Energy Networks Innovation Strategy

April 2024

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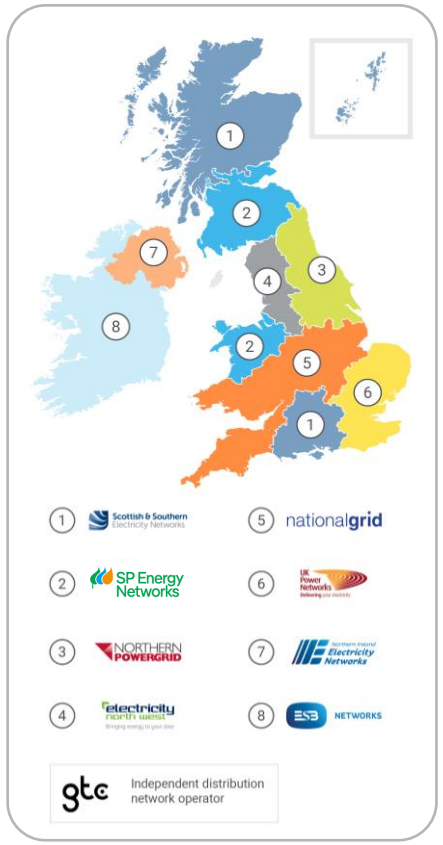
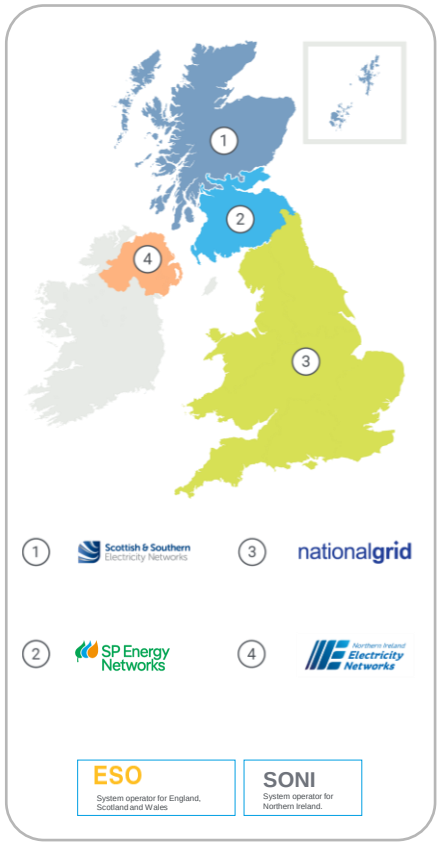
Energy network companies

Electricity Distribution



Electricity Transmission



Gas Distribution

Gas Transmission

This Energy Networks Innovation Strategy has been produced by LCP Delta for Energy Networks Association (ENA) and participating Licensed Network Operators (LNOs). ENA is the voice of the networks, representing the 'wires and pipes' transmission and distribution network operators for gas and electricity in the UK and Ireland.

Foreword

This is a pivotal year for the UK's net zero transition and the UK's energy networks are working hard to supply the infrastructure that underpins the ongoing change. To do so successfully, we know it's impossible to simply continue with what works today – we need new technology, new approaches, new types of collaboration and a shared culture of placing innovation at the core of our corporate planning. Already the UK is at the leading edge of many elements of the transition but to meet our national goals we need to accelerate further. ENA's Innovation Strategy Update aims to help the sector do just that.

Alongside this update, we have produced a forward look infographic which provides a clearer articulation of our vision up until 2050 for enabling the full decarbonisation of the UK through the delivery of a resilient and sustainable future energy system. It aims to set out the key areas where change and innovation are required to achieve our shared decarbonisation milestones.

The UK's approach to supporting energy innovation, including unique features like Strategic Innovation Fund (SIF) and Network Innovation Allowance (NIA) funding and the Smarter Networks Portal, has created some globally recognised projects and schemes. However, in creating this strategy update we listened to the sector and wider stakeholders on existing and emerging barriers. It is clear that we need strategic alignment on improving data sharing across different sectors, the development of new materials, improvement to the UK's supply chains and reform of our planning processes, amongst other priorities, if this success is to continue.

Equally, innovation must be targeted to meet the needs of consumers, particularly those with accessibility needs or specific technical requirements.

ENA's Innovation Strategy is a roadmap for how network operators can innovate to support the net zero transition and tackle potential challenges to the UK's energy security. We intend this document, and the priorities, themes and principles it contains, to help enable collaboration and shape the sector's efforts over the years ahead. We hope everyone in the sector and those decision-makers working with our members will continue to join us in this journey.

Lawrence Slade

Chief Executive, ENA

Introduction

Identify

Identified potential future challenges for testing with stakeholders

Consult

Online consultation to seek stakeholder feedback

Modify

Modified and finalised themes and principles for 2024

Discuss

Stakeholder workshops to discuss longer-term innovation focus areas

Modify

Modified and finalised themes and principles for 2024

Finalise

Energy Networks Innovation Strategy content finalised

Energy networks transport electricity and gas from where it's made to homes and businesses in the UK. To meet industry and UK Government decarbonisation milestones, energy networks need to develop innovative ideas and solutions. Innovation projects allow networks to better understand how to integrate and roll out new technologies, practices and markets and help to tackle the broader energy challenges we face.

Our vision is to enable the full decarbonisation of the UK through delivering a resilient and sustainable future energy system. Energy network operators leverage innovation to transform the UK's energy systems with cutting-edge technologies and sustainable practices, aiming to set a global standard in creating a resilient, efficient, transparent and Net Zero[1] energy landscape.

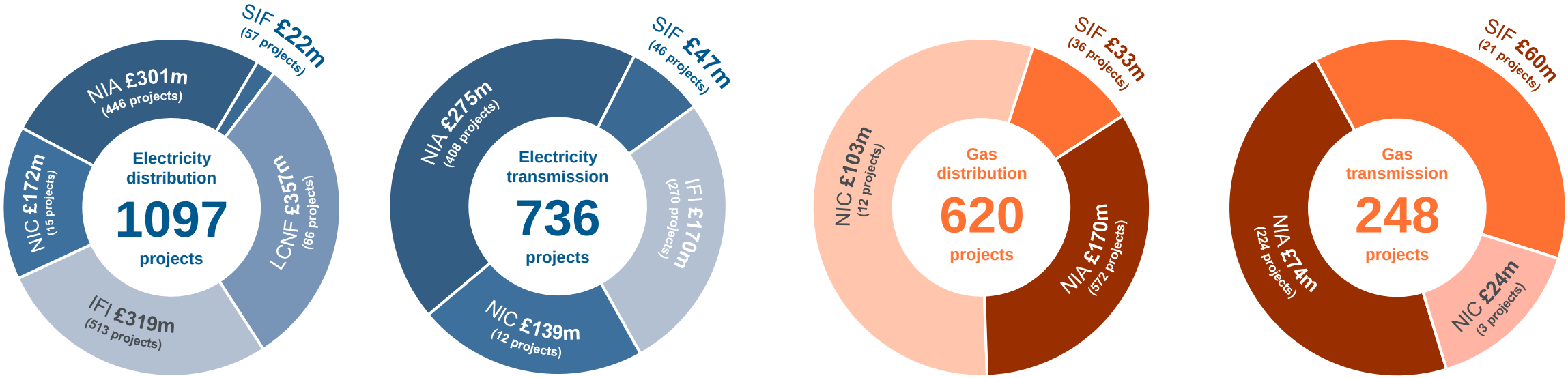
Stakeholder feedback helped to shape this Innovation Strategy. It is to be used as a comprehensive and actionable guide for network innovation, steering the UK's energy networks towards their mission. The principles and themes of innovation set out in this strategy are to be used as innovation directions; by following these themes and principles, innovation projects will contribute to delivering safety, resilience and efficiency, moving the UK closer to Net Zero.

To further support the transformation of the energy system, this Innovation Strategy is accompanied by a 2050 Forward Look for energy networks which sets out the key areas where changes and innovation are required to achieve decarbonisation milestones.

We recognise that we cannot solve the complex challenges in the energy system on our own. We want to continue to open innovation activities to an ever-broader range of organisations and individuals both within and beyond the energy sector. This strategy sets out where we would like your help to develop, trial and implement innovative ideas that address some of our most pressing challenges, and details how you can get involved.

[1] as per the UK Government's Net Zero commitment

Network innovation to date



We are building on an extensive and impactful portfolio of innovation projects, with network companies having developed, trialled and tested over 2,600 innovative ideas since 2009. Through our Smarter Networks Portal, stakeholders can see the valuable learning and expected benefits from each project, aligned with the UK Government's ten-point plan for Net Zero by 2050. These usually include cost savings, emissions reductions and environmental improvements, customer benefits, and better outcomes for vulnerable customers. All networks produce an Annual Innovation Summary by July 31st, which sets out key information about their innovation activities in that regulatory year, including network innovation benefits tables. An industry-wide Annual Innovation Report is also published by October 31st every year to highlight key trends and progress against the themes set out in the Innovation Strategy.

439

Ideas generated by the networks and 3rd party partners in 2022/23

199

3rd party partners worked with the networks on innovation projects in 2022/23

Figures from ENA Annual Innovation Summary Report FY23 and Smarter Networks Portal. Project numbers include each follow-on phase of a project.

Network innovation to date: SIF

Key benefits

Potential from SIF Round 1 - Beta[1]

£2.6b
Financial savings

7.1
$mtCO_{2\text{-}eq}$ carbon savings

Wider benefits

- Cost savings on consumer energy bills and for users of network services
- Reduced operating costs for the network and wider energy system
- Reduced direct and indirect emissions
- Better access to revenue and new revenue streams
- New products, processes and services

[1] Ofgem SIF Annual Report 2023 (UKRI)

In RIIO-2 to date, the networks (all distribution and transmission networks) have made 214 SIF applications (across Rounds 1 and 2 for Discovery, Alpha, and Beta), of which 160 have been funded.

The SIF programme was launched at the start of RIIO-2 as a competitive funding pool focused on areas of strategic importance to the energy system. SIF aims to identify high-potential projects with the greatest impact, providing support from conception to implementation through a five-year funding programme of around £450 million administered through Innovate UK. A regulated energy network company must lead each SIF project, which should involve collaboration with partners such as SMEs, businesses, local authorities, or academic institutions.

Each year, a new round of the SIF starts, running alongside previous rounds, building a diverse portfolio of projects in various stages of the Discovery / Alpha / Beta process. All projects offer learning opportunities.

Example contributions to UK decarbonisation

Decarbonising electricity grid by 2035

SIF explores new technical, process, and market approaches to deliver an equitable and secure net zero power system.

Example: Black Start Demonstrator from offshore wind (BLADE) (SP Energy Networks)

10GW low-carbon hydrogen by 2030

SIF looks at key issues to unlock the system value of green hydrogen production and storage to provide system flexibility and network optimisation using power-to-gas (P2G).

Example: HyNTS Compression (National Gas)

-15% building energy consumption by 2030

SIF investigates the benefits of flexibility to support shifting or reducing demand using new technologies and better coordination and planning.

Example: CrowdFlex (NGESO)

Network innovation to date: NIA

Key benefits

Benefits of NIA funding

Stability
Enables continuous innovation

Informative
Informs key decisions at multiple levels

Wider benefits

- Providing agility & flexibility
- Encouraging collaboration between networks
- Enabling funding for low TRL projects
- Allowing collaboration between funding sources
- Iterative and dynamic progress of solutions

1,650 projects have been funded by the NIA to date, totalling £809 million. NIA projects are self-governed by the networks, unlocking opportunity for smaller innovation projects with less restrictions from application windows and timing constraints.

The NIA provides funding to facilitate energy system transition and/or benefit consumers in vulnerable situations with the potential to deliver net benefit to consumers e.g., financial, social, environmental or wider energy supply resilience.[1]

The non-competitive nature of the NIA encourages continuity in innovation and ensures a common innovation framework, which benefits innovation projects by retaining experience and allowing learnings to be easily transferred between projects.

NIA funded projects also help inform decision making in three key areas, including:

- policy decisions made by government bodies,
- business plans and strategies within networks
- external market decisions.

Example contributions to UK decarbonisation

Decarbonising electricity grid by 2035

NIA has given insights on how to improve the grid to facilitate renewables whilst also minimising carbon impact

Example: Rural Electrification 2.0 (NPG)

10GW low-carbon hydrogen by 2030

NIA has aided government decision-making on the role of hydrogen ahead of large-scale investments

Example: Hydrogen de-blending in the GB gas network (National Gas Transmission)

-15% building energy consumption by 2030

NIA has allowed the exploration of innovative ways to enable and promote energy efficiency

Example: Solent Achieving Value from Efficiency (SAVE) (SSEN-D)

[1] RIIO-2 NIA Governance Document Update

The changing innovation landscape

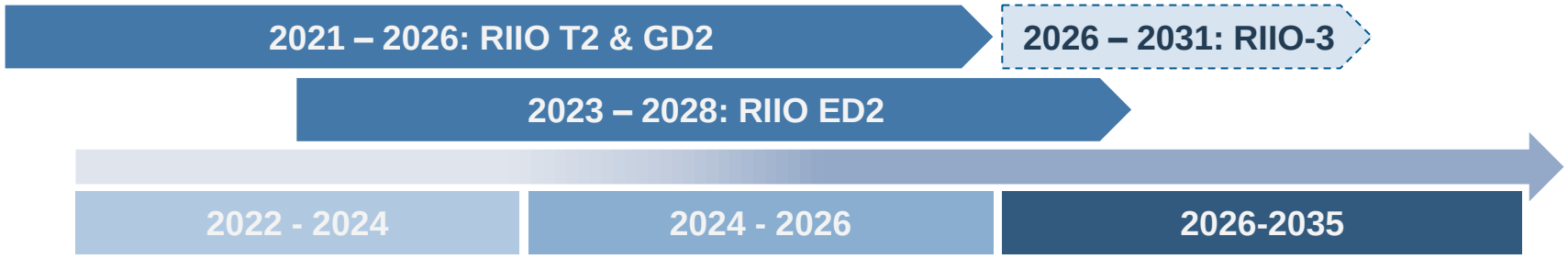
The innovation landscape has undergone a significant transformation since the previous energy networks innovation strategy was published in March 2022.

From the start of RIIO-2 to the end of FY23, 569 innovation projects have been registered, 288 of which were/are collaborative. Energy Innovation Summits were hosted in 2022 and 2023, where networks shared trends and learnings from the largest innovation projects funded through NIA, SIF, and NIC. The ENA and Ofgem kick-started the Innovation Basecamp in February 2023, which calls on innovators to accelerate the transition to a 2035 Net Zero energy network.

Progress on innovation is organised around a set of four "outcome areas" which originate from the Innovation Measurement Framework (IMF):

1. **The focus of innovation** – spread of projects across innovation themes
2. **Working with partners** – collaboration in innovation projects
3. **The innovation funnel** – translating ideas into projects
4. **Benefits for customers** – delivering positive outcomes for consumers

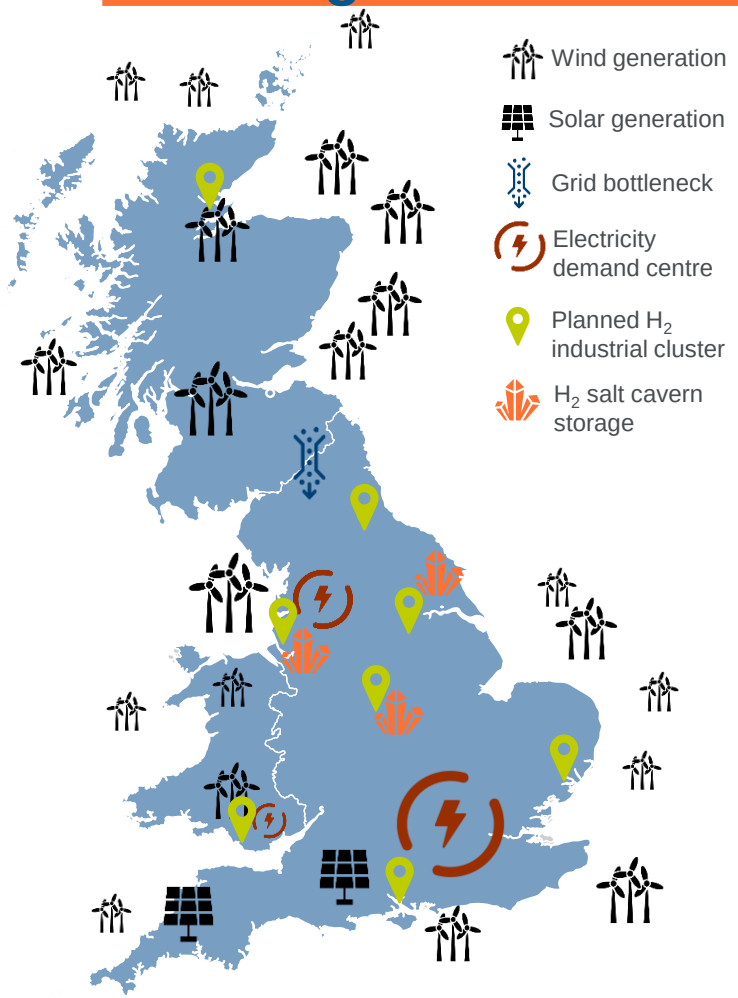
Ofgem published its Future Systems and Network Regulation: Framework Decision Overview that sets out the framework design for the RIIO-3 price controls that will run 2026-2031 and use an approach that is comparable to RIIO-2 but simplified where possible.



RIIO (Revenue = Incentives + Innovation + Outputs) is the framework that sets price controls on gas and electricity companies.

For gas distribution and transmission networks the RIIO-2 period (RIIO-T2 and RIIO-GD2) runs from 2021-2026 and for electricity distribution networks (RIIO-ED2) the period runs from 2023-2028. The RIIO-3 period will run from 2028-2033.

Enabling Net Zero: mass transport of low-carbon power



To meet Net Zero milestones, we must drive greater electrification and support hydrogen production by marrying renewable generation with low carbon heat, power and transport demand. The challenge of transmitting and distributing energy from mass-scale intermittent renewable sources over long distances is unprecedented and will require significant investment and modernisation, like the building of the “super grid” in the 1950s. However, this needs to happen even faster to meet 2035 targets – innovation plays a crucial role in enabling this acceleration.

Energy systems have evolved as renewable energy sources are now often located far from the areas of highest demand. As shown on the map, significant renewable energy generation is planned in remote regions, such as the north of Scotland. The UK Government’s ambition is to connect 50 GW of offshore wind by 2030 (incl. 20 GW in Scotland), necessitating a robust and extensive network as well as an increase in north-to-south power transfer, to supply densely populated areas, hydrogen clusters and other long-duration storage sites. These new energy flows require significant network reinforcements to deliver increased system capacity – a fourfold increase in the North of Scotland alone.

The energy network's transition to new energy must have a holistic, long-term view, with a whole system approach. Networks are focused on innovating to ensure:

- The development of new infrastructure to connect renewable generation to energy demand centres
- Security of supply
- Value for consumers
- Network resilience
- Full utilisation of existing infrastructure
- Minimal environmental impact

The transformation of transmission and distribution networks is not just a technical hurdle, it is the cornerstone of the UK’s climate commitment, requiring an estimated £60 billion investment. Without this critical development, Net Zero milestones remain unachievable. Prioritising and addressing the challenges facing transmission and distribution networks is essential to meet environmental targets and unlock the potential of a sustainable, green economy for generations to come.

Network innovation strategy

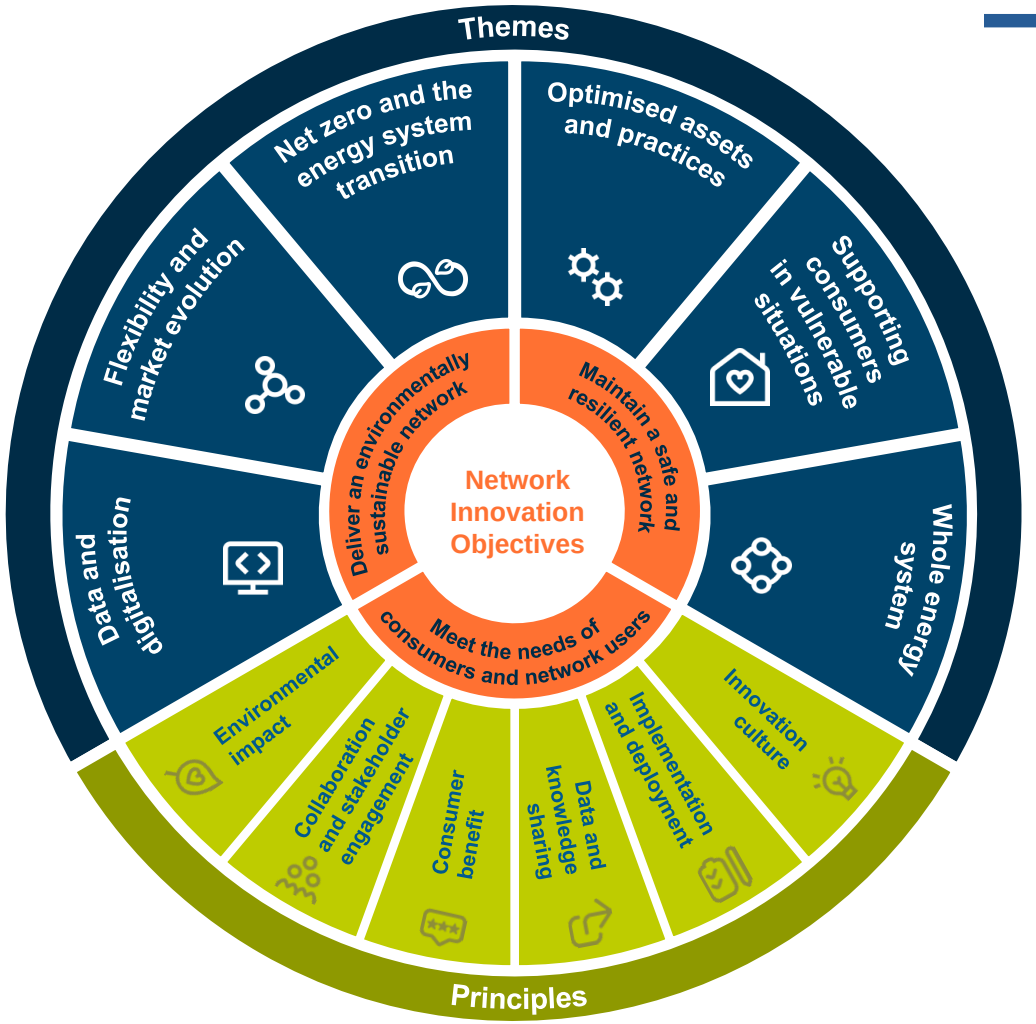
This shared strategy is flexible and ambitious, so it can motivate and engage the innovators without imposing too many constraints.

The strategy is centred around three overarching network innovation objectives – featured in the centre of the graphic. These are the three consumer-facing outcome categories set by Ofgem that underpin all network innovation activity.

The underlying network innovation principles apply to all innovation activity and should be considered at all stages of an innovation project.

The shared network innovation themes are the priority innovation areas for all networks and ensure a shared strategic direction. Network innovation projects must fit under one of these themes to ensure they are focused on solving our biggest challenges.

To add clarity to the project ideas we are seeking, we have identified key focus areas within each of these themes. These focus areas have been developed with our stakeholders and aim to help innovators better understand how they can collaborate with us.



Network Innovation principles

Environmental impact

Collaboration and stakeholder engagement

Consumer benefit

Data and knowledge sharing

Implementation and deployment

Innovation culture

Principle

Environmental impact

93%

of stakeholders[1] believe this principle is key to network innovation

Innovation projects should have a positive impact on the environment and the UK's Net Zero emissions target.

Innovation projects can help reduce carbon emissions and provide various environmental benefits.

All our innovation activities should aim to have a positive impact on carbon emissions, even if projects are not specifically focused on facilitating and accelerating the UK's transition to Net Zero carbon emissions.

We have updated this principle to explicitly include broader environmental impacts based on feedback from our stakeholders. We acknowledge the significance of providing additional environmental benefits, for example by reducing impact on local wildlife.

It is important to analyse and evaluate the impact of our innovation activities on both carbon and the environment. We are committed to ensuring that any significant environmental impact that a project may have is positive, without compromising the project objectives.

ENA's **Whole System Cost-Benefit Analysis** tool incorporates the impact of the following environmental factors:

- CO_2 emissions associated with the final gas / electricity / hydrogen demand.
- CO_2 emissions associated with electricity losses.
- Greenhouse gas emissions, including Hydrogen (H_2), Sulphur hexafluoride (SF_6) and methane (CH_4).
- Nitrogen oxides (NO_x) emissions.
- Oil or methane leakages.
- Shrinkage.

In addition to analysing these environmental factors, there are other ways that innovation could look to improve the environment. For example, where real-world trials are carried out as part of our innovation activities, projects should consider their impacts on the surrounding environment.

> "Environmental impact goes beyond carbon impact, including impact on the wildlife, biodiversity and species diversity on our sites."
>
> *Feedback from network representative*

> "Projects that improve the efficiency of networks, while not purely aimed at Net Zero, will have a benefit for Net Zero."
>
> *Feedback from network representative*

[1] Respondents to the online consultation

Principle

Collaboration and stakeholder management

90% of stakeholders[1] believe this principle is key to network innovation

Network innovation activity should be requirement-led, provide shared learning, and drive collaboration with stakeholders.

Collaboration and effective stakeholder engagement are crucial for innovation. By working together, we can ensure our stakeholders inform and guide the strategic direction of our innovation activities, while successful collaboration will result in new ideas, shared learning and avoid duplication.

An energy network stakeholder is any individual, group or organisation that has an interest in the future of our energy system. For example, this includes:

- Government (national and local) and regulatory bodies.
- Non-energy utilities and wider industry.
- Research and academia.
- Industry associations.
- Our supply chains.
- Consumers and consumer representatives.
- Technology and equipment providers.
- Communities and community groups.
- Expert consultancies.
- The wider energy sector, including generators, associations and retailers.
- Independent Network Operators

> "Collaboration and stakeholder engagement appear to be different things - both are key to delivering innovation."
>
> *Feedback from a supply chain representative*

We believe innovation activity should be driven by requirements rather than individual ideas. Similarly, companies bringing forth ideas should be included in the delivery of those ideas.

From the beginning of the RIIO-2 period to the end of FY23, 325 projects were completed by collaborating with 199 3rd parties.[2] We are constantly looking to develop our approach to collaboration between networks and with other organisations, and this will continue to evolve in the future.

Working together under ENA, we have developed a range of collaborative initiatives which include:

The **Low Carbon Technologies Group** works with stakeholders, both industry and regulatory, to agree on strategies for Low Carbon grid solutions.

The **Open Networks Programme** seeks to work collaboratively with industry to lead the transition to a smart, flexible, Net Zero energy system in Great Britain.

The **Gas Goes Green Programme** shares learning to deliver Net Zero gas.

The **Innovation Strategy Group** aims to coordinate network innovation activities.

Showcase and conference events such as the annual **Energy Networks Innovation Summit** and quarterly Energy Innovation Forums.

DESNZ, Ofgem, UKRI and industry meet with the networks at the **Whole Systems Group** to collaborate on standardisation and interoperability opportunities.

The **Data and Digitalisation Steering Group** seeks to collaboratively address energy data issues.

The **Smarter Networks Portal** shares key details and learnings for all regulatory-funded projects.

The Energy Innovation **Basecamp** aims to break down obstacles to energy system innovation.

[1] Respondents to the online consultation

[2] ENA Annual Innovation Summary, 2023.

Principle

Consumer benefit

93%
of stakeholders[1] believe this principle is key to network innovation

Network innovation activity should ultimately benefit consumers financially, supporting them in a fair and inclusive energy transition.

Energy consumers comprise anyone who connects to one or more of our gas and electricity networks, uses energy or pays an energy bill.

We recognise that consumers are individuals whose needs and priorities will change depending on where they live and work. We will be working to ensure that the specific needs of our consumers within each of our network regions are reflected in the innovation projects that we run.

We will also seek to communicate our innovation work with our consumers, minimising any disruption they may cause. Where consumers are directly involved in innovation projects, we will ensure we are transparent, open and accessible in all our communications.

A cornerstone of all our innovation activity is exploring new and more efficient ways of working to support all our consumers in two key ways:

- Financially benefit our consumers by reducing energy costs.
- Ensure equity and fairness for our consumers as we transition to Net Zero.

A fair and inclusive energy transition is one that benefits all consumers, regardless of their background, and ensures that the transition to cleaner energy sources and a more efficient energy network is sustainable and equitable in the long run.

Where applicable, projects aim to quantify their benefits, which are then collated and reported in the IMF. An assessment of the expected benefits for each project can be found in the project documentation uploaded to the **Smarter Networks Portal**. Projects do not always lead to clear material benefits; learning can also be a valuable outcome. The Social Return on Investment is included within the cost-benefit analysis of projects.

All proposals for projects are assessed in terms of the benefit they provide to customers, which feeds into the decision to take the project forward.

Innovation projects can deliver a wide range of benefits to our consumers:

[1] Respondents to the online consultation

Principle

Data and knowledge sharing

83%

of stakeholders[1] believe this principle is key to network innovation

Data and knowledge should be collected for and shared with stakeholders, where possible, in a transparent and accessible way.

All innovation projects, whether or not they become part of BAU, can provide valuable learning to increase the chance of success for future projects through effective knowledge sharing.

We are committed to ensuring that learning and insights from innovation projects should be 'presumed open', and network companies have developed Digitalisation Strategies and Action Plans to set out the process for digitalising and sharing their network data.

This principle aims to ease the sharing of data between all relevant stakeholders. We encourage innovators to collect all relevant data with the intent to share it, where possible.

The **Energy Data Taskforce** sets out three key data principles which are all applicable to network innovation projects:

- Data should be discoverable, searchable and understandable.
- Data should adhere to standard structures and interfaces.
- Data should be secure and resilient.

The network companies have also collaborated to develop the **National Energy Systems Map.** This proof-of-concept, in-depth digital energy system map of the UK will demonstrate the power of data to support a more efficient pathway to Net Zero.

You can find information about all network innovation projects on the **Smarter Networks Portal** including the outputs of a project when it has concluded.

All network innovation projects should, where possible, make the following information available and accessible:

- Key project outcomes and learning.
- An overview of the key outputs and results.
- Project datasets, data tables and supporting information (such as method statements, registers or process diagrams).
- Key information that may be of use to future innovation projects.

You can also contact the networks directly about specific projects via the Smarter Networks Portal.

Project dissemination events are held by the networks and ENA throughout the year, including the annual **Energy Innovation Summit.**

> "Data and knowledge sharing seem to be two different things."
>
> *Feedback from a consultancy/advisory*

Annual innovation project progress reports and project closedown reports are on the **Smarter Networks Portal**

ENA publishes the links to each **network's annual innovation report**

ENA holds regular **Energy Innovation forums**

More information on the **Energy Innovation Summit**

[1] Respondents to the online consultation

Principle

Implementation and deployment

90%

of stakeholders[1] believe this principle is key to network innovation

Accelerating and supporting the implementation and deployment of viable initiatives into business-as-usual.

Innovation is about developing, testing and trialling new ideas and approaches. The ultimate objective of any innovation project is to be successfully deployed into business-as-usual. This is when the benefits will start to be realised and value for consumers maximised.

Of course, some innovation projects will not get this far – but they will still be able to provide valuable learning that will make future innovation projects more likely to succeed.

Some innovations will develop over several stages to ensure they are effective in solving the challenges they aim to address. In the demonstration and trial phases of an innovation project, the aim is to ensure the network is safe and secure, the innovative solution delivered has been thoroughly tested for cost effectiveness and value for consumers and that all alternatives have been considered.

We are committed to implementing and deploying proven innovations as quickly and cost effectively as possible:

- We build robust requirement specifications with the teams who will lead the deployment into business-as-usual to ensure technologies are relevant, effective and safe.
- We involve key staff in the innovation process before transitioning to business-as-usual to lead the adoption of new approaches.
- We have created specific roles or teams to prepare for and facilitate future change.
- We ensure that engineering and regulatory standards, industry codes and policies are updated (or created) as a result of innovation projects.
- We collaborate between network companies to facilitate the deployment of solutions at scale.
- We always consider the cost of deployment into business-as-usual within our benefits calculations to ensure value for energy consumers.

It is important to note that the progression of a project into BAU is not solely dependent on the networks, and that RIIO-2 is in its early stages. Additionally, due to the nature of many of the projects being trialled, they will only be integrated into BAU in the next regulatory period (e.g. hydrogen projects integrated after government decision on hydrogen for heating).

Innovation Measurement Framework (IMF)

The IMF is used by the energy networks to report on a broad range of innovation outcomes and benefits from projects, including collaboration and partnerships, the speed at which successful innovation is transitioned into BAU and the benefits innovation has delivered for network customers.

The reported outcomes from the IMF are published annually by each energy network and provide stakeholders with a transparent, accurate and comparable representation of the benefits of investing in network innovation. Reports are published on the SNP. Data processing documentation from the networks will not be published.

By 31 October each year, energy networks will publish a collective industry-wide summary report.

[1] Respondents to the online consultation

Principle

Innovation culture

62%

of stakeholders[1] believe this principle is key to network innovation

Network companies and the regulator should embrace an innovation culture throughout their businesses to better enable them to deliver transformative change.

An innovation culture is one where people working across the network companies and the regulator feel empowered to think creatively and explore new ideas to drive value for all our consumers through improved products, services or processes.

All network companies and the regulator are committed to further developing a culture of innovation that is tailored to each network company. In 2023, the UKRI published its '**Innovation Culture: There's no stopping you**' report, in collaboration with Ofgem and several networks. Some other ways we are improving innovation culture include:

- **Raising and maintaining the profile of innovation across our organisations.** By showcasing the variety of our innovation activities and the benefits these have brought to our consumers, we want to encourage our people to think about solving challenges in a collaborative, agile and innovative way. We will encourage people from across all areas of the network companies to get involved by holding events such as hackathons, collaboration days and innovation think tanks.
- **Driving stronger links between the network companies and the regulator, including through our innovation teams and other areas of our organisations.** In many cases, innovation projects are already led by dedicated leads from across the networks to encourage a smooth and successful transition into business-as-usual.
- **Building innovation into personal objectives across all areas and levels of our organisations,** including those of our senior leadership teams. Where appropriate, innovation projects will be sponsored by a senior member who can provide support to the delivery team and help to ensure its success by mitigating risks and roadblocks.

Embracing an environment where innovative thinking is encouraged will enable greater creativity to accelerate our journey to Net Zero.

[1] Respondents to the online consultation

Shared network innovation themes

- Data and digitalisation
- Flexibility and market evolution
- Net Zero and the energy system transition
- Optimised assets and practices
- Supporting consumers in vulnerable situations
- Whole energy system

Theme

Data and digitalisation

Developing new data services and applying data science methods to harness the power of digitalisation to solve both system operation and wider stakeholder challenges.

The shift to data-driven, digitally-enabled networks is critical as we move towards Net Zero. This theme signifies the scope of innovation to explore new data methods and techniques.

Innovative use of data and improved data practices can deliver benefits to consumers by driving efficiencies in the way we manage and operate our networks as well as improving resilience.

As our networks become smarter, digital initiatives will play a greater role in optimising how we use and manage our networks. The future energy system will be more dynamic than ever before and it is crucial we support the adoption of new data methods, including artificial intelligence, predictive analytics, augmented and virtual reality and the internet of things. Networks are also focused on ensuring the security of their processes, data and assets.

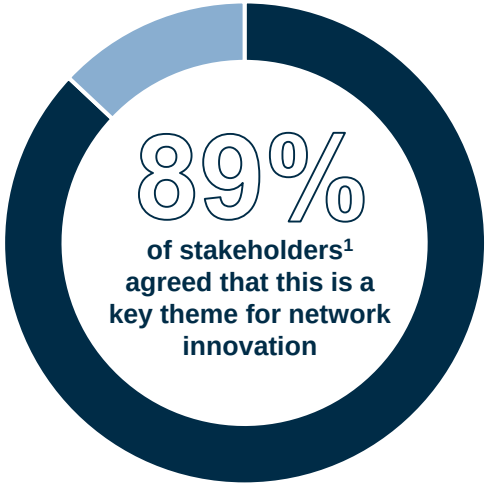
Data quality and assurance, accessibility and cross-industry interoperability are the core foundations of all energy network data and these will become increasingly important as the networks become smarter and more data-driven.

DESNZ (prev. BEIS), in its '**Digitalising our energy system for Net Zero**' strategy and action plan, highlights the following benefits of a digitalised energy system:

- Decarbonising the energy system.
- Creating a fair deal for consumers.
- Stimulating economic growth across all sectors.

The Department for Energy Security and Net Zero (DESNZ), Ofgem and Innovate UK launched the Energy Digitalisation Taskforce (EDiT) in 2021. Its '**Delivering a Digitalised Energy System**' report recommends:

- Unlocking value of customer actions and assets.
- Delivering interoperability.
- Implementing new digital governance approach and entities.
- Adopting digital security measures.
- Enabling carbon monitoring and accounting.
- Embedding a digitalisation culture.



> Data and digitalisation is cross-cutting and will underpin all of our network activities rather than being a specific item.
>
> *Stakeholder feedback*

[1]Respondents to the online consultation

Theme

Data and digitalisation

Predict4Resilience
SP Energy Networks
March 2022 – January 2027

Predict 4 Resilience (P4R) will provide accurate fault insights and forecast for its users, predicting where network faults are most likely to occur and their expected volume up to 5 days in advance. Through an advanced indication of where the network will be affected and a better prediction of expected fault numbers, P4R will enable resources to be proactively placed in those areas most likely to be impacted.

Eye in the Sky
National Grid Electricity Transmission
August 2022 – February 2023

This project brings forward 3 of 12 asset monitoring use cases studied during the Discovery phase, which at maturity would collectively deliver an estimated 22 million GBP (NPV over 10 years) value to Networks and customers through a combination of cost savings by replacing manual ground and aerial monitoring, and cost avoidance through increased risk awareness. A switch away from manual monitoring will also lower emissions associated with Operation & Maintenance activities.

Collaborative Local Energy Optimisation (CLEO)
UK Power Networks
March 2022 – July 2024

We will provide core planning datasets via an on-line, self-service energy planning tool to support the planning process for our local authorities, helping them make the best choices for their communities. This local area energy planning self-service tool will allow local authorities to layer local input such as decarbonisation strategies and action plans, local market trends, social inclusion policies, transport plans and so forth upon our network infrastructure data to develop options for their communities.

Pathfinder Development
Wales & West Utilities
February 2024 – April 2024

This project will deliver a toolset for social housing landlords and local authorities to use before rolling it out as part of the existing Local Area Energy Planning (LAEP) strategy to support the energy transition. This will enable landlords and local authorities to make informed decisions regarding decarbonisation of their housing stock; potentially lowering energy bills and carbon emissions simultaneously. Depending on how landlords choose to implement changes to their housing stock, they could pass any realised savings onto their tenants.

Focus areas

These are the five focus areas for our near-term priorities:

- Develop new toolsets to improve and ensure the standardisation and interoperability of network data.
- Explore new approaches to develop and prioritise use cases for the data-driven networks of the future.
- Use digital tools, including Artificial Intelligence, to support new techniques that accelerate the transformation to Net Zero.
- Explore new methods of improving and enhancing the security of all consumer data, processes, and assets.
- Test innovative methods to develop a digitally-ready workforce.

Theme

Flexibility and market evolution

Developing and testing market-based solutions to increase the flexibility and efficiency of the energy system; accelerating the adoption of low carbon solutions.

We need to quickly and efficiently respond to the rapidly evolving needs of the energy system by embracing new methods of flexibility and new commercial arrangements.

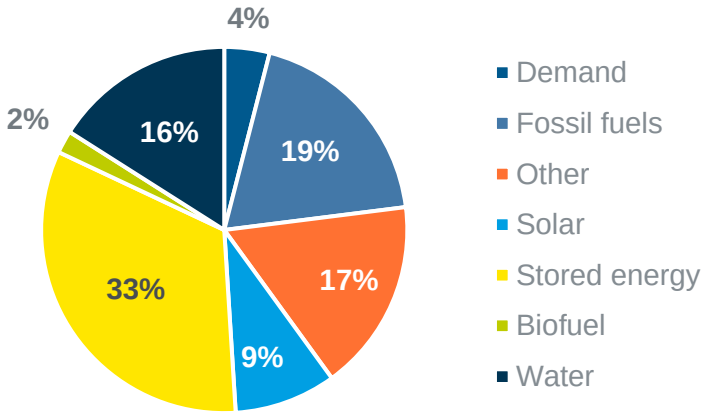
DESNZ and Ofgem define flexibility as “the ability to shift in time or location the consumption or generation of energy”. Innovation can help us explore new flexibility offerings and market-based solutions to accelerate the adoption of low carbon solutions and a smarter network.

Effective integration and management of flexibility such as energy storage and demand side response into **our electricity networks** is becoming increasingly critical to cope with peaks in generation and demand and to reduce the need for network reinforcements. Our flexibility first approach already ensures that flexible solutions take priority over network reinforcements.

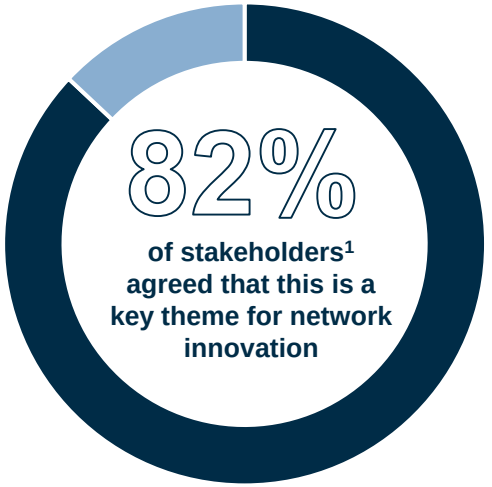
Our **gas networks** are managing a more complicated network of inputs and offtakes with greater variation in generation and use. New commercial arrangements could encourage further growth in the number of green gas projects connecting to the gas networks, such as those injecting biomethane. We will need to ensure we adapt our forecasting models and methodologies to maximise the value that these sites can bring. Our networks will also need to continue to evolve to supply alternative gases like hydrogen.

We will need to ensure we use flexible low carbon technologies and navigate the new commercial arrangements, markets and incentives that underpin them to drive the best value for our consumers.

Total contracted flex for delivery in 22/23[1]



[1] ENA ON GB Flexibility Figures 2023/24



[1]Respondents to the online consultation

Theme

Flexibility and market evolution

Demand Flexibility Service (DFS)
National Grid ESO
May 2023 –

Demand Flexibility Service (DFS) allows customers to earn rewards for shifting electricity usage outside of peak demand hours. The groundbreaking DFS gave over 1.6 million households and businesses the opportunity to participate in a national flexibility service and be rewarded for the first time, providing ~350MW of flexibility to the ESO during winter 2022/23. ESO issues a Service requirement to the market and suppliers and aggregators ask their customers to voluntarily reduce demand in exchange for payment following delivery.

Fusion
SP Energy Networks
October 2018 – December 2023

Project FUSION successfully established and operated GB's first fully USEF-adherent local flexibility market. During the 18-month trial, in which two aggregators were contracted to provide 1.7MW of flexible capacity to congestion points on our networks in East Fife, the DNO issued approximately 700 requests for flexibility, with 94% receiving at least one offer from aggregators. This resulted in aggregators delivering nearly 50MWh of flexibility over the trial period, with an 80% observed reliability of delivery.

Community DSO
Northern Powergrid
January 2022 – December 2022

Smart local energy systems are one approach to future energy systems architectures.
A fractal approach, using a limited set of configurable local energy archetypes has been proposed.
This project aims to understand , and to provide initial estimates of the magnitude of, the technical, social and economic issues that are important in determining whether this approach is a viable future option and to identify barriers to implementation.

HyCoRe
Northern Gas Networks
Oct 2023 – Apr 2024

HyCoRe aims to pinpoint UK regions with strong potential for green hydrogen production from offshore wind, offering a more cost-effective solution than direct electricity generation. It focuses on national modelling, regional-specific infrastructure, and technical challenges. HyCoRe will analyse resilience through Monte Carlo modelling and propose diversification of energy options (hydrogen and electricity) for offshore wind energy. Solutions involving decentralisation and grid flexibility are also considered.

Focus areas

These are the five focus areas for our near-term priorities:

- Simplify flexibility market structures and eliminate barriers to entry for smaller market entrants.
- Trial and implement innovative arrangements and market-based solutions to support network management, flexibility and storage solutions.
- Support and enable all consumers to fairly participate in, and benefit from, flexibility markets.
- Identify regulatory barriers and make recommendations for reform.
- Develop commercial arrangements for connecting and supplying green hydrogen.

Theme

Net Zero and the energy system transition

Facilitating and accelerating the UK's transition to Net Zero greenhouse gas emissions and beyond to an inclusive, fully sustainable energy system.

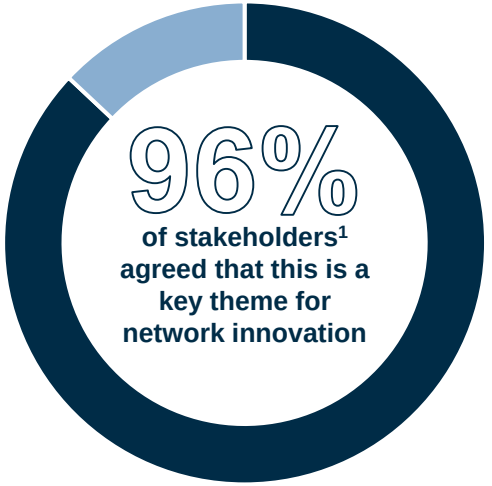
The UK government has published a clear strategic direction for our transition to Net Zero by 2050 and the devolved governments of the UK have also set ambitious targets, with Scotland pursuing Net Zero by 2045. Some local and regional governments are also pursuing accelerated Net Zero timelines. This is reflected in the UK's ambition to fully decarbonise the electricity system by 2035 and we are also exploring the decarbonisation of the gas networks through the Gas Goes Green programme.

Of the 222 projects initiated in FY23, 138 (61%)[1] were registered with this theme as their primary theme. The individual network strategies for 2024 will continue to prioritise Net Zero. Decarbonisation in homes and the future of heating were a central focus for projects in this theme.

We need a multi-faceted, whole-systems approach to achieve Net Zero greenhouse gas emissions. It is imperative we engage effectively with our consumers to better understand the changing way in which energy is used both domestically and commercially and how this impacts the networks. To do this, we want to work together to develop new commercial models and technical solutions that facilitate consumer choice and help us to manage the networks effectively.

In the transition to Net Zero greenhouse gas emissions, we will strive to be as inclusive as possible to ensure no consumer is left behind. This ties in with the 'Supporting Consumers in Vulnerable Situations' innovation theme.

Innovation can help us to meet the challenges and seize the opportunities presented by the increasing speed and scale of the rollout of low and zero carbon technologies.



[1]Smarter Networks Portal

[1]Respondents to the online consultation

Theme

Net Zero and the energy system transition

TOTEM (Transmission Owner Tools for EMT Modelling)
Scottish & Southern Electricity Networks
May 2020 – May 2022

The GB power system is rapidly evolving as conventional generation is decommissioned and ever greater levels of renewable sources are connected. At the same time there are increasing numbers of HVDC links and Flexible AC Transmission systems (FACTs) devices being connected in proximity in parts of the system. The potential for adverse control interactions between these devices is rising and needs careful consideration within the context of a potentially weaker GB system.

D-Suite
SP Energy Networks
April 2023 – June 2023

Compared with conventional solutions, we will better address both thermal and voltage issues that we increasingly experience in LV networks. The TRL of this project is approximately 4-5 and will benefit from dedicated innovation support to uplift the readiness of the following technologies: LV Distributed STATCOM (D-STATCOM), Distributed Soft Open Point (D-SOP), Distributed Smart Transformer (D-ST), and Distributed Harmonic Filter (D-HF).

Effect of 100% hydrogen on cast iron assets
Cadent
May 2023 – December 2024

In the UK, cast iron was the material of choice for the gas distribution network pipework up until the 1970's. At this time, it was acknowledged that the susceptibility of cast iron to corrosion was greater than polyethylene or steel pipelines which were available as alternative construction materials. Since 1974, there has been a national strategy to replace cast iron mains with alternative materials, however its scope does not cover all iron mains present within the networks.

FutureGrid Phase 1 – 5% Hydrogen Blend Test
National Gas Transmission
August 2021 – August 2023

This project aims to establish an evidence base for operating 5% hydrogen blends in the National Transmission System (NTS), aligning with the ongoing FutureGrid Phase 1 NIC project. It plans 1.5 months of testing on the FutureGrid Facility, replicating testing methods of hydrogen blends from 2% to 20%. Conducting the 5% blend test within the FutureGrid program yields significant cost savings and broader benefits. It saves on creating a hydrogen testing facility and prevents valve replacements, resulting in carbon emission reductions.

Focus areas

These are the five focus areas for our near-term priorities:

- Facilitate and support the adoption of flexibility and smart systems.
- Develop market solutions to enable the energy transition for all consumers.
- Enable the transition to low and zero carbon transport and heating for all users.
- Explore the optimal use of different energy vectors in the energy system transition.
- Support all consumers to engage in the energy system transition.

Theme

Optimised assets and practices

Developing and implementing industry-leading techniques for optimising existing core business and adopting new technologies.

Innovation has a key role to play in ensuring our networks continue to remain reliable, safe, secure and resilient to our changing climate. Optimising our assets and practices is a critical enabler of the energy transition.

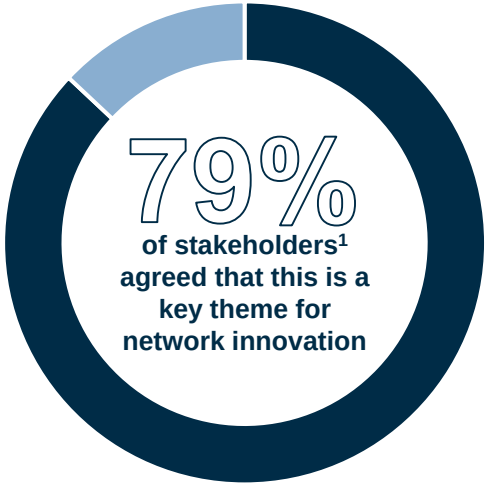
All our network assets face significant changes in the coming years both in how we manage our assets, and the way consumers use them. We need to make sure we continue to invest in our infrastructure to ensure we are well placed to facilitate and respond to:

- Increasing numbers of new low and zero carbon technology connections.
- Evolving patterns in consumer demand.
- Changing security threats.
- Appropriate workforce planning to ensure technical expertise is retained within our businesses.
- Our changing climate.
- Evolving regulation and industry codes.

It is imperative that we can safely trial and implement new ways to future-proof our network assets and practices to ensure we proactively support the energy system transition and deliver value for our stakeholders. To do this, we need to think of new ways to improve:

- Asset health and monitoring capability.
- Physical and digital security.
- Resilience and reliability.
- The safety of our assets and our people who work with them.
- The impacts our assets have on the environment.
- Our digital tools for risk management.

Beyond innovation projects, innovation can accelerate the optimisation of our assets and practices, transforming our business-as-usual portfolio and processes. We have updated the theme definition to reflect this.



> Optimised assets and practices also applies to current practices as traditional reinforcement is inevitable in large volumes.
>
> *Feedback from network representative*

[1]Respondents to the online consultation

Theme

Optimised assets and practices

Visual Inspection and Condition Assessment Platform for Overhead Line Tower Steelwork (VICAP)

National Grid Electricity Transmission

April 2022 – September 2023

Through this project NGET has created an automated end-to-end process for condition assessment of overhead line steel lattice towers. This project has enhanced condition assessment practice with capabilities such as autonomous drone flight 'Beyond Visual Line of Sight' and AI-driven automated image processing that enables NGET to inspect their network in an optimal, safe and resource efficient manner.

Connecting with Customers – Intelligent Virtual Surveying Tool for Vulnerable Customers

Cadent Gas

March 2021 – October 2021

Cadent carries out site surveys for any connection request that is received, at relatively high cost with long lead times. The proposed solution is a product called Vyntelligence, which allows surveyors to remotely survey sites, reducing the cost per survey and increasing the number of surveys possible in a day. Vyn also offers further computing intelligence to pick out words and prompt actions, driving "right-first-time" data capture.

Predictive Safety Interventions

SGN

March 2022 – February 2025

The Predictive Safety Interventions project aims to reduce injuries and costs in gas network operations. FYLD Ltd and Southern Gas Networks developed an AI model to forecast fieldworker injuries, now enhanced with human behaviour and live network data in the Beta phase. The project will deliver personalized AI interventions to field teams and managers in real-time, preventing on-site incidents. Success will yield a market-leading predictive AI model for incident prevention.

LV Predict

Electricity North West

July 2021 – January 2023

The Low Voltage (LV) distribution network (defined as 1kV and below) represents a significant proportion of network expenditure, yet until recently there has been relatively poor visibility of these assets.
This project will identify and test novel methodologies that could contribute to enhanced asset management for LV network assets by introducing predictive methods based on models that can determine the probability of failure.

Focus areas

These are the five focus areas for our near-term priorities:

- Reduce and mitigate future unplanned outages, supply interruptions, constraints and wider disruptions.
- Minimise the impact of networks on the environment.
- Ensure the networks are resilient and adaptable to climate change.
- Test and explore innovative methods to train and upskill the workforce.
- Explore how to future-proof assets and practices.

Theme

Supporting consumers in vulnerable situations

Exploring how best to support the needs of consumers who find themselves in vulnerable positions, where it lies within our power, to enable a just transition.

Equality and fairness are the foundations of a just transition to Net Zero. As we move to a smarter system, we need to better understand all types of vulnerability, and its changing nature, to ensure no one is left behind.

Energy consumers can find themselves in vulnerable situations at different times and for different reasons. Consumers in vulnerable situations are significantly less likely to be able to protect their interests in the energy market, are more likely to be disadvantaged as the energy system changes and may need more support during outages.

Ofgem, in its **Consumer Vulnerability Strategy 2025,** defines vulnerability as when a "consumer's personal circumstances and characteristics combine with aspects of the market to create situations where they are:

- Significantly less able than a typical domestic consumer to protect or represent their interests;

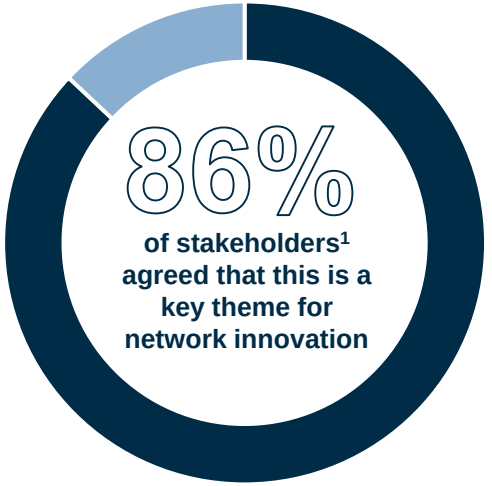
and/or

- Significantly more likely than a typical domestic consumer to suffer detriment or that detriment is likely to be more substantial."

Innovation is central in exploring how we can best support all our consumers who find themselves in vulnerable situations by testing and trialling new technologies, services and best practices. We will continue to identify and listen to consumers who may find themselves vulnerable and ensure they have a secure supply of energy and heat. We will continue to assess risk of unintended detrimental consequences of innovation projects to these consumers and work on alleviating those risks.

The **Vulnerability Assessment Tool**, introduced in 2021, helped pave the way for a standardised approach to dealing with projects likely to impact vulnerable customers. The prototype **Vulnerability Visualisation Tool** has created a single model to understand vulnerability in an area, which enables networks to direct additional support to where it is most needed.

It is important to note that, although networks don't always engage directly with consumers, innovation projects like those above can allow networks to support consumers indirectly (e.g. by reducing costs and improving network resilience).



> "Supporting consumers in vulnerable situations should be a given in a progressive society where no one is left behind!"
>
> *Feedback from academia/research org*

[1]Respondents to the online consultation

Theme

Supporting consumers in vulnerable situations

Spotlight
UK Power Networks
October 2023 – January 2025

Spotlight addresses the challenge of identifying Priority Services Register (PSR), Fuel Poor (FP), and Leaving No One Behind (LNB) customers at a household level, surpassing current methods limited to high-level demographic trends. To do so, the project seeks to access data from sectors such as telecommunications and finance to enhance customer identification. Additionally, the project aims to optimise engagement strategies with PSR, FP, and LNB customers.

Switching vulnerable consumers to hydrogen
Wales & West Utilities
October 2021 – August 2022

The project aimed to fund the design of a practical, safe process for switching vulnerable customers from NG to hydrogen. The project identified existing knowledge, devised a detailed transition process, addressed vulnerable customers' concerns, and implemented safety measures. Additionally, it recognized scalability challenges and extracted key lessons for consumer support, ensuring a smooth transition.

Net Zero Terrace
Electricity North West
October 2023 – April 2024

Net Zero Terrace will produce a replicable technical and financial model for decarbonisation of mixed-tenure terraced housing that can be scaled and is appropriate for those that might otherwise be left behind. The objective is to develop an affordable and scalable solution to decarbonising terraced streets in the UK. There are nearly 10 million terraced homes, many of which cannot easily transition to low carbon heat due to space constraints, affordability, and capacity in the DNO networks.

EV Respond
National Grid Electricity Distribution
April 2023 – July 2023

The supply of electricity is critically linked to health and wellbeing of energy consumers, with loss of supply having a severe impact on people's lives, particularly those living in vulnerable circumstances and with certain health conditions. Current measures involve deployment of diesel generators which are costly to deploy, carbon-emitting and take up time of DNO resources; preventing them from fixing the underlying course. This project focused on three main temporary re-supply options using EVs.

Focus areas

These are the five focus areas for our near-term priorities:

- Understand and support the transient and situational nature of vulnerability.
- Explore how to reduce the financial impact of Net Zero on consumers in vulnerable situations.
- Understand how network companies can support the fuel poor and improve affordability for consumers.
- Improve network engagement with all consumers to build on and strengthen trusted relationships.
- Collaborate with appropriate organisations to better support consumers in vulnerable situations.

Theme

Whole energy system

Optimising system efficiency and reliability by integrating and coordinating the operation of electricity, gas, and heat networks with other sectors and utilities.

The whole energy system refers to a holistic approach to managing the UK's energy needs, advocating for a collaborative approach between energy networks and other infrastructural entities, e.g. water, transport, and communications.

Innovation and a whole systems approach are intrinsically linked. Applying whole systems thinking, and partnering collaboratively across sectors, will drive value for our consumers by finding efficiencies in how we plan, forecast, design, construct, operate and maintain our networks. One of the ways we can do this is by improving how we share network data to leverage additional value and insights.

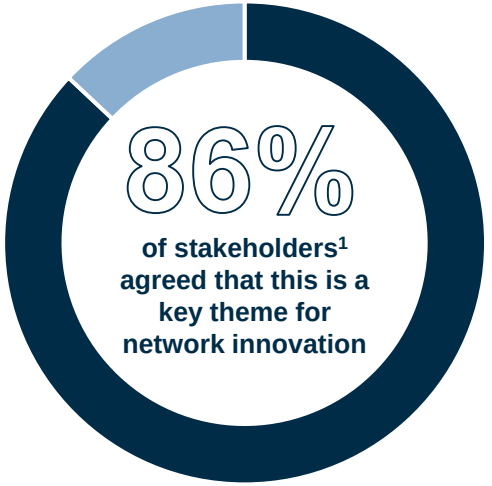
We will also need to continue to improve our understanding of the interactions across all the networks through joined-up forecasting and planning that recognises the changing demands and evolution of our energy networks.

The rapid decarbonisation of our energy system makes employing a whole systems approach increasingly important. For example, we will need to work more closely with cities and regional bodies to understand how we can enable their Net Zero ambitions.

Looking to and learning from other sectors will highlight innovative ideas that we can trial on our networks. For example, some innovative technologies now implemented by the gas distribution networks have their origins in the water industry.

Network companies are already working together successfully, and we recognise that the more we seek to learn from each other, the more we can encourage new innovations to come forward. We would particularly like to work more closely with other sectors including:

- Industry sectors such as transport, buildings and power.
- Other utilities such as water, waste and telecommunications.
- Local energy systems, cities and regions.
- Generators and consumers.



[1]Respondents to the online consultation

Theme

Whole energy system

Network-DC Circuit Breakers
Scottish & Southern Electricity Networks - Transmission
September 2023 – June 2027

Offshore wind projects seek to make landfall close to offshore wind areas and establish substations to access the GB electricity network. This situation will create network congestion and environmental and social impacts on nearby coastal areas. To minimise landfalls and onshore substations, the recent Holistic Network Design (HND) created by the NGESO recommends the use of a Direct Current Switching Station (DCSS) to act as a terminal for gathering and distributing DC power.

Regional Energy System Optimisation Planning (RESOP)
Scottish & Southern Electricity Networks - Distribution
October 2023 – October 2025

The RESOP project is a continuation of NIA Whole Systems Growth Scenario Modelling Phase 2 (WSGSM2). It will continue to develop digital tools necessary to create Local Area Energy Plans (LAEPs) and Local Heat and Energy Efficiency Strategies (LHEES). It aims to bring together a wider range of subject matter experts (SMEs), including Distribution Network Operators (DNOs), Gas Distribution Networks (GDNs), Heat Network Specialists, Water Networks and LCT specialists, for the purpose of building LAEPs.

Data Sharing Protocols
SGN
October 2021 – December 2022

Energy network development requires a move towards a whole system approach - driven by data, innovation, and collaboration. Improved coordination between the power and gas sector will ensure that low carbon energy is available to be delivered to the consumer safely, securely, reliably, and efficiently.
Creating a common set of structures for sharing information between local networks will be instrumental to creating an enduring whole systems approach during GD2.

Customer Energy Village: Project 1: Energy Efficiency
Northern Gas Networks
November 2021 – January 2024

This project will construct new research infrastructure, the Customer Energy Village, which reflect the challenges of heat decarbonisation faced by millions of consumers. It will then utilise that infrastructure to undertake research into new energy efficiency measures from across the supply chain, and working with the NEA customer base explore the barriers to adoption of those measures, to support development of future policy and training materials, aiming to reduce existing heat demand and enable decarbonisation to take place.

Focus areas

These are the five focus areas for our near-term priorities:

- Explore data sharing opportunities between networks companies and with other service providers.
- Coordinate the operation of a whole energy system through collaboration.
- Join up approaches to regional network planning and forecasting.
- Develop a whole system life cycle assessment approach.
- Collaborate on enabling the growth and operation of low and zero carbon solutions.

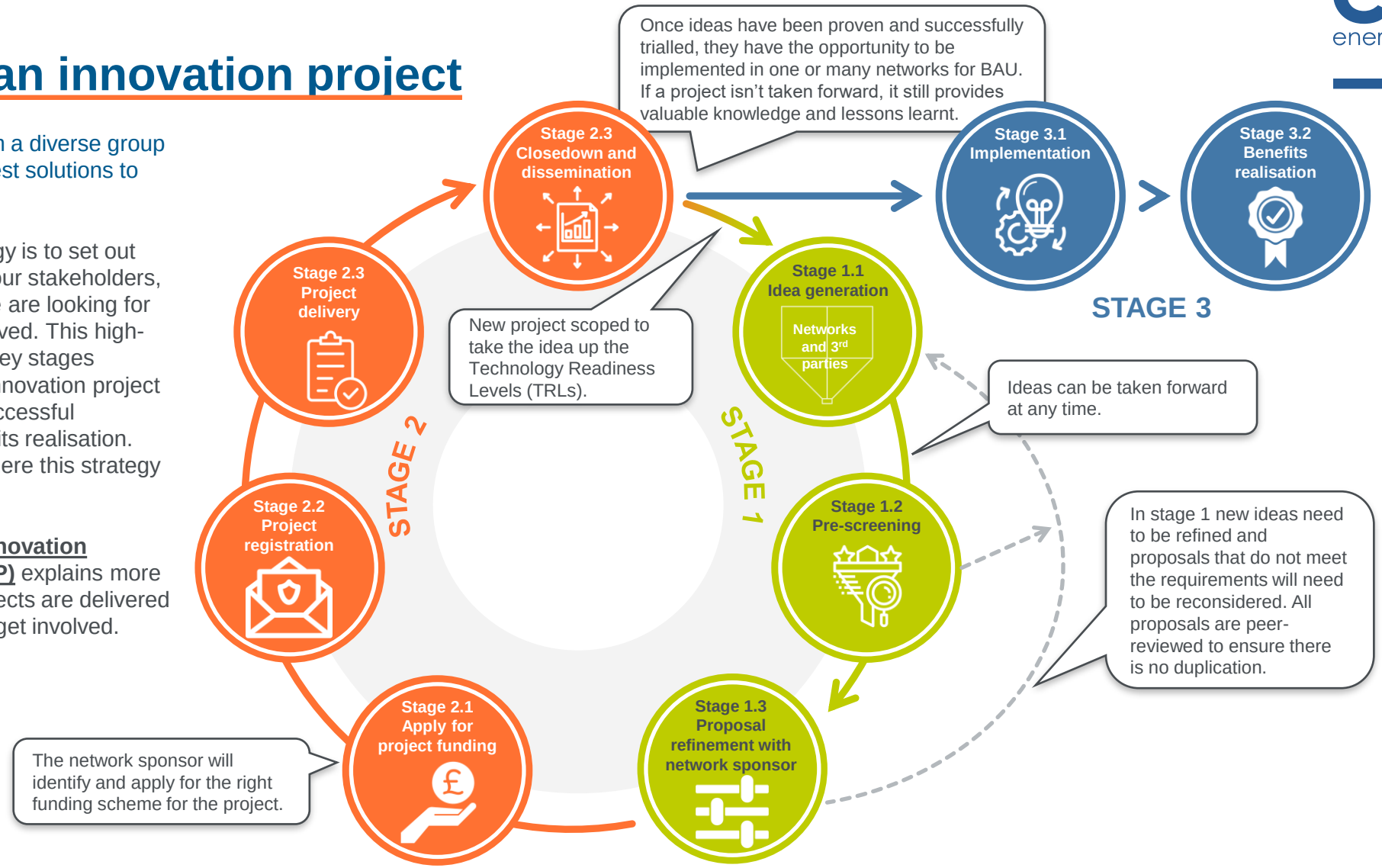
Journey of an innovation project

Journey of an innovation project

We are seeking ideas from a diverse group of innovators to find the best solutions to deliver our priorities.

The purpose of this strategy is to set out our priorities to help you, our stakeholders, better understand what we are looking for and how you can get involved. This high-level guide maps out the key stages involved in delivering an innovation project from an initial idea to a successful implementation and benefits realisation. This process highlights where this strategy can help.

The Energy Networks Innovation Process Document (ENIP) explains more about how innovation projects are delivered and how third parties can get involved.



How to get involved 1/2

How to

Propose Share Discuss

an innovation idea

National routes

The Smarter Networks Portal

Hub for regulatory-funded network innovation projects. Can be used to explore ongoing projects, find partners, and submit ideas for review by all network companies.

UK Research and Innovation (UKRI)

UKRI website has key funding programmes and a 'funding finder' tool to search for current opportunities across UKRI, research councils, and Innovate UK.

Knowledge Transfer Network (KTN)

Part of Innovate UK that exists to connect innovators with new partners who will work with you to refine your ideas, and direct you to appropriate funding opportunities.

Engage directly with the respective company for network-specific ideas

Online channels

Exploring the individual energy networks' innovation websites and social media accounts (including LinkedIn).

Innovation strategies

Looking at the individual innovation strategies or business plans published by the network companies and reading the networks' and ENA's newsletters.

Networking events

Talking to the networks at events held throughout the year, including the annual **Energy Innovation Summit**.

How to

Refine Develop

your innovation idea and project proposal

The best way to refine your proposal is to work with the network sponsor who you will be collaborating with to deliver the project. Each network has its own innovation website (click on the network logos on the right to follow the links) and you can often find some of the key questions you will need to answer about your idea. These questions – or criteria – can also be found in the relevant funding mechanism governance documents.

How to get involved 2/2

Learn more about

Innovation funding mechanisms

and ways to engage

Network Innovation Allowance (NIA)

NIA mechanism supports research, development, and demonstration projects. NIA covers all types of innovation including commercial, technological, and operation. Available in RIIO-2.

Energy Innovation Basecamp

Runs every year, launching in early March. Application window for Innovator Submissions opens a week after the launch and stays open for a month.

Strategic Innovation Fund (SIF)

SIF replaces NIC in RIIO-2 and supports network innovation that contributes to Net Zero goals while delivering net benefits to energy consumers.

More about the SIF

Sign up for SIF updates

Watch short summaries of the SIF projects launched in March-22

The network companies can also use their own funds to transition an innovation project into business-as-usual or to explore new efficiency methods to drive continuous improvements. If you think your idea might suit this type of funding, it is best to engage directly with the network.

Check the ENA's events page for the latest opportunities to meet and collaborate.

How to

Apply for funding

Once you have agreed an idea to take forward with your network sponsor, they will help you apply for the appropriate funding.

The eligibility criteria and application questions for each of the key network funding mechanisms are included in the governance documents, linked opposite.

Energy Networks Innovation Process (ENIP) Overview and Governance Document

Published by ENA, ENIP is a valuable resource which delves into all points around eligibility criteria and FAQs on application processes in much greater detail. It explains how innovation projects are delivered, how third parties can get involved and contains the full details of the end-to-end industry led process for reporting, collaboration and dissemination of regulatory funded innovation projects.

We will review and update this strategy again in 2026. Your feedback will be key to ensuring that the updates to the principles, themes and focus areas are the right ones and we will continue to engage with you to seek your views. If you have any questions or would like to discuss this strategy in more detail, please get in touch: smarter@energynetworks.org

Glossary

IFI	Innovation Funding Incentive. Intended to provide funding for projects primarily focused on the technical development of the networks, to deliver value (e.g. financial, quality of supply, environmental, safety) to consumers. Replaced by NIA in 2013.
IMF	Innovation Measurement Framework. Enables the networks to consistently report on innovation outcomes.
NIA	Network Innovation Allowance. Supports research, development, and demonstration projects. Available in RIIO-2.
NIC	Network Innovation Competition. An annual opportunity for network companies to compete for funding for the development and demonstration of new technologies, operating and commercial arrangements. No longer available in RIIO-2 (see SIF below).
RIIO	Revenue = Incentives + Innovation + Outputs. The framework that sets price controls on gas and electricity companies.
SIF	Strategic Innovation Fund. Replaces NIC in RIIO-2. Supports network innovation that contributes to Net Zero goals while delivering net benefits to energy consumers.
TRL	Technology Readiness Level. A system used to assess the technical maturity of a technology through its development.
LCT	Low Carbon Technology. Technologies generating energy using lower amounts of carbon emissions such as wind, solar and hydro.

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