

Our Contribution

National Grid's Environmental
Sustainability Strategy





Foreword



Our business remains at the centre of one of the 21st century's greatest challenges: to build affordable, reliable and sustainable energy systems that can supply tomorrow's world with the energy it needs to prosper.

We see the value in operating in an environmentally responsible way and we know it's about more than just being a green business. Profit and growth must go hand in hand with environmental benefit. By embedding sustainability in our business strategy and using it as a lens to guide the way we do business, we are driving more efficient performance and future-proofing our organisation within a changing environmental and social landscape.

Our environmental sustainability strategy, Our Contribution, sets out our ambition to transform the way we do business and provide a sustainable legacy from our operations. It provides a blueprint for embedding sustainable decision-making into our day-to-day business operations – and how we plan for the future.

This strategy lays out our targets for 2020 and a climate commitment to 2050. It also reiterates our passion and commitment for working sustainably across our global operations. Company-wide ambitions are supported by regional targets and specific areas of focus in the UK and US.

There is a passion and commitment for working sustainably across our global operations, and case studies from our employees describe some of the success we've already seen.

We're on a challenging journey and we're making good progress. But there's still a long road ahead. By making Our Contribution, we're creating a resilient business, capable of delivering long-term shared value to our customers, investors, society and the environment. Together, we bring energy to life.

John Pettigrew,
Chief Executive

50 sites
By 2020

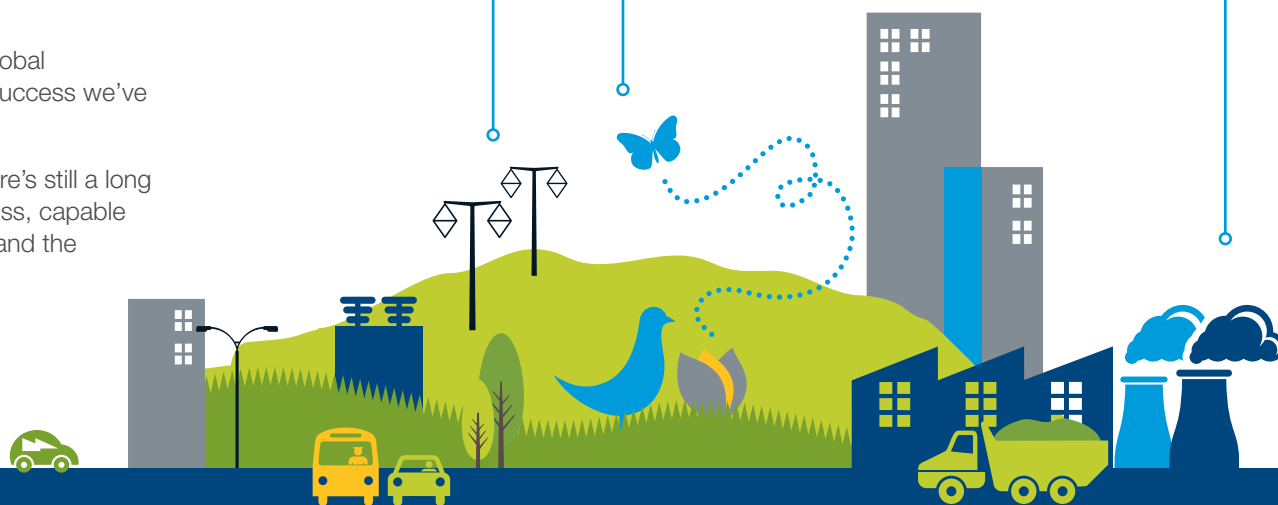
we will recognise and enhance the value of our natural assets on at least 50 of our sites.

100%
By 2020

we will reuse or recycle all of our recovered assets.

80%
By 2050

we will make an 80% reduction in our Greenhouse Gas emissions (from a 1990 baseline).





Sustainable business is good business

Sustainable business provides the essential foundation for a resilient business that will make possible the energy systems of the future.

Our purpose is to bring energy to life by delivering energy to our customers' homes and businesses, safely and securely. It's what we do. But how we do it is just as important to us. We want to operate in an environmentally sustainable way because we know that's the right thing to do – for society, the environment and our business.

Our Contribution focuses on the areas where we can make the greatest contribution to a more sustainable future. It responds to – and is driven by – the following environmental and social issues, which we believe are most significant for our customers and our business:

- Climate change due to greenhouse gas (GHG) emissions¹.
- A growing global population putting unprecedented pressure on non-renewable resources, and changing lifestyles leading to rising energy demand.
- The depletion of natural environmental resources, habitats and ecosystems.

All these issues bring new drivers for change in our business. Through Our Contribution, we're working to respond to these, minimise risk and continue to deliver the service our customers rely on.

Shareholder returns are maximised through new innovations that reduce carbon and safeguard our resources. By understanding the potential risks posed by climate change, we build a high level of resilience into our current and future networks.

We recognise that we can't reduce our impact alone – and we work with contractors, suppliers and partners to embed sustainable products and processes into our business.

Throughout this document, you'll find case studies from our employees, who are drivers of change. They describe real examples of projects and new ways of doing things. Together we're looking ahead, confident that we're working towards a more sustainable future.

“Having sustainability as the foundation of our financial decision making means building a long term legacy we can all be proud of. It's a win-win for the world we live in and the bottom line.”

**Andrew Bonfield, Chief Financial Officer,
National Grid**

¹ Where we refer to carbon throughout this document, we use it as a proxy for GHG emissions





Protecting the planet – and our business

We're passionate about making a positive contribution to the environmental and energy challenges that our society faces. We want to preserve what we value now, so we safeguard it for future generations.

Big challenges require a big response. That's why we've set ourselves global targets for change across our entire business. These commitments reflect the environmental challenges that we feel are most significant – climate, resources and the natural environment.

These goals are not just a win for the planet. They go hand in hand with delivering value for our customers, shareholders, investors, employees and the local communities where we operate.

	Climate change due to GHG emissions	Global pressure on our natural resources	Loss of natural environmental resources
Theme	Our climate commitment	Responsible resource use	Caring for the natural environment
Business Benefit	<ul style="list-style-type: none"> • Drive cost efficiencies • Increase business's resilience to climate change 	<ul style="list-style-type: none"> • Drive cost efficiencies • Reduce our risk to volatile markets, such as metals 	<ul style="list-style-type: none"> • Increase value of our natural assets • Shared benefits with our communities
Our Targets	<ul style="list-style-type: none"> • 80% reduction in GHG emissions by 2050 • 45% reduction in GHG emissions by 2020 <p><i>See below for regional targets*</i></p>	<ul style="list-style-type: none"> • Reuse or recycle 100% of recovered assets by 2020 • Send zero office waste to landfill by 2020² 	<ul style="list-style-type: none"> • Recognise and enhance the value of our natural assets on at least 50 sites by 2020 • Drive net gain in environmental value (including biodiversity) on major construction projects by 2020
*Regional Targets	<p>UK</p> <ul style="list-style-type: none"> - Implement carbon pricing on all major investment decisions by 2020 - Reduce capital carbon of our major construction projects by 50% by 2020 - Increase energy efficiency of our property portfolio by 10% by 2020 <p>US</p> <ul style="list-style-type: none"> - Reduce GHG emissions and save customers money through our energy efficiency programmes - Increase energy efficiency of our 10 largest property sites by 20% by 2020 		
	Consistently maintaining outstanding environmental management standards		

² 8 sites in the US and 6 in the UK



Case Study: Transforming technology to harness more heat



Chris Jones is a Team Leader at Bishops Wood Substation, Worcestershire, UK. He explains how we now view waste heat as a resource.

What are we doing?

“Transformers in our substations change electricity from high transmission voltages to the lower voltages needed for distribution. This process generates a lot of heat. But instead of wasting this energy, we can harvest it to use at our own sites as well as nearby buildings.

“Here at Bishops Wood, for example, we’re using the system to supply warmth and hot water to the neighbouring environmental education centre.”

The benefits

“This system is estimated to cut the use of electricity by 69%. That means we’ll reduce costs, emissions and our carbon footprint.

“Our plan is to install further systems to capitalise on these successes. And it all contributes to our target to reduce GHG emissions by 80% by 2050.”





Powered by our people

If our approach to sustainability is to be successful, we need the engagement, support and passion of every person at every level of our business.

We have ambitious environmental targets to meet and we firmly believe that to get there we'll need to innovate and find new ways of working. That's why we're working hard to develop a culture where every employee can challenge our processes and put new ideas forward.

This people-first approach has already generated some great ideas and initiatives. It's helped us make significant progress towards achieving our vision. There's still a long road ahead but our employees are keen to turn new ideas into action. We're making good use of these initiatives at our offices and sites, and we're sharing best practice with other organisations.

Partnerships to achieve our goals

We have partnerships with specialist environmental organisations that can advise us on the best ways to operate on a local scale. [You can read about our partners here.](#)

By working together, we'll meet our targets and change the way we do business for good.

Case Study: Giving new life to our old IT equipment



We continue to improve the quality and capability of our IT systems to make sure that they are suitable to meet the challenges of our changing business. In the course of our operations, significant numbers of laptops, PCs, mobile phones, and other IT equipment are no longer usable or needed. Daniel Wood, Commercial Manager for Global IS, explains how we've been working with partners to share the value of our IT resources.



3,396

pieces of used IT equipment with 10 per cent reused and 90 per cent broken down and recycled.

What are we doing?

"To make sure there is a sustainable future for this valuable resource stream, we redeploy unused equipment within the company until it reaches the end of its lifecycle. We've partnered with IT Efficient, a specialist in refurbishing and remarketing IT resources, who facilitate the refurbishment, resale, or donation of old equipment.

Where reuse or resale is not an option, individual parts and materials are separated and sold."

The benefits

"In 2016, we collected almost 3,400 pieces of used IT equipment, with 10 per cent reused and 90 per cent broken down and recycled. None of this equipment was sent to landfill.

We made donations valued at more than £12,000 to charities and schools.

The environmental benefits include the sustainable management of resources, avoided emissions associated with the manufacturing of new IT equipment and the avoidance of landfill.

This project has shown me that we can achieve more by working with specialist partners, who have the knowledge and ability to make sure the value of our resources is shared with communities."



Case Study: Helping the move to low-carbon transport in the US



Karsten Barde, Principle Program Manager, New Energy Solutions, describes how we're working in partnership with customers, local businesses and other organisations in Massachusetts, US.



What are we doing?


"Demand for low-carbon transport in Massachusetts is growing. To help the state with this challenge, and meet the needs of our customers, we have proposed to develop more than 1,200 electric vehicle charging ports at 140 sites over three years.

"We'd like to get standard and fast-charging ports installed at workplaces, domestic areas and other frequently visited public locations. We're also working on an educational plan to increase customer awareness of the advantages of driving electric vehicles (EVs)."

The benefits

Through these partnerships, we aim to help increase the uptake of electric vehicles as a lower carbon alternative to petrol or diesel vehicles. As well as supporting our customers to transition to electric vehicles, we also have an internal commitment to replace 5% of our US fleet with alternative fuel vehicles each year."

"This partnership approach to the uptake of low-carbon transport is helping to reduce GHG emissions, both within our business and in the communities where we operate."

 **1,200**
electric vehicle charging ports at 140 sites
over 3 years



Taking climate positive action

Helping society to decarbonise is the biggest contribution we can make to the environment.

We're connecting low-carbon energy sources and supporting technologies that reduce the impact of energy generation and transmission.

To reduce greenhouse gas (GHG) emissions resulting from our activities, we're modernising our infrastructure networks and cutting carbon in our projects, processes, operations and offices. We know this will not only help combat climate change and save money but also strengthen our business for the future.

Our long-term targets to reduce GHG emissions will be challenging. But we're ahead of schedule against our 2020 target and already looking towards 2050. We will continue to reduce the GHG emissions from burning fossil fuels and from the release of sulphur hexafluoride (SF₆, an insulating gas) and natural gas from our energy networks.

The biggest opportunities to reduce our emissions and make cost savings include gas mains replacement and finding alternatives to SF₆.

- **We'll reduce our carbon emissions by 45% by 2020 and 80% by 2050.**

By setting these targets, we're supporting the global agreement made at the Climate Change Summit in Paris in 2015 to limit the rise in global temperatures to less than 2°C.

Case Study: Low-carbon innovation – finding an alternative to SF₆

An ambitious innovation project is underway to reduce our GHG impact by finding an alternative to the insulating gas SF₆. Project Engineer Steve Thorpe explains.

What we're doing

"SF₆ is used as an electric insulator in our high-voltage substation equipment and has a greenhouse effect around 22,800 times more potent than carbon dioxide (CO₂).

"We needed to act. So we invested in new assets and technologies to detect leaks more accurately and capture leaked gas for cleaning and reuse. This is greatly reducing our emissions from SF₆ release.

"We'll continue to focus on projects that manage our use of SF₆ and reduce system leaks. We're also beginning an exciting collaboration with technology giants Alstom to replace SF₆ with G³ (or Green Gas for Grid)."

The benefits

"G³ is a new gas mixture that matches the insulating strength of SF₆ while reducing its global warming potential from 22,800 to 345. This means that for the same mass of G³ leaked, it has less than 2% of the impact of SF₆.



"We're trialling the new gas at our Sellindge substation in Kent, UK. Using the gas on live high-voltage equipment is a world first, and it could have a profound impact on the future of our energy system. I'm proud to be working on such an innovative project."



Reducing capital carbon in our energy networks

In the UK, we've also been examining the end-to-end design, construction and operation of our assets and infrastructure to see where GHG emissions can be reduced across the whole life of an asset.

- **We'll reduce the capital carbon of our major construction projects by 50% by 2020.**

On major investment projects, we include carbon weighting in the tender award criteria to incentivise suppliers to reduce carbon throughout the lifetime of an asset.

As we expand our networks, we challenge suppliers to show low carbon innovation in the products and services they offer us.

We're working with our supply chain to reduce the GHG emissions associated with everything they supply to us, and encouraging them to adopt sustainable practices in sourcing and manufacturing.

- **By 2020, 80% of our top 250 suppliers will be reporting their emissions.³**

³ As part of the CDP supply chain carbon disclosure project.

Case Study: Lower carbon, lower cost



William Duncan, a Project Engineer in the UK, explains how the team has saved carbon on major infrastructure projects.

What are we doing?

"National Grid has introduced a carbon weighting in tender assessments, and we've been using smarter thinking to save carbon, time and money.

"A good example is a major contract for our new substation in Wimbledon, London. Better use of offsite manufacturing helped us reduce materials, site waste and site operations. We reduced the volumes of SF₆, the insulating gas that contributes to GHG emissions. We also used low carbon concrete, used recycled steel for

reinforcement, and reused site spoil. Planning in detail, with 3D and 4D models, kept subcontractors' onsite activities to a minimum, too."

The benefits

"For the Wimbledon project, carbon savings across the asset's life will be an estimated 23%; cost savings against the original design are £3 million.

"Putting these new ways of working into practice means we now have a baseline to work from for future tenders."

£3m

of cost savings against the original design



Further Targets

- **By 2020, we'll include a carbon price in all our major investment decisions in the UK.**

This means we can include the social cost of carbon in our financial assessments and consider the lifetime carbon impact of projects when we make investment decisions.

- **We'll increase energy efficiency of our property portfolio by 10% by 2020 in the UK, and by 20% at 10 large property sites in the US.**

We're finding new ways to manage energy in our buildings to save carbon and reduce costs. Data analysis allows us to identify hotspots of high energy use, then we invest in energy-efficient technology to cut our usage.

- **In the US, our energy efficiency programmes will save customers money and reduce carbon emissions.**

State-level programmes in New York, Massachusetts and Rhode Island support the move to a decarbonised energy network. We provide incentives to our customers for buying energy efficient lighting, heating and ventilation. Industrial customers can also gain incentives for energy efficient production and manufacturing solutions.

We know that the cheapest, lowest carbon unit of energy is the one that's never used, so we're passionately committed to helping customers become more energy efficient, in turn cutting their GHG emissions and bills.

Case Study: Knowledge is power – helping our customers save energy in the US

Emily Albertson, Manager of National Grid's Sustainability Hub, shares her experiences of helping customers save energy.

What we're doing

"As part of our Smart Energy Solutions Program, we're upgrading electrical infrastructure in Worcester, MA. We also have a state-of-the-art Sustainability Hub, made possible by partnering with the City of Worcester, local businesses and institutions.

"Since opening in October 2013, the Hub has welcomed over 8,000 local people and hosted more than 500 community events. Through face-to-face interactions and hands-on experiences, visitors can learn about sustainability, modernisation of the electric grid, and how to reduce energy use."



The benefits

"Advanced technologies offer almost 11,000 customers in the city opportunities to save energy, GHG emissions and money. Over two years, our programme saved 1,573 MWh of energy and more than \$180,000 for customers.

"Our Hub gives customers information to help them use these technologies. In turn, we get insights into customers' needs, and we feed this data back into the programme and future smart grid efforts.

"The Hub is co-designing the future of energy and sustainability in the heart of a community. I believe it's helping to create a smarter, greener city."

\$1.25m

saved for customers in 2015.



Making the most of our assets

To build and maintain energy networks that perform safely and reliably, we need to use finite – or non-renewable – resources, such as steel for pylons and aluminium for overhead lines.



As populations and economies grow, we're seeing rising demand for these resources. This not only makes it harder for us to source them, it also leads to price rises and volatility, and increases the environmental impact of extracting them. Against this backdrop, it's essential that we make the most of the materials we own and buy.

Making the 'circular economy' our natural way of working

We support the principles of a circular economy, which aims to maximise the value of materials by designing assets that can be recycled, refurbished and reused at the end of their operational life.

It's vital that we don't view ageing assets or materials as waste. So we're rethinking how we source, reuse and recycle them. We're also finding more cost-effective and environmentally responsible ways of buying raw materials.

We're thinking differently and working towards the following targets:

- **By 2020, we'll reuse or recycle all of our recovered assets, such as overhead line cable and components from our steel towers.**

To reach this goal, we're working with our supply chain, industry peers and wider stakeholders. By asking suppliers to consider end-of-life processes at the design stage of infrastructure projects, they're building our assets with sustainability in mind and designing components that will be easier to disassemble, reuse and remanufacture. This reduces our need for raw materials and energy during construction and ensures our assets hold their value.

- **By 2020, we'll send zero office waste to landfill.⁴**

To meet this target, we'll launch new campaigns to get everyone on board, at all levels of the organisation. We'll educate and encourage office employees to reduce, reuse and recycle their waste so that they can employ environmentally friendly habits within the office, and hopefully outside of it as well.

We have strong employee-led environmental groups, and we'll use their skills to encourage understanding and best practice across our business.

⁴ Applies to 8 office sites in the US and 5 sites in the UK.



Case Study: Reusing aluminium in overhead conductors

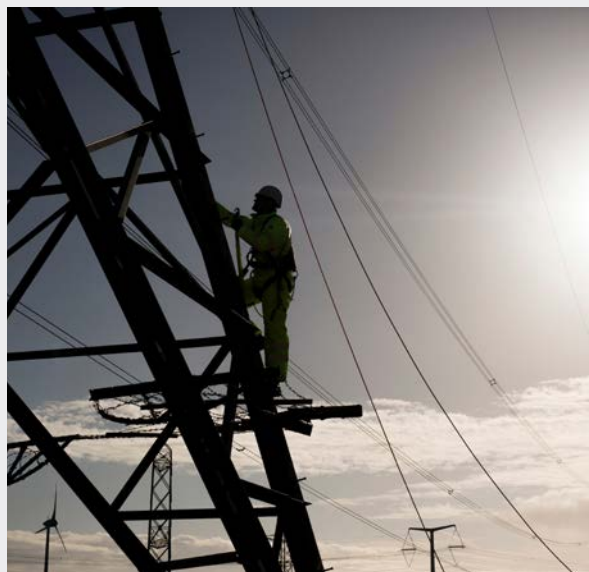


Simon Smith, Category Manager in Global Procurement, explains how National Grid now makes better use of scrap materials.



+40yrs

the lifespan of overhead line in
between processing



What we're doing

"Our procurement team and overhead line conductor supplier have been working together to revolutionise the way we recycle aluminium overhead lines that reach the end of their operational life.

"In the UK, our business transmits electricity across England and Wales via nearly 7,200 km of aluminium overhead line conductor. Traditionally, when a conductor reached the end of its operational life, it would be taken down and passed to a metal merchant for recycling. We'd simply get a scrap value for the material.

"From 2013, we piloted a new approach with our manufacturer Midal Cables. We arranged for end-of-life conductors to be degreased and chipped in the UK before being transported to Midal's facilities in Bahrain. On arrival, the aluminium was added to the furnaces, and the company directly remanufactured it into new conductors for us."

The benefits

"This method reprocesses the overhead line using the same raw material. It saves money through more efficient use of materials. After a successful trial, a further 90 tonnes of aluminium cable has been processed and is ready to be shipped to Midal to be made into new conductor.

"It's an innovative and sustainable approach and shows how we can reconsider the ongoing use of existing metal assets into the future."



Case Study: Reusing resources to reduce waste



Tim Felasco, Investment Recovery Manager, describes the work of National Grid's Investment Recovery centre in the US.

\$9m

profit made from selling scrap materials



What we're doing

"Our facility is devoted to recycling scrap metals and reselling equipment and materials that we no longer need.

"Since 1984, we've been working with Monarch, an agency that provides training and job opportunities for people with developmental disabilities. This partnership allows Monarch employees to learn skills in sorting, taking apart, managing and repackaging scrap metals and other material."

The benefits

"Less material ends up in landfill and we bring in revenue for the company.

"In 2016, we turned \$1 million worth of otherwise scrap material into active kit. We also made \$9 million by selling scrap metal, wire, cable and other materials we didn't need."



Making our green spaces more valuable

It's important that we manage the land we own in ways that deliver the greatest value to us and our stakeholders, and to the wider environment in which we operate.

Through our Natural Grid programme in the UK, we're working with others to make the best of our green spaces, minimise risk, and benefit local communities and habitats.

Making the most of every opportunity

There's no standard model for bringing a Natural Grid site to life. It could mean putting in management practices to improve the habitat for particular species, encouraging more managed grazing of land, or leasing the land to colleges or universities for practical academic use. Each solution is carefully tailored to drive the most shared value from that particular piece of land.

As a significant landholder, the more we work with our neighbours and partners to improve our land management, the bigger the contribution we'll make to improving the state of nature in both the UK and US regions in which we operate – delivering positive returns for our business and wider stakeholders.

This collaborative approach is already delivering significant benefits, including improving biodiversity and habitats, and reducing our land-management costs. In the UK, we're also developing national partnerships with groups like the Wildlife Trusts and RSPB so we make the most of every site and opportunity.

We're working towards the following target, so we can make a significant and meaningful impact:

- **By 2020, we'll recognise and enhance the value of our natural assets on at least 50 of our sites.**

We'll continue to work closely with local and national stakeholders to enhance ecosystems and improve the quality of nature across our landholdings.

Natural assets, such as trees, water sources and green spaces, deliver valuable services for society and our business, so we want to safeguard them for the long term.

To guide us, we've developed a tool that puts a financial 'natural capital' value on natural assets. It allows us to highlight their true value and build a business case for challenging conventional ways of working.

- **We'll also drive net gain in environmental value (including biodiversity) on our major construction projects by 2020.**

We will focus on net gain in areas such as pollination and carbon sequestration, as well as biodiversity. We'll do this in a way that's consistent with our community engagement policies at our construction projects.

By

2020

we'll recognise and enhance the value of our natural assets on at least 50 of our sites.





Case Study: Enhancing nature at Ambergate

Close collaboration with local communities and stakeholders is guiding us to maximise the natural capital value on our Ambergate site in the UK. Senior Sustainability Advisor Chris Plester explains.



17
hectares designated as a Site
of Special Scientific Interest

What are we doing?

“Ambergate is next to our Gas Pipeline Maintenance Centre in Derbyshire. It consists of 77 hectares of operational and non-operational land, including more than 17 hectares marked as a Site of Special Scientific Interest (SSSI).

“We own the land so it’s our legal duty to protect the SSSI site. To help us, we’ve developed a five-year plan with the Derbyshire Wildlife Trust (DWT), a local farmer and Natural England.



“We want to protect the environment in a cost-effective way and at the same time, build links with the local community and our employees.

“It’s a two-way thing. For example, the DWT has arranged community events where we explain our work. In return, local people help us gather information about plant and animal life at the site. Volunteers, including our employees, also help manage the brambles and scrub that would otherwise threaten the grassland.”

The benefits

“Our approach here shows how working together with expert partners helps us focus on the natural features that are most important. It’s good for the environment and our business.

“There’s been a big improvement at Ambergate – in species diversity, biodiversity, as well as the land’s general condition. And it’s great that we can use our position as a landowner to benefit ecosystems and communities like this across the UK.”



Case Study: Enabling natural encounters



We've been working with the local community around the National Grid substation at Bramley, UK, to open up some of our land for outdoor education. Team Leader Pete Draper explains why and how the partnership came about.



What are we doing?

"It's all part of our strategy to use land to make a positive contribution. The local community needed secure outdoor spaces that could support environmental education programmes. The ancient woodland at Bramley is a unique environment – perfect for 'forest schools'.

"A local forest school leader works with the team to develop woodland areas for outdoor activities that build local skills. Numerous school sessions take place here every week, alongside community events such as family conservation days."

The benefits

"Local people have the chance to learn new skills. We're improving how we manage the site's natural environment for the future. And vacant buildings and disused land have a new lease of life.

"The collaborative approach we've taken at Bramley is a great example of working well with partners. We effectively manage land together, in a way that's good for the environment. There are social and financial benefits, too, for the wider community and our business."



Contact us

As we continue to make Our Contribution, we'll share updates, successes and insights along the way on our [website](#)

We'd also like to hear from you – our stakeholders, investors, employees and customers. Our Contribution is a collaborative programme, so we need your feedback to make sure we're focusing on the right areas and delivering the right results.

We invite you to get in touch [via email](#)

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