



# EIC

Together we innovate

The Ultimate Guide to:

## **Innovating with the UK Energy Networks**

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# 1 About the EIC

**We are the EIC. We bring innovators and energy networks together to collaborate for a safe, affordable and decarbonised future that will improve lives for the better.**

Our mission is to create an environment that allows innovators and energy networks to openly innovate together, accelerating the pace of progress, and ultimately, delivering benefits to the consumer. The EIC helps to facilitate cooperation between innovators, the energy networks and the wider sector – all while bringing together funding and new ideas.



## 2 Foreword

### **Climate change is already having a visible impact on the world and the action we take now will affect the lives of future generations.**

The UK has committed to ambitious targets of decarbonising the electricity system by 2035 and being carbon neutral by 2050. The energy networks have a key role to play in progressing towards these targets and achieving them requires a step change in collaboration and pace of innovation.

If we are to progress further and faster, then the pooling of skills, knowledge and experience between industry and innovators will be critical. The challenge of seeking out innovations to accelerate the transition to Net Zero is one that is best realised through partnership.

### **The Energy Innovation Landscape**

The UK has a successful history of innovation, and it is through accelerating innovation that the energy networks will continuously improve the way in which energy is delivered to customers. However, smart innovation requires funding and in Great Britain, some of this funding is provided via the RIIO (Revenues = Incentive + Innovation + Outputs) regulatory framework.

The current RIIO2 price control period provides the framework for the energy networks to actively progress towards achieving Net Zero. The aim is to allow them to do this work at the lowest possible cost to customers while maintaining world-leading levels of system reliability and customer service – as well as ensuring that consumers in vulnerable situations are not left behind.

Rapid and effective innovation requires new ideas and creative ways of thinking from a wide and deep pool of committed global innovators.



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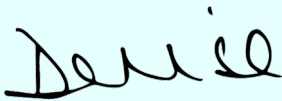
Licensees should work collaboratively, so that this support aimed at improving access to network innovation partnership opportunities is realised in the most efficient and effective manner.

The Ofgem logo, consisting of the word "ofgem" in a lowercase, sans-serif font, with "of" in orange and "gem" in blue, all contained within a white circle.

Source: RII02 NIA governance document, Ofgem

This guide provides an overview of the energy innovation landscape today and explains how you, as an innovator, can be involved.

**Together we innovate.**

A handwritten signature in black ink that reads "Denise".

**Denise Massey**  
Managing Director



## 3 About This Guide

### **Innovators are at the heart of what makes the EIC unique.**

Since 2008, the EIC has supported and empowered hundreds of innovators, helping them to access vital funding for their products, solutions and ideas, and better navigate what can be a highly complex industry.

In 2023, the EIC launched its Innovator Action Plan as a strategic response to feedback gathered from its community of innovators.

The action plan focuses on key areas where the industry must improve the pathways into business as usual, as well as highlights the actions that the EIC – together with its network partners – is taking to improve the experience of innovators and accelerate the pace of innovation.

#### **This new version of the Ultimate Guide supports the commitments set out in the Innovator Action Plan and offers:**

- Clarity about the various routes, support systems and mechanisms that exist to help drive innovation within the energy sector.
- An overview of the roles of Energy Regulator (Ofgem), UKRI, ENA and others.
- Guidance on where to find key industry resources.

Thank you to all those in our innovator community who provided the feedback that has helped to shape this version of the Ultimate Guide.

## 4 The Energy Networks

Who are they and what do they do?

**The UK energy networks are a collection of companies responsible for the distribution and transmission of electricity and gas across the country.**

These companies are regulated by Ofgem, which provides the Government framework in which the companies operate, ensuring that consumers receive safe, reliable and affordable energy services now and in the future.



### Transmission

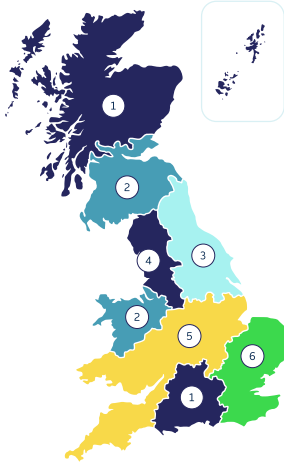
Energy transmission networks are systems that allow for the transportation of high voltage electricity and high-pressure gas from power plants to high energy business users and distribution networks. These transmission lines facilitate the movement of energy over long distances.



### Distribution

Energy distribution networks are the systems that bring electricity and gas from the transmission network to individual homes and businesses. These networks consist of lower-voltage power overhead lines, underground cables, gas mains, transformers and other equipment to connect with end users - both to deliver energy to meet demand and to collect the output from embedded generation.

# Electricity



## Distribution Networks

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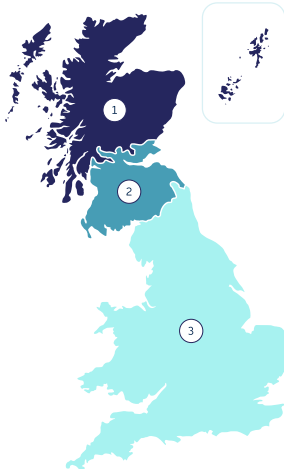
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## Transmission Networks

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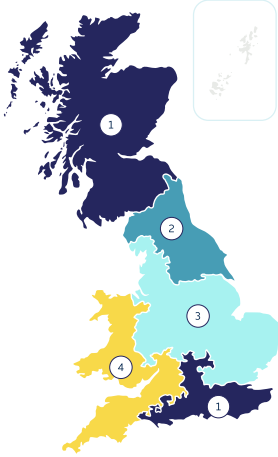
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Nationwide:



# Gas



## Distribution Networks

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## Transmission Networks

1

## 5 The EIC Partnership

**The EIC Partnership allows great businesses and innovators, big and small, to openly innovate together.**

The Partnership consists of nine energy network companies, together with an evolving global community of more than 10,000 innovators.

The Partnership welcomes all innovators who have products, solutions and/or ideas with the potential to contribute towards achieving Net Zero, and improve how energy networks are operated and maintained. It helps to drive progress, creating new opportunities for growth and innovation, and ultimately delivering benefits for customers and communities across the UK.

### The Partners



### The Partnership:

- Shares key network challenges that require understanding, effective collaboration and ambitious innovation.
- Inspires and supports innovators who are developing new solutions to meet these challenges.
- Has proven and established processes to take ideas from development stage all the way through to business as usual deployment.
- Provides innovators with a collective voice.

## IMPACT

# Latest statistics on EIC Partnership Benefits



200+

Challenges advertised to innovators to date



20+

Projects expected to transition into BAU in RII02



£50m

Brokered to date



£200m

Financial benefits expected to be delivered from projects



Reaching out to the EIC was a good first step on our journey to Net Zero. The first thing the EIC were able to do for us was to open the doors. As a company with no prior experience of working with the distribution network operators, we didn't know where to begin when approaching such big companies. More importantly, the EIC has facilitated trials of our product with four of the operators now, providing all the correct formal documentation so that we've been able to deploy our products with the four DNOs for the last 18 months now. We couldn't have done it without them.

**ALAN GREIG** INNOVATOR, APK INDUSTRIES

## 6 Explained: The Energy Whole System

The Energy Whole System approach describes how different sources of energy are produced and delivered to meet the needs of industry, business and domestic users. The overarching aim is to reduce carbon impact and greenhouse gas emissions as we move rapidly towards a Net Zero future.

In the past, the electricity, gas, renewable and oil industries usually worked separately. But now, a united approach considering and involving all energy vectors is needed to provide clean energy for various needs, such as transportation, electricity and gas, so that we can reduce emissions and make real headway towards saving the future of our planet.



## 7 Ofgem Innovation Vision 2021 - 2025

The transition to Net Zero, including the decarbonising of power, heat, and transport - will redefine and shape the energy landscape over the next two decades. But tangible, accelerated progress needs to start now, if the industry is to achieve targets set out for 2030.

As the regulator for energy markets, Ofgem recognises the need to stimulate innovation, particularly in more tightly regulated areas. To achieve this, it has set out three [Innovation Principles and priorities](#) to highlight areas where significant innovation is needed, as well as to encourage regulated parties and other innovators to push for progress in these spaces.

### Consumer benefits:

- ✓ More reliable energy supply
- ✓ Inclusive engagement
- ✓ Wider socio-economic benefits
- ✓ Accelerated decarbonisation
- ✓ Efficiency improvements
- ✓ Positive impact on employees
- ✓ Safer and secure networks
- ✓ Reduced environmental impact

Source: Energy Networks Association

### Innovation Principles:

- Innovation should create value for the whole system.
- Innovation should be customer focused.
- Information on innovation should be widely disseminated (Ofgem).

## 8 The Energy Innovation Landscape

### **Collaboration between industry, innovators and key industry bodies is a key enabler for ensuring a greener and safer future for our planet.**

The following organisations – along with the EIC – are driving innovation in the UK energy sector and helping to create a more sustainable and resilient energy system for the future.

Through their support, innovators can access funding and expertise, as well as general guidance on getting their ambitious plans off the ground.

Ofgem's Innovation Link offers support on energy regulation to innovators looking to trial or launch new products, services, methodologies, or business models.

ENA (Energy Networks Association) is the industry body for the UK and Ireland's energy networks, funded by gas and electricity transmission distribution licence holders. The ENA hosts the Smarter Networks Portal, which innovators can also use as a source of information in relation to network innovation.

UKRI (UK Research and Innovation) is a public body that funds and coordinates research and innovation activities in the United Kingdom. It was established in 2018 to bring together several research councils and other organisations to promote collaboration and drive innovation across different fields. Additionally, UKRI ensures that innovation across the energy networks aligns with wider Government initiatives and other sectors, and is responsible for managing the Strategic Innovation Fund.

Innovate UK KTN exists to connect innovators with new partners and new opportunities – accelerating ambitious ideas into real-world solutions.

Energy Systems Catapult is an independent, not-for-profit organisation set up to accelerate the transformation of the UK's energy system by identifying and addressing innovation opportunities and market barriers.

## 9 The Funding Landscape

### **The energy industry funding landscape is dynamic and constantly evolving**

With the increasing focus on sustainability, efficiency and Net Zero - there is a growing need for innovative solutions, technologies and processes. As a result, there are various funding mechanisms available to support entrepreneurs and innovators in this field.

### **Energy Networks Innovation Funding**

#### **Network Innovation Allowance**

Each network licensee receives a set Network Innovation Allowance (NIA) as part of the price controls set by the regulator.

This provides each network with the flexibility to decide which technical, commercial or operational innovations it will take forward for the benefit of consumers and the business.

#### **The NIA is a vital funding mechanism for the sector because:**

- It cultivates an agile approach to innovation that actively encourages participation of third parties, such as SME innovators.
- It encourages industry collaboration on projects that the licensees would not otherwise undertake within the price control.
- It supports projects that have the potential to facilitate the energy system transition and/or benefit consumers in vulnerable situations.

## Strategic Innovation Fund

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Innovation in energy is a vital part of the process of bringing down the cost for energy consumers, accelerating the decarbonisation of our energy system and reducing our dependence on costly imported fossil fuels, over time. We have to transform the way we travel, heat our homes, and fuel our industries, and energy networks will need to innovate accordingly.

Ofgem set up the Strategic Innovation Fund to help accelerate this transition in a way that is fair and affordable for consumers.



**Neil Kenward**  
Ofgem Director for Strategy  
and Decarbonisation

Source: Ofgem's Strategic Innovation Fund Publication

Launched in 2021, the Strategic Innovation Fund (SIF) is an Ofgem programme that is managed in partnership with Innovate UK (which is part of UK Research and Innovation).

The programme is designed to support collaborations between businesses, academics and networks with the goal of benefiting consumers, reducing emissions, reducing costs, improving energy market access and developing new products or services.

Funding is provided through SIF for projects that respond to specific Innovation Challenges set by the regulator. The ambition for SIF is that it will position the UK as a global energy innovation hub and support more SMEs to scale up.



# 10

## Industry Innovator Support Resources



In addition to the industry information included in this Ultimate Guide, there is a wealth of advice and guidance available to innovators about the energy sector.

This section brings resources together from a range of trusted sources, saving you the job of seeking it out for yourself.

### Introduction To The Industry & The Energy Networks

Source: [Ofgem](#) / [UKRI](#) / [Carbon Trust](#) / [EIC](#)

### Information On Current Or Completed Projects

Source: [ENA](#) / [UKRI](#)

### Energy Networks Innovation Strategy 2022

Source: [ENA](#)

### Key Industry Organisations (Excluding the energy networks)

Source: [EIC](#)

### **Governance Of Regulatory Funding Schemes: NIA & SIF**

Governance documents

Source:

**Ofgem**

### **Industry Challenges**

Source:

**EIC / Ofgem / UKRI**

### **Pitching To Networks Guidance**

Source:

**EIC**

### **Testing & Demonstration Facilities**

Source:

**EIC**

### **Industry Innovation Process**

Source:

**ENA**

### **Energy Industry Regulatory Framework Overview**

Source:

**CEER**

### **Intellectual Property (IP) Guidance**

Source:

**EIC / ENA**

### **Strategic Innovation Fund (SIF) Overview & Guidance**

More info:

**UKRI**

### Energy Regulation Support

Source: **Ofgem**

### Innovator FAQs

Source: **EIC**

### Industry Jargon Explained

Source: **EIC**

### Funding Available

Source: **EIC**

### Innovation Deployment

Coming soon

Source: **UKRI / EIC**

### Innovation Procurement Guide

Coming soon

Source: **EIC**

Innovation strategies for each network operator are linked below:

#### Electricity

Distribution Networks

Transmission Networks

Nationwide:

#### Gas

Distribution Networks

Transmission Networks

# It's time to get started!

We hope that the knowledge shared in this guide empowers you to get started on your own journey of innovation.

**For more information about how you can start making real impact today with the help of the EIC, visit [www.ukeic.com](http://www.ukeic.com) where you can...**

- Explore our list of industry opportunities on the EIC website.
- Sign up to our energy innovation hub for full access to all of the useful tools and materials mentioned in this document.
- Connect with EIC Innovator community across the world for new collaboration opportunities.

**Together we innovate**

## APPENDIX 1:

# Glossary of Terms

**Business As Usual (BAU):** When an innovation is described as being business as usual, this means it has been adopted into the business and is being used as part of normal operations, typically following a development project or trial.

**Call for innovation:** Calls for innovation are requests for innovation from our network partners, across the energy sector, that aim to solve specific business issues.

**Customer vulnerability:** Ofgem's 'Consumer Vulnerability Strategy 2025' defines a vulnerable customer as "one who is: significantly less able than a typical consumer to protect or represent their own interests; and/or significantly more likely to experience detriment, or for that detriment to be more substantial".

**Deployment ready solution:** An innovation that is fully developed at a technology readiness level (TRL) of 9, and ready to be deployed for use in the industry.

**Development proposal:** A proposal for an innovation that requires further work or development to raise its TRL.

**Distribution Network Operator (DNO):** The DNOs own and operate the distribution network infrastructure which connects the transmission networks to the end consumer.

**Distribution Systems Operator (DSO):** A distribution system operator (DSO) is responsible for operating and developing the active distribution system. This will involve managing the electricity network so that distributed sources of electricity generation, including large commercial facilities and smaller domestic facilities, are considered and controlled when making network interventions.

**Energy Networks Association (ENA):** The ENA is the industry body for the UK and Ireland's energy networks, funded by gas and electricity transmission distribution licence holders.

**Energy Systems Operator (ESO):** The electricity system operator is responsible for ensuring the stable and secure operation of the national electricity transmission system. This role is performed by National Grid Electricity System Operator (NGESO).

**Gas Distribution Network (GDN):** The GDNs own and operate the gas distribution network infrastructure which transports gas from the transmission network to the end user.

**Industry challenge:** Industry challenges are requests for proposals to solve wider, more general industry challenges than those put forward as calls for innovation.

**Intellectual Property (IP):** "Property (such as an idea, invention, or process) that derives from the work of the mind or intellect." Source: <https://www.merriam-webster.com/dictionary/intellectual%20property>

**National Transmission System (NTS):** This is the high pressure gas network which transports gas from the entry terminals to gas distribution networks, or directly to power stations and other large industrial users.

**Net Zero:** Net Zero refers to the balance between the amount of greenhouse gas emissions being produced and the amount being removed from the atmosphere.

**Network Innovation Allowance (NIA):** Each network licensee receives a set Network Innovation Allowance (NIA) as part of the price controls set by the regulator. See page 15 for more detail.

**Priority Services Register (PSR):** The Priority Services Register is a free service provided by suppliers and network operators, designed to ensure that the required support is delivered to the networks' most vulnerable customers.

**RIO/RIO2:** Ofgem, the energy market regulator, has a price control approach called RIO to ensure the energy networks have enough revenue to run an efficient network that delivers what customers need. RIO stands for Revenues = Incentives + Innovation + Outputs. One of the sources of investment in innovation, unique to Great Britain, is via the RIO framework. The most recent price control period, known as RIO2, will prepare the GB energy networks to deliver Net Zero at lowest cost to customers while maintaining world-class levels of system reliability and customer service, and ensuring no consumer is left behind.

**Strategic Innovation Fund (SIF):** As part of RIO2 price controls, Ofgem has introduced the SIF to support transition to Net Zero. This fund supports large-scale transformational research and development projects.

**Technology Readiness Level (TRL):** TRL is a method of measuring the maturity of an innovation or technology in relation to its development.

**Transmission Operator (TO):** Transmission Operators are responsible for developing, operating and maintaining a high voltage electricity system within a distinct transmission area. In Great Britain, the three TOs are National Grid Electricity Transmission plc (NGET) for England and Wales, Scottish Power Transmission Limited for southern Scotland and Scottish Hydro Electric Transmission plc for northern Scotland and the Scottish islands groups.

**Whole system:** “Joined up and efficient approaches across multiple aspects of the energy system, beyond a specific network, around planning, forecasting, design, construction, operation, maintenance and data.” Source: [ENA Energy Network Innovation Strategy, March 2020](#)

**RIIO-ED2:** RIIO-ED2 is the price control for the electricity distribution network, where network companies take power from the transmission network and deliver it at safe, lower voltages to homes and businesses. The price control runs for five years, from 2023-2028. The RIIO-ED1 price control covered the period from 2015-2023.

**RIIO-T2:** RIIO-T2 is the price control for the high voltage electricity transmission networks and high pressure gas transmission networks which transmit energy across Britain from where it is generated. The price control runs for five years from 2021-2026.

**RIIO-GD2:** RIIO-GD2 is the price control for the gas distribution network, where network companies take gas from the transmission network and deliver it at safe, lower pressures to homes and businesses. The price control runs from 2021-2026. The RIIO-GD1 price control ran from 2013-2021.

## APPENDIX 2:

# Key Industry Organisations

**BEAMA:** UK trade association for manufacturers and providers of energy infrastructure technologies and systems.

**The Carbon Trust:** The Carbon Trust partners with businesses, governments and organisations around the world- helping them to decarbonise and accelerate to Net Zero.

**EIC:** The EIC, formerly the Energy Innovation Centre, brings industry and innovators together. As a not-for-profit organisation, the EIC operates a shared platform and provides an open environment for its industry partners and innovation community to innovate together.

**Energy and Utilities Alliance (EUA):** The Energy and Utilities Alliance is a not-for-profit trade association that provides a leading industry voice to help shift future policy direction within the energy and utilities sectors.

**Energy Networks Association (ENA):** The Energy Networks Association is the industry body for the UK and Ireland's energy networks, funded by gas and electricity transmission and distribution licence holders.

**Energy Systems Catapult (ESC):** The ESC is an independent, not-for-profit organisation set up to accelerate the transformation of the UK's energy system by identifying and addressing innovation opportunities and market barriers.

**Energy UK:** Energy UK is the trade association for the energy industry with over 100 members spanning every aspect of the energy sector – from established FTSE 100 companies right through to new, growing suppliers and generators.

**The Institution of Engineering and Technology (IET):** The Institution of Engineering and Technology is a multidisciplinary professional engineering institution.

**Institution of Gas Engineers & Managers (IGEM):** The Institute of Gas Engineers and Managers is the professional engineering institution for gas. It supports individuals and organisations connected with the gas industry.

**Innovate UK:** Innovate UK is part of UK Research and Innovation (UKRI) a non-departmental public body funded by a grant-in-aid from the UK government. Innovate UK funds business and research collaborations to accelerate innovation and drive business investment into research and development. Innovate UK EDGE is a key part of Innovate UK's support network. It offers a range of services to help innovative businesses grow and scale.



**Knowledge Transfer Network (KTN):** Innovate UK KTN exists to connect innovators with new partners and new opportunities – accelerating ambitious ideas into real-world solutions.

**Ofgem:** The Office of Gas and Electricity Markets is the government regulator for the electricity and downstream natural gas markets in Great Britain.

**Ofgem Innovation Link:** Ofgem's Innovation Link offers support on energy regulation to innovators looking to trial or launch new products, services, methodologies or business models.

**Power Networks Demonstration Centre (PNDC):** The Power Networks Demonstration Centre is a facility unique in its capabilities. It enables companies to develop, test and demonstrate products and solutions in a real distribution network environment. The centre is open to anyone with an interesting or relevant project that may make a contribution to the low carbon future in an EU or global setting.

# EIC

Together we innovate

[twitter.com/EIC\\_UK](https://twitter.com/EIC_UK)

[linkedin.com/company/energy-innovation-centre/](https://linkedin.com/company/energy-innovation-centre/)

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## EIC Partners

