

THE ELECTRICITY STORAGE
NETWORK

The
**Electricity Storage Network
Annual Symposium**

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I'm delighted to welcome you to the tenth Electricity Storage Network (ESN) annual symposium and the first since Regen has taken on the management of the ESN.

The ESN was established in 2008 as the UK industry group dedicated to electricity storage.

We are in the midst of a revolution in our energy system in which storage has a key role to play. Long-established power sector business models are being transformed and new players are emerging. However, both storage and decentralised generation are at pivotal points, grappling to achieve a model that allows them to flourish in the face of challenging policy and regulation.

This symposium connects experts from across the whole energy system to consider how to maximise the value of storage and decentralised generation. The event provides a platform for debate between the key players and policy makers and a forum for learning and insight; a chance for us, together, to devise solutions to our most pressing challenges.

I hope you leave today inspired by what we can achieve together in the years ahead.



Rachel Hayes
Director, The Electricity Storage Network



THE ELECTRICITY STORAGE NETWORK

The Electricity Storage Network Annual Symposium

Osborne Clarke, London | 4 June 2019

9:00 Registration, exhibition and networking

9:30 Chair's introduction

Merlin Hyman, chief executive officer, Regen

Storage sector progress report

Ray Arrell, senior project manager, Regen



9:40 Leaders forum: the value of storage in smart, decarbonised energy system

To kick off the conference, we will be debating where the value for storage will be in the energy system. Our leaders include key decision makers in the future design and operation of the system and a prominent entrepreneur focused on optimising storage business models. Questions for discussion will include:

- ▶ What challenges does the energy transformation create for system operators responsible for balancing and managing the grid and what value streams will this create?
- ▶ What will the key revenue streams be to underpin storage business models in a changing system?
- ▶ How can storage and distributed generation work together to underpin a smart, decarbonised energy system?

Chair: Merlin Hyman, chief executive officer, Regen

Participants:

- ▶ Cathy McClay, head of future markets, National Grid Electricity System Operator
- ▶ Ben Irons, co-founder, Habitat Energy
- ▶ Javier Cavada, chief executive office, Highview Power
- ▶ Mike Ryan, asset management director, Anesco



10:25 How can we capitalise on smart, digital technologies for storage?

Smart technologies such as machine learning, distributed ledgers and the Internet of Things are often pegged as the answer to all ills in the energy sector, particularly for storage. The prospects are certainly exciting – new market models or enhanced prediction facilitating time of use. But despite high levels of ambition in the industry and from government, the benefits have not yet materialised. What technologies are achievable in the near term? What are the barriers to implementing them for storage?

Participants:

- ▶ Jon Ferris, strategy director, Electron
- ▶ David Sykes, head of data science, Octopus Energy
- ▶ Laura Sandys, chief executive officer, Challenging Ideas and Energy Data Taskforce
- ▶ Maria Carmona, energy market analyst, Arenko



11:15 Break and networking



11:45 The next chapter of flexibility provision

The flexibility provided by storage is central to enabling decarbonisation of the energy system, but how it is incentivised and remunerated has varied dramatically over the last few years. How should markets be shaping flexibility provision in future? What will price volatility do for the arbitrage model? How will we get longer duration storage onto the system?

After a 'state of the sector' update on past and current flexibility markets from Ray Arrell, our industry panel will share their experiences and map out a future for flexibility and storage in the UK.

Speaker and chair: Ray Arrell, senior project manager, Regen

Participants:

- ▶ Steve Atkins, DSO transition manager, Scottish and Southern Electricity Networks
- ▶ Tom Palmer, principal consultant, Cornwall Insight
- ▶ Andy Scott, consultant, Swanbarton
- ▶ Hallstein Hagen, senior consultant, NODES



12:30 Interview with Frances Warburton, director, energy system transition, Ofgem

This one-to-one interview is an opportunity to understand Ofgem's aims, how the multitude of regulatory reforms fit together, and gain an insight into Ofgem's decision making.



13:00 Lunch and networking

14:30 How can policy and regulation enable the transformation of our energy system and unlock the potential of storage?

Storage is put forward as the vital cog to solve the myriad challenges facing the energy network, but its deployment and its treatment in regulation does not yet match this ambition. In the run up to a new government Energy White Paper is radical change needed?

Two speakers will present a disruptive view of policy and regulation in the sector and our panellists will assess whether we're up the challenge.

Chair: Alan John, partner, Osborne Clarke

Speaker: Felicity Jones, partner, Everoze

Participants:

- ▶ Will Broad, interim deputy director, electricity systems at Department of Business, Energy and Industrial Strategy
- ▶ Madeleine Greenhalgh, policy lead, The Electricity Storage Network
- ▶ Catalina Rozo, regulatory analyst, Zenobe
- ▶ Mike Hemsley, senior power analyst, Committee on Climate Change



15:30 Storage: the long term vision

Storage, like many other new technologies in the energy industry, has dealt with a rapidly changing environment since its entrance into the sector. What does a more stable, long-term future look like for storage? What does the government need to do to enable that?

As we think about the long term financial and environmental future of the energy system, what are the necessary and likely projections for storage deployment? What future market opportunities are there? Can we take heed from international examples?

Chair: Merlin Hyman, chief executive officer, Regen

Participants:

- ▶ Toddington Harper, chief executive officer, GRIDSERVE
- ▶ Marek Kubik, market director, Fluence
- ▶ Rubina Singh, global channel propositions, Centrica
- ▶ Irena Spazzapan, partner, SYSTEMIQ



16:15 Close



Ray Arrell

Regen, senior project manager

Ray's main focus is to continue Regen's work and understanding around energy storage, flexibility markets and the evolution of the UK's electricity and gas networks. Ray has strong experience in managing technical projects and is a regular speaker at energy industry events and conferences. Ray holds a first class honours degree in electrical engineering, is a registered Incorporated Engineer and has a parallel role working as senior technical officer for the Electricity Storage Network. Ray joined Regen at the end of January 2017, after 13 years working in energy management in the water industry, predominantly through a number of roles he held at South West Water and the regional committee for the Institute of Water.



Steve Atkins

Scottish and Southern Electricity Networks, DSO transition manager

Steve spent 17 years in finance performing a number of strategic roles before setting up his own renewables company (with support from Regen). He joined SSEN in 2004 to manage their major commercial contracts and is now responsible for managing the DSO transition, working closely with the ENA's Open Networks Project.



Will Broad

Department for Business, Energy and Industrial Strategy, interim deputy director, Electricity Systems

Will Broad is interim deputy director for electricity systems at the Department of Business, Energy and Industrial Strategy, and has been heading up the Government's smart energy policy since January 2018. He previously was head of electricity storage, and before that worked on energy efficiency policy for Government and Ofgem.



Maria Carmona

Arenko, energy market analyst

Maria is a young professional in the energy sector with an academic background in energy engineering and policy, and a deep-rooted passion for the environment and tackling climate change on all levels. Maria soon developed a keen interest in energy storage as a way to promote grid flexibility, firmly believing that it must be a vital component of a large-scale transition towards intermittent generation from renewables. Working with Arenko Group opened her eyes to the role of smart technologies in creating a successful business model for storage within this transition, focusing on the digitisation of assets and their optimisation via artificial intelligence and machine learning.



Javier Cavada

Highview, chief executive officer

Dr Javier Cavada drives the international expansion and deployment of Highview Power's Cryogenic Energy storage technology, which provides long-duration and large scale to integrate 100% renewables. Javier joined Highview Power in 2018 after 17 years at Wartsilä Corporation where he was President of the energy division, and chairman of Greensmith Energy, US leading provider of energy storage services. Javier has also held executive roles in China, Italy, the Netherlands, Spain and Finland.

Speakers



Jon Ferris
Electron, strategy director

Jon Ferris has spent his career in energy focused on making the industry function better for consumers, by helping them take control of the risks resulting from their need for energy. Starting in 2005 at the outset of flexible energy contracts, Jon developed trading and reporting systems, and automated market information and data services to support the very largest businesses manage their exposure to the energy markets, eventually building up a trading desk, managing 12 TWh of wholesale power and gas.



Madeleine Greenhalgh
Electricity Storage Network, policy lead

Madeleine is the policy lead for Regen and the Electricity Storage Network, working to improve the policy environment for renewables, storage and smart technologies. Madeleine's previous experience includes working in the heart of government to formulate policy, with particular experience on data science and privacy.



Toddington Harper
GRIDSERVE, chief executive officer

Toddington has had leadership roles in sustainable energy businesses for the last 15-years, most recently prior to GRIDSERVE, as the CEO of BELECTRIC UK, which he co-founded in 2011, and grew to a business employing over one hundred people, developing and constructing over 350MW of solar and battery projects, before overseeing the sale of the business to RWE's Innogy in 2016. Since 2016 Toddington has been building GRIDSERVE into a business with now over 20 employees and ambitions to become a global energy services market leader, with a focus on sustainable energy solutions for critical power applications.



Hallstein Hagen
NODES, senior consultant

Hallstein Hagen is a Senior Consultant at NODES and has been part of the Agder Energi Flexibility project that led to the establishment of NODES in 2016. Hallstein has long experience delivering energy trading and risk management software to the energy sector as well as international experience from the finance and commodity industry from his time at Reuters. NODES is building Europe's most customer-centric, integrated energy marketplace to unlock the value of local flexible power resources supporting the drive to a sustainable, emission free future.



Mike Hemsley
Committee on Climate Change, senior power analyst

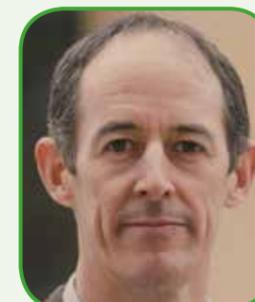
Mike Hemsley leads the CCC's work on power sector decarbonisation, having joined the Committee on Climate Change five years ago. He has focused on technologies and policies to reduce emissions in the UK power system, as well as improving electricity system flexibility and producing research on the costs of low-carbon policies on consumer bills in the UK. He has recently completed the CCC's review of the best use of hydrogen to meet UK decarbonisation targets, alongside a modelling project on the system costs of decarbonising heat. Prior to joining the CCC, Mike studied Environmental Technology and energy policy at Imperial College London, and worked in Brussels at the European Renewable Energy Council.

Speakers



Merlin Hyman
Regen, chief executive officer

Merlin leads Regen's mission to transform how we generate, supply and use energy. Merlin is a passionate advocate of a smart, decentralised, low carbon energy system based on renewable energy. He is an influential figure in energy policy sitting on leading forums such as the BEIS and Ofgem Smart Systems Forum. Merlin writes and presents extensively on Regen's pioneering work. Merlin was previously director of the Environmental Industries Commission, where he worked in Whitehall and Westminster to ensure government support for British companies to succeed in the rapidly growing worldwide market for low-carbon products and services.



Ben Irons
Habitat Energy, co-founder

Ben is a battery storage expert, entrepreneur, and co-founder of Habitat Energy, a trading and optimisation platform for grid-scale battery storage. Ben previously founded the consulting arm of Aurora Energy Research where he advised battery developers and investors on forecasting and strategy. Before that he was a director at Centrica Energy, and energy consultant at McKinsey in London. He has a PhD in economics from Oxford University.



Alan John
Osborne Clarke, partner

Alan is a partner in Osborne Clarke's projects practice and heads the firm's environment and energy group, with a focus on providing legal advice to clients in the renewable energy sector. He has more than twenty five years' experience working for clients across all renewable technologies. Holistic advice on climate change, sustainability and low-carbon business is a core focus of his practice and he has particular specialisms in energy management and storage, power and heat purchase agreements and private wire, reserve power and ancillary services arrangements. He works for a wide range of clients across the environment and energy sector, ranging from large established businesses to younger, entrepreneurial companies. Alan is also a non-executive director of Regen.



Felicity Jones
Everoze, partner

Felicity is a partner at Everoze, an employee-owned technical and commercial consultancy specialising in renewables, storage and energy system flexibility. She takes particular interest in new energy business models and revenue-stacking for distributed asset portfolios. Felicity is a member of the Customer Engagement Group for Western Power Distribution, a Trustee of the Centre for Sustainable Energy and an advisory group member for the University of Exeter's iGov2 programme on energy system change. She has previously served as chair of the World Energy Council storage knowledge network.



Marek Kubik
Fluence, market director

Marek leads Fluence's UK and Ireland client solutions team; responsible for overseeing energy storage sales and project proposals across UK and Ireland, the Middle East and Africa. He has a decade of experience in cleantech, including an instrumental role in delivering Europe's first commercial battery storage array in 2014/15 and more recently a record-breaking 120 MW energy storage portfolio transaction; the largest in the world to date. A tech futurist and Forbes contributor, Marek was also named a 2017 Forbes 30 Under 30 honouree; a list that recognises young entrepreneurs and industry leaders.

Speakers



Cathy McClay

National Grid Electricity System Operator, head of future markets

Cathy McClay is head of future markets in the System Operator at National Grid. Cathy and her team work with the wider industry to develop and drive the change in the gas, electricity and capacity markets required to transition to the energy system of the future. A key focus of her role is ensuring that the market design and the code governance underpinning the markets is fit for purpose given the much wider number of market participants than in the past. Prior to this, Cathy was head of commercial, electricity. Cathy has over 15 years' experience in the electricity industry working for several energy companies in the UK, France and the Netherlands where she specialised in modelling and analysis for trading, risk management and strategy.



Tom Palmer

Cornwall Insight, principal consultant

Tom is a Principal Consultant and manages the Cornwall Insight GB consultancy business. At Cornwall Insight, Tom has:

- Supported a global institutional investor on energy supply and DSR due diligence
- Supported on the commercial due diligence on a number of battery storage deals
- Worked for government on future market based mechanisms for CCUS

Tom has 14 years' experience working across a range of energy roles at EDF Energy, Ofgem, AEA and Origami Energy. His specialist areas include: flexibility, frequency response, reserve markets, renewables, investment appraisal and energy policy.



Catalina Rozo

Zenobe, regulatory analyst

Catalina works as a regulation and public affairs specialist at Zenobe Energy. Prior to Zenobe, Catalina was part of Ofgem's assurance team. She also worked as a regulatory analyst for an energy supplier. She has a comprehensive knowledge of the European energy market and attended the Paris climate conference (COP 21) with the Colombian delegation in 2015. Catalina has a bachelor's degree in economics, a master's degree in energy economics and a master's degree in network economics. She is a member of the British Institute of Energy Economics.



Mike Ryan

Anesco, asset management director

Mike Ryan is the asset management director at Anesco, where he focuses on maximising returns on the solar and storage assets through optimising revenue from wholesale markets and grid services. He joined Anesco in 2018 having previously worked for National Grid Electricity System Operator (ESO), where he held the positions of operability strategy manager and trading manager, responsible for reducing the cost to the end consumer of system operation through the use of traded products and forward contracts. Mike holds a degree in electromechanical engineering from the University of Southampton.



Laura Sandys

Challenging Ideas, chief executive officer

Laura is a senior independent director at SGN Network and has recently been appointed chair of the BEIS/Ofgem Energy System Data Taskforce, and co-chair of the IPPR Environment and Justice Commission. She was appointed as a member of the Advisory Panel for the Government's Cost of Energy Review, and is on the Council for Carbon Capture Utilisation and Storage. Laura is also a founder of the Food Foundation and co-founder of POWERful Women, a Visiting senior Fellow at Kings College, and a member of the Carbon Tracker Advisory Board.

Speakers



Andy Scott

Swanbarton Energy Storage Consultants, consultant

Andy has led Swanbarton's consultancy business for 3 years providing commercial analysis and due diligence on energy storage projects. He has also commercialised Swanbarton's Local Energy Market platform and storage control devices. Previous roles have included founding a start-up developing data collection mobile apps for utilities, product management for business process software, broadcast monitoring systems and telecoms monitoring.



Rubina Singh

Centrica, global channel propositions

Rubina Singh has 10 years of experience in renewable energy research and innovation, technology development and commercialisation in the North American and European markets. She is currently working on global strategic partnerships and business development for launching energy solutions, at Centrica Business Solutions. Some of her previous roles have been senior strategy consultant at Gemserv and head of Fraunhofer TechBridge. Her experience includes residential and commercial solar, e-mobility and battery storage in the UK and US markets.



Irena Spazzapan

SYSTEMIQ, partner

Irena leads the energy team at SYSTEMIQ, an investor in and advisor to clean tech start ups and corporates engaged with the energy transition. She is on the board of Upside Energy. She was previously 12 years at Goldman Sachs as an executive director in Gas and Power Origination. She is a CFA Charterholder and has degrees from SOAS and the University of Trieste.



David Sykes

Octopus Energy, head of data science

David leads the data science and analytics unit at Octopus Energy, a technology business that supplies green energy to 700 thousand households and businesses and retails electric vehicles and charging technology. David and his team build and maintain the cloud-based analytics and machine learning capabilities that sit at the heart of Octopus's Kraken platform, forecasting customer behaviour and helping to optimise hedging, pricing and operations. David built Agile Octopus and Outgoing Octopus, two dynamic time of use and time of generation tariffs that enable customers to benefit from smart energy management.



Frances Warburton

Ofgem, director, energy system transition

Frances joined Ofgem in January 2015 and is the director for energy systems transmission, with responsibility for the integration and transition of energy systems. This involves overseeing all aspects of network charging, access and system operation across the electricity and gas networks, and leading Ofgem's work on the future of gas and heat.

Before joining Ofgem, Frances was a director in the economic advisory practice at EY where she specialised in the energy sector. Prior to that, she was a competition investigation director at the Office of Fair Trading. Frances has a masters degree in economics from LSE and a bachelors degree in engineering physics.

MEMBER

THE ELECTRICITY STORAGE NETWORK



Madeleine Greenhalgh
ESN policy lead

The ESN was established in 2008 as the UK industry group dedicated to electricity storage. The Network includes a broad range of electricity storage technologies and members, such as electricity storage manufacturers and suppliers, project developers, users, electricity network operators, consultants, academic institutions, and research organisations. The ESN is managed by Regen.

Benefits of the Electricity Storage Network membership



Have influence

Have a stronger voice with BEIS, Ofgem, Treasury and key players, and shape the policy agenda around issues affecting the deployment of electricity storage and the role flexibility plays in the overall system.



Raise your profile

Increase your representation in the media and raise the profile of storage and its role in the system. Access our targeted networking opportunities through our exclusive events.



Stay informed

Attend our dedicated ESN-only events and working groups addressing the latest key issues for the sector, and receive our timely member newsletters and policy updates.

ESN working groups

As a network, we hold regular working group meetings where we discuss sector developments and how industry and government can improve and adapt to increase the uptake of storage. We work closely with government and regulators to create a sector that allows storage to flourish



Markets and Revenues

The markets and revenues working group looks at key market opportunities and new business models for storage, including future plans from the system operator and distribution system operators, existing and emerging markets and network charging reforms.



Health and Safety

The health and safety working group works alongside the Health and Safety Governance Group run by BEIS and the British Standards Institution. Key areas of focus include, sustainable materials sourcing and recycling. In particular, key materials such as lithium, cobalt and nickel warrant increased attention and action.



Planning

Reforming the planning regime for storage is a key area of focus for the ESN. This working group investigates current barriers within the planning regime and develop recommendations to influence officials.

ESN membership costs

Package	Conditions	2019
Sponsor	Any welcome	£5000 + VAT
Large corporate	Turnover above £1 million	£2500 + VAT
Medium corporate	£300K - £1 million turnover	£1000 + VAT
Small corporate	Up to 5 employees and/or up to £300K turnover	£500 + VAT
Academic	Academic institution	£500 + VAT

Sponsors

Anesco

www.ansesco.co.uk

Anesco is a global leader in renewable energy and recognised as one of the top cleantech companies in the world. Its specialist team manages the funding, development, operation and maintenance of renewable energy and energy efficiency projects.

Anesco is the market leader in energy storage in the UK having already developed over 100 MW as well as a substantial future pipeline. The company is also a major solar developer and has constructed over 100 solar farms, while its O&M division is monitoring over 21,500 sites.

Anesco was the first in the UK to achieve subsidy-free solar; first to introduce utility-scale energy storage; and first to co-locate energy storage with existing solar sites. To date, the technologies the company has deployed and managed are generating over 1 GW of renewable energy.



Fluence Energy

www.fluenceenergy.com

Fluence is the leading global energy storage technology and services company, created and backed by Siemens and AES, two industry powerhouses and pioneers in energy storage. Our mission is to create a more sustainable future by transforming the way we power our world.

Energy storage is critical to this transformation, yet today the market is fragmented and customers face the challenge of finding a trusted partner. Fluence brings proven technology solutions and services to customers that are modernizing our energy networks. We are the partner that can deliver at global scale with the most experienced and knowledgeable team in the world.



Highview Power

www.highviewpower.com

Highview Power is a designer and developer of true long-duration energy storage solutions for utilities and distributed power systems. The company's proprietary technology uses liquid air as the storage medium and its custom designed Liquid Air Energy Storage (LAES) solutions can deliver anywhere from 10 MW/40 MWh to more than 200 MW/1.2 GWh of energy. LAES has been developed using proven components from mature industries to deliver pumped-hydro capabilities without geographical constraints and it can be configured to convert waste heat and cold to power.



Osborne Clarke

www.osborneclarke.com

Osborne Clarke provide insightful and effective legal services to meet their clients' advisory, litigation and transactional needs. They help their clients gain competitive advantage in an international business environment that is reshaping to meet new digital, economic, environmental and political challenges. Their advice is framed by their deep knowledge of clients' industries and their international reach – Osborne Clarke have a presence across Europe and in the US.



Swanbarton Energy Storage Consultants

www.swanbarton.co.uk

Swanbarton Limited is an engineering and commercial consultancy business which is actively involved in the development and deployment of modern and smart technologies for electricity networks. Their background is in the development and the applications of electrical energy storage technologies. Their experience covers technical, commercial, marketing and regulatory aspects of energy technologies and their interaction with the power network. We support the development and deployment of energy storage, believing it to be our core knowledge area along with engineering and commercial insight into technology transfer, intellectual property and technology strategy, coupled with a powerful background in competitive analysis, market analysis, market development and marketing communication.



Media Partners

Energy-Storage.news



Focusing on one of the most important components of the decentralised, decarbonised and digitised energy systems of the future, Energy-Storage.news is the world's leading source for breaking news, analysis and opinion dedicated to the international industry, innovations and technologies.

reNEWS



reNEWS is the 'digital newspaper' and real-time news website tracking the renewable energy market. Established in 2002, the reNEWS newsletter is regarded as a leading source of information on the sector, providing the exclusive and unmissable stories that matter to the industry.

CURRENT ±



RENEWABLE FUTURES & GREEN ENERGY AWARDS

CONFERENCE | EXHIBITION | AWARDS
ASSEMBLY ROOMS, BATH – 27 NOVEMBER 2019



www.regen.co.uk/event/renewable-futures-and-green-energy-awards For more information, contact Hannah on hstanley@regen.co.uk or 01392 494 399

Regen energy insight paper series 2019

A series of policy and market insight papers exploring how the energy industry, and energy users, can rise to the challenge of climate change.

There is a growing recognition that action to combat climate change cannot be delayed and that, while we may have targets set for 2050, in reality the steps taken within the next decade will determine whether the world can avoid the worst effects of climate change above 1.5°C.

Evidence to support the assertion that the next decade is critical includes the 2018 **UN Intergovernmental Panel on Climate Change (IPCC) special report** on climate change impacts, which has highlighted the need to take action now, or risk either the catastrophic impact of runaway climate change or a much more drastic and expensive course of action to try and mitigate those effects later.

The progress made to decarbonise the UK power sector since 2010 is a great example of how the alignment of government policy, investment and industry can deliver new renewable energy solutions at scale. Important steps have been taken but, in truth, we are still walking in the foothills of energy transformation. The biggest challenges to achieve full decarbonisation across all energy vectors – power, heat and transport – have yet to be met and if anything, progress has begun to falter over the past three years.

A decade to make a difference – insight series

Faced with the need to achieve both rapid and dramatic change, the energy industry is being asked to rise to the decarbonisation challenge. The big question is whether the industry will be able to do this? And if so, what new technologies, policies and business models will be required to enable radical change?

Throughout 2019, Regen will be publishing a series of thought-provoking papers looking at the challenges and solutions that would deliver transformation change across the energy industry.

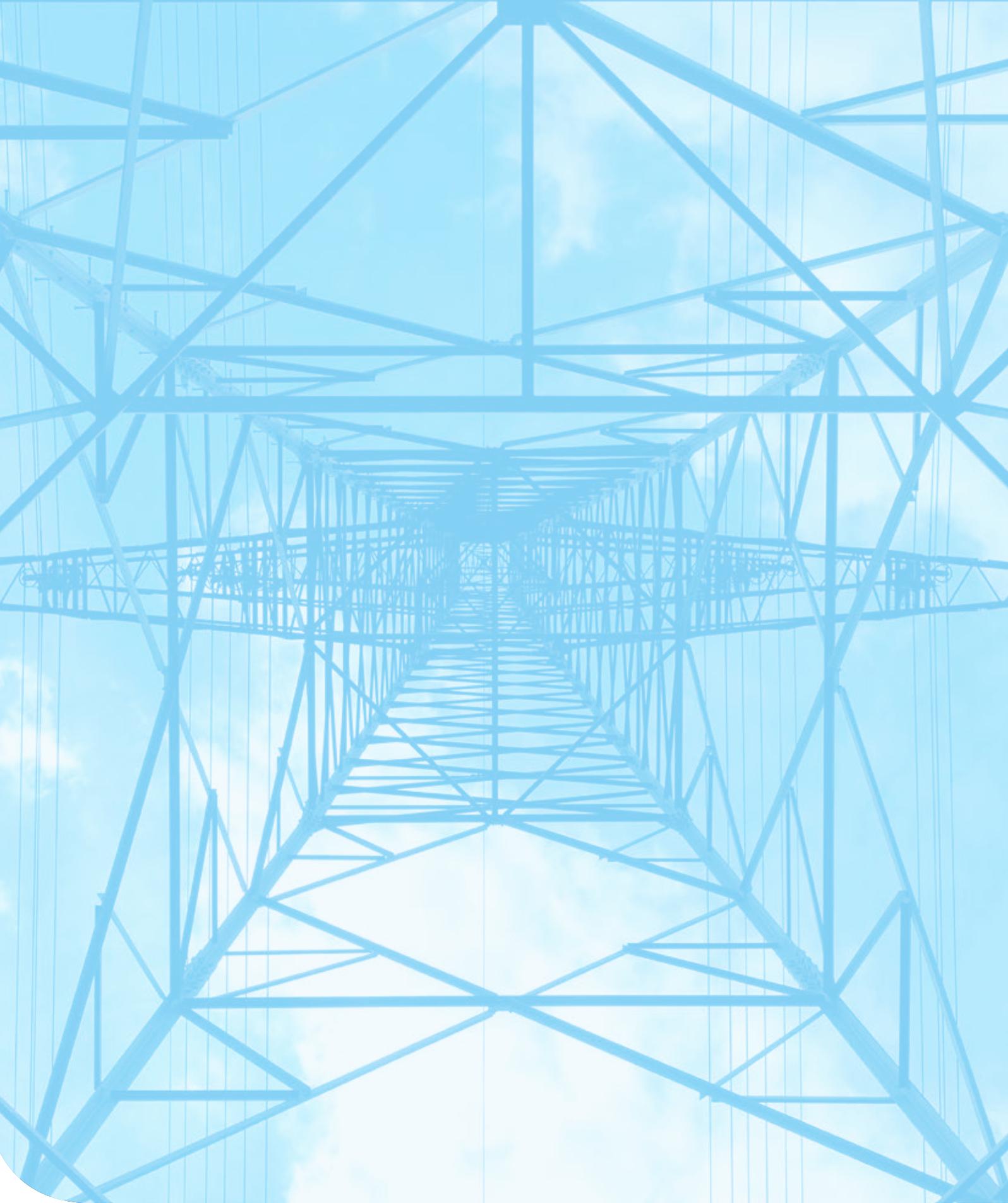
While the papers will cover the very broad sweep of energy from large and small-scale power generation and energy efficiency, to the decarbonisation of heat and transport, each paper will try to pin-point ideas and measures that could enable the sort of radical step-change that we believe is needed to meet the climate change challenge.

So far Regen has identified five potential papers that we would like to develop.

- Paper 1 We've got the power: re-energising investment in renewable electricity**
- Paper 2 Decarbonisation of heat: the biggest challenge**
- Paper 3 Transport: the revolution is coming**
- Paper 4 Energy efficiency: transforming the way we use energy**
- Paper 5 Making a difference: how communities, cities and regions can lead the low carbon revolution**



For further information and sponsorship opportunities, please contact Rachel Hayes
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