SUSTAINABLE TECHNOLOGIES

for today and for the future

5. ENVIRONMENT

CASE STUDY

The Right Solution for Water Purification

Growth through new businesses is an important element of our strategy. Our focus is on areas that are adjacent to our existing activities and that fit well with our technology competences. Our market led approach combines organic development with targeted acquisitions, where appropriate, to generate the next material growth engines for the group.

Water purification for industrial applications is one of our new business areas. To complement our R&D programmes we have recently acquired new advanced ion exchange technology to strengthen our position in the market and inform our in house developments.

We are especially targeting the mining and chemicals industry where complex problems exist today. Our water technologies team is working closely with customers on new processes from our applications centres in the US, China and Europe. In one example we are working with a major Chinese nickel producer that generates silver as a byproduct of its nickel mining operations. This silver is then refined electrochemically in a liquid phase process to finally produce silver ingots. The customer was experiencing process inefficiencies and effluent issues as some contaminants in its liquid phase were affecting the final quality of the silver product. Using our advanced ion exchange technologies, the customer is now able to selectively remove the contaminants, solving both its quality and effluent issues. Furthermore, our materials can be washed and reused, making them an efficient option that minimises natural resource use.

With strong legislative and environmental drivers to improve water quality, there is demand for more effective solutions for water purification. At Johnson Matthey we are applying our expertise in advanced materials to develop a new generation of sustainable technologies to tackle problematic pollutants in water.

Contents

Environment

Performance Summary

		2014	2013	% change
Energy consumption	thousands GJ	**4,915**	4,648	+6
Total global warming potential	thousand tonnes CO_2 equivalent	**444**	413	+7
Total acid gas emissions	tonnes SO_2 equivalent	**405**	334	+21
Total VOC emissions	tonnes	**209**	186	+12
Total waste	tonnes	**121,594**	110,448	+10
Total waste to landfill	tonnes	**3,819**	3,218	+19
Water consumption	thousands m^3	**2,564**	2,444	+5

JOHNSON MATTHEY HAS AN IMPACT ON THE ENVIRONMENT IN MANY WAYS:

through the resources we use, the way we operate our processes and the action of our products and services on enhancing the environment for others.

A major part of our business involves applying our scientific knowledge and expertise to turn natural resources into value adding sustainable technologies for our customers. As a result, many of our products, including emission control catalysts for vehicles and process catalysts that improve resource efficiency, have a positive impact on the environment. A significant proportion of our R&D efforts are directed towards developing the next generation of environmentally beneficial products.

Given that we operate in a world where increased demand for key resources and critical raw materials can expose the group to the risk of price volatility or resource availability, we also aim to apply our technical expertise to mitigate these risks. Our efforts are threefold: we develop products which deliver the same performance but with less critical raw material content (such as thrifting rare earth materials from our emission control catalysts and refinery additives); we develop products that can be manufactured via a less resource intense route (such as our compact catalysed soot filter product for diesel cars); or we develop products that enable our customers to lower their environmental footprint (for example our process catalysts).

In addition, our Sustainability 2017 and Manufacturing Excellence programmes both focus on increasing resource efficiency, generating cost savings for our business today and helping to conserve resources for the future.

Read more on the environmental benefits of our products at www.matthey.com/sustainability/products.

Improving Our Processes, Products and Performance

Targets to improve environmental performance are a key part of our Sustainability 2017 programme. The group aims to cut its carbon intensity by half, achieve zero waste to landfill and halve the key resources per unit of output consumed (compared with baseline data from 2007) by 2017. We have identified natural gas, electricity and water as our most significant resources in the current and future context of availability (including accessibility, geopolitical factors and infrastructure), cost and quantities used. In order to meet these aspirations, long term environmental improvement plans and performance indicators have been established.

Read more on Sustainability 2017 at www.matthey.com/sustainability.

Read more on our progress towards Sustainability 2017 on the inner front cover of this report.

Each of our businesses sets internal reduction targets which are formally reviewed as part of the annual budget process to ensure alignment of their Sustainability 2017 and Manufacturing Excellence programme efforts and their contribution towards the group's goals. In addition to process improvement efforts, efficiency and longevity of equipment are considered in purchasing decisions and for large capital expenditure projects.

At group level, we have well established policies, systems and processes in place to manage environmental performance and to drive continuous improvement. All our major manufacturing sites are required to maintain certification to the ISO 14001 environmental management system as a means of setting, maintaining and improving standards. The group also requires new or acquired sites to achieve ISO 14001 certification within two years of beneficial operation or acquisition. Following the acquisition of Johnson Matthey Battery Systems (formerly Axeon) and Formox in 2012/13, work is underway to implement the standard at their major manufacturing sites.

During the year we introduced an enhanced reporting system for environmental data. We also worked to further specify definitions used in our annual data collection processes which resulted in the creation of a 'data dictionary' which was distributed to all sites. Together these will provide greater consistency and clarity of reporting across our global operations.

Read more in the Governance section on pages 80 and 81.

Read full details of our policies and strategies to manage and drive performance at www.matthey.com/sustainability.

Environmental Performance

Johnson Matthey undertakes a comprehensive annual review of group environmental performance which covers all manufacturing and research and development facilities. Data is presented for a five year period for ten environmental indicators on page 183 of this report. Year on year performance is highlighted in the sections below.

The group recorded increases across all ten indicators this year and, unless otherwise stated, this was mainly as a result of higher production levels and also due to a full year's contribution from the two businesses acquired in 2012/13.

Johnson Matthey's sales excluding precious metals (sales) grew by 11% in the year; energy consumption, total global warming potential (GWP), total waste and water consumption reduced relative to the rate of growth of the group's sales, demonstrating the positive impact of our efforts through our Sustainability 2017 and Manufacturing Excellence programmes.

There were no significant fines and no non-monetary sanctions for non-compliance with environmental laws and regulations in the year.

Energy Consumption

The group's total energy consumption increased by 6% to 4,915 thousand GJ but decreased by 5% relative to sales. Of the energy consumed in 2013/14, 63% arose from direct sources (i.e. various fuels and natural gas combusted by the group) and 37% from consumed electricity generated by a supplier.

Global Warming Potential

We report greenhouse gas emissions from process and energy use and convert the total group energy use to tonnes of carbon dioxide (CO_2) equivalent using national and regional conversion factors for each emission source as appropriate. The group's total GWP is based on the following (as defined by the greenhouse gas protocol www.ghgprotocol.org):

- Scope 1 emissions (generated by the direct burning of fuel, predominantly natural gas).
- Scope 2 emissions (generated from grid electricity and steam use at our facilities).
- Scope 3 emissions from the losses associated with transmission and distribution of electricity.

In 2013/14 the group's total GWP increased by 7% to 444 thousand tonnes CO_2 equivalent but decreased by 3% relative to sales. The breakdown of the group's total GWP is shown in the table on page 72.

CASE STUDY

→ Benefits of Combined Heat and Power at Redwitz, Germany

When Johnson Matthey's heating system at its Redwitz site needed replacing, thoughts turned to more efficient and sustainable combined heat and power (CHP) systems.

As electricity is generated in a CHP plant, waste heat produced by the system is captured and channelled into a heating system. Energy losses are modest compared to conventional methods of generation and energy produced is used locally.

Energy prices have been rising in Germany and consumption is subject to various taxes – this provided an additional incentive.

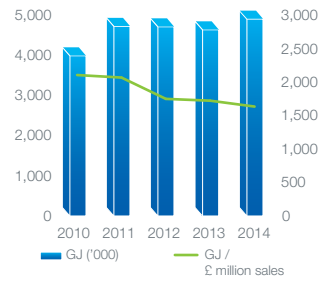
To test the waters, a small CHP unit was installed. This allowed the team to understand the functionality and handling of the system. The next step will be to monitor and assess the benefits and consider recommending a larger installation covering the whole site.

As a cost saving and energy efficient approach to heating and energy generation, CHP will strengthen the sustainability of the business both financially and environmentally. On a site that manufactures environmental technologies, what could be more fitting?

Read the full case study at www.matthey.com/sustainability.

Energy Consumption

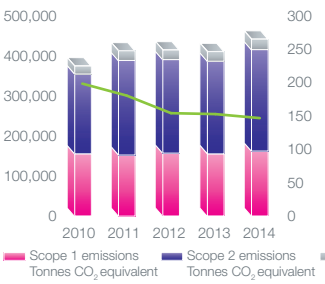
GJ ('000) | GJ / £ million sales



	GJ ('000)	GJ / £ million sales
2010	4,001	2,121
2011	4,749	2,083
2012	4,726	1,764
2013	4,648	1,737
2014	**4,915**	**1,649**

Total Global Warming Potential

Tonnes CO_2 equivalent | Tonnes / £ million sales



	Tonnes CO_2 equivalent ('000)	Tonnes / £ million sales
2010	377	199.9
2011	415	182.0
2012	417	155.7
2013	413	154.3
2014	**444**	**149.0**

Environment continued

Total Global Warming Potential

	2014 thousand tonnes CO_2 equivalent	2014 % of total GWP	2013 thousand tonnes CO_2 equivalent	2013 % of total GWP
Scope 1	**165**	**37%**	158	38%
Scope 2	**253**	**57%**	231	56%
Scope 3 (from electricity transmission and distribution)	**26**	**6%**	24	6%
Total global warming potential	**444**	**100%**	413	100%

Although we consumed more natural gas than electricity, natural gas has a lower carbon intensity than grid electricity and thus represents a lower proportion of GWP.

We do not report fully on our Scope 3 emissions, however, the emissions we report from electricity consumed at our facilities include Scope 2 emissions from electricity generation and Scope 3 emissions caused by transport and distribution losses in electricity grids. In terms of other Scope 3 emissions, those from travel by employees on company business are not material and the majority of our products are high value but low volume and so the carbon produced by transportation is low, relative to other carbon intensity figures. The majority of our Scope 3 emissions relate to the extraction and / or production of purchased materials and outsourced activities such as waste disposal. We continue to quantify these Scope 3 emissions through conducting life cycle analysis studies of our major product categories and by improving our knowledge of our role in the value chain.

Other Emissions

Emissions from our operations are generated from a number of sources including combustion processes, materials handling and chemical reactions and are typically licensed by local regulations. All sites monitor emissions to ensure compliance with these regulations and set their own absolute targets aimed at reducing significant emissions as part of their local environment, health and safety improvement plans.

In 2013/14, our total emissions of acid gases have increased by 21% to 405 tonnes sulphur dioxide (SO_2) equivalent. Emissions relative to sales also increased, by 9%. This is mainly due to increased emissions at our platinum group metal refinery in Brimsdown, UK. As a result of a variation in product mix this year, more intake material has required thermal pre-treatment, as opposed to melting, during the refining process. Thermal pre-treatment generated more SO_2 and NOx. In addition, the site has also improved the accuracy of its acid gas emissions measurements.

In 2013/14, our emissions of oxides of nitrogen (NOx) increased by 15% to 483 tonnes and total SO_2 emissions increased by 68% to 67.0 tonnes.

Emissions of volatile organic compounds (VOCs) have also risen this year by 13% to 209.3 tonnes. Our site in Savannah, USA, has improved the accuracy of its recording, which has led to it reporting a large increase in non-halogenated VOCs. This was partially offset by our other large emitter, in Edinburgh, UK, which reported a reduction due to lower solvent use.

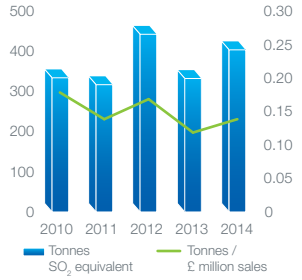
Waste

The group generated 121,594 tonnes of waste during the year, up 10% in absolute terms but slightly lower relative to sales. Waste to landfill also increased in the year, up 19% to 3,819 tonnes as two sites disposed of increased amounts of construction waste which they had stored for a number of years. Our site in Savannah, USA brought a new plant on line this year and production from the new plant has also contributed to the increase in landfilled waste.

Achieving zero waste to landfill by 2017 is one of the group's Sustainability 2017 targets and our focus has been to reduce, reuse and, where possible, recycle. Our sites now evaluate their waste beyond simply a material destined for disposal and increases this year were offset by initiatives, such as waste to energy opportunities, at our facilities worldwide to reduce their landfilled waste.

Total Acid Gas Emissions

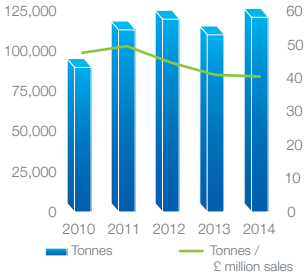
Tonnes SO_2 equivalent — Tonnes / £ million sales



	Tonnes SO_2 equivalent	Tonnes / £ million sales
2010	335	0.1776
2011	318	0.1395
2012	444	0.1658
2013	334	0.1248
2014	**405**	**0.1359**

Total Waste

Tonnes — Tonnes / £ million sales



	Tonnes	Tonnes / £ million sales
2010	90,308	47.88
2011	113,671	49.86
2012	120,363	44.94
2013	110,448	41.27
2014	**121,594**	**40.79**

CASE **STUDY**

→ The Value of Waste at Clitheroe

Over the past 12 months, new byproduct routes have been identified for two effluent streams at our manufacturing site at Clitheroe in the UK.

To be classed as a byproduct, waste must be capable of being used without further treatment. In 2013/14, 3,233 tonnes of one byproduct, weak ammonium nitrate solution, was used as a raw material by a fertiliser manufacturer. We also worked with another partner to prove the beneficial effects of concentrated sodium nitrate, which has achieved a significant expansion of this material as a byproduct.

The sodium nitrate is used to provide chemical oxygen to sewage / waste water. In some instances, the result is a reduction in electricity consumed for alternative technologies, whereas in other instances, it is the most practical treatment of waste water and corrosion prevention in sewer pipelines. This development has resulted in nearly all of the sodium nitrate being utilised as a beneficial byproduct.

Clitheroe is also making a significant contribution to Johnson Matthey's target of sending zero waste to landfill by 2017. In 2012/13 the Clitheroe site's figure stood at 45 tonnes; in 2013/14 it fell by 78% to 10 tonnes.

Read the full case study at www.matthey.com/sustainability.

Water Consumption

During the year, water consumption increased by 5% compared with 2012/13 to 2.6 million m^3. Of the total water used by the group, 91% was supplied by local municipal water authorities and 9% was abstracted.

Total effluent decreased by 2% to 1.7 million m^3 as we have restated last year's result following investigation of a large year on year difference at one of our sites. Of the total effluent produced, 89% was discharged to local authority sewers after treatment and in accordance with local discharge consent agreements. The remainder of our effluent was discharged to water courses after treatment and within quality limits set by local water authorities. The method of water treatment used at each site is appropriate to the effluent quality and volume and the requirements of the receptor. Our Formox site, acquired in 2012/13, was included for the first time in 2013/14, adding to our effluent discharged to water courses, but this was more than offset by reductions elsewhere.

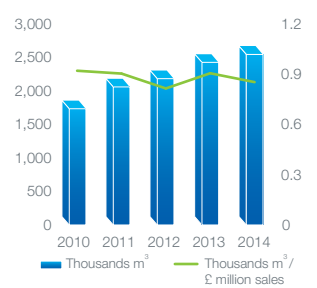
The chemical oxygen demand (COD) test is commonly used to indirectly measure the amount of organic compounds in water and is a useful measure of water quality. In 2013/14 the group discharged organic chemicals equivalent to a COD of 436 tonnes into water courses, as regulated by local emission limits at each manufacturing facility, an increase of 93% on the previous year. This is primarily a result of COD emissions at the Formox site, which is incorporated for the first time.

Johnson Matthey has a robust and effective management system which requires all sites to report environmental incidents to the group's environment, health and safety department. During 2013/14 no significant spillages to the environment of raw materials, intermediates or products have been reported by the group.

Looking Ahead to 2014/15

As part of a broader re-evaluation of environment, health and safety at Johnson Matthey, there will be a strong focus on environmental performance over the coming year to ensure we continue to improve and that we are well placed to manage any future regulatory changes. As the company continues to expand we are keen to benchmark our environmental performance against that of the largest global organisations. As a result, we are revisiting the performance metrics we currently use with a view to developing metrics that are more appropriate for our sites and for our future business aspirations.

Water Consumption



	Thousands m^3	Thousands m^3 / £ million sales
2010	1,750	0.928
2011	2,076	0.911
2012	2,201	0.822
2013	2,444	0.913
2014	**2,564**	**0.860**

The Strategic Report was approved by the board on 4th June 2014 and is signed on its behalf by:

Neil Carson
Chief Executive