

National Grid: Initiatives which reduce the environmental impact of gas distribution

Executive summary

This year has been a landmark year of innovation and achievements, presented in the context of a clear, joined up organisational vision and strategy.

The past twelve months have seen us become the first GDN to connect a purpose-designed Anaerobic Digestion plant to the gas grid, introduce a sector-leading meter recycling facility, build a sixth environmental centre to inspire future generations, and ramp up our initiatives to reduce shrinkage. As a result we have achieved a 55% reduction in our total emissions against a 2050 target of 80%, and have helped thousands of customers and employees reduce their emissions too.



Our strategic objectives

When we say we have put climate change at the heart of our business, it isn't simply an empty sound bite. It is a genuine commitment to reducing our environmental impact in line with RIIO and GDPCR1 ambitions: making significant steps towards helping the UK's transition to a low carbon economy whilst reducing our own organisational emissions. With this in mind we have set

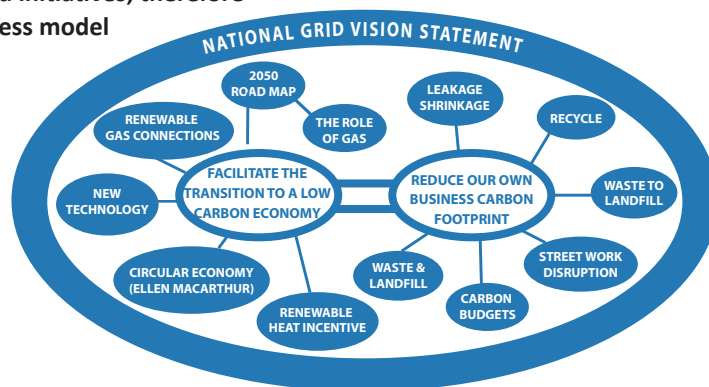
some ambitious targets:

- **80% greenhouse gas reduction** across our businesses by 2050.
- **80% reduction in methane leakage** and venting by 2050.
- Contribute towards Department of Energy and Climate Change (DECC)'s target of the UK generating 7TWh/a of grid-connected biomethane by 2020.
- 100% recycling of road spoil by 2010-11.

Embedding environmental best practice within our business

These targets could not be achieved through miscellaneous disconnected initiatives; therefore our approach has been truly holistic. We've adopted a low carbon business model and are supporting the development of low carbon energy markets:

- 100% of employees working to certified ISO 14001 environmental management systems.
- Each of our lines of business developed five year plans for greenhouse gas reduction.
- We now use a Non-Traded Price of Carbon in all the company's economic decisions.
- Executive compensation is now linked to performance against greenhouse gas reduction plans.
- We have created a truly interconnected approach - see diagram.



A breakthrough in low carbon gas production

The past year has seen National Grid become the first GDN to connect a purpose-designed Anaerobic Digestion plant to the gas grid, making Biomethane a reality rather than an aspiration. Our flagship project is the Adnams BioEnergy facility in Suffolk:

- This facility turns up to 12,000 tonnes of organic waste into biomethane and liquid fertiliser each year.
- The first biomethane was transferred from the producer to the gas grid in October 2010 (a £1.4m project).
- We have received over 100 enquiries in relation to other potential biomethane plants.
- We have provided direct support to DECC leading to a policy change on the Renewable Heat Incentive which will support our ambition in this market.

A breakthrough in meter recycling

In May 2010 National Grid opened its Meter Assessment and Recycling Centre (MARC), a purpose built facility to streamline the recovery, disassembly and re-use of materials and components used in metering technologies. The programme is finding innovative new ways of maximising material re-use and improving the disposal of hazardous waste. Thanks to this innovation, out of the 1.4 million meters returned annually in the UK, MARC ensures that 300,000 are refurbished rather than scrapped, and a further 3,000 tonnes of waste materials are recycled rather than sent to landfill. Our Meter Assessment and Recycling Centre is used by the Ellen MacArthur foundation as a case study for her work.

Other recycling achievements

- **Recycling energy:** We are putting pilot projects in place in London to capture the energy used to move gas around our gas networks.
- **Recycling road spoil:** During the year we have achieved our goal of 100% recycling of road spoil, saving around 500,000 tonnes of material from land-fill.

Reducing customer & employee emissions

- **Advanced smart metering:** We are actively pursuing smart metering trials in the UK as well as smart grid projects.
- **Converting customers to gas:** In converting fuel poor customers to gas have reduced their emissions by circa 638,871 tonnes (lifetime CO₂ savings).
- **National Grid Employee Scheme:** All 12,000 employees have been offered support by Affordable Warmth Solutions to help them install energy efficiency measures within their homes.

Gas shrinkage systems and procedures

- **Replacing old pipes:** As part of our major ongoing programme of replacing old cast iron pipes with modern polyethylene (PE) pipes we have replaced around 2,000km of pipes in the past year.
- **MEG Research:** For those metallic pipes still in operation during the year we have invested around £45,000 in a study into Mono Ethylene Glycol (MEG) sampling techniques which has helped minimise risks to health and safety and the environment from the risks associated with the storage, transportation and handling of a hazardous substance.
- **Streetworks initiatives:** We have continued to develop new best practice technologies to reduce the duration of streetworks (and thus the unavoidable leakage of gas) as well as increasing our recycling of road spoil.

Monitoring our performance

- **Performance monitoring:** We have implemented carbon budgets across our business and aligned emissions reductions alongside other business performance indicators.
- **New measuring technology:** We've achieved the certification of new biomethane measuring technology, which we've provided to other GDNs. High quality system pressure data supplements our low pressure leakage model data, improving shrinkage measurements.
- **Reporting:** Our environmental performance is published in our annual report, our annual corporate responsibility report, and on our website.

Stakeholder engagement

- **Government:** Representation on DECC and Department for Environment, Food and Rural Affairs (DEFRA) bioenergy work streams.
- **Ministry of Justice:** Our Meter Assessment and Recycling Centre is staffed mostly by young offenders being rehabilitated. Young offenders participating are reoffending at a rate of just 7% compared to a 70% national average.

- **Private investors:** The future is looking bright. So far we have engaged with over 100 potential renewable gas producers.
- **Environmentalists:** We actively consult on the environmental impacts of our activities with organisations including the Renewable Energy Association (REA), Carbon Trust, the Committee on Climate Change, WWF and the Environment Agency.
- **Biffa waste management:** diverting waste from landfill using recycling facilities across 70 gas distribution sites.
- **Schools:** We have set up 6 Environmental Education Centres, providing outdoor education for school children to support key National Curriculum targets. Our centres welcome 90,000 visitors per year, and reach an additional 15,000 through outreach.



Impacts - against key performance indicators

We measure the achievement of our objectives by qualitative assessments and the monitoring of quantitative indicators as below:

Energy production impact:

- Adnams Bioenergy will generate 4.8 Million Kilowatt-hours of biomethane per year - enough to heat 235 homes a year or power an average family car for 4 million miles.
- Processing 12,000 tonnes per year of food and brewery waste will save 50k tonnes of CO₂ emission compared with landfilling.
- We achieved "end of waste" status for the biomethane from the Environment Agency.

Gas shrinkage performance:

- We have already reduced methane leakage by more than 50% since 1990 against our target of 80% reduction by 2050. This is equivalent to a reduction of 43,000 tonnes of CO₂ per year.
- Medium pressure optimisation has reduced MP leakage rates in the London network alone by 32% (that's 6,000 tonnes of CO₂).

Emissions reduction:

- As a company we have achieved a 55% reduction in our greenhouse gas emissions compared with our 1990 baseline – a reduction of 1.5m tonnes/year – and have helped customers reduce energy consumption by 2.1bn MWh since 1987.

Significant environmental incidents:

- There were zero significant environmental incidents within UK gas distribution operations in 2010/11.

Leading the wider industry

In line with RIIO and GPCR1 ambitions about working with industry partners we have undertaken the following:

- We have provided certified equipment to all three GDNs so they can benefit from our biomethane developments.
- The new visitor centre at Adnams BioEnergy will demonstrate the plant to engineers, politicians, schools and the public.
- We support extensive research into bioenergy.
- Two Senior Managers from our Sustainable Gas Team have spoken at several Government and industry conferences including an Environmental conference.
- We are members of key industry bodies relating to Biogas, such as the International Energy Agency's Task 37 Working Group, two CBI Working Groups and the REA's Biogas Group.

- We contributed significantly to the REA's submissions to DECC in relation to the cost base for the renewable heat incentive.
- We work with other GDNs through the Energy Networks Association to facilitate distributed entry of renewable and other non-conventional sources of gas.
- We led the development of the co-sponsored report produced by Redpoint which analysed the future contribution that gas, and in particular renewable gas, could make to UK energy supplies in the period to 2050.
- We have taken a leading role in changing charging methodology to make biomethane more commercially viable.
- We have partnered with Ellen MacArthur to launch the Ellen MacArthur Foundation which is promoting 'The Circular Economy': 'using things' rather than 'using things up'. A good example of this is our Meter Assessment and Recycling Centre.

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Supporting Document

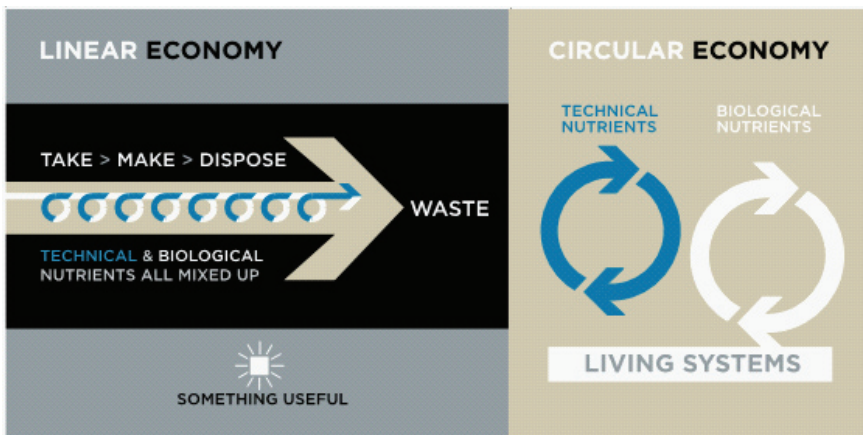


Adnams Bio Energy facility

The Adnams Bio Energy facility turns up to 12,000 tonnes of organic waste into biomethane and liquid fertiliser each year. In October 2010 the first biomethane was transferred to the gas grid.

Our Meter Assessment and Recycling Centre

Our Meter Assessment and Recycling Centre (MARC) ensures that 300,000 meters are refurbished rather than scrapped annually. The centre is staffed mostly by young offenders being rehabilitated. Young offenders participating are reoffending at a rate of just 7% compared to a 70% national average.



Partnering with the Ellen MacArthur Foundation

National Grid has partnered with the Ellen MacArthur Foundation which encourages businesses to embrace a “circular economy” rather than a “linear economy”. This is preferential to a lot of environmental strategies which attempt to reduce consumption and improve efficiency which, at best, result in a slowing down of harm rather than a step change. Our Meter Assessment and Recycling Centre is used by the foundation as a case study for this approach.



Environmental centres: Skelton Environmental Centre



The building of a new education centre

