



The Coal
Authority



sustainability report

2015-16



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1 Our vision

Our vision 'to be a world leader in resolving the impacts of mining' requires us to operate both sustainably and responsibly

To us, this means working in a way which does not cause harm to, and where possible improves, the environmental or socio-economic standing of the areas in which we operate, while protecting the safety of the public and our employees.

As well as focussing on our activities, we also have responsibilities as a global citizen for the long term sustainability of our planet and for future generations.

In this report, we:

- provide information about our work and how it contributes towards sustainable development
- outline our sustainability performance in the past year
- set out future priorities for the sustainable development of our business



Saltburn mine water treatment scheme

2 Review of the year

Protecting the public is at the heart of everything we do. We also protect the environment from the impacts of historical coal mining

We deliver our business through our:

- 24-hour response service which enables the public to report a coal mining hazard or subsidence damage
- mine water treatment programme which mitigates the impact of coal and metal mine pollution within UK watercourses
- mining information, geo-hazard reporting and data services that enable the property industry to make informed, risk based decisions on how best to use land in former coal mining areas
- licensing and permitting services that ensure public safety and environmental impacts are considered by those undertaking mining operations and development in areas affected by historic coal mining
- planning consultation and local authority liaison service that informs public safety and strategic planning decisions to ensure valuable mineral resources remain accessible for future generations
- restoration advice service that enables planning authorities to ensure sufficient funds are available to reinstate mining and quarrying operations
- tip management service that enables other public authorities to expertly manage their derelict historic mineral waste sites
- commercial services that generate value for our clients from our technical experience and minimise our cost to the tax payer

Protecting the public

Our public safety team respond to our 24-hour emergency service helpline. They give advice and valuable information to first responders attending the scene and ensure that any incident is properly managed.

During the year we responded to 887 reported surface hazards. All were assessed and the appropriate emergency response times achieved to minimise the risk to the public.

There were a number of incidents which presented a particularly challenging risk due to the environmental constraints.

Our mine entry inspectors identified an open mine shaft, surrounded by a dilapidated dry stone wall on farmland near to Buxton. The repair works required a suitable design in keeping with its location in the Peak District National Park.

Our engineers are working closely with the landowner and Parks Authority to ensure the design has minimal impact on the local flora and fauna. The shaft cap design incorporates bat access and local materials will be used to reinstate the site to maintain the existing character of the area.



Mine gas hazard

Our mine gas specialists were called to an incident in Warrington. They undertook monitoring to establish the source of the problem, which was found to be a release of methane gas from deep coal mine workings, in a small access road adjacent to residential property.

Work was completed to capture the gas and enable it to be managed in a controlled and safe way. A gas vent is due to be installed as a permanent solution.

All mine gases are dangerous when they exist within confined spaces such as mine workings, mine entries that are open at the surface, surface crown hole collapses or if they find their way into confined spaces at or near the surface such as buildings or drains.

They are generally colourless and odourless, so are usually only detected if you are looking for them. This makes them particularly dangerous hidden hazards.



Mine gas vents at the Stadium of Light, Sunderland

Mine shaft collapse

The picture below shows the progress of work to repair a major shaft collapse in the North East of England. The incident was responded to by our regional project team who initially fenced off the shaft and filled the void with stone.

After ground investigation our in-house engineers designed an appropriate permanent solution which provided peace of mind for the local community.

Throughout the works, we kept the local residents informed of our progress, whilst minimising disruption to their everyday lives.

“On arrival we were faced with significant challenges in securing the site to ensure local residents were protected. As well as protecting the public, we were able to educate the emergency services and local authority first responders who were unfamiliar with the risks posed by a shaft collapse”

Martin Anderson
Project Manager



Following the demise of the mining operator, UK Coal and the closure of the last deep mines in the UK at Thoresby, Hatfield and Kellingley, we took over responsibility for all existing and future subsidence claims.

Over the coming years, this will increase the number of claims we manage significantly.

Our surface hazard and subsidence work is largely reactive due to the unpredictable nature of mining subsidence. In addition to providing public protection, we continued our risk based inspection programme of recorded mine entries.

Including shafts and inclined tunnels we completed 24,894 inspections during the year, compared with 22,722 in 2014-15.



Hatfield Colliery,
near Doncaster

Protecting our people

Our people are our greatest resource and their wellbeing is vital to our future ambitions as well as being morally imperative. The safety, health and wellbeing of our employees and those that work on our behalf are therefore a priority.

To achieve this, we have developed and sought to improve our:

- integrated safety, health and environmental (SHE) management system to ensure a clear framework for delivering our goals
- culture to achieve a consistent positive attitude towards health and safety
- workplaces and work equipment to support the highest health and safety standards

During the year we have continued to:

- provide an employee assistance programme and staff medicals
- support the EU Healthy Workplaces campaign, running a number of events to raise awareness of stress in the workplace and how it can be managed
- run our wellbeing programme
- work in partnership with our contractors to improve health and safety practices
- train employees and support implementation of the new construction health and safety regulations

Protecting water courses

During the year, 2 new mine water treatment schemes have started to operate, 1 at Whitburn in Tyne and Wear and the other at Force Crag in Cumbria.

We now operate and maintain 75 mine water treatment schemes in Britain. Our schemes help to remove water borne pollutants associated with historic coal mining from waterways and improve their ecological status.

To ensure our schemes are sustainable in the long term, we are always looking at ways to improve their efficiency through design and operation. This year we entered into new long term contracts with key partners to support this goal. The contracts, known collectively as 'Confluence' have a strong focus on collaboration and sustainability.

Over time, we have expanded our role and work with the Department for Environment, Food and Rural Affairs (Defra) to deal with pollution from metal mines.

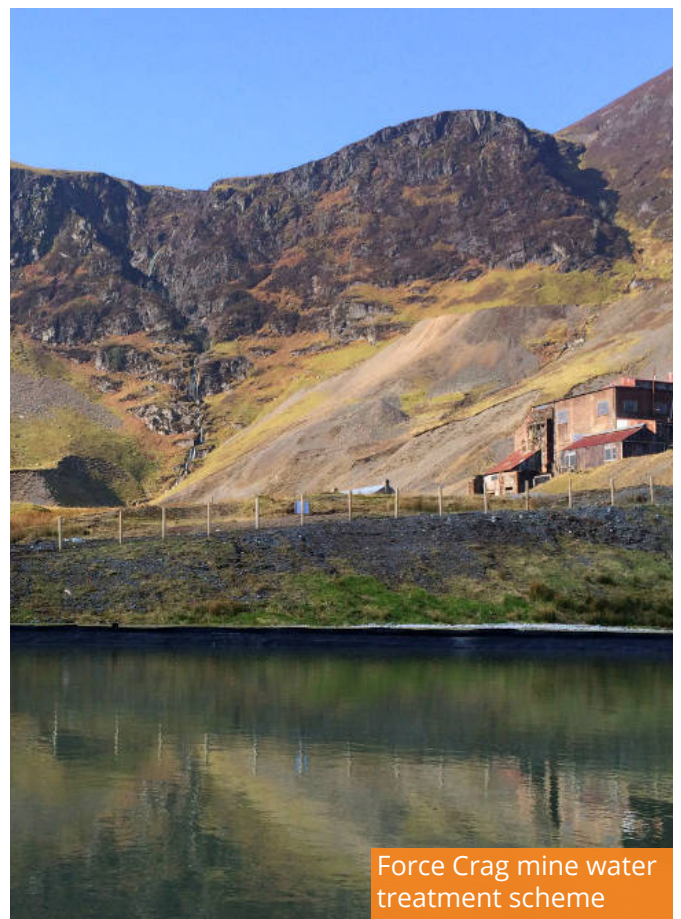
More recently we have successfully obtained funding from a local enterprise partnership to help them improve the socio-economic status in their geographical area.

The Whitburn aquifer protection scheme, prevents mine water from entering the limestone rocks beneath the surface. These rocks form an important regional aquifer, which hold the drinking water source for thousands of homes and businesses in South Tyneside and Sunderland.

The scheme pumps mine water from the abandoned workings deep beneath the Whitburn Coastal Park, controlling it at around 50 metres below ground. The mine water is then transported 230 metres out to sea, beyond the low-tide level, where it is dispersed by natural processes.

The scheme at Force Crag represents a significant milestone for us in that the type of treatment required for water from this former Lead, Zinc and Barytes mine is significantly more complex than anything we have done before. Being located in such a sensitive site, being both a scheduled monument and site of special scientific interest, meant there were significant additional challenges in designing and building the scheme.

The scheme was officially opened by the Minister, Rory Stewart in November 2015 and is Europe's first zero-chemical, zero-power, metal mine water treatment scheme.



As well as 2 new water treatment schemes, we improved the efficiency of existing schemes. This resulted in significant cost savings of £1/4 million and also contributes to their long term sustainability.

Below are a few examples of the work we have completed this year:

Kibblesworth

Works to improve pumping efficiency and the installation of power factor correction resulted in a reduction in power use of 900 MWh and carbon savings of 480 tonnes.

Caphouse

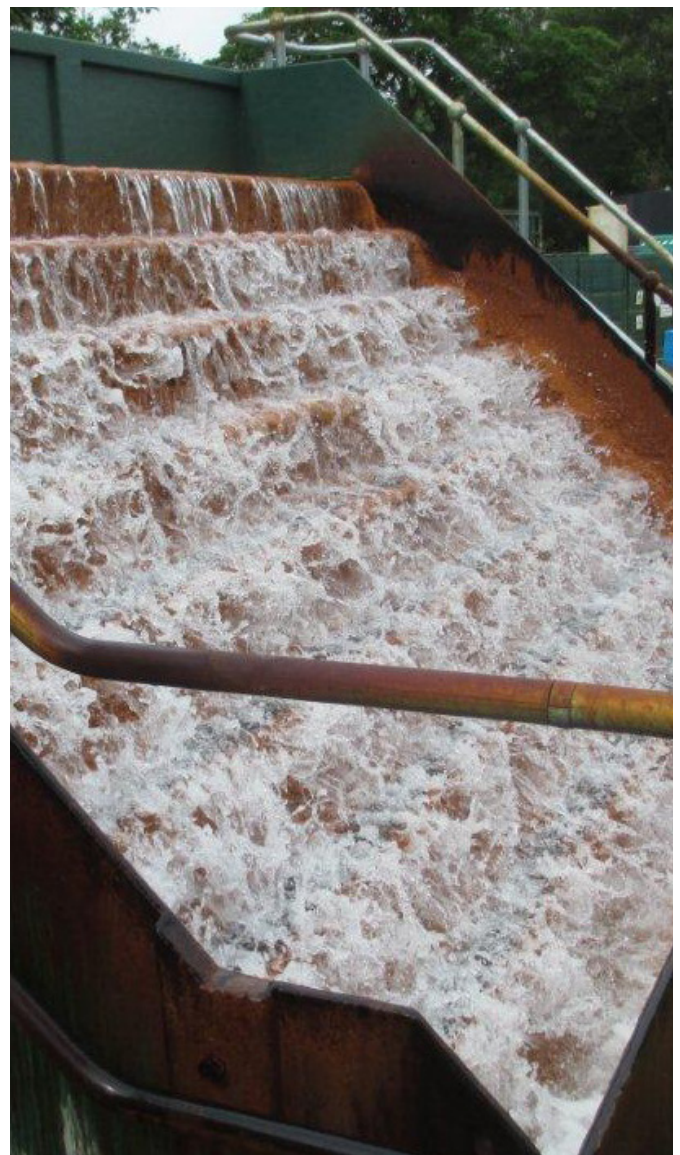
This scheme, located at the National Coal Mining Museum, had a new high flow, low head pump installed which has reduced power use by 360MWh and achieved carbon savings of 200 tonnes.



Blenkinsopp

To reduce the amount of chemical used to treat water, a new cascade has been installed. This has significantly improved water aeration and reduced the amount of caustic soda required for dosing by 1,670 tonnes.

As well as significant cost savings, this has resulted in 1,870 tonnes less embedded carbon.



Woodside

This long standing scheme has undergone an extensive rebuild including installation of a new low voltage electrical supply. A reduction in power use of 1.5GWh and carbon savings of 780 tonnes has been achieved, which represents nearly a two third reduction overall.



Overall we have;

**REDUCED OUR
CARBON FOOTPRINT BY**



Which means we have;

**REDUCED ELECTRICITY
USE BY**

**2.7
GWh**



**DIRECT TOTAL CARBON
SAVINGS**

**1447
CO^{2e}**



**REDUCED INDIRECT
CARBON BY**



SAVED OVER

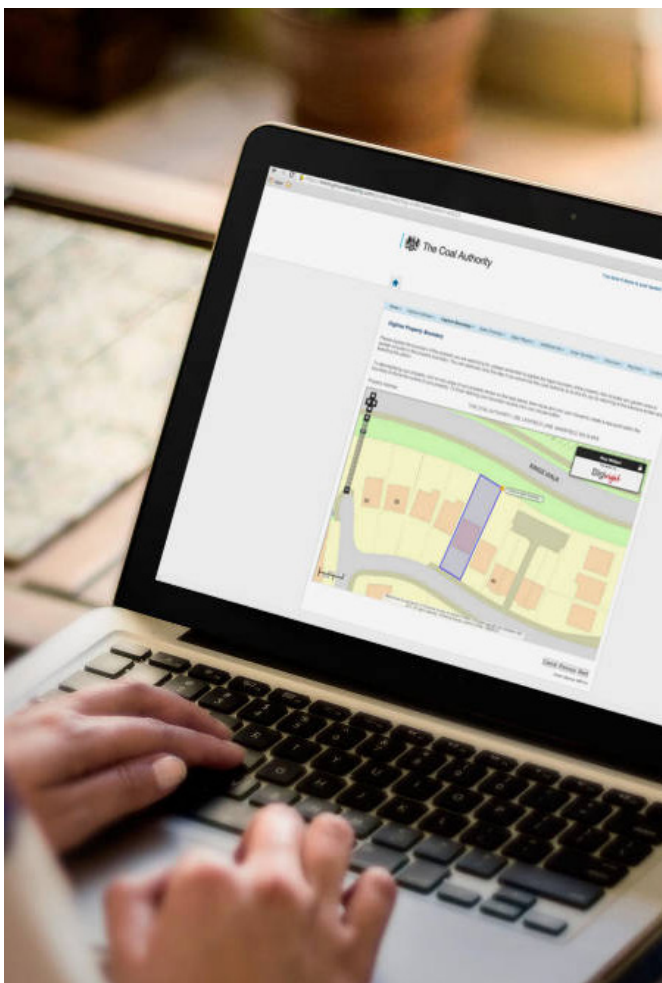
**£250
THOUSAND**



Providing peace of mind

Our data products provide information about mining and other geo-hazards to the development and conveyancing sectors, which enables the wider property industry to make informed, risk based decisions on how best to use land in former coal mining areas.

During the year, we produced 345,818 mining reports, providing a responsive service to our customers helping them conduct their business safely and sustainably.



Safeguarding development

Supporting our data products, the work of our licensing, permitting and planning consultation teams has helped ensure:

- coal mining is carried out in the most environmentally sensitive way
- valuable mineral resources are safeguarded for future generations
- future development can be carried out safely

3 Our expertise

We are on an ambitious programme aimed at becoming increasingly self-sufficient of government funding

Innovation

At the start of 2015, we launched an ambitious programme aimed at becoming increasingly self-sufficient of government funding. Although we initially focussed on achieving efficiencies in our mine water schemes, we have identified other opportunities for reducing cost.

Improving our economic performance is critical to ensure our valuable work continues. This programme also contributes significantly to improving environmental and social outcomes in the work we do and therefore our sustainable development as an organisation.

We initially focussed on identifying opportunities across a broad spectrum and generated over 350 ideas and potential opportunities.

From these, a strategy has developed based on catchment areas and the opportunities associated with:

- sale of water
- sale of heat
- sale of iron rich sludge (ochre)
- use of renewables
- ecosystem services

Using information sources to identify opportunities to innovate, we have set ourselves an ambitious target of constructing and operating our first zero cost mine water scheme by 2017/18.

Although, the year has been focussed on identifying opportunities and strategy development, we have started our renewables programme and have successfully installed solar panels at our Dawdon mine water treatment scheme.

These alone will produce 43MWh per year with a carbon saving of 21 tonnes.



Solar panels at Dawdon mine water treatment scheme

Research and development

To support our innovation programme and other critical business issues is an active research and development programme.

Projects include:

Improving tip flood resilience

As part of our drive for continual improvements in our tip management systems, we installed telemetered weather and flow monitoring at 5 of our tip sites in Wales.

Having monitoring the data for the past year, to ensure seasonal trends are captured, we can see clear correlations between rainfall events, flows in site drainage infrastructure and shallow groundwater levels. Patterns also correlate well with nearby Natural Resource Wales river monitoring records.

Over the next year, we will use the monitoring dataset to build and calibrate flood risk models for each tip. Modelling different storm event scenarios will allow us to assess the resilience of our sites to flood events, aiding management of risks to downstream receptors.

Improving treatment efficiency

Research at Cardiff University has investigated the treatment efficiency achieved by settlement lagoons. This work was sponsored by us and partly funded by the Research Fund for Coal and Steel (RFCS) Manager project

Building on this research, we have installed baffle curtains at Clough Foot mine water treatment scheme. The baffles enhance the performance of the settlement lagoon, which results in improved metal removal efficiency.

Our field trial confirmed that fitting baffles can significantly improve passive mine water treatment performance.

This approach will be used to improve our existing mine water treatment schemes and will mean that new schemes will need less land but will not be any less efficient.



Tracer testing at Clough Foot mine water treatment scheme

Innovative new treatment technologies

In partnership with the Environment Agency we have been working on field trials of innovative water treatment technologies. This will benefit the future programme for metal mine water treatment by adding new small footprint options to our toolbox of treatment technologies.

The field trial programme included working with De Montfort University to trial an ion-exchange reactor and working with Remedios Ltd to test an organic sorption technology.

The primary objectives of the field trials were to assess the metal removal efficiency achieved by the technologies in the field and to assess any technical and logistical issues that would influence the design and deployment of the technologies in full-scale mine water treatment works.

Metal recovery

Research with Newcastle University on Vertical Flow Pond (VFP) bioreactors, such as our scheme at Force Crag, has shown that metals can potentially be recovered from the spent VFP treatment media through adapting soil washing technologies, by leaching with acids or by using bio mining techniques.

These methods could significantly reduce operating costs, which will help lower the whole life costs of VFP treatment schemes. Resource recovery contributes towards a more sustainable circular economy.

Impacts on biodiversity

We continued to work with the University of Nottingham on research into biodiversity in constructed wetlands. The ecology of the constructed wetlands at Hockery Brook and Taff Merthyr mine water treatment sites is being compared with that present within other types of natural and artificial wetlands.



Now in the second year of the project, initial results show that our constructed wetlands rank highly in terms of biodiversity, with ecological survey scores that are comparable with similar natural wetland systems.

4 Our performance

For our core activities, information and performance is provided under review of the year. This section focusses on 3 core pillars - Health and Safety, People and Economy and Environmental

Health and Safety

In recent years, we have had a strong focus on developing our culture and the role that individuals can play in improving health and safety across the organisation.

The introduction of personal safety responsibilities and the drive towards everyone taking positive action to report unsafe acts and conditions as well as examples of good practice through the submission of SHE observations, has made a significant difference.

Our accident triangle, below shows our performance this year.



The launch of our Six for Safety has further reinforced the cultural message.

Six for Safety

The Coal Authority

- ! Your safety and wellbeing starts with **YOU**.
- ! If it's not safe **don't do it**.
- ! Keep your colleagues **safe and well**.
- ! Always take action - **don't walk by**.
- ! Lone working - use the **safe system**.
- ! Driving - stay alert and watch your **speed**.

People and Economy

Small to medium enterprises (SME's) provides 60% of all private sector employment and accounts for £1.8 trillion in turnover for the UK economy. The government is committed to ensuring these businesses receive a significant proportion of government expenditure.

We are committed to achieving the government target of 33% by 2020 and make every effort through our procurement processes to engage with SMEs. We currently spend 27% and are well placed to meet the government's target.

Departmental SHE action plans

Each year we develop our departmental SHE actions plans, which provide a focus on the priorities for individuals and teams. We have achieved the majority of objectives we set ourselves, with a clear plan to complete the remainder.

Category	Year	SHE Observations			Environmental Incidents (all categories)	SHE Inspections	Accidents		
		Unsafe acts	Good practice examples	Significant (all categories)			No lost time	Lost time	RIDDOR
		Unsafe conditions							
Staff	2013/14	120	0	2013/14 - 318	2013/14 - 54	2013/14 - 52	3	0	1
	2014/15	666	38				12	0	1
	2015/16	767	81				7	0	0
Contractors	2013/14	882	0	2014/15 - 62	2014/15 - 101	2014/15 - 200	9	3	1
	2014/15	884	24				4	0	1
	2015/16	463	64				4	0	0
Visitors/Public	2013/14	122	0	2015/16 - 39	2015/16 - 27	2015/16 - 254	0	0	0
	2014/15	70	0				0	0	0
	2015/16	0	0				0	0	0

The statistics demonstrate what we have achieved, with a considerable reduction in significant incidents being reported year on year and the number of near misses now starting to fall.

Environmental

We continue to collate information on our environmental impacts which include greenhouse gas emissions from electricity and business travel and water use and waste management at our Head Office.

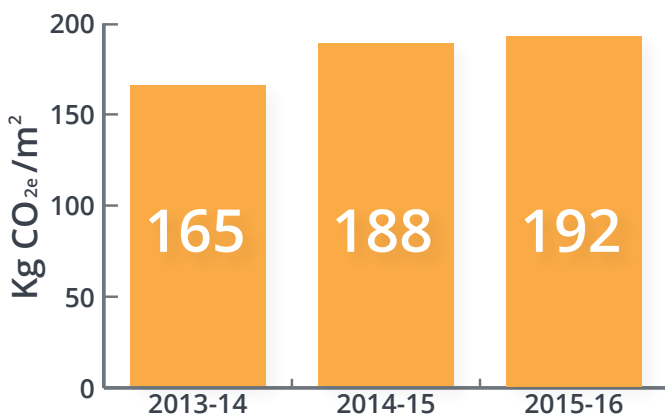
We have a mixture of total and normalised measures to help us assess our overall and relative performance.

Greenhouse gas emissions

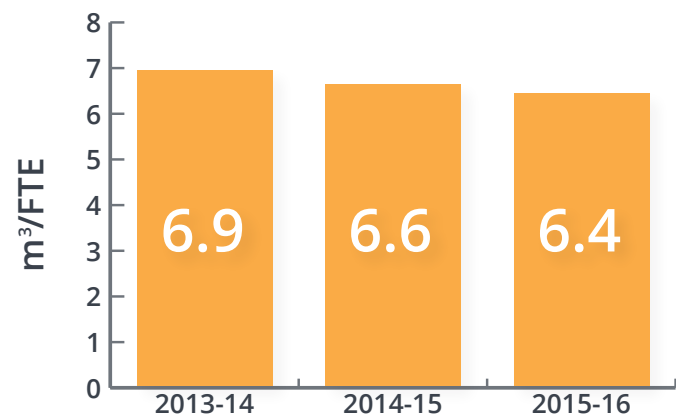
Greenhouse gas emissions (GHG)		2013-14	2014-15	2015-16
Non-financial indicators (tCO _{2e})	Scope 1	91	107	82
	Scope 2	14,277	13,918	15,155
	Scope 3	43	33	44
	Total	14,411	14,058	15,281
	Emissions per FTE (tonnes)	104	87	88
Financial Indicators (£)	CRC Gross Expenditure (2011 onwards)	c £205,000	c £219,000	c £245,000

Head office

Carbon intensity*



Water intensity

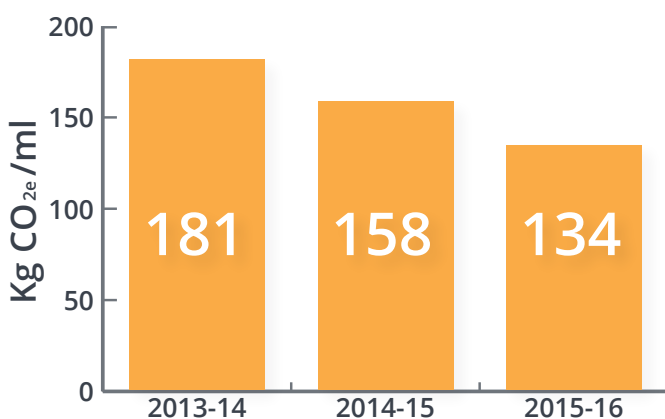


*Carbon intensity is a focus for 2016/17

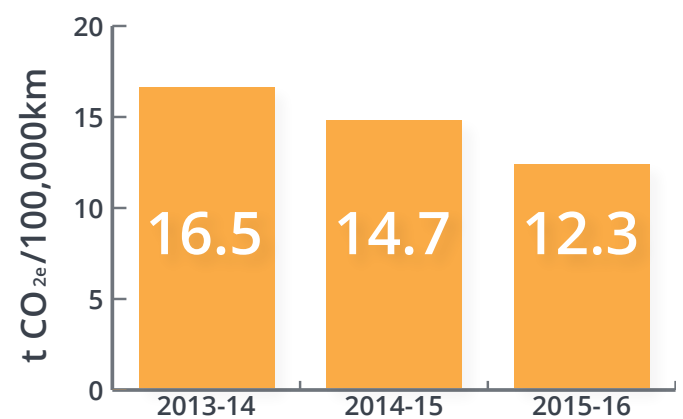
Waste

Head office	2014-15	2015-16
General	18,920	6,490
Recycled	12,250	12,080
Closed loop	4,435	10,590
Total	35,605	29,160
% Recycled	47	78

Mine water treatment sites



Business travel



As our portfolio of sites grows, our total carbon emissions have increased. However, our work on the minewater efficiency programme has shown significant benefits with our carbon intensity reducing by 26% since 2013/14.

Similarly due to increased use of public transport, we have reduced the carbon intensity of our business travel by a similar amount.

There remains work to do at our head office to improve its carbon intensity and this is priority for next year. A number of works are planned including installation of voltage optimisation, solar panels and LED lighting.

Our normalised head office water use continues to fall and we are close to the government best practice target of 6m³/FTE.

As a result of better segregation practices, awareness raising and the use of a closed loop paper recycling system, the amount of waste and recycled rates have improved significantly.

Sustainable Development Charter

The Charter raises awareness on sustainable development across all business sectors and supports implementation of the well-being of Future Generations (Wales) Act, which came into force in April 2015. It places duties on all public bodies to set and meet objectives related to specified well-being goals.

As we undertake a significant amount of work in Wales, we signed up to the charter in 2015 and are committed to support its aims.



Y SIARTER SUSTAINABLE
DATBLYGU DEVELOPMENT
CYNALIADWY CHARTER

Closed loop recycling

Closed loop recycling provides a cost effective and secure solution for managing paper waste sustainably.

In practice, this means that most of the paper we use, is collected, recycled and then re-used again. We adopted the system alongside the use of secure card ID for printing in 2013. This has resulted in less paper

being used and other environmental benefits, including a reduction in the use of natural resources and energy resulting in less embodied carbon overall, associated with the production of the paper.



5 Our governance and systems

Governance

Effective governance supports effective prioritisation, good risk management, timely decision making, transparency and accountability. It also ensures that we are legally compliant.

This year we reduced the number and complexity of committees and groups to ensure we could focus on strategic direction, and improving our culture.

The SHE Committee is chaired by a Non-Executive Director and is attended by the Chief Executive and members of the senior management team. It met on 3 occasions this year and focussed on:

- developing the Sustainability framework
- reviewing the findings from the internal SHE audit and monitoring the actions
- undertaking a review of the effectiveness of our contractor procurement and management processes

The SHE Culture Steering Group met every 2 months. It organised a number of initiatives during the year, including the EU Healthy Workplaces Campaign. In addition the group has:

- issues a SHE newsletter to raise awareness on seasonal and emerging issues
- run SHE culture awareness sessions for new employees

- organised mock employment tribunals based on a health and safety failing to emphasise the importance of taking positive action for health and safety
- issued a staff survey to help identify opportunities that could influence SHE culture

Systems

Our management systems for health and safety and environment have been simplified and are now fully integrated. They are aligned to the relevant international standards and regularly reviewed against compliance and our risk appetite.

During the year we updated our procedures on contractor management, incorporating the new construction health and safety regulations that came into force on 1 April 2015.

Contractors are involved in all of our critical operational activities and a comprehensive programme of awareness training was completed to enable our operational staff to deliver this consistently and effectively.

6 Future strategy and objectives

We are committed to continual improvement in everything we do and our strategy for sustainability is no exception.

Our existing SHE objectives and targets have helped drive improvement in recent years but as we look to the future, we believe it's more important than ever to consider all angles in delivering our remit.

To enable us to target those issues that are most relevant and have the most significant impact, we have developed a Sustainability Framework. This sets out our future strategy, helping us focus on where we can make the most difference for our people, customers, stakeholders and the public.

The framework is available on our website at www.groundstability.com

Our sustainability objectives are not an add-on; they are an integral part of our core objectives as a business. Next year the focus is to:

- establish a baseline set of sustainability measures with a view to setting quantified targets which we can use to drive continual improvement in subsequent years
- progress our innovation programme to increasing efficiencies across our activities increase our income through business development, by diversifying our products and services and increasing our customer base
- continue our SHE culture development journey, through the SHE Newsletter, presentations and initiatives

