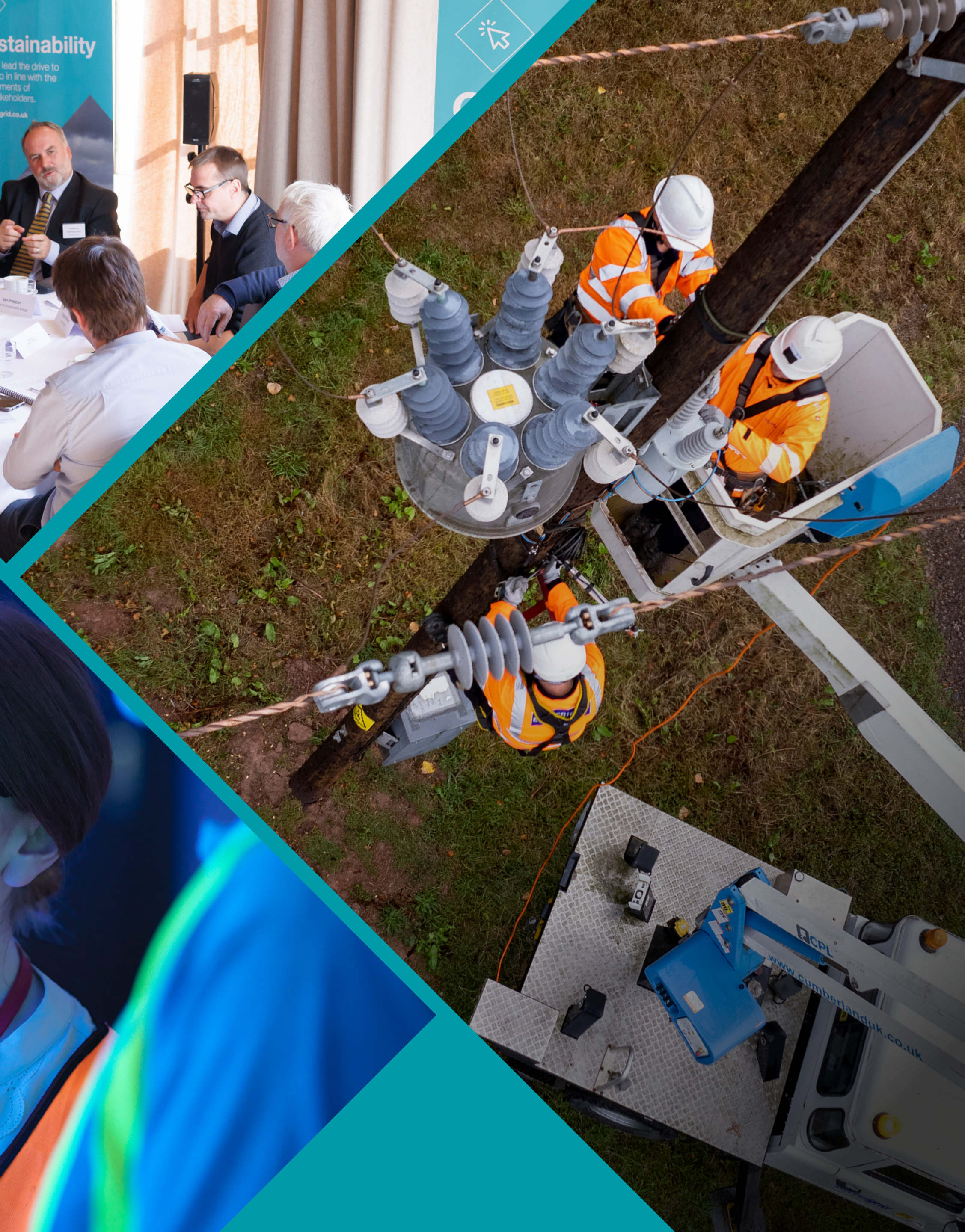


nationalgrid

Network Innovation Allowance (NIA) Annual Summary

2023-24

► Electricity Distribution



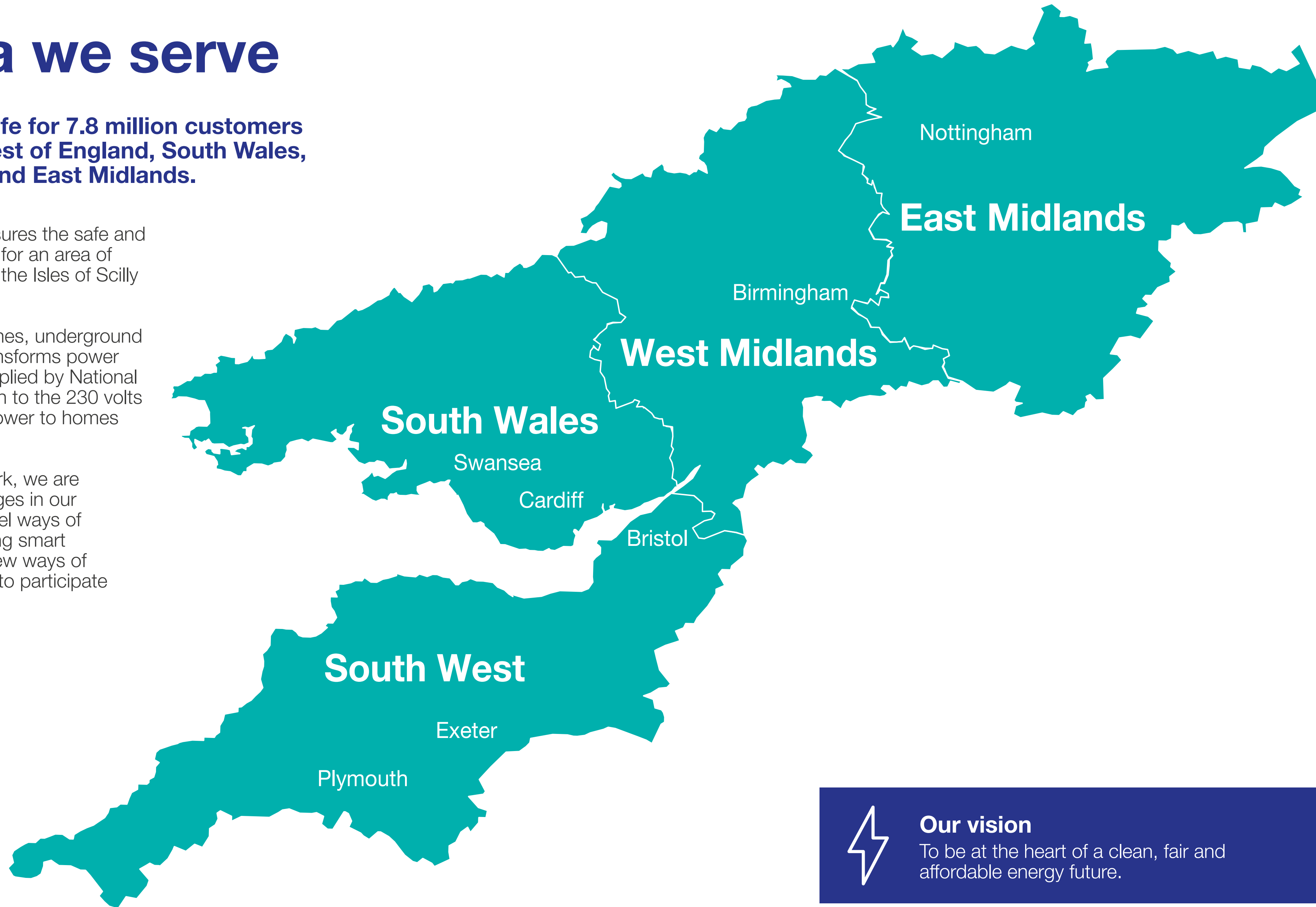
The area we serve

We bring energy to life for 7.8 million customers across the South West of England, South Wales, the West Midlands and East Midlands.

Our 6,500-strong team ensures the safe and reliable supply of electricity for an area of 55,500km² stretching from the Isles of Scilly to Cardiff to Lincolnshire.

Our network of overhead lines, underground cables and substations transforms power from the 400,000 volts supplied by National Grid Electricity Transmission to the 230 volts which provides essential power to homes and businesses.

Through our innovation work, we are adapting to the rapid changes in our network by developing novel ways of operating our assets, trialling smart technologies and finding new ways of enabling all our customers to participate in the energy transition.



Our vision
To be at the heart of a clean, fair and affordable energy future.



- The area we serve
- Welcome
- Executive summary
- Innovation in numbers
- Our Innovation Strategy
- Our Innovation Programme
- Our NIA highlights
- Implementation
- Project highlights
- Technical learning points
- Dissemination and events
- Our events timeline
- Other funding mechanisms
- Network Innovation Competition
- Strategic Innovation Fund

Welcome to our Innovation Annual Summary 2023/24

The work we do in Innovation makes a real difference to our customers everyday. We have several innovation programmes that have different focuses and time horizons. Our Regulated innovation programme allows us to focus on far sighted and strategic challenges that are essential to preparing for the longer term challenges facing our industry.

National Grid Electricity Distribution puts innovation at the heart of the business both today and in the future and we have several programmes sponsored by executive sponsors that attest to this.

Our regulated innovation programme is distinct from our other programmes as it seeks to deliver benefits that project beyond our current RIIO-ED2 price control period and also explore creative solutions that would not be supportable within the lower risk incentive frameworks that apply to our primary deliverables and outputs.

Our recent RIIO-ED2 business plan demonstrated how we plan to fund and roll out the far-sighted innovation that we completed in RIIO-ED1. We also passed on the savings associated with this innovation onto our customers and these savings were four times bigger than the innovation funding that we received in RIIO-ED1.

We expect to continue our regulated innovation programme to focus on RIIO-ED3 and beyond.

Clarity on the long-term arrangements regarding the Network Innovation Allowance and the Strategic Innovation Fund will be essential to be able to plan and deliver the progress that these schemes enable.

To increase the speed at which customers receive the benefits from Innovation, we are also developing partnership techniques for how we might be able to fund roll out of mature innovation within price control periods without needing to wait for the next price control. As one example of this initiative, we are currently exploring how we can fund bringing pre-fabricated primary substations to market.

Within this report, we describe our regulated innovation activity from the last year.

The world around us is changing fast and our staff are a creative and collaborative collection of engineers pioneering new capabilities in our sector and ensuring we roll out huge benefits to all of our customers, bringing energy to life.

Phillipa Slater
Director of Asset Management and Operations Support



The area we serve

Welcome

Executive summary

Innovation in numbers

Our Innovation Strategy

Our Innovation Programme

Our NIA highlights

Implementation

Project highlights

Technical learning points

Dissemination and events

Our events timeline

Other funding mechanisms

Network Innovation Competition

Strategic Innovation Fund

Executive summary

Our culture is one of working with stakeholders to find solutions to ensure we are efficient and meet the huge challenge of net zero. This report contains not just a summary of all of our NIA Activity within 1 April 2023 to 31 March 2024 but also some great examples of what we are doing to ensure we are at the forefront of the energy transition.

National Grid is continuing to deliver a wide portfolio of low carbon projects through the NIA to bring significant benefits to our customers via a timely and agile process which is responsive to new developments. We also support other research, development and demonstration projects, which fall outside the scope of the innovation mechanisms.

We continue developing commercial models and technical solutions that facilitate customer choice in a cost effective way, whilst at the same time managing the impact on the networks.

We have a number of projects which have produced significant learning. Our Pre-Fix project has been demonstrating our HV pre-fault capabilities in the trial areas of Coventry and Exeter, where we have identified that HV cable pre-fault can be exploited to better inform our asset management, and overhead pre-faults can be identified in time to help us better serve our customers.

Also, we have generated significant learning from our Headroom – Whole System Thinking project, where we have identified an accumulated system cost saving of between ~£330m and ~£17bn between 2023 and 2034 if generation assets are enabled to dispatch freely.

We expect to use this knowledge to better direct our future innovation and development.

We remain committed to continuing and increasing our third party involvement within our innovation programme, to enable project outcomes to be taken through to Business as Usual (BaU) quickly and effectively.

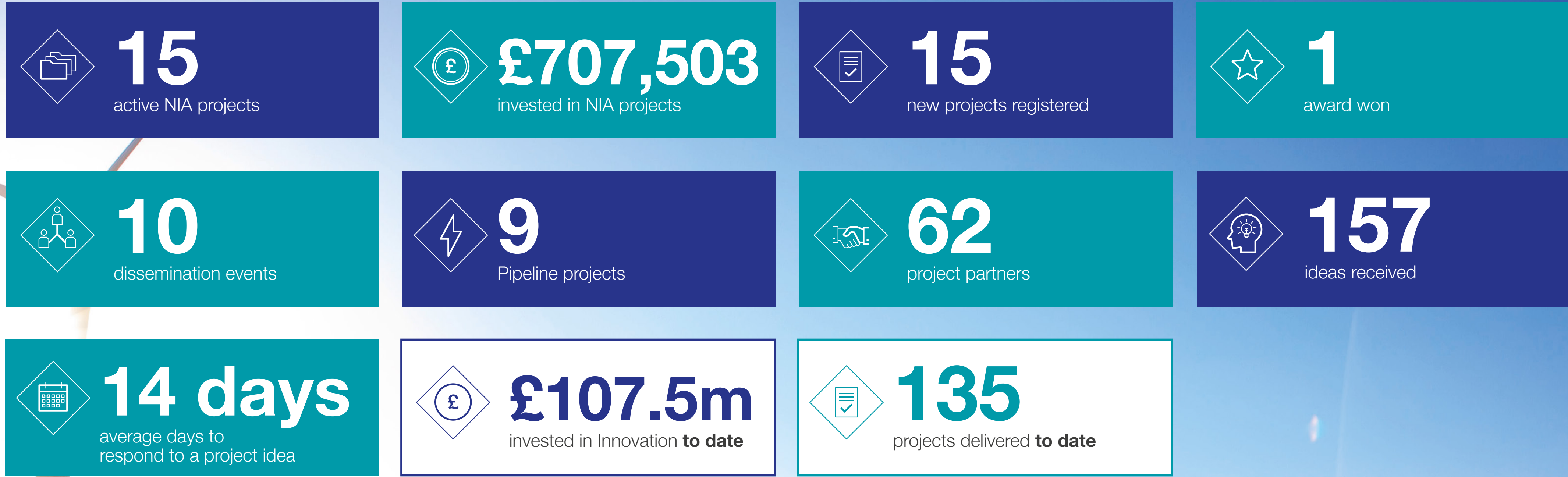
We welcome Ofgem’s decision to retain innovation funding in the form of the NIA for the first three years of RIIO-ED2 and look forward to clarity on the arrangements for the remainder of the RIIO-ED2 period.

This report contains a summary of all our NIA activity within the period from 1 April 2023 to 31 March 2024 for the four licence areas of National Grid Electricity Distribution: South West, South Wales, East and West Midlands.

This report has been produced in accordance with the Regulatory Instructions and Guidance (RIGs) issued by Ofgem.



Innovation in numbers



- The area we serve
- Welcome
- Executive summary
- Innovation in numbers**
- Our Innovation Strategy
- Our Innovation Programme
- Our NIA highlights
- Implementation
- Project highlights
- Technical learning points
- Dissemination and events
- Our events timeline
- Other funding mechanisms
- Network Innovation Competition
- Strategic Innovation Fund

Our Innovation Strategy

Our Innovation Strategy presents the focus areas and values of our innovation team, which are shaped by the challenges of the industry and our ethos as a company.

Our Innovation Strategy was originally produced as part of the RIIO-ED1 business plan and has since been reviewed, updated and re-issued annually to reflect changing external factors, business priorities and to incorporate learning from the previous 12 months.

The document applies to all four NGED distribution licences of West Midlands, East Midlands, South Wales and South West.

The Innovation Strategy looks at the long term development of our distribution assets, network operations and customer service caused by changing system and customer needs.

We annually revise our Innovation Strategy, to make sure it's more in line with the current price control period and our organisational purposes and ambitions and we are presently reviewing our strategy ahead of the next update.

Our values

One of our goals is to be a main contributor to decarbonisation and we aim to achieve that by having a portfolio of projects that is focusing on the right areas.

To deliver our projects successfully, collaboration is a crucial part of how we innovate. We are always looking for new partnerships with organisations and individuals that share the same passion and values as we do, so that we can achieve excellence together.

We are committed to delivering value for money to our customers and utilising our innovation funding in the most effective manner.

We have internal governance processes in place to ensure that we achieve that through the way that we create, manage and deliver our projects.

Our focus areas

Through our innovation work we aim to find the most efficient ways of addressing the technical challenges of the future electricity network while at the same time, keeping electricity affordable for everyone.

As part of this, we want to understand how we can best support our customers and our communities so that no one is left behind in the energy transition.

To achieve this, our projects are shaped around the key priority areas of decarbonisation and net zero, heat and transport, data, communities and consumer vulnerability.



We are a team of engineers dedicated to identifying problems, finding solutions and trialling them.



Everything we do evolves around contributing to decarbonisation, achieving excellence and providing value for money to our customers.



We recognise collaboration is essential to find solutions for all of our customers.



You can view our full Innovation Strategy here nationalgrid.co.uk/innovation

The area we serve

Welcome

Executive summary

Innovation in numbers

Our Innovation Strategy

Our Innovation Programme

Our NIA highlights

Implementation

Project highlights

Technical learning points

Dissemination and events

Our events timeline

Other funding mechanisms

Network Innovation Competition

Strategic Innovation Fund

Our Innovation Programme

Network Innovation Allowance (NIA) Projects	Start Date	End Date
Solving Intelligent LV – Evaluating Responsive Smart Management to Increase Total Headroom (SILVERSMITH)	June 2022	May 2023
ANM – Balancing Coordination Demonstration (ABCD)	June 2022	May 2023
Q-Flex	September 2022	June 2023
Network Event and Alarm Transparency (NEAT)	October 2020	June 2023
Flexible Operation of Water Networks Enabling Response Services (FLOWERS)	January 2022	July 2023
Demand Forecasting Encapsulating Domestic Efficiency Retrofits (DEFENDER)	March 2022	July 2023
Smart Meter Innovations and Test Network (SMITN)	March 2022	July 2023
Hydrogen Economy: Reassessing Approaches to Connecting Large Electrolyser Sites (HERACLES)	April 2022	July 2023
Vulnerability and Energy Networks, Identification and Consumption Evaluation (VENICE)	July 2021	August 2023
Active Creosote Extraction (ACE)	November 2021	November 2023
Pre-Fix	October 2021	January 2024
Coordinated Operational Methodology for Managing and Accessing Network Distributed Energy Resources (COMMANDER)	October 2022	January 2024
Running Cool	June 2022	March 2024
Headroom – Whole System Thinking	September 2023	October 2024
HV Pinpoint	March 2024	October 2025
Network Innovation Competition (NIC) Projects	Start Date	End Date
EQUINOX (Equitable Novel Exchange)	March 2022	December 2025

The area we serve

Welcome

Executive summary

Innovation
in numbers

Our Innovation
Strategy

**Our Innovation
Programme**

Our NIA highlights

Implementation

Project highlights

Technical learning
points

Dissemination
and events

Our events timeline

Other funding
mechanisms

Network Innovation
Competition

Strategic
Innovation Fund

Our Innovation Programme

Strategic Innovation Fund (SIF) Projects	Phase	Start Date	End Date
EV Respond	Discovery Phase	April 2023	July 2023
Shifting Currents	Discovery Phase	April 2023	July 2023
PIONEER (Proportional Investment of Networks in Energy Efficiency Retrofit)	Discovery Phase	April 2023	July 2023
PRIDE (Planning Regional Infrastructure in a Digital Environment)	Discovery Phase	April 2023	July 2023
TEED (Tyseley Environmental Enterprise District)	Discovery Phase	April 2023	July 2023
PRIDE (Planning Regional Infrastructure in a Digital Environment)	Alpha Phase	October 2023	April 2024
Rural Energy and Community Heat (REACH)	Discovery Phase	March 2024	May 2024
Road to Power	Discovery Phase	March 2024	May 2024

Business Funded Projects	Start Date	End Date
FASTER	December 2023	April 2024
Flamberge	December 2023	October 2024

You can read more on all our projects at nationalgrid.co.uk or read more on the Network Innovation Competition and Strategic Innovation Fund ([page 20](#)).

- The area we serve
- Welcome
- Executive summary
- Innovation in numbers
- Our Innovation Strategy
- Our Innovation Programme**
- Our NIA highlights
- Implementation
- Project highlights
- Technical learning points
- Dissemination and events
- Our events timeline
- Other funding mechanisms
- Network Innovation Competition
- Strategic Innovation Fund



— The area we serve

— Welcome

— Executive summary

— Innovation
in numbers

— Our Innovation
Strategy

— Our Innovation
Programme

— **Our NIA highlights**

— Implementation

— Project highlights

— Technical learning
points

— Dissemination
and events

— Our events timeline

— Other funding
mechanisms

— Network Innovation
Competition

— Strategic
Innovation Fund

Our NIA highlights

Implementation

Pre-Fix

The Pre-Fix project has specified, designed, tested and trialed a Common Disturbance Information Platform (C-DIP) to help detect and locate HV faults before they occur.

Customer's reliance on the electricity network continues to increase with the shift to low carbon technologies. Therefore, network resilience is critical to a successful net zero transition. We aim to avoid customer interruptions and reduce the time customers are off supply in the event of a fault.

The Pre-Fix project has been able to detect and locate pre-fault anomalies on the HV network, with the potential to avoid customer interruptions through more predictive maintenance practices. In addition to this, the Pre-Fix project has also been able to detect and locate HV faults, reducing the length of customer interruptions.

HV pre-fault capable devices were installed on our network, monitoring 17 Primary substations to capture pre-fault and post fault data. Over the course of a 15 month trial period, Pre-Fix has been successful in detecting and predicting both pre-fault and fault events on the network.

The project has developed and tested a common disturbance information platform for ingesting pre-fault and post fault data and defined the requirements for HV devices to integrate into the platform. Distance to pre-fault and fault algorithms, along with a waveform classification algorithm have been validated.

During the project, there was a 90% success rate in locating pre-fault anomalies to within operationally useful zones correct circuit section. For post fault locations, the Pre-Fix system achieved accuracies of less than 600m and had a success rate of 95% for phase to phase and 3-phase faults.



Pre-Fix has published two CIRED papers regarding use of the C-DIP and waveform classification, 2023.



The area we serve

Welcome

Executive summary

Innovation
in numbers

Our Innovation
Strategy

Our Innovation
Programme

Our NIA highlights

Implementation

Project highlights

Technical learning
points

Dissemination
and events

Our events timeline

Other funding
mechanisms

Network Innovation
Competition

Strategic
Innovation Fund

Project highlights

Headroom – Whole System Thinking

This project is investigating the impact Distribution Network curtailment may have on wholesale electricity costs and the carbon intensity of the grid.

Our current strategy to accelerate renewable connections includes issuing curtailable connections to generators. Under schemes such as Active Network Management, generators are required to reduce their export when our network risks becoming overloaded.

So far, the project has forecast that up to 460,000GWh of generation may be curtailed in 2034 which would result in a 6.88% increase in electricity costs compared to a scenario where distribution connected assets are able to dispatch freely.

This project aims to understand the key drivers of this opportunity, highlighting where future innovation to increase network headroom would offer greatest return on electricity pricing and carbon reduction. The remainder of the project will develop a more detailed network curtailment forecasting methodology and establish curtailment cost curves to help us understand how the total volume of curtailment across GB influences electricity pricing.

If successful, this project will deliver strategic innovation that can direct our future strategy towards maximum value for UK customers.



 The accumulated system cost saving could range from ~£330m to ~£17bn between 2023 and 2034 if generation assets were able to dispatch freely

- The area we serve
- Welcome
- Executive summary
- Innovation in numbers
- Our Innovation Strategy
- Our Innovation Programme
- Our NIA highlights
- Implementation
- **Project highlights**
- Technical learning points
- Dissemination and events
- Our events timeline
- Other funding mechanisms
- Network Innovation Competition
- Strategic Innovation Fund

Project highlights

HV Pinpoint

HV Pinpoint is developing a methodology for detection and precise location of pre-fault events in the HV underground network.

HV faults on the underground network account for a large proportion of unplanned outages, where customers may remain off-supply until the fault is found and repaired unless an alternative network arrangement is used to back feed.

Our Pre-Fix project has demonstrated that HV pre-faults are a phenomenon that can be detected, but learning from this has shown that we need new tools to take advantage of this.

HV Pinpoint is carrying out the development of several new enabling technologies to find and respond to pre-fault activity. This includes:

- wraparound 3-phase online cable sensors
- cable end Precision Event Timing Units (PETU)
- a webserver, and
- two completely novel street-level devices - a Pulse Injection Generator (PIG) for location validation and a sensor mat for pinpointing.

These components will make up a system to either be used in conjunction with the Pre-Fix method to provide a more precise defect location, or as an alternative pre-fault method.

The intention of this is to reduce the reliance on test van methods, as well as providing a new solution to more easily retrofit sensors on to existing underground cables.

To date, we have been developing the novel sensors and street level devices, with some long lead time items ordered. Work has also been carried out on updating the webserver ahead of its use in the test and trial phases of the project.



Project highlights

V2G Dynamic Headroom Control

V2G functionality can provide increased flexibility services to the whole system and financially benefit customers. V2G Dynamic Headroom Control project aims to facilitate uptake of V2G by using measured voltage and demand data from smart meters to better inform control policies in V2G devices while minimizing reinforcement costs and optimizing fairness between customers.

There is a concern that V2G connections can increase level of power exports, potentially pushing voltages beyond statutory limits and/or exceeding thermal limits. These exports could have long time durations and could have low levels of diversity.

Previous innovation projects addressed these concerns by setting fixed limits to the V2G active power export.

However, in many instances, exports will occur at the same time as other demands, or when other customers cannot participate as their EVs are elsewhere, and so the fixed limit unnecessarily obstructs a potentially useful grid service.

The customer may also lose revenue that would have supported their investment in providing the V2G capability.

There is an opportunity to use measured voltage data from smart meters to better inform the control policies implemented in V2G devices.

V2G Dynamic Headroom Control project will conduct an assessment of smart meter data to develop realistic insights into the voltage profiles that occur today on LV feeders.

We will then use these insights to conduct research into what may be the most beneficial methods to contain the voltage rise associated with V2G, using the voltage baseline as a starting point.



Technical learning points

Running Cool

Running Cool sought to challenge current curtailment arrangements for Active Network Management (ANM) connections by creating a new post fault capability for overhead lines and a new ANM architecture which can help to avoid curtailment by unlocking significant latent capacity.

ANM systems are implemented in areas where multiple complex constraints affect a number of customers over a long time period. A significant number of ANM schemes curtail customers on a precautionary basis under intact network conditions in anticipation of the next worst circuit fault to ensure the network parameters remain within operational limits.

Running Cool demonstrated how integration of dynamic, or specifically Short-Term Post-Fault Ratings (STPFR), could allow for uplift in capacity on the overhead lines.

When the uplift associated with STPFR capability coincides with ANM curtailment periods, the avoidance in curtailment can be realised benefiting both generation customer and Distribution Network Operators (DNOs).

Results of the analysis demonstrated a clear potential for capacity release and financial benefits associated with STPFR capability on OHL network – it is “little but often” benefit with significant aggregate volume. The greatest capacity uplift was shown to be produced during the cooler months of the year.

Network use cases explored in the study showed potential yearly savings of £102,300 for heavily loaded circuits with currently operating ANM system.

The area we serve

Welcome

Executive summary

Innovation
in numbers

Our Innovation
Strategy

Our Innovation
Programme

Our NIA highlights

Implementation

Project highlights

**Technical learning
points**

Dissemination
and events

Our events timeline

Other funding
mechanisms

Network Innovation
Competition

Strategic
Innovation Fund



Dissemination and events

- The area we serve
- Welcome
- Executive summary
- Innovation in numbers
- Our Innovation Strategy
- Our Innovation Programme
- Our NIA highlights
- Implementation
- Project highlights
- Technical learning points
- **Dissemination and events**
- Our events timeline
- Other funding mechanisms
- Network Innovation Competition
- Strategic Innovation Fund

Dissemination and events

26toZero

Following the success of our 28toZero event, we returned in February 2024 to the Institution of Civil Engineers in London. Our 26toZero event publicised our innovation work and changes to our organizational structure. The event was themed around the wider question of how we gear up to deliver net zero.

The day mixed speaker presentations with a panel discussion with opportunities for attendees to ask questions throughout the day. The projects that were presented covered a range of funding mechanisms and stages.

This included SMITN and Take Charge that were in the process of being rolled out into BAU. Once again, the event's expert host, Laurence Hunter, provided continuity while ensuring everything ran to time.

A wide range of stakeholders attended, with backgrounds including: manufacturing, charity and academia. Guests were able to submit questions in real-time to the speakers and panelists, who discussed 'how we can maintain momentum for Net Zero delivery when we are competing with high priority economic factors such as the cost of living.

Phillipa Slater, the Director of Asset Management and Operational Support was able to introduce her vision for innovation as part of her team.

Paul Morris, Head of Future Capability, was also able to demonstrate the value our projects have created, with a suggested overall return of £4 for every pound spent on innovation work, and how our Innovation Strategy will focus on delivering additional capacity to our organisation in order to make sure achieving Net Zero is possible.

Project presentations included:

- ACE (Active Creosote Extraction) which has demonstrated a new method to reduce the environmental hazards from redundant wood poles.
- Pre-Fix, showing how we are developing the ability to identify and manage faults before they interrupt customers.
- Headroom - Whole System Thinking which is determining the value of distribution network capacity across the whole energy system.
- PRIDE, our first SIF Alpha project, which is working with local authorities to provide a platform that can support the development of Local Area Energy Plans as well as enabling data exchanges with DNOs so that planning is consistent and joined-up.



- The area we serve
- Welcome
- Executive summary
- Innovation in numbers
- Our Innovation Strategy
- Our Innovation Programme
- Our NIA highlights
- Implementation
- Project highlights
- Technical learning points
- **Dissemination and events**
- Our events timeline
- Other funding mechanisms
- Network Innovation Competition
- Strategic Innovation Fund

Dissemination and events

Energy Innovation Summit

The Energy Innovation Summit, also known as The Summit, took place from 31st October to 1st November 2023 at Exhibition Centre Liverpool. We presented and exhibited at the event.

This annual event brings together a wide range of stakeholders with an interest in innovation, energy networks, and the transition to Net Zero. It provided an opportunity to share the lessons learned from innovation projects to all network companies, and for innovators to catch up with us on our stand to talk to us about their ideas and for wider networking.

This year the opportunities for dissemination were increased by the inclusion of project posters with experts on hand to provide further information. We presented posters on EPIC (Energy Planning Integrated with Councils) as well as FLOWERS and Shifting Currents which both relate to the potential for flexible use of power by water companies.

Project EQUINOX was presented within the session on “The future of heat” while Running Cool was presented as part of the discussions on how near real-time data could enable consumer participation.

CIREd

At CIREd this year we were very active with project learning dissemination. As well as presenting posters we presented in the auditorium on some of our projects where we had submitted papers.

We were able to share learning from our projects REDMAST, which looked at potential alternative regulatory models, Reliability Threat Assessment which considered how we measure network reliability and VENICE which considered how customers with vulnerabilities have been impacted by COVID and the support required by community energy groups.

A project partner presented a poster on SMITN which investigated the use of smart meter data to validate customer connectivity and LCTs.

Additionally, we took part in a round table discussion on Dynamic network tariffs and Local Flexibility Markets.

Utility Week Live

This year we returned to exhibiting at Utility Week Live.

The team were kept busy for the whole event by enquiries from innovators wanting to know more about the different ways they could work with us. We were also able to present on our Pre-Fix, Reliability Threat Assessment and ACCELERATED projects.

ACCELERATED uses current data on how fault rates vary with windspeed and temperature to create vulnerability curves that are then applied to projections of future weather conditions reflecting climate change.

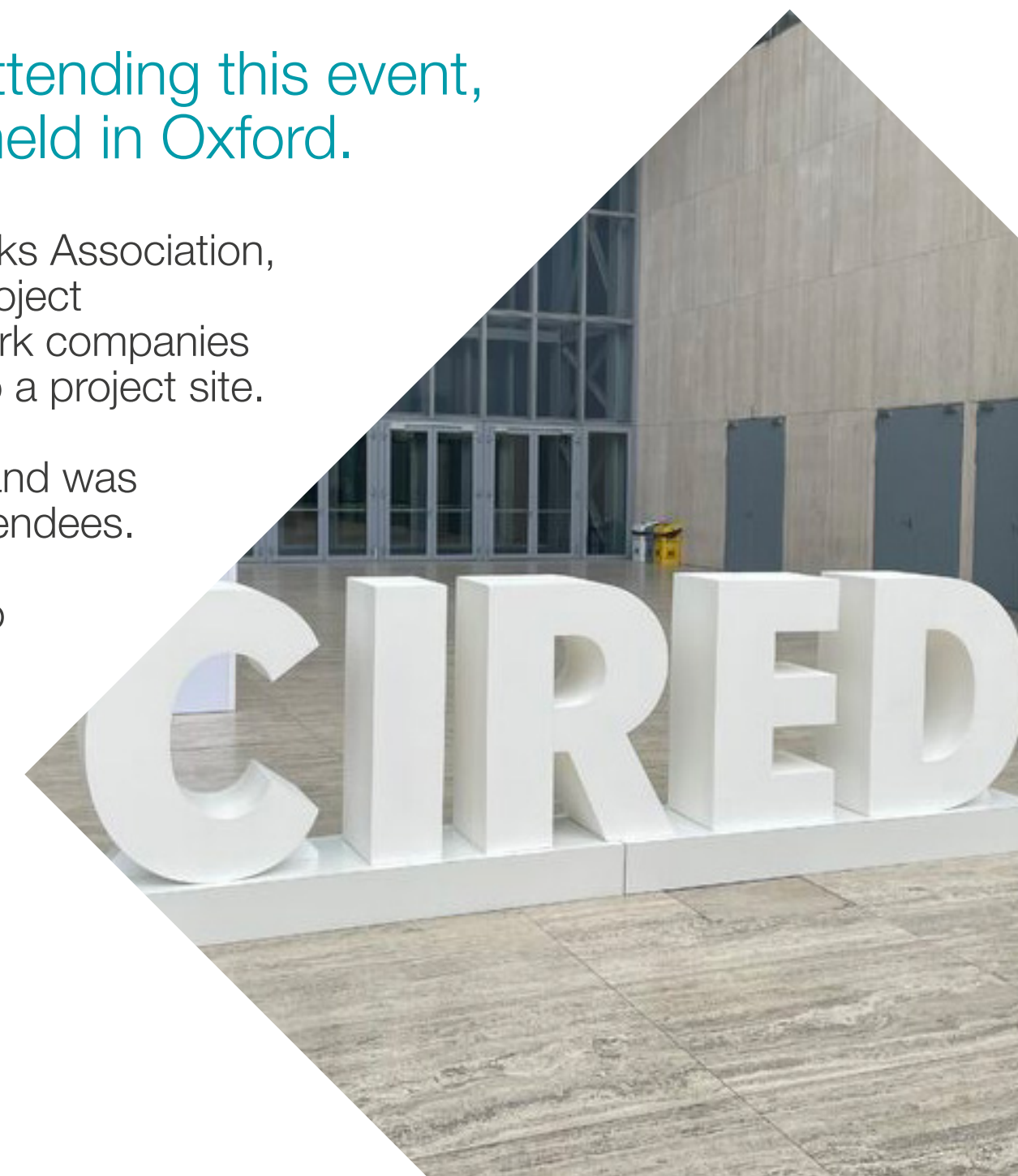
Energy Innovation Forum

It was our first time attending this event, which this year was held in Oxford.

Hosted by the Energy Networks Association, this event allows for further project dissemination between network companies but also included a field trip to a project site.

This brings the project to life and was greatly appreciated by the attendees.

During the event we were also able to present an update on our EQUINOX project.



The area we serve

Welcome

Executive summary

Innovation in numbers

Our Innovation Strategy

Our Innovation Programme

Our NIA highlights

Implementation

Project highlights

Technical learning points

Dissemination and events

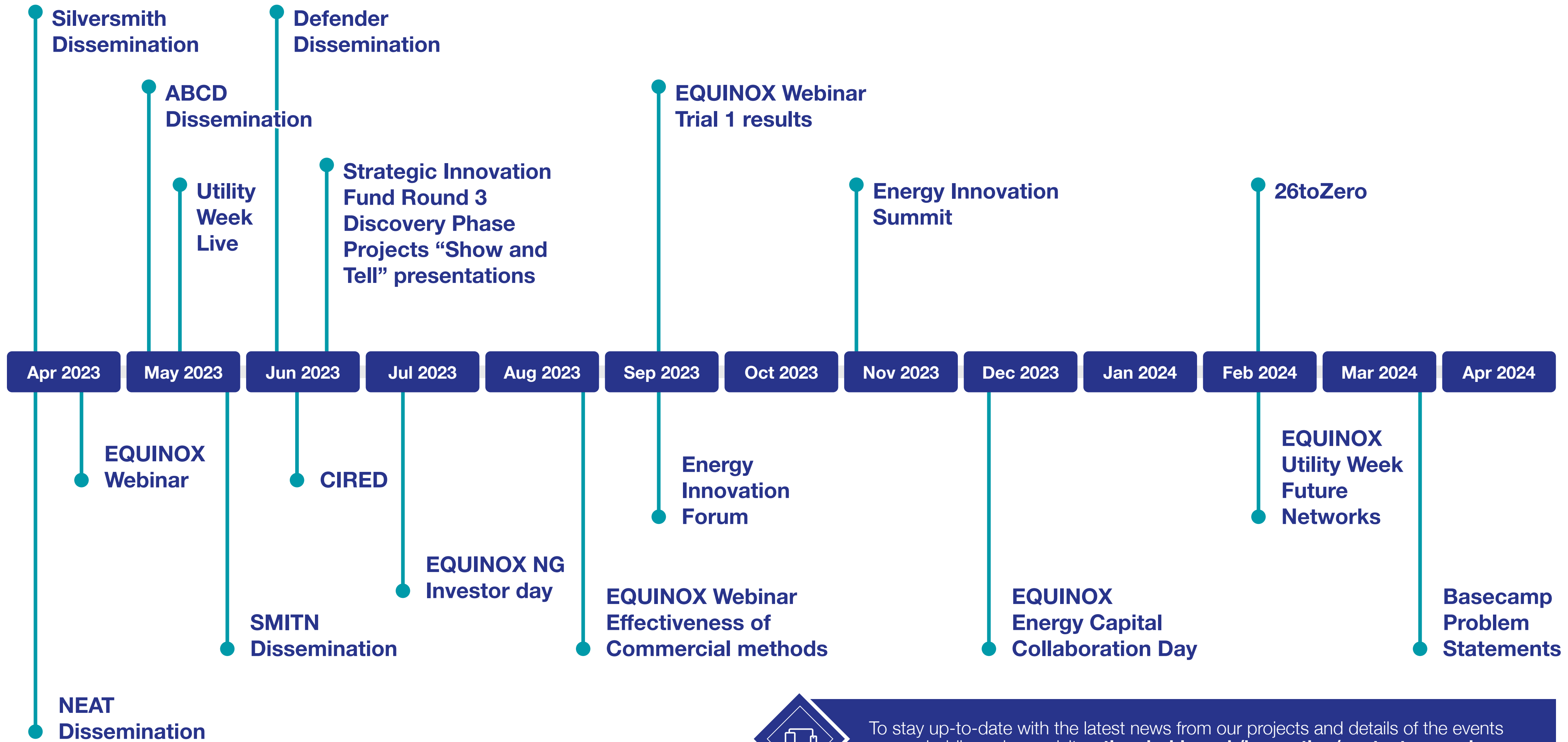
Our events timeline

Other funding mechanisms

Network Innovation Competition

Strategic Innovation Fund

Our events timeline



To stay up-to-date with the latest news from our projects and details of the events we are holding, please visit nationalgrid.co.uk/innovation/contact-us-and-more

- The area we serve
- Welcome
- Executive summary
- Innovation in numbers
- Our Innovation Strategy
- Our Innovation Programme
- Our NIA highlights
- Implementation
- Project highlights
- Technical learning points
- Dissemination and events
- **Our events timeline**
- Other funding mechanisms
- Network Innovation Competition
- Strategic Innovation Fund



The area we serve

Welcome

Executive summary

Innovation
in numbers

Our Innovation
Strategy

Our Innovation
Programme

Our NIA highlights

Implementation

Project highlights

Technical learning
points

Dissemination
and events

Our events timeline

**Other funding
mechanisms**

Network Innovation
Competition

Strategic
Innovation Fund

Other funding mechanisms

Network Innovation Competition

The Network Innovation Competition (NIC) was a funding mechanism used from 2015 to 2023. It was an annual competition across all UK electricity network operators to fund larger scale, greater value projects.

EQUINOX was our last project approved under the NIC funding mechanism.

The NIC has now been replaced by the Strategic Innovation Fund which works up to large scale “Beta” phase projects by first carrying out smaller scale Discovery and Alpha phase projects to incrementally reduce the risk of carrying out large scale projects.

EQUINOX

EQUINOX is the first NIC project dedicated to addressing the challenges DNOs face with the electrification of heat. The project will develop novel commercial arrangements and supporting technologies that unlock flexibility from residential low carbon heating, while meeting the needs of all consumers, including the fuel poor and vulnerable.

Unless new solutions are developed to manage this new load, DNOs will witness a substantial increase in peak demand, triggering significant network reinforcement throughout the later years of R10-ED2 and ED3. Currently, limited viable solutions exist for DNOs to unlock the flexibility from residential low carbon heat at scale in a reliable, cost-effective and equitable way.

The EQUINOX project seeks to demonstrate the benefits available to the network through flexibility from domestic heat pumps. The first round of trials acted as a proof of concept for this flexibility, with 400 customers across two suppliers turning down around 9 MWh across winter 22/23.

The second trial has been building on this to inform BaU arrangements with a larger and more diverse pool of customers from three suppliers. Variables being tested have included payment amount, notice period, control method and time of day. Results from this trial will be available in summer 2024, and will be used to define what is left to be investigated in trial 3 prior to roll-out following completion of the project.



EQUINOX will run from 2022 to 2025.



The project's first trial took place between December 2022 and March 2023, and the second trial ran from November 2023 to March this year.



The project is the largest domestic heat pump flexibility project ever carried out, with over 1000 customers signed up for the second trial in winter 2023-2024.



EQUINOX trials aim to include households from all sectors of society, ensuring that commercial and technical arrangements are designed equitably.



- The area we serve
- Welcome
- Executive summary
- Innovation in numbers**
- Our Innovation Strategy
- Our Innovation Programme
- Our NIA highlights
- Implementation
- Project highlights
- Technical learning points
- Dissemination and events
- Our events timeline
- Other funding mechanisms
- Network Innovation Competition**
- Strategic Innovation Fund

Strategic Innovation Fund

The Strategic Innovation Fund (SIF) was established to enable larger scale innovation to transform the gas and electricity networks in order to achieve a low carbon future. With a total budget of £450m, the vision is to support pioneering and inventive projects that can shape the energy networks of the future and accelerate the journey to net zero, but also to stimulate innovation in the UK to become the “Silicon Valley” of energy.

The fund is split into annual rounds, each addressing different challenge areas. SIF projects are split into three-stages: Discovery (for feasibility studies), Alpha (for experimental development), and Beta (for building, operating, and/or demonstrating).

We have built on the success of our first set of Discovery projects in Round 2 by securing Alpha phase funding for the PRIDE project. This has involved the development of a platform to assist local authorities to create Local Area Energy Plans and to support data exchanges between NGED and the platform to ensure alignment of our planning assumptions with the local authorities.

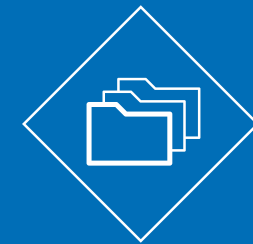
We have applied for Beta Phase funding where we intend to explore how we will work with the new role of the Regional Energy System Planner (RESP).

We have also been successful in Round 3 with two additional Discovery phase projects REACH which considers how we can help rural communities decarbonise using a modular energy centre. and Road to Power which is looking at the impact of decarbonising street works and similar activities.

These projects have resulted in us working with several new partners.



8 projects
including Discovery
and Alpha phases



Over 150
proposals received



12 additional projects
collaborated on with Wales
and West Utilities (WU)
and National Grid ESO

The area we serve

Welcome

Executive summary

Innovation
in numbers

Our Innovation
Strategy

Our Innovation
Programme

Our NIA highlights

Implementation

Project highlights

Technical learning
points

Dissemination
and events

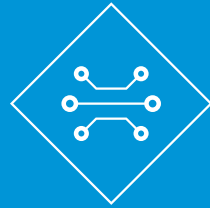
Our events timeline

Other funding
mechanisms

Network Innovation
Competition

Strategic
Innovation Fund

Strategic Innovation Fund



PRIDE (Planning Regional Infrastructure in a Digital Environment)

Planning Regional Infrastructure in a Digital Environment (PRIDE) will investigate how we can bring together datasets from a variety of sources on a single platform to support regional planning.

Working with West Midlands Combined Authority and Advanced Infrastructure, PRIDE examines how local decision making could be enabled by a digital twin, and what new supporting models and datasets would be required.

[youtube.com/watch?v=mofadzFOsAU](https://www.youtube.com/watch?v=mofadzFOsAU)

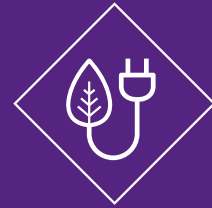


Road to Power

The decarbonization of street and road works presents unique challenges as 7.8TWh of energy is currently used per annum across 700,000 major works.

Road to Power will forecast future power requirements including an assessment of the likely adoption of hydrogen and specify tools to facilitate temporary grid connections. It will also investigate whether alternative methods to provide temporary connections.

[youtube.com/watch?v=0nsBTK9AfXI&list=PL-hp80OckWOCesQpeW8ZytuHm478-oeqf&index=12&pp=iAQB](https://www.youtube.com/watch?v=0nsBTK9AfXI&list=PL-hp80OckWOCesQpeW8ZytuHm478-oeqf&index=12&pp=iAQB)



REACH (Rural Energy And Community Heat)

The REACH project is an innovative new approach to rural decarbonisation, taking a community first approach to develop a modular energy centre and community guidance tool.

It aims to provide an additional option to support community energy groups decarbonise local heat and transport faster than traditional reinforcement.

[youtube.com/watch?v=SK49Qk2yBwA](https://www.youtube.com/watch?v=SK49Qk2yBwA)



We currently have applications in progress for Beta Phase;

PRIDE

To develop the Alpha phase project further and test interactions with the new Regional Energy System Planner.

Phase Switched System

To develop and test a switch that minimizes phase imbalance on LV feeders by dynamically reconnecting upper and lower halves of the feeder, alongside development of a planning tool to help select the optimum locations to install the device.

We have also applied for Alpha phase funding for REACH and Road to Power.

We will be attending pitching sessions for Round 4 Discovery Phase over the summer for the challenge areas.

- Challenge 1: Faster network development
- Challenge 2: Greater heat flexibility
- Challenge 3: Embedding resilience
- Challenge 4: Accelerating towards net zero energy networks.

The area we serve

Welcome

Executive summary

Innovation in numbers

Our Innovation Strategy

Our Innovation Programme

Our NIA highlights

Implementation

Project highlights

Technical learning points

Dissemination and events

Our events timeline

Other funding mechanisms

Network Innovation Competition

Strategic Innovation Fund

National Grid Electricity Distribution plc
Avonbank
Feeder Road
Bristol
BS2 0TB

nationalgrid.co.uk