



# SUSTAINABILITY TODAY

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energy | water | waste | recycling | sustainability

## Connecting you to the grid

g2 Energy have recently completed the 33kV Contestable Grid Connection and the full on-site Balance of Plant works on a 29MW battery storage facility, at Aylesford in Kent, for our client BESS Ltd.



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g2 Energy's in-house teams completed both the design and build for the entire project with site construction works commencing in October, and all works being completed in less than 4 months to ensure our client achieved two of the Triad revenue opportunities.

### Works included

- ▼ Appointed as Principal Contractor under the CDM regulations
- ▼ Electrical, Civil & Structural Design for the UKPN Contestable Works & associated S/S
- ▼ Supply & Install the DNO

approved switchboard to include 33kV metering circuit breaker, Protection System, Battery & Charger to DNO specification, plus all multicore cabling

- ▼ Detailed Electrical & Civil design for the BoP works to include general arrangement and site layout plans, 33kV client side Containerised Substation, all cable and drainage plans
- ▼ Earthing study and report, plus all site specific Power System Studies and site topographical and geotechnical surveys

- ▼ Supply and install of all concrete foundations for the 23 Battery Containers, Substations, Transformers and lighting and CCTV columns
- ▼ Supply & install 40ft steel Containerised Substation to include; 33kV switchboard, battery charger, metering panel, 33kV transformers, LVAC board and small lighting, heating and power, plus the associated internal & external Earthing systems
- ▼ Supply and install 33kV cable works, including all jointing and termination works
- ▼ All miscellaneous site works including security and remote operational access (SCADA) systems.

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## EMS Industries

EMS Industries are a world leading UK manufacturer of ram pumps and grit removal equipment used in a wide ranging variety of applications including food waste, farm waste and waste water.

The EMS ram pump is renowned for being a robust solution for handling the most arduous of applications whilst maintaining reliability and low maintenance costs.

Following on from introducing our Ram pump into the arduous food waste market either pumping directly from Hammer Mills or in the Thermal process both of which are crucial pinch points we have had huge success in replacing existing pumps that just cannot cope with the wearing properties of the incoming waste.

We now have many "real life" success stories backed by our satisfied customers who in some cases have seen payback on



their investments within 6 months. Speak to the EMS sales team about how we can help to improve your pump reliability, lower spare parts usage, reduce mechanical interventions and provide significant savings on whole life costs.

EMS will again be exhibiting UK AD & Biogas Exhibition in July 2018 at the NEC Birmingham, please take time to visit our stand B405 to discuss any requirements you may have.

Contact  
T +44 (0)1782 510051  
[www.emsindustriesltd.com](http://www.emsindustriesltd.com)

# Decarbonising energy using high energy density batteries

Dr Gareth Hinds, NPL Fellow and Science Area Leader in Electrochemistry at the National Physical Laboratory (NPL)

A major transition from fossil fuels to renewable, low carbon energy is under way, driven by the need to cut greenhouse gas emissions and mitigate air pollution in urban areas. High energy density batteries will play a critical role in achieving this transition by enabling the rollout of electric vehicles (EVs) and providing a means to balance supply and demand on the grid as renewable penetration increases. However, as adoption of these technologies continues to grow, so will consumer expectations of battery performance.

### UK ambition

The Faraday Battery Challenge, announced by the Government in 2017, is a commitment of £246 million over 4 years for battery research, and has set challenging targets for 2035 – to double the range of EV battery packs, while decreasing their cost by over 60% and increasing lifetime from 8 to 15 years. World-class R&D will be vital to ensure that these targets are met and to realise the UK's ambition to lead the world in the design, development and manufacture of batteries for the electrification of vehicles.

NPL's research in battery technologies is primarily focused on the development of in-situ diagnostic techniques, modelling tools and standard test methods to better understand battery performance and degradation. This is helping industry to develop cheaper, longer lasting and safer batteries.

### Improving battery safety

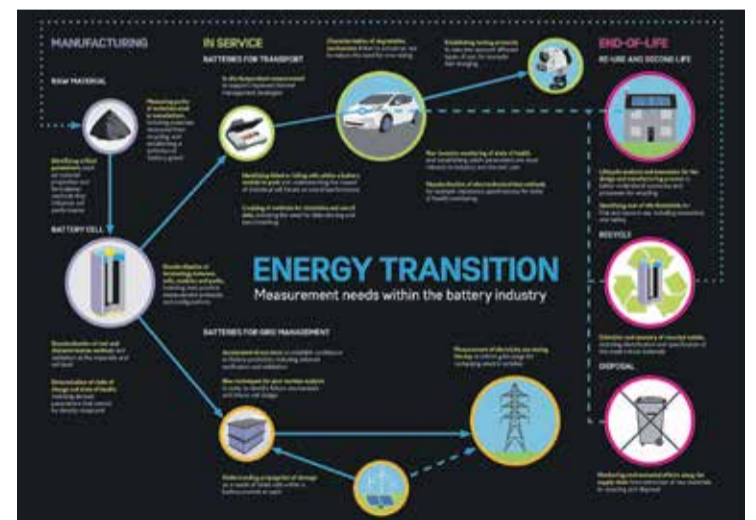
As the energy density of battery cells increases to meet the

demanding requirements of emerging markets, the effectiveness of battery safety features becomes ever more critical. The failure mechanism of most concern from a safety perspective is thermal runaway, which can occur when local heating within a battery cell, for example due to a manufacturing flaw, leads to chemical reactions that generate further heat within the cell. This positive feedback process can then cascade rapidly to produce explosion or fire.

The design of cells that are resistant to thermal runaway is an urgent priority for manufacturers and end users, as highlighted by the Samsung mobile phone fires and the grounding of the Boeing Dreamliner fleet a few years ago.

NPL has been working closely with UCL, NASA, the US National Renewable Energy Laboratory (NREL) and the European Synchrotron Research Facility (ESRF) to understand what happens inside a lithium ion battery cell in the moments leading up to thermal runaway. By combining high speed synchrotron X-ray imaging with a novel internal short circuit device, we achieved the first real time 3D images of the initiation and propagation of thermal runaway over a timescale of milliseconds. The importance of this research was recognised by The Engineer's 2017 Collaborate to Innovate Award in the Safety and Security category.

This novel approach has demonstrated that the addition of a second pressure relief vent at the base of a cylindrical lithium ion cell can significantly reduce the risk of cell rupture due to vent clogging, providing essential



information to manufacturers to improve the safety of batteries.

### Next steps for batteries

At NPL, we are aware that the challenges don't stop there. In consultation with a range of key stakeholders, we have produced a report 'Energy Transition: Measurement needs within the battery industry', which identifies and prioritises measurement challenges across the UK battery supply chain. The infographic above highlights the key challenges that need to be overcome to pave the way for an electric future.

Find out more about NPL's work in Electrochemistry  
<http://npl.co.uk/science-technology/electrochemistry/>

## Solutions for Smart Manufacturing and Green Cities



Delta, a global leader in power and thermal management solutions, highlighted at Hannover Messe 2018, its unique ecosystem of smart and energy-efficient solutions to realise smart manufacturing as well as safe and comfortable green cities. Delta underscored the superior features of its new High-Flexibility Multi-Tasking Smart Production Line, a 4-meter IIoT-based manufacturing platform integrating three robot workstations, software systems and a smart conveyor to offer visitors a live demo of smart manufacturing. In addition, Delta displayed an abundant range of solutions for sustainable cities, including the IoT-based Building Management Platform, which integrates our building automation technologies, IP surveillance equipment and smart LED lighting to deliver substantial energy savings and lower carbon emissions in commercial and industrial facilities.

For smart manufacturing, Delta presented its full range of Industrial Automation Solutions, which this year are led by the new High-Flexibility Multi-Tasking Smart Production Line, a highly sophisticated platform capable of producing different product types simultaneously through the support of Delta's own Delta Manufacturing Execution System (DIAMES), IIoT routers, machine vision systems, 6-axis articulated and SCARA robot workstations as well as a smart conveyor. The IoT-based Building Management Platform highlighted to visitors Delta's high-calibre expertise in enabling smart green buildings.

The booth featured energy infrastructure solutions developed to support two key megatrends that are transforming cities worldwide: Electric vehicles (EV) and energy storage.

[www.delta-emea.com](http://www.delta-emea.com)

## UPS Systems support mission critical applications in five football stadiums



Delta, a global leader in power and thermal management solutions, announced the strong track record of its

uninterruptible power supply (UPS) systems in Russia continues thriving as they have been recently implemented to provide enhanced reliability and energy efficiency to various mission critical applications in five of the football stadiums selected to host the 2018 FIFA World Cup Russia™.

Within five football stadiums, over 1.2 MW power capacities of Delta's UPS systems support football field and emergency lighting, more than 1.5 MW sustain key infrastructure such as common area lighting and fire protection systems, and approximately 300 kW support surveillance and data transmission equipment.

Other Delta UPSs installed in these five stadiums include the HPH series with highly flexible power architectures of 20kVA and 40kVA to better fit specific customer requirements. These systems provide reliable power to emergency notification systems and fire protection infrastructure. These cutting-edge UPS systems as well as Delta's entire portfolio on Data Centre Infrastructure Solutions was exhibited at CeBIT 2018, the world's largest IT trade fair in Hannover, Germany.

### \*Disclaimer

The capitalized terms "FIFA", "FIFA World Cup", "2018 FIFA World Cup Russia", "Atos", "CEBIT" or other marks, trademarks, or trade names mentioned herein are trademarks, trade names, or copyrights of their respective owners and are herein referred to only for explanation of facts or descriptive purpose and to the respective owners' benefit, without intention of any use, implied sponsor, introduce, or infringement.

[www.delta-emea.com](http://www.delta-emea.com)

## CP Electronics gives voice to single and multi-room scene-setting via cloud based apps

The new RAPID Scene Control Solutions from CP Electronics gives the ability to customise lighting in offices and commercial buildings on a room by room basis using voice recognition, through cloud-based apps via a tablet and smartphone.

This energy and cost-saving system works in conjunction with the system's dimming lighting control modules (LCMs) and dimming luminaires. This integration allows RAPID to achieve advanced scene-setting capability across individual rooms and multiple floors. The use of a tablet or PC, especially if configured to voice recognition, provides end

users with real convenience and ease in set-up.

Using the simple command, "room recall", the RAPID control system allows set-up of the lighting control within a single room, using voice only. RAPID Scene Control can be used in a wide range of applications, allowing users to set different lighting



moods. Set up within each room through RAPID scene select plates or network WI-FI using a new cloud-based app created by CP Electronics. Compatible with windows 10, iOS, and android devices it gives end users instant scene control of their environment.

CP Electronics works with clients to create unique personal profiles, configured to the end users' exact requirements.

**Contact**  
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# AUDACY

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## New UltraChill range of Industrial Process Chillers

The UltraChill range of process chillers go from 0.89 to 160 kW. These compact, energy efficient units are suitable for a wide range of process cooling applications and industry sectors, including automotive, engineering, food and drinks production, pharmaceutical, plastics, print and packaging, medical and scientific.

The UltraChill range are available in varying formats and come with a wide range of standard options enabling easy adaption to best suit individual processes and applications. All units come with a fully corrosion resistant, nonferrous

coolant circuit, including powerful circulating pump and high efficiency, copper brazed, stainless steel plate heat exchanger. A package of safety interlocks help protect both the chiller and process, whilst an advanced digital controller with diagnostics and alarms, provide a comprehensive user interface.

Highly competitive, the UltraChill range are available on short lead times and supported nationwide by a fully trained network of engineers, ensuring ongoing, quick and reliable support.

Thermal Exchange Ltd is an ISO 9001 Company specialising in providing process cooling and thermal management systems for industrial, medical and scientific applications. Based in Leicester since 1982, Thermal Exchange both manufacture and distribute a wide range of standard temperature control equipment and also welcome enquiries for special design requirements.

**Contact**  
T +44 (0)116 254 6652  
sales@thermalexchange.co.uk



## All bark, no bite

It's essential that any new environmental watchdog can genuinely hold the government to account after Brexit, writes Neil Howe.



As the UK's exit from the EU continues to be negotiated, we are starting to gain some insight into how the country's environment will look post-Brexit. The latest glimpse comes from the UK government's consultation on Environmental Principles and Governance after EU Exit. Running until August 2018, the consultation proposes the creation of an independent watchdog to hold the government to account for the policies and decisions it makes on environmental protection. Currently, the European Commission, supported by the European Environment Agency, monitors the implementation of EU environmental legislation across member states. Where necessary, cases of non-compliance are

brought to the European Court of Justice to ensure appropriate application of the law.

### Addressing the issues

Once the UK leaves the EU, it will need an independent body to take over the monitoring of the UK government, in place of European jurisdiction. The consultation attempts to address this, by examining:

- ▼ The current environmental principles in international and EU law, and how they can be implemented into domestic policy and a legal framework through a new policy statement
- ▼ The creation of a new watchdog to hold the government accountable for the environment, including the development and implementation of policies
- ▼ The role of the watchdog in the wider environmental context, and how it will work with the government and other authorities, such as the Environment Agency and Natural England.

### Long time coming

Proposals for a new environmental watchdog were first suggested by environment secretary Michael Gove in November 2017. Amid concerns that the environmental legislation enshrined in EU law could be lost, and that the UK would be prepared to relax environmental policies post-Brexit, he suggested creating a "green Brexit" in which the environment would have a powerful voice. However, the suggested consultation did not materialise – something that has been picked up on by the House of Lords in its ongoing scrutiny of the EU Withdrawal Bill.

### Modest proposals

Several months on, we finally saw some initial published proposals, although they appeared to reflect current governmental divisions; it was a compromise. There would be a new watchdog, but it would be without any real power. No means to initiate legal action against the government. No



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legislation made simple

obligation to continue to operate key environmental elements, such as the precautionary and 'polluter pays' principles. Nothing to do with climate change. 'Holding the government accountable' wouldn't mean taking it to court if it flouts environmental standards; it would mean serving it with 'advisory notices' that request compliance and identify corrective actions

### House rules

Initially, criticism of the proposals came from environmental campaigners, who almost universally condemned them; more recently, the Houses of Parliament have increased political scrutiny around the proposals.



On 13 June, during an intense session on the EU Withdrawal Bill, the Commons passed an amendment by 320 votes to 296 that ensure the watchdog will have the power to take "proportionate enforcement action – including legal proceedings if necessary".

There were also reassurances that existing EU environmental principles would be set in primary legislation.

However, its powers would be limited to central government, and not public bodies like local authorities and the Environment Agency. Despite the amendments, it still means the UK will have less protection than it currently has.

### Mind the gap

In a time of uncertainty for our profession, concrete proposals on filling the environmental 'governance gap' once the UK exits the EU are a positive step. However, it seems doubtful that, in its proposed form, the new environmental watchdog will be able to do the task that has successfully been carried out by the European Commission and the European Court of Justice. Gove claimed the watchdog would have "real bite" – but without the power EU authorities currently enjoy, it lacks teeth. It's essential that any new body can genuinely hold the government to account in the same way that European institutions have been able to do in the past.

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## Jacopa enters tertiary treatment market

Wastewater systems and solutions experts Jacopa are to enter the UK and Ireland tertiary treatment market with a range of high-performance, low-operating cost, cloth media tertiary filters for wastewater treatment. The move marks a watershed for the company as it consolidates and builds on its extensive wastewater treatment expertise to provide a one-stop-shop for wastewater treatment products and services.

The FFP™ fixed plate cloth media filters are manufactured by American company Fluidyne; a well established innovator in filtration technologies. The filters are already recognised internationally as an ideal solution for phosphorus removal in wastewater treatment works, and have a wide range of further applications.

The deployment of tertiary treatment processes to polish effluents, reducing concentrations of suspended solids is well established and requirements to achieve higher standards is leading to increased interest in priority substance removal including phosphorus, putting more reliance upon tertiary treatment to maintain compliance with ever tightening consent standards.

Fluidyne FFP™ cloth media filters feature an innovative fixed panel design that uses simple gravity to produce filtration and backwash flow. The high performance, low-operating cost, cloth media filter is suitable for tertiary treatment for both large and small wastewater treatment applications.

Their popularity is due to a combination of factors including ease of operation, simple maintenance, cost-effectiveness, robustness and reliability. The filter requires no internal or submerged moving parts; so much of the mechanical complexity, maintenance, and costs that arise with other systems is removed.

The exceptionally low cost of media replacement is a particular advantage. The chemically resistant acrylic cloth media is supplied in flat sheets, requiring no stitching or fabrication and is simply clamped to the cassette frame with no specialist tools required.



This simple design reduces replacement media cost, lead-time and maintenance.

The units deliver highly effective filtration and have a wide capacity range. Fluidyne filters remove suspended solids down to 10 microns and can be configured for flows ranging up to 250 litres/s per unit. The filters are provided as completely factory assembled freestanding modular stainless steel packages, additionally modules can be retrofitted into new or existing concrete basins. Packages are built offsite and delivered fully assembled requiring just power and piping connections enabling efficient, economical installation and set up with reduced site health and safety risks.

Tertiary suspended solids and phosphorus removal are seen as key applications in the UK and Ireland, though the cloth filters have multiple potential uses both for municipal and industrial applications upstream and downstream of other treatment processes.

www.jacopa.com

# Delta and Redington Gulf Sign Partnership to Distribute Uninterruptable Power Supply (UPS) Systems in East Africa

Delta, a global leader in power and thermal management solutions, announced the signing of a partnership agreement that designates Redington Gulf as its authorised distributor of its Uninterrupted Power Supply (UPS) systems in East Africa. Redington Gulf is a prominent distributor specialised in providing end-to-end supply chain solutions in this high-growth market in East Africa. The agreement is expected to create synergies resulting from the integration of Delta's state-of-the-art UPS systems and Redington Gulf's local market expertise, partner ecosystem and services platform to ultimately enhance the power reliability, protection and efficiency of various mission critical applications in the region. Speaking about the announcement, Mr. Motaz Al Ma'ani, Senior Manager & General Manager, Middle East & Africa, Delta Electronics EMEA Region, stressed that the growth of a business should never be at risk of limitation or delay due to avoidable technical restrictions of existing power hardware. He also added that with its Datacentre and UPS solutions, Delta delivers a competitive edge to companies that are reliant on first rate power solutions.

"Delta's flexible and scalable UPS solutions are built to be easy to expand as required and to accommodate the demand for power protection" said Mr. Al Ma'ani. "We are committed to improving the solutions we offer through advanced technology and innovation, to ensure that we meet the needs of our consumers while delivering utmost value and efficiency," he concluded.

Also commenting about the agreement, Redington Gulf President, IT Volume Africa, Mr. Aloysius Fernandes, said that the partnership would reinforce its vision of being the leading Value-Added Distributor and Service Provider for all global brands in IT and Telecommunications for Middle, East, Africa, Turkey and CIS countries.

"We are excited to be affiliated and named as the distributor of choice for the world recognised brand, Delta Electronics. Indeed, this is a great addition to our growing portfolio," he stated.

The announcement is timely and comes as a relief to many companies, as the lack of a stable electricity supply is often cited as a major constraint of doing business in East Africa. It is estimated that power outages often lead to losses of 1% -2% of the annual GDP. 78.9% of businesses in the region report having experienced electrical outages. In a typical month, the number of outages is about nine, with the average duration of an outage lasting for six hours - which has a considerable impact for any business competing in today's always connected, digital economy.

Delta's entry into East Africa - as supported by Redington Gulf - will see businesses gain access to a stable and consistent power supply even during supply failures, which will greatly reduce costs to a business and drive competitiveness while ensuring operations continue to run smoothly.

The award-winning Delta Electronics' UPS systems are



trusted as the ideal power solutions by a wide range of industries spanning from financial institutions, to IT centres and SMEs. For example, mission critical applications in airline companies in the Middle East and telecom carriers in Saudi Arabia, benefit from the high-quality power protection provided by our systems. Our UPSs are designed to work as advanced power managers capable of ensuring the availability of an uninterrupted power supply while safeguarding against several potential energy issues, including voltage surges and spikes, voltage sags, total power failure and frequency differences.

[www.delta-emea.com](http://www.delta-emea.com)

## Editor Recommends

### Siloxanes Measuring Centre at ADBlogas 2018



SITS Instruments and IMSPEX Diagnostics have combined forces to showcase the Siloxanes Measuring Centre at this years AD Biogas event which will deliver a complete service for monitoring siloxanes in biogas for CHP and Gas-to-Grid installations.

Siloxanes, used in food, pharmaceutical, cosmetics and dry-cleaning industries, burn to silica in CHP engines and heating appliances. The silica forms damaging coatings on flame sensors in heating equipment and coats plugs, valves and cylinder heads in CHP engines, as well as abrading all contact surfaces. Loss of generating revenue and damage to CHP plant can run into tens of thousands of pounds.

Cleaning of the raw gas is therefore imperative and for both CHP and Gas to Grid applications this involves the use of activated carbon filters. Monitoring these filters enables optimisation of change over whilst monitoring the cleaned gas proves compliance with siloxane concentration limits of the grid.

Instrument sensitivity ranges from 0.03mg/m<sup>3</sup> up to 200 mg/m<sup>3</sup> and so covers sewage, landfill and food waste operations. Monitors can be supplied in packaged, weatherproof kiosks. Data comms, monitoring service, installation and routine maintenance are all provided in house.

Please visit and speak to us about your siloxanes measuring requirements at stand number H101

Contact  
T 01443 740217  
[www.imspe.com](http://www.imspe.com)

### Lanes Group's new contract with Durham University



Durham University has awarded Lanes Group plc a contract to provide it with a comprehensive range of drainage services. Under the 18-month contract, Lanes is sole provider of all specialist drainage services needed by the university, one of the most prestigious centres of academic learning in the world.

The work is being carried out by drainage teams from the Lanes Newcastle depot - with the university also having the benefit of access to specialist skills and services of Lanes teams across the UK, if they are needed.

Richard Leigh, Lanes Group Development Director, said: "We're delighted that Durham University has selected Lanes to be its drainage service provider. We were able to demonstrate that we can deliver a full range of services with the high quality and value the university expects, while maintaining the highest standard of

safety and customer service while working in live environments, with least disruption to students, staff, and visitors."

Lanes Group is delivering reactive and planned drainage maintenance services across all Durham University's built assets, including teaching facilities, administration buildings, and student accommodation.

Services include CCTV drainage surveys, emergency drain and sewer unblocking, planned drain cleaning and maintenance, pipe descaling, manhole repairs, grease trap cleaning, and septic tank emptying and cleaning.

Durham University's estate is on two sites, in Durham City and on the Queen's Campus in Stockton-on-Tees. Working safely and sensitively on drainage systems both within and under buildings that have significant historical importance will be essential.

Of the 320 buildings in the estate, about 17 percent are more than 150 years old, with one dating back to 1076. Durham Castle and associated building are part of a World Heritage Site.

Durham is one of the most modern and successful research universities in the UK. It is a World Top 100 University with a global reputation and performance in research and education.

[www.lanesfordrains.co.uk](http://www.lanesfordrains.co.uk)

### DC Rapid Electric Vehicle (EV) Charger



Delta has signed a partnership agreement with Rolec EV, one of Europe's leading EV charge point manufacturers and installers.

Under the terms of the agreement, Delta's range of DC EV chargers will be available within the UK with immediate effect from Rolec EV.

Delta's rapid DC EV charging technology can provide energy for up to four EVs simultaneously (up to two DC ports, plus up to two in AC). This dramatically reduces the queuing time for users as well as on-site space requirements. When configured to provide 150kW of output, it allows users to charge a range of up to 100 km in less than 15 minutes.

Rolec already boasts the UK's largest and most comprehensive AC EV charging range and this latest announcement with Delta will place Rolec at the forefront of the DC rapid charger industry.

[www.delta-emea.com](http://www.delta-emea.com)

### Battery Recycling

T 0121 369 9960 [www.AEL.global](http://www.AEL.global)

