

Module: Introduction

Page: Introduction

CC0.1

Introduction

Please give a general description and introduction to your organization.

Johnson Matthey is a leader in sustainable technologies. We focus on clean air, clean energy and low carbon technologies and are experts in the application and recycling of precious metals.

Johnson Matthey is a global speciality chemicals company. We have operations in over 30 countries and employ around 13,000 people worldwide.

Johnson Matthey's principal activities are the manufacture of autocatalysts, heavy duty diesel catalysts and pollution control systems, catalysts and components for fuel cells, batteries for electric vehicles, catalysts and technologies for chemical processes, fine chemicals, chemical catalysts and active pharmaceutical ingredients and the marketing, refining, and fabrication of precious metals.

Johnson Matthey has continued to develop its technology for almost 200 years, demonstrating the company's ability to maintain world leadership by adapting constantly to rapidly changing customer needs. Rigorous in its own environmental policies, many of Johnson Matthey's products have a major beneficial impact on the environment and enhance the quality of life for millions of people around the world.

We invest in R&D to develop high technology products that enhance the quality of life for millions of people around the world.

Johnson Matthey is focused on developing products that deliver sustainability benefits to our customers and to society. Today, some 88% of the group's sales represent products and services which provide sustainability benefits through their positive impact on the environment, resource efficiency or our health.

Our latest annual integrated report can be found at : <http://www.matthey.com/ar16/>
For more information about Johnson Matthey, see our corporate website : www.matthey.com

CC0.2**Reporting Year**

Please state the start and end date of the year for which you are reporting data.

The current reporting year is the latest/most recent 12-month period for which data is reported. Enter the dates of this year first.

We request data for more than one reporting period for some emission accounting questions. Please provide data for the three years prior to the current reporting year if you have not provided this information before, or if this is the first time you have answered a CDP information request. (This does not apply if you have been offered and selected the option of answering the shorter questionnaire). If you are going to provide additional years of data, please give the dates of those reporting periods here. Work backwards from the most recent reporting year.

Please enter dates in following format: day(DD)/month(MM)/year(YYYY) (i.e. 31/01/2001).

Enter Periods that will be disclosed

Fri 01 Apr 2016 - Fri 31 Mar 2017

CC0.3**Country list configuration**

Please select the countries for which you will be supplying data. If you are responding to the Electric Utilities module, this selection will be carried forward to assist you in completing your response.

Select country

Rest of world

CC0.4

Currency selection

Please select the currency in which you would like to submit your response. All financial information contained in the response should be in this currency.

GBP(£)

CC0.6

Modules

As part of the request for information on behalf of investors, companies in the electric utility sector, companies in the automobile and auto component manufacturing sector, companies in the oil and gas sector, companies in the information and communications technology sector (ICT) and companies in the food, beverage and tobacco sector (FBT) should complete supplementary questions in addition to the core questionnaire.

If you are in these sector groupings, the corresponding sector modules will not appear among the options of question CC0.6 but will automatically appear in the ORS navigation bar when you save this page. If you want to query your classification, please email respond@cdp.net.

If you have not been presented with a sector module that you consider would be appropriate for your company to answer, please select the module below in CC0.6.

Further Information

Module: Management

Page: CC1. Governance

CC1.1

Where is the highest level of direct responsibility for climate change within your organization?

Board or individual/sub-set of the Board or other committee appointed by the Board

CC1.1a

Please identify the position of the individual or name of the committee with this responsibility

Board of Directors / Chief Executives General Management Committee (GMC).

Our board of directors is ultimately responsible for social, environmental and ethical matters, which includes climate Change. These matters are embedded in Johnson Matthey's 3C strategy and risk management processes and are formally reviewed annually by our board. Policies are set and approved by the Chief Executive's General Management Committee (GMC). The GMC also addresses risk and control issues and reviews key EHS, social and governance issues. The Group Policy & Compliance Committee (GPCC), a sub-committee of the GMC, has specific executive responsibility for the identification and monitoring of risks in these areas.

The Audit Committee has responsibility for reviewing the effectiveness of the group's system of internal control and procedures for the identification, assessment, management and reporting of Climate Change risks. The Group Risk Register is reviewed by the GMC and actions to mitigate / eliminate the risk identified. Every business unit is required to include sustainability targets (including energy use targets and carbon targets) in its annual budget setting process and define the nature of programmes and projects to be undertaken together with capital expenditure requirements and value generated over a three year business cycle. Business Unit directors are responsible for setting and achieving these targets - in the light of the Group targets - and formally discuss their plans with the GMC before they are formally approved by the board on an annual basis.

Business unit directors overall incentive schemes take account of both non-financial (i.e. environmental, health and safety KPIs) as well as financial performance KPIs.

CC1.2

Do you provide incentives for the management of climate change issues, including the attainment of targets?

Yes

CC1.2a

Please provide further details on the incentives provided for the management of climate change issues

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Process operation managers	Monetary reward	Emissions reduction target Energy reduction target	The managers of all our manufacturing facilities are assessed on their performance against agreed annual objectives, within which is included their performance against our Operational Efficiency targets. These include our energy efficiency and GHG emissions targets "Halve the use of gas+electricity per unit output by 2017" and "halve the carbon footprint of our operations by 2017"

Who is entitled to benefit from these incentives?	The type of incentives	Incentivized performance indicator	Comment
Environment/Sustainability managers	Monetary reward	Emissions reduction target Energy reduction target	The Group Sustainability Director is assessed against objectives set annually and against progress towards the Sustainability 2017 targets. This includes our energy efficiency and GHG emissions targets "Halve the use of gas + electricity per unit output by 2017" and "halve the carbon footprint of our operations by 2017" For this employee, the performance of the whole JM Group against these sustainability objectives is linked to any decision on key performance related remuneration.
All employees	Recognition (non-monetary)	Emissions reduction target Energy reduction target	Johnson Matthey Annual Inventor Recognition Awards Presented by the Chief Executive to the teams or individuals who have developed new technology, catalysts or processes leading to new opportunities for our business. Many of these are in the low carbon, renewable feed-stocks or operational efficiency areas.
All employees	Recognition (non-monetary)	Emissions reduction target Energy reduction target	Johnson Matthey has a Global Annual Sustainability Awards scheme. This includes categories such as "sustainable technologies" and "sustainable operations". All employees are encouraged to submit entries. The winners of each category receive a trophy and certificate from the Chief Executive and a cash award to donate to a local charity / community group of their choice.

Further Information

Page: **CC2. Strategy**

CC2.1

Please select the option that best describes your risk management procedures with regard to climate change risks and opportunities

Integrated into multi-disciplinary company wide risk management processes

CC2.1a

Please provide further details on your risk management procedures with regard to climate change risks and opportunities

Frequency of monitoring	To whom are results reported?	Geographical areas considered	How far into the future are risks considered?	Comment
Six-monthly or more frequently	Board or individual/sub-set of the Board or committee appointed by the Board	Global	> 6 years	The board has overall responsibility for ensuring that risk is effectively managed across the group and the Audit Committee is responsible for reviewing the effectiveness of the group's system of internal control, including the approach to risk management and procedures for the identification, assessment, management, mitigation and reporting of risk, and meets 4 times a year. The group has a process in place for the continuous review of its risks. Additionally, every division has a Ten Year plan for strategic development which is reviewed in detail every three years. Climate change risks and opportunities are incorporated as part of this three-yearly strategic review. Refer to further details in CC2.1b and c

CC2.1b

Please describe how your risk and opportunity identification processes are applied at both company and asset level

The group's risk management process is aimed at monitoring material issues to enable the early identification of key risks and initiation of action to mitigate those risks. The Board has overall responsibility for ensuring that Risk is effectively managed across the group and the Audit Committee is responsible for reviewing the effectiveness of the group's system of internal control, including the risk management process. The JM Group has a process in place for the continuous review of its risks. As part of the risk management process, each Division reviews its own risks, mitigation strategies and actions. The most significant risks identified are then collated into a Group Risk Register. The Group Risk Register is reviewed by the Board twice a year and the most significant Risks published externally. Each individual risk is considered, together with the effectiveness of current controls and the status and progression of mitigation actions and plans are monitored. Our most significant assets in all divisions are our manufacturing sites, precious metal stores and our people; the risks associate with them are assessed and monitored in the same way as described above. For example, at an asset level, we assess the impact of climate change and carbon emissions regulations on our products, and the impact of extreme weather events on our manufacturing sites.

The Opportunities Identification process is the cornerstone of our Ten Year planning process, initiated in 2010 which is subject to a Three-yearly Strategic Review, both at a company level and within each of the five divisions. The most significant opportunities identified are captured within the Ten year plan. Most are then assigned to our New Business Development Division for further investigation.

During our 2010 Strategic Review, we identified Ten Global Drivers (one of which is Climate Change) we believe are relevant to our business and all new opportunities are assessed against these Global Drivers.

CC2.1c**How do you prioritize the risks and opportunities identified?**

Risks and opportunities are prioritised based on both impact (financial and non-financial) and likelihood of them occurring using a 'five by five' reference scale i.e. five references for likelihood (ranging from an Extraordinary event i.e. unlikely to occur within 10 years, to an event which is expected to occur at least annually) and five references for impact based on financial and non-financial data .

Each individual risk is considered, together with the effectiveness of current controls and the status and progression of mitigation actions and plans are monitored. Each individual opportunity is assessed against its relevance to our strategy to develop Sustainable Products, our Core Skills and our Global Drivers.

CC2.1d

Please explain why you do not have a process in place for assessing and managing risks and opportunities from climate change, and whether you plan to introduce such a process in future

Main reason for not having a process	Do you plan to introduce a process?	Comment
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CC2.2**Is climate change integrated into your business strategy?**

Yes

CC2.2a

Please describe the process of how climate change is integrated into your business strategy and any outcomes of this process

WHAT IS THE PROCESS BY WHICH THE BUSINESS STRATEGY IS INFLUENCED BY CLIMATE CHANGE RISKS AND/OR OPPORTUNITIES?

Climate Change is integrated into our Business Strategy in two ways:

i) Climate Change is listed as one of the Ten key Global Drivers we assess as part of our Ten-Year Plan and Three-yearly Strategic reviews for each of our Divisions, and used to select potential new business opportunities to be explored by our New Business Development Division

ii) Managing our own direct impact on Climate Change is key element of our Sustainability 2017 vision and targets, which were launched in 2007. It is also a key element of our follow-up strategy: Sustainable Business 2025, whose goals and quantitative targets are being launched mid-year 2017.

- WHAT ARE THE CLIMATE CHANGE ASPECTS THAT HAVE INFLUENCED THE STRATEGY?

1. Increasing CO2 levels in the atmosphere is thought to be the key driver to initiating man-made climate change. We are strategically committed to developing and providing low carbon products and additional technology services for our customers to help them mitigate their own climate change impacts. We are also strategically committed to reducing the carbon footprint of our own operations. Annual report 2017 pages 8-11.

2. The changing and less predictable precipitation patterns in the geographical regions where licensed opium poppies are traditionally grown have influenced our strategic decision to become self-sufficient in growing poppy straw the principle raw material used by our Active Pharmaceutical Ingredients business and to start growing the crops in new countries of the world.

3. A reduction in availability of clean water in geographies increasingly susceptible drought has led us to recognise the opportunity for a water purification business for industry, especially mining, in those regions.

- WHAT ARE THE MOST IMPORTANT COMPONENTS OF STRATEGY INFLUENCED BY CLIMATE CHANGE?

REALISING CLIMATE CHANGE OPPORTUNITIES

Following a strategic review of our Ten year plan in 2010, our New Business Development Division was established with a target to achieve sales of around £200 million per annum by 2020, a return of investment period longer than our normal 3-year cycle. A strategic decision was taken that all new product areas must sustainably address environmental or health issues for our planet as per our Strategic Intent; (this includes products that mitigate man-made climate change) .

The Business Opportunities we are currently exploring which relate directly to Climate Change opportunities are:

Rechargeable Batteries for electric vehicles

Fuel Cells for electric vehicles

Engineering + catalytic solutions for commercialisation of next generation bio-fuels

Water purification devices, especially for industries in water-stressed geographies

MITIGATING CLIMATE CHANGE RISKS

We have six quantitative targets linked to our Sustainability 2017 strategy. Two of them are directly focused on reducing the climate change impacts of our own operations:

i) to halve our carbon intensity (our "GWP" = Scope 1 + 2 emissions) relative to sales by 2017 compared to our baseline year of 2007

ii) to reduce our Energy use (gas and electricity) and water usage per unit sales by 2017 compared to our baseline year of 2007.

We achieved these targets on schedule in March 2017.

In our annual report 2017 we announced a follow-on program of work to further reduce our negative contributions to climate changes: one of our Sustainable business 2025 goals is to "Reduce our greenhouse emissions per unit of production output" by 2025. (page 51) We will announce the detail of this quantitative target in Q3 2017. We are in consultation with a number of experts, including Pedro Faria at CDP, on what would constitute a science-based target for us.

We have identified that using virgin precious metal in our products is by far the largest component of our largest scope 3 carbon footprint. We actively encourage all our customers to return all used, precious metal-containing products to us at end of life. We recycle them internally and our continuing improving the processes by which we do this, as part of our operational efficiency programs.

We have identified that changing precipitation patterns are affecting the reliability of the supply of our opiate poppy straw for our manufacturing business. Therefore, we have taken a strategic decisions to become self-reliant by growing our own poppies and investing in farming in new geographies which we have identified as been more resilient to climate change than the traditional licensed poppy- growing areas of the world.

- HOW ARE YOU GAINING A STRATEGIC ADVANTAGE OVER COMPETITORS?

We are gaining strategic advantage over competitors in these new business markets, by ensuring that we select opportunities that fit well with our core skills and by being prepared to invest for the long term (profits in > 10 years, in many cases) and are closely aligned with the needs of society, as defined by the UN Sustainable Development goals. We seek to identify joint development partners in each business new area at an early stage to ensure that market needs are well-understood, so our Research & Development activities are appropriately targeted and the barriers to scale-up and commercialisation are lowered.

- WHAT ARE THE MOST SUBSTANTIAL BUSINESS DECISIONS MADE DURING THE REPORTING YEAR WHICH WERE INFLUENCED BY CLIMATE CHANGE?

1. We have signed the Paris Pledge for Action www.parispledgeforaction.org in February 2016.

2. Johnson Matthey's strategic response to climate change was embedded in the outcome of our Strategic Review of the Ten-Year plan in December 2016. The 2016 Strategic Review of the Ten-year plan confirmed that the direction and identified focus of the company was good (in all areas, including climate change) and no significant new business decisions were made in the last year.

- Is the business strategy linked to an emissions reduction or energy reduction target?

The business strategy is linked to a climate-change related emission reduction target and an energy reduction target:

One of our key sustainability 2017 targets was to halve our carbon intensity (our "GWP" = Scope 1 + 2 emissions) by 2017 when compared to our baseline year of 2007. We achieved it on schedule :

2007 baseline	294 tonnes CO ₂ e / £M sales (excluding precious metals)
2016-17 performance	142 tonnes CO ₂ e / £M sales (excluding precious metals)
2017 target	147 tonnes CO ₂ e / £M sales (excluding precious metals)

3. We have announced in our June 2017 annual report that we will be setting a new, tougher Carbon Intensity Target for our business out to 2025. We are in consultation with a number of experts, including Pedro Faria at CDP, on what would constitute a science-based target for us and will announce the detail of our new quantitative target in Q3 2017.

Please explain why climate change is not integrated into your business strategy

CC2.2c

Does your company use an internal price on carbon?

No, and we currently don't anticipate doing so in the next 2 years

CC2.2d

Please provide details and examples of how your company uses an internal price on carbon

CC2.3

Do you engage in activities that could either directly or indirectly influence public policy on climate change through any of the following? (tick all that apply)

Trade associations
Other

CC2.3a

On what issues have you been engaging directly with policy makers?

Focus of legislation	Corporate Position	Details of engagement	Proposed legislative solution
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CC2.3b

Are you on the Board of any trade associations or provide funding beyond membership?

Yes

CC2.3c

Please enter the details of those trade associations that are likely to take a position on climate change legislation

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
The UK Chemical Industries Association	Consistent	<p>The Chemical Industries Association (CIA) is the organisation that represents chemical and pharmaceutical businesses throughout the UK. The CIA's activities are split between lobbying and provision of advice and services. Their policy agenda stretches across energy, trade and competitiveness; our products and the way we work. Energy and climate change issues are a key priority for members and they published a position paper "Energy and Climate Change in 2014. It can be found at their website: https://www.cia.org.uk/LinkClick.aspx?fileticket=HdhiMQtgCkM%3d&portalid=0 In August 2016 they published a position paper about EU-ETS. https://www.cia.org.uk/Policy/Our-positions Priorities include enhancing the contribution of climate change solutions to sectors of the economy while optimizing energy use and reducing carbon emissions within the UK chemical sector itself. https://www.cia.org.uk/LinkClick.aspx?fileticket=HdhiMQtgCkM%3d&portalid=0 Johnson Matthey has several representatives on CIA committees including the "Energy & Climate Change Network"</p>	Help build consensus, provide expert opinion and assist in building a consistent view.
The International Platinum Group Metals Association	Consistent	<p>PGM miners and fabricators have gathered under the umbrella of the IPA to set down a framework of sustainability principles. We commit to: • Improving our understanding of the environmental, social and economic impacts and benefits of our materials across their life cycle; Johnson Matthey has several representatives on IPA committees including the "Sustainability committee" http://ipa-news.com/index/sustainability/ They understand that minimising the carbon footprint of the industry is important to combat climate change and commissioned a project to understand and measure it, in the first instance.. JM participated in the IPA's LCA project to calculate the carbon footprint of precious metals, mined and recycled, and of automotive catalysts. They have recently issued position paper on Air Quality. http://ipa-news.com/index/news-und-debates/statements/ipa-position-paper-on-clean-diesel-vehicles-and-air-quality.html</p>	Help build consensus and assist in building a consistent view Ensure that the environmental impacts of recycling of precious metals is accurately captured in any future European legislation relating to carbon footprinting of (consumer) products.

Trade association	Is your position on climate change consistent with theirs?	Please explain the trade association's position	How have you, or are you attempting to, influence the position?
The Aldersgate Group	Consistent	The Aldersgate Group (AG) is an alliance of leaders from business, politics and society that drives action for a sustainable economy. JM supported the work on "the low carbon compacts" and "mandatory carbon reporting". One of our senior managers, leads the work stream on "The New Economy". The Aldersgate Group urges UK government to build on promising growth of UK's low carbon economy. It also provides positions on e.g. "Meeting the UK's carbon budgets: What priorities for the new government?"	Help build consensus, provide expert opinion and assist in building a consistent view.
Eurometaux	Consistent	The European non-ferrous metals alliance. Johnson Matthey has several representatives on Eurometaux committees including the "Sustainability" and "Life-Cycle" teams and has contributed to the position paper = the long-term roadmap for the European industry. We are currently involved in an LCA pilot project for metal sheet as part of the European Commission DG_ENV initiative to understand the environmental impacts of metals. Contribute to discussion resulting in position papers such as : "Eurometaux Position Paper on the EU's 2030 Climate and Energy Package"; "Alliance of Energy Intensive Industries - Strategic Choices for ETS Post - 2020". Climate and Energy Package"; "Alliance of Energy Intensive Industries - Strategic Choices for ETS Post - 2020". More information at : http://www.eurometaux.eu/EnergyClimateChange.aspx . The companies in the non-ferrous metals industry take climate protection seriously, and have launched the "Metals pro Climate" initiative in order to put the focus on our industry's knowledge and technology-based solutions for climate protection.	Help build consensus, provide expert opinion and assist in building a consistent view. Ensure that any EU policy is consistent with the overall needs of members. Ensure the environmental impacts of recycling of base and precious metals is accurately captured in any future European legislation relating to carbon footprinting of (consumer) products and the concept of the "circular economy".

CC2.3d

Do you publicly disclose a list of all the research organizations that you fund?

CC2.3e

Please provide details of the other engagement activities that you undertake

1. EDUCATING THE NEXT GENERATION OF SCIENTISTS

Johnson Matthey is strategically committed to promoting Science, Technology and Engineering (STEM) education in all regions of the world where we operate, including about climate change. We engage with local school and university students both by going into their schools to teach about the science behind our product portfolio, and also by inviting groups of school students to our facilities to learn about our technology. Typically primary school children would be invited for a one day workshop and tour of our laboratories, whereas secondary schoolchildren would be invited for 3-5 days of education and tertiary students for placements of up to one year in our laboratories.

Within our STEM education programs we seek to highlight sustainability issues such as climate change and to promote the technology which will help protect our environment from further damage. For example in Pennsylvania USA, we partner with Collegium Charter School, and the local Girl Scouts to promote our shared aims of science education. In 2012 we hosted a Sustainability and Social Media session with a group of older students and provided volunteer judges for the school science fair. We saw a doubling of sustainability-themed entries at the lower school level since the previous year. For our contributions towards STEM education for young women, Johnson Matthey was awarded the Friend of Girl Scouts of Eastern Pennsylvania Award at their 2013 Council Celebration.

We sponsored the Royal Society Christmas lectures, broadcast globally by the BBC and we are hosting several Royal Society family science days at our UK sites in 2017.

2. EMPLOYEE EDUCATION AND AWARENESS PROGRAMMES.

All of our employees are encouraged to learn about Sustainability and our response to Climate change through our extensive in-house programs of continuing education. Our structured in-house management training programs span career foundation and mid-career and senior management levels. Every training program includes a module about Johnson Matthey's Sustainability 2017 strategy and our quantitative targets to reduce our energy use and carbon footprint, taught personally by the Sustainability Director or members of the Group Sustainability Team.

All employees have been invited to complete an online learning course on Johnson Matthey's Sustainability 2017 Vision, which includes material about our response to Climate Change.

3. PEER GROUP NETWORKING / SHARING

Johnson Matthey is involved in many peer network groups e.g. Sustainability 50 Forum and Thinkstep's Product Sustainability Round Table in which we share and exchange ideas, good practice, emerging issues with like-minded companies. These discussions involve much debate on the potential impacts of climate change and consensus building for industry solutions.

4. In 2015 we signed the Paris Pledge for action, to support the aim to implement a global binding agreement on Climate Change at the UN COP-21 Climate Change Conference. In February 2016 we signed the International Council of Chemical Associations' "Responsible care Charter".

CC2.3f

What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

We review our climate change strategy (as part of our broader sustainability strategy) by the Chief Executive's General Management Committee (GMC) and the Board at least annually, and set this in the context of changing external policy / regulation.

In order to ensure that all of our direct and indirect activities that influence policy are consistent with our overall climate change strategy, all the activities of each Business Unit and Division are then reviewed annually by the GMC and Sustainability Director during the Annual Budget Review process, where there is a special section devoted discussing each Business Unit's three-year plan to help the JM Group achieve its overarching Sustainability 2017 strategy and Targets (which include climate change strategy). This is the key point at which business unit activity is reviewed to ensure it is consistent with Climate Change strategy on an annual basis.

Additionally each Division holds a Ten-year plan which is subject to a Three-yearly in depth strategic review against our Ten Global Drivers; one of our key Global Drivers is Climate Change. The most recent review was conducted in Q4 2016 and confirmed Climate Change as the principle driver for our New Business investments.

We maintain an awareness of energy and climate related legislation and scientific publications / positions through subject matter experts. These include a review of the latest climate science publications and maintaining an awareness of activities at a national (e.g. UK Carbon budgets) and international level (e.g. COP21). Where relevant, these are communicated throughout Johnson Matthey.

Our sustainability targets including our GHG emissions targets are also reviewed annually by the Board to ensure they are still relevant.

We also conduct detailed life cycle assessments to ensure we accurately understand the environmental impacts and benefits of our technology offerings to the marketplace.

CC2.3g

Please explain why you do not engage with policy makers

Further Information

Page: CC3. Targets and Initiatives

CC3.1

Did you have an emissions reduction or renewable energy consumption or production target that was active (ongoing or reached completion) in the reporting year?

Intensity target

CC3.1a

Please provide details of your absolute target

ID	Scope	% of emissions in scope	% reduction from base year	Base year	Base year emissions covered by target (metric tonnes CO2e)	Target year	Is this a science-based target?	Comment

CC3.1b

Please provide details of your intensity target

ID	Scope	% of emissions in scope	% reduction from base year	Metric	Base year	Normalized base year emissions covered by target	Target year	Is this a science-based target?	Comment
Int1	Scope 1+2 (location-based)	100%	50%	Metric tonnes CO2e per unit revenue	2007	294	2017	No, but we anticipate setting one in the next 2 years	Relative (Tonnes CO2e / £M sales excl . precious metals). Our carbon intensity target is to halve the carbon intensity. i.e. A 50% reduction of the GWP relative to sales (excluding precious metals). We have exceeded this target this year, the final year of the ten year program. Scope 3 losses due to transmission & distribution of electricity are also included in this target as they were defined as scope 2 until 2013.

CC3.1c

Please also indicate what change in absolute emissions this intensity target reflects

ID	Direction of change anticipated in absolute Scope 1+2 emissions at target completion?	% change anticipated in absolute Scope 1+2 emissions	Direction of change anticipated in absolute Scope 3 emissions at target completion?	% change anticipated in absolute Scope 3 emissions	Comment
Int1	No change	0	No change	0	Since our baseline year, our business has grown significantly. At the start of the program we anticipated a doubling of sales with zero change in absolute carbon emissions. Since the launch of our Sustainability 2017 targets in 2007, sales revenues have risen faster than this, by 167%, and underlying EPS is up 154% • However, resource use and emissions has grown at much lower rate: • GWP is up only 29% and total Energy use has risen by only 33%.

CC3.1d

Please provide details of your renewable energy consumption and/or production target

ID	Energy types covered by target	Base year	Base year energy for energy type covered (MWh)	% renewable energy in base year	Target year	% renewable energy in target year	Comment
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CC3.1e

For all of your targets, please provide details on the progress made in the reporting year

ID	% complete (time)	% complete (emissions or renewable energy)	Comment
Int1	100%	100%	We have exceed our target in the final year of our ten year program. The final reduction was 103% of our target.

CC3.1f

Please explain (i) why you do not have a target; and (ii) forecast how your emissions will change over the next five years

CC3.2

Do you classify any of your existing goods and/or services as low carbon products or do they enable a third party to avoid GHG emissions?

Yes

CC3.2a

Please provide details of your products and/or services that you classify as low carbon products or that enable a third party to avoid GHG emissions

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
Group of products	<p>1. JOHNSON MATTHEY OFFERS TECHNOLOGY SOLUTIONS TO AVOID THE USE OF FOSSIL FUEL SOURCES IN THE TRANSPORTATION SECTOR. Johnson Matthey Battery Technologies is Europe's largest independent designer and manufacturer of (rechargeable) lithium-ion battery systems. We deliver individual battery solutions for electric and hybrid vehicles, as well as high volumes of batteries for e-bikes, power tools and mobile technologies. We can also offer battery solutions for stationary energy storage applications. All these include state-of-the-art battery management systems. Batteries in electric vehicles save GHGs if the electricity used to re-charge them is more GHG efficient than the combustion engine that they are replacing. A typical passenger car with an internal combustion engine, currently emits approximately 21 tonnes of CO2 during its lifetime. A typical electric passenger car uses 32 MWh of grid electricity of its lifetime. In the case where renewable electricity (e.g. from solar, hydro, geothermal, wind power) is used to charge the battery, then the vehicle becomes zero emission vehicle and 21 tonnes CO2 are saved by replacing the combustion engine with a battery. In the case where average grid electricity for Europe is used to charge the vehicle, 11 tonnes of CO2 are saved.</p>	Low carbon product	Climate Bonds Taxonomy		Less than or equal to 10%	
Group of products	<p>JOHNSON MATTHEY OFFERS TECHNOLOGY SOLUTIONS TO SUPPORT THE DEVELOPMENT OF THE HYDROGEN ECONOMY IN THE COMBINED HEAT AND POWER, BACKUP POWER SECTOR AND TRANSPORTATION SECTORS Johnson Matthey Fuel Cells is a world leader in the production of catalysed components for use in fuel cells, a technology for generating low carbon power, in a similar manner to the battery example above. Fuel cells use hydrogen to generate power. Where that hydrogen has been generated from a low carbon/carbon-free source then the</p>	Low carbon product	Climate Bonds Taxonomy		Less than or equal to 10%	

Level of aggregation	Description of product/Group of products	Are you reporting low carbon product/s or avoided emissions?	Taxonomy, project or methodology used to classify product/s as low carbon or to calculate avoided emissions	% revenue from low carbon product/s in the reporting year	% R&D in low carbon product/s in the reporting year	Comment
	GHG emissions are saved by replacing a traditional combustion engine with a fuel cell.					
Group of products	. JOHNSON MATTHEY OFFERS CATALYSTS AND ENGINEERING SOLUTIONS TO ENABLE THE USE OF BIOFEEDSTOCKS IN THE MANUFACTURE OF BIOCHEMICALS AND BIOFUELS and is developing new solutions in joint ventures. For example we announced our progress in a joint venture with Rennovia on the manufacture of Bio-Based Glucaric Acid in July 2015. http://www.rennovia.com/wp-content/uploads/2015/07/Johnson-Matthey-Process-Technologies-and-Rennovia-Announce-On-Time-Start-of-Mini-Plant-for-Bio-Based-Glucaric-Acid-Production-July-16th-2015.pdf For more detailed information on the wide range of catalysts we offer for this market please see http://matthey.com/about_us/products-technologies/catalysts-technologies-biorenewables	Avoided emissions	Addressing the Avoided Emissions Challenge- Chemicals sector		Less than or equal to 10%	

CC3.3

Did you have emissions reduction initiatives that were active within the reporting year (this can include those in the planning and/or implementation phases)

Yes

CC3.3a

Please identify the total number of projects at each stage of development, and for those in the implementation stages, the estimated CO2e savings

Stage of development	Number of projects	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	16	
To be implemented*	27	65
Implementation commenced*	25	353
Implemented*	17	2555
Not to be implemented	0	

CC3.3b

For those initiatives implemented in the reporting year, please provide details in the table below

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Energy efficiency: Processes	Install a Natural Gas fuel optimization product, (Maxsys) capable of optimizing fuel burner efficiency while reducing CO2 emissions with the goal of achieving a minimum of 5% reduction of use in Natural Gas consumption.	1037	Scope 1	Voluntary	71607	295370	4-10 years	>30 years	

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Energy efficiency: Processes	We have significantly reduced diesel consumption on one of our manufacturing plants in India due to process improvements.	488	Scope 1	Voluntary	87919	0	<1 year	Ongoing	
Energy efficiency: Processes	We have started re-using a hot waste water stream (containing nitrates) to reduce raw water usage and reduced the amount of steam we have to produce at one of our UK manufacturing sites.	318	Scope 1	Voluntary	32543	0	<1 year	Ongoing	
Energy efficiency: Building services	At one of our New Jersey USA facilities we have significantly reduced airflow to the Thermal Oxidizer on VOC abatement system without compromising its performance. This has enabled us to reduce the use of natural gas for the unit.	227	Scope 1	Voluntary	18750	0	<1 year	Ongoing	
Energy efficiency: Processes	We have reduced the energy usage of the dryers during downtime on our manufacturing lines in Macedonia. One is powered by electricity, the other by natural gas, so there have been savings of both.	391	Scope 1 Scope 2 (location-based) Scope 2 (market-based) Scope 3	Voluntary	22360	0	<1 year	Ongoing	
Energy efficiency: Processes	At our plant in Malaysia, we have reduced the change-over time from 45 mins to 20 mins, so saving energy during that time.	63	Scope 2 (market-based)	Voluntary	7390	0	<1 year	Ongoing	

Activity type	Description of activity	Estimated annual CO2e savings (metric tonnes CO2e)	Scope	Voluntary/ Mandatory	Annual monetary savings (unit currency - as specified in CC0.4)	Investment required (unit currency - as specified in CC0.4)	Payback period	Estimated lifetime of the initiative	Comment
Low carbon energy installation	At our site in Australia we have replaced all the lighting with LEDs and installed solar panels on the roof of the plant. We have also renegotiated our electricity tariff with our supplier	1	Scope 2 (location-based) Scope 2 (market-based)	Voluntary	9901	59406	4-10 years	11-15 years	
Low carbon energy installation	Replacement of all lighting with LEDs at two facilities in USA and UK one in a car park and one inside a manufacturing facility.	30	Scope 2 (location-based) Scope 2 (market-based) Scope 3		8650	51300	4-10 years	21-30 years	

CC3.3c

What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Internal finance mechanisms	Capital investment processes, these are evolving to include better projections of future energy costs and an "internal" cost of carbon.

Method	Comment
Dedicated budget for low carbon product R&D	Low Carbon R&D team in JM Technology Centre (corporate lab) investigating and developing technologies & new business opportunities in the low Carbon arena including: - Distributed H2 generation for small scale and industrial CHP - Methane abatement from coal mines - Carbon capture and storage - Direct carbon fuel cells - Flare gas abatement - Biomass gasification (tar reforming) - Biomass to chemicals - Bio-oil upgrading - PV applications - Reduction in food spoilage - Next generation Li ion battery materials - Fuel cells for stationary and mobile applications - Biorenewable feedstocks for fuels and chemicals - More selective/lower temperature process catalysts
Dedicated budget for energy efficiency	Launched a company wide Manufacturing Excellence Program in 2011, which has energy efficiency projects as a core activity. These dedicated projects drive the company's internal carbon reduction activities
Employee engagement	Sustainability 2017 Program with a dedicated Carbon Intensity reduction target is a company-wide initiative to engage all employees in energy saving activities, that's been running since 2007.
Internal incentives/recognition programs	Sustainability Awards are given annually by the CEO to groups of employees who have made outstanding contributions towards achieving the Sustainability 2017 Targets. Senior directors have components of their Bonus payments linked to performance against agreed annual Sustainability Budgets and energy reduction targets

CC3.3d

If you do not have any emissions reduction initiatives, please explain why not

Further Information

Page: **CC4. Communication**

CC4.1

Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s)

Publication	Status	Page/Section reference	Attach the document	Comment
In mainstream reports (including an integrated report) in accordance with the CDSB Framework	Complete	14-15 and 66-69	https://www.cdp.net/sites/2017/92/9792/Climate Change 2017/Shared Documents/Attachments/CC4.1/jm_ar2017secured.pdf	Details of our Sustainability 2017 program and progress against quantitative targets are found on p14. p15 outlines our forward strategy to 2025. p51 shows our materiality matrix for the company, and includes more detail of our priorities out to 2025, which include a new GHG emissions target. p66-69 give a detailed analysis of our environmental performance for FY2016/17 and the 5-year record.

Further Information

Module: Risks and Opportunities

Page: CC5. Climate Change Risks

CC5.1

Have you identified any inherent climate change risks that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

- Risks driven by changes in regulation
- Risks driven by changes in physical climate parameters
- Risks driven by changes in other climate-related developments

CC5.1a

Please describe your inherent risks that are driven by changes in regulation

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
General environmental regulations, including planning	A significant tightening of legislation regulating carbon emissions from vehicles could adversely affect group sales and profitability. 37% of the group's sales are derived from sales of automotive exhaust catalysts for light duty vehicles (sales of £1,400m for 2016/17). For example, introduction of legislation to ban petrol and/or diesel-powered cars, in favour of lower emissions alternatives, from any substantial	Reduced demand for goods/services	3 to 6 years	Indirect (Client)	Unlikely	Medium-high	Revenues from sales of autocatalysts for petrol/diesel powered cars were £1,400m in 2016/17 (39% of Group sales excluding precious metals). Europe: £698m Asia: £339m N America: £214m Should markets for catalysts in any of these regions disappear due to legislative changes these sales would disappear.	The group continues to invest in R&D of autocatalysts to ensure we have products to meet the latest up and coming legislation, which is currently tightening around the world. There is constant innovation and development of autocatalysts in close collaborative partnership with JM's key automotive customers - the OEMs. We work with the OEMs and via our trade associations to inform the European Commission of the technical possibilities for tighter limits, in particular for upcoming EURO7 legislation due to be introduced in 2020. In order to mitigate this risk of the loss of the autocatalyst business due to tightening CO2 emissions limits to the point where combustion engines can no longer meet the challenge, JM is also investing in the	£80m was spent on R&D by ECT division in 2016/17 in order to develop new autocatalyst technology to keep pace with legislative changes. £18m was spent in 2016/17 developing our business opportunities in rechargeable batteries and fuel cells, to power electric vehicles which may in the future replace petrol/diesel powered vehicles.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	geographical region would have a significant impact on JM's ECT business's profits, as the market for these products in that region would disappear. There have been reports in the press about proposals to ban diesel vehicles from various European city centres but no expectation that such legislation would come in at a national or continental level.							low/zero carbon engine technology i.e. high-density rechargeable batteries and fuel cells for electric vehicles. We plan for this business to grow at, at least, a similar rate to that at which our existing autocatalyst business might decline.	
General environmental regulations,	Slackening of future environmental legislation,	Reduced demand for goods/services	3 to 6 years	Indirect (Client)	Exceptionally unlikely	High	Revenues from autocatalysts sales for	Changes in legislation are carefully monitored globally and R&D activities focussed to	£80m was spent on R&D by ECT division in

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
including planning	particularly related to automotive emissions (e.g. failure to implement EURO7 in Europe in 2020). 60% of the group's sales are driven by environmental legislation limiting emissions from light duty (sales of £1,400m for 2016/17) and heavy duty (sales of £824m for 2016/17) vehicles. A curtailment in environmental legislation in any substantial geographical region or vehicle category could limit the group's						lightduty vehicles were £1,400m in 2016/17 and £824m from heavy duty autocatalyst sales. (60% Group sales) The severity of the financial implication depends upon the size of the geographical market affected by the weakening of any legislation that requires our worldclass catalyst technology and also which vehicle categories are included. Should markets for catalysts in any of these	meet expected demand. There's currently no indication of legislation weakening anywhere in the world in the foreseeable future. EURO6 Emissions legislation that determines HC/CO/NOx/particulate emissions limits from all new vehicles registered in Europe came into force in Sept 2014. Even tighter Euro7 legislation is planned for introduction in 2020. When legislation remains flat, profit margins can be maintained with ongoing improvements in technology to reduce the cost and improve the effectiveness of our products, in particular by thrifting out the quantities of high value components - the platinum group metals and the rare earths. The group works hard to maintain a diverse product portfolio, so that the loss of sales of any one product will not	2016/17 in order to develop new technology to keep pace with legislative changes. £18m was spent in 2016/17 developing our New Business opportunities.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	growth potential and undermine profit margins.						regions disappear due to legislative changes these sales would disappear.	significantly affect the performance of the Group as a whole. In 2012 our New Business Development Division was formed with a remit to create new business opportunities with £200m sales by 2020; sales in 2016/17 were £191 million.	

CC5.1b

Please describe your inherent risks that are driven by changes in physical climate parameters

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Change in precipitation pattern	Potential changes to medium-long term precipitation patterns relative to regional demand, could impact on the availability of	Increased operational cost	>6 years	Direct	About as likely as not	Low	Based on the Global Water Tool model, 17% of Group "sales excluding precious metals" are derived from sites in areas of extreme water scarcity and	As part of our Sustainability 2017 strategy we set a target to halve our water usage per unit sales across all sites over ten years, and achieved	CAPEX costs are minimal. Costs associated with process water recycling and rain water catchment form part of

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>water for our manufacturing operations in different parts of the world. In 2016 we conducted a new survey using the World Business Council for Sustainable Development (WBCSD) Global Water Tool™ (version 1.3). All our manufacturing sites were included in the assessment. 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:</p>						<p>using close to the available amount of water per capita regionally. Therefore should water become completely unavailable at these sites and production could not be moved elsewhere quickly then the max loss could be £540m.</p>	<p>96% of the target. Process water recycling and introducing rain water catchment systems at many sites are part of JM's response to halving the amount of water it uses per unit of output by 2017. We have performed a water stress assessment of all our facilities using WRI tools and identified a small number in areas of high water stress sites and are taking additional steps to further minimise their need for fresh water. For example, During the year our business continuity</p>	<p>JM's response to halving the amount of water are deemed to be part of business as usual - any additional associated costs are insignificant.</p>

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	Taloja, India; Yantai, China; New Mexico, US; Brimsdown, UK. These represent 14% of our total water withdrawals worldwide.							programme highlighted our site in Taloja, India is at high risk from water stress and a project was initiated to reduce water consumption. Recycling of effluent streams has allowed the site to reduce its consumption by 23% and operate through outages. Further improvements have been identified to reduce consumption to 46% of April 2015 levels. As a final mitigation to the risk of sudden loss of water supply, we have "disaster recovery plans" in place to ensure that the processes	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								contained within these plants could quickly be reproduced in other JM manufacturing facilities in different geographies, so production could be switched to a new location at short notice, in most cases.	
Change in precipitation pattern	Johnson Matthey manufactures the Active Pharmaceutical Ingredients that go into opiate-based medications; the raw material for these is poppy straw . Traditionally 60% of the world's licensed supply of poppy straw is grown by a small number of suppliers in Tasmania, an	Reduction/disruption in production capacity	1 to 3 years	Direct	About as likely as not	Low	Sales for the API manufacturing business amounted to £236m in 2016/17 (7% of Group sales). Many of these sales are derived from opiates which come from poppy straw and should these crops fail as a result of an extreme weather event (e.g. flood, drought) these sales could be lost. However,	In 2009 we took a strategic decision to improve our security of supply and reduce our dependence on the weather in one geographical region (Tasmania) by taking over the task of growing the majority our own poppy straw. We assessed a large number of	Johnson Matthey does not own the agricultural land so capital costs in managing this risk are relatively low. Capital investment in additional storage and processing plants for raw poppy straw were £10-20m in 2015.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>area that is being affected by changing precipitation patterns due to climate change. This is leading to increasing issues with security of supply and rising prices for this key raw material. In 2006 Johnson Matthey took ownership of all opium poppy growing in the UK (SE England). However, this area is also increasingly vulnerable to extreme weather events (e.g. summer storms/floods and/or droughts) and so in 2016 we have taken the decision to stop growing poppies in the UK and move production into mainland</p>						<p>they are grown in more than one country so they are very unlikely to all fail simultaneously.</p>	<p>new countries for their suitability to grow poppies sustainably, taking into account the possibility of future climate change, and selected Portugal in the region of the Alqueva Dam, which provides water to 120,000 hectares of good arable land in the Alentejo (we aim to farm 3000-5000 hectares). Our first crop was successfully harvested in Portugal in June 2014. We begun to increase our storage of poppy straw from 2014 in order to mitigate the risk of partial crop</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	southern Europe.							failure affecting production of APIs. We aim to keep c. 30% excess stock in storage in future. We employ local weather/soil experts to monitor moisture levels in the soils during the growing season. We are incentivising our farmers with commercial contracts that encourage them to maintain yields and plan for adverse weather e.g. by using irrigation systems. in 2016 we have taken the decision to stop growing poppies in the UK and move production into mainland	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								southern Europe.	

CC5.1c

Please describe your inherent risks that are driven by changes in other climate-related developments

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Uncertainty in market signals	The uncertainty of a global legally-binding agreement on climate change (successor to Kyoto agreement) and poorly incentivised cap-and-trade schemes (EU-ETS) has led to a collapse in the price of Carbon globally. This has reduced demand for Johnson Matthey's greenhouse gas abatement technology and the profitability of	Reduced demand for goods/services	Unknown	Direct	Very likely	Low	Sales of N2O abatement catalysts are part of our Noble Metals business which had £133m revenues in 2015. Revenues from sales of N2O abatement catalyst declined by 55% in 2013/14 due to the collapse in the carbon price and remained static in 2015/16. We expect demand for this product to remain at this low level	JM closely monitors market signals globally to identify regions where legislation is being considered that would incentivise installation of our N2O abatement systems in the future, and has a process for identifying new business opportunities in greenhouse gas abatement. We will maintain the manufacturing flexibility to	The management method described is part of business as usual and there are no additional costs to managing this risk.

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>schemes we have already installed. JM has one specific product for which it has been earning CERs under the Clean Development Mechanism since 2006 - N2O Abatement catalyst systems for nitric acid plants. Nitrous oxide (N2O), a powerful greenhouse gas with a potency of 310 times that of carbon dioxide (CO2), is formed as a by-product of nitric acid production for fertilisers. Fully certified Carbon credits (CERs) can be claimed under the UN Clean Development Mechanism (CDM) for reducing greenhouse gas emissions from nitric acid plants. Johnson Matthey, together with Yara</p>						<p>unless the carbon prices rise. We currently hold 447,392 CERs on account. Total market value in 2011 would have been €5.6m; now worth ~€13k. We haven't sold or retired any in the last financial year.</p>	<p>increase production N2O abatement catalyst when the market returns due to tighter legislation or a rise in the price of carbon. We will hold onto all the CERs we currently own in the expectation the price will improve in future years. There are signs that this may happen in the later stages of EU-ETS phase 3, as the number of excess ERUs in the market is reduced.</p>	

Risk driver	Description	Potential impact	Timeframe	Direct/ Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>International, have developed a very effective N2O abatement system for this purpose and has been earning CERs from sales of the technology in CDM nations since 2006. The market for this technology is, however, very sensitive to the "carbon price" which has collapsed from a high of €21.20 in 2008, being stable at €12.50 per tCO2e through 2010/11 to ~€1 per tCO2e in 2012 and €0.3 per tCO2e in 2013. Consequently, sales of this high value technology have been substantially lower since 2015.</p>								

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC5.1e

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC5.1f

Please explain why you do not consider your company to be exposed to inherent risks driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

Further Information

Page: CC6. Climate Change Opportunities

CC6.1

Have you identified any inherent climate change opportunities that have the potential to generate a substantive change in your business operations, revenue or expenditure? Tick all that apply

Opportunities driven by changes in regulation

Opportunities driven by changes in physical climate parameters

Opportunities driven by changes in other climate-related developments

CC6.1a

Please describe your inherent opportunities that are driven by changes in regulation

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Air pollution limits	AUTOMOTIVE CATALYSTS FOR TRUCKS/HEAVY-DUTY DIESEL VEHICLES: Johnson Matthey is the world leader in catalyst technology for heavy duty diesel (HDD). New and tighter legislation is already on the statute books across the globe for the next decade and higher demand for HDD vehicles is forecast. The new legislation will impose dramatically higher technical demands on the emission control systems required	Increased demand for existing products/services	1 to 3 years	Indirect (Client)	Virtually certain	High	This market is expected to grow from \$2bn in 2015 to \$3.5bn in 2020. Johnson Matthey currently has a 50% share globally. Assuming business conditions do not change significantly, JM expects to maintain at least a 30% share of this market out to 2020 (increasing	We continue to invest heavily in R&D to maintain our technology leading position in this market. During 2016/17 our new heavy duty diesel catalyst manufacturing capacity in Germany and China, which we started building in 2015, commenced production. These new plants are expected to meet future demand out to beyond 2020 when China VI legislation is implemented. Sales in Europe	We spent £81m on R&D in Emission Control technologies in 2016/17 (heavy + light duty automotive catalyst combined) In order to provide sufficient capacity to satisfy anticipated requirements for tighter European emissions legislation in the medium term, and also to enhance our

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	to produce cleaner exhaust emissions. We won the Queen's award for Enterprise for inventing and then bringing to market the first HDD emissions control systems and remain well-placed to meet this challenge. This technology enables diesel manufacturers to move to lower CO2 emitting engines without an increase in acid gases (NOx).						sales revenue to at least £1bn). Sales were £824m in 2016/17, an increase of 13% on the previous year.	increased by 15% and in China 47% on last year. We work very closely with our customers (the automotive OEMs) in joint development programs in ensure we develop exactly the right technology to match with their engine development programs in order to meet the emission legislation demands in all geographical regions. We closely monitor upcoming legislative changes globally and lobby for forward looking legislation through our trade associations.	global efficiency and operating flexibility, we commenced investment of approximately £90 million in the construction of a new manufacturing plant in Poland. This plant will commence production in summer 2019.
Air pollution limits	AUTOMOTIVE CATALYSTS	Increased demand for	1 to 3 years	Indirect (Client)	Virtually certain	High	We had sales of	During 2017 we completed the	We spent £81m on

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>GASOLINE/LIGHT-DUTY DIESEL Johnson Matthey is the world leader in catalyst technology for light duty vehicles. We manufactured the world's first automotive catalyst in our UK plant in 1974 and have maintained our market share of the global market for > 20 years. Continued growth in global light duty vehicle production, especially in Asia but also in Europe with the Euro 6c and real world driving conditions (RDE) light duty standard being introduced in Sept 2017, Euro7 in 2020, and other tightening legislation around the world will all drive increased value for Johnson Matthey in the</p>	existing products/services					£1400m in this market in 2016/17 an increase of 18% on the previous year. This market is expected to continue to grow at similar rates over the next 3 years.	expansions of light duty diesel manufacturing capacity in China in order to meet the projected future rise in demand. These became operation in FY2016/17. This year we commenced construction of a new manufacturing plant in Poland. This plant will commence production in summer 2019. We work very closely with our customers (the automotive OEMS) in joint development programs in ensure we develop exactly the right technology to match with their engine development programs in order	R&D in Emission Control technologies in 2016/17 (heavy + light duty automotive catalyst combined) In order to provide sufficient capacity to satisfy anticipated requirements for tighter European emissions legislation in the medium term, and also to enhance our global efficiency and operating flexibility, we commenced approximately £90 million in the construction

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>next 3 years. Whilst car companies have a number of options on how they achieve lower pollution levels, ultimately, tighter legislation and the desire to lower precious metal loadings will require improved catalyst technology, ensuring continued catalyst value growth for Johnson Matthey. In Europe, the popularity of diesel powered cars has led to the introduction of tighter legislation to control emissions of both particulate matter (soot) and acid gases (NOx) in September 2014 (Euro6)*. This has created a need for new catalyst products. Under current legislated</p>							<p>to meet the emission legislation demands in all geographical regions. We closely monitor upcoming legislative changes globally and lobby for forward looking legislation through our trade associations.</p>	<p>of a new manufacturing plant in Poland. This plant will commence production in summer 2019.</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	standards (Euro 6) for diesel cars, the catalysts required are considerably more complex than those for gasoline cars, equating to approximately five times more value for Johnson Matthey. *Euro 6b light duty diesel emission standards were introduced in September 2014 have been mandated for all new vehicles since September 2015.								
Air pollution limits	BATTERIES FOR LOW CARBON AUTOMOTIVE VEHICLES Additional national greenhouse gas regulations, fuel economy regulations, the creation of "low emission zones" and "clean city" strategies are all likely to encourage	New products/business services	3 to 6 years	Indirect (Client)	Very likely	Medium	We achieved sales of £147m 2016/17, an increase of 13% on the previous year. We expect this business to continue to break even in the near	Johnson Matthey Battery Technologies which specialises in the design, development and manufacture of integrated battery systems was formed in 2013, following the acquisition of Axion Ltd in October 2012.. A	The business broke even in 2015/16, excluding acquisition related costs, and we expect it to continue to do some in the near term. Two acquisitions to the Battery

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>the growth of the electric or hybrid vehicle market over the next decade. In 2014 the European Commission has set a goal of 95 grams of carbon dioxide per kilometer (g/km) as an average for all new vehicles sold in Europe from 2020. This is expected to significantly increase the number of battery powered vehicles manufactured in this timeframe. A number of European cities are discussing legislation to ban diesel vehicles from their city centres and incentivising use of electric and hybrid vehicles, which is accelerating growth in this market.</p>						<p>term as we expand it via organic growth and further acquisitions. We expect it to be producing significant profits within the next 5 - 10 years.</p>	<p>combination of further acquisitions of specialist technology (two in 2015/16) and investment in internal R&D has grown the business such that sales in 2016/17 increased by 23% on the previous year. Our focus is on the development of battery materials for highly demanding applications such as for the automotive sector. In 2016/17 we have two new licensing agreements and are developing nickel rich, high energy battery materials. Our longer term approach includes our work on the EU co-funded LISSEN</p>	<p>business were completed during 2015/16 and we also licensed lithium cathode technology from CAMX PowerLLC. Acquisition related costs were £18m. We invested £18m in FY2016/17 in R&D in Battery technologies and Fuel cell technology combined.</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
								project on the development on lithium sulphur batteries, which are expected to have 3 times the energy density of current batteries.	
Air pollution limits	<p>FUEL CELLS FOR LOW CARBON STATIONARY AND AUTOMOTIVE APPLICATIONS</p> <p>Fuel cell technology for transport applications, especially cars, remains an important opportunity for Johnson Matthey and major car companies have reaffirmed their interest in fuel cell powertrains as part of a balanced portfolio of electric vehicles. We have continued to develop technology for</p>	New products/business services	>6 years	Indirect (Client)	Likely	Medium	<p>We achieved sales on £12 m in 2016/17 a 23% increase on the previous year and reduced the net expense by 20% in the same period. A declining net expense for the next 3-5 years followed by rapid growth in profitability over the following decade with the potential for >£100m</p>	<p>Johnson Matthey Fuel Cells Ltd was formed in 1999 with investment from AngloAmerican. The company has world class R&D and fuel cell manufacturing facilities and scientists. We work in joint development programs with our key customers (including automotive OEMs) to develop technology suitable for commercialisation. Investment in the technology and</p>	<p>The net expense of our Fuel Cells business was £5 million in 2016/17 a reduction of 41% on the previous year. We invested £18m in FY2016/17 in R&D in Battery technologies and Fuel cell technology combined.</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>automotive membrane electrode assemblies and our products have been well received by car companies, providing cost and performance characteristics in line with their needs. The European Commission's new goal of 95 grams of carbon dioxide per kilometer (g/km) as an average for all new vehicles sold in Europe from 2020 is likely to aid the commercialisation of fuel-cell powered vehicle manufactured in this timeframe.</p>						contribution in the 2025 timescale	manufacturing capability of the business, by Johnson Matthey plc, continues on a yearly basis.	

CC6.1b

Please describe your inherent opportunities that are driven by changes in physical climate parameters

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Induced changes in natural resources	<p>Opportunities arising from the move from fossil-derived chemicals and fuels to those derived from "renewable" resources (biochemicals), such as sugar and palm oil, presents some new business opportunities for Johnson Matthey. Such a change would contribute to climate change mitigation, as the biochemicals should have a lower carbon footprint than their fossil-fuel derived equivalents. Johnson Matthey has an in-house capability to provide catalyst and engineering resources to</p>	New products/business services	3 to 6 years	Indirect (Client)	Likely	Medium	<p>£20-50m revenue from catalysts and process licensing incomes expected by 2025 across biofuel and biochemicals. For example fossil fuel derived adipic acid is with \$5bn annual sales. We are working on scaling up technology capable of producing a bio-based adipic acid at a lower cost, and with a significantly improved environmental footprint.</p>	<p>Johnson Matthey has formed strategic partnerships in the biochemicals and biofuels sector. For example, we have on-going collaborations with Myriant Corporation, a global renewable chemicals company and Rennovia, Inc., a development stage company. In 2013 JM Davy and Myriant announced capability together to produce biobutandiol economically with lower carbon footprint; this is a clear milestone in our overall strategy to bring renewable biochemicals to the market. In July 2015 we announced our progress in a joint venture with Rennovia on the manufacture of Bio-Based Glucaric Acid http://www.rennovia.com/wp-content/uploads/2015/07/Johnson-Matthey-Process-Technologies-and-Rennovia-Announce-On-Time-Start-of-Mini-Plant-for-Bio-Based-Glucaric-Acid-Production-July-16th-2015.pdf</p>	<p>Our bio-fuel R&D work in-house and with our partners forms part of our R&D expenditure for our Process Technologies Division. PTD's total R&D spend for 2015/16 was £15m.</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	enable the scale-up and commercialisation of 2nd generation biochemical and biofuels from within its Process Technology Division. We have developed a new technology that produces biodiesel from the fatty acids of cheap waste oils. The technology was recognised by the UK's Institution of Chemical engineering (IChemE) with a sustainable technology award in November 2014.								
Change in precipitation pattern	Water purification for industrial applications is a	New products/business services	>6 years	Indirect (Client)	Likely	Medium	Water Technologies business delivered	We are growing this business by a combination of acquisition and in-house R&D. In April 2016 we completed the	In 2015/16 we invested approximately £10m in

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>new business opportunity for Johnson Matthey, identified at our 2010 strategic review. Driven by changes in rainfall patterns and reductions in underground water reserves, businesses that high demand for water - particularly in the mining sector - are increasing requiring complex solutions for effluent treatment that will enable them to recycle water from their processes for re-use. Johnson Matthey is a world-expert in the catalyst technology and process engineering that are necessary</p>						<p>sales of around £15m in 2016/17 and , excluding integration costs, made a small operating loss.</p>	<p>purchase of MIOX Corporation and in May 2016 we acquired FINEX to broaden our technology and commercial capabilities. Our water technologies team works closely with customers on new processes from our applications centres in the US, China and Europe. These are generally individual projects requiring bespoke technical solutions.</p>	<p>our Water Technologies business by acquisition of MIOX and FINEX.</p>

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	to find the right solution to remove contaminants (e.g. heavy metals) from effluent in a cost-effective way.								

CC6.1c

Please describe your inherent opportunities that are driven by changes in other climate-related developments

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
Increasing humanitarian demands	Demand for all types of fruit and vegetables to be available for purchase around the world 52 weeks of the year, means more and more is transported internationally to take advantage of different growing	New products/business services	3 to 6 years	Indirect (Client)	More likely than not	Unknown	The business made sales of £16m and a small operating profit in 2016/17. We expect this to increase year on year.	This Business Opportunity is being explored in JM's New Business Development Division. We acquired StePac modified atmosphere packaging in May2015 and it is now fully	The management costs are fully integrated into our business and it turned a small profit in 2016/17, on sales of £16m.

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	<p>seasons around our planet. There is a significant business opportunity to create advanced technologies to extend the post life harvest of fresh food to allow for more flexibility in transportation and storage options. This will reduce the amount of food that is wasted during transit, allow longer storage times and reduce the requirement for refrigeration during transit. For example, food can be transported by slower land/sea routes that are lower carbon than air freight and still retain its freshness. It will also reduce waste at the supermarket and in the home, which should then reduce the quantities of</p>							<p>integrated in Johnson Matthey. We will continue to grow the business by a combination of acquisition and in-house R&D.</p>	

Opportunity driver	Description	Potential impact	Timeframe	Direct/Indirect	Likelihood	Magnitude of impact	Estimated financial implications	Management method	Cost of management
	crops/food that need to be grown per head of population.								

CC6.1d

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in regulation that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC6.1e

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in physical climate parameters that have the potential to generate a substantive change in your business operations, revenue or expenditure

CC6.1f

Please explain why you do not consider your company to be exposed to inherent opportunities driven by changes in other climate-related developments that have the potential to generate a substantive change in your business operations, revenue or expenditure

Further Information

Module: GHG Emissions Accounting, Energy and Fuel Use, and Trading

Page: CC7. Emissions Methodology

CC7.1

Please provide your base year and base year emissions (Scopes 1 and 2)

Scope	Base year	Base year emissions (metric tonnes CO₂e)
Scope 1	Sun 01 Jan 2006 - Sun 31 Dec 2006	156800
Scope 2 (location-based)	Sun 01 Jan 2006 - Sun 31 Dec 2006	236284
Scope 2 (market-based)	Tue 09 May 2017 - Tue 09 May 2017	

CC7.2

Please give the name of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

Please select the published methodologies that you use

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

CC7.2a

If you have selected "Other" in CC7.2 please provide details of the standard, protocol or methodology you have used to collect activity data and calculate Scope 1 and Scope 2 emissions

CC7.3

Please give the source for the global warming potentials you have used

Gas	Reference
CO2	Other: 2015 Defra Guidance/ DECC's GHG Conversion Factors for Company Reporting

CC7.4

Please give the emissions factors you have applied and their origin; alternatively, please attach an Excel spreadsheet with this data at the bottom of this page

Fuel/Material/Energy	Emission Factor	Unit	Reference
Diesel/Gas oil	0.06830	metric tonnes CO2e per GJ	2016 Defra Guidance/ DECC's GHG Conversion Factors for Company Reporting
Liquefied petroleum gas (LPG)	0.0596	metric tonnes CO2e per GJ	2016 Defra Guidance/ DECC's GHG Conversion Factors for Company Reporting
Motor gasoline	0.06479	metric tonnes CO2e per GJ	2016 Defra Guidance/ DECC's GHG Conversion Factors for Company Reporting
Natural gas	0.05111	metric tonnes CO2e per metric tonne	2016 Defra Guidance/ DECC's GHG Conversion Factors for Company Reporting
Steam	0.051	metric tonnes CO2e per metric tonne	The Engineering Toolbox, http://www.engineeringtoolbox.com/boiler-efficiency-d_438.html and http://www.engineeringtoolbox.com/saturated-steam-properties-d_457.html Defra Guidance/ DECC's GHG Conversion Factors for Company Reporting

Further Information

As a UK domiciled company, Johnson Matthey refers to Defra guidance for emission factors. this year, Defra have not published any location-based emissions factors for electricity, but have encouraged companies to purchase factors direct from IEA. We have used IEA CO2 Emissions from Fuel Combustion, OECD/IEA, Paris, 2016, with the exception of for U.S. facilities where US State conversion factors for electricity are taken from eGRID2016 Year 2014

Attachments

[https://www.cdp.net/sites/2017/92/9792/Climate Change 2017/Shared Documents/Attachments/ClimateChange2017/CC7.EmissionsMethodology/IEA CO2kWh Data 2016.xlsx](https://www.cdp.net/sites/2017/92/9792/Climate%20Change%202017/Shared%20Documents/Attachments/ClimateChange2017/CC7.EmissionsMethodology/IEA%20CO2kWh%20Data%202016.xlsx)

[https://www.cdp.net/sites/2017/92/9792/Climate Change 2017/Shared Documents/Attachments/ClimateChange2017/CC7.EmissionsMethodology/egrid_summarytables2014.pdf](https://www.cdp.net/sites/2017/92/9792/Climate%20Change%202017/Shared%20Documents/Attachments/ClimateChange2017/CC7.EmissionsMethodology/egrid_summarytables2014.pdf)

Page: CC8. Emissions Data - (1 Apr 2016 - 31 Mar 2017)

CC8.1

Please select the boundary you are using for your Scope 1 and 2 greenhouse gas inventory

Financial control

CC8.2

Please provide your gross global Scope 1 emissions figures in metric tonnes CO₂e

203205

CC8.3

Please describe your approach to reporting Scope 2 emissions

Scope 2, location-based	Scope 2, market-based	Comment
We are reporting a Scope 2, location-based figure	We are reporting a Scope 2, market-based figure	

CC8.3a

Please provide your gross global Scope 2 emissions figures in metric tonnes CO₂e

Scope 2, location-based	Scope 2, market-based (if applicable)	Comment
282409	246525	

CC8.4

Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

No

CC8.4a

Please provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure

Source	Relevance of Scope 1 emissions from this source	Relevance of location-based Scope 2 emissions from this source	Relevance of market-based Scope 2 emissions from this source (if applicable)	Explain why the source is excluded

CC8.5

Please estimate the level of uncertainty of the total gross global Scope 1 and 2 emissions figures that you have supplied and specify the sources of uncertainty in your data gathering, handling and calculations

Scope	Uncertainty range	Main sources of uncertainty	Please expand on the uncertainty in your data
Scope 1	More than 2% but less than or equal to 5%	Metering/ Measurement Constraints	All our energy data is taken from invoices from local electricity suppliers. We operate in a diverse group of nations, including several developing nations (e.g. South Africa, India) with different national regulatory requirements for the accuracy of electricity metering. Therefore, we cannot guarantee the metering/billing is as accurate everywhere as would be required in the UK.
Scope 2 (location-based)	More than 2% but less than or equal to 5%	Metering/ Measurement Constraints	All our electricity data is taken from invoices from local electricity suppliers. We operate in a diverse group of nations, including several developing nations (e.g. South Africa, India) with different national regulatory requirements for the accuracy of electricity metering. Therefore, we cannot guarantee the metering/billing is as accurate everywhere as would be required in the UK.
Scope 2 (market-based)	More than 2% but less than or equal to 5%		All our electricity data is taken from invoices from local electricity suppliers. We operate in a diverse group of nations, including several developing nations (e.g. South Africa, India) with different national regulatory requirements for the accuracy of electricity metering. Therefore, we cannot guarantee the metering/billing is as accurate everywhere as would be required in the UK.

CC8.6

Please indicate the verification/assurance status that applies to your reported Scope 1 emissions

Third party verification or assurance process in place

CC8.6a

Please provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/section reference	Relevant standard	Proportion of reported Scope 1 emissions verified (%)
Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/92/9792/Climate Change 2017/Shared Documents/Attachments/CC8.6a/CDP-verification-statement 2017 - Johnson Matthey - Final.pdf	pages 1-2	ISAE 3410	100
Annual process	Complete	Reasonable assurance	https://www.cdp.net/sites/2017/92/9792/Climate Change 2017/Shared Documents/Attachments/CC8.6a/Johnson Matthey - AE Final VOS - 2016 - 15032017.pdf	pages 11- 14	European Union Emissions Trading System (EU ETS)	11

CC8.6b

Please provide further details of the regulatory regime to which you are complying that specifies the use of Continuous Emission Monitoring Systems (CEMS)

Regulation	% of emissions covered by the system	Compliance period	Evidence of submission

CC8.7

Please indicate the verification/assurance status that applies to at least one of your reported Scope 2 emissions figures

Third party verification or assurance process in place

CC8.7a

Please provide further details of the verification/assurance undertaken for your location-based and/or market-based Scope 2 emissions, and attach the relevant statements

Location-based or market-based figure?	Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 2 emissions verified (%)
Location-based	Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/92/9792/Climate Change 2017/Shared Documents/Attachments/CC8.7a/CDP-verification-statement 2017 - Johnson Matthey - Final.pdf	pages 1-2	ISAE 3410	100
Market-based	Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/92/9792/Climate Change 2017/Shared Documents/Attachments/CC8.7a/CDP-verification-statement 2017 - Johnson Matthey - Final.pdf	pages 1-2	ISAE 3410	100

CC8.8

Please identify if any data points have been verified as part of the third party verification work undertaken, other than the verification of emissions figures reported in CC8.6, CC8.7 and CC14.2

Additional data points verified	Comment

CC8.9

Are carbon dioxide emissions from biologically sequestered carbon relevant to your organization?

No

CC8.9a

Please provide the emissions from biologically sequestered carbon relevant to your organization in metric tonnes CO2

Further Information

Page: CC9. Scope 1 Emissions Breakdown - (1 Apr 2016 - 31 Mar 2017)

CC9.1

Do you have Scope 1 emissions sources in more than one country?

Yes

CC9.1a

Please break down your total gross global Scope 1 emissions by country/region

Country/Region	Scope 1 metric tonnes CO2e
United Kingdom	69945
Americas	89958
Europe, Middle East and Africa (EMEA)	19089
Asia, Australasia	24213

CC9.2

Please indicate which other Scope 1 emissions breakdowns you are able to provide (tick all that apply)

By business division

CC9.2a

Please break down your total gross global Scope 1 emissions by business division

Business division	Scope 1 emissions (metric tonnes CO2e)
ECT	50008
FCD	22549
PMP	47320
PTD	74054
NBD	8529
PLC	745

CC9.2b

Please break down your total gross global Scope 1 emissions by facility

Facility	Scope 1 emissions (metric tonnes CO2e)	Latitude	Longitude
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CC9.2c

Please break down your total gross global Scope 1 emissions by GHG type

GHG type	Scope 1 emissions (metric tonnes CO2e)
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CC9.2d

Please break down your total gross global Scope 1 emissions by activity

Activity	Scope 1 emissions (metric tonnes CO2e)
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Further Information

Page: CC10. Scope 2 Emissions Breakdown - (1 Apr 2016 - 31 Mar 2017)

CC10.1

Do you have Scope 2 emissions sources in more than one country?

Yes

CC10.1a

Please break down your total gross global Scope 2 emissions and energy consumption by country/region

Country/Region	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)	Purchased and consumed electricity, heat, steam or cooling (MWh)	Purchased and consumed low carbon electricity, heat, steam or cooling accounted in market- based approach (MWh)
United Kingdom	58036	15442	137701	92141
Europe, Middle East and Africa (EMEA)	97285	95310	139219	9902
Asia, Australasia	53752	54990	78768	171
Americas	73066	80783	187376	2392

CC10.2

Please indicate which other Scope 2 emissions breakdowns you are able to provide (tick all that apply)

By business division

CC10.2a

Please break down your total gross global Scope 2 emissions by business division

Business division	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
ECT	165770	162163

Business division	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)
FCD	29878	27942
PMP	30027	11166
PTD	42864	35310
NBD	11729	9823
PLC	2141	121

CC10.2b

Please break down your total gross global Scope 2 emissions by facility

Facility	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)

CC10.2c

Please break down your total gross global Scope 2 emissions by activity

Activity	Scope 2, location-based (metric tonnes CO2e)	Scope 2, market-based (metric tonnes CO2e)

Further Information

CC11.1

What percentage of your total operational spend in the reporting year was on energy?

More than 0% but less than or equal to 5%

CC11.2

Please state how much heat, steam, and cooling in MWh your organization has purchased and consumed during the reporting year

Energy type	MWh
Heat	
Steam	9522
Cooling	

CC11.3

Please state how much fuel in MWh your organization has consumed (for energy purposes) during the reporting year

874101

CC11.3a

Please complete the table by breaking down the total "Fuel" figure entered above by fuel type

Fuels	MWh
Natural gas	796689
Diesel/Gas oil	27217
Motor gasoline	14785
Liquefied petroleum gas (LPG)	22178
Distillate fuel oil No 1	13232

CC11.4

Please provide details of the electricity, heat, steam or cooling amounts that were accounted at a low carbon emission factor in the market-based Scope 2 figure reported in CC8.3a

Basis for applying a low carbon emission factor	MWh consumed associated with low carbon electricity, heat, steam or cooling	Emissions factor (in units of metric tonnes CO2e per MWh)	Comment
Contract with suppliers or utilities, supported by energy attribute certificates	101970	0	The majority of our UK sites are now supplied grid electricity on a zero carbon contract with RECs
Off-grid energy consumption from an on-site installation or through a direct line to an off-site generator owned by another company	2637	0	Our off-grid renewable electricity comes from a number of small scale solar installation - some owned and operated by JM, some by local 3rd parties.

CC11.5

Please report how much electricity you produce in MWh, and how much electricity you consume in MWh

Total electricity consumed (MWh)	Consumed electricity that is purchased (MWh)	Total electricity produced (MWh)	Total renewable electricity produced (MWh)	Consumed renewable electricity that is produced by company (MWh)	Comment
716647	540426	48462	881	881	The majority of electricity produced on site is natural gas powered CHP units. The renewable energy is produced via a number of small scale solar installations.

Further Information

Page: CC12. Emissions Performance

CC12.1

How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to the previous year?

Decreased

CC12.1a

Please identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined) and for each of them specify how your emissions compare to the previous year

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
Emissions reduction activities	0.5	Decrease	We have seen small reduction in carbon footprint of 0.5% due to Energy savings projects. The detail of this can be found in answer to CC3.3

Reason	Emissions value (percentage)	Direction of change	Please explain and include calculation
Divestment	0	No change	We have not divested any sites during the financial year
Acquisitions	0.5	Increase	We have acquired 3 new sites during the financial year.
Mergers	0	No change	We have not merged with any companies this year
Change in output	0.6	Increase	Our exiting sites have used 0.1% more energy this year, compared to last year
Change in methodology	0	No change	Same methodology as last year (GHG Protocol)
Change in boundary	1.0	Increase	We have included an estimation of scope 1 emissions from incineration of feed stream waste at our refineries for the first time this year.
Change in physical operating conditions	2.4	Decrease	We have used our natural gas powered CHP systems less this year, in favour of using purchased grid electricity at our UK sites. These UK sites switched to a zero carbon grid electricity contract on 1st April 2016 and so this benefits our market-based carbon footprint, but not our location-based carbon footprint Overall we have used 8.5% more electricity and 2.7% less gas.
Unidentified	0	No change	No other reasons identified
Other	0	No change	No other reasons identified

CC12.1b

Is your emissions performance calculations in CC12.1 and CC12.1a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Market-based

CC12.2

Please describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tonnes CO2e per unit currency total revenue

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator: Unit total revenue	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
0.0000404	metric tonnes CO2e	12031000000	Location-based	6	Decrease	Revenue has grown faster than carbon emissions. Partly due to switching to zero carbon grid electricity contracts in the UK.

CC12.3

Please provide any additional intensity (normalized) metrics that are appropriate to your business operations

Intensity figure =	Metric numerator (Gross global combined Scope 1 and 2 emissions)	Metric denominator	Metric denominator: Unit total	Scope 2 figure used	% change from previous year	Direction of change from previous year	Reason for change
136	metric tonnes CO2e	Other: per million GBP sales, excluding precious metals	3578	Location-based	11	Decrease	Sales have grown by 13%, whereas absolute carbon emission have only grown by 5%

Further Information

Page: **CC13. Emissions Trading**

CC13.1

Do you participate in any emissions trading schemes?

Yes

CC13.1a

Please complete the following table for each of the emission trading schemes in which you participate

Scheme name	Period for which data is supplied	Allowances allocated	Allowances purchased	Verified emissions in metric tonnes CO2e	Details of ownership
European Union ETS	Fri 01 Jan 2016 - Sat 31 Dec 2016	7642	35000	22965	Facilities we own and operate

CC13.1b

What is your strategy for complying with the schemes in which you participate or anticipate participating?

The Group Policies & Compliance Committee, which reports directly to the Group Management Committee, is responsible for our strategy regards Emission Trading Schemes. It is their responsibility to monitor all existing and forthcoming schemes globally and keep track of which JM sites might be affected by them.

Our strategy for compliance within these schemes is, first & foremost, to reduce our GHG emissions. We will then make up any shortfall between verified emissions and allowances allocated in the most cost-effective way possible, generally either by purchasing ERUs.

Our targets to reduce our Emissions are encompassed in our Sustainability 2017 strategy, which was launched in 2007:

"Halve the carbon intensity of our own operations by 2017"

"Have the use of energy per unit sales by 2017"

Each site is responsible for its own plan as to how to achieve these targets, and presents their plan to the Board for approval on an annual basis.

1. We aim to reduce energy consumption through many avenues including installing more efficient equipment and improving the efficiency of our chemical processing. We have many projects running concurrently throughout our sites at any one time towards this objective.

2. Our Royston site is the only one large enough to participate in EU-ETS in the UK. We have a Combined Heat and Power plant on site producing a large proportion of the site's power needs and it consumes the majority of the Royston site's natural gas. This plant is part of the CHP Quality Assurance scheme which incentivises efficient electrical production. The CHP plant is Fully Qualified under the CHPQA. From April 2016 we switched to using zero carbon grid electricity at this site, and are now using our on-site CHP generators (which are natural gas powered) less often. This will substantially reduce our carbon emissions from the site in the year ahead.

3. We also use Climate-Change Agreements (CCAs) to minimise our commitment to EU-ETS and CRC. The Royston and Brimsdown sites have agreed to reduce their energy consumption by 11.8% between 2008 -2020 under a Climate Change Agreement (CCA)

4. To make up any shortfall between our allocation and verified emissions, we purchase EUAs on the open market, when prices are favourable. Low prices in the past year is the reason we purchased more EUAs than we needed.

CC13.2

Has your organization originated any project-based carbon credits or purchased any within the reporting period?

No

CC13.2a

Please provide details on the project-based carbon credits originated or purchased by your organization in the reporting period

Credit origination or credit purchase	Project type	Project identification	Verified to which standard	Number of credits (metric tonnes CO2e)	Number of credits (metric tonnes CO2e): Risk adjusted volume	Credits canceled	Purpose, e.g. compliance

Further Information

CC14.1

Please account for your organization’s Scope 3 emissions, disclosing and explaining any exclusions

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Purchased goods and services	Relevant, calculated	3932180	Cradle-to-Gate LCA studies of key products have been carried out according to the requirements of the ISO 14040 and ISO 14044 standards. The carbon footprints were calculated using the IPCC 2007 GWP 100a v1.02 method in SimaPro. The EcoInvent 3 database in SimaPro was used to describe the carbon footprint of non-pgm raw materials.	84.00%	This disclosure covers ~90% of the raw materials that we use to manufacture our products across all business units. We use in-house numbers (derived from our refining operations) to distinguish the carbon footprint of virgin and secondary precious metal that we use, and can estimate to a high degree of certainty how much of this precious metal comes from virgin sources and how much comes from secondary sources. It does not include agrocrops grown to provide feedstocks for our API manufacturing business.
Capital goods	Relevant, not yet calculated	0		0.00%	

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Fuel-and-energy-related activities (not included in Scope 1 or 2)	Relevant, calculated	23754	2016 UK Defra Guidance/ DECC's GHG Conversion Factors for Company Reporting of emissions from electricity updated 1 June 2016 https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting	100.00%	The number presented here is JM's scope 3 carbon emissions from electricity transport and distribution losses from grid-connected electricity purchased globally.
Upstream transportation and distribution	Not relevant, calculated	500	Cradle-to-Gate LCA studies of key products have been carried out according to the requirements of the ISO 14040 and ISO 14044 standards. The carbon footprints were calculated using the IPPC 2007 GWP 100a v1.02 method in SimaPro. The EcoInvent 2.2 database in SimaPro was used to describe the carbon footprint of transportation of raw materials.	0.00%	We have calculated the transportation footprint of several of our key raw materials and found it to be about 0.02% of the total Scope 3 carbon footprint of each of our products. Therefore, we do not consider their transportation to be material in our scope 3 carbon footprint
Waste generated in operations	Not relevant, calculated	200	Cradle-to-Gate LCA studies of key products have been carried out according to the requirements of the ISO 14040 and ISO 14044 standards. The carbon footprints were calculated using the IPPC 2007 GWP 100a v1.02 method in SimaPro. The EcoInvent 2.2 database in SimaPro was used to describe the carbon footprint of our production waste, according to its disposal method	0.00%	We have calculated the production waste footprint of 40% of our key products and found it to be about 0.01% of the total Scope 3 carbon footprint of the products. Therefore, we do not consider production waste to be material in our scope 3 carbon footprint

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
Business travel	Not relevant, calculated	7832	GHG Protocol Corporate Accounting Standard; 2011-12 data provided for JM employee business travel	100.00%	We have collected data on business travel by employees in previous years (last in 2012) and found it to be only 0.2% of our Scope 3 emissions. Therefore we do not consider it material to our Carbon footprint and have discontinued collecting the data every year
Employee commuting	Not relevant, calculated	90		13.00%	The employee commuting footprint was based on results of a travel survey at our largest site in the UK, where 13% of JM employees work. 80% employees reported they came by car; 5% by train and 15% walked/cycled. The number was then scaled up to represent 100% JM employee commuting - assuming commuting habits are similar all JM sites cross the globe. This is unlikely to be the case in detail, but we estimate that it will be an over-estimate, as employees tend to travel longer distances to work in the UK

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
					than they do at our other locations. The resulting number is only 0.005% of our Scope 3 emissions. Therefore we do not consider it material to our Carbon footprint.
Upstream leased assets	Not relevant, explanation provided	0		0.00%	We don't have any leased assets
Downstream transportation and distribution	Not relevant, calculated	200	Cradle-to-Gate LCA studies of key products have been carried out according to the requirements of the ISO 14040 and ISO 14044 standards. The carbon footprints were calculated using the IPCC 2007 GWP 100a v1.02 method in SimaPro. The EcoInvent 2.2 database in SimaPro was used to describe the carbon footprint of transportation of products.	0.00%	We have calculated the transportation footprint of several of our key products and found it to be less than 0.01% of the total Scope 3 carbon footprint. Therefore, we do not consider their transportation to be material in our carbon footprint.
Processing of sold products	Not relevant, explanation provided	0		0.00%	Our products are no subject to energy-intensive downstream processing. As catalysts, they are typically mechanically inserted into metallic containers.
Use of sold products	Relevant, calculated	25000000	Calculations of annual CO2 savings from JM products "in use" in CDM/JI projects were calculated and third-party verified according to the CDM methodology for CER allocation. The impact of catalysts on GHG emissions from a vehicle was measured directly in our	0.00%	This is a partial disclosure. We have so far completed "in-use" LCA studies on approximately 45% of our

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
			engine test facilities Every vehicle will emit a slightly different mix of GHGs from its engine depending on the fuel used, engine type, car weight and driving style of the driver. We have taken an average engine out exhaust gas mixture from a mid-size passenger vehicle calibrated to Euro5 standards, driven over the European Drive Cycle Test to make these calculations.		product portfolio, by sales revenues. Some of JM's products are designed specifically to save GHGs being emitted to atmosphere (e.g. N2O abatement catalysts). Our automotive catalysts create some CO2 whilst they are destroying other environmentally harmful gases and particulates eg. acid gases or photochemical smog in the engine out exhaust gas mixture.
End of life treatment of sold products	Not relevant, explanation provided	0		0.00%	We receive a very high percentage (> 90%) of our precious metal-containing products back to our own factories at End-of-Life. We then recycle them internally, and the emissions associated with this activity are thus included in our Scope1+2 reporting. Most exceptions to this rule are from our pharmaceutical and medical components businesses where the products are either

Sources of Scope 3 emissions	Evaluation status	metric tonnes CO2e	Emissions calculation methodology	Percentage of emissions calculated using data obtained from suppliers or value chain partners	Explanation
					consumed or remain in the body until death.
Downstream leased assets	Not relevant, explanation provided	0		0.00%	We do not have any downstream leased assets
Franchises	Not relevant, explanation provided	0		0.00%	We do not have any franchises.
Investments	Not relevant, explanation provided	0		0.00%	We do not generally make investments outside the boundaries of our own business.
Other (upstream)	Not relevant, explanation provided	0		0.00%	We do not believe we have anything that fits this category.
Other (downstream)	Not relevant, explanation provided	0		0.00%	We do not believe we have anything that fits this category.

CC14.2

Please indicate the verification/assurance status that applies to your reported Scope 3 emissions

Third party verification or assurance process in place

CC14.2a

Please provide further details of the verification/assurance undertaken, and attach the relevant statements

Verification or assurance cycle in place	Status in the current reporting year	Type of verification or assurance	Attach the statement	Page/Section reference	Relevant standard	Proportion of reported Scope 3 emissions verified (%)
Annual process	Complete	Limited assurance	https://www.cdp.net/sites/2017/92/9792/Climate Change 2017/Shared Documents/Attachments/CC14.2a/CDP-verification-statement 2017 - Johnson Matthey - Final.pdf	1-2	ISAE 3410	1

CC14.3

Are you able to compare your Scope 3 emissions for the reporting year with those for the previous year for any sources?

Yes

CC14.3a

Please identify the reasons for any change in your Scope 3 emissions and for each of them specify how your emissions compare to the previous year

Sources of Scope 3 emissions	Reason for change	Emissions value (percentage)	Direction of change	Comment
Fuel- and energy-related activities (not included in Scopes 1 or 2)	Change in physical operating conditions	20	Increase	An 9% increase due to an increase in the amount of grid electricity used by the company. An 11% increase due to changes in the carbon intensity factors for grid transmission losses according to DEFRA carbon factor issued in June 2015.
Purchased goods & services	Change in output	10	Increase	An increase in production volumes. Group revenues increased by 12% in line with this increase in production volumes.

CC14.4

Do you engage with any of the elements of your value chain on GHG emissions and climate change strategies? (Tick all that apply)

Yes, our suppliers
Yes, our customers

CC14.4a

Please give details of methods of engagement, your strategy for prioritizing engagements and measures of success

METHODS OF ENGAGEMENT ON CLIMATE CHANGE ISSUES We provide product environmental footprint information to all our customers on request, both through the CDP Supply Chain Disclosure and privately. To date, we have responded to 100% sustainability questionnaires from customers, regardless of the importance of that particular customer to our business. This is in excess of 50 questionnaires in the last 12 months. We are involved in a number of Product Environmental Footprinting projects for platinum-containing products through our trade association: . With the "The International Platinum Association" we have contributed data and expertise to enable them to calculate an industry average environmental footprint for primary and secondary precious metals, and fully functional automotive catalytic converters. With "Eurometaux" we are engaged in a European Commission pilot environmental footprint project for metal sheet. We have regular dialogue with key strategic raw material suppliers. We have visited about 25 of our strategic suppliers of key raw materials in the last 12 months to perform on-site sustainability audits. We released a global supplier manual within our ECT division in 2013, which is applicable to all our suppliers in that Division (54% JM's business by sales). Page 13, Section 5.3 of this document references Climate change and Energy Reduction "Climate Change and Energy Reduction Suppliers should account for their greenhouse gas emissions (GHG), in accordance with the Greenhouse Gas Protocol and are expected to have energy-efficiency programmes in place to reduce their carbon footprint. JM may ask Suppliers to provide data on their GHG emissions through the Carbon Disclosure Project (CDP)

Supply Chain section, or through an annual questionnaire. Suppliers are encouraged to obtain ISO50001 (Energy Management Systems) certification.” Reference - <http://ect.jmcatalysts.com/pdfs-suppliers/SMS-013%20Global%20Supplier%20Manual.pdf> OUR STRATEGY TO PRIORITISE ENGAGEMENTS Our strategy for engagement is to prioritise our efforts with those suppliers and customers who are most critical to our success. We use a Material Classification Decision Tree to classify the importance of our suppliers in our Supplier Database; the most important are designated as “strategic suppliers” and each have a dedicated supply chain manager. Generally, it is those companies that supply us with critical functional components of the product, high value raw materials and/ or those where there are limited options for alternative suppliers. All customers have dedicated account managers if the revenue from there sales is significant in our balance sheet. Strategic customers have a dedicated account manager and dedicated technical contact who spend 100% of their time working with that customer. Engagement is on a weekly or even daily basis, by phone, video and personal visits with those most critical to our profitability. MEASURES OF SUCCESS The overall measure of success of our value chain engagement strategy is continuing sales revenues and rising profit margins, year on year. We measure our supply chain success based on our ability to maintain security of supply whilst keeping prices stable. Any interruption to production or price hike of raw materials would be highlighted in our supply chain management reviews. We measure success with our customer on ability to maintain profit margins with any individual customer on a year on year basis. Critical to this relationship is maintaining on-time delivery and low reject rates.

CC14.4b

To give a sense of scale of this engagement, please give the number of suppliers with whom you are engaging and the proportion of your total spend that they represent

Type of engagement	Number of suppliers	% of total spend (direct and indirect)	Impact of engagement
Active engagement	24	96%	This is a partial response. Currently we only collate these data for our Environmental Catalyst Division (which represents 59% of our total sales). Please also note that whilst precious metals (platinum, palladium) are the key raw ingredient of the majority of our products, the metal always remains "owned" by our customers whilst we process it for them, and thus is not included in our raw material spend numbers. 96% of ECT's strategic suppliers have been subject to an on-site Sustainability Audit by trained Johnson Matthey auditors in the last 3 years. We have also engaged with our strategic suppliers of non-pgm containing raw materials, performing on-site sustainability audits of their operations in the last 12 months. This includes asking questions about the GHG emissions of their operations. Additionally, we have engaged with our supplier of virgin Precious Metals to obtain carbon footprint numbers for their mining/refining operations, and to perform an on-site sustainability audit.

CC14.4c

Please explain why you do not engage with any elements of your value chain on GHG emissions and climate change strategies, and any plans you have to develop an engagement strategy in the future

Further Information

Module: Sign Off

Page: CC15. Sign Off

CC15.1

Please provide the following information for the person that has signed off (approved) your CDP climate change response

Name	Job title	Corresponding job category
Robert MacLeod	Chief Executive Officer	Chief Executive Officer (CEO)

Further Information

CDP