

3. People and Planet

Our Environmental Impact

Our science is applied by customers every day to create products that improve the environment and make the world around us cleaner and healthier. We also take responsibility to ensure the way we run our operations is environmentally conscious too.

Performance Summary

		2017	2016	% change
Carbon footprint ¹	thousand tonnes CO ₂ equivalent	509	482 ²	+6
Energy consumption	thousands GJ	5,136	5,064	+1
Electricity consumption	thousands GJ	1,955	1,801	+9
Natural gas consumption	thousands GJ	2,868	2,948	-3
Waste to landfill	tonnes	6,894³	1,953	+253
Water withdrawal	thousands cubic metres	2,643	2,605	+1

¹ Calculated using regional or national emissions data.

² Restated to account for a miscalculation in the carbon intensity of electricity at Redwitz, Germany.

³ Excludes 17,682 tonnes of uncontaminated soil from a construction project in Redwitz, Germany, which was classified as non-hazardous waste to landfill under local law (see page 67).

Improving Processes to Support Performance

Sustainability 2017 has supported our ambition to grow responsibly. We have made huge progress towards the tough environmental targets we set ourselves in 2007 (detailed on page 14). In some cases we exceeded them, thanks to the work that has been carried out by our employees at a business and site level supported by established policies, systems and processes at the group level.

Our Manufacturing Excellence programme is one such way we have realised our ambitions. Launched half way through the Sustainability 2017 programme in 2012, it encourages a continuous improvement culture to enhance the efficiency and long term profitability of our operations. Progress is measured against ten criteria. The highest performing sites can work towards silver, gold or platinum status. This year, our site in Skopje, Macedonia, became the first to reach gold level and was followed by our Smithfield site in the US.

Each of our businesses sets internal reduction targets that are formally reviewed as part of the annual budget process to ensure that they are aligned with, and contributing to, the group's goals. In addition to process improvement efforts, the efficiency and longevity of equipment are considered in purchasing decisions and for large capital expenditure projects.

We have well established policies, processes and systems in place to manage environmental performance and help us realise 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. We also require new or acquired sites to achieve ISO 14001 certification within two years of beneficial operation or acquisition; 89% of such sites are ISO 14001 compliant. Across all our global manufacturing sites 86% are compliant.

Going beyond this, 15% of our manufacturing sites are also ISO 50001 compliant. ISO 50001 builds on ISO 14001 and looks specifically at the development of energy management systems to systematically and continuously improve energy efficiency. Our manufacturing sites in Macedonia, South Africa and our major sites in Germany have all achieved this standard.

Environmental Performance

Every year we undertake a comprehensive review of group environmental performance across all our manufacturing and R&D facilities. Data over a five year period is presented on page 69. Year on year performance is highlighted in the commentary below.

This year four of our six key environmental indicators improved relative to sales, demonstrating the positive impact of our sustainability and continuous improvement efforts as our business grows.

Carbon Footprint

One of our Sustainability 2017 targets has been to halve our carbon intensity from a 2007 baseline. We achieved that goal and we are aiming to further reduce greenhouse gas emissions per unit of production output as part of our sustainable business goals to 2025.

We report greenhouse gas emissions from our manufacturing processes and energy usage in accordance with the 2015 revision of the Greenhouse Gas Protocol (www.ghgprotocol.org). Our total carbon footprint is based on:

- Scope 1 emissions – generated by the direct burning of fuel (predominantly natural gas) and process derived carbon dioxide (CO₂) emissions
- Scope 2 emissions – generated from grid electricity and steam use at our facilities
- Scope 3 emissions – losses from the transmission and distribution of electricity.

We report Scope 2 emissions using two methods: the location method, which makes assumptions based on regional or national emissions data; and the more recently introduced market method, which accounts more accurately for the emissions from the energy a business is buying, particularly when using low or zero carbon green tariffs.

16% of our sites are now using zero carbon tariffs for their electricity. Across all the areas where market data is available (which is 86% of our operations), 63% of sites are using electricity with a lower carbon intensity than the regional average.

As such, our total carbon footprint (Scope 1 and 2 emissions) is 7% lower using the market method than with the location method. Using the market method, our carbon footprint relative to sales decreased by 12%, and by 6% using the location method.

We will use the market method for recording progress against our new sustainable business goals to better reward sites that are switching to green lower carbon tariffs.

Energy Consumption

Sales grew by 13% in the year at actual rates and 3% at constant rates. By contrast we recorded a 1% absolute increase in energy usage within our facilities this year, attributed to the addition of two new manufacturing sites in the US and Finland and our new precious metal refinery in China. The differential highlights the ongoing energy efficiency and decarbonisation of our manufacturing processes and the efforts our people are making in continuous improvement.

Our site energy use comprises 56% natural gas, 38% electricity and 6% other fuels, predominantly attributed to diesel and gasoline used in our automotive engine test facilities. 0.5% of our electricity came from solar energy sources that are not grid connected.

Waste

For a business with as many complex global operations as Johnson Matthey, achieving zero waste to landfill has always been a particularly challenging target. This year, we introduced a more detailed waste reporting system for waste disposal across the group, allowing us to better track and report the considerable efforts our sites are making in minimising their waste streams and disposing of waste in the most responsible way.

These efforts have allowed us to make good progress towards our waste target in previous years, but in this final year of Sustainability 2017 we experienced some significant setbacks in the face of changing classifications and regulations.

Most significant was the disposal of 17,682 tonnes of non-hazardous soil in a construction project at our site in Redwitz, Germany. Local law states that any soil extracted must be reused within the same county and, if builders cannot find a buyer for their soil within the county, it must go to landfill.

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Unfortunately, our Redwitz site was unable to find a buyer for its soil and so it was sent to landfill. We consider this to be an exceptional event and so have not included it in our ten year performance metrics for Sustainability 2017.

This year we also needed to send inert refinery slag from our Brimsdown, UK refinery to landfill. When the material has been produced in previous years we have been able to find reuse applications for it in the construction industry. Unfortunately we were unable to find an appropriate partner to work with on this occasion. This is not a sustainable solution and we will continue to search for a new partner.

Nonetheless, our sites continue to make efforts to find innovative ways to reduce their waste. Our site in Panki, India rethought its recycling process in the year, improving safety by reducing manual handling and reducing the site's waste by 2%.

Water Withdrawal

Our water withdrawal was similar to last year at 2.6 million m³, a 2% increase in absolute terms but a 10% decrease relative to sales. 92% was supplied by local municipal water authorities, 6% was abstracted from groundwater, 2% was abstracted from fresh surface water and 0.01% was stored rainwater.

26 sites operate their own waste water treatment facilities treating 1.2 million m³ of waste water per year. 26% of the water treated on site is recycled back into our processes rather than being discharged as effluent, also reducing our water demand. Our Clitheroe, UK site is leading the way, recycling 41% of the water treated on site.

Our total effluent increased 23% to 2.1 million m³, largely due to more accurate metering at some of our facilities. 89% was discharged to local authority sewers after treatment and in accordance with local discharge consent agreements. The remainder was discharged to water courses after treatment and within quality limits set by local water authorities.

Our total consumption, water withdrawn less water discharged, was 573,664 m³.

Water Risk

Water is an essential resource. The World Resource Institute (WRI) reported in June 2016 that in the industrialised world, fresh water is becoming scarcer due to increased demand and higher pollution levels. Availability is often transient, dependent on changing weather patterns.

A reliable supply of fresh water is required by all our manufacturing sites and, often in considerably greater quantities, by our strategic suppliers. To examine our exposure, we periodically undertake water stress surveys of our business. We also report our principal water risk publicly through the annual CDP Water survey.

Since our last water stress survey in 2012, our portfolio of sites has grown and changed, so this year we conducted a new survey using the World Business Council for Sustainable Development (WBCSD) Global Water Tool™ (version 1.3). Of the 66 principal sites surveyed, 15 were identified as being in regions of extreme water stress. Our water usage at most of these is very low, however there are four sites that are mains connected and are close to using the available supply per capita: Taloja, India; Yantai, China; New Mexico, US; Brimsdown, UK. Using the data from the survey we will prioritise water conservation projects for the sites that are at the greatest risk of an interruption to supply.

Our largest water risks are in our supply chain, where we are exposed to industries that are significant water users, such as mining and agriculture. The next step is to gather the exact locations of our strategic suppliers' facilities and evaluate them with the WBCSD tool.

Environmental Incidents

Johnson Matthey has a robust and effective management system that requires all sites to report environmental incidents to our Group Environment, Health and Safety (EHS) department. All spills that occur on unmade ground or near drinking water sources are classified as significant. Under this definition, two sites reported one significant spill each this year, both of which were remediated. There were no significant fines and no non-monetary sanctions for non-compliance with environmental laws and regulations in the year. However, we are involved in one ongoing dispute.

Environmental Spills

Site	Volume (litres)	Material	Impact
Kotka, Finland	3,700	Chemicals	Remediated with no environmental impact
West Deptford, US	50	Chemicals	Under investigation

Understanding Potential Impacts of Climate Change on Our Business

We disclose our environment, social and governance (ESG) performance through the Carbon Disclosure Project (CDP) climate change programme, which looks at risks and opportunities of climate from the world's largest companies on behalf of institutional investors. We also participate in benchmarking studies to deepen our knowledge and compare our progress against our peers. A changing global climate brings with it a number of risks and opportunities for Johnson Matthey which we continually consider and review annually as part of our CDP disclosure. The most significant of these continue to be environmental legislation and water availability.

Priorities for 2017/18

Having halved our carbon intensity over the ten years of Sustainability 2017, we are looking to extend our efforts in this area with the ongoing reduction of greenhouse gases per unit of production output. This is one of the themes of our sustainable business goals to 2025. We will continue to report our carbon footprint using the location and market based methods but will switch to the market method for reporting progress as it more accurately reflects the efforts our sites are making to decarbonise their energy usage.

Our Environmental Impact – Performance Data

Carbon Footprint

	2017 thousand tonnes CO ₂ equivalent	2017 % of total carbon footprint	2016 thousand tonnes CO ₂ equivalent ¹	2016 % of total carbon footprint ¹
Scope 1	203	40%	204	42%
Scope 2 (location based method)	282	55%	258	54%
Scope 2 (market based method)	247	52%	253	53%
Scope 3 (from electricity transmission and distribution)	24	5%	20	4%
Total carbon footprint (location based method)	509	100%	482	100%
Total carbon footprint (market based method)	474	100%	477	100%

¹ Restated to account for a miscalculation in the carbon intensity of electricity at Redwitz, Germany.

Water Withdrawal

	Thousands m ³	Thousands m ³ / £ million sales
2013	2,444	0.907
2014	2,564	0.850
2015	2,529	0.799
2016	2,605	0.820
2017	2,643	0.740

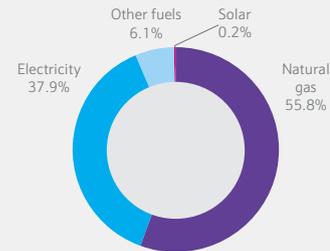


Carbon Footprint

	Tonnes CO ₂ equivalent ('000)	Tonnes / £ million sales
2013	413	153.2
2014	463	153.4
2015	510	161.2
2016	482 ¹	151.8
2017	509	142.4



Energy Consumption

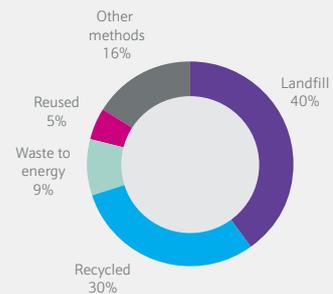


Energy Consumption

	GJ (‘000)	GJ / £ million sales
2013	4,648	1,724
2014	5,015	1,662
2015	5,366	1,696
2016	5,064	1,594
2017	5,136	1,435



Where Our Waste Goes



We disposed of 61,270 tonnes of waste via third parties in 2016/17. 36% was classified as hazardous waste, 5% of which was shipped internationally for disposal. In addition, we incinerated 7,974 tonnes of waste within our own facilities, including waste sent to our refineries for precious metal recovery.

Total Waste to Landfill

	Tonnes	Tonnes / £ million sales
2013	3,218	1.19
2014	3,819	1.27
2015	3,482	1.10
2016	1,953	0.61
2017	6,894²	1.93



² Excludes 17,682 tonnes of uncontaminated soil from a construction project in Redwitz, Germany which was classified as non-hazardous waste to landfill under local law (see page 67).

The Strategic Report was approved by the board on 31st May 2017 and is signed on its behalf by:

Robert MacLeod

Robert MacLeod
Chief Executive