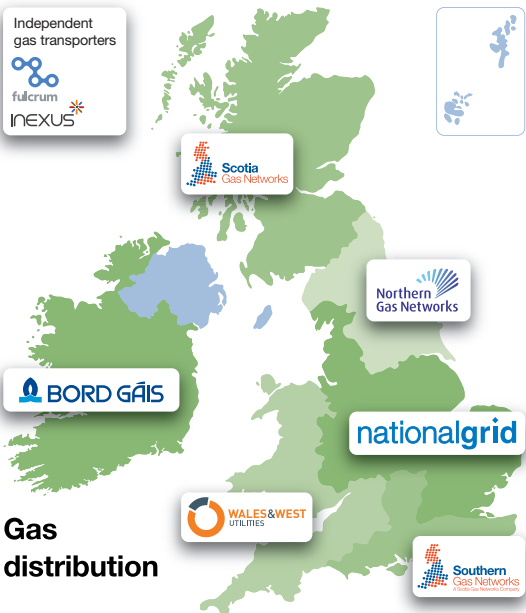
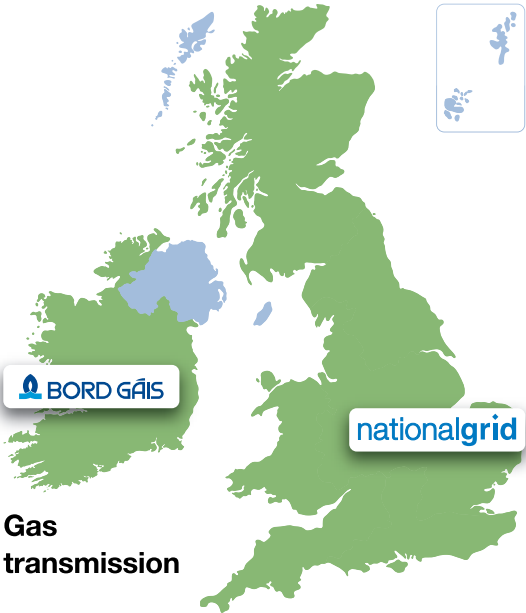


# UK and Ireland energy networks

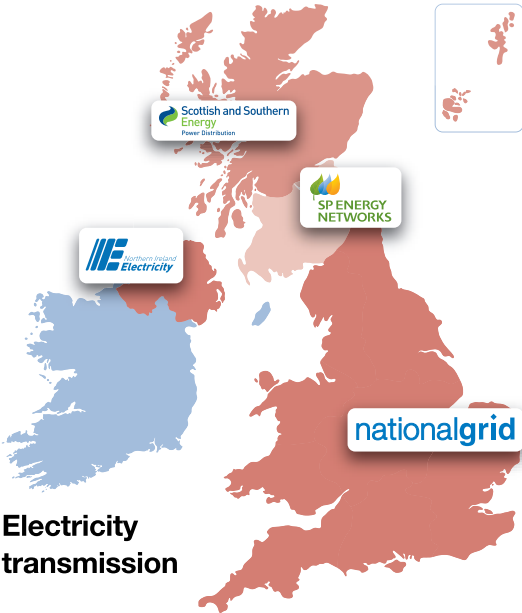
Sustainable, secure  
and essential



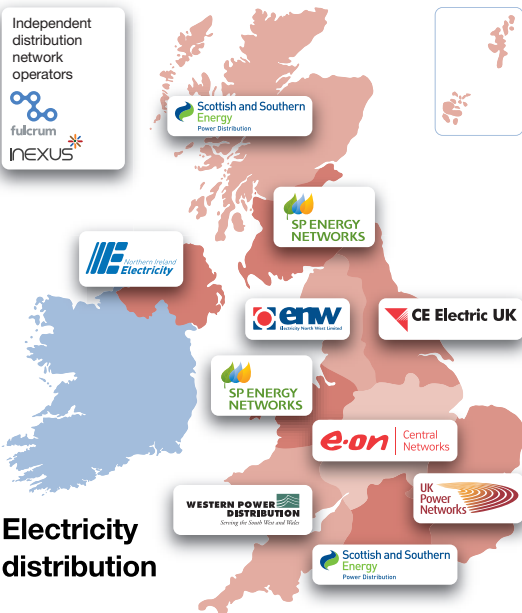
# Energy Networks Association (ENA) energy transmission and distribution the interest of its members in the



is the industry body for UK and Ireland licence holders and operators acting in energy 'wires and pipes' sectors



**Electricity transmission**



**Electricity distribution**

# Welcome

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**For every minute of every day ENA's members ensure that the lights stay on and that the UK and Ireland keep working.**

Our members deliver power along overhead lines and underground cables through the length and breadth of the UK and Ireland at voltages as high as 400,000 volts. Our members also deliver gas at pressures as high as 85 bar along pipes into homes and businesses, that's 85 times normal air pressure.

The networks operate in a regulated environment and are subject to price reviews by economic regulation, which set out the companies' investment drivers. This has delivered a lean, efficient and constantly improving service over the past 20 years.

The UK and Ireland face major challenges as the energy world goes through a once in a generation transformation. In the following pages we have provided some useful facts about the networks, and some of the big issues facing the UK and Ireland and our members. In addition we provide details of who to contact if there is a power cut or someone smells gas. I hope you find it useful.

**David Smith**

Chief Executive

# About ENA

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ENA represents the interests of the energy networks at home and in Europe. Our organisation is made up of a diverse mix of gas and electricity organisations, from major international companies to independent network operators, including network operators in the Irish Republic.

ENA is trusted and respected by government, regulators and the EU Commission. ENA also produces a wide range of industry standards.

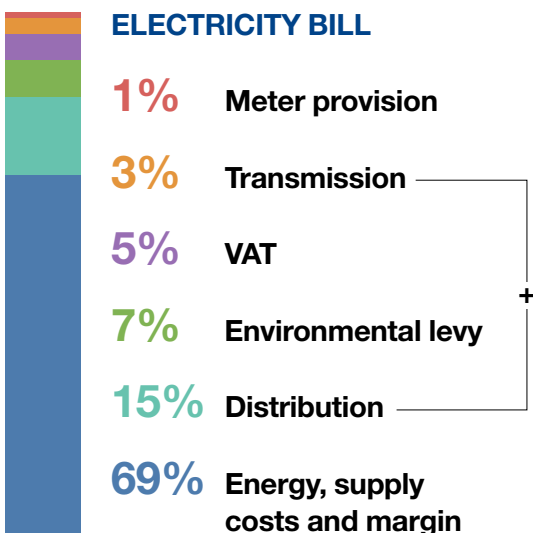
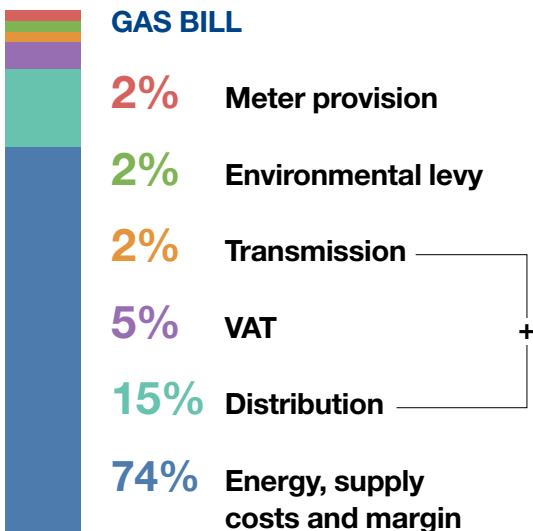
ENA is instrumental in addressing safety issues across the energy industry. It has established a unique level of co-operation and partnership between government, industry and trade unions. ENA also supports the Gas Industry Safety Group (GISG), which brings together the principal organisations in the GB gas industry to promote onshore gas safety.

The impact of regulation, the increasing influence of European legislation, the challenge of new technologies and the importance of securing our energy future, all against the background of the 2020 renewable energy targets, are just some issues we are dealing with.

ENA acts as a gateway to the network companies and ensures you are fully informed about everything to do with the networks.

# The cost of the GB networks

Reflecting current prices in November 2010, the networks represent only **17%** of domestic gas charges and **18%** of electricity charges. *Source: Ofgem*

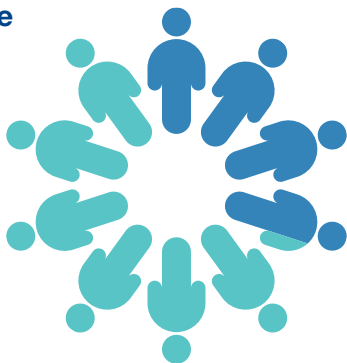


# The UK low carbon economy

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**29 million electricity customers** and **21.5 million gas customers** are served by ENA member network companies.

**68,000 people** are employed by the network companies which is **38% of all energy industry workers.**



**9,000 new jobs** (including contractors) will be created in the electricity distribution sector – these new jobs are just enough to maintain the current services and cope with the new demands of the low carbon economy, including distributed generation.



The average family with gas heating needs a **1.5 kilowatt (kW)** electricity supply. With electric heating and an electric vehicle that **increases ten-fold to 15kW.**

# UK networks performance

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Electricity transmission and distribution networks are **over 99% reliable**.

Gas distribution network customer satisfaction scores have been consistent at **3.96 out of 5** over the past three years (a score of five out of five indicates 'very satisfied').

Since electricity privatisation in the UK in 1990:

- real electricity operating costs per unit have **fallen by 5.5% per year** in electricity distribution;
- we have seen a **30% reduction** in both the number and duration of reported electrical power outages;
- real prices have declined by about **50%** in electricity distribution and **30%** in electricity transmission, despite unprecedented levels of capital investment; and
- fatal, major and 'over three-day' electrical accident incidence rates have seen a **five-fold reduction**.

Meanwhile, in gas:

- > gas network companies are replacing up to **4,000km of mains** per year;
- > since 2002, there has been a **50% increase in the total length of pipe replaced** across the gas network, totalling **12,348 miles (19,873km)**.

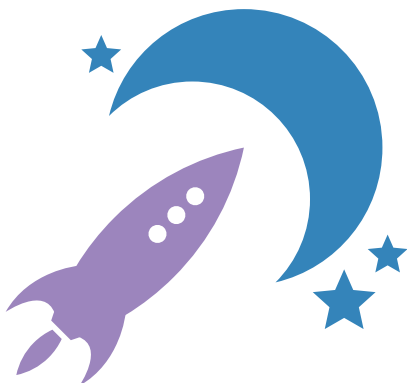
## The size of our networks

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Gas is transported along **180,000 miles (289,000km)** of pipes, enough to go **six times around the world**.

The networks cover a surface area of **126,655 square miles (328,031 square km)**.

The UK networks companies transport electricity along **497,097 miles (800,000 km)** of lines and cable – more than **twice the distance of the earth from the moon**.



**£126 billion** would be the cost of replacing the UK's electricity networks, **£95.6 billion** being associated with distribution network and **£30.6 billion** with transmission networks.

ENA members can deliver **60 gigawatts (GW)** of power through the network, providing enough power to supply **60 million electric fires**.

Gas is delivered to nearly **60 million people** in the UK and the latest figures show that gas provides **over 50% of UK energy demand**.

The gas network companies connect up to **100,000 new gas consumers** a year, with gas particularly used to address domestic fuel poverty. Capital investment in gas distribution alone runs at **£400m a year**.



# Renewable energy

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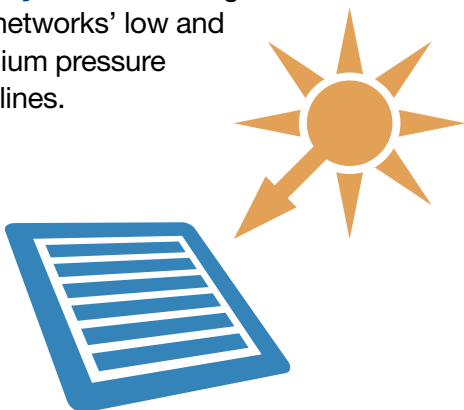
There are major opportunities for the gas networks to be deployed to help exploit bio-methane opportunities and

for the network companies to consider new carbon capture and storage transportation.

Government targets require **15% renewable energy by 2020** – translating to **30% of electricity from renewable sources**.

**80% reduction** in carbon dioxide emissions by 2050 is now mandatory.

Gas distribution networks have achieved a **5% total reduction in methane and natural gas emissions over the past three years** lost through the networks' low and medium pressure pipelines.

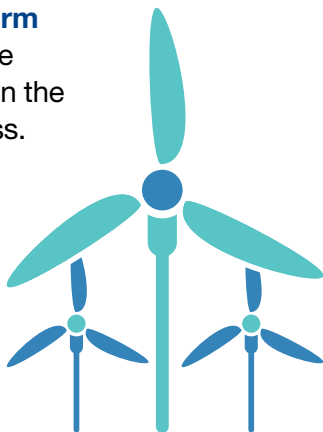


# Planning: the need for reform

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**70% of wind farm applications** are currently stuck in the planning process.

Gas and electricity applications can go across **several local authorities.**



The Beaulay-Denny transmission line in Scotland, vital to our renewable future, has already been in the planning process for **over eight years.**

A 20km wooden pole-mounted distribution network line in the ScottishPower area (needed to ensure the efficient supply to 60,000 homes) has been in the planning process **since 2003.**

The North Yorkshire electricity transmission line took **ten years** to be approved.

## Investing in the UK networks

The UK energy sector requires **£200 billion** of investment over the next few decades.

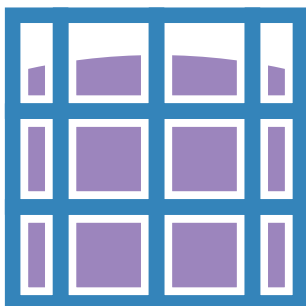
**One third** of existing electricity generation needs replacement over the next decade.

Ofgem estimates that the 'wires and pipes' will need **£32 billion of additional investment** over the coming decade, a **75% increase** in current asset value.

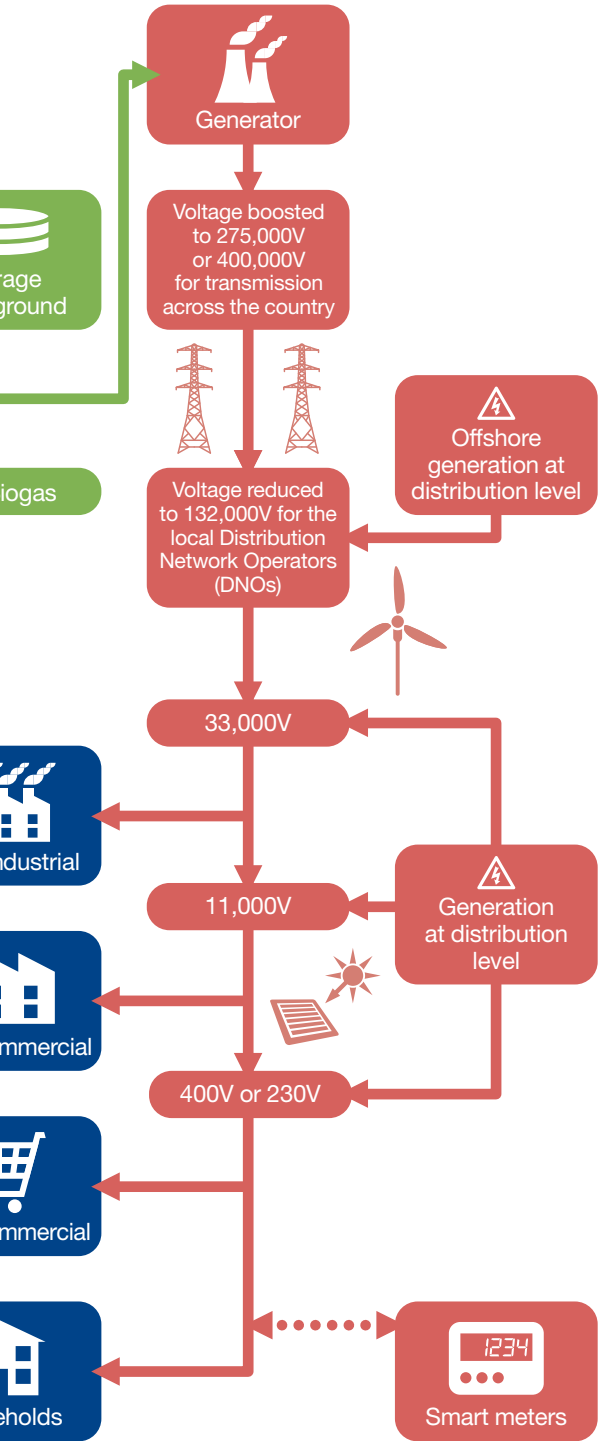
**80%** of UK gas could be imported by 2020 requiring new pipelines.

Connecting up an additional 35GW of renewable and 10GW of nuclear power will need up to **621 miles (1,000km) of new cables** – the single largest expansion of the grid since the 1960s.

Estimates say that **46,602 miles (75,000 km) of new cable** will be needed to rewire Britain for a renewable future – **nearly matching current annual world cable production.**







## The road to a smart grid

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The need to address the trilemma of energy affordability, sustainability and security has presented us with the need to provide a solution. We have come up with that solution – **the smart grid.**

Central to delivery of this will be the networks and the key to our ability to create an effective smart network will be information and communications technology.

ENA is already thinking about tomorrow's energy networks today. We have brought together a group of the industry's leading experts on transmission, distributed generation, the smart grid, gas futures and distribution scenarios – to look at smart metering, heat and energy saving, information and communication technology, feed-in tariffs and electric vehicles.



## The smart grid can save us money

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The smart grid will benefit the smoothing of the load curve to reduce the need for reinforcement of the transmission and distribution networks.

A report by Imperial College London, commissioned by ENA in March 2010, estimated that saving of several billion pounds could be realised.

It will enable the networks to distribute renewable energy generation effectively by reducing the impact of their quality and intermittency.

The smart grid will:

- facilitate much more efficient use of energy by the public;
- facilitate use of electric vehicles, so meeting the low carbon challenge and providing potential new sources of storage technology; and
- enable the network companies to actively manage distribution in the same way as the transmission networks.

**The age of 'design and forget' is about to end.**

## Gas – helping to meet the challenge

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ENA believes the answer to the challenge of delivering a low carbon economy is an all-encompassing energy solution – not just an electricity or gas solution.

The UK and Ireland gas networks are vital assets to both countries' economies, central to securing affordable and low carbon energy supplies now and in the future. To help inform the debate, ENA commissioned Redpoint (who have undertaken work for DECC and Ofgem) to conduct a long-range scenario-based modelling study of the future utilisation of gas through to 2050.

They found that gas could offer a major low cost solution in meeting both the 2050 carbon targets and the 2020 renewable energy targets. There could be potential savings of **£700bn** over the 2010 to 2050 period – around **£20,000 per household**.

## Smart meters

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Smart meters can provide two-way communication between the customer's supply point and the networks.

Although the roll-out is supplier led, there will be a clear impact on the networks. Smart meters are vital to the introduction of smart grids, where

operation and management of ‘active’ networks will be essential to accommodate a variety of localised renewable gas and electricity sources.

Network companies have a direct relationship with every property in the UK and therefore are uniquely placed to support the regional roll-out of smart meters and the supporting communication networks.

ENA has set up a group of industry experts to look at how smart meters can best complement the smart grid technology of the future.

## Decentralised energy

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The increasing development of small-scale energy generation is an obvious issue for network companies. Integrating this new localised active network with large-scale generation poses technical challenges. Far from leading to a ‘gridless’ future as some have said, it will mean a more complex, effective and efficient network.

## Research, development and innovation

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ENA supports increasing research and development (R&D) investment to 2.5% of turnover. We strongly endorse initiatives such as the Low Carbon Networks Fund in GB.

## Electric vehicles

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Networks are central to making electric vehicles a success. These vehicles present a number of challenges, such as drivers simultaneously recharging cars in peak times.

The networks are also crucial to facilitate the viable use of electric vehicles across the UK and the European Union as a whole. ENA member companies are working with the Government and vehicle manufacturers to achieve practical solutions.

## Skills

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As a responsible industry, our members are actively involved in looking collectively at how to address potential sector skill shortages, through the Sector Skills Council (Energy and Utility Skills) in GB. We are working hard to inspire the young people who will engineer our energy future. We are also working to ensure we have enough good, experienced, academic and sector-specific trainers. ENA has been instrumental in support for the new National Skills Academy for Power.

## Fuel poverty

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Energy network companies are committed to addressing fuel poverty.

In the UK, they are fully utilising an Ofgem incentive scheme to extend the gas network to fuel-poor communities. The gas distribution networks have been working with local groups to find eligible communities to assist.

In electricity, the efficiency and reliability of the network will allow more investment for vulnerable customers while cushioning them from some of the increased costs of targets.

## Powering improvement

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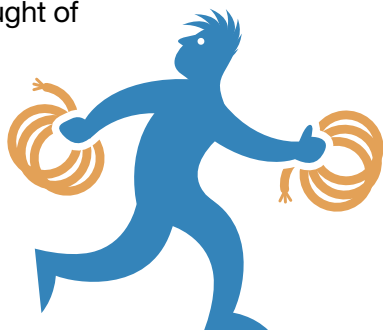
ENA plays a central role in delivering a safer and healthier environment for energy sector workers.

The initiative, called '**Powering Improvement**', has set its ambition for the energy industry to be a world leader in health and safety performance in the world by 2015.

## Metal theft

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Network companies face a daily onslaught of metal thefts which have major societal impacts. These risk the safety of the public,



loss of supply to communities and considerable damage to the environment. To address this we believe it is vital that the means of selling on the stolen metal is stopped and are working to change the law that governs scrap metal dealers.

## Economic climate

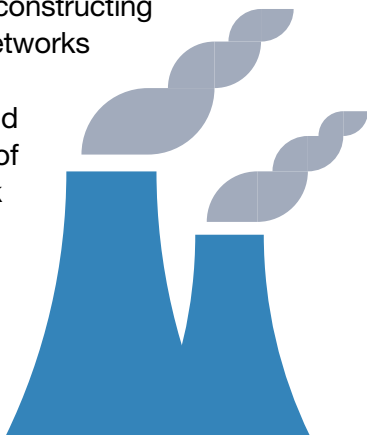
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Prospective investors in the networks must be reassured that all efficient expenditure by network companies is recoverable and that the rewards available to them are commensurate with the risks they face in transforming their infrastructure.

## Carbon capture and storage

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Building coal-fired plants in new locations demands additional network capacity and reinforcement of the existing infrastructure. At the same time, constructing new CO<sub>2</sub> networks calls for the expertise and experience of gas network providers.



## Electric and magnetic fields

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The electricity industry has long supported high-quality independent research into the electric and magnetic fields (EMFs) produced by the power system, and the possible connection between them and health. The industry has a longstanding policy of open communication with the public on this issue – for example, by providing one of the world’s leading sources of factual information at [www.emfs.info](http://www.emfs.info).

ENA was instrumental in establishing the Stakeholder Advisory Group on Extra Low Frequency EMFs (SAGE) which brought together stakeholders, citizen groups and independent scientists as well as government and industry.

## Carbon monoxide

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The gas distribution networks have always carried out carbon monoxide awareness campaigns independently and with community and voluntary groups, and through the provision of literature to customers.

They have now created an all-fuels carbon monoxide leaflet, which they will leave with customers when they visit.

This outlines the measures that customers can take to protect themselves from and alert themselves to carbon monoxide, and what action to take if they suspect a carbon monoxide incident.

## Supply chain (capacity and procurement)

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Supply chain constraints at both the UK and Ireland and international level – whether a shortage of ships to lay sub-sea cables or long lead-in times in procuring vital gas and electricity components – must be taken into consideration when planning major energy infrastructure development.

## Planning

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Adequate government funding for planning is essential. The UK Government must also ensure that key participants in the new planning framework (such as local authorities and agencies) are able to fully participate in the pre-application consultation process and not delay it due to lack of funds.

ENA has been keen to ensure the consultations process for the GB National Policy Statements (NPS) will be thorough and ensure the maximum participation of policy stakeholders, Parliamentarians and the public.

## We're here to help

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If you would like to talk to us about what we do or how energy is delivered to your door, please do not hesitate to contact ENA on **+44 (0)20 7706 5122** or **[policy@energynetworks.org](mailto:policy@energynetworks.org)** You can also find out more about ENA by visiting **[www.energynetworks.org](http://www.energynetworks.org)**

To keep stakeholders up-to-date with developing networks and energy-related issues, ENA produces '**ENA Bulletin**' – a free fortnightly round-up of key issues affecting the sector. Visit **[www.energynetworks.org/bulletin](http://www.energynetworks.org/bulletin)** for the latest edition or to sign up for email notifications.

## Useful contacts

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### **Association of Electricity Producers**

**T +44 (0)20 7930 9390**

[www.aepuk.com](http://www.aepuk.com)

### **Energy Retail Association**

**T +44 (0)20 7104 4150**

[www.energy-retail.org.uk](http://www.energy-retail.org.uk)

### **Energy UK**

**T +44 (0)20 7104 4160**

[www.energy-uk.org.uk](http://www.energy-uk.org.uk)

### **Irish Commission for Energy Regulation**

**T +353 (0)1 4000 800**

[www.cer.ie](http://www.cer.ie)

## **Ofgem**

**T** +44 (0)20 7901 7000

[www.ofgem.gov.uk](http://www.ofgem.gov.uk)

## **Utility Regulator of Northern Ireland**

**T** +44 (0)2890 311 575

[www.uregni.gov.uk](http://www.uregni.gov.uk)

## **ENA member companies**

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*Telephone numbers provided are for public affairs contacts*

### **Bord Gáis**

**T** +353 (0)21 4534273

[www.bordgais.ie](http://www.bordgais.ie)

### **CE Electric UK**

**T** +44 (0)191 229 4315

[www.ce-electricuk.com](http://www.ce-electricuk.com)

### **Central Networks**

**T** +44 (0)20 7826 2726

[www.eon-uk.com/distribution](http://www.eon-uk.com/distribution)

### **Electricity North West**

**T** +44 (0)1925 534 431

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

### **Fulcrum**

**T** +44 (0)845 641 3010

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

### **Inexus**

**T** +44 (0)29 2090 8550

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

### **National Grid**

**T** +44 (0)1926 653 497

[www.nationalgrid.com](http://www.nationalgrid.com)

### **Northern Gas Networks**

**T** +44 (0)113 397 5377

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

### **Northern Ireland Electricity**

**T** +44 (0)28 9066 1100

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

### **Scotia Gas Networks**

**T** +44 (0)845 0760 530

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

### **Scottish and Southern Energy**

**T** +44 (0)845 0760 530

[www.scottish-southern.co.uk](http://www.scottish-southern.co.uk)

### **ScottishPower**

**T** +44 (0)141 566 4866

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

### **UK Power Networks**

**T** +44 (0)20 7752 2173

### **Wales & West Utilities**

**T** +44 (0)29 2027 8860

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

### **Western Power Distribution**

**T** +44 (0)117 933 2175

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

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6th Floor, Dean Bradley House  
52 Horseferry Road  
London SW1P 2AF

**T** +44 (0)20 7706 5100

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