worlds, with a particular focus on regulatory and 'public interest' issues. She spent 14 years with National Grid, her last role being a six-year spell as Group Head of Public Affairs. Judith is an Honorary Fellow at the University of Exeter ; a member of the BEIS / Ofgem Smart Systems Forum - and the Ofgem Design Advisory Board for Settlement Reform. For Sustainability First, Judith has been a member of Ofgem's RIIO2 Challenge Group (to June 2019).

CIR MODERATORS: Judith Ward, Sustainability First

2019 SPEAKERS

Sylvain Vittecoq: Speaker Profile

Summary

Sylvain joined Connode in 2011 as Development Manager & Architect and was appointed Lead Design Authority & Delivery Manager for the narrowband RF mesh solution part of the UK Smart Metering Implementation Program.

Following the acquisition of Connode, Sylvain was appointed VP of Engineering for the Group.

In February 2018, he was appointed Chief Technology Officer and is responsible for the overall technical vision and solution definition. Sylvain runs workshops for customers and partners, sharing the Company's knowledge of the IoT landscape, as well as providing information on the benefits and scope of CyanConnode's technology. He is working very closely with a talented team of engineers based in the UK and India to deliver world-class M2M solutions and products.

Previous Experience

Prior to joining Connode, Sylvain established and managed engineering teams in companies in Sweden, France and the US.

Talk Synopsis Main Points

The benefits of RF mesh networks for smart metering, smart grid and IoT

This presentation provides an overview of wireless radio frequency (RF) mesh technology and discusses the many benefits of sub GHz RF mesh networks for Smart metering, Smart Grid and many applications in the broader industrial Internet of Things (IoT). The RF mesh connectivity is filling the gap between long-range radio for simplistic battery-powered sensors that require minimal bandwidth and cellular only connectivity, which provides more throughput but usually offers limited or even poor coverage for devices deployed indoor or in basements for instance. This presentation also includes some high-level remarks on how to secure such infrastructure based on field experience from several projects in different parts of the world over many years.

CIR BUSINESS CONFERENCE SPEAKERS: Sylvain Vittecoq, CTO, CyanConnode plc

2019 SPEAKERS

Dr Sean Cochrane: Speaker Profile

Summary

Sean joined Cyan in 2006, and spent three years working on embedded radio applications development for energy utilities. Since then Sean has worked in a variety of technical and commercial roles, including 6 years supporting Cyan's radio products in India, and has more recently focussed on customer/partner engagements in South Asia, Africa and the Middle East.

Talk Synopsis: *Commercialising an IoT communication platform for smart metering and the opportunities for global expansion*

This presentation discusses the lessons learnt by CyanConnode over a decade of commercialising it's IoT communication platform for energy utilities and identifies further opportunities for global expansion.

Cyan started working in India in 2008 and quickly identified a need to address the country's significant losses in electricity distribution. Advanced Metering Infrastructure (AMI) was proposed as the solution, with radio access to remote meters providing improved consumer billing services, and the identification of losses.

In 2018 CyanConnode delivered its latest generation IoT platform, Omnimesh, to the Indian market. This platform is now realising significant benefits to the Indian utilities, including reduced losses and improved utility revenue.

This is achieved by a robust field hardened technology, that reliably connects remote meters to utility servers. A key lesson learnt is that whilst the problem may have been quickly identified, delivering a commercialised solution requires many localised issued to be addressed. Turning to global expansion, the problems may be similar in many parts of the world, but each region has a different ecosystem of suppliers to the utility sector.

CIR CONFERENCE EXEC BRIEFING SPEAKERS: Dr Sean Cochrane, Head of Technical Sales, CyanConnode plc

These regions, therefore, require localised strategies that allow established partners to also gain (commercially) from the technology.

2019 SPEAKERS Mash-Hud Iqbal: Speaker Profile

CIR SPEAKER: Mash-Hud Iqbal, Partner, Marks & Clerk LLP

Mash-Hud is a partner at Marks & Clerk LLP. He is a Chartered (UK) and European Patent Attorney.

Mash-Hud joined Marks & Clerk in 2008 and qualified as a European Patent Attorney and UK Chartered Patent Attorney in 2013. Mash-Hud has been recognised as a rising star by Managing Intellectual Property, IP Stars, 2017 and 2018.

Professional role

Mash-Hud is a qualified patent attorney who is experienced in drafting and prosecution work in semiconductor technologies, opto-electronics, mobile telecommunications, software, medical devices and oil well technology. He also has experience at opposition proceedings before the EPO.

Academic background & research interests

After completing a BSc degree with first class honours in Electronics and Computing, Mash-Hud moved to the University of Cambridge where he gained an MPhil and PhD in Solid State Engineering. Mash-Hud's MPhil research was directed to modelling novel power devices for emerging technologies. He then carried out further research for his PhD on silicon-on-insulator (SOI) based high voltage devices for power ICs and nanoscale transistors using silicon nanowires.

Talk synopsis

Focus on Energy Innovation and IPR (to be announced).

2019 SPEAKERS

Pamela Taylor: Moderators Profiles

Summary

Pamela Taylor is a Non-Executive Director and Executive Coach with 15 years' experience in the energy sector. A former Director at Ofgem and FTI Consulting, she understands the challenges facing leaders in the public and private sectors.

Pamela works with boards to develop business strategies, manage risk and compliance, influence policy and regulation and promote organisations externally. She is currently independent Chair of the Energy Switch Guarantee, of the Green Gas Certification Scheme's Compliance Committee and a member of Western Power Distribution's Consumer Engagement Group. An experienced public speaker, Pamela regularly presents and chairs panels at conferences.

A qualified Executive Coach, Pamela set up her coaching practice, Taylor Macpherson, to support leaders and their teams to transform their thinking and ways of working to make a difference to themselves and their organisations. Her coaching supports clients to navigate career transition, overcome self-doubt or limiting beliefs, build effective and influential working relationships and support themselves and teams through change.

CIR MODERATORS: Pamela Taylor, Taylor Macpherson

2019 SPEAKERS

Eric Topham: Speaker Profile

Summary

Eric Topham is Data Science Director at The Data Analysis Bureau.

Whether in academic research or the private sector, Eric is driven by the challenge of solving big problems using data and the scientific process. Eric leads the analytical and machine learning elements of the The Data Analysis Bureau, a data science and engineering innovation agency, primarily designing solutions to solve client problems.

Talk title and synopsis

The energy business is central to human society and powers advancements in technology and human wellbeing. However, with the increase in human population projected to attain almost 10 billion people by 2050, energy supply has to meet demand. As a result, decisions regarding management of energy resources have become ever more critical, since they can have a enormous economic impact if poorly handled, resulting in shortage and sub-optimal allocation.

Sufficiently accurate models of physical phenomena are complex to formulate and can be extremely expensive to solve. Worse, complex physical models are rarely known or fully understood. This lack of capability to theoretically model increasingly complex relationships between model input and response variables dictates the use of data (e.g. measurements, surveys) to infer relationships and derive data-driven predictions.

Machine learning, deep learning, and optimisation methods are the ideal solution to such a use case. In particular, algorithm types inspired by neuroscience, ecology and the study of animal behaviour provide powerful tools and have particular application to problems faced by the energy industry. The role of machine learning is not

CIR SPEAKERS: Eric Topham, T-DAB Data Science Director

to replace the human, but instead to augment and enable their ability to efficiently and effectively manage complex systems, including those critical to the energy industry.

SPEAKERS 2019

Athan Fox: Speaker Profile

Dr Athan Fox is a PhD graduate in Chemistry from the University of Cambridge and Chief Technology and Innovation Officer at Aurelius Environmental.

"My passion is science and technology which could make the world a better place. My core interests are in the development of new and ground-breaking technology to address the world's challenges in sustainability, recycling and the circular economy - to create a 'world without waste'.

Our aim is to revolutionise recycling. Our vision is a web of industries where one stream's waste is another stream's in-feed: bridging linear and wasteful processes to create a circular, pollution-free, zero-waste future. To put it simply: we harvest resources from urban waste.

I have been selected to represent the UK and the European Commission on multiple government-led missions to Japan, South Korea, Indonesia, Europe and the Middle East. In Jan 2019, our business Aurelius Environmental won two prestigious Rushlight awards. In the past 3 years we have secured grant-funding for our lead-acid battery recycling project, including a Horizon 2020 Phase 2 SME, Innovate UK Newton Fund, and Innovate UK Open Programme awards.

Our future depends on more than just ground-breaking research; we must translate science into meaningful and economically sensible products and services. Turning great ideas into things people need, but always underpinned by ambitious yet realistic business models."

Talk Synopsis

Out of the furnace and into the leaching tank

Imagine a world without waste...

Our aim is to revolutionise recycling. Our vision is a web of industries where one

CIR SPEAKERS: Athan Fox, CTIO, Aurelius Environmental

stream's waste is another stream's in-feed: bridging linear and wasteful processes to create a circular, pollution-free, zero-waste future. To put it simply: we harvest resources from urban waste.

We are working on a range of projects across the Technology Readiness scale. These projects include the recycling of lead-acid batteries, lithium-ion batteries, spent catalysts (used in the petrochemicals industry), spent tyres and municipal waste. Our objective is to convert waste products into raw materials and reagents capable of treating / recycling other waste streams: like an Eco City where nothing but waste enters and nothing but products leave.

Our flagship technology is a green process for recycling lead-acid battery paste. We reduce the carbon footprint by 80-89%; eliminate noxious gases (e.g. sulphur dioxide and nitrogen dioxide) at no extra cost; we cut energy by more than 7,000 mWh per 10,000 tonnes of battery scrap throughput; we reduce slag by at least 90%; and we save more than $500,000 per 10,000 tonnes throughput. Batteries produced from our recycled lead oxide exhibit higher energy density and improved cycling compared to current batteries on the market.

SPEAKERS 2019

Natalie Lowery, Practice Manager - Local Area Planning, Energy Systems Catapult: Speaker Profile

CIR SPEAKER: Natalie Lowery, Energy Systems Catapult

Summary

Natalie is a senior modelling analyst with first-class degree and PhD in mathematics.

She has excellent programming and data analysis skills and joined the Energy Systems Catapult in 2015 from the Energy Technologies Institute.

She has supported development of local energy system modelling capability and leads the technical delivery of a number of energy system modelling and data analysis projects within the Catapult which currently includes supporting Innovate UK's Prospering from the Energy Revolution Programme.

Academic Background

Natalie completed her PhD from the University of Reading in 2013, and has a first class degree in mathematics. Her PhD explored the application of techniques in machine learning to quality control of fuel cells. She finds fuel cells interesting as a means of realising the potential of intermittent renewable technologies.

Talk Title and Synopsis

Local Area Energy Planning

Local Area Energy Planning is a valuable activity that can assist in meeting the ambitious decarbonisation and housing energy performance target. In this presentation we discuss the Energy System Catapult's novel data driven approach to modelling transition options for a local area, enabling local and regional coordination and action.

SPEAKERS 2019

Dr Rumen Tomov: Speaker Profile

CIR SPEAKER: Rumen Tomov, CAMJET Ltd

Summary

Dr Rumen Tomov is Research Associate in Materials Chemistry Group (Department of Materials Science & Metallurgy). His area of expertise is focused on nano-functionalization of electrodes for energy generation and storage devices.

His research interests are focused on inkjet printing of functional materials customised for the renewable energy storage and generation including nano-functionalization of electrodes for fuel cells, batteries and supercapacitors.

Recently, he has been involved in some pioneering work on inkjet printing of SOFC and Li-S batteries electrodes.

R.I. Tomov has been reviewer for a number of international peer-review journals (The International Journal of Energy Research; The International Journal of Hydrogen Energy; The Electrochemical Society Journals; Applied Materials Today; Journal of Sol-Gel Science and Technology; Journal of European Ceramic Society) as well as a guest editor to the Nanomaterials Journal" MDPI, Switzerland.

Academic Background

Rumen I. Tomov received BS degree in Materials Science from St. Petersburg Electro-technical University (LETI), Russia in 1986; Ph.D. in Physics from Bulgarian Academy of Sciences in 1997 and MSc in Hydrogen Safety Engineering from the University of Ulster in 2012.

He joined the Department of Materials Science & Metallurgy of the University of Cambridge in 1999.

SPEAKERS Jon Horsley, Technical Account Manager, ERIS, Energy Systems Catapult

Biographical summary

Jon brings a broad experience in the energy and transport sector to his role at the Catapult, as well as an insider's view of grant-funding programmes from 5 years as Lead Technologist at InnovateUK and as Programme Director of the BEIS-funded Digital Engineering & Test Centre.

Jon's industrial experience covers electric, hybrid, and alternatively-fuelled vehicle engineering, and renewable energy projects in East Anglia. He offers a holistic approach to supporting ISCF PFER projects with the extensive range of capabilities available from Energy Systems Catapult and aims to deliver the best combination of services to each project to maximise projects' effectiveness.

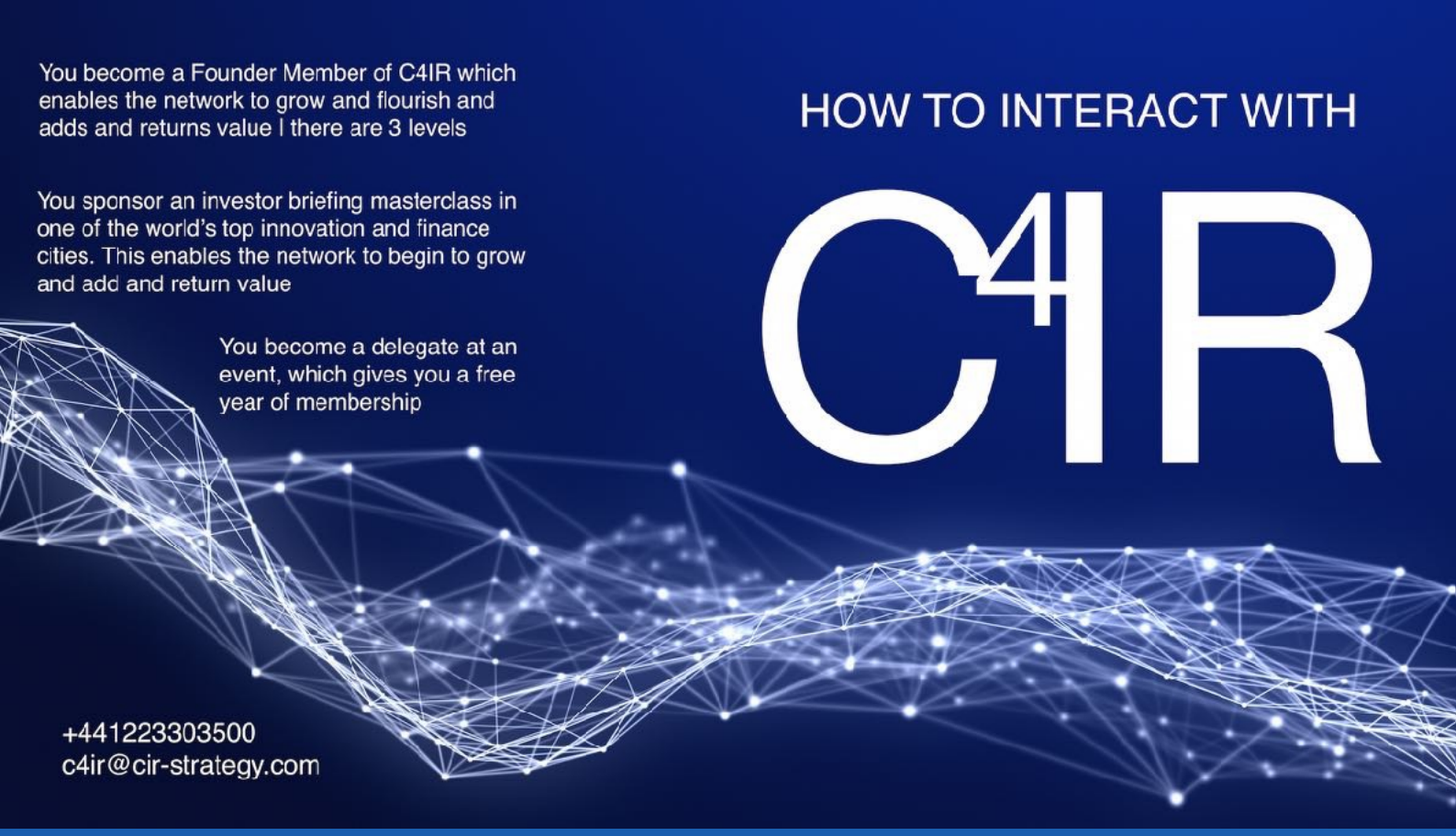
CIR SPEAKERS: Jon Horsley, Technical Account Manager, ERIS

Talk title

Prospering from the Energy Revolution: An introduction to the Energy Revolution Integration Service

Synopsis

UK Government is investing in research and industry to develop future smart energy systems through the Industrial Strategy Challenge Fund – Prospering from the Energy Revolution (PFER). Energy Systems Catapult is playing a central role within PFER through the Energy Revolution Integration Service (ERIS), providing expert guidance and support to selected projects, consistent and coherent analysis of the maturity, risks and benefits of the smart local energy systems and, as the programme progresses, capturing lessons and insights from the programme. This talk will introduce the work that the Catapult is doing to help projects move closer to real-world implementation.



We look forward to seeing you at

Cleanpower Smart Grids

Grand Challenges: Innovation for Clean Growth

1-2 July 2019
Cambridge

#CPSG19

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