

Contents

Strategic report	01
2022 Summary performance	01
Chair's statement	02
Chief Executive's statement and strategic review	04
Our business model	07
Our purpose and vision	10
Realising our vision	12
Market review	18
Chief Financial Officer's review	20
Financial performance review	22
Key performance indicators	31
Engaging with our stakeholders	32
Sustainability	34
Products and services	36
Operations	41
People	49
Taskforce for Climate-related Financial Disclosures	60
Risk report	70
Going concern and Viability	80
Non-Financial Information and section 172 statement	81
Governance	83
Chair's introduction	84
Board at a glance	85
Board of Directors	86
Our governance structure	88
Corporate governance report	90
Board activities	92
Section 172 statement	94
Board and committee effectiveness	96
Societal Value Committee report	98
Nomination Committee report	100
Audit Committee report	104
Remuneration Committee report	111
Directors' report	131
Responsibilities of directors	136
Financial statements	137
Other information	214

Front Cover: Paul Wright, Principal Researcher, working at our syngas generation rig in Chilton, UK.

Catalysing the net zero transition

Johnson Matthey's vision is for a world that is cleaner and healthier, today and for future generations. Our contribution to that world is based on the transformative power of platinum group metal (PGM) chemistry, where our 200-year history gives us a unique advantage.

Drawing on that expertise in PGM chemistry, catalysis and process design, we create technologies and processes that help power our customers' products – principally in the automotive, chemicals and energy markets. It's this expertise that has helped remove harmful emissions from vehicles for almost 50 years and is now enabling the rapid commercialisation and scale-up of low- and zero-carbon technologies – like sustainable fuels and green hydrogen – to catalyse the world's transition to net zero.

Our position as the world's largest recycler of secondary PGMs means we also have a distinctive role in the circular economy, ensuring our businesses and customers have access to a reliable, sustainable supply of these scarce precious resources.

Following our announcement on 26th May 2022, we have changed the name of our Group Management Committee to the Group Leadership Team (GLT). Given this change, this report refers to the GLT throughout.

In addition, we may also refer to our Efficient Natural Resources business throughout this report as we report against it for the financial year. Going forward, this will be reported as our PGM Services and Catalyst Technologies businesses.



Visit matthey.com to learn more

Cautionary statement

The Strategic report and certain other sections of this annual report contain forward looking statements that are subject to risk factors associated with, among other things, the economic and business circumstances occurring from time to time in the countries and sectors in which the group operates. It is believed that the expectations reflected in these statements are reasonable, but they may be affected by a wide range of variables which could cause actual results to differ materially from those currently anticipated.

2022 Summary performance

Financial performance

Revenue	Sales	Operating profit	Underlying operating profit
£16,025m	£3,778m	£255m	£553m
4%	3%	-17%	17%
2020/21: £15,435m	2020/21: £3,685m	2020/21: £309m	2020/21: £473m
(Loss) / earnings per share	Underlying earnings per share	Ordinary dividend per share ¹	Free cash flow
-52.6p	213.2p	77.0p	£221m
N/A as loss this year	26%	10%	-25%
2020/21: 106.5p	2020/21: 168.9p	2020/21: 70.0p	2020/21: £295m ²

Non-financial performance

Products and services		Operations		People	
Sales contributing to four priority UN SDGs	Gross R&D spend contributing to four priority UN SDGs	Scope 1 and 2 GHG emissions	Upstream Scope 3 GHG emissions (purchased goods and services)	Total recordable injury and illness rate	Diversity and inclusion
83.8%	88.1%	399,906	3.01m	0.59	27%
2020/21: 84.7%	2020/21: 87.3%	CO ₂ tonnes equivalent	CO ₂ tonnes equivalent	2020/21: 0.55	women across all management levels
		2020/21: 385,455 ³	2020/21: 2.85 million		2020/21: 27%
		CO ₂ tonnes equivalent	CO ₂ tonnes equivalent		

1. The board recommends a final dividend for the year ended 31st March 2022 of 55.0 pence per ordinary share of 110^{49/53}, which if approved, will be paid on 2nd August 2022 to all ordinary shareholders on the register at the close of business on 10th June 2022. An interim dividend of 22.0 pence was paid on 1st February 2022.

2. Restated to exclude Health.

3. Restated from the prior year, please see page 215 for more information.

Chair's statement



"This has been a very challenging year for Johnson Matthey and our shareholders. We took important and necessary strategic decisions with regard to the business portfolio, with the exit from Battery Materials and divestment of Health. I know many of our stakeholders were very disappointed, but these were essential actions to enable us to focus on attractive, high-growth opportunities that have a vital role to play in the acceleration towards net zero. I, the rest of the board and the executive team are determined that we will restore value to our shareholders."

Welcoming our new Chief Executive

Looking ahead, Johnson Matthey has a strong foundation from which to build, and we have delivered a robust set of underlying results in the year. I am delighted to welcome our new Chief Executive, Liam Condon, who joined JM in March 2022, following Robert MacLeod's decision to retire. Liam brings with him natural commercial acumen and a talent for building relationships and partnerships, and the board and I are pleased that he has settled in so quickly, and has already injected pace and commercial thinking into JM to drive a more performance-oriented culture. We have been impressed with the progress he and his leadership team have made in a few short months during their review of our strategy.

Liam shares the outcome of that review in his statement on pages 4 to 9, so I won't repeat everything he says, but instead share a few high-level observations.

JM has world-class scientific skills, great technology and incredibly talented people. That hasn't changed. But what became clear during the board's discussions with Liam and

the Group Leadership Team (GLT) is that some of our historical portfolio choices – like Battery Materials and Health – were never a logical fit. That's because they were not borne out of JM's foundation: our expertise in platinum group metal (PGM) chemistry, catalysis and process design.

The review has, therefore, underlined the need to strengthen our commercial focus to ensure that we concentrate on the technologies and markets where we have the greatest strength and competitive advantage.

This is important because the technologies that the world needs to decarbonise rely on PGMs, which means JM has a huge opportunity to help accelerate the journey to net zero. But to do that, we must transform our culture, becoming a simpler, more agile organisation in order to drive that commercial focus into everything we do.

It takes a lot of work to review a company's strategy – and some tough conversations – but I speak for the whole board when I say that we have enjoyed working with Liam and his team during this process, and fully endorse the revised strategy Liam has proposed.

Chair's statement *continued*

Exiting Battery Materials and Health to protect JM's future

In many ways, our decisions to exit Battery Materials and Health were the forerunners for this strategic work. These weren't decisions we took lightly but they were the right ones for JM's future.

The battery materials sector is changing more quickly than we anticipated, with car manufacturers looking for the cheapest technology. So while some of our automotive customers have told me that we were making market-leading components, we were unable to sell them at the right price. The more the board and GLT looked at the numbers, the clearer it became that JM would need to invest billions to keep up. In time, this would have compromised our ability to develop our other growth businesses.

I have spoken to a lot of shareholders this year and I know that some are frustrated by the decision. I share their disappointment, but given the battery material market's rapid commoditisation, we moved quickly to avoid further investment. Since then, Nano One, a clean technology innovator in battery materials, has agreed to acquire 100% of the shares of Johnson Matthey Battery Materials Canada, while we have also agreed to sell part of the Battery Materials business to EV Metals Group, a global battery chemicals and technology business. As well as £50 million cash, JM will receive a minority equity stake in EV Metals Group.

In Health, meanwhile, we were disappointed by the reduced sale price we received, but it reflects the fact that the business was hit by a series of external

factors, including pricing pressure and shortages in supply and labour. However, we have retained a c. 30% minority stake. I am heartened by those investors who believe JM is now a stronger investment proposition.

A robust set of results despite a challenging year

It's worth noting that this decision has had minimal impact on our underlying financial performance this year. In fact, I am pleased to report that JM has delivered another robust set of full-year results, in line with market expectations.

This is a great achievement and I would like to thank Robert for his steady leadership during an incredibly volatile year that has included COVID-19-related supply chain disruption, and rising inflation.

The external landscape has, of course, become even more challenging given the tragic events that have unfolded since Russia invaded Ukraine in February 2022. Russia's actions are a violation of international law, specifically the sovereignty of an independent country, and JM continues to stand united with Ukraine. We are not doing any new business in Russia and Belarus for the time being and have suspended production operations in Russia indefinitely. We have also set up a fund to help our Ukrainian employees working in Poland access money to cover accommodation and living costs for family and friends seeking refuge. And we have looked after our Russian employees, continuing to pay them during this time.

JM has navigated this uncertainty well. Russia represents around 1% of 2021/22 group sales, and, thanks to our position as

the world's leading recycler of secondary PGMs, we have a highly diversified supply of metal. Russia supplies a significant quantity of the world's precious metals, particularly palladium. And although companies adjusted quickly to meet international sanctions, those sanctions have made an already scarce resource harder to buy.

We also successfully executed our £200 million share buyback this year and completed the sale of our Advanced Glass Technologies business. Like Health, this is an excellent business in its own right, but does not fit naturally in our more focused portfolio.

As a result of all this, we are pleased to announce a dividend of 77 pence this year. This reflects the strength of our balance sheet and capital allocation priorities.

A new energy to help accelerate net zero

JM's continued financial strength will be essential as we look to the future. We will need to combine that strength with our new commercial focus and more efficient culture in order to execute our strategy.

But we'll also need to draw on certain aspects that have helped make this 200-year-old company so special, such as our values and purpose. Throughout its history, JM has shown that it can pivot its focus, while staying true to what matters most: using its science and engineering skills to do the right thing. Now we must pivot again to help the world accelerate towards net zero. Our planet is already feeling the effects of climate change, and we have a duty to get more of our products and services, such as technologies that help make sustainable aviation fuels, into the market more quickly.

It is a duty that I know everyone at JM shares, having had the privilege once again to talk to employees, as part of the board's ongoing commitment to employee engagement. JM has worked hard in the past couple of years to set out its sustainability agenda, including committing to net zero by 2040. And it has taken further steps this year to increase its engagement, including a new board-level Societal Value Committee. You can read more about the Committee's remit from page 98, but I welcome the move and believe it will strengthen our governance and help JM meet its sustainability commitments.

A clear path to the future

Navigating change is never easy. But JM is a resilient company built on great technology, talented people and enormous integrity. This, allied with a new commercial focus, led by Liam and his team, gives me great confidence that we have an exciting, prosperous future ahead of us. This future is firmly focused on investing in the technologies where we have the greatest strength and competitive advantage to help decarbonise society as fast as possible – and the board and I look forward to supporting Liam and his team in pursuing this future to restore and drive value creation for our shareholders and wider stakeholders.

Patrick Thomas
Chair

Chief Executive's statement and strategic review

"Throughout my career, I have only ever worked for companies that combine science with a strong sense of purpose. Science fuels progress, it's how the world grows. But, for me, that progress needs to be purposeful, it needs to make the world a better place. That desire to combine science and purpose resulted in me spending 20 years of my life working in human health and 10 years in animal and plant health. Now, I am delighted to lead a company that is focused on using science to protect our planet's health."

And what tremendous science and purpose Johnson Matthey has. Since becoming Chief Executive in March 2022, I have been struck by how passionate JM's people are about using their expertise in platinum group metal (PGM) chemistry, catalysis and process design to create a cleaner, healthier world – expertise that has developed world-class technology and market-leading positions. However, it is also clear that we have not performed well in recent years and, from a shareholder point of view, have done a poor job of value creation, which is something that my new team and I are committed to changing.

Robust underlying results

While our share price clearly suffered in the past year, our people's expertise means that the operational business has remained relatively strong and delivered another set of robust underlying full-year results in a year of market volatility and global uncertainty. This is testament to the hard work and commitment of every single employee at JM. I would like to thank everyone for their dedication, resilience and ongoing passion to keep innovating.



Find out more, visit matthey.com/strategy

"Our strategy is to catalyse the net zero transition for our customers in automotive, chemicals and energy"

Revised strategy to drive value creation

Most of my time so far has been spent talking with employees, customers and investors, while, in parallel, reviewing our strategy. Through these conversations, I have heard a consistent message: JM is a great company – with great people and technology. But we need a much clearer strategy that outlines how the company will create more value, both for shareholders and society going forward as we help the world accelerate progress to net zero. We also need to set out how we will allocate resources in a more disciplined manner and transform our culture to enable successful strategic execution.

Three things have become clearer to me. The first is that we already have the core talent and technology to accelerate progress towards net zero. In fact, as the world looks to decarbonise, the markets for our products will increase significantly, opening up tremendous new growth opportunities for JM. We just need to define where we want to focus our energy and resources.

My second observation is that our complex business structure and lack of commercial focus is getting in the way of our ability to create significant value. Our customers have told us that they love our technology – and very often consider our products to be best in class – but we don't make the most of our opportunities. That's why we need to simplify and drive stronger emphasis on accountability and faster decision-making.

The third observation is that in new growth ventures, JM has often been playing 'not to lose', as opposed to 'playing to win'. To succeed in a hyper-competitive, ultra-fast and very volatile world, JM needs to play to win. That requires developing a strong performance culture that is disciplined in executing our strategy and delivers consistent results.

Our vision for a cleaner, healthier world drives our strategy and mirrors society's need to create a more sustainable future. JM will catalyse the net zero transition for our customers in automotive, chemicals and energy, and thereby create significant value for shareholders and society.

Focus

JM needs more strategic clarity and to focus resources where we can win. Where JM has faltered historically has typically been due to a lack of focus on core competencies, a lack of understanding of new market dynamics and an overly inward focus. Going forward, we will focus on our core competencies, with a business structure that is in line with our strategic ambitions and allows us to maximise group synergies. We will exit non-core businesses, which will also ensure better resource allocation.

Simplify

JM needs to become simpler, more agile, and more cost effective. And we must reduce complexity across our entire organisation. This means leaner processes, less duplication and clear lines of accountability. This will help unlock JM's potential, by increasing the speed with which we make decisions, eliminating duplication and reducing costs.

Execute

Our strategy will be underpinned by a rigorous performance culture. We are launching a transformation programme to drive stronger execution, unlock near-term cost opportunity and position us strategically to more strongly drive growth.

We will strengthen our capabilities in two particular ways:

- Capital project execution: clear governance, accountability and enhanced capabilities will ensure we are highly disciplined in capital allocation and much stronger in execution.
- Commercial skills: strengthening capabilities and cross-group commercial synergies, with a strong focus on value creation and more strategic partnerships.

Our core strengths

A truly purpose-driven organisation

Being a catalyst to help make our world cleaner and healthier is deeply engrained in JM's DNA, and is hugely motivational for our people. This includes our own commitment to reach net zero in our operations by 2040.

Talented and innovative people

We employ some of the world's brightest and best: our 13,000+ people are talented and passionate about making a difference through innovation. We combine science with purpose to help drive progress in the world.

An impressive and highly relevant technology portfolio

Only science can solve the climate crisis and enable the net zero transition. We have cutting-edge research across our sectors with innovations in the pipeline that the world really needs to accelerate progress.

Focus

Focusing our portfolio on core strengths

Our expertise in PGM chemistry and catalysis, combined with our process technology skills, is the beating heart of this company. It is that expertise that has helped remove harmful emissions from vehicles for almost 50 years. And that same expertise is essential for decarbonising our world: we are enabling low- and zero-carbon technologies in Catalyst Technologies and Hydrogen Technologies, enabling the automotive, chemical and energy industries to transition from carbon-intensive fossil fuels to sustainable fuels and energy.

All of which means that JM is well positioned to be a market leader in sustainable technologies across multiple industries. Beyond the PGMs synergies across our group, we also have significant technology and extensive customer-related synergies, since our customers all need to transition to a more sustainable world.

PGM Services – the backbone of our business

JM is the world's largest recycler of secondary PGMs and is around twice the size of our nearest competitor. PGM Services provides the flexible metal sourcing and price risk management that we need to run the rest of JM, and is key to the trust our customers place in us. For example, our Clean Air and Hydrogen Technologies customers depend on PGM Services for access to a reliable supply of sustainable, scarce precious metals and recycling services to support a circular economy. We have a competitive advantage that is both very hard to replicate and essential for helping the world reach net zero.

Our PGM Services backbone will support our other three focused business divisions Clean Air, Catalyst Technologies and Hydrogen Technologies, which in turn enable PGM Services to maintain its scale and leadership.

1. Clean Air – continuing to play a leading role in the autocatalyst market

Clean Air will remain a significant business well into the next decade even as the world transitions towards lower and zero-carbon technologies. That transition will take time, and in the meantime governments around the world intend to roll out more stringent air quality regulations, which offer new opportunities for our innovative technology. Clean Air will create significant value and we are highly confident that we will generate at least £4 billion of cash over the decade to 2030/31, with more thereafter.

2. Catalyst Technologies – decarbonising chemicals and creating sustainable fuels

We are already an established, leading provider of process technology and catalysts to the chemicals and energy sectors, especially in synthesis gas (syngas). Our Catalyst Technologies business will strengthen our focus on the syngas value chain, growing our existing business alongside newer opportunities in blue hydrogen, sustainable fuels and low-carbon solutions. Fueled by the net zero transition,

we expect these markets to grow rapidly in the medium term as future production needs to decarbonise. We intend to move quickly and strengthen our leading positions across Catalyst Technologies to deliver high single digit growth over the medium term.

3. Hydrogen Technologies – decarbonising transport and energy

Combining our PGM and catalysis expertise with our fuel cell and green hydrogen activities, our Hydrogen Technologies business will help decarbonise the transport and energy sectors and create very significant growth in the medium-longer term. We already have an established hydrogen business, having been active in fuel cells for over 20 years. Importantly, we already have customer contracts and partnerships today with leading hydrogen players including a major German automotive supplier for the supply of next generation catalyst coated membranes into the global automotive market.

We have taken the next step in our strategic partnership with Plug Power, a leading provider of cutting-edge green hydrogen

and fuel cell solutions, with JM bringing extensive precious metals and catalysis expertise and potential to develop a closed-loop PGM recycling system. The partnership extends across advanced components for both fuel cells and electrolysis and embodies a commitment to rapidly scale up to meet accelerating market demand, combining the strengths of both businesses to drive the capacity needed to 2030 and beyond. The collaboration is expected to generate significant value.

In addition, we expanded our presence in green hydrogen by investing into Enapter, a pioneer and commercial leader in anion exchange membrane (AEM) electrolysis. Our partnership encompasses joint development of advanced components, supply of specialist catalysts and we are jointly investigating opportunities for recycling.

We aim to become the market leader in high value performance components that are essential to power fuel cells and green hydrogen electrolyzers. We are targeting more than £200 million of sales in Hydrogen Technologies by the end of 2024/25.

Simplify

Simplifying our business structure – our business model

We will serve our global customer base through our four businesses: the current core business of Clean Air, together with our growth businesses, Catalyst Technologies and Hydrogen Technologies, all built on our foundational PGM Services business, which supplies and enables the other businesses. These businesses are tightly linked by three reinforcing synergies: common customers and partners, shared technology capabilities, and a shared PGM ecosystem that enables dependable supply and circularity.

Common customers and partners

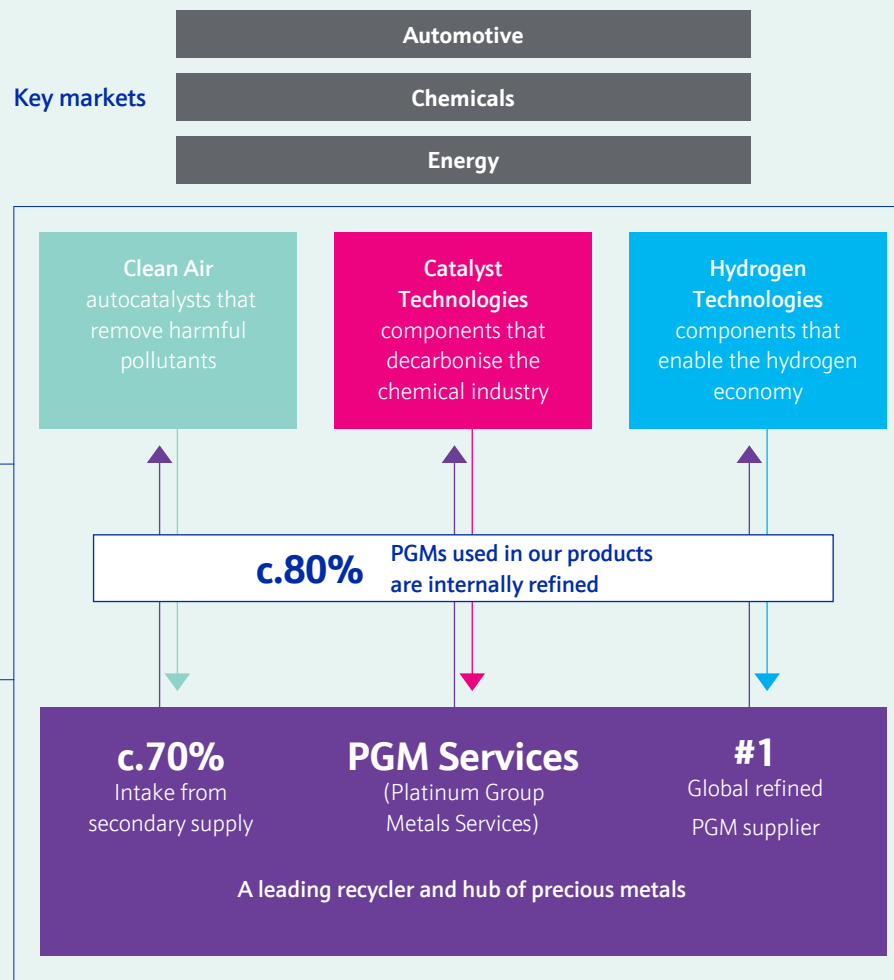
As our customers transition to net zero, new market opportunities are opening up for JM through existing customers. For instance, we have automotive customers in Clean Air today who are becoming Hydrogen Technologies customers for fuel cells. We are also building cross-business offers, such as our Catalyst Technologies and Hydrogen Technologies businesses working together to create an integrated value proposition for customers in blue and green hydrogen. Also, our presence in several net zero transition technologies, such as blue and green hydrogen, reduces our risk and ensures our position as a market leader, regardless of which technology becomes dominant at any given point in time.

Shared technology capabilities

We have common technology capabilities across all our businesses, with more than 5,000 patents granted and around 1,500 patent applications pending. With PGM chemistry expertise at our core, we can take advantage of our unique heritage at scale across engineering, design, synthesis and catalysis. Because of this, our people have shared core skills that we can invest in and grow since we use them across the whole of JM. This also gives us the opportunity to accelerate our product development thanks to our integrated position in the value chain.

A shared PGM ecosystem

Our PGM Services business is our backbone. That means we can ensure around 80% of the PGMs that are used in our products are refined within the group. This demonstrates the physical flow between our businesses and provides a strong foundation for the whole of JM. This integration gives us and our customers many advantages, including superior insights and market edge from an integrated view of PGMs supply and demand, along with resilience in our metals supply and increased customer trust. We also have a unique position in the circular economy, given our internal refining skills. This is especially important to ensure we have a highly competitive integrated offer as we move through the next wave of emissions control legislation. We can also optimise supply and demand, which lowers exposure to PGMs price risk for both JM and our customers. And we deploy more efficient working capital, since our integrated position means we can be more flexible in the way that we source and supply metal.



Execute

Transforming our culture and executing at pace

Playing to win not only means we need to focus on where we can win, but also do things differently. We need to transform our culture and execute at pace. We need a leaner, more efficient and more agile culture, with a strong commercial approach, to help unlock the full potential of our leading technology. We're going to change the way we work based on three cultural principles, which we will embed across the business:

1. **More efficient, less bureaucratic** – simpler, more efficient processes and clearer internal accountabilities that will enable us to work at pace and deliver £150 million in annualised cost efficiencies by 2024/25. This reflects simplification in corporate, global functions, procurement, site infrastructure and other costs.
2. **A high-performance, commercial mindset** – a fast-paced, bolder culture, one focused on winning in our chosen markets. That means we need to strengthen our commercial skills, set ourselves clearer business objectives and rigorously track performance against them.
3. **A more external outlook** – creating new ventures and strategic partnerships at the technology and commercial ends of our business to accelerate growth and unlock greater value.

At the start of our strategic review, as well as listening to shareholder feedback we asked JM employees to tell us what they think through a programme I launched in March called The Big Listen. Our people shared many great ideas for improvement with us, and told us they want both clear strategic direction and a more efficient organisation that gives them space to realise their full potential. I believe our new strategy will deliver on both of these requests and deliver significant value for our shareholders.

Disciplined capital allocation to drive success

As we execute our strategy, we will maintain a strong balance sheet and ensure we allocate capital in a very disciplined way. That means: investing for growth and attractive returns, and ensuring a reliable dividend, while returning excess capital to shareholders.

For the next three years to 2024/25, we expect cumulative capital expenditure to be around £1 billion. This will be focused on our core activities where we have a right to win and need to invest to drive growth: our PGM refineries, Catalyst Technologies and Hydrogen Technologies. We may also consider acquisitions, but we will be highly selective in our approach, with a focus on bolt-on deals to acquire technology or accelerate growth in our core growth businesses. For our shareholders, we will at least maintain and aim to grow the

dividend, targeting a 40% pay-out ratio over the medium term. Our aim is to maintain a strong balance sheet with our target level of net debt to EBITDA of 1.5-2.0 times.

Embedding sustainability into everything we do

We have a unique opportunity to play a leading role in the net zero transition, but we must also ensure we make our products in ways that minimise our own impact on the planet. JM already has a strong sustainability framework in place, with targets that focus on current and future technologies that we know will be fundamental to addressing the climate challenge.

We remain committed to reaching net zero by 2040, underpinned by a series of 2030 goals arranged under three key pillars: products and services, operations and people. See pages 34 to 59 for our sustainability report.

We are also a signatory to the UN Global Compact's Business Ambition for 1.5°C and our greenhouse gas (GHG) emissions targets have been independently verified by the Science Based Targets initiative:

- Absolute reduction in Scope 1 and Scope 2 GHGs of at least 33% by 2030 (baseline 2019/20).
- Absolute reduction of Scope 3 GHGs of at least 20% by 2030 (baseline 2019/20).¹

One of the great things about JM is the energy our people all have for our sustainability agenda. This gives me confidence that we can do even more – and we should – by designing ever more stringent sustainability standards into our products that will ultimately give us a competitive advantage by leading the way. We have created a new Chief Sustainability Officer role, reporting directly to me, and I'm delighted that Anne Chassagnette joined JM in May 2022. Anne will play a key role in driving JM's sustainability agenda, ensuring our sustainability objectives are fully integrated into the company's strategic and operational decisions.

1. Scope 1 covers direct greenhouse emissions from owned or controlled sources. Scope 2 covers indirect emissions from the generation of purchased electricity, steam, heating and cooling consumed by the reporting company. Scope 3 includes purchased goods and services.

Strengthening our leadership team for a successful future

As well as Anne, we are appointing four new business leaders for each of our businesses, two of whom are external appointments.

Anish Taneja, formerly a leader of a large division of Michelin, will take over as Chief Executive, Clean Air. Anish will also chair JM's cross-group Commercial Council.

Alastair Judge, currently interim Chief Executive, Clean Air, will become Chief Executive of our enabling PGM Services business.

Jane Toogood, currently Chief Executive, Efficient Natural Resources, will become Chief Executive, Catalyst Technologies.

Mark Wilson, formerly of BP, among other firms, and a highly experienced leader in the energy industry will become our new Chief Executive, Hydrogen Technologies.

Meanwhile, Christian Günther, currently Chief Executive, Battery Materials, will lead our strategy and transformation work.

We are also expanding the scope of role for our Chief EHS & Operations Officer, Ron Gerrard, to now include all strategic capex, to ensure clear accountability for capital projects planning, design and execution.

With this mix of new colleagues, and the strong team I inherited, we now have a world-class leadership team capable of driving execution of our strategy at pace and thereby creating significant value.

Looking ahead

As a keen marathon runner, I know how important it is to be realistic about the journey ahead. Success in long-distance running is about being well-prepared and committed to reaching your goal at the right pace. Business is no different.

Our strategy is clear and our commitment to delivering on our promises is unequivocal – as you'll see from the strategic milestones we have set ourselves in the areas of customers, operations, people and sustainability.

Now, we need to focus on executing our strategy with a strong sense of urgency and discipline. As we make progress towards achieving those milestones, we will create significant value for our customers, employees, shareholders and consumers, all of whom are relying on our science and technology to help solve the climate challenge.

Liam Condon
Chief Executive

We have clear milestones until end of 2023/24

	2022/23	2023/24
Customers		
Win at least 2 large-scale strategic partnerships in Hydrogen Technologies	●	
Win targeted Euro 7 business and deliver on £4bn+ trajectory for Clean Air	●	●
Win >10 additional large-scale projects by 2023/24 ¹		●
Investments		
Expand PGM Services refining capacity in China	●	
Complete construction of Hydrogen Technologies CCM plant in UK ²		●
Targeted capacity expansion (fuel cells catalyst, formaldehyde catalyst)		●
Complete divestment of Value Businesses		●
People		
Achieve >70% employee engagement score		●
Sustainability		
Achieve c.10% reduction in Scope 1+2 CO ₂ e emissions		●
Help customers reduce CO ₂ e emissions by >1 mt p.a. through use of our products		●

1. Includes Catalyst Technologies and Hydrogen Technologies projects.

2. To expand total capacity from 2GW to 5GW.

Inspiring science, enhancing life

Our purpose and vision *continued*

Our vision is for a world that is cleaner and healthier, today and for future generations.

Supported by our values

Our purpose and vision are underpinned by our values and delivered every day by our incredible people across the world.

Protecting people and the planet

Acting with integrity

Innovating and improving

Working together

Owning what we do

Realising our vision

Our expertise in PGM chemistry, catalysis and process design has never been more relevant or so urgently needed.

As laid out on pages 5-9, we have revised our strategy to focus on the technologies and processes with the biggest potential to catalyse the transition to net zero and realise our vision for a cleaner, healthier world.

Over the next six pages, we share a few examples of the work we're doing to help make that vision a reality – from five decades of automotive catalysts that clean the air, to catalyst technologies that make sustainable aviation fuel from surprising sources, to hydrogen technologies that can help decarbonise modern life. And we meet some of our incredible people using their skills and creativity to make all this happen.

Cleaner air, healthier people

Page 12

Decarbonising air travel

Page 14

Unlocking the potential of hydrogen

Page 16

Accelerating zero emissions transport

See more on matthey.com/fuel-cell-story



Cleaner air, healthier people

For almost 50 years, Johnson Matthey has used its expertise in PGM chemistry and catalysis to make a product that has helped save countless lives: the catalytic converter.

Back in the 1970s, cities like Los Angeles and Tokyo were shrouded in a haze of harmful pollution known as smog. Research showed this smog was largely caused by an atmospheric reaction between nitrogen oxides (NOx) and hydrocarbons, mostly from car exhausts. To combat the problem, authorities around the world began introducing new air quality legislation.

That's where we came in. Thanks to our unique heritage, we understood better than anyone the chemical properties of PGMs and their potential to address vehicle emissions. Five decades later, one in every three new cars on the roads use our catalytic converters. In the process, we created the world's first circular economy by recycling and reusing the PGMs inside those catalysis.

But today, despite significant improvements in air quality, around 4.2 million lives are still cut short every year by conditions like lung cancer and stroke directly caused by outdoor air pollution.

So we need to continue helping to clean internal combustion engine vehicles while road transport evolves to include a growing share of zero-emission vehicles, such as battery electric and fuel cell electric vehicles. That's why we're developing the next generation of catalytic converters to help our customers prepare for the toughest ever regulations, coming first in places like Europe and the USA.

We cracked the code for cleaner air back in 1974. Almost 50 years later, we're still hard at work using our expertise to help the world breathe more easily.



“JM is a real pioneer in the autocatalyst market... and as new, tougher air regulations come into effect, we’re already working hard to innovate again. It’s pretty exciting.”

Sabrina Elix, Industrialisation Lead

I’m part of JM’s process development team, which takes the work we do in our labs and scales it up for full production. It’s my job to help make our manufacturing plants more efficient. Just recently, I helped build and commission a production line for a brand-new catalyst.

JM is a real pioneer in the autocatalyst market: we actually created the world’s first commercial autocatalyst at our plant in Royston, UK, almost 50 years ago. It’s amazing to think about how many people have worked on, and improved, this

technology over the years. And as new, even tougher air regulations come into effect, we’re already working hard to innovate again. It’s pretty exciting.

What makes working for JM so special is that the focus isn’t just on trying to get as many parts out of a manufacturing plant as possible. It’s all about finding ways to work together to create something that’s going to bring benefit to the world. That’s really rewarding. Every day I feel like the work I do is actually making a difference.



See Sabrina’s story online, visit matthey.com/clean-air-story

Decarbonising air travel

Since commercial flights began, we've relied on fossil fuels to power our aeroplanes. Now, we're designing new technologies that are helping to change that.

Today, aviation is responsible for around 12% of all transport-related CO₂ emissions. The lack of alternative fuels means it's been hard to decarbonise air travel. Until now.

Using our expertise in PGM chemistry and catalysis, we've designed clever ways to make sustainable aviation fuel (SAF) from alternative feedstocks. For example, our award-winning FT CANST[™] technology, developed in partnership with bp, converts synthesis gas (a mixture of hydrogen and carbon monoxide, also known as syngas), made from household waste, into synthetic crude oil. Refiners can upgrade this crude oil into SAF.

From 2022, our technology will begin helping Fulcrum Bioenergy make millions of gallons of synthetic crude, while diverting thousands of tonnes of waste from landfills every year.

We also launched our HyCOgen[™] technology in January 2022, which captures CO₂ from existing emissions or from the air, and reacts it with zero-carbon 'green' hydrogen to generate syngas that can be turned into SAF.

We can now combine HyCOgen[™] and FT CANST[™] technology to create an end-to-end, low-carbon process to make synthetic crude. And in May 2022, Aramco and Repsol selected both for a new synthetic fuels plant in Bilbao, Spain. Once online in 2024, the plant will make a sustainable synthetic 'drop-in' fuel that can be blended for a variety of vehicles, including planes.

The SAF market will grow quickly. The International Air Transport Association (IATA), which represents major airlines in 120 countries, wants members to increase the amount of SAF they use from 5% in 2030 to 65% by 2050. The good news is our technologies are ready today to help meet that growing demand.

IATA wants members (airlines from 120 countries) to increase from

5%

SAF use in 2030 to

2030

65%
by 2050



"JM's vision to build a cleaner, healthier world aligns with my own passions... it gives me the opportunity to use my engineering skills to tackle climate change and protect our planet. I feel like I can personally make a difference for future generations."

Amelia Cook, Senior Engineer

I'm leading the development of our new HyCOgen™ technology. It's really exciting. The technology captures carbon dioxide that would otherwise be released into the atmosphere, which you can then react with hydrogen to make synthesis gas – a mixture of hydrogen and carbon monoxide. This gas can then be used to make more sustainable fuels and chemicals.

The fact that JM has been able to bring this to market in just a couple of years, and during a global pandemic as well, is amazing. It's been a fascinating challenge.

JM's vision to build a cleaner, healthier world aligns with my own passions. We've got to do something or time is going to run out. JM gives me the opportunity to use my engineering skills to tackle climate change and protect our planet. I want us all to have a sustainable future, and JM gives me the chance to actively contribute. I feel like I can personally make a difference for future generations.



See Amelia's story online, visit matthey.com/saf-story

Unlocking the potential of hydrogen

Decarbonising modern life means changing the way we power our daily lives. And there's one energy source that will be crucial in getting us there: hydrogen.

This versatile molecule can be used to run everything from industrial turbines to fuel cell electric cars. It can be used to store power and also turned into chemical building blocks such as those used to make everyday items like clothes. But if hydrogen is to help decarbonise the world, we're going to need a lot more of it, made in ways that minimise CO₂ emissions.

Thanks to our expertise in PGM chemistry, catalysis and process design, Johnson Matthey is doing just that.

Our award-winning LCH™ technology helps make clean hydrogen from natural gas while capturing more than 95% of the associated CO₂. Crucially, it's available at scale today and is already being incorporated into the UK's flagship HyNet North West hydrogen project.

Meanwhile, we're making key components that are helping to demonstrate commercial-scale renewable hydrogen production by using renewable energy to power water electrolysis with a number of key electrolyser producers including Plug Power, Hystar and Hoeller.

Whether a country chooses to produce hydrogen with carbon capture or renewable hydrogen or a mixture of both, will depend on local circumstances. Typically, hydrogen with carbon capture is a good fit for places like the UK and the USA east coast, which both have natural gas availability, industrial clusters providing concentrated demand, and access to carbon sequestration sites.

Meanwhile, renewable hydrogen will better suit geographies like North Africa and South America, where these resources are not as readily available, but where there is an abundance of solar or wind.

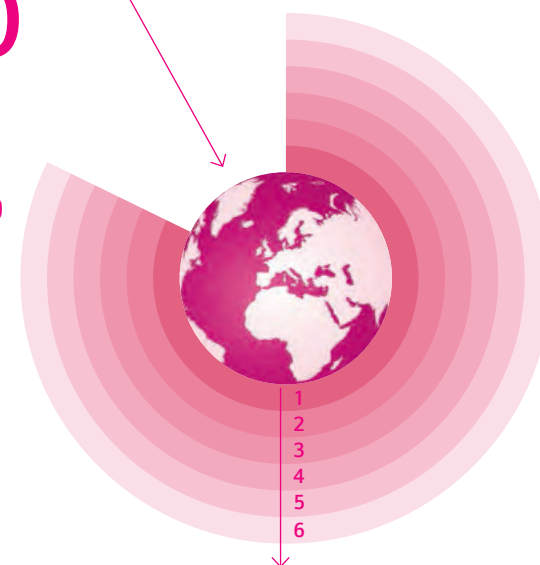
So, there is a place for both in future. In fact, forecasts suggest that clean hydrogen could help prevent cumulative emissions of 80 gigatonnes of CO₂ between now and 2050 – eight times China's emissions in 2019¹. Whichever route a country chooses, JM's technologies will be right at the core of this hydrogen revolution.

1. Hydrogen Council – Hydrogen for net-zero report.

18%



of all our energy
will be made from
hydrogen sources
every year by 2050



preventing
six giga tonnes of
CO₂ entering
the atmosphere

“For me, JM’s purpose means I can make an impact, so that in 2050 we’re in a better place. It means I can look my grandson – who will be in his 30s by then – in the eye and say I did my bit.”

Will McDonnell, Research Scientist

I help make the key component that fits into our customer’s electrolyzers – the catalyst-coated membrane. That component is where the clever chemistry happens, splitting water into hydrogen. Combine that with renewable energy and you can make hydrogen with no resulting CO₂ emissions.

Creating a cleaner, healthier world is so important. Everyone’s worried about climate change, and chemistry can play a big part in ensuring we still enjoy the only planet we have.

I work with some of the best scientists and engineers that walk the earth. We know we’re making a positive contribution to help make the planet a better place to live.

Mark McKenna, Process Technology Manager

I’m involved in designing the technology and processes that help make hydrogen using our LCH™ technology. That means taking natural gas, the same kind we might use for cooking or heating our homes, and transforming it into hydrogen while capturing as much of the associated CO₂ as possible. We’re proud that our technology is among the best in the world, capturing more than 95% of the CO₂ that would’ve gone into the atmosphere.

For me, JM’s purpose means I can make an impact, so that in 2050 we’re in a better place. It means I can look my grandson – who will be in his 30s by then – in the eye and say I did my bit.



See Will and Mark’s story online, visit matthey.com/hydrogen-story



Market review

Our world is in transition. A transition with the potential to transform the way we power modern life and care for our planet. It is driven by consumers who expect governments and businesses to do more to address climate change and help the world live in a more sustainable way.

After more than a century of economic development, the current path is no longer sustainable for our planet. We have to break our reliance on fossil fuels, and decarbonise the way we make industrial products, grow food, move people and goods around, run our businesses and heat and cool our homes. In short, the world needs to decarbonise the foundations that support modern life to achieve net zero. It also means a profound shift in our collective attitude towards consumption, shifting from a linear 'use and dispose' mindset to a circular 'use, reuse and recycle' outlook.

Our technology, and the services we offer our customers, mean that JM is at the heart of this transition. We've been recycling precious metals and designing technologies that improve air quality for decades. But we recognise that we are just one part of a much larger picture. Here, we outline three of the biggest market trends with the potential to deeply affect our business over the next decade and beyond.

Decarbonising modern life			
Trend	Outlook	Opportunities and challenges	How we are responding
Sustainable fuels	<p>We need fuel to power our industries, keep people and goods moving and run our businesses and homes. Historically, the world has relied on fossil fuels, like oil, natural gas and coal, to create that fuel. But there is growing recognition that the world is on an unsustainable path, with two-thirds of people around the world now believing climate change is a global emergency.</p> <p>Governments are responding, with countries designing policy and regulation to close the 30% gap between emissions under current policies and the 1.5°C target under the Paris Agreement.</p> <p>Governments in countries that represent more than 60% of global GDP have already set themselves net zero targets. Meanwhile, many countries are also setting transport targets to phase out internal combustion engines, increase battery, electric and fuel cell vehicles, and tackle emissions in other forms of transport such as aviation, which accounts for 12% of all transport-related carbon dioxide (CO₂) emissions.</p> <p>For example, at COP26 in 2021 more than 100 governments, city authorities, car manufacturers, fleet owners, financial institutions and investors agreed to work towards zero emissions in all sales of new cars and vans by 2040. And China wants to introduce more than one million fuel cell vehicles on its roads by 2030.</p> <p>Creating more sustainable fuels will require a fundamental shift to decarbonise existing fossil-based feedstocks, introduce lower-carbon options, such as blue and green hydrogen, and develop entirely new types of fuel from alternative feedstocks, such as waste.</p> <p>Customers will need access to cost-effective catalyst technologies at scale in order to create more sustainable products.</p>	<p>According to the International Energy Association, 18% of all our energy will be made from hydrogen sources every year by 2050, preventing six gigatonnes of CO₂ entering the atmosphere. To achieve real sustainability, it must be clean hydrogen. But to do that, the world will need 35-60 times more clean hydrogen than is produced today. This is a huge challenge, but potentially represents growth opportunities for JM and our customers.</p> <p>JM is already a leader in blue hydrogen technologies, which turn traditional feedstocks into fuels for heat and power generation, industrial processes, and transport while capturing the associated CO₂.</p> <p>We are also using our expertise in platinum group metal (PGM) chemistry, catalysis and process design to design and scale up new green hydrogen technologies that can turn more sustainable feedstocks, such as renewable energy, into low-carbon fuels.</p> <p>The world will need to invest heavily in new infrastructure, particularly in CO₂ transport and storage, to help rapidly scale up blue hydrogen production. To succeed, JM and our customers will need to work in partnership and move at pace to accelerate the development and commercialisation of green hydrogen technologies.</p> <p>JM also has a significant role to play in the fuel cell market, having made fuel cell components for more than 50 years.</p> <p>This will be particularly important in helping to decarbonise heavy duty transport since fuel cells have a longer range, relatively lower weight and faster refuelling times than batteries. They also run on hydrogen, where the only by-product is water.</p> <p>The fuel cell market is growing rapidly. We believe that 5% of the world's trucks will be powered by fuel cells by 2030, rising to one-third by 2040. And in China, for example, we expect to see the market for catalyst-coated membranes to grow to more than £1 billion a year by 2030.</p>	<p>We are already involved in several large-scale blue hydrogen projects, such as HyNet in northwest England. Once online, HyNet will provide 3TWh of low-cost, low-carbon hydrogen every year for industrial, transport, domestic and business customers in the region. At the same time, it will capture and store 600,000 tonnes of associated carbon, equivalent to taking more than 250,000 petrol or diesel cars off the road. By 2030, that figure will rise to 10 million tonnes.</p> <p>Meanwhile, in May 2022, we agreed to invest €20 million in Enapter, a pioneer and commercial leader in anion exchange membrane (AEM) electrolysis. This technology promises to drive down the cost of green hydrogen towards a point at which it becomes competitive with fossil fuels.</p>

Decarbonising modern life (cont)			
Trend	Outlook	Opportunities and challenges	How we are responding
Sustainable chemicals	<p>Industry underpins economic growth but it, too, has been built on fossil fuels. This is particularly true in the chemicals industry, where oil, gas and coal provide the chemical building blocks to make other products, such as plastics, medicine and clothing.</p> <p>While demand for primary chemicals is set to grow by 25% by 2030, the industry currently accounts for 18% of the world's CO₂ emissions. So, as it grows, it must do so in ways that reduce those emissions.</p> <p>Increasingly, customers are looking to combine alternative, sustainable feedstocks, such as biomass and waste, with catalyst technologies that can turn them into useful products, such as sustainable aviation fuel.</p>	<p>For decades, JM's catalyst and process technologies have turned traditional feedstocks into synthesis gas (syngas), an essential part of the value chain for key chemical building blocks such as methanol and ammonia. In fact, we are a global market leader in the supply of syngas process technology.</p> <p>Syngas is essential in enabling the decarbonisation of chemical processes, since it can also be made from alternative, more sustainable feedstocks, such as biomass, waste and captured CO₂ using our catalyst technologies. From there, syngas can be turned into green products such as sustainable aviation fuel. In other words, the chemical processes we support today could help make the fuels of tomorrow.</p> <p>However, we still need to invest in innovation to design the next generation of advanced catalysts and demonstrate their use at scale to keep up with the rapidly developing emerging sustainable fuels market.</p> <p>That means we need to make choices about partnerships, projects and technology pathways today when it is not yet clear which partners and technologies will be most successful.</p> <p>The industry will also need to invest heavily in existing chemical infrastructure to enable the switch to new feedstocks.</p>	<p>We are a partner in Chile's Haru Oni project, which will become the world's first large-scale commercial plant producing climate-neutral e-methanol and e-gasoline from green hydrogen and CO₂ recovered by direct air capture. JM is licensing methanol technology and supplying the engineering, catalyst and equipment for the project. By 2026, the plant will produce 550 million litres of e-fuels, enough for approximately 220,000 gasoline vehicles.</p> <p>In May 2022, our co-developed Fischer Tropsch (FT) CANS™ technology and HyCOgen™ technology were selected for use by Aramco and Repsol at a new synthetic fuels plant in Bilbao, Spain. The plant will be commissioned in 2024 and make a sustainable synthetic drop-in fuel that can be blended for existing road vehicle engines, planes and ships.</p>
Creating a circular economy			
There is growing recognition that the world needs to move from a linear to a circular system, where recycling and reuse are incorporated into products while still on the drawing board.			
Trend	Outlook	Opportunities and challenges	How we are responding
Designing for recycling and reuse	<p>Designing products in ways that make it easier to recycle and reuse their constituent parts is especially important given how much of our modern world – from smart phones to electric vehicles – depends on scarce metals such as platinum and cobalt.</p> <p>Customers have relied on our recycling skills for centuries and will continue to need our expertise, particularly since the PGMs recycling industry is expected to grow annually by 3-5%.</p>	<p>JM has a significant market share of the global PGM recycling business, with 99.95% purity. And since the amount of carbon embedded in an ounce of recycled PGM is 50 times lower than newly mined PGM, there is significant opportunity to use our recycling skills to help the world achieve net zero without damaging economic growth.</p> <p>We can apply our longstanding recycling expertise to emerging PGM technologies, including fuel cell and electrolyser stacks to help enable the hydrogen economy. We're investing in our infrastructure and developing our processes to further strengthen those capabilities, so that when fuel cell stacks and hydrogen electrolysers reach their end of life, we will be ready to efficiently recover and refine the PGMs to a very high purity – just as we do today with production scrap. These critical materials can then be reused, creating an endless loop of PGM availability.</p>	<p>Because JM operates in different parts of the value chain, we understand the full life cycle of our products. That means we can design them in a way that makes it more efficient to recycle, and refine them at the end of their life.</p>
Cleaner air, healthier people			
Today, 50% of the global population live in urban centres. By 2050, that's expected to hit 70%. In the EU alone, lorries, buses and coaches represent around one-quarter of all road transport emissions. Countries and regions are setting ever more stringent air quality regulations.			
Trend	Outlook	Opportunities and challenges	How we are responding
Tackling air quality issues caused by rising urbanisation	<p>Increasing urbanisation is likely to put even more pressure on local air quality, which is why countries and regions are setting ever more stringent air quality regulations.</p> <p>Customers need us to design the next generation of emission control technologies so that they are ready to meet local standards as soon as they come into force.</p>	<p>It simply isn't possible to switch the world's transport system to more sustainable fuels overnight, and we know that regions like the European Union plan to introduce tougher air quality legislation over the next few years. What's more, automotive catalysts may still be needed even as alternative fuel sources, such as biofuels and hydrogen, grow in stature.</p> <p>So there is enormous potential for our Clean Air business to help reduce emissions further and keep growing over the next decade.</p> <p>That said, we are likely to see demand for existing autocatalysts in light duty vehicles fall over the longer term, as the world's transport systems begin to make the transition to lower-carbon options. This will eventually have an impact on our Clean Air business.</p>	<p>Today, one in three cars carries JM's emission control technology. And we continue to invest and innovate to ensure that our technologies help customers meet new legislation. For example, our latest technology for heavy duty vehicles ensured customers were ready for China's tough new NO_x emissions standard which came into force in July 2021 (see page 39 for more information on this).</p>

Chief Financial Officer's review

“My first full year at Johnson Matthey has certainly brought a lot of challenge and unexpected surprises – with difficult portfolio choices and the need to react to highly volatile global markets.”



Of course, the challenge of transforming Johnson Matthey is why I joined the company, and I remain just as optimistic – if not more so – about our future as the day I started in April last year. However, the scale of the opportunity ahead has only increased the urgency with which we must commercialise our science and technology. And the need to transform our business is even more pressing than I had first anticipated.

Battery Materials exit: a difficult decision

That urgency has meant some tough decisions this year. The biggest was exiting our Battery Materials business. I am acutely aware of the detrimental impact that this has had on JM's value, our shareholders and our employees. Because of that impact, I and other members of our leadership team will see a clawback in our incentive package.

While not an easy decision, exiting Battery Materials was absolutely necessary to protect JM's future. Last autumn, we carried out a detailed review of the business, with support from the board and in advance of several critical investment milestones. Together, we

concluded that the potential returns from Battery Materials were not adequate for us to justify further investment.

What became very clear during that review is that the transition to electric vehicles was accelerating faster than JM had envisaged, bringing with it rapid commoditisation of battery materials. Car manufacturers are looking for the cheapest technology, giving bulk chemicals manufacturers the biggest advantage.

JM is not a bulk speciality chemicals business; our heritage in PGM chemistry, catalysis and process design means we work best when focused on high value, complex solutions. This exposed JM's lack of commercial experience and ability to execute large-scale capital projects.

This has been a humbling experience for everyone at JM and we have learned some tough, necessary and valuable lessons. Not least, the urgent need to strengthen our commercial focus and simplify our portfolio so that we can focus on the markets where we have a right to win.

In addressing this through the exit of Battery Materials announced in November 2021, and subsequently the sale of our non-core Health

business in December, we began to set JM on the path that our new Chief Executive, Liam, has developed through the strategic review, laid out in his statement on pages 4 to 9. We are moving quickly to execute that strategy, simplify JM and restore the lost value and trust for all our stakeholders.

We have made progress since deciding to exit, with announcements in May 2022 that Nano One will acquire 100% of the shares in Johnson Matthey Battery Materials Canada and that we have agreed to sell part of the Battery Materials business to EV Metals Group for £50 million cash. JM will also receive a minority stake in EV Metals Group to help capture future upside in this market.

Robust results despite external challenges

Turning to our financial performance this year. JM has delivered a robust set of results, with group underlying operating profit from continuing operations of £553 million.

But it has been a financial year of two halves – a strong recovery in the first six months, offset by a weaker second half with the effects of automotive supply chain disruption in Clean Air. The performance of Health was particularly disappointing, affected by pricing pressure and acute labour shortages. This reduced the value we received on selling the business, and why, like Battery Materials, we have retained a 30% minority stake to benefit from future upside.

Our Clean Air business saw a partial recovery in demand, with sales up 5% and operating profit up 17% as we benefited from improved volumes and our efficiency programme.

A strong recovery in the automotive sector early in the year was later hampered by a global shortage in semi-conductor chips that has severely limited vehicle production.

While supply chains are adjusting to this challenge, the early effects of the impact of Russia's war in Ukraine and COVID-19-related lockdowns in China are now affecting the business.

Despite all this, Clean Air saw strong cash generation of around £800 million which we used to reduce metal leases and increase metal holdings to ensure security of supply for our customers in these volatile times.

We saw a good performance in our Efficient Natural Resources (ENR) division, with sales up 9% and operating profit up 33%. This was primarily driven by higher PGM prices, and a good operating performance in our refineries. Catalyst Technologies (CT) saw continued recovery in sales and has an exciting pipeline of opportunities in sustainable fuels, blue hydrogen and other low-carbon solutions that will drive future growth.

In our Other Markets division, we saw sales of £25 million in our Hydrogen Technologies business. This was lower than in previous years because we are diverting capacity to qualifying products for new customers. We are working hard to install additional capacity and scale the business to meet rapidly increasing customer demand for our technologies.

Turning to the work we've done this year to drive down internal costs, I am pleased to see that we continued to make good progress here and also to reduce our working capital. This is thanks, in particular, to the teams in Clean Air and our PGM refineries. We delivered £87 million in efficiency savings in the year from a total annualised programme target of £100 million excluding Health, by 2023/24. Reduced working capital led to lower than expected net debt of around £856 million and we ended the year with a strong balance sheet, and with free cash flow of £221 million.

We expect the sale of Health to complete in May and we recently announced the sale of our Battery Materials assets, which closes the chapter to exit that business. We also completed the sale of our Advanced Glass Technologies business (AGT) in January 2022 for a total consideration of £178 million. The combined exits from Health and Battery Materials have resulted in a significant and painful one-off loss of £363 million (£325 million impairment and £38 million restructuring charge). This has been partially offset by the gain on sale of AGT of £106 million, and £42 million of one-off net benefits from legal settlements. We also recorded combined impairment and restructuring charges of £77 million in relation to our exposures in Russia and a lower than expected value of our Diagnostic Services business.

We now have a focused portfolio comprising our four key businesses, Clean Air, Catalyst Technologies, Hydrogen Technologies, and PGM Services, that will be supported by streamlined corporate functions.

Drawing on our strengths to restore value and trust

This combination of simplified portfolio and strong balance sheet are essential for us to restore JM's value, build back shareholder trust and realise the full potential of our businesses. As Liam mentions, JM's expertise means we already have many of the technologies that the world needs to decarbonise at speed. That gives us a distinct competitive advantage. Indeed, we are already market leaders in many of our chosen technologies, and we see opportunities to scale our growth businesses with levels of capital intensity and returns that JM is familiar with.

As I mentioned at the start, the speed and scale at which we need to transform in order to realise these opportunities is even greater than I anticipated when I joined. We need to work quickly to build our commercial muscle, strengthen our ability to scale capital projects, further reduce our cost base and transform our culture.

I continue to be hugely impressed by the quality of our people and I have inherited a fantastic team. Together, we are already making good progress to help create a more efficient, high-performing culture. In my direct areas of finance and IT, we continue to invest to upgrade our processes and systems, and in 2022 we launched our new digital HR platform. This is a big milestone in our transformation as it will give us better data to help us run our businesses effectively, understand and manage our people's strengths and gaps, and simplify the way we work together. We still have further work to do to upgrade our systems and processes in other areas of the business.

A challenging, but exciting year ahead

As we execute our strategy and transform our culture over the coming months, we must do so while continuing to navigate ongoing global political and economic uncertainty. The combination of combating inflation, the ongoing effects of COVID-19 and the effects of Russia's war in Ukraine are likely to make the next 12 months just as challenging for JM as the previous 12 months.

Nonetheless, I truly believe JM is entering an exciting new era. We have a once-in-a-lifetime opportunity to transform our company and play a leading role in the journey to net zero. We have a lot of work ahead of us, but I am as excited as I was on the day I joined to play my part.

Stephen Oxley
Chief Financial Officer

Financial performance review

		Reported results			Underlying results (continuing) ^{1,2}			
		Year ended 31 st March		% change	Year ended 31 st March		% change	% change, constant FX rates
		2022	2021 ²		2022	2021 ²		
Revenue	£m	16,025	15,435	+4				
Sales excluding precious metals ⁴	£m				3,778	3,685	+3	+5
Operating profit	£m	255	309	-17	553	473	+17	+21
Profit before tax	£m	195	224	-13	493	388	+27	
Profit after tax (continuing)	£m	116	194	-40	407	326	+25	
(Loss) / profit after tax (discontinued)	£m	(217)	11	n/a				
(Loss) / earnings per share	pence	(52.6)	106.5	n/a	213.2	168.9	+26	
Ordinary dividend per share	pence	77.0	70.0	+10				

Underlying performance – continuing operations^{1,2,3}

- Robust underlying results for 2021/22, in line with market expectations⁵
- Sales of £3.8 billion, up 5%, driven by a partial recovery in Clean Air and good performance in Efficient Natural Resources
- Underlying operating profit of £553 million, up 21%, driven by good performance in Clean Air and Efficient Natural Resources, higher average PGM prices and efficiencies
- Underlying earnings per share up 26% due to stronger operational results and lower net finance charges
- Free cash flow of £221 million, moderately down on the prior year
- Strong balance sheet with net debt of £856 million reflecting continued strong management of working capital; net debt to EBITDA of 1.2 times

Reported results²

- Revenue up 4% primarily driven by higher average precious metal prices
- Operating profit declined 17% to £255 million, largely reflecting the one-off impairment and exit costs for Battery Materials
- Profit before tax declined 13% to £195 million, reflecting lower operating profit which was largely impacted by the one-off impairment in Battery Materials
- Loss after tax on discontinued operations of £217 million including Health underlying operating profit of £3 million and an impairment and restructuring charge of £242 million relating to its sale that is expected to complete at the end of May
- Reported loss per share of 52.6 pence
- Cash inflow from operating activities of £605 million (2020/21: £769 million)
- Ordinary dividend of 77.0 pence per share, up 10%
- Share buyback of £200 million now complete

Notes:

1. Underlying is before profit or loss on disposal of businesses, gain or loss on significant legal proceedings together with associated legal costs, amortisation of acquired intangibles, major impairment and restructuring charges and, where relevant, related tax effects. For definitions and reconciliations of other non-GAAP measures, see pages 210 to 213.
2. 2020/21 is restated to reflect the group's updated reporting segments and removal of inter-segment copper zeolite sales in Efficient Natural Resources as well as the classification of Health as a discontinued operation.
3. Unless otherwise stated, sales and operating profit commentary refers to performance at constant exchange rates. Growth at constant rates excludes the translation impact of foreign exchange movements, with 2020/21 results converted at 2021/22 average rates. In 2021/22, the translational impact of exchange rates on group sales and underlying operating profit was an adverse impact of c.£101 million and c.£17 million respectively.
4. Revenue excluding sales of precious metals to customers and the precious metal content of products sold to customers.
5. Vara consensus for full year group underlying operating profit in 2021/22 was £545 million (range: £532 million to £561 million) as at 25th May 2022. 2020/21 group underlying operating profit was £504 million.

Reporting structure changes

To provide greater transparency and reflect how we manage our businesses, we are changing our reporting structure for 2022/23. Under this basis, we have provided sales and underlying operating profit for 2021/22 and 2020/21 below:

Sales (£ million)	2022	Year ended 31 st March 2021 ¹	% change, constant FX rates
Clean Air	2,457	2,412	+5
PGM Services	587	531	+13
Catalyst Technologies	454	443	+5
Hydrogen Technologies	25	41	-39
Value Businesses ¹	280	274	+8
Eliminations	(99)	(113)	
Total sales (adjusted)	3,704	3,588	+6
Adjustments ²	236	334	
Total sales	3,940	3,922	+3

Underlying operating profit (£ million)	2022	Year ended 31 st March 2021 ¹	% change, constant FX rates
Clean Air	302	269	+17
PGM Services	308	244	+28
Catalyst Technologies	50	32	+67
Hydrogen Technologies	(33)	1	n/a
Value Businesses ¹	18	5	+260
Corporate	(86)	(73)	
Total operating profit (adjusted)	559	478	+21
Adjustments ³	(3)	26	
Total operating profit	556	504	+14

Notes:

- Includes Battery Systems, Medical Device Components and Diagnostic Services.
- Sales adjustments reflect removal of Health (2021/22: £162m, 2020/21: £237m), Advanced Glass Technologies (2021/22: £62m, 2020/21: £66m), Battery Materials (2021/22: £12m, 2020/21: £14m) and Other – Water and Atmosphere Control Technologies (2021/22: nil, 2020/21: £17m).
- Underlying operating profit adjustments reflect removal of Health (2021/22: £3m, 2020/21: £31m), Advanced Glass Technologies (2021/22: £16m, 2020/21: £17m), Battery Materials (2021/22: -£22m, 2020/21: -£23m) and Other – Water and Atmosphere Control Technologies (2021/22: nil, 2020/21: £1m).

Summary of underlying operating results from continuing operations

Unless otherwise stated, commentary refers to performance at constant rates. Percentage changes in the tables are calculated on rounded numbers

Sales (£ million)	2022	Year ended 31 st March 2021 ¹	% change	% change, constant FX rates
Clean Air	2,457	2,412	+2	+5
Efficient Natural Resources	1,041	974	+7	+9
Other Markets	379	412	-8	-4
Eliminations	(99)	(113)		
Sales (continuing)	3,778	3,685	+3	+5
Health (discontinued)	162	237		-29
Total sales	3,940	3,922	-	+3

Underlying operating profit (£ million)	2022	Year ended 31 st March 2021 ¹	% change	% change, constant FX rates
Clean Air	302	269	+12	+17
Efficient Natural Resources	358	276	+30	+33
Other Markets	(21)	1	n/a	n/a
Corporate	(86)	(73)		
Underlying operating profit (continuing)	553	473	+17	+21
Health (discontinued)	3	31		-90
Total underlying operating profit	556	504	+10	+14

Reconciliation of underlying operating profit (continuing) to operating profit (£ million)	2022	Year ended 31 st March 2021 ¹
Underlying operating profit (continuing)	553	473
Profit on disposal of businesses	106	-
Gains and losses on significant legal proceedings ²	42	-
Amortisation of acquired intangibles	(6)	(10)
Major impairment and restructuring charges ²	(440)	(154)
Operating profit	255	309

Notes:

- 2020/21 is restated to reflect the group's updated reporting segments and removal of inter-segment copper zeolite sales in Efficient Natural Resources as well as the classification of Health as a discontinued operation.
- For further detail on these items please see page 169.

Clean Air

Sales up driven by a partial recovery in demand

- Sales were up 5% driven by a partial recovery in demand, although volumes were constrained by supply chain disruption, principally shortages of semi-conductor chips
- Underlying operating profit increased 17%. Margins increased driven by operational leverage and benefits from our transformation programme, but were held back by the impact of chip shortages and inflation
- Strong cash generation of around £800 million in the year¹

	Year ended		% change	% change, constant FX rates
	2022 £ million	2021 £ million		
Sales				
Light duty diesel	1,005	1,017	-1	+2
Light duty gasoline	574	624	-8	-7
Heavy duty diesel	878	772	+14	+17
Total sales	2,457	2,412	+2	+5
Underlying operating profit	302	269	+12	+17
Underlying margin	12.3%	11.2%		
Reported operating profit	273	165		

A partial recovery in demand, still impacted by supply chain disruption

Clean Air provides catalysts for emission control after-treatment systems used in light and heavy duty vehicles powered by internal combustion engines.

Sales were up 5%, supported by increased activity in autos due to a partial recovery in demand. This was driven by heavy duty diesel and to a lesser extent by light duty diesel, with a decline in light duty gasoline. However, supply chain disruption and semi-conductor shortages continue to act as a constraint on vehicle production and this was more pronounced during the second half. This, in combination with strong demand in the second half of last year resulted in 2H sales being 9% lower year-on-year.

We are making good progress on our Clean Air transformation programme. We are continuing to rebalance production into our most efficient plants (notably from the UK into Poland and Macedonia) and have started manufacturing at our site in India, the last of our new highly efficient plants to be completed.

We remain focused on driving efficiency and cash generation across our Clean Air operations, having generated around £800¹ million of cash this year. We have a plan to deliver at least £4 billion of cash by 2030/31² and remain confident in the significant profitability and cash generation of the business beyond this period. We continued to win the Euro 7 and equivalent business we have targeted and remain positive on our bidding for further platforms to meet this legislation.

Light duty catalysts – diesel and gasoline

Light duty diesel

In light duty diesel global sales were slightly up, outperforming the overall light duty diesel market. We saw good performance in the Americas and Asia, offset by a weak European market which represents around 65% of our total light duty diesel sales. In both the Americas and Asia, we saw strong sales growth ahead of the market as we won new business. In Europe, sales declined due to the weak market, although we benefited from a favourable platform mix.

Light duty gasoline

Global sales in light duty gasoline were down 7% with declines across all regions, underperforming the overall light duty gasoline market due to the impact of previous platform losses in Europe and the Americas. We have been investing in light duty gasoline to support future platform wins and are confident our technology and commercial offering is now competitive.

Heavy duty diesel catalysts

Heavy duty diesel sales grew 17% during the year, in line with the overall market, with double-digit growth across all regions. In the Americas, we saw strong sales growth in line with market production driven by a cyclical recovery in the US Class 8 truck cycle. In Europe, heavy duty sales growth outperformed market production, benefiting from a favourable platform mix. In Asia, sales grew strongly in a market that declined, supported by market share gains and increased value per vehicle due to tighter legislation in China.

Underlying operating profit

Underlying operating profit increased 17% and margin increased to 12.3%, driven by operational leverage and benefits from our transformation programme, but were held back by the impact of chip shortages and inflation.

Notes:

1. Delivered around £800 million of cash at actual precious metal prices, which equates to just over £600 million at constant prices (March 2021).
2. At least £4 billion of cash under our range of scenarios from 1st April 2021 to 31st March 2031. Cash target pre-tax and post restructuring costs.

Efficient Natural Resources

Good performance driven by PGM Services and recovery in Catalyst Technologies

- Good performance with sales up 9%. PGM Services grew strongly primarily benefiting from higher average precious metal prices. Catalyst Technologies also grew driven by higher refill catalysts across industrial and consumer, principally in methanol
- Underlying operating profit up 33% and margin expanded 6.1 percentage points driven by strong growth in PGM Services

	Year ended 31 st March		% change	% change, constant FX rates
	2022 £ million	2021 ¹ £ million		
Sales				
PGM Services	587	531	+11	+13
Catalyst Technologies	454	443	+2	+5
Total sales	1,041	974	+7	+9
PGM Services	308	244	+26	+28
Catalyst Technologies	50	32	+56	+67
Underlying operating profit	358	276	+30	+33
Underlying margin	34.4%	28.3%		
Reported operating profit	385	250		

1. Restated following change to reporting segments and removal of inter-segment Copper Zeolites sales.

PGM Services

PGM Services is the world's largest secondary recycler of platinum group metals (PGMs). This business has an important role in enabling the energy transition through providing circular solutions as demand for scarce critical materials increases. PGM Services also provides a strategic service to the group, supporting Clean Air, Catalyst Technologies and Hydrogen Technologies with security of metal supply in a volatile market.

Strong growth, benefiting from good performance in our refining business

Sales grew 13% reflecting good performance in our refining business primarily benefiting from higher average PGM prices. Sales were partly offset by reduced activity in our trading business which had a strong prior year.

Across our other businesses, performance was good. Life Science Technologies, which provides advanced PGM based catalysts to the pharmaceutical and agricultural chemicals markets, performed strongly reflecting new product launches from our customers.

Refining backlogs remain at low levels

Refinery backlogs remain at low levels, which reflects our continued strong operational focus and efficient management of precious metal working capital. This supports the group's balance sheet efficiency.

Catalyst Technologies

Catalyst Technologies is focused on enabling the decarbonisation of chemical value chains and we have leading positions in syngas: methanol, ammonia, hydrogen and formaldehyde. Catalyst Technologies serves three key end markets: industrial and consumer, traditional fuels and the nascent sustainable fuels market. Our revenue streams comprise refill catalysts, first fill catalysts and licensing income. In the year, sales were up 5% primarily driven by higher demand for refill catalysts.

Industrial and consumer: good growth in refills, particularly methanol

Industrial and consumer includes our methanol, ammonia, formaldehyde offerings as well as the majority of our licensing business. Overall, sales in industrial and consumer were up in the period and, within that, refill catalysts grew double digit. This largely reflected higher demand in methanol where we benefited from a pick-up in market demand.

Licensing and first fill sales, which are driven by the start-up of new plants and are lumpy by nature, were lower following particularly strong performance in the prior year in ammonia and oxalcohols.

Traditional fuels: refills and additives flat

Traditional fuels includes our refining additives, hydrogen and natural gas purification offerings. Refills and additives, which make up the majority of sales in this segment, were flat. First fill sales were down, largely driven by hydrogen where we saw strong performance in the prior year as new plants came on stream.

Sustainable fuels: first sales relating to new sustainable technologies

We are developing new technologies to enable the new, fast-growing sustainable fuels markets which include our blue hydrogen, sustainable fuels and low carbon solutions offerings. Although small in value at this stage, sales were supported by the supply of the first methanol catalyst for the Haru Oni project in Chile, the world's first integrated and commercial large-scale plant to produce climate neutral e-methanol and e-gasoline from wind power. In addition, we also supplied the first catalyst used by our Fischer Tropsch (FT) CANST™ technology to Fulcrum for one of the world's first plants for the production of sustainable fuel from municipal solid waste.

Pipeline of future opportunities – driving growth from sustainable technologies

Licensing activity remains good and we signed four new licences in the period (2020/21: nine licences)¹. We are working with customers on a number of future opportunities focused on our decarbonisation technology, including sustainable aviation fuel, blue hydrogen and low carbon solutions. Across these exciting growth areas, we have a strong and growing pipeline with more than 70 potential projects.

Underlying operating profit

Underlying operating profit up 33% and margin expanded 6.1 percentage points, primarily driven by strong growth in PGM Services.

- PGM Services was up 28%, benefiting from higher average PGM prices (c.£45 million), partly offset by reduced activity in our trading business.
- In Catalyst Technologies, profit grew 67%, primarily reflecting a recovery in our refill catalyst business, as well as the absence of one-off impairments recognised in the prior year. Towards the end of the year, we saw an impact from the cessation of our activities in Russia. We expect the loss of business into Russia to have a c.£10 million impact year-on-year on Catalyst Technologies operating profit in 2022/23.

Other Markets

Investing to support growth in Hydrogen Technologies whilst driving value from non-core businesses

- Performance in Hydrogen Technologies reflected increased investment to support growth and manufacturing constraints as we scale up the business and utilised capacity to qualify new customer products
- Completed the sale of Advanced Glass Technologies on 31st January 2022 for a total consideration of £178 million
- Shortly completing our exit from our Battery Materials business

	Year ended		% change	% change, constant FX rates
	2022 £ million	2021 ¹ £ million		
Sales				
New Markets	37	55	-33	-33
Value Businesses	342	357	-4	+1
Total sales	379	412	-8	-4
New Markets	(55)	(22)	n/a	n/a
Value Businesses	34	23	+48	+55
Underlying operating loss	(21)	1	n/a	n/a
Underlying margin	-5.5%	0.2%		
Reported operating loss	(309)	(9)		

1. Restated following change to reporting segments.

Notes:

1. 2020/21 and 2021/22 numbers exclude low value licences.

New Markets

In the year, New Markets comprised Hydrogen Technologies (Fuel Cells and Green Hydrogen) and Battery Materials. In Hydrogen Technologies, we provide catalyst coated membranes that are essential for fuel cells and green hydrogen electrolyzers.

New Markets sales decreased 33% in the period. We are experiencing manufacturing constraints in Hydrogen Technologies as we scale up the business and utilise capacity for new customer qualification. Work is ongoing to expand our manufacturing capacity in the UK and China with the first phase expected to commence production in early 2023. In Green Hydrogen, we are commercialising at pace and generated our first sales in April 2022.

We are shortly completing our exit from Battery Materials and have impaired the carrying value of the assets to fair value, and communicated associated exit costs net of anticipated proceeds from asset sales. Together, these resulted in an exceptional item outside underlying operating profit of £363 million.

Value Businesses

Value Businesses is managed to drive shareholder value from activities considered to be non-core to JM, and comprises Battery Systems, Medical Device Components and Diagnostic Services. Advanced Glass Technologies was divested during the year.

Sales were broadly flat¹ in the period. We saw good sales performance in Medical Devices and Diagnostic Services which benefited from actions taken to drive improved business performance as well as improved demand following COVID-19. This was offset by weaker sales in Battery Systems, which was impacted by the global shortage of semi-conductor chips.

Underlying operating loss

Other Markets reported an underlying operating loss of £21 million, reflecting an operating loss of £55 million in New Markets partially offset by an operating profit of £34 million in Value Businesses.

Within New Markets, we accelerated our investment in the scale up of Hydrogen Technologies during the period resulting in loss for that business of £33 million. Battery Materials operating losses were £22 million.

Corporate

Corporate costs were £86 million, an increase of £13 million from the prior period, primarily due to building capability across our group functions and upgrading our core IT systems, as well as an increase in the pension service cost.

Notes:

1. The sale of Advanced Glass Technologies was completed on 31st January 2022. On a continuing basis (excluding Advanced Glass Technologies and other divested businesses in 2020/21 from both 2020/21 and 2021/22), sales in Value Businesses increased 8%.

Discontinued operations: Health

Performance impacted by lower demand and pricing pressure in Generics, US labour shortage and supply chain constraints

- Sale of Health to Altaris Capital Partners agreed on 17th December 2021, with the transaction expected to complete at the end of May
- Performance impacted by lower demand and pricing pressure in opioid analgesics (Generics), labour shortages in the US pharma market and global supply chain constraints

	Year ended 31 st March		% change	% change, constant FX rates
	2022 £ million	2021 £ million		
Sales				
Generics	77	146	-47	-46
Innovators	86	91	-5	-1
Total sales	163	237	-31	-29
Underlying operating profit (discontinued)	3	31	-90	-90
Underlying margin (discontinued)	1.8%	13.1%		
Reported operating (loss) / profit	(239)	14		

Update on sale to Altaris Capital Partners

On 17th December 2021, we announced the sale of Health to Altaris Capital Partners. The transaction is expected to complete at the end of May. As previously announced, we will retain approximately a 30% equity stake in the business. We have recorded a major impairment and restructuring charge of £242 million based on the amount expected to be recovered through the sale.

Sales performance

Overall sales were down 29% in the period, driven by weaker performance in Generics. Within **Generics**, sales of opioid addiction therapies decreased reflecting lower demand and pricing pressure in the US as the market genericises, whilst demand for opioid analgesics was impacted by the postponement of elective medical procedures. In addition, we saw manufacturing delays in some areas due to US labour shortages and supply chain constraints. **Innovators** sales were broadly flat in the year, with sales constrained by labour and raw material shortages in the US which negatively impacted our operations.

Underlying operating profit (discontinued)

Underlying operating profit declined 90%, reflecting weaker sales in Generics and manufacturing challenges in both businesses due to temporary US labour market shortages and supply chain disruption.

Financial review – continuing operations

Research and development (R&D)

R&D spend (excluding Health) was £201 million in the year, including £22 million of capitalised R&D. This was up from £185 million in the prior period and represents c.5% of sales excluding precious metals. The increase was mainly due to investment in Hydrogen Technologies as we commercialise our fuel cell and green hydrogen offerings, as well as continued investment in our Clean Air business ahead of new emissions regulations. Investment in Battery Materials, which was largely capitalised, also drove the increase in spend in the year.

Foreign exchange

The calculation of growth at constant rates excludes the impact of foreign exchange movements arising from the translation of overseas subsidiaries' profit into sterling. The group does not hedge the impact of translation effects on the income statement. The principal overseas currencies, which represented 78% of the non-sterling denominated underlying operating profit in year ended 31st March 2022, were:

	Share of 2021/22 non-sterling denominated underlying operating profit	Average exchange rate Year ended 31 st March		% change
		2022	2021	
US dollar	30%	1.36	1.31	+4
Euro	29%	1.18	1.12	+5
Chinese renminbi	19%	8.75	8.85	-1

For the year, the impact of exchange rates decreased sales by £101 million and underlying operating profit by £17 million.

If current exchange rates (£:\$ 1.23, £:€ 1.18, £:RMB 8.31) are maintained throughout the year ending 31st March 2023, foreign currency translation will have a positive impact of approximately £25 million on underlying operating profit. A one cent change in the average US dollar and euro exchange rates each have an impact of approximately

£1 million and £2 million respectively on full year underlying operating profit, and a ten fen change in the average rate of the Chinese renminbi has an impact of approximately £1 million.

Efficiency savings

Our efficiency programme in relation to the consolidation of our Clean Air manufacturing footprint and the implementation of a new group operating model, which targeted savings of £100 million per annum (excluding Health) by 2023/24, is now largely complete.

£ million	Delivered to 2020/21	Delivered in 2021/22 ¹	Annualised benefits by 2023/24 ²
Total active efficiency programmes	37	87	100

Following the strategic review, we have now commenced our new group transformation programme as part of which we expect to deliver further efficiencies of £150 million by 2024/25. Associated costs to deliver the programme – all of which are cash – are around £100 million.

Notes:

1. Savings achieved in 2021/22 exclude £7 million relating to Health.
2. Annualised benefits by 2023/24 exclude £10 million relating to Health.

Items outside underlying operating profit

Non-underlying charge/income (£ million)	As at 31 st March 2022	As at 31 st March 2021
Major impairments and restructuring	(440)	(154)
Battery Materials	(363)	–
Russia – Ukraine conflict	(32)	–
Diagnostic Services	(45)	–
Gains and losses on significant legal proceedings	42	–
Disposal of Advanced Glass Technologies	106	–
Amortisation of acquired intangibles	(6)	(10)
Total	(298)	(164)

Major impairment and restructuring costs

Following the announcement of our intention to exit our Battery Materials business we have impaired the carrying value of the assets to fair value and communicated associated exit costs, which is net of anticipated proceeds from asset sales. Together, these resulted in an exceptional item outside underlying operating profit of £363 million.

As announced on 7th March 2022, we discontinued with immediate effect all new commercial activities in Russia and Belarus in light of the ongoing conflict with Ukraine. Our operations in Russia include a small Clean Air manufacturing plant, and a small Catalyst Technologies office. We have fully impaired the assets associated with both businesses resulting in a charge of £32 million.

As part of our annual impairment testing of goodwill, we updated our long-term market assumptions for the oil and gas industry in which Diagnostic Services serves its customers.

The growth rate and discount rate assumptions for Diagnostic Services have also been updated to reflect the faster paced transition to non-carbon intensive industries and the simplification of our portfolio to focus on core markets. This resulted in an impairment to goodwill of £45 million.

Gains and losses on significant legal proceedings

During the period, the group recognised a net gain of £42 million largely reflecting damages and interest from a company found to have unlawfully copied one of JM's technology designs.

Disposal of Advanced Glass Technologies

On 31st January 2022, the group completed the sale of its Advanced Glass Technologies business for a total consideration of £178 million and recognised a non-underlying gain of £106 million.

Discontinued operations – Health

We announced the sale of Health on 17th December 2021 to Altaris Capital Partners. The expected proceeds fair value less costs to sell is £272 million leading to an impairment to Health's net assets of £228 million. The non-underlying impairment has been recognised in 2021/22 upon reclassing Health to 'held for sale' and discontinued operations. Non-underlying transaction and separation costs of c.£14 million have been incurred and expensed in the current year.

Finance charges

Net finance charges in the period amounted to £60 million, down from £85 million last year. Finance costs on metal borrowings have decreased due to lower metal borrowings and the focus across the group on reducing precious metal working capital.

Taxation

The tax charge on underlying profit before tax for the year ended 31st March 2022 was £86 million, an effective underlying tax rate of 17.4%, slightly up from 16.3% in 2020/21.

The effective tax rate on reported loss for the year ended 31st March 2022 was 56.4%, from 13.9% in the prior period. This represents a tax charge of £57 million, compared with £33 million in the prior year. The increased effective rate is due to major impairments and disposals arising in the year where no tax relief is available.

We currently expect the tax rate on underlying profit for the year ending 31st March 2023 to be around 19%, and then increase progressively to around 21% by 2024/25 reflecting rising corporate tax rates.

Post-employment benefits

IFRS – accounting basis

At 31st March 2022, the group's net post-employment benefit position, excluding bond assets held in a special purpose vehicle, was a surplus of around £283 million.

The cost of providing post-employment benefits in the year was £62 million, down from £65 million last year. The prior year charge included a £3 million credit, compared to a £11 million credit this year.

Capital expenditure

Capital expenditure (excluding Health) was £446 million in the year, 2.6 times depreciation and amortisation (excluding amortisation of acquired intangibles). In the period, projects included:

- In Efficient Natural Resources, investing to increase the resilience and capacity of our PGM refining assets
- Development and commercialisation of eLNO, our portfolio of high nickel cathode materials within Battery Materials
- Upgrading our core IT business systems

Strong balance sheet

Net debt (excluding Health) at 31st March 2022 was £856 million, an increase from £770 million from 31st March 2021. Net debt is £25 million higher at £881 million when post tax pension deficits are included. The group's net debt (including post tax pension deficits) to EBITDA was 1.2 times (31st March 2021: 1.3 times), slightly below our target range of 1.5 to 2.0 times.

We use short-term metal leases as part of our mix of funding for working capital, which are outside the scope of IFRS 16 as they qualify as short-term leases. These amounted to £140 million as at 31st March 2022 (31st March 2021: £437 million).

Free cash flow and working capital

Free cash flow was £221 million in the year, compared to £295 million in the prior period, largely reflecting a non-precious metal working capital outflow.

Excluding precious metal, average working capital days to 31st March 2022 decreased to 36 days compared to 45 days to 31st March 2021. The prior period was higher due to the lower average sales volume through the period.

Outlook for the year ending 31st March 2023

For 2022/23, we are facing a period of greater political and economic uncertainty with a combination of factors that may affect the year ahead. Our performance for the full year will continue to correlate closely to levels of auto production and precious metal prices.

In Clean Air, although end customer demand remains robust, there continues to be supply chain disruption affecting many of our automotive customers constraining their production volumes, most recently with COVID-19 lockdowns in China and sourcing components from Ukraine. We expect conditions to ease through the year and Clean Air performance to improve with levels of auto production, although visibility remains low. For the year 2022/23 external data currently suggests auto production will be 5% higher than 2021/22. In this scenario, we would anticipate Clean Air operating performance to be broadly in line with 2021/22 with cost inflation being offset by further efficiencies. Clean Air has a flexible cost base, enabling us to manage different levels of activity, with around 75% of costs before mitigation being variable.

PGM Services continues to benefit from relatively high and volatile precious metals prices, albeit current prices are slightly below the prior year. If they were to remain at their current level¹ for the rest of this year, we would expect the adverse impact on the full year to be around £25 million². We are also expecting slightly lower refinery intake volumes due to lower scrap levels with the semi-conductor chip shortage supporting a buoyant second-hand car market.

Catalyst Technologies end markets remain robust. As reported previously, we have limited operations in Russia representing around only 1% of group sales and a slightly higher proportion of group operating profit, mainly in Catalyst Technologies. The profit impact in Catalyst Technologies in 2022/23 of c.£10 million will be compensated by new business elsewhere thereafter.

In Hydrogen Technologies we are investing to enable us to scale at pace, to capture value from the significant opportunities rapidly growing hydrogen markets present. Consequently, we expect a larger operating loss in 2022/23.

At current foreign exchange rates³, translational foreign exchange movements for the year ending 31st March 2023 are expected to benefit underlying operating profit by around £25 million.

As a result, whilst visibility is low and the outcome for the year remains uncertain, we currently expect operating performance to be in the lower half of the consensus range.⁴

Longer term, we expect the current geopolitical situation to drive a significant acceleration towards a net zero carbon economy, with corresponding investment to position us strongly for significant growth opportunities from our sustainable technology portfolio.

Dividend and share buyback

The board will propose a final ordinary dividend for the year of 55.0 pence at the Annual General Meeting on 21st July 2022. Together with the interim dividend of 22.0 pence per share, this gives a total ordinary dividend of 77.0 pence representing a 10% increase on the prior year. Subject to approval by shareholders, the final dividend will be paid on 2nd August 2022, with an ex-dividend date of 9th June 2022. Our previously announced £200 million share buyback completed on 13th May 2022.

1. Based on average precious metal prices in May 2022 (month to date).



2. A \$100 change in the average annual platinum, palladium and rhodium metal prices each have an impact of approximately £1 million, £1.5 million and £1 million respectively on full year underlying operating profit.

3. Based on foreign exchange rates in May 2022 (month to date).

4. Vara consensus for full year group underlying operating profit in 2022/23 was £562 million (range: £491 million to £641 million) as at 25th May 2022. 2021/22 group underlying operating profit on an adjusted basis was £559 million (adjusted for disposals of Health, Battery Materials and Advanced Glass Technologies).

Key performance indicators

Our key performance indicators (KPIs) measure progress against our financial aims, our strategy and our 2030 sustainability targets. The KPIs reported here are those we reported on last year, since they were in place at the start of this financial year. We will report KPIs against our new strategy next year.

Indicator	2022 progress
Overall strategy	
Products and services for a cleaner, healthier world % sales from products contributing to our four priority UN SDGs	83.8% (2021: 84.7%)
Progress against our financial targets from continuing operations¹	
Sales excluding precious metals (sales)	£3,778m (2021: £3,685m)
Underlying operating profit margin	14.6% (2021: 12.8%)
Underlying earnings per share	213.2p (2021: 168.9p)
Average working capital days (excluding precious metals)	36 days (2021: 45 days)
Progress against our strategic objectives	
 Invest in growth areas targeted at climate change and circularity	
Gross research and development expenditure from continuing operations	£201m (2021: £185m)
 Manage our established businesses to support growth	
Clean Air cash flow Delivered £772 million of cash at actual precious metal prices	£772m

1. These numbers exclude our Health business which is reported as a discontinued operation

Indicator	2022 progress
Progress against our strategic objectives continued	
 Promote a fast-paced, efficient business and high-performance culture	
Annualised cost savings from transformation programme	£104m +181% (2021: £37m)
Progress for a sustainable business	
For our products and services	
 Drive lower global greenhouse gas emissions 2030 target: 50 million tonnes of greenhouse gas emissions avoided during year by our customers using technologies enabled by our products and solutions, compared to conventional offerings	489,000 tonnes
For our operations	
 Achieve net zero by 2040 2030 target: 33% reduction in Scope 1 and Scope 2 GHG emissions	2% increase from 2019/20 baseline
For our people	
 Create a diverse, inclusive and engaged company 2030 target: achieve more than 40% of female representation across all management levels	27%

 [Read more about our financial KPIs on pages 20 to 30 and our non-financial KPIs on pages 34 to 59](#)

Engaging with our stakeholders

Understanding the views and concerns of our stakeholders is an important way in which we develop and carry out our strategy. Their perspectives help us identify the topics that are most material to our business and inform our decisions.

This table highlights our key stakeholder groups and some of the ways we've worked with them this year.

Key stakeholder groups	Why we engage	How we engage
Employees Many thousands of JM employees work in our labs, production sites and offices to deliver great services and quality products to our customers	<ul style="list-style-type: none"> » To create a safe and inclusive working environment for all our employees, wherever they are based. » Improve customer experience. » Ensure our employees have the skills and knowledge they need to deliver high-quality services now and in the future. 	<ul style="list-style-type: none"> » We invite employee feedback on a variety of subjects, from how we can better manage our channels and content (survey and focus groups run in November 2021) to listening activity such as The Big Listen, which our new CEO, Liam Condon, launched in March 2022. During the month, we invited our global workforce to share their opinions to feed into Liam's strategy review. Employees were asked to share details about the things that make them proud to work at JM, as well as to help identify areas for improvement.
Customers and partners We need to understand our customers' and partners' needs and be able to respond quickly	<ul style="list-style-type: none"> » Improve customer experience and satisfaction. » Adapt quickly to changing customer needs and requirements. » Help customers deliver own decarbonisation and sustainability commitments. 	<ul style="list-style-type: none"> » Our customer satisfaction rating improved in Efficient Natural Resources for the fourth year running (0.6ppts up versus previous year), driven by technical expertise, responsiveness, and quality. » Our latest Clean Air customer satisfaction saw a consistent good overall score and improvement on scores from our largest customers, despite a challenging market environment, highlighting in particular our technology capabilities and cooperative approach. JM received supplier awards for cost reduction excellence and also best delivery performance.
Investors We regularly engage with our investors to help them make informed investment decisions and to ensure we are fully aware of the range of views from our shareholders	<ul style="list-style-type: none"> » Keep investors informed and well briefed on key business activities and decisions. » Listen and respond to concerns, questions and interests. » Strengthen the long-term success of JM. 	<ul style="list-style-type: none"> » We regularly update the market on the company's financial and operational performance, including at the Annual General Meeting, first half and full year results. » We held roundtable teach-ins for investors and analysts on both Clean Air and Catalyst Technologies, providing greater insights into the sectors and their cash generation and growth targets respectively. » Held multiple investor meetings and calls with our Chair, CEO, CFO and / or the investor relations department through the year.

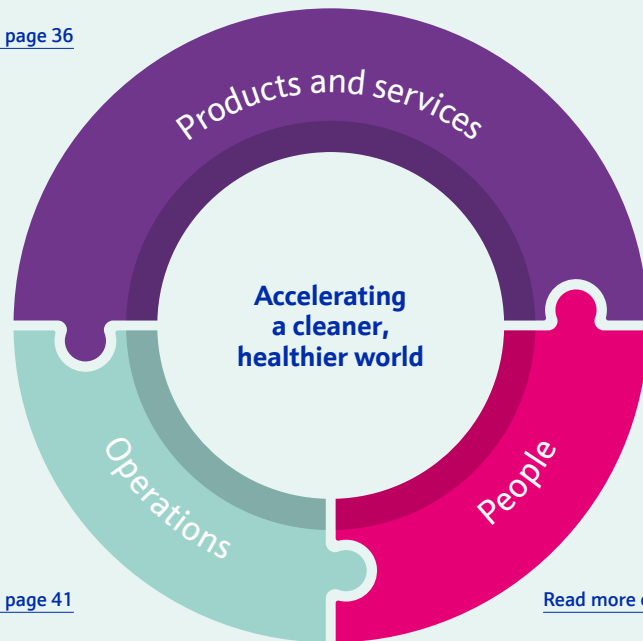
Engaging with our stakeholders *continued*

Key stakeholder groups	Why we engage	How we engage
Government bodies Strong relationships and engagement with government bodies around the world are essential to JM	<ul style="list-style-type: none"> » To share our expertise in sustainable technologies. » To play an active role in policy and regulatory discussions, advocating for solutions that support the transition to a cleaner, healthier world. » To garner support for our plants and operations at a local level. 	<ul style="list-style-type: none"> » The CEO of our Efficient Natural Resources business is the co-chair (alongside the Secretary of State for Business, Energy and Industrial Strategy) of the UK Government's Hydrogen Advisory Council, on which JM is separately represented. In this capacity we have contributed to the UK government's development and implementation of its hydrogen strategy. » We discussed our sustainable technologies directly with the Directorates-General at the European Commission to explain how they can support the European Green Deal, including the 'Fit for 55' package of legislative initiatives. » In China, we joined the UK / China Hydrogen Alliance and HK / China Hydrogen Working Group to contribute to central government and industry collaboration on hydrogen policy.
Industry and scientific institutions Creating strong relationships with our partners and peers is important in helping to accelerate the net zero transition.	<ul style="list-style-type: none"> » Work alongside our partners and peers to create a unified industry voice in policy discussions. » Help accelerate the energy transition. » Share expertise and improve our own knowledge and understanding of specific issues. 	<ul style="list-style-type: none"> » We play an active role in a number of important global associations, including the Chemical Industries Association, the International Platinum Group Metals Association, the Royal Society of Chemistry and the Faraday Institute. We are also a founding member of the Society of Chemical Industry. » We also play a leading role in hydrogen-related associations, including being a board member of the H₂ Council, Hydrogen UK, UK Fuel Cells Association and the International Hydrogen Energy Centre, and we are a member of the Prince of Wales' Sustainable Markets Initiative Hydrogen Taskforce.
Suppliers We work with suppliers of all sizes across the globe to access goods and services that help us deliver value to our customers and investors.	<ul style="list-style-type: none"> » Monitor, manage and mitigate supply chain risks. » Optimise our supply base, to drive value for our customers and investors, managed through our Supplier Relationship Management (SRM) framework. » Ensure that we drive inclusive and diverse relationships with innovative suppliers to help broaden our thinking. 	<ul style="list-style-type: none"> » We implemented our SRM framework with our strategic suppliers for Facilities Management and Security, to help us reduce the number of suppliers that we work with and optimise our specifications. This delivered approximately £1.5 million in savings in the past 12 months. » We are piloting our diversity approach across our professional services supply base to develop a strategy to ensure we are inclusive and diverse in our engagements. The pilot covers over 2,000 suppliers globally. The outputs will provide a roadmap for embedding of inclusive procurement throughout JM by building a baseline of spend with diverse suppliers and capturing the value they are delivering.
Communities We place huge importance on giving back to our communities and connecting our employees with projects they care about.	<ul style="list-style-type: none"> » Keep our position at the heart of our communities. » To understand the issues our neighbours face so that we can build our engagement activities and respond to their needs. 	<ul style="list-style-type: none"> » In California, JM employees volunteered more than 450 hours at Martha's Kitchen, preparing and serving warm meals for families facing difficulties, many of whom were teachers, nurses and part-time workers. » In South Africa, we contributed 990 food parcels to the local community near our Germiston site. We also held a weekly sandwich drive, which supported more than 1,127 children. More than 500 families received a food parcel, many of whom are living with HIV / AIDS.

Sustainability

Our products and services are the clearest demonstration of our vision for a cleaner, healthier world. And their biggest positive impact occurs when our customers use them in their products. But we also want to ensure we make them in ways that minimise our impact on the planet and our local communities. We rely on our talented employees and supply chain partners to help us do that. To reflect our commitment in these areas and support our target to reach net zero by 2040, we organise our sustainability priorities around three pillars:

[Read more on page 36](#)



[Read more on page 41](#)

[Read more on page 49](#)

Our three sustainability pillars are underpinned by a series of 11 goals and 17 targets, 14 of which we announced in June 2021. During 2021/22, we defined our remaining three targets, which seek to quantify the unique societal value of the products and technologies that form our business strategy. We also began to develop our net zero roadmap. To continue strengthening our sustainability governance, we set up a new board-level Societal Value Committee in May 2021 (see page 98 for more information about this committee), and recruited our first Chief Sustainability Officer who joined JM in May 2022.

Our approach to reporting

This report has been prepared in accordance with Global Reporting Initiative (GRI) reporting standard, Core option. More information about our materiality assessment of which sustainability issues are important to our business and the full GRI index disclosure can be found at matthey.com/GRI-2022. This year's report also aligns with the Sustainability Accounting Standards Board (SASB) chemical sector reporting requirements (version 2018-10). Our Task Force on Climate-related Financial Disclosures (TCFD) report is included within this section of the report, where we provide a summary report on the progress made during the year against each of the four pillars of the TCFD framework. The numbers included in this section cover the entire Johnson Matthey group, including Health, which is reported as a discontinued operation.

[+ See page 60 for our TCFD report.](#)

Sustainability ratings

During 2021/22, we were pleased to receive several validations of our environmental, social and governance (ESG) performance:



EcoVadis: Platinum rating, putting JM in the top 1% of all companies rated by the organisation.





MSCI: AAA, is the highest possible rating, placing us above our speciality chemicals industry peers.



We retained our membership of the **Dow Jones Sustainability Index (Europe)**, which places us in the top six European chemical companies and 92nd percentile globally.



A high score of 4.1 out of 5 on the **FTSE4Good Europe Index**, which recognises leading all-round ESG performance.

	Our goal	2030 target	Performance in 2021/22	
 <p>Products and services We use our expertise in PGM chemistry, catalysis and process design to make products and services that create a cleaner, healthier world, lower emissions and support the circular economy.</p>	Produce and innovate for a cleaner, healthier world	More than 95% of sales contributing to four priority UN SDGs More than 95% of R&D spend supporting four priority UN SDGs	83.8% 88.1%	See our Products and services section on pages 36-40 for more on our progress against these targets.
	Drive lower global greenhouse gas (GHG) emissions	50 million tonnes of GHG emissions avoided per year using technologies enabled by JM's products and solutions, compared to conventional offerings	489,000 tonnes	
	Enable less harmful air pollution globally	700,000 additional tonnes of NOx removed from vehicle tailpipes per year using technologies enabled by JM's products, compared to regulated baseline levels	63,000 tonnes	
	Conserve scarce resources	Increase recycled PGM content in JM's manufactured products to at least 75%	71 %	
 <p>Operations As well as helping our customers achieve their sustainability goals, we aim to lower the environmental impact of our own operations. <i>Note: performance and targets relate to a 2019/20 baseline</i></p>	Achieve net zero by 2040	33% reduction in Scope 1 and Scope 2 GHG emissions 20% reduction in Scope 3 emissions from purchased goods and services	2% increase 8% reduction	See our Operations section on pages 41-48 for more on our progress against these targets.
	Reduce water consumption and waste	25% reduction in net water usage 50% reduction in total hazardous waste produced	4% reduction 6% increase	
	Minimise environmental footprint	40% reduction in NOx emissions from our operations Make cradle-to-gate life cycle analysis (LCA) information available for more than 95% of our products	5% increase Recruited a small team of LCA specialists to begin making progress in 2022/23	
	Keep people safe	Achieve a total recordable injury and illness rate for employees and contractors below 0.25 Reduce our ICCA process safety severity rate to 0.4	0.59 1.37	
 <p>People We value difference and are committed to ensuring that everyone who works with us can do so in a safe, welcoming environment. We support high ethical standards in our value chain and are proud of our long-standing connections with our local communities.</p>	Create a diverse, inclusive and engaged company	Achieve an employee engagement score of more than 75% Achieve more than 40% of female representation across all management levels	65% 27%	See our People section on pages 49-59 for more on our progress against these targets.
	Uphold human rights in our value chain	100% of value chain partners assessed for human rights risks and remedial plans in place where high risks identified	Worked with KPMG to develop a robust human rights risk framework	
	Invest in our local communities	More than 6,000 days of corporate volunteering annually	1,322	

Our calculation methodologies for these targets can be found in the Basis of Reporting section on pages 214-220.



Products and services

In this section

Introduction	36
1. Produce and innovate for a cleaner, healthier world	36
Progress against our priority UN SDGs	37
2. Drive lower global greenhouse gas emissions	38
Innovating to help the world transition to net zero	38
3. Enable less harmful air pollution globally	39
Continuing to drive innovation to reduce vehicle air pollution	39
4. Conserve scarce resources	40
JM at the heart of the PGM market	40

We use our expertise in platinum group metal (PGM) chemistry, catalysis and process design to research, design and make products, services and solutions that support our vision for a cleaner, healthier world. From automotive catalysts that prevent harmful pollutants entering the atmosphere, to catalysts that help turn household waste into sustainable fuels, and from technologies that help make clean hydrogen to world-class recycling skills that help recover and reuse scarce precious metals. And we use our science and innovation skills to maintain a pipeline of new and improved products that will help the world accelerate towards net zero.

This year, we set important new 2030 targets to measure how much our products benefit society as they address global greenhouse gas emissions and air pollution, and to advance the circular economy as we increase the amount of recycled PGMs in our technologies.

1. Produce and innovate for a cleaner, healthier world

While we are proud of our legacy, we keep looking forward and using our skills to create the next generation of products and services that will help the world tread a more sustainable path. Over the past five years, we have tracked our progress by assessing our products and services against the United Nations Sustainable Development Goals (SDGs). In 2021, we refined our approach to concentrate on the four UN SDGs where we can have the most material impact because they are closely aligned with our purpose and business strategy.

We have set ourselves two 2030 targets to increase sales and our R&D investment against these four priority UN SDGs:

UN SDG

Examples of JM products and services that support each goal



3. Good health and wellbeing

- Emission control technologies that remove harmful oxides of nitrogen (NOx) and particulates from vehicle tailpipes and stationary engines
- Purification technologies that remove harmful contaminants, such as mercury, from industrial processes
- Refinery additives to mitigate NOx and oxides of sulphur (SOx) emissions
- Catalysts used to make pharmaceutical ingredients



7. Affordable and clean energy

- Blue hydrogen technologies that are available today to help make low-carbon hydrogen at scale
- Green hydrogen technologies that will support the drive to zero-carbon hydrogen production using renewable energy and electrolysis



12. Responsible consumption and production

- PGM recycling to recover and reuse scarce natural resources



13. Climate action

- Technologies that turn high sources of carbon, such as household waste, into sustainable aviation fuels
- Fuel cell components for low-carbon transportation and distributed power units

Progress against our priority UN SDGs

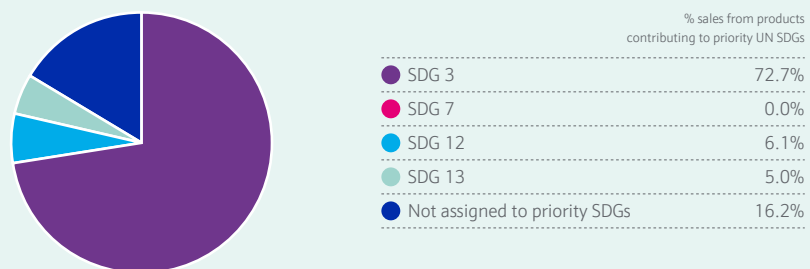
Setting targets for sales of sustainable products that are aligned with our strategic aim to support four priority UN SDGs is only part of the journey. To deliver this, we must also make sure that our R&D and innovation activities are aligned with those UN SDGs in order to deliver our sales target by the end of the decade. At the same time, we must continue to focus on innovation – both in-house and in partnership with others – to ensure that we maintain a steady pipeline of new and improved products to support our growth businesses beyond 2030, as the pace picks up globally to reach net zero.

Progress against our 2030 targets

Sales¹ contributing to our four priority UN SDGs

2030 target	2021/22	2020/21
>95%	83.8%	84.7%

% sales from products contributing to priority UN SDGs (2021/22)¹



We saw a slight fall in sales against our priority UN SDGs this year, primarily because of proportionally higher sales in Catalyst Technologies, which is where most of our unassigned sales reside. However, we are encouraged that a higher percentage of our R&D budget was aligned with our priority UN SDGs, particularly SDG 7 and SDG 13 where we have worked to align our spend within our strategic growth platforms of decarbonisation, circularity and hydrogen technologies.

Progress against our priority UN SDGs – R&D spend

% R&D spend contributing to four priority UN SDGs

2030 target	2021/22	2020/21
>95%	88.1%	87.3%

% R&D spend from products contributing to priority UN SDGs (2021/22)



To achieve this, we spent £215 million on R&D in 2021/22, which includes £33 million of capitalised R&D. We employ a corporate R&D team of around 400 employees to work alongside our customer-facing R&D and commercial teams to create a balanced portfolio of short-, medium- and long-term research opportunities and a pipeline of new and improved products and technologies for our customers.

We have also identified our revenues that align with the SASB Chemicals Sustainability Accounting Standard's definition of products that, when used, improve energy efficiency, eliminate or reduce GHG emissions, reduce raw materials consumption, lower water consumption and / or increase product life. In 2021/22, those sales were £812 million.

Our methodology is described in Basis for Reporting, on pages 214-220.

1. Sales excluding precious metals. See Note 2 for more information.

2. Drive lower global greenhouse gas emissions

The world will need a range of low-carbon solutions if we are to decarbonise our transport, energy and industrial systems and reach net zero. Our products and services already help our customers avoid GHG emissions every year and, over the next decade, we aim to increase our impact considerably. During the year, we finalised our methodology to quantify these benefits. We set ourselves the target for 2030 that JM technologies operating globally will contribute towards avoiding 50 million tonnes of greenhouse gases entering the earth's atmosphere per year, compared to conventional technologies in 2020. This is equivalent to preventing half of all UK GHG emissions from road transport in 2019.

Since there are no 'off-the-shelf' methodologies available for setting this target, we developed our own. We based our methodology on guidelines for calculating and reporting avoided GHG emissions developed by the World Resources Institute, as well as by the World Business Council for Sustainable Development and the International Council of Chemical Associations.

We also appointed EcoAct to review and validate our GHG-avoidance methodology for all our product families that are contributing towards our target. EcoAct concluded that our approach complied with recognised public guidelines, and considered our calculations to be both fairly stated and representative of a balanced view of our contribution in enabling avoided emissions through relevant technologies. EcoAct also determined that our calculations follow industry best practice for measurement.

Our new target for 2030		
Greenhouse gas emissions avoided during year by our customers using technologies enabled by our products and solutions, compared to conventional offerings		
2030 target	2021/22	2020/21
50 million tonnes	489,000 tonnes	211,000 tonnes

In 2020/21, our technologies helped avoid 211,000 tonnes carbon dioxide (CO₂) equivalent entering the atmosphere compared to conventional technologies. This mostly arose from the sale of fuel cell components for hydrogen-powered distributed power generation systems. Given this is the baseline year for our target, it only captures the operational impact of our technologies sold in 2020/21. Our 2021/22 result represents the impact from all technologies sold since the start of our baseline year, that are still operating in 2021/22. This year's figure is more than double that of the previous year because we sold more fuel cell components for distributed power systems this year versus 2020/21.

Innovating to help the world transition to net zero

In the coming years, we expect to be adding many new product lines to our 'avoided GHG emissions' target, with the majority connected to the growing hydrogen economy. Producing low-carbon hydrogen will be key to a net zero future, but to make that future a reality, the world will need eight times more hydrogen by 2050, than is produced today. For example, the UK's HyNet project will use our LCH™ technology to produce low-carbon 'blue' hydrogen at scale, while capturing up to 98% of the associated CO₂ emissions. Once online, the facility will capture the same amount of CO₂ every year as taking more than 250,000 petrol or diesel cars off the road.

We are also aiming to become the number one supplier of the highly efficient catalyst-coated membranes that are essential to the workings of 'green' hydrogen electrolyzers. We're working with companies such as Plug Power, a leading provider of green hydrogen solutions, to accelerate the development and scale-up of electrolyser technology to make green hydrogen using renewable energy.

JM is already an established, leading provider of process technology and catalysts to the chemicals and energy sectors especially in synthesis gas (a mixture of hydrogen and carbon monoxide, also known as syngas). Our new HyCOgen™ technology, launched in January 2022, is one of the best examples of this. This catalyst technology converts green hydrogen and CO₂ into carbon monoxide, which is then combined with additional hydrogen to create syngas. When used alongside our award-winning Fischer Tropsch catalyst technology (FT CANS™), developed in collaboration with bp, HyCOgen creates a highly efficient, scalable process that can turn most of the CO₂ into high-quality synthetic crude oil. This can then be processed in a refinery to make more sustainable fuels, including renewable diesel, naphtha and aviation fuels – key to helping governments and airlines tackle emissions in the aviation industry.

3. Enable less harmful air pollution globally

We have worked with automotive manufacturers for decades, using our catalyst expertise to design emission control systems that help them meet strict air quality regulations. For the past four decades, those systems have helped prevent millions of tonnes of harmful emissions, such as carbon monoxide, NOx and particulates, from entering the atmosphere, improving the health of millions of people living and working in cities around the world. Today, around one-third of all new cars in the world are fitted with one of our catalytic converters, and we believe that they are collectively removing around seven million tonnes of NOx from the atmosphere.

While diesel and gasoline vehicles won't be around forever, most vehicles on our roads will continue to run on an internal combustion or hybrid engine for some years to come. That's why regions like Europe, the USA and China are introducing their toughest air quality regulations yet. We believe that NOx emissions standards can go even lower, and our R&D scientists have been working hard to create the catalysts to enable this.

Our new target for 2030

Additional NOx removed from tailpipes by JM technology during year compared to that achievable with 2020 technology

2030 target	2021/22
700,000 tonnes	63,000 tonnes

Our new target for continuing to reduce NOx emissions globally over the next decade takes the additional NOx removed from tailpipes by JM technology compared to that achievable with 2020 technology. In other words, we take the combined tailpipe emissions of vehicles containing JM technology operating at 2020 regulatory standards as a baseline, and then count all additional NOx emissions removed by using JM automotive catalysts, where they meet tighter emission regulations in subsequent years.

Continuing to drive innovation to reduce vehicle air pollution

Our target to remove an additional 700,000 tonnes of NOx specifically captures the impact of the scientific advances we expect to make over the next decade to meet tightening tailpipe emissions regulations. This is equivalent to 2.5 times the NOx emissions from UK road transport in 2019.

For example, we designed our latest emission control catalyst for heavy duty vehicles so that customers were ready for the new China VI-a emission standards introduced in July 2021. This standard slashed China's NOx limit from 2,000 milligrams per kilowatt hour (mg/kWh) to 460 mg/kWh. Our calculations show that for every heavy duty vehicle in China that is fitted with one of our latest emission control catalysts, we help remove more than 180 kg of additional NOx in the first year of use.

We also expect Europe to introduce its latest level of regulation in the next four years, so we're already at work designing a new generation of automotive catalysts to comply with the new Euro 7 regulations as soon as they are launched.

Using an externally verified calculation, we estimate that an additional 700,000 tonnes of NOx removed will help to avoid 5,800 additional premature deaths, demonstrating the impact our emission control technologies have on UN SDG 3 – Good health and wellbeing.¹

Our emission control catalysts can also be used to help remove harmful emissions in stationary applications, such as data storage centres, waste incinerators, as well as in shipping, agriculture and mining operations.

1. Adapted from the ICCT paper Comments and Technical Recommendations on Future Euro 7/VI Emission Standards, 2021, in which 4.2 million tonnes of NOx is approximately equal to 35,000 premature deaths.

4. Conserve scarce resources

Many of our technologies rely on PGMs. Yet these metals are hard to extract from the earth's crust, typically only being present in concentrations of less than 10 ppm. Studies show that the carbon footprint associated with recycled (or 'secondary') PGMs is an order of magnitude lower than that of newly mined virgin metals.²

JM is already the world's largest recycler of secondary PGMs, so this expertise is one of the most important ways we can help the world to create more circular economies for scarce resources. As part of our role in the PGM industry we want to encourage all stakeholders to consider the carbon footprint and circularity of their PGM supply. So we are setting a target for recycled content for the PGMs in the products that we make. While additional new supply of PGMs may be necessary to support growing uses of these important materials in the transition to net zero for some years, we aim to have at least 75% of all the PGMs that we use in manufacturing to have come from recycled sources by 2030, with the majority of this secondary material purified in our own refineries. This reflects the need to focus on bringing important resources, such as PGMs, back around the loop, while recognising that these unique metals have an important role as the transition occurs, a role that may not be completely fulfilled by the available recycled supply.

Our new target for 2030

Average % of recycled PGM content in products manufactured by JM during year.*

2030 target	2021/22 result
>75%	71%

* Average across all use of five PGMs in JM manufacturing: platinum, palladium, rhodium, iridium and ruthenium.

We see this new target as a step in our journey. It encourages the use of secondary supply, and designing this into our products from the outset. It also encourages industry dialogue on where PGMs come from and the relevant sustainability considerations for those sources. To support this increased dialogue, we're also looking at how provenance could be digitally traced and are working with our customers to understand what their needs are for PGM provenance so that we can continue to encourage greater sustainability in PGM supply. And our industry-leading market research team are helping us forecast what future recycling flows will look like over the next two decades. This will help us focus both our innovation work and investment plans.

Palladium	Autocatalysts
Platinum	Industrial applications
Rhodium	Fuel cells
Iridium	Green hydrogen technologies
Ruthenium	

#1 global refined PGM supplier	#1 secondary recycler	c.2x capacity of nearest competitor
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2. See International Platinum Group Metals Association, Life cycle assessment, Second IPA LCA Study (2017 data).



Operations

In this section

Introduction	41
Managing our environmental performance	41
1. Achieve net zero by 2040	42
Our performance in 2021/22	42
Developing our net zero roadmap	44
Using energy more efficiently	45
Making progress towards our renewable electricity target	45
2. Reduce water consumption and waste	45
Performance on water	45
Water stress analysis to identify our priorities	46
Performance on waste	46
3. Minimise environmental footprint	47
Other operational air emissions	47
Performance	47
Improving our management of NOx	47
Product life cycle management	47
Maintaining high standards to meet changing regulation	47
Working with industry bodies to meet regulations	48
Finding safer alternatives and reducing risk	48
Developing life cycle analysis for our products	48

While our products can help deliver our vision for a cleaner, healthier world, we must ensure we make them in ways that lower our own environmental impact. Last year, we committed to reaching net zero by 2040 and developed a series of 2030 targets to set us on our way. We also joined the UN Global Compact's Business Ambition for 1.5°C.

Managing our environmental performance

Our Sustainability Council is responsible for agreeing our overall approach to environmental performance.

We have group policies, processes and systems that help us achieve a high level of environmental performance. We also have a number of corporate standards that cover the following environmental aspects:

- Waste
- Energy
- Emissions to atmosphere
- Discharge to surface and ground waters
- Protection of waste water discharge systems

We assess our sites against these standards as part of our ongoing audit work. All our sites are assessed by our centralised internal audit team at least once every three years.

In all, 86% of our manufacturing sites use environmental management systems that meet ISO 14001. Many of our operations are covered by environmental permits or licences and, as a minimum, we ensure we comply with all regulations in the locations where we operate.

We expect all our sites to report any incident that affects the environment to their local authorities. We classify any spills that occur on unmade ground or near drinking water sources as significant. We reported no significant spills during 2021/22. We had one reportable environmental fine of £12,000 in China.

We measure progress against our key performance indicators (KPIs) monthly and use the data to improve performance. The details behind the methodologies used for our KPIs and the third-party assurance certificate can be found at the end of this report at page 221.

1. Achieve net zero by 2040

In June 2021, we publicly committed to achieve net zero by 2040 and, in October, our intermediate targets to reduce Scope 1, 2 and 3 emissions by 2030 were validated by the Science Based Targets initiative (SBTi), providing important confirmation that they are in line with the 'well-below 2°C trajectory' of the UN Paris Agreement.

Our Scope 1 and 2 GHG emissions come from our manufacturing operations and represent the part of our footprint that we can directly influence by changing the way we use energy in our facilities. Our Scope 1 and 2 GHG emissions data is verified to ISAE3000 standard by a third party – see page 221. The full assurance statement can be found online at: matthey.com/assurance-statement-2022.

Scope 3 GHG emissions represent 90% of our footprint and mostly result from the raw materials we buy.

Progress against our 2030 targets

Reduce Scope 1 and 2 GHG emissions by 33% from 2019/20 baseline

Reduce Scope 3 emissions from purchased goods and services by 20% from 2019/20 baseline

2021/22
399,906
 tonnes

2% increase
 from baseline

2021/22
3,008,648
 tonnes

8% decrease
 from baseline

Our performance in 2021/22

We use various energy sources, from renewable electricity to power our plants, to natural gas to generate heat for triggering chemical reactions. This year, we saw a 5% rise in our use of energy and 4% rise in our Scope 1 and 2 GHG emissions, and a 3% rise in our carbon intensity as our manufacturing output rose at a lower rate. Our energy efficiency performance shows a similar trend. This decline in performance occurred because we brought two new large facilities online in our Clean Air business. It is normal, at start-up, to operate at reduced throughput as you start to validate parts and finish commissioning equipment. As the sites move to full production, we expect our efficiency will improve again.

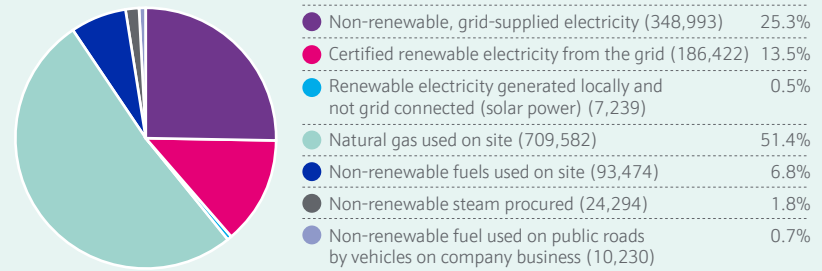
This year, 14% of our energy consumption came from certified renewable sources. Four of our largest manufacturing sites also make electricity using combined heat and power plants (CHPs). Although these run off natural gas, they are a more climate-friendly way of generating electricity, if the heat is also used in the manufacturing facility. In 2021/22, our CHPs generated 28,825 MWh of electricity.

Our Scope 1 emissions rose broadly in line with the increase in natural gas use. Meanwhile, our Scope 2 emissions remained broadly flat because the impact on our carbon emissions from using more electricity was offset by the strides we have made to increase the amount of renewable electricity our facilities use. This year, we purchased 18% more renewable electricity than last year.

Overall, our Scope 3 GHG emissions rose 7.7% in 2021/22 versus the previous year because we procured more raw materials, although this is still 8% lower than our 2019/20 baseline. Some 86% of our Scope 3 footprint comes from our purchased goods and services category. These emissions rose more slowly than our volumes of procured raw material, as we have started to see the carbon intensity of the operations of some of our strategic suppliers fall. While Scope 3 GHG emissions from business travel emissions have also gone up, our employee commuting emissions are significantly lower, because more of our employees have worked flexibly from home since the start of the COVID-19 pandemic.

We have made some adjustments to our calculation methodology during the year to strengthen the quality of our data, and on the advice of the SBTi assessors. Details can be found in the Basis for Reporting section on pages 214-220.

Energy mix (MWh)



Sustainable business *continued***Operations continued****Scope 1 and 2 greenhouse gas (GHG) footprint and energy efficiency**

	2020/21			2021/22			% change (global)
	Global	UK only	Global (excl UK)	Global	UK only	Global (excl UK)	
Scope 1 (tonnes CO ₂ eq)	203,930	66,634	137,296	219,846	68,282	151,564	+7.8%
Scope 2 – market based method (tonnes CO ₂ eq)	181,525*	3,969	181,005	180,060	1,488	178,572	-0.8%
Scope 2 – location based method (tonnes CO ₂ eq)	227,381	34,871	192,510	240,897	29,768	211,129	+5.9%
Total operational carbon footprint – Scope 1 and 2 market based method (tonnes CO₂ eq)	385,455*	70,603	318,301	399,906	69,770	330,136	+3.8%
Total operational carbon footprint – Scope 1 and 2 location based method (tonnes CO ₂ eq)	431,311	101,505	329,806	460,742	98,049	362,693	+6.8%
Total Scope 1 and 2 carbon intensity – market based (tonnes CO ₂ eq/tonnes sales)	3.4	7.1	3.1	3.5	13.0	3.0	+2.9%

	2020/21			2021/22			% change (global)
	Global	UK only	Global (excl UK)	Global	UK only	Global (excl UK)	
Total energy consumption (MWh)	1,312,084	431,466	880,618	1,380,234	422,225	958,009	+5.2%
Total energy efficiency (MWh/tonne)	11.5	43.4	8.5	12.1	78.7	8.8	+2.5%

Scope 3 GHG emissions by category(tonnes of CO₂ equivalent)

Category	Category number	2021/22	2020/21	2019/20
Purchased goods and services	1	3,008,648	2,851,616	3,282,096
Capital goods	2	349,214	308,835	399,630
Fuel and energy-related activities	3	46,990	39,725	41,425
Upstream transportation and distribution	4	168,750	102,552	102,552
Waste generated in operations	5	5,775	5,257	5,303
Business travel	6	1,336	67	9,202
Employee commuting	7	15,718	29,957	29,957
Upstream leased assets	8	698	602	5,094
Use of sold products*	11	0	0	0
Investments**	14	16	665	10,997
Total		3,597,145	3,339,276	3,886,256

* We have removed Use of sold products from our footprint by agreement with SBTi, as it determined that the emissions we reported in this category were 'indirect' and should not, therefore, be included.

** Investments category accounts for JM's Joint Ventures only.

Five-year performance table

	2021/22	2020/21	2019/20	2018/19	2017/18
Total energy consumption (MWh)	1,380,234	1,312,084	1,355,295	1,444,890	1,431,360
Total Scope 1 and Scope 2 (market based) GHG emission (tonnes CO ₂ eq)	399,906	385,455	391,459	423,130	445,509
Total Scope 3 GHG emission (tonnes CO ₂ eq)	3,597,145	3,339,276	3,886,256	–	–

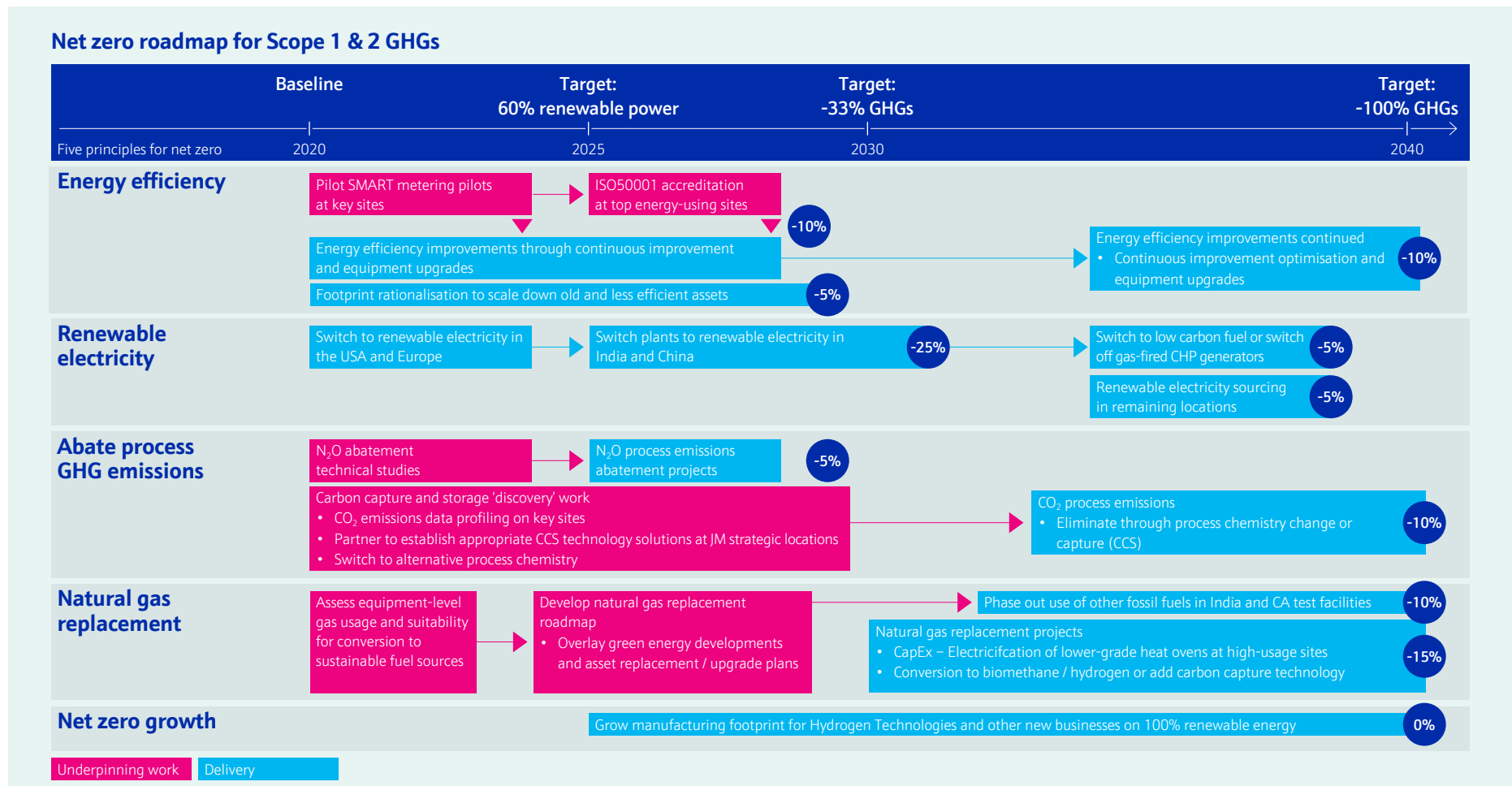
For more information on our methodology, please see pages 214-220 in Basis for Reporting.

Developing our net zero roadmap

To realise our net zero ambition, each of our businesses is developing a roadmap to prioritise the work we'll need to do to improve energy efficiency, switch to lower-carbon forms of energy and eliminate or abate the GHG emissions that our chemical processes generate. It is important we tackle these challenges in a cost-effective way, so we aim to manage large equipment replacements as part of our ongoing capital renewal programme.

Our roadmaps help us identify the short-, medium- and long-term steps we need to take to meet our 2030 targets. In the coming year, we will be working with our supply chain partners to extend it to include tackling our scope 3 GHG emissions as well.

Managing our energy mix, switching to more low-carbon power and improving energy efficiency are all key ways we can realise our net zero ambition in the near term.



Sustainable business *continued*

Operations continued

Using energy more efficiently

It is important that we continually improve the efficiency of all manufacturing facilities, and recent global energy price rises have made this even more urgent. To accelerate our progress, during the year, we have assessed our top 20 energy-consuming sites against the following criteria to better understand how they are working to reduce energy consumption:

- Energy management systems
- Metering, forecasting and monitoring
- Key performance indicators, goals and targets
- Energy saving programmes
- Employee communications.

Many sites scored well in monitoring, energy saving, metering and goals. We also identified areas for improvement, including use of energy management systems. Currently, 20% of our top 20 sites are certified with the ISO 50001 energy management standard, which provides the best framework for evaluating and measuring energy management. The remaining 80% of these sites plan to work towards certification, and we will be training our operational teams globally during the next year to achieve this.

In 2021, our procurement team ran a UK pilot project on mitigating commodity energy price risks, which insulated our UK businesses from around 80% of the rapid price rises seen in the global energy market during the year. We have since used lessons learned from the pilot to develop new energy procurement methodology, which we are now rolling out across JM globally. We spent £85 million on energy versus £64 million in 2020/21.

In addition, in our Clean Air business, we have continued to find ways to improve our production cycle times and run equipment at optimal temperatures for maximum efficiency at existing plants. And we are improving our 'right first time' rate to maintain high product standards while reducing the quantity of raw materials we use. Similarly, in Catalyst Technologies, we have carried out operational assessments to identify projects to drive greater efficiency. For example, some sites are carrying out feasibility studies to see how we could better integrate sources of heat to reduce the amount of energy we use.

Making progress towards our renewable electricity target

We are making good progress towards our target to buy 60% of our electricity from certified renewable sources by 2025. In 2021/22, we reached 34% from sources with a renewable energy guarantee of origin, up from 30% last year. A total of four sites switched to grid-supplied renewable electricity contracts this year, including our new Clean Air manufacturing site in Poland.

To accelerate our progress to source renewable electricity in countries where it is not so readily available in the market, we employ third-party specialists, South Pole Group. So far, they have worked with our sites that use the most energy in Europe, the USA and India to identify new low-carbon energy opportunities. These include power purchase agreements, electricity from certified renewable sources and on-site electricity generation, with particular focus on sites that could have the most impact on our 2030 target.

2. Reduce water consumption and waste

Climate change and a growing population are set to put more stress on global consumption and the security of the water supply, which is why we have set a target to use less by 2030. We use water to make some of our products and for heating and cooling. We aim to use it responsibly and we look for ways to recycle and reuse it wherever possible.

Meanwhile, our operations create waste, which must be treated in line with local regulations. But beyond that we are committed to disposing of it responsibly, particularly important given that 63% contains hazardous materials. Here, too, we have set ourselves a target to reduce this type of waste. And we work with specialist treatment companies to ensure this waste is managed safely, and we look for ways to reduce and recycle waste.

Performance on water

We source 93% from mains supplies, extracting the rest from groundwater sources.

In 2021/22, we used 6% more water than the previous year and our water efficiency declined slightly to 19.5 m³ of water per tonne of product sold. This was an accumulation of a number of local effects. For example, one of our sites in India operated a specific manufacturing process more frequently this year, which requires more water to work efficiently. At another of our sites, in Malaysia, a fire hydrant leak led to a rise in water use. However, our water use remains 4.2% lower than our 2020 baseline.

Progress against our 2030 target

Reduce net water use by 25%

2021/22

2,160,000 m³

4.2% reduction from
2019/20 baseline

We discharged 1.64 million wastewater, 92% to municipal treatment plants and the remainder back to its original source after treatment. Our waste water had an average chemical oxygen demand (COD) of 182 mg/L. We treated 1.167 million m³ of waste water onsite, of which we recycled 22.4% back into our manufacturing processes instead of discharging.

Net fresh water consumption	000's m ³
2021/22	2,160
2020/21	2,039
2019/20	2,254

Water stress analysis to identify our priorities

To understand where we need to act most quickly for most benefit, we used the World Resource Institute's (WRI) Water Risk Atlas tool to analyse usage at our sites. The tool identified 16 facilities that are located in regions with a high or extremely high baseline water stress level, which means that they are at higher risk of declining water availability or increased cost in the future due to drought or groundwater table decline. They represent 24% of total water consumption.

From this analysis, we have developed group-wide guidance to help sites adopt effective water management plans, improve measurement and reduce water consumption. We are rolling this out to all our sites during 2022 and plan to run awareness sessions to help employees understand the role they play in driving towards our water target.

This work is part of our broader climate risk assessment work aligned with the Taskforce for Climate-related Financial Disclosures (TCFD) framework. See pages 60-69 for our full TCFD report.

Performance on waste

In 2021/22, the total amount of waste we produced and sent for treatment by third parties rose to 96,286 tonnes. Within this number, we saw rises in both our hazardous waste and our total waste sent to landfill categories, which we are keen to address. These rises are due in large part to the fact that we brought two new sites online that began producing waste, but it is also a result of changes in our product mix at some of our other sites.

Of this hazardous waste, we recycled and reused 47% this year. That is a 74% increase on 2020/21, thanks to a waste vendor recycling a particular liquid hazardous waste stream from one of our effluent treatment plants in Royston, UK.

Progress against our 2030 target

Reduce total hazardous waste sent offsite for third-party treatment by 50%

2021/22

60,470
tonnes

6.5% increase from
2019/20 baseline

Type of waste

Type of waste (tonnes)	2021/22	2020/21	% change
Liquid hazardous waste	57,478	54,171	+6.1
Solid hazardous waste	2,992	3,042	-1.6
Liquid non-hazardous waste	19,367	18,166	+6.6
Solid non-hazardous waste	16,448	12,167	+35.2
Total waste	96,286	87,546	+10

Waste treatment

Type of treatment (tonnes)	2021/22	2020/21	% change
Reuse	1,692	1,895	-10.7
Recycling	40,526	25,845	+56.8
Offsite incineration with energy recovery	4,380	3,314	+32.2
Incineration or other offsite treatment	45,446	52,891	-14.1
Landfill	4,242	3,601	+17.8
Total	96,286	87,546	+10

3. Minimise environmental footprint

Other operational air emissions

Some of our operations produce other air emissions as by-products of chemical reactions, including nitrogen oxides (NOx), sulphur oxides (SOx) and volatile organic compounds (VOCs). All our permitted sites monitor these emissions to ensure they comply with local regulations. When we design and build new facilities, we carry out an environmental impact assessment, which highlights the emissions abatement technology that we need to install.

Progress against our 2030 target
 Reduce NOx emissions from our operations by 40%

2021/22

379 tonnes

5% increase from 2019/20 baseline

Performance

In 2021/22, we saw a small increase in our year-on-year NOx emissions, in line with our new sites coming online and the associated rise in production levels.

Our VOCs and SOx emissions both increased this year as well. We do not emit VOCs and SOx at every site, and our product mix at the sites that do produce these emissions has a large effect on our reported numbers.

We are investigating how best to monitor and report on other hazardous air pollutants (HAP) and hope to include a fuller report on our HAP emissions next year.

	2021/22 ¹	2020/21 ²	2019/20 ¹
NOx (tonnes)	379	375	360
SOx (tonnes)	79	49	28
VOCs (tonnes)	92	83	99
% sites covered for NOx reporting	79%	74%	67%

1. 2% sites not included are those due to divest or close in 2022.

2. Restated as explained below.

For example, at one US site we are installing 'selective catalytic reduction' technology, which uses ammonia and a catalyst to reduce NOx emissions. We expect the new system to come online later in 2022.

Improving our management of NOx

Our foundational work towards achieving our 2030 target has been to ensure we are measuring all the NOx that our manufacturing plants produce globally in a standard manner. Measuring and reporting our NOx emissions has always been a challenge, because of the complex chemistries in the products we make. This programme to standardise our NOx reporting has led us to restate our last three years of data (see opposite) and the only sites not yet covered are those that have been announced as earmarked for divestment in the near future. We believe this now gives us a firm foundation on which to prioritise where to add specialist equipment to help reduce NOx emissions.

Product life cycle management

To realise our vision for a cleaner, healthier world our products must be made in ways that are as safe as possible for people and the planet. Some of the materials we use and the products we make are inherently hazardous, so our licence to operate depends on high standards of product stewardship. As well as supporting our Environment, Health and Safety teams to identify and manage the chemical risks in our own operations, we consider a product's full life cycle to ensure the risks are addressed at every stage.

Our Innovation team also works with our businesses to ensure new products are designed with safety and sustainability in mind. Together, they use key questions, such as 'are there any elements of the product that cannot be recycled or degraded?' or 'are any substances in the product included on substances of concern lists?' to determine whether product development should continue.

 [See page 49 in People, for more information on keeping our employees and contractors safe when handling hazardous chemicals.](#)

Our product stewardship policies define our key requirements, processes and responsibilities to ensure we comply with relevant laws and regulations. They also support our commitment to Responsible Care®, a voluntary industry-wide initiative to support safe chemicals management.

Maintaining high standards to meet changing regulation

We work in several highly regulated industries, which means we must adhere to strict requirements, such as notifying or registering products and following certain rules on manufacture and use. Our Product Stewardship Centre of Expertise works with our businesses to ensure we comply with these rules. The team is also designing a new IT tool to help assess the potential impact that proposed regulatory changes or new hazard information could have on our portfolio.

Our product stewards also monitor changes around the world and assess their potential impact on our supply chain. This year, we prepared for new chemicals regulation in Turkey, India, South Korea, Latin America and the Eurasian Economic Union. For example, in advance of India's widely anticipated Chemicals Management and Safety Rule, we prepared a substance inventory check for chemicals we make and import into the country.

Operations continued

We have also continued to work on our compliance programmes in China. And in the UK, we are working with the government, directly and through the Chemicals Industry Association (CIA), on potential revisions to the UK's Registration, Evaluation, Authorisation and Restriction of Chemicals (UK REACH) regulation.

Our product stewardship reporting programme helps us track operational and product performance every year. This year, the programme found no reports of significant health effects from the use of our products. It also confirmed we continue to comply with health and safety, labelling and marketing regulations, and voluntary codes. There were no transportation incidents with significant impact on the environment reported either.

Reassuring customers on product safety

We assess all the potential chemical hazards in our products and provide customers with legally compliant safety data sheets. These contain information on the chemical and its hazards, along with guidelines on safe handling and what to do in the event of a spill or emergency. We also submit this information to national poison centres around the world.

We work closely with our customers to understand how they use our products to see if we can further control or minimise risks and to better understand any adverse effects on human or animal health, or on the environment. For example, this year JM assisted customers in Oman to obtain trans-frontier shipment notifications to enable the safe and appropriate treatment and disposal of mercury waste.

Working with industry bodies to meet regulations

As well as ensuring we maintain the highest standards of product stewardship in our business, we work with our industry to foster sound product safety assessments and support proportionate government regulation.

For example, we belong to voluntary European industry initiatives such as the Cefic/ECHA REACH Dossier Improvement Action Plan, designed to improve the quality of hazard and risk management information that chemicals companies like JM must submit under the EU REACH regulation. This year, we re-evaluated, and where necessary, updated almost 90 EU registration documents, six of which JM is the sole or lead registrant.

We also belong to a variety of industry bodies so that we can make our voice heard in discussions about new regulation, and to help us better understand, and plan for, potential changes. For example, in the UK, we belong to the CIA, and in Europe we are members of the European Chemical Industry Council (Cefic) and Eurometaux. We are also members of the European Precious Metals Federation (EPMF) and the Cobalt Institute.

In 2021, JM ranked fifth in the non-governmental organisation ChemSec's latest Chemscore report. The report assessed the world's 50 largest chemicals companies against several criteria, including toxicity of product portfolio and transparency. While our overall score is the same as 2020, we were pleased to retain our top five ranking despite the report expanding from 35 to 50 companies.

Finding safer alternatives and reducing risk

Where possible (and always where legally required), we strive to replace 'high hazard' substances – chemicals that may pose a significant risk to human health or the environment – with safer and economic alternatives. In cases where we need to use these substances in new products or technology projects, a senior site or operations leader must approve a risk assessment. Approvals are time-limited (varying by project) to ensure our R&D team continues work to identify less hazardous alternatives.

Where replacement in existing products isn't possible, we conduct detailed safety assessments for each use and ensure that our operations and customers have robust risk management processes in place. This may include site visits, co-developing site-specific exposure scenarios to ensure appropriate risk management measures are in place, or requiring written confirmation of conformance.

The number of substances we use that are regulated¹ or are considered to be of international concern² is limited. Approximately 5% of our sales come from products that are made using or containing such substances.

Working with genetically engineered microorganisms

Genetically engineered microorganisms in our biocatalysts (enzymes) represent just 0.01% of our sales. These products do not contain live organisms at the point of supply. Biocatalysts are important because they can help us make more of a desired chemical product with fewer undesirable by-products.

Our policy on animal testing

As a chemicals company, we must comply with international legislation to provide toxicity information to assure the safety of our products for humans, wildlife and the environment. Sometimes, this means we have to use animal testing. We are committed to ethical principles of animal protection and always look for other options first, such as computer modelling and non-animal testing methods.

Where no data or alternative methods exist, and a study is required by law, we seek to limit new testing and avoid duplication by working in collaboration with industrial partners with the same data needs. We only use fully accredited contract research organisations and we do not carry out in-house testing.

We also look for opportunities to use non-animal testing where regulation allows. For example, we are currently working with SenzaGen AB to assess the use of its non-animal testing methods to identify hazardous properties of difficult-to-test metallic products.

For more information on our animal testing policy, visit: matthey.com/product-stewardship

Developing life cycle analysis for our products

Product life cycle analysis (LCA) is an important way in which we can demonstrate how the environmental benefits of our products outweigh the impact of making them in the first place.

We have also set ourselves a 2030 target to make cradle-to-gate LCA information available for more than 95% of our product families, and in 2022 we recruited a small, dedicated LCA team to help us get to work.

1. Such as substances of very high concern under REACH and the EU's Restriction of Hazardous Substances Directive or substances listed under California Prop 65.

2. Such as substances controlled by the Montreal Protocol, Stockholm and Rotterdam Conventions, GHS category 1A/1B carcinogens, mutagens or reprotoxins.



People

In this section

1. Keep people safe	49
Our approach to health and safety	49
Occupational health and safety performance	50
Protecting our people from different types of risk	51
Process safety	51
Strengthening our audit programme	52
2. High-performing, inclusive and engaged company	52
Building skills and career paths for a successful future	52
Enabling our people navigate change	53
Diversity and inclusion	53
Our equal opportunities policy	54
Employee engagement	55
Transforming our culture	55
Ethics and compliance	55
<i>Our progress this year</i>	55
<i>Campaigns and training to strengthen employee engagement</i>	55
<i>Encouraging a 'speak-up' culture</i>	56
3. Uphold human rights in our value chain	56
Strengthening our commitment to human rights	56
Our approach to human rights - Modern Slavery Statement	57
Our raw materials supply chain	57
Doing business in higher-risk jurisdictions	58
What we expect when working with our suppliers	58
4. Invest in our local communities	59
Our performance in 2021/22	59
Connecting young people with science through Science and Me	59

1. Keep people safe

Everyone in JM is responsible for keeping themselves and each other safe. We also rely on the skills and diligence of our operational and safety teams to keep our plants and sites running safely and efficiently.

Our approach to health and safety

To keep our people, plants and sites safe, we focus on:

- Occupational health and safety to track, report and address more frequent, but typically less severe incidents, such as slips, trips and falls.
- Process safety – to manage our most hazardous processes and ensure we design, operate and maintain safe factories.



Our Group Environment, Health and Safety (EHS) policy, available in local languages, guides everything we do and is underpinned by eight lifesaving policies, such as working in confined spaces. We give our sites guidance on how to implement these policies and put local processes in place to meet them. We also monitor compliance through EHS audits.

We recognise that the changes we're making in our portfolio have created uncertainty for employees this year. And we know that uncertainty can make it harder to stay vigilant. As a result, we have seen a higher number of incidents in some areas. To combat this and get everyone back on track, we have launched our 'Take 5' programme to help employees carry out simple safety checks to identify hazards and controls before starting any activity.

Nonetheless, our people continued to demonstrate care for one another throughout the ongoing challenges of COVID-19. We continued to monitor the site measures and controls we have in place to protect our operational employees and rolled out regular lateral flow testing at our UK sites. We are pleased to say that we have had no fatalities of employees or contractors in the last seven years.

Progress against our 2030 targets

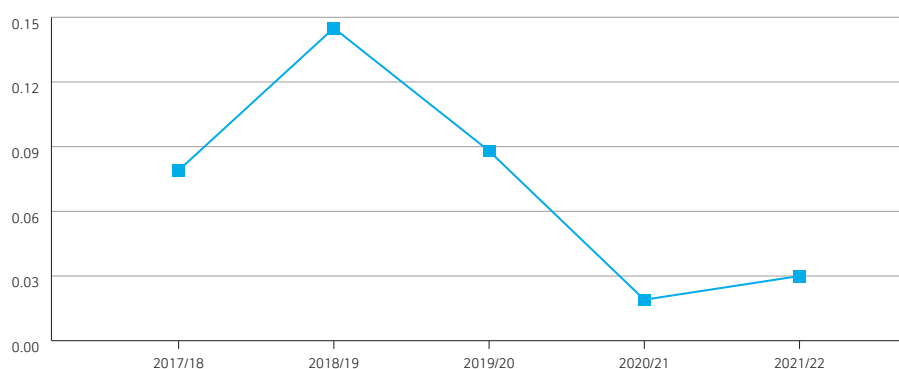
Total recordable injury and illness rate – employees and contractors (per 200,000 hours worked)	ICCA process severity rate (per 200,000 hours worked)
2030 target	2030 target
below 0.25	0.4
2021/22	2021/22
0.59	1.37

Occupational health and safety performance

We want everyone to go home safe and well at the end of every day. We use several leading and lagging indicators, such as lost time injury and illness rates (LTIIR), to help us track performance and make improvements.

Of our recordable injuries, 42% occurred in the USA, where some sites faced resourcing difficulties, leading to more overtime and fatigue. A couple of our sites also had more ergonomic injuries related to old equipment that is not ergonomically designed. These sites now have plans to address the issues and, in 2022, most of our sites will have carried out gap assessments against our behaviour standard which we relaunched in 2021. While our overall recordable injury and illness rate deteriorated slightly this year, our severity rate improved by 29%. This means that those injuries were less serious and resulted in fewer lost working days.

Occupational illness incident cases per 200,000hrs worked



Recordable injury and illness rates for employees and contractors

Lost time injury and illness rate and total recordable injury and illness rate (all per 200,000 working hours in a rolling year)

	2021/22	2020/21	2019/20	2018/19	2017/18
All personnel - LTIIR	0.29	0.28	0.34	0.56	0.54
All personnel - TRIIR	0.59	0.55	0.79	0.97	0.99
Employees and temporary employees - LTIIR	0.29	0.29	0.35	0.57	0.52
Employees and temporary employees - TRIIR	0.61	0.56	0.79	1.01	0.96
Contractors - LTIIR	0.27	0.23	0.27	0.40	0.74
Contractors - TRIIR	0.49	0.45	0.80	0.53	1.29

* Note: all personnel above means employees, temporary employees, and contractors

During the year, we continued to embed new tools, including 'golden rules' to support our lifesaving policies. For example, when working at height one of our rules states: 'I will always wear a secured harness where the risk of a fall cannot be eliminated'.

Our 'Take 5' programme helps employees carry out simple safety checks to identify hazards and controls before starting any activity. We have also relaunched our behaviour standard as part of our ongoing Work Safe, Home Safe campaign. This helps sites assess safety culture between different employee levels, identifying why those differences exist and developing plans to close gaps.

In the coming year, we plan to introduce training to help improve the quality of safety observations and conversations at our sites. The training will help our people learn how to ask open ended questions, ask each other what could go wrong before carrying out an activity, and remind everyone of their responsibility to stop and report any unsafe practices.

Keeping our contracting community safe

This year, we continued work on several large capital investment projects across the group, which meant we had many more contractors on site than usual. With our contracting partners, we helped them to understand our EHS expectations and regularly monitored their compliance. This meant our contractor LTIIR for the past 12 months increased only slightly, from 0.23 to 0.27, as did our our total recordable injury and illness rate (TRIIR), from 0.45 to 0.49. Our five-year contractor LTIIR and TRIIR performance can be found in the table above.

Protecting our people from different types of risk

At JM, our EHS standard and guidelines help us assess, monitor and reduce employee and contractor exposure to hazardous materials. These cover a range of issues, including how to manage exposure to chemical, physical and biological risks.


Every site has its own monitoring plans to identify potential exposure against regulatory and internal JM limits, and to set out its control measures to either reduce or remove exposure.

Our group EHS team regularly audits sites against our EHS standard. It also shares good practice and tools to improve safety standards, and frequently reviews our industrial hygiene exposure risk evaluation and control programmes.

Our Group industrial hygiene and occupational health team also carries out regular site reviews to assess health management programmes and, when needed, support improvement plans.

In the next year, we will continue to focus on our ergonomics programme – one of our biggest occupational health challenges. And we plan to introduce a central database to record exposure risk assessments and exposure monitoring data. We also work through industry associations, such as the International Platinum Group Metals Association and European Precious Metals Association to support industry health studies.

Our central team continues to support new projects across JM with appropriate advice on health risk management, including risk assessment, containment and control, and ongoing health management.

 [See pages 47–48 in Products for more information on our broader approach to product life cycle management and safety.](#)

Process safety

Keeping our plants and equipment in good working order helps reduce the risk of failures that could cause significant injury or harm the environment. Process safety relies on well-designed facilities, strong engineering skills, regular maintenance programmes and clear, consistent training.

Our performance in 2021/22

Our main lagging indicator for process safety is the severity score of loss of primary containment (LOPC) incidents, based on the International Council of Chemical Associations (ICCA) standard. Our performance declined this year. Two factors contributed to this year's results: two significant LOPC incidents, and more and accurate reporting from our sites. When compared with our pre-pandemic 2019/20 statistics, our figures for this year are broadly flat.

We investigate every process safety event to understand the root causes and put measures in place to correct the problem. In 2021/22, our most serious incident occurred when a road tanker carrying 50% caustic soda was accidentally offloaded to a storage tank that was out of service for maintenance. This resulted in the release of a small amount of corrosive liquid outside the containment area. The spill was contained on site and no one was harmed, since the area was empty. Our root cause analysis revealed failures in the tanker offloading procedure, including a process that meant a critical lock on the connection between the tanker and the storage tank was removed too early. We shared the lessons from this incident via a video presentation to our operations community. And we carried out a gap assessment at all sites that receive chemical bulk deliveries to ensure they are following good practice to prevent offloading errors.

We also completed a group-wide gap assessment on design for selected chemical processes that could cause excess flammable gas. The sites with these processes now have plans in place to address gaps.

Our Tier 1 process safety events increased from five in 2020/21 to 11 in 2021/22. This was partly due to better reporting of LOPC events from our sites. See Basis for Reporting on pages 214-220 for a definition of a Tier 1 event.

In 2021/22, 93% of operations-based staff completed our process safety training, designed to help employees understand their part in keeping our equipment in good working order. In addition, we launched a new process safety technical training website and ran 15 online courses for more than 200 participants on a range of process safety topics.

We relaunched our process safety performance indicators with clear requirements for lagging indicators, including our LOPC rate. These also look at leading indicators that focus on areas such as overdue inspections on safety-critical equipment and process safety-related near misses.

We also carried out individual process safety competency assessments for 150 managers and engineers in process safety-critical roles at facilities rated 'high hazard'. We will complete the remaining 37 assessments throughout 2022/23.

ICCA process safety severity rate (PSER)

PSER per 200,000 hours worked

Year	Rate
2021/22	1.37
2020/21	0.81
2019/20	1.20
2018/19	1.54

Strengthening our audit programme

Despite ongoing COVID-19 restrictions in the first half of the year, we audited eight of our sites across Europe and Asia during 2021/22, either in person or remotely. We also completed face-to-face audits at seven of our North American operating facilities, in line with our proposed schedule. Our audits in Europe and Asia identified gaps in our programmes to implement lifesaving policies. In North America, we found issues around contractor management, the control of hazardous energy and managing change programmes. All our audited facilities now have remedial action plans in place to address these gaps and we will track those plans until they are completed.

This year, we introduced a new audit rating to better illustrate a site's progress against its EHS risks, while our sector EHS leaders introduced more rigour for acting on audit findings and identifying work that requires capital investment.

Another key development was a new methodology for deep dive audits on risk management events that could lead to catastrophic incidents. This will help ensure we have the right controls to reduce the likelihood of an event happening. In 2021/22, we audited three sites and plan to audit the remainder in 2022.

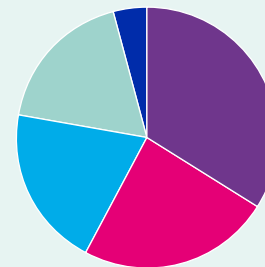
As we continue to transform, we know we must do even more to help our people stay safe. Continuing our programme of site process safety hazard reviews is key, and we have now assessed 74% of our high-hazard processes, all of which have plans to act on the recommendations. We're also working to reduce our LOPC statistics, including introducing more automated fail-safe instruments.

We are also planning further improvements over the next 18 months, including completing work to verify safety instrumented systems, such as trips and interlocks for high-hazard critical events. And we will continue to improve group support for incident investigations and sharing lessons learnt across JM from serious process safety incidents.

2. High-performing, inclusive and engaged company

We are proud of our talented people. They kept each other and our facilities safe throughout the ongoing COVID-19 pandemic, while showing determination to continue winning business and driving results. They also demonstrated resilience as we carry out important work to simplify our portfolio, while delivering our ongoing business.

JM people around the world Total employees by region



Monthly average number of employees	14,421 ¹
UK	34%
Rest of Europe	24%
North America	20%
Asia	18%
Rest of World	4%

1. This includes 924 agency staff.

Building skills and career paths for a successful future

We have deep technological expertise, particularly in platinum group metal (PGM) chemistry, catalysis and process design, and have leading positions in many of our chosen markets. To make the most of this competitive edge and unlock the greatest value for our customers and JM, we are focusing on strengthening our in-house commercial capabilities. During the year, we set up a Commercial Council to accelerate this work, making progress in several areas, including cross-sector accounts management, introducing a new customer relationship management approach and exploring the use of sales incentives. Our Sales Academy was core to this strong progress.

Supporting leaders throughout their career

Our 'Aspire' leadership development programmes are designed to support leaders at all levels of JM, from first-time team leaders to senior managers. Since launching the programmes, close to half of all JM leaders have taken training modules. Course evaluations were consistently positive, with scores well above 80% in all key categories, such as the relevance of content to people's jobs.

Sustainable business *continued*

People continued

To support our leaders as we transform our business, we also launched several new global coaching programmes and leadership masterclasses on topics such as empowering teams. Our Boost programme, for example, has helped to embed a coaching culture at our manufacturing sites, while driving process and efficiency improvements. In 2022, we aim to establish new learning and development analytics to provide individuals and groups with more targeted development opportunities. And we established a new JM capability framework to give employees clarity on how to develop and manage their career at JM. In 2022, we aim to establish new learning and development analytics to provide individuals and groups with more targeted development opportunities.

Creating clear career paths

This year, we developed more detailed functional skills resources, particularly for our Commercial and Human Resources functions, and promoted our MyCareer digital career site. In 2022, we will also develop new skills and careers resources for our innovation and engineering functions to help them identify cross-sector opportunities and grow their JM career.

Enabling our people to navigate change

The world is changing at an extraordinary rate and JM is adapting to ensure our business is fit for the future. In the past year, our portfolio review and ongoing transformation programme have caused short-term uncertainty for our people, including some roles being made redundant. We have, however, a re-deployment programme to help affected colleagues take up roles in other parts of JM. Where this is not possible, we provide financial and career support. COVID-19 and a tightening labour market, particularly in the USA, have also affected our employee turnover this year. Our total turnover decreased slightly from 15.7% to 15.4% compared to last year. However, our voluntary turnover rate increased from 9.0% in 2021/22 to 11.6%.

We respect and promote the rights of people to freedom of association. In 2021/22, and 23% of our people globally were covered by collective bargaining agreements and represented by trade unions.

We work collaboratively with 10 trade unions across JM, focusing on a range of topics, such as safety, wellbeing and improving the way we work at our local sites. Together, we discuss site, sector and business performance, environment, health and safety issues, working practices, business change needs, employee training and reskilling. We also support engagement at regional and national levels where needed.

Change of any kind can be unsettling, and it is more important than ever that we help our people look after their health and wellbeing. During the year, we ran a number of sessions for all employees across the organisation.

Across JM, we also looked for ways to promote physical wellbeing in 2021. This included launching a global step challenge in July. More than 2,200 employees joined the challenge, taking more than one billion steps. We followed this with a global wellbeing festival, running more than 50 different sessions on a range of mental and physical wellbeing topics. We saw over 3,500 registrations and received positive feedback from employees.

The future of work – a more agile approach

As part of our ongoing transformation programme, we rolled out several global processes to simplify and standardise our business. We are also rolling out new digital tools and processes, including Workday. This HR platform will give us better quality data to help us run our businesses effectively, understand our talent and simplify how we do things.

We also introduced hybrid working policies at several offices around the world. This gives our people greater flexibility to choose where, when and how they do their jobs. In some locations we reconfigured our offices to make it easier for people to work together.

Diversity and inclusion

We continued to make progress in our diversity and inclusion agenda this year, introducing a new diversity, inclusion and belonging roadmap built on five pillars: leadership accountability; developing and attracting talent; engaging employees; supplier diversity; and community engagement.

It is underpinned by inclusive policies and procedures designed to create a fair workplace for all. It will also guide our actions as we work to build an organisation that realises the benefits of diverse thinking, as well as greater inclusion and belonging.

Progress against our 2030 target

Female representation across all management levels.

2030 target
>40%

2021/22
27%

Progress on gender diversity

As at 31st March 2022, women represented 33% of Board members (2020/21: 34%) and 37% of all senior managers.

However, female representation across all management levels has remained at the same as 2020/21 at 27%. Achieving our 2030 gender target for this group of employees is a long-term process that is both structural and behavioural. It all starts at the beginning of our people development pipeline and we are delighted that this year women made up 58% of our new graduates and 56% of our talent acceleration programme. In 2022/23, we will introduce a development programme for leaders and people managers to ensure they understand why diverse teams, supported by inclusive cultures, are essential for business.

Gender diversity statistics

As at 31 st March 2022	Men	Women	Total	% men	% women
Board	6	3	9	67%	33%
GLT	6	2	8	75%	25%
Subsidiary Directors	100	17	117	85%	15%
Senior managers*	38	22	60	63%	37%
All management levels	1,303	487	1,789	73%	27%
New recruits	1,355	718	2,073	71%	35%
All employees	9,532	3,898	13,430	71%	29%

* Within JM our senior managers are defined as direct reports of the GLT. The UK Corporate Governance Code 2018 requires companies to disclose the gender balance of senior management, which is defined in the Code as a company's executive committee and the Company Secretary, the statistics for this are included in the GLT row above. Some individuals are included in more than one category.

Gender pay gap

We have made excellent progress. Our latest combined UK gender pay gap is 5.4%, an improvement on 6.7% in 2020/21. We continue to perform well against the national average of 15.4%.

Increasing diversity in all its forms

We want our teams to represent the communities in which we operate, which means going beyond gender.

This year, we have focused on building awareness and education among our employees to enable us to develop a culture of inclusion and belonging. This work is designed to increase our people's skills and confidence when talking about diversity and inclusion. In partnership with our Black Employee and Pride networks, we arranged 23 reverse mentoring relationships. This gave JM leaders the opportunity to be mentored by more junior colleagues and hear first-hand experiences from underrepresented communities while also providing their mentors with advice on career progression.

To support our HR colleagues and leaders, we ran training sessions on key diversity, inclusion and belonging topics. We also launched our first global, mandatory diversity and inclusion training for all employees, covering topics such as creating a respectful workplace and unconscious bias.

In 2021/22, we launched several new employee resource groups (ERGs), including a family group, a veterans' network and an Asian network – all sponsored by senior JM leaders, who champion and advocate for these groups in their businesses. As part of our ongoing employee engagement programme, we worked with our ERGs to run webinars on important topics ranging from autism to menopause to LGBTQ+ Pride month.

We remain committed to increasing racial diversity in senior leadership. In the UK, we participated in a cross-company talent acceleration programme, run by the Black British Business Awards.

We plan to focus more on ethnic diversity with our new Workday HR system, which will give us the opportunity to measure ethnic representation across the business and track future progress. From 2022/23, we will encourage employees to share diversity demographics in Workday, which will enable us to set UK and US ethnicity targets.

We also joined Valuable 500, which aims to encourage business leaders to address disability and inclusion, and have made several commitments to drive inclusion across the business.

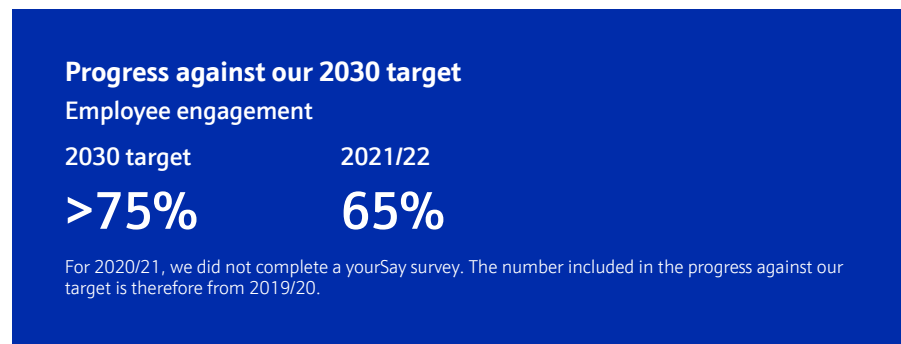
During the year, we partnered with Microsoft to run a series of accessibility in IT webinars. These explored visible and invisible disabilities and demonstrated IT features and support for people with disabilities, as well as how others can work more inclusively.

Meanwhile, as part of our commitment to be recognised in global LGBTQ+ indices, we were delighted to receive a Silver Employer Award from Stonewall. Our score rose significantly from 2019, reflecting the work we have done in the past few years to help our employees feel they can be themselves at work.

Our equal opportunities policy

Johnson Matthey recruits, trains and develops employees who are best suited to the requirements of the job, regardless of gender, ethnic origin, age, religion or belief, marriage or civil partnership, pregnancy or maternity, sexual orientation, gender identity or disability.

Employee engagement



As reported last year, we were pleased to see a rise in the number of employees who responded to our biennial yourSay survey in 2021. Later in 2022, we will use Workday to move to a continuous listening programme, pulse survey approach providing more frequent, detailed insights on the issues our employee face.

This year, we also ran structured leadership-led listening programmes, including regular sector and function-specific townhalls, to help leaders better understand their strengths and areas for improvement, and conducted several pulse surveys. And we introduced an engagement programme for our top 400 leaders giving them the chance to hear regularly from the GLT, discuss the challenges the company faces, ask questions about JM and help shape the company's future.

Our board held a number of employee engagement sessions across seven countries, focusing on sustainability with a very high level of employee engagement, see page 91 for more information.

Transforming our culture

Johnson Matthey's culture has evolved over the company's long history and we have tremendous strength that we will build on. However, we know that to successfully execute our strategy we need to transform elements of our culture. We are very excited about the next stage of our culture journey. We know there are many aspects of how we work that influence culture and we will be addressing all of these to help JM to be a truly high-performing organisation.

To do that, we intend to change the way we work based on three cultural principles:

- 1. More efficient, less bureaucratic** – introduce simpler, more efficient ways of working and clearer internal accountabilities to help us work at pace.
- 2. A high-performance, commercial mindset** – strengthen our commercial skills and set clearer business objectives to create a fast-paced, bolder culture focused on winning in our chosen markets.
- 3. A more external outlook** – create new ventures and partnerships with customers, industry and governments to accelerate growth and the transition to net zero.

Ethics and compliance

We expect everyone who works with JM to live by our value to 'act with integrity'. That means upholding the highest ethical standards in everything we do – from how we treat one another to how we do business. Our Code of Ethics helps everyone to understand what doing the right thing means at JM.

Our progress this year

We have had an active year, rolling out a series of tools to give senior leaders better visibility of the ethics and compliance issues within their areas and across JM. This information will help drive greater business ownership and, where needed, support remedial plans that directly address their business issues.

For example, we:

- Share anonymised information and notable examples of Speak Ups and ethical dilemmas with the board, GLT and our Societal Value Committee. We also provide sector leaders with an annual or biannual breakdown of ethics and compliance issues and trends in their business (see 'Encouraging a speak up culture' on page 56).
- Introduced new tools (such as an ethical culture heat map) to help us strengthen the way we analyse and report ethics and compliance data back to the business.
- Regularly communicate with employees on compliance risks, including anti-bribery and corruption, competition, export controls and sanctions, data protection, conflicts of interest and supply chain compliance.
- Joined the UN Global Compact for Human Rights in January 2022 and supported Principle 10 (working against corruption in all its forms). We do this through training, encouraging teams to share 'ethics moments' at the start of meetings, updating our central bank of ethics scenarios and continued focus on the way in which we bring on board and monitor our third-party intermediaries.

Campaigns and training to strengthen employee engagement

In June 2021, we ran a four-week campaign to raise awareness of the impact that change and uncertainty can have on behaviour in the workplace. It aimed to remind employees about the importance of good, ethical decision-making and that we always encourage people to speak up and ask for help if faced with a problem.

In October, more than 50 sites took part in our annual Ethics Week celebrations, with employees around the world at all levels sharing videos about what ethics means to them. We also heard from a customer who discussed the importance of ethics in their supply chain. Feedback was positive, with participants telling us they liked the employee-led approach.

In 2021/22, 77.5% of our employees completed our Code of Ethics training. This is the third year in a row that we have seen a rise in our training statistics. In future, our new digital tools, including Workday, will help us roll out more tailored training.

Encouraging a 'speak-up' culture

It is essential that employees feel they can speak up when they have a concern. We encourage them to do this via their manager, ethics ambassador, HR or legal representative. Or, they can contact our independent 'Speak Up' helpline. Where local law permits, these conversations can be anonymous.

This year, we received 158 Speak Ups – our highest ever number. While an increase, the number is in line with external benchmarks. We see this as a positive sign that our people feel comfortable raising concerns in JM and have faith in our process. Our Ethics Panel oversees all Speak Ups and appropriate action is taken where necessary. The panel also reports back to the board.

Speak Up reports in 2021/22

Concern/allegation	Number of cases investigated
Bribery and corruption	12
Business and financial reporting	0
Competition / anti-trust	0
Confidential information and intellectual property	0
Conflict of interest	10
Discrimination, including harassment and retaliation	51
Employee rights	56
Enquiry	7
Environmental protection, product stewardship or health and safety	17
Insider trading	0
Misconduct or inappropriate behaviour	2
Physical assets	1
Theft	0
Violence or threats	0
Computer, email and internet use	1
Substance abuse	1
Total	158

3. Uphold human rights in our value chain

Progress against our 2030 target

- 2030 – assess 100% of our value chain partners for human rights risks and put remedial plans in place where high risks are identified
- 2021/22 – identified human rights risk areas of focus and developed a tailored risk assessment framework to segment our value chain and prioritise actions

We work in a global, multi-tiered supply chain and rely on our suppliers to provide raw materials, including PGMs, and goods and services like engineering support and process equipment, and utilities, catering and security for our facilities. We also buy transport services to move materials and products around the world and rely on corporate support, such as travel, IT and finance. As a result, our procurement teams work with thousands of suppliers, and in 2021/22 we spent £2.8 billion (excluding PGMs) with them.

In 2021/22, we had to manage additional supply chain complexity, including disruptions caused by the ongoing COVID-19 pandemic and logistical delays caused by bad weather events, such as Hurricane Ida, and the Suez Canal blockage. To help us move key materials in a more timely fashion in future, Procurement is developing new methodology to mitigate supply interruption from known weather events.

We are proud of our strong relationships with our suppliers and will rely on them even more as we work towards our sustainability targets while navigating the challenges of rising inflation and geopolitical tensions. Despite those challenges, we remain committed to working with our supply chain partners to uphold human rights and the highest standards in raw materials procurement.

Strengthening our commitment to human rights

To make progress against our 2030 target, we worked with a third-party specialist to identify the human rights risks that we will focus on, and developed a tailored risk assessment framework to segment our value chain and prioritise actions. As part of this process, we are also looking at risk in our own operations. We will begin to implement this framework during 2022/23.

As part of our people commitments, we also joined the UN Global Compact in January 2022, which demonstrates our support for internationally proclaimed human rights.

Our approach to human rights

We support the principles of the Universal Declaration of Human Rights and the International Labour Organization (ILO) Core Conventions, and align ourselves with key frameworks that define human rights principles for businesses. These include the UN Global Compact, UN Guiding Principles on Business and Human Rights and the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises.

Our independent Speak Up helpline is available for anyone wishing to raise a human rights concern. See page 56 for more information on this helpline.

Modern Slavery Statement

We are committed to ensuring no modern slavery exists in our business and to identifying and resolving any issues we find in our value chain. We publish our Modern Slavery Statement annually to demonstrate our progress. Our full 2021 statement is online at matthey.com/modern-slavery

Our raw materials supply chain

We source raw materials from around the world, some of which are only available from a small number of countries. It is essential that we understand and manage the associated supply chain risks. As a result of changes in our portfolio, the quantity of some raw materials that we source will not grow as anticipated, such as cobalt and lithium. We also expect to stop sourcing narcotic raw materials in mid-2022.

Where we source strategic raw materials

Material	Country
Primary PGMs	Canada, USA, South Africa
Secondary PGMs	USA, Germany, UK, Singapore, Italy
Rare earth materials	Brazil, China
Zeolites	USA, China, Japan
Ceramic substrates	Peru, France, China, India
Narcotic raw materials	Spain, Australia

* We ceased sourcing from Russia in line with government sanctions from February 2022.

Responsible sourcing of PGMs

We work with our customers and with industry associations, such as the International Platinum Group Metals Association (IPA), to ensure we source our PGMs in an ethical way.

We expect our PGM suppliers and refining customers to adhere to equivalent practices such as those set out in our platinum and palladium supply chain policy statement and to carry out appropriate due diligence on the counterparties from whom they source PGM material.

Our full policy statement is online at: matthey.com/responsible-sourcing-policy

Our primary and secondary metal needs are diversified in type and geography, so we have very little exposure to Russian PGM supply. However, we did ensure we had entirely ceased sourcing from Russia early in 2022.

Our UK and USA refineries are on the London Platinum and Palladium Market's (LPPM) 'Good Delivery' lists for platinum and palladium and are subject to its Responsible Platinum and Palladium Guidance (RPPG). We are audited annually and, following a successful second audit, we received new LPPM certificates in August 2021 confirming our ongoing compliance. Our annual LPPM compliance statement can be found at matthey.com/LPP-compliance

Conflict minerals

The term 'conflict minerals' refers to tin, tungsten, tantalum and gold (3TGs). They often originate in mines in parts of the world affected by conflict, particularly areas of military conflict where mining is often illegal and linked to serious human rights abuses, including modern slavery and child labour. We use small quantities of these metals in some of our products, most notably tungsten in some of our automotive catalysts, of which total expenditure is less than 0.1% of our procurement spend.

We are committed to sourcing these minerals to the highest standard, as outlined in our conflict minerals policy, which is aligned with the OECD's Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas. This includes keeping records that allow us to track the suppliers of all the raw materials we use that contain 3TGs and identify which refiners and smelters the 3TGs came from. We only use materials from refiners and smelters that meet the Responsible Minerals Assurance Process (RMAP) assessment protocols and that are listed on the Responsible Minerals Initiative database.

In September 2021, we published our first annual conflict minerals disclosure, outlining how we reviewed our 3TG suppliers against our policy commitments during the year.



[Read our policy and statement on our website, matthey.com/sustainability-governance.](https://matthey.com/sustainability-governance)

Doing business in higher-risk jurisdictions

Some of our customers, suppliers and other partners are based in parts of the world that represent a higher legal or reputational risk. Our policy, 'doing business in higher-risk jurisdictions', sets out how we manage these risks using enhanced due diligence. In 2021/22, we carried out this due diligence on 488 counterparties. While this figure is less than 1% of all our counterparties, they are the ones that present some of our highest risks from an ethics and compliance perspective. As a result, we put remedial measures in place and declined business in select instances.

Our Group Ethics and Compliance team actively monitors the geopolitical landscape to ensure we comply with all regulations, including international export control and sanctions regimes. For example, this year we actively managed the situation involving Russia, Belarus and Ukraine to ensure we comply with our legal obligations, act consistently with our values and minimise any impact on business continuity.

What we expect when working with our suppliers

Our Supplier Code of Conduct, sets out our expectations on key issues, including health and safety, environmental management and human rights.

During 2021/22, Procurement began a phased roll out of our due diligence framework to strengthen our supplier relationships and simplify the way we work with them. We now require all new suppliers to complete an online self-assessment to demonstrate their alignment with our Supplier Code. We review these assessments as part of our supplier onboarding process and follow up with additional actions, as appropriate. More than 300 new suppliers participated in this process this year.

We have also started assessing our existing suppliers using EcoVadis, the world's largest provider of business sustainability ratings. To date, 25% of our total procurement spend is with suppliers who have an active EcoVadis rating and good governance in all aspects of our Supplier Code. The nature of the concerns highlighted by the EcoVadis assessment are shown in the table below.

EcoVadis rating	% procurement spend
Spend with suppliers who have current EcoVadis medal	25%
Suppliers with a good score on alignment with our Supplier Code of Conduct but no medal due to adverse media in the past three years	1.5%
Suppliers with current rating but no medal	0.2%
Suppliers without an active EcoVadis rating or not yet requested	73%

Area of concern that led to low EcoVadis rating for JM suppliers due to lack of governance or regulatory fines reported in media in the past three years		Number of suppliers
Environmental	Environmental	6
Labour practices and human rights	Labour practices and workers' rights	3
	Health and safety	3
	Child labour	0
Ethics	Anti-bribery and corruption	2
	Anti-competition	4
	Inadequate ethics governance	3
Procurement practices	Lack of responsible sourcing governance	1

In early 2022, Procurement also began introducing a programme to support our commitment to work with more businesses that are owned and run by people from diverse and under-represented communities, as well as other companies that are committed to promoting diversity in their business. This includes a pilot project with more than 500 suppliers, primarily in professional services in the UK and USA, to strengthen our procurement process and ensure our sourcing processes are more inclusive. It will also help JM identify and address areas where we can make it easier for suppliers to work with us. We will continue to roll out this programme across JM during 2022. We are also working with MSD UK, which connects ethnic minority businesses with global corporations to widen our access to diverse suppliers.

4. Invest in our local communities

Community investment helps us connect with each other and our local communities, and we are proud of the connections we have made over the years via our global volunteering and match funding programmes.

Progress against our 2030 targets

2030 target	2021/22 progress
>6,000	1,322
days of corporate volunteering every year	

Our performance in 2021/22

Our employees volunteered 1,322 days during 2021/22, significantly higher than last year, which is testament to their commitment to the organisations they care about. Research also shows that volunteering has a significant impact on mental wellbeing. That's why we focused our internal communications on the idea of reconnecting with our communities. Of course, some parts of the world kept their COVID-19 restrictions in place for longer, and some people have not felt as comfortable returning to in-person activities as quickly as others. This is why our number currently remains lower than our baseline.

We saw a strong response to our third annual International Volunteer Day campaign in December 2021, with around 500 employees donating time worth 430 days. During the summer in North Macedonia, more than 50% of employees helped to clean two local cities over two days.

We manage the bulk of our donation to charity via our Charities Aid Foundation (CAF) account. During the COVID-19 pandemic, we have donated to this account at a faster rate than we drew on it and so took the decision not to top it up this year. This year, we did use our CAF account to donate £302,612. Around £60,000 was used to match donations made by more than 400 employees to help the people of Ukraine, following Russia's invasion in February 2022. JM also set up a special fund to help our Ukrainian employees working in Poland cover accommodation and living costs for family and friends seeking refuge over the border.

Community investment summary

	Investment 2021/22 £'000	Investment 2020/21 £'000	% change
Direct expenditure	168	1,374	-88
Indirect expenditure	283	32	+790
Total	451	1,406	-99

Connecting young people with science through Science and Me

We gave grants to 12 new projects during the first full year of our Science and Me programme. For example, in North Macedonia we funded a project to build a chemistry lab for socially vulnerable primary and secondary school students. In the UK and USA, we supported a digital project that allows young people to talk to scientists directly about their careers. We also funded three projects that help Black and Asian minority students develop new skills to support science, technology, engineering and mathematics (STEM) careers.

In the UK, we ran another successful virtual work experience week involving around 80 students and 70 employees, including our former Chief Executive, Robert MacLeod, and our Chief Technology Officer, Maurits van Tol. In total, our employees spent 20 hours with the students over the week. In December, GLT members talked to students about their careers and what else businesses could do to create a more sustainable world.

We also took part in Green Skills Week, a campaign launched by the charity Speakers for Schools, welcoming 104 students to three days of online talks about green technology. Out of those students, 46 were selected to take part in a challenge to present their ideas on new green technologies linked to plastic, air pollution and carbon emissions. The students presented to a panel of internal and external judges, including our Director of Technology, Liz Rowsell.

Taskforce for Climate-related Financial Disclosures

In this section

Introduction	60
Governance	60
Strategy	61
Risk management	68
Metrics and targets	69

Introduction

Climate change is one of the most pressing threats facing our planet today. It is affecting our environment and poses a growing risk for people and businesses alike. We recognise that what we do at JM has impacts – both positive and negative. Our products and services remove harmful air emissions and recycle scarce metals, and we are designing new technologies so that we can help accelerate the transition to a low-carbon future. But the manufacturing and chemical processes we use have their own environmental impact, creating greenhouse gas emissions, using water, and producing waste.

Our strategy is shaped, therefore, around the opportunities and the risks that our changing climate presents. And we have set ourselves the ambition of achieving net zero by 2040 with a series of challenging intermediate targets for 2030, to ensure we keep driving up the benefits of our products while reducing their environmental impact (see page 35 for a full table of targets).

The requirement to report using the framework of the Task Force on Climate-related Financial Disclosures (TCFD) is a useful tool in this process. It helps us think holistically about the future impact that climate change and the transition to a low-carbon world could have on us and, during the year, we continued to work with global sustainability consultancy Environmental Resources Management (ERM) to develop our approach. We have organised our report under the headings of the four pillars of TCFD framework because we believe that it's most useful for our stakeholders to include our response to TCFD as a standalone section within our annual report. In doing so, we have reported consistent with the framework, although we are still working on quantifying the climate-related impact of some of our risks.

Governance

Given the nature of our business, and how closely aligned our strategy is to a warming world, climate-related risks and opportunities have been on the board's agenda for many years. In May 2021, we announced the creation of a new board committee, the Societal Value Committee (SVC), to help the board focus more closely on the governance of sustainability matters including response to climate change. Nonetheless, the SVC is only part of the wider governance arrangements that support the board in discharging these responsibilities, as summarised in the diagram on page 61.

Role of the board and its committees

The board is responsible for setting and overseeing the implementation of the group's strategy, including the annual budget and detailed business plans. In doing so, it considers climate-related issues, including when approving requests for capital expenditure or new initiatives.

The SVC meets at least three times a year. It supports the board by overseeing the delivery of our sustainability strategy, and monitoring and overseeing progress against our sustainability goals and targets, with regular updates from the Chief EHS and Operations Officer. Jane Griffiths, the SVC Chair, reports to the board after each meeting, including bringing forward any recommendations from the committee. Given how fast society's response to climate change is developing, the SVC receives papers on emerging issues at each meeting, such as legislation and stakeholders' expectations. It also invites external experts to get an 'outside-in' view on our sustainability plans, and other emerging topics, which this year included diversity and inclusion, and human rights for more on the SVC's work, see page 98.

During the year, the wider board received an update on climate-related legislation and a training session on the implementation of TCFD recommendations.

Together with the Nomination Committee, the board ensures that, among the directors, it has the necessary sustainability and climate-related expertise. For more details of our non-executive directors' skills and experience, see pages 86-87.

As an initial step, the Audit Committee has this year reviewed the internal assurance in respect of TCFD. It will continue to assess the level of assurance over TCFD and climate-related issues as we continue to develop our reporting in this area. The Audit Committee is also responsible for reviewing the effectiveness of internal control and risk management, which includes climate-related risk.

This year, the Remuneration Committee reviewed the role of sustainability and climate-related targets within the group's remuneration approach. Measures will be included within the Performance Share Plan, reflecting our intent to contribute to an acceleration of the transition to a net zero world. For more details, see page 69.

As a result of our internal board effectiveness review, the responsibilities of the board and its committees in relation to climate-related issues and the broader sustainability agenda have been refined and clarified.

Role of management

The board delegates responsibility for running the business to the Chief Executive; this includes overall responsibility for climate-related issues, which resides with the Chief Executive, assisted by the Group Leadership Team (GLT). The Chief Executive is supported by the Chief EHS and Operations Officer who is responsible for day-to-day climate-related matters and provides updates to the GLT on the steps taken to develop or implement our sustainability strategy, including key metrics, risks and opportunities. The Chief EHS and Operations Officer is in turn supported by the Sustainability Council. The Sustainability Council is made up of managers from across our sectors and functions who, together, develop our sustainability vision, goals and targets. To prioritise driving our sustainability agenda and threading all elements into our business, we appointed a new Chief Sustainability Officer with effect from 16th May 2022. The Chief Sustainability Officer will report to the Chief Executive and be a member of the GLT.

Governance structure for climate-related issues



Strategy

Our business strategy is based on addressing the world's need to transition to a low-carbon future through enabling the necessary transitions in transport, energy, industry and the circular economy. Climate change offers us many opportunities, while also requiring us to adapt our operations to ensure we are resilient. So that we properly understand and can plan for its potential impacts, this year we developed climate-change scenarios to frame the ambiguities of an increasingly volatile and complex environment. These scenarios, which project the impact of climate change on our operational and commercial performance, are essential in informing our strategic choices, such as how we invest in R&D, or which new products to develop. We also use climate scenarios to consider the resilience to changing weather patterns of our own operations, those of our strategic suppliers and our core supply routes.

Climate scenarios for evaluating transition risks and opportunities

Our climate scenarios are central to our plan to achieve net zero by 2040, and our nearer-term ten-year strategic planning. They are used by all our businesses as a common basis for planning, forecasting and stress testing their strategy and assumptions on growth.

To test the resilience of our strategy and portfolio, and our assumptions about growth, we have developed three transition scenarios that represent a wide range of outcomes.

- Rapid transition scenario (aligned to 1.5°C) – net zero achieved globally by 2050, in line with the goal of the Paris Agreement to limit the world's temperature rise to well below 2°C by 2100, and preferably no more than 1.5°C. This reflects swift and decisive action with regard to policy interventions and decarbonisation commitments.
- Pragmatic evolution scenario (aligned to 2°C) – net zero achieved globally by 2080, which reflects a step-up in policy interventions and decarbonisation commitments compared with today, but not as decisive as under the rapid transition scenario.
- Slow transition scenario (aligned to 3°C) – net zero not achieved by 2100, reflecting a global lack of urgency on climate change with limited policy or legislative interventions.

We developed our climate scenarios internally with support from an external expert, reflecting the latest available research from internationally recognised sources such as the International Energy Agency (IEA). The IEA research we used included three scenarios: the Net Zero Emissions Scenario, the Sustainable Development Scenario, and the Stated Policies Scenario. Our methodology breaks down the different energy sources (electricity, hydrogen, gas, coal, oil, renewables, biomass and others) and considers forecasts for each source by demand type: transport, buildings, industry, power and heat, and feedstocks for materials. We developed in-house forecasts for specific source / demand combinations close to our areas of expertise in automotive, chemicals, hydrogen and other industries, while ensuring that, at a macro level, we remained within IEA's forecasts. This methodology allowed us to develop an economy-wide view, while also including enough detail about our key markets to inform our specific strategies for different parts of the business.

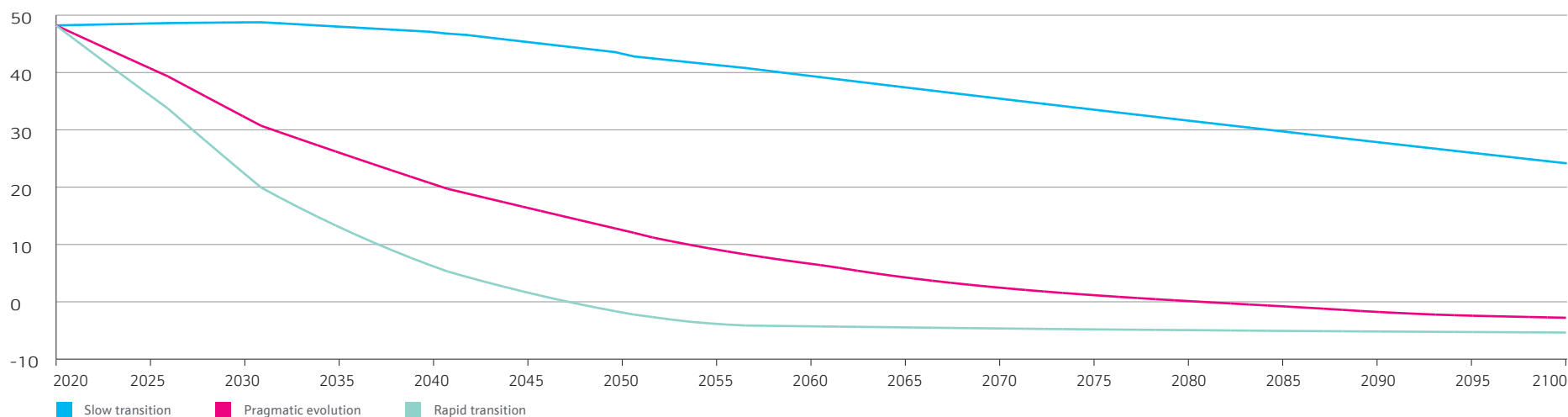
We update the scenarios at least annually to reflect any changes in external drivers. In these updates, we incorporate the latest from internationally recognised sources alongside our own forecasts, which take into account policy developments, technology evolution and the rate of public and private investment in new plants and infrastructure.

We model scenarios up to 2100 (see chart below), but look at shorter-term horizons, specifically 2030 and 2040, to inform our strategic and operational decisions. The table below details the main qualitative and quantitative assumptions we used for our 2040 scenarios, given that this is our target date to achieve net zero. We use the pragmatic evolution scenario as our base case for our strategic planning.

Market Sector	Metric (2040)	Unit	Rapid transition	Pragmatic evolution	Slow transition
Global	Total primary energy demand	EJ	500-550	550-600	690-740
	Renewables supply	% of total energy supply	c. 55%	c. 40%	c. 25%
Automotive	Global sales of zero-emissions vehicles	% of total automotive sales	c. 90%	c. 70%	c. 40%
	Global sales of fuel cell electric vehicles	% of total automotive sales	c. 20%	c. 15%	c. 10%
Hydrogen	Global hydrogen production	Mt p.a	350-400	200-250	150-200

IEA's NZE and SDS scenarios are used to inform our rapid and pragmatic transition scenarios, respectively. Both rely on policy interventions beyond current pledges to reduce fossil fuel-related emissions. The NZE assumes a wider range of interventions and stronger implementation rates, including in terms of near-term support to early deployment of key innovative technologies and supporting infrastructure. The NZE also assumes substantial energy efficiency gains through stronger standards for appliances and fuel economy, among other levers.

Total anthropogenic emissions (GtCO₂/yr)



Taskforce for Climate-related Financial Disclosures *continued***Our transition risks and opportunities**

Through our scenario work, we identified four distinct potential climate-related impacts, which represent both risks and opportunities for our business. We have added the first climate impact risk to our principal risks because it is of strategic importance to our business (see page 74).

Climate impact	Description of the transition risk and opportunity
1 Changing customer and consumer demand for our products	Increasing awareness of the impacts of a warming climate is changing consumer habits, leading to lower demand for some of our existing products and higher demand for new products. We need to carefully match supply as demand changes, and to identify new markets for our solutions catalysing the net zero transition for our customers to avoid negative financial impacts and realise opportunities for our revenue, cash flow and profitability.
2 Increasing demand for low-carbon manufacturing and recycling of key materials	Customers and policy makers are increasingly interested in the carbon footprint of our products, demanding a lower carbon footprint and specifying recycled content for key raw materials. We need to make the right capital investment decisions to transition our operations to net-zero emissions in line with market demand, and use low-carbon raw materials to increase our competitive advantage and avoid the potential issue of stranded assets.
3 Increasing carbon taxation	An increasing number of governments are introducing or considering introducing a carbon tax or trading schemes. This could raise the costs of energy, water and waste both for us and our suppliers, and also the cost of transport and logistics, which may be affected by international border carbon tax mechanisms. If this results in higher prices for our products, our customers may be less willing to buy them.
4 Increasing stakeholder expectations of corporate climate policy and performance	Market expectations are rising and corporate policy / performance regarding climate-related targets are under increasing scrutiny. If we do not meet our stated net-zero commitments and strategy, or our commitments do not keep pace with societal / market expectations of net zero, we could suffer from a loss of stakeholder and / or shareholder confidence, loss of reputation, shareholder action and climate-related litigation. Conversely, if we outperform our competitors in how we adapt to climate change, we could attract new shareholders and customers.

We have used our climate scenarios to evaluate these risks and opportunities in the short (0–3 years), medium (3–10 years) and long term (10+ years), in line with our usual business planning timescales. We believe the pragmatic evolution climate scenario is most likely to occur, so have used it as the base case for assessing our transition impacts, and the other two scenarios to stress test the sensitivity and resilience of our business plans.

Climate transition impact	Primary driver of impact	Opportunities (with time horizons)	Risks (with time horizons)	Management of impacts	Financial impacts (after management)	KPIs to monitor impacts
1. Changing customer and consumer demand for products	<p>Regulation</p> <ul style="list-style-type: none"> Emissions standards for vehicles Emissions standards for energy production Requirements for use of bio-based feedstocks <p>Markets</p> <ul style="list-style-type: none"> Shifts in consumer preferences Uncertainty over which technologies will prevail. 	<p>Sustained sales of existing products for internal combustion engine vehicles in the short and medium term, as tighter emissions standards demand state-of-the-art technology for exhaust pipe catalysis.</p> <p>Opportunities for new products in the medium and long term:</p> <ul style="list-style-type: none"> Lower carbon energy sources (blue and green hydrogen). Hydrogen-powered vehicles (fuel cells) and sustainable aviation fuels. Low-carbon solutions for the chemicals industry. 	<p>Without adaptation of our portfolio, there is a long-term risk that we may not have a financially viable future business model and / or capability as society transitions away from fossil fuels.</p> <ul style="list-style-type: none"> Reduced demand for existing autocatalyst products for light duty vehicles (long term). Uncertainty in the rate of market evolution from existing to new technology options which could affect profitability (medium / long term). Ability to scale up rapidly to manufacture new products for new markets (short / medium term). 	<p>We focus on managing our existing businesses effectively, while pivoting away from fossil fuels-based industries to ones based on sustainable chemicals, fuels and clean energy as markets develop.</p> <ul style="list-style-type: none"> We are closely monitoring the changing market environment, updating our climate scenarios at least once a year to inform our strategic decisions. We keep investing in innovation to make sure we have products that differentiate us in all our markets. For our maturing businesses, we have a plan to reduce our cost base to improve efficiency and cash flow For some of our growth businesses, we plan to invest in production assets and to make sure our capital projects are implemented effectively through our capital expenditure control programme. 	<p>Growth</p> <p>Accelerating profit growth, with low double-digit growth rate towards end of decade¹ and c. 40% of profit coming from businesses related to the net zero transition by 2031/32. Clean Air remain a cash generative business of scale, with sales² c. £2bn in base case by end of decade.</p> <p>Costs</p> <p>c. £300m of cumulative capital expenditures dedicated to businesses related to the net zero transition over 2022/23-2024/25. £100m-£200m fixed cost savings from Clean Air by 2030/31.</p> <ol style="list-style-type: none"> At constant 2021/22 average PGM prices and FX rates Sales excluding precious metals 	<p>Progress towards our 2030 sustainability targets for products and services:</p> <ul style="list-style-type: none"> Sales, R&D and revenues aligned with SDG7 and SDG13. Tonnes of GHGs avoided by customers using our products. <p>Economic activity aligned with EU taxonomy regulation - climate delegate act.</p> <p>Market evolution forecasts</p> <ul style="list-style-type: none"> Automotive emissions regulation changes Market forecasts for vehicle sales by type and region Governments' investments in hydrogen infrastructure Evolution of the use of sustainable aviation fuels

Climate transition impact	Primary driver of impact	Opportunities (with time horizons)	Risks (with time horizons)	Management of impacts	Financial impacts (after management)	KPIs to monitor impacts
2. Increased demand for low-carbon manufacturing and recycling	<p>Markets</p> <ul style="list-style-type: none"> Shift in consumer preferences towards products with a low-carbon footprint <p>Regulation</p> <ul style="list-style-type: none"> Emerging rules on recycled content of consumer goods and the need for companies to declare the carbon footprint of their products 	<p>As the world's largest recycler of secondary PGMs, we could benefit from the increased demand for goods with low-carbon and / or recycled critical raw material content (short / medium term).</p> <p>Opportunity to expand our knowledge of metal recycling into new markets, particularly lithium, nickel and cobalt, which are required by the electric vehicle industry to meet the EU's directive on battery recycling (medium / long term).</p> <p>Commercial advantage if we adapt our manufacturing plants to low carbon operation faster than our competitors.</p>	<p>Medium-term risk that we cannot transition our operations for net zero at the correct pace to meet customer demand of low carbon products.</p> <ul style="list-style-type: none"> Loss of customers and failure to attract new customers (medium / long term). Greater capital required to transition our assets to low-carbon manufacturing (medium / long term). Inability to access the alternative renewable energy sources needed to decarbonise our operations (medium / long term). 	<ul style="list-style-type: none"> We have set challenging recycling, and net zero targets to decarbonise our manufacturing operations We have established a cross-functional Sustainability Council to drive progress towards these targets In 2022, we will introduce an internal carbon price for our capital investment decisions to help us make the right choices for decarbonising our operations for net zero in the long term We are developing a roadmap to net zero by 2040, which we plan to publish in 2023 	<p>Work is under way to quantify the financial impact of our commitment to net zero manufacturing by 2040.</p>	<p>Progress towards our 2030 sustainability targets for products and services:</p> <ul style="list-style-type: none"> % recycled PGM content in our products. % reduction in Scope 1, 2 and 3 GHG emissions % products with a cradle-to-gate LCA available to our customers Number of customer requests for low-carbon and recycled content in products.
3. Increasing carbon taxation	<p>Regulation</p> <ul style="list-style-type: none"> Carbon pricing mechanisms 	<p>Increasing regulations and the introduction of carbon taxes will accelerate growth in our new target markets – sustainable chemicals, sustainable fuels and clean energy (medium term).</p>	<p>Many jurisdictions are implementing carbon pricing mechanisms with rates increasing over time.</p> <ul style="list-style-type: none"> Increased costs to us and our suppliers of goods and logistics due to carbon taxation on raw materials and fossil-fuel derived energy (medium term). Loss of competitive advantage due to the increasing price of our products (medium / long term). Reputational damage if we do not transition fast enough to cleaner energy solutions in our operations (medium / long term). 	<p>We are tracking carbon price risks through:</p> <ul style="list-style-type: none"> An annual exercise with the help of outside experts to forecast the effect of long-term carbon prices on our portfolio. Working to embed carbon prices within our three- and ten-year planning cycles going forwards. In 2022, we will introduce an internal carbon price for our capital investment decisions to help us make the right choices for decarbonising our operations. 	<p>Work under way to quantify financial impacts to our portfolio.</p>	<p>Potential exposure to carbon taxation in 2030 by Scope 1, 2 and 3</p>

Taskforce for Climate-related Financial Disclosures *continued*

Climate transition impact	Primary driver of impact	Opportunities (with time horizons)	Risks (with time horizons)	Management of impacts	Financial impacts (after management)	KPIs to monitor impacts
4. Increasing stakeholder expectations of corporate climate policy and performance	Reputation <ul style="list-style-type: none"> Increased concerns or negative feedback from stakeholders Legal <ul style="list-style-type: none"> Exposure to litigation 	<p>Developing and delivering robust climate policy will increase our long-term business resilience, attracting shareholders and employees aligned with our values.</p> <p>Delivering our net zero commitment and science based targets will help us demonstrate sustainability leadership, and increase our profile with new customers and shareholders.</p>	<p>Investors, employees and wider society are scrutinising companies' sustainability commitments ever more closely. Failing to meet their expectations could damage our reputation, losing us customers, making it difficult to attract and retain staff, and ultimately increasing the risk of shareholder action. (medium / long term)</p> <ul style="list-style-type: none"> Our climate policy, net zero ambitions and sustainability targets do not keep up with stakeholder expectations. Our plans for meeting these commitments are not deemed sufficiently detailed or credible. We fail to meet these commitments. 	<p>We continue to monitor and manage the expectations of our stakeholders as follows:</p> <ul style="list-style-type: none"> Formed SVC and Sustainability Council to enhance our governance of climate-related issues. Close monitoring of the latest case law and developments in climate litigation. Developing and monitoring net zero roadmaps to 2040. Maintaining regular dialogue with investors. Market scanning and benchmarking of targets to ensure our climate-related policies and commitments meet the highest expectations. 	<p>Reputation risk is not easily quantified.</p>	<p>Progress towards our 2030 sustainability targets:</p> <ul style="list-style-type: none"> % reduction in Scope 1, 2 and 3 emissions. <p>How we score on leading ESG platforms:</p> <ul style="list-style-type: none"> CDP Investor score. DJSI, Sustainalytics and MSCI climate sections. Employee engagement score.

Climate scenarios for evaluating physical risks

Changing weather patterns as the climate warms may result in physical risks to our assets and supply chains. During the year, we worked with Zurich Resilience Solutions to evaluate the exposure of all our assets and those of our strategic suppliers to these risks. To support this work, we used the Shared Socio-economic Pathways (SSPs), the latest climate change modelling scenarios from the Intergovernmental Panel on Climate Change (IPCC). The SSPs produce forward-looking climate data by running climate models driven by assumptions about future global GHG emissions, together with plausible future socio-economic development metrics (economic growth / GDP, demographics, land use and urbanisation), and incorporating the likely implementation of adaptation and mitigation measures.

We looked at three SSPs for the locations of all our own operations and those of our strategic suppliers. We considered four time horizons - 2020 (our baseline), 2030, 2040 and 2050 to identify the top hazards and how they are likely to change. SSP 1-2.6 assumes the lowest temperature rise, and therefore the least physical impact, disruption and adaptation costs; SSP 2-4.5 is the middle temperature rise; and SSP 5-8.5 assumes the highest temperature rise, and therefore the greatest physical impact, and disruption adaptation costs.

Given its potential severity, for scenario SSP 5-8.5, the resilience of our most critical sites. SSP5-8.5 is an extreme scenario that is unlikely to arise, but it is useful for stress testing. We then used it to test the resilience of our top 10 most critical sites. The site criticality ranking included financial criteria such as external sales and total asset value, as well as those climate-related perils ranked highly for increases in 2050. The ranking also took into account commercial factors and those sites considered to be of significant strategic importance to us. In looking at location-specific hazards, we also used various forward-looking climate data, including Jupiter Intelligence's Climate Score Global.

Scenario	Assumed temperature increase (relative to 1850-1900)
SSP 1-2.6	Best estimate of 1.7°C warming by 2041-2060, and 1.8°C by 2081-2100
SSP 2-4.5	Best estimate of 2.0°C warming by 2041-2060, and 2.7°C by 2081-2100
SSP 5-8.5	Best estimate of 2.4°C warming by 2041-2060, and 4.4°C by 2081-2100

Our physical risks

The physical risks of climate change can be grouped into two categories:

- **Acute**, which are extreme events such as tropical cyclones, severe flooding events, heatwaves and fires.
- **Chronic**, which are gradual changes like rising sea levels that damage coastal property, or sustained changes to temperature and rainfall.

In total, we investigated eight weather-related perils across these two types of risk: temperature, rainfall, thunderstorms, flood, drought, wind, wildfire and hail. We looked at them in two ways:

- **Risk to our own assets**, which could damage our sites and disrupt production, leading to loss of sales and increased costs, as well as posing risks to our employees.
- **Risk to our suppliers and value chain**, which could hamper our access to strategic raw materials (including metals) and products, and increase costs.

Analysis of our ten most critical locations shows that there is no material financial impact from climate change risks on the quantifiable hazards (flood and windstorm) on the medium time horizon (to 2030) in any of the scenarios. The most significant impact predicted by the models out to 2030, under the worst case scenario, was an additional 35% of our physical asset value to be subject to a high rainfall hazard. This includes our facilities in Skopje (N. Macedonia), Devon (USA), Manesar (India) and Royston (UK). Over time, drought may also become more significant. We have evaluated the impact this could have on water availability to our operations using the World Resource Institute's (WRI) Water Risk Atlas tool see page 46 for more information about this.

For risks to our supply chains, we concluded that our precious metal suppliers, on horizon of 2030 climate change under the worst case scenario of SSP5-8.5 could become subject to a high or very high rainfall hazard, and additionally a high or very high heat stress. This includes PGM mines and the processing operations in the Rustenburg region in South Africa, mines in Zimbabwe and some smelters in central USA.

For our other suppliers, on the shorter-term horizon of 2030, climate change under the worst case scenario of SSP5-8.5 is expected to cause a small number of our strategic suppliers' locations to be subject to a high rainfall hazard, heat stress or high or very high drought. In particular, this includes suppliers' locations in Vietnam, India, and USA.

Going forward into the next year, we will start to use this information to communicate with our strategic suppliers about their climate adaption plans and resilience.

Taskforce for Climate-related Financial Disclosures *continued*

Physical climate impact	Primary driver of impact	Opportunities (with time horizons)	Risks (with time horizons)	Management of impacts	Financial impacts (after management)	KPIs to monitor impacts
5. Disruption to our operations resulting in damage to or loss of assets, increased costs and harm to our employees.	Physical risks (acute and chronic). Increased frequency, severity and variability of extreme weather events and natural disasters.	Competitive advantage by improving our business resilience and controls through diligent climate-related screening of assets, and integration with business continuity plans. (medium term, three to ten years)	Damage to our key sites, equipment or stock from severe weather (wind, rain and drought) if any increased risk is not prioritised and there is no formal planning of climate-change mitigation and / or adaptation measures. (medium term) Insurance of our sites could become inadequate, more expensive or even unavailable, if a site is at very high risk of weather-related damage. (medium term)	Integration of weather-related risks in business continuity plans and follow-up action plans. (medium term) We regularly review the type and limit of insurance available for climate risks to our portfolio. See more in risk 8 Asset failure on page 77. (medium term) Climate change considered as part of new investments, including new sites with the business in transition e.g. China – fuel cell vehicles growth market, which reduces our operating costs. (medium term)	Zurich's analysis of our ten most critical locations shows that there is no material financial impact from climate change risks on the quantifiable hazards (flood and windstorm in the medium term). We are currently assessing whether we will need to do any mitigation to improve asset resilience in the medium term.	We use the WRI tool to monitor where clean water availability could be at risk in the long term (see page 46). Proportion of physical asset value exposed to a climate change related high or very high hazard levels by 2030: <ul style="list-style-type: none"> Number of sites in water-stressed areas. Amount of water consumed in areas or high or extremely high baseline water stress.
6. Disruption to our supply chain (upstream and downstream) hampering our access to strategic raw materials (including metals) and products, and increasing costs.	Physical risks (acute and chronic). Increased frequency, severity and variability of extreme weather events and natural disasters.	Engaging with our suppliers to help them manage climate risks to their sites could enhance our relationships with them and save us money. (medium term) Increase in business resilience through more diligent and frequent screening of our suppliers' assets (e.g. through integration with business continuity plans). (medium term)	Disruption of supply of key raw materials risks our ability to deliver goods on time to customers, resulting in loss of sales and future business and damage to our reputation. (medium term) Insurance cover of suppliers is inadequate, and uncertainty over the future level of increased risk responsibility that will be assumed by suppliers and / or JM relating to climate risks, or if physical risks should be transferred. (medium term, three to ten years)	We work with strategic suppliers to integrate specific climate mitigating actions for strategic and extreme cases. (medium term) We ensure that the type and limit of our suppliers' insurance is in line with our own risks and external obligations. (medium term) We work with suppliers to prioritise and integrate forward-looking potential climate risk actions and costs reductions in alignment with JM timeframe and ambitions. (medium term)	Not yet quantified. We are currently assessing whether we need to do any mitigation work in partnership with our strategic suppliers to improve their resilience or switch to alternative partners for high-risk delivery routes. (short / medium term)	We are working on developing these indicators as part of our broader supplier risk management (see principal risk 4 on page 75).

Next steps

- Our own assets – Building on the group-wide assessment, we will carry out local site assessments to determine their resilience and, if necessary, develop plans to mitigate their specific climate-related risks.
- Suppliers – We will continue to work with our suppliers, particularly those at highest risk from climate change, to develop plans to mitigate these risks.

Risk management

This year, we set up a cross-functional working group to help us identify, assess and manage the impact of climate on our business. The group includes representatives from our finance, strategy, sustainability and risk teams, and is supported by sustainability consultancy ERM.

Identifying climate-related risks

Through a series of workshops, the cross-functional working group identified six potentially significant climate-related risks, covering both the physical (extreme events, slow-onset hazards) and transitional (policy, legal, market, technology and reputation) aspects of climate change. We have yet to fully develop our monetary definition of material financial impact. However, in the context for our risk identification exercise, materiality was defined as a matter that in the short, medium or long term could significantly influence our ability to meet our strategic objectives.

As part of our work with ERM this year, they provided detailed guidance on how to carry out a thorough assessment of climate-change risk. During the identification stage of this process, we used a range of inputs, including:

- The TCFD risk taxonomy, including physical and transitional climate risks.
- Expert judgement within our TCFD working group, including technical experts from our finance, strategy, sustainability and risk teams.
- Consideration of risks in the context of our climate scenarios used for businesses strategic planning.
- An external review of risks disclosed by industry peers.

We documented what drives these risks, what their potential effects might be, and what mitigating actions we need to take to manage them. We also had the risks validated by ERM. We will continue to develop and refine our response to risk and target our mitigating actions towards the root causes of those risks.

Assessing those risks

JM's group risk framework provides guidance on the tools and processes required to manage and assess all risk types, including climate-related risks. During the year, with the help of EY, and approved for use by ERM, we developed a standardised group risk impact scoring methodology. We have since used this to conduct initial qualitative assessments of our transitional climate-related risks.

Our working group helps us assess climate-related risks across the whole organisation. The group manages each risk, making them part of our principal risk agenda, and drives meaningful discussion and actions around risk at all levels.

From our physical risk assessments, we can see that we need to put a time scale on specific risks that might affect our business – and we need to align those risks with the climate-change scenarios we consider in our strategic planning. To help us, Zurich Resilience

Solutions provided a detailed analysis of which locations and suppliers we should prioritise, in the short and long term, as discussed on page 66 – climate scenarios section. We will refine these first assessments with assessments on site, which will help us better understand what mitigating actions we need to consider and when.

We have also made significant progress in assessing future product demand and carbon taxation risks, and have begun quantifying the potential financial impacts of these risks and opportunities, aligned with our climate scenarios.

Integrating those risks

It is essential that we integrate climate-related risks and opportunities into our strategic decision making, and our risk management framework guides us on the tools and processes we need to manage all risk types, including those related to climate. We want considering climate change to be an everyday part of how we operate, so we've included climate in our bottom-up operational risk management process, giving us a clear view of climate-related risks across the organisation. We've aligned our climate change work with the TCFD risk taxonomy to make sure we're covering physical and transitional climate risks.

This focused climate-change work now sees us aligning strategic growth with the transition to a low-carbon economy and including this as a standalone principal risk. We're also embedding what we've learnt from our early assessments of physical climate risk into our principal risk of asset failure and supply failure. Prioritising climate by incorporating it into our principal risk process means it will be reviewed formally, twice a year, by the GLT and the board – on top of the more detailed and focused review already done by the SVC.

In the coming year, we aim to:

- Continue to integrate the six climate-related risks we've identified.
- Strengthen our overall governance of climate-related risks.
- Ensure we are properly monitoring the risks themselves, and how we are mitigating them, by tracking progress against the targets we have set.

Managing those risks

The board SVC committee oversees our sustainability strategy, including climate-related risks. Our climate risks may have a direct or indirect impact on our principal risks and are therefore managed alongside and integrated within our principal risk process. Each of our climate risks has been assigned a risk coordinator. These individuals are senior stakeholders who are accountable for reviewing, monitoring and assessing the magnitude of the risk as well as overseeing the implementation of appropriate mitigations to treat the risk.

But truly managing risk effectively throughout the business has to be a collective endeavour by all our people. We hold quarterly risk knowledge-sharing forums to raise awareness and understanding of risks throughout the business. Our Clean Air and ENR sectors have established sustainability steering committees to help drive our sustainability agenda and improve the governance of climate-related risks in their areas.

Metrics and targets

We have reflected on appropriate metrics and targets to help us manage our climate risks and opportunities effectively. They were identified in climate-impact tables on pages 63-65 and their values are summarised here. We are still considering additional metrics and targets that would be most useful in helping us monitor our physical risks. We have had our Scope 1, 2 and 3 GHG targets independently verified by the Science-based Targets initiative to ensure that our level of ambition is aligned with the UN Paris agreement on climate change's Well below 2°C scenario (WB2DS).

Metric description	Alignment	Target type	Baseline year	Baseline value	FY2029/30 target	2022 progress	More on page
Tonnes GHGs avoided by customers when using our technologies	1	Absolute	2020/21	211,000	50 million	489,000	38
% sales aligned with SDG7 and SDG13	1	Intensity	2020/21	6.1%	No target	5%	37
% R&D spend aligned with SDG7 and SDG13	1	Intensity	2020/21	22.3%	No target	22.8%	37
Scope 1 and Scope 2 GHG (tonnes)	2, 4	Absolute	2019/20	391,459	260,973	399,905	42
Scope 3 GHG purchased goods and services (tonnes)	2, 4	Absolute	2019/20	3,282,096	2,625,269	3,008,648	42
% recycled PGM content in our products	2	Intensity	2021/22	71%	75%	71%	40
Potential exposure to carbon taxation in 2030	3	Intensity	2021/22	Not disclosed	Not disclosed	Not disclosed	
CDP climate score	4	Absolute	2019/20	B	A	B	66
% physical asset value exposed to high weather-related hazard by 2030	5	Intensity	2020/21	35%	No target	35%	66
Water consumed in regions of high baseline water stress (m ³)	5	Absolute	2020/21	531,000	No target	499,000	46

EU taxonomy eligibility

As supporting global decarbonisation is one of our strategic aims, we have assessed how our portfolio is aligned with the EU Green Taxonomy Regulation (EU) 2020/852. The first delegated act to the Taxonomy Regulation, the 'Climate Delegated Act', was adopted in June 2021 and addresses the first two environmental objectives, Climate Change Mitigation and Climate Change Adaptation. Our activities in our growth businesses, particularly Hydrogen Technologies meet the eligibility criteria for this activity.

We have evaluated what percentage of our financial activity meets the eligibility criteria for these activities.

Another delegated act, the 'Environmental Delegated Act', addressing the remaining four environmental objectives of the EU Taxonomy Regulation, has not yet been adopted. Once the remaining four criteria are published, we expect our percentage alignment to increase substantially.

Remuneration Committee integration of targets into PSP

The Remuneration Committee has agreed to include a sustainability performance measure into its long-term Performance Share Plan (PSP) for the first time in 2022. This sustainability measure will represent 20% of the total award, with the balance of the award focused on financial performance measures. The sustainability measure will consist of a scorecard of

quantitative measures that cover the three areas of our sustainability ambition, namely Products & Services, Operations, and People. Further details on the specific targets will be published on our website during June.

Introducing internal carbon pricing

In the next year, we will be introducing a shadow carbon price to our capital investment business case assessment process, as recommended by the Bank of England. This will incentivise us to reach net zero, by ensuring all investments are made for a low-carbon world where the price of carbon is higher than it is today. Although the ICP is not a real cost of the investment, it demonstrates what the impact would be of carbon taxation forecast for 2030 and beyond, and we will use it to evaluate and compare potential investments. At this stage, we plan to apply the ICP only to emissions related to the asset when operational (including raw material and supply chain impacts emissions). We do not plan to apply them to emissions related to the development of the project itself, such as equipment manufacture, or to construction-related emissions, since such emissions are both short term and generally minor in relation to the overall life of the assets.

Risk report

Managing risks effectively

Our long-term success, and how we achieve our strategic objectives, is grounded in how well we manage the risks our business faces. To do that well, we've made managing those risks an integral part of how we are governed and of how we work at all levels of the organisation. We keep ahead of potential risks by training our people and investing in awareness campaigns. We've also established an integrated governance, risk and compliance (GRC) platform – called JMProtect – to help us oversee our risks, processes and controls.

Although it was a difficult decision to divest our Health and Battery Materials businesses last year, it has meant reducing our exposure to risk in those areas. It has also meant we can now deliver more growth in a more focused way and make consistent capital investments. We are conscious of the uncertainty this decision has created for our people, so our senior management are actively managing this change.

COVID-19 still presents significant challenges to our global operations and employees, which is why we've continued to work hard to keep our employees safe, our operations running and our customers served. Volatility in the supply chain, especially the shortage of semi-conductor chips, has affected production for several of our automotive and truck customers. This has reduced the automotive industry's demand for precious metals overall, which has meant prices have declined. We have successfully navigated – and continue to navigate – these uncertainties, some of which are unavoidable: we've worked to better understand the risks, closely collaborated with our suppliers and customers, and taken actions to reduce their impact on how we operate. Our strong management team and robust risk and controls framework have been crucial to this.

Climate-related risks and opportunities

We support the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) and continue to disclose how effectively we are managing climate-related risks and opportunities. Our working group for TCFD has focused on the key themes relevant to our business, both in terms of the opportunities climate change brings and its effect on our strategy and operations. Its work will continue as we learn more about the specific impacts our business might face, and when and how adequate our mitigations are.

We are beginning to embed climate and broader environmental, social and governance (ESG) risks into our principal risks, and our operational risk management processes, by:

- Reviewing our principal risks and:
 - Updating our strategic growth risk to make sure we can still execute our strategy while moving to a low-carbon economy.
 - Including physical climate-related risks within our supply (metal and non-metal) and asset failure risks.
- Updating our risk universe, which means including climate change within this framework and embedding it within JMProtect, so that risks are recorded and reported across the business.
- Aligning and embedding sustainability ambitions, metrics and 2030 targets into our principal risks, so they can be managed and monitored.

How we manage risk

Our risk management process does two important things: it identifies key risks, and it provides reasonable assurance that we understand and are managing those risks in line with our defined risk appetite. Our people are at the core of our risk process, taking business and operational decisions every day, which is why it's crucial to provide them with the relevant support.

We operate a three-lines-of-defence risk assurance model. The first line represents operational management – the people who own and manage risk on a day-to-day basis, using effective internal controls. Group functions and sectors monitor and oversee these activities, representing governance and compliance – the second line. The third line is the independent assurance over these activities that our Group Assurance function and other third parties provide. We continue to strengthen this model and mature how we manage our assurance activities.

The board has overall responsibility and accountability for risk management and internal controls – and it reviews their effectiveness at least once a year. Supported by the Group Leadership Team (GLT), the board's reviews are done against the principal and emerging risks facing the business. This makes sure that the risks identified are relevant to our goals and strategic objectives. The Audit Committee helps the board monitor how effective our risk management and internal control policies, procedures and systems are.

Our risk management framework uses a top-down approach – that is, from board level down, to identify our principal risks; and a bottom-up approach – that is, from a day-to-day level up, to identify operational risks. These work in parallel, and we continue to improve the connections and alignment between them.

Individual GLT members take the lead on our principal risks as risk sponsors. They regularly review their risks by considering emerging risks, current activities and actions needed to operate within our defined risk appetite. The GLT undertakes ad hoc deep-dive reviews to support relevant strategic topics. Reviewing risk is part of each business's or function's review process, which makes sure that risks are considered in the context of our values and strategic priorities.

Functions, sectors and site teams are responsible for identifying, assessing and prioritising their risks. They also consider how likely it is that a risk will happen and what effect that would have on our objectives. This includes reviewing whether a risk has changed, how strong the controls we use to manage the risk are, and whether mitigating actions are in place. We use a self-assessment process to report, at least once a year, on whether the most relevant controls are still appropriate.

To decide where we need insurance cover, we continue to focus on the most significant areas of risk, where we have a legal or contractual requirement – but we also use insurance as a risk mitigation tool, where it's available on commercially reasonable terms from leading insurance companies. This year, despite a more challenging external insurance market, we have maintained a similar level of insurance. We use a captive insurance company to cover some of the risks we retain. This makes sure there's balance of risk between us and our external insurers that is appropriate and makes financial sense.

We review the type and limit of our insurance to make sure it's aligned with where we think our risks are and with our external obligations: for example, we mitigate the potential financial impact of extreme weather events through our property damage and business interruption insurance programme. Where appropriate, we get advice from industry to help us assess risks and develop mitigation plans. We've partnered with Zurich Resilience Solutions, for example, to assess our existing and future physical climate risks. This has helped us to better understand the potential effects of climate change on our assets and across our supply chain. For more detail, see our TCFD disclosures on pages 60-69.

Risk management framework

Group Assurance function

- Challenges and helps the board, Audit Committee, GLT risk sponsors, sectors and functions to consider the range and materiality of risks identified
- Monitors how well mitigating actions or projects are implemented, and how effectively they reduce risk to suit our risk appetite



Effective risk management helps JM:

- Deliver strategic objectives and fully assess threats to our strategy.
- Pursue new opportunities, while mitigating our risks in a rapidly changing external environment.
- Implement relevant controls to mitigate or prevent risks from happening.
- Direct our assurance resources to specific areas of risk and uncertainty.
- Comply with UK Corporate Governance Code requirements.

In the past 12 months, we have continued to improve how we address and monitor risks.

- GRC platform up and running – Our GRC platform, JMProtect, is now operating across the business, providing a combined and centralised view of our risk universe and controls framework.

- Risk universe now implemented – Our risk universe – which describes the risks we face or might face, how severely and how often, and how we manage them – is now in place. It is improving how we see and compare risks across our sectors and sites, and is highlighting any emerging themes.
- Assurance map pilot under way – To improve our corporate governance, we are piloting an assurance map. An assurance map links our risks to various assurance activities in a single platform, letting us look at the nature, quality, results and spread of our assurance activity across all our areas of risk.

Emerging risks and opportunities

We use our risk management framework to identify emerging risks. We carry out top-down reviews across the business and validate these with bottom-up analysis within our sectors. We track and flag key risk indicators, and then consider them alongside our climate scenarios – in 2021, we identified significant emerging risks around ransomware and climate activism, for example.

Identifying emerging opportunities relies on how well we understand the context of the markets we operate in – in particular, the transition to a low-carbon economy. We use our internal climate scenarios to model how the transition might play out in industries like automotive and hydrogen.

We also consider trends – such as carbon pricing and regulations – that could affect the bigger picture, globally and regionally. Understanding market context feeds into our strategy, too. It's an exercise that helps us see opportunities to strengthen our existing growth businesses and find new opportunities.

Given the challenges we have faced with COVID-19, remote working, cybersecurity and socio-political risks, we now need to refine our approach to business resilience. A new strategy and a simplified business model will help to focus our work here. Strengthening our capabilities around operational resilience more broadly will make sure we can endure times of high stress and significant change.

We established a taskforce to monitor the developing situation between Russia and Ukraine and manage our response to Russia's invasion. This encompassed all aspects of our work in the region, including people, operations and supply chain.

Principal risks and uncertainties

As a group, we are affected by risk factors, including macroeconomic and industry-specific risk factors, that are outside our control. We detail our principal risks on the following pages, and included commentary about how we mitigate them. We also discuss the threats and opportunities driven by climate change, although not in any particular order of materiality or likelihood. Indeed, there may be other risks – currently unknown or considered immaterial – that could become material. Any of these risks could affect our performance, assets, liquidity, capital resources and reputation.




We review our principal risks regularly to make sure we're meeting the challenges facing the business and our strategic priorities. To understand our current risk universe, our GLT risk sponsors assess changes to their risks. They prioritise principal risks as needed, and create focused mitigation plans. Our risk management process – facilitated by our Group Assurance function – makes this possible.

We've continued to shape our risk coverage, and clarify opportunities and actions, in the past year:

- We created a new strategic risk – Strategic growth: business transition to low-carbon economy – to replace the Existing market outlook and Future growth risks set out in last year's annual report. This single risk specifically covers climate change and our transition to a low-carbon economy, reducing the total number of principal risks.
- Scenario planning around climate change continues to be an important part of our risk management process, given the rate and extent of change in our key markets. Climate change drives some of our principal risks, such as environment, health and safety and supply failure. We must manage these risks effectively to deliver our growth strategy, to inspire confidence in our stakeholders and to report against TCFD requirements.
- Due to the divestment of our Health business, which will be completed in early June, we have removed two of the principal risks discussed in last year's annual report: Product quality and Security of metal / highly regulated substances, which were driven by exposure to the health sector. We will monitor any remaining impacts of these risks through our operational risk process.
- We have replaced the Security of metal / highly regulated substances risk with a risk specifically focused on Managing our metal commitments. This risk covers all metal elements, including sourcing, prices, availability and physical security. The Precious Metal Management team has strengthened our metal governance and improved how we manage our metal commitments. We're also continuing to reduce refinery backlogs.
- Cyberattacks continue to pose a significant risk to all businesses and organisations, given the rapid evolution of technology and the rise in the number of attacks – particularly ransomware attacks. Under our Information technology and cybersecurity risk, we continue to assess and develop our controls to respond to such threats and maintain industry best practice.
- In the next reporting cycle, we will decide whether a separate business resilience risk, covering aspects of security of assets and business continuity, needs to be made a standalone principal risk.

The following table sets out our principal risks and uncertainties, and details the actions in place to mitigate them. These risks, either individually or in combination, could have a material adverse effect on our business. We continually analyse our mitigation plans, recognising that our risk profile and the potential impact of each risk will change over time.

Link to strategy

-  Invest in growth areas targeted at climate change and circularity
-  Manage our established businesses to support growth
-  Promote a fast-paced, efficient business and high-performance culture

Change in risk

-  Increased since 2021 annual report
-  No change
-  Decreased since 2021 annual report
-  Risk movement not applicable as new risk

1. Strategic growth: business transition to low-carbon economy

GLT sponsor: Liam Condon



Risks, opportunities and impact	Key mitigations	Changes since 2021 annual report	Links with climate change and sustainability
<p>Our strategy is focused on managing our existing businesses effectively, while pivoting away from fossil fuel-based industries to those based on sustainable chemicals and fuels, and clean energy.</p> <p>Our overall risk is that we may not have a financially viable future business model and / or capability as we transition to a low-carbon economy and are unable to make and / or sell the products and services our customers demand.</p> <p>Our growth platforms include:</p> <ul style="list-style-type: none"> • Green hydrogen and fuel cells within hydrogen technologies. • Low-carbon hydrogen, sustainable aviation fuels and low-carbon solutions within catalyst technologies. 	<ul style="list-style-type: none"> • We continue to monitor the changing market environment and our customers' requirements. Using this information, we can update our strategic plans and actions where needed • We keep investing in innovation to make sure we have products that differentiate us in all our markets • For our maturing businesses, we have a plan to reduce our cost base to improve efficiency and cash flow • For our growth businesses, we plan to invest in production assets and to make sure our capital projects are implemented effectively through our capital expenditure control programme 	<p>We have revised this risk to reflect our ability to create value in line with the global transition to a low-carbon economy.</p> <p>We have increased our investment in growth platforms – in particular, hydrogen technologies – and exited our Battery Materials business, a decision based on looking again at the likelihood of success in an increasingly competitive market.</p> <p>To be successful in our growth platforms, we are making sure we:</p> <ul style="list-style-type: none"> • Understand the market by regularly engaging with customers and other external parties – and by assessing market demand, key customers' requirements and the competitive environment. We use this data to update our climate scenarios and then embed this into our business-planning process. • Effectively deliver our capital projects. • Have sufficient investment in key, next-generation, low-carbon technologies within our innovation platforms. • Have a strong new-product introduction process to bring quality commercial products to market. 	<p>We have consolidated our strategic risks so we can focus on executing our strategy during a transition to a low-carbon economy. This also focuses our thinking about how to do business in the face of changing risks and the opportunities presented by megatrends – global shifts in the way we live and do business. To execute our strategy, we are focused on effectively delivering capital projects on time and on cost, investing in the correct technology areas and innovation platforms, and commercialising new products.</p> <p>Our products and services are where we can make most progress towards a cleaner, healthier world. We are committed to investing in technologies that address our four priority UN Sustainable Development Goals.</p>

2. Maintaining competitive advantage of our products and operations

GLT sponsor: Maurits van Tol



Risks, opportunities and impact	Key mitigations	Changes since 2021 annual report	Links with climate change and sustainability
<p>This risk addresses failing to maintain our competitive advantage in our markets and not meeting our customers' evolving needs as effectively and profitably as our competitors can. This could reduce the value of our brand.</p> <p>Customers use our products in a wide range of their own end products, processes and systems. It is crucial then that our products work properly and meet the established quality criteria.</p> <p>Performance failure or quality defects could harm consumers or leave us open to liability claims. This could lead to loss of future business and our licence to operate, and to reputational damage.</p>	<ul style="list-style-type: none"> • We maintain strong customer relationships through our technical proposition, good market reputation and high level of technical service • We adopt the quality by design-concept for introducing new products or changing existing ones • We maintain a strong portfolio of innovative products and services, using our new technology platform and product development process • We carry out technology readiness reviews to make sure we launch robust platforms and solutions • We use standardised processes to make sure our manufacturing and preventative maintenance systems are robust 	<p>We have broadened this risk to include our ability to be innovative and create industry-leading technical solutions, while still becoming more efficient.</p> <p>We are actively looking for ways to improve our processes. Our R&D and manufacturing teams closely collaborate across the whole innovation process, to increase overall innovation success rate.</p>	<p>Our biggest opportunity to have an impact on climate change and societal sustainability is through the benefits and impacts of our products and services – one of the three pillars of our sustainability strategy. Delivering reliable, quality products lets us and our customers and consumers:</p> <ul style="list-style-type: none"> • Drive lower global greenhouse gas emissions • Cause less harmful air pollution • Conserve scarce resources • Create and produce products for a cleaner, healthier world

3.Environment, health and safety (EHS)

GLT sponsor: Ron Gerrard



Risks, opportunities and impact	Key mitigations	Changes since 2021 annual report	Links with climate change and sustainability
<p>Like other high-hazard manufacturing companies, our business is controlled by a wide range of challenging health, safety and environmental laws, standards and regulations, which are set by governments and regulatory agencies around the world.</p> <p>If we fail to operate safely, we could injure people, incur significant financial loss or breach applicable laws, which could have a negative effect on our reputation, our people or the environment. This could also mean we lose production time and attract negative interest from the media and regulators, which could lead to fines and penalties.</p>	<ul style="list-style-type: none"> We have a strong health and safety culture across the business. This is based on clear policies, guidelines and standards, continual training and awareness activities and audits. Together, we can keep improving how we work We regularly review process safety hazards at relevant sites We thoroughly investigate incidents or accidents to find their root cause, and then develop plans to remediate the problem We monitor our environmental risk, report on environmental data associated with our sites and always look for opportunities to improve We regularly review our regulatory and reputational risks and put mitigation plans in place where we need to 	<p>The health and safety of our people is still our priority. COVID-19 has changed the way many of our people work, so we have adapted our processes to make sure that training, online hazard studies and other assessments can continue remotely.</p> <p>Because of the pandemic's long duration and travel restrictions, our senior management haven't been able to visit, monitor or give personal support to as many sites as usual. We know this has affected our EHS performance.</p>	<p>Our 2030 sustainability targets aim to reduce our environmental footprint by:</p> <ul style="list-style-type: none"> Reducing Scope 1, 2 and 3 GHG emissions in line with our ambition to be net zero by 2040. Reducing our net water consumption and hazardous waste production. Reducing NOx and assessing the environmental effects of the life cycle of our products. <p>The People pillar of our sustainability strategy also focuses on our employees' and contractors' safety. We are committed to reducing our rates for total recordable injury, illness and the International Council of Chemical Associations' process safety metric. We manage this risk through line management responsibility and the application of our EHS management system.</p> <p>We monitor restricted substances lists, including the EU's substances of very high concern list. Through our product stewardship programme and our new product introduction process, we aim to reduce or eliminate our use of high-concern substances.</p>




4. Supply failure (excluding platinum group metals – see risk 6 Managing our metal commitments)

GLT sponsor: Ron Gerrard



Risks, opportunities and impact	Key mitigations	Changes since 2021 annual report	Links with climate change and sustainability
<p>Given the types of products and services we develop, there are only a few suppliers from which we can source certain important raw materials.</p> <p>If there was a significant breakdown in their supply, we would be unable to manufacture our products and satisfy customer demand.</p> <p>Our work on the effects of climate change means we understand that more frequent extreme weather events and natural disasters may disrupt our supply and value chains, upstream and downstream. Getting raw materials and delivering products would be harder and costs would increase.</p>	<ul style="list-style-type: none"> We regularly review our relationships with our suppliers. We talk to them about their constraints and how they are identifying and mitigating risks to our supply chain and our quality management processes. This also helps us manage the resilience of our supply chain Where it's appropriate, we carry strategic stocks of raw materials and regularly monitor those stock levels against changes in the business environment We regularly investigate alternative materials to use, as part of our research and development work We conduct ongoing market research to understand and monitor how short-term events could affect the long-term supply of materials and services critical to our business 	<p>We are continuing to implement our procurement strategy. We have improved our understanding of the supply chains across our sectors, especially for capital projects.</p> <p>In line with the strategy for our product portfolio, we continue to review our direct suppliers of critical raw materials.</p> <p>The pandemic has highlighted the volatility of supply chains and caused interruptions in the supply of materials. But our relationships with our suppliers and key partners means we've been able to jointly identify short-term risks and potential mitigations, making sure we can still supply our customers.</p>	<p>Because we source our chemical and process suppliers from around the world, many of them are located in adverse weather zones, and so may be affected by climate change in the future.</p> <p>An increase in severe weather events or changes to weather patterns may be serious enough to interrupt supply. That could mean suppliers:</p> <ul style="list-style-type: none"> Losing assets or equipment, or having buildings damaged. Losing stored input and output materials. Seeing total loss, or damage or severe delays to in-transit materials. <p>By looking at weather patterns in key supplier locations, we are assessing how physical climate change risks – acute and chronic – could cause supply failure. We also review what mitigations suppliers are taking.</p>

Link to strategy

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Change in risk

-  Increased since 2021 annual report
-  No change
-  Decreased since 2021 annual report
-  Risk movement not applicable as new risk

5. People, culture and leadership

GLT sponsor: Annette Kelleher



Risks, opportunities and impact

Culture is essential to executing our strategy, delivering growth and being more efficient. High-quality leaders can create inclusive, engaged and diverse teams, and inspire and motivate them.

We will make sure we have the capability to identify new business, capture opportunities and grow.

Key mitigations

- We conduct regular employee engagement surveys and develop targeted action plans
- We run programmes to attract and keep key talent
- We are building a more inclusive environment so that we can attract, engage and make the most of diverse talent
- We have put in place a digital human resources platform – Workday, which includes some automation – to give us standard HR processes and meaningful insights into our business
- We regularly review how we work across the business to find ways of working more simply and efficiently

Changes since 2021 annual report

Divesting our Health and Battery Materials businesses has had a significant impact on our employees and structure of our business. However, we recognise the importance of managing our internal talent and have worked to retain and redeploy key capabilities.

Our new HR platform globally will mean we can focus on developing and engaging talent.

We have improved our talent review processes – particularly our approach to diversity and inclusion – so that we're creating the right environment and capabilities for the next phase of our people strategy.

We continue to prioritise our people's health, safety and wellbeing.

We have improved our approach to employee engagement and continue to invest significantly in our people.

Links with climate change and sustainability

To achieve our vision, we need the right people throughout our company and value chain – and we will treat them and our communities in an ethical and respectful way.

The People pillar of our sustainability strategy sets out that we will reach our goals and 2030 ambitions by creating a diverse and engaged company and investing in our local communities.

Our targets against these goals will be tracked through this, our People, culture and leadership risk.

6. Managing our metal commitments

GLT sponsor: Jane Toogood



Risks, opportunities and impact

Our products contain precious metals sourced from either primary, secondary (recycled) or financial institutions. There is a risk that we have insufficient metal for our manufacturing businesses and metal commitments. Our primary and secondary metal supply are diversified in type and geography, and we have very little exposure to Russian PGM supply.

Our PMM business ensures the group has sufficient metal to meet business demands and manages our metal liquidity levels. There is a risk that we do not have sufficient metal available. We operate within tight trading limits and defined liquidity levels to manage the demand volatility. Metal price volatility affects how much our Trading business earns.

We hedge all our metal transactions centrally through looking at the overall group supply and demand. Accordingly, we do not carry significant exposure to price risk. Our Refining business earnings also depend on metal price; a fall in price reduces revenue and operating profit. Any metal gains or losses that are generated through the refining process are settled regularly to ensure we are not exposed to short-term price fluctuations.

In addition, a failure of our security management systems may result in a loss of or theft of precious metal, which could lead to financial loss and / or a failure to satisfy our customers. This could reduce customer confidence or result in legal action.

Key mitigations

- We continue to improve the control environment within our PMM team, which is our metal trading business. This includes introducing a Trading Risk Committee
- We have refreshed our internal metal policies and updated our risk management for metal controls. We've also completed several metal training courses to improve awareness across the organisation
- We have continued to implement our security improvement roadmap
- We have appropriate insurance cover in place

Changes since 2021 annual report

As result of our exit from the Health and Battery Materials businesses we have described our metal risk differently.

We have also continued to strengthen the control environment to ensure we have a proportionate control structure to manage and optimise our metal holdings.

As a result of our mitigating actions and diverse portfolio, we have not been significantly affected by the Russia-Ukraine conflict.

Links with climate change and sustainability

For details about how we're assessing the risks of physical climate change to our metal suppliers, see risk 4 Supply failure.

7. Intellectual property management

GLT sponsor: Maurits van Tol    




Risks, opportunities and impact	Key mitigations	Changes since 2021 annual report	Links with climate change and sustainability
<p>By not adequately managing our own or third-party intellectual property (IP), knowledge and information, we risk losing business advantage.</p> <p>This could happen through:</p> <ul style="list-style-type: none"> • Loss of IP • Failing to protect and exploit our investment in research and development • Loss of freedom to operate • Reputational damage associated with litigation 	<ul style="list-style-type: none"> • Each year, we review our IP portfolio against our strategic priorities to make sure they are aligned • We actively manage our IP portfolio, including our trade secrets, and use digital tools to support governance • We provide training to raise awareness of IP, including in management of confidential information • We have processes in place to make sure no IP is disclosed outside JM without appropriate approval • IP lawyers provide us with specialist guidance, including about using IP as a business tool 	<p>The IP landscape for each technology we use continues to be inherently challenging – sustainable technology development, for example, is a very dynamic space.</p> <p>To reduce our risk, we have developed a trade secret management procedure. We've also launched and populated a platform to record and manage our key trade secrets and know-how. This will let us better manage our IP and guard against loss, whether it's inadvertent or deliberate.</p> <p>JMProtect has given us better visibility of how IP controls operate in our sectors. This is helping us to reduce IP risk and move it closer to our defined risk appetite.</p>	<p>We have considered this principal risk in the context of the climate transition. At this stage, it does not have a clear effect on how we manage and protect our IP.</p>

8. Asset failure

GLT sponsor: Ron Gerrard    

Risks, opportunities and impact	Key mitigations	Changes since 2021 annual report	Links with climate change and sustainability
<p>A critical asset failure may have a material effect on our supply chains, performance, share value and reputation. Our work on the effects of climate change means we understand that more frequent extreme weather events and natural disasters may disrupt our operations and increase our costs.</p>	<ul style="list-style-type: none"> • We continue to monitor and prioritise critical spare parts and capital expenditure for any ageing assets and infrastructure • We prioritise actions from key insurance reviews, and business continuity planning • We continue to implement robust mitigations at our sites, including business impact assessments, business continuity plans, asset management programmes, and rigorous support systems for our operational technology 	<p>Even with mitigations in place, there is work needed to reach our risk appetite.</p> <p>We assess this risk based on the high level of exposure faced by our PGM Services business. The nature of this business means it would feel the greatest potential effect of a critical asset failure.</p> <p>We continue to progress a multi year capital investment programme across PGM Services to renew assets that are approaching the end of their life and need replacing.</p>	<p>Increasing temperatures, and the severity and frequency of extreme weather events, could have an effect across our global assets. These may also have a significant effect on the health and safety of our people.</p> <p>In line with the scenario-based risk analysis recommended by the TCFD, we are currently completing phase one of our climate-related physical risk assessment. By looking at weather patterns, we are assessing how physical climate change risks – acute and chronic – could cause interruptions across our production sites and key supplier locations.</p>

Link to strategy

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Change in risk

-  Increased since 2021 annual report
-  No change
-  Decreased since 2021 annual report
-  Risk movement not applicable as new risk

9. Ethics and compliance

GLT sponsor: Nick Cooper



Risks, opportunities and impact	Key mitigations	Changes since 2021 annual report	Links with climate change and sustainability
<p>If we fail to comply with ethical and regulatory standards, we could face reputational damage, and leave the company or individuals open to potential criminal or legal action.</p>	<ul style="list-style-type: none"> We are creating a culture of 'doing the right thing' by embedding our Code of Ethics. We promote our code at all levels of the organisation through tailored training, an ethics ambassador network, and organisation-wide events like Ethics Week We promote issues and trends and organise activities supported by senior management to encourage every business to own its risks and mitigations We help our employees to understand their obligations by regularly training them in policies and procedures. We make sure these are refreshed to reflect legislative changes, updated regulatory guidance and lessons learnt We employ internal and external subject matter experts to identify risks, set standards and provide advice and counsel We carry out due diligence on third parties to assess and manage the risks associated with various counterparty relationships We promote our Speak Up facility for employees to raise concerns through their site management and our network of ethics ambassadors. Our Ethics Panel investigates reported issues and recommends actions to address them 	<p>Competition enforcement cases globally are growing. That's why we have put significant effort into evaluating our specific risks in this area, raising awareness of them and updating training and reference materials, in terms of both content and approach.</p> <p>We continue to monitor the geopolitical environment, particularly its effect on export controls and sanctions and reputational risks – in the past year, we've implemented higher thresholds for approving transactions in certain jurisdictions.</p> <p>We continue to implement our data protection programme in the Americas and Asia Pacific. Relevant legislative changes across the world mean we are updating guidance, contractual terms, templates and training materials. We've provided data protection support to help the rollout of Workday and other key programmes.</p> <p>Using ethics scenarios in our training, we have increased awareness of the ethical dilemmas we face and how we resolve them responsibly – maintaining confidentiality and anonymity where appropriate. We discuss these issues regularly with the Societal Value Committee, GLT, Ethics Panel and our wider employee base.</p> <p>We have also developed a dashboard report to highlight data-driven measures of ethical culture at each of our larger sites. This helps to engage employees before issues are reported. We are looking at this for our smaller sites.</p>	<p>As climate change puts developing and low-lying countries under increased environmental and economic pressure, we will face challenges in many of the markets we operate in.</p> <p>Competition for resources and associated economic growth mean we will need to be even more vigilant with respect to anti-bribery and corruption, competition, sanctions, modern slavery and resource exploitation issues. Similarly, our ethical standards will be as important as ever in helping to inform our approach.</p> <p>Our Group Ethics and Compliance function is responsible for delivering the human rights target within our sustainability goals: that we will uphold human rights throughout our value chain and, by 2030, 100% of our value chain partners will be assessed for human rights risks, with remedial plans in place where high risks are identified.</p>

10. Business transformation

GLT sponsor: Liam Condon



Risks, opportunities and impact	Key mitigations	Changes since 2021 annual report	Links with climate change and sustainability
<p>If we fail to manage and deliver business change in a controlled manner, we may not achieve the business benefits.</p> <p>If we don't effectively implement the efficiencies of a simpler and more streamlined business structure, we may not see the cultural improvements and new ways of working we expect.</p>	<ul style="list-style-type: none"> We have embedded project management and a business change framework across all key initiatives, which is overseen by the GLT and led by the Chief Financial Officer We have established a second line of assurance for key technology-enabled programmes We are undertaking independent assurance on key change programmes 	<p>The changes we made to the group during the year mean we need to reduce cost and simplify the way we work. We have an established cost-reduction programme, which we have added to during the year.</p> <p>Our new global HR system, Workday, has been rolled out and will let us see data more clearly and make decisions quickly.</p>	<p>We have considered this principal risk in the context of the climate transition. At this stage, it does not have a clear effect on how we manage and protect our business transformation.</p>

11. Information technology and cybersecurity

GLT sponsor: Stephen Oxley



Risks, opportunities and impact

If we fail to adapt our IT systems to changing business requirements or suffer a significant disruption to those systems or a major cybersecurity incident, we could see our financial position and reputation harmed, or face regulatory penalties, or unintentionally break the law.

Key mitigations

- We have enhanced cybersecurity technologies to improve our ability to predict, prevent, detect and respond to cyberthreats. We have increased controls in areas where we see a heightened risk
- We continue to deploy regular cybersecurity awareness initiatives across the company. This is a key preventative control, which supplements our technology and process controls
- We continue to invest in refreshing and standardising our core systems and applications, to reduce reliance on legacy systems
- We have initiated a multi year programme of work to create a single system for our operational technology and IT
- Dedicated IT projects have supported our divestment activities, helping us to balance the value of the sale against the risk – including cybersecurity risks

Changes since 2021 annual report

This risk now includes innovation and digital areas – and, in line with good industry practice, we continue to proactively track and update it to reflect wider IT risks.

We continue to focus heavily on our cybersecurity and IT core controls, including a deep review of IT general controls. This is allowing us better visibility and governance of these – and is supporting a more efficient and standardised business IT landscape.

We are maintaining frequent communication and awareness activities to keep our employees alert to the external risks of COVID-19 fraud.

We work closely with our business security teams to protect our key physical assets and manage incidents of all kinds in a connected way.

Links with climate change and sustainability

Our IT function is supporting our sustainability targets by introducing new technologies and running its services more efficiently.

We are reducing our energy consumption by decommissioning legacy infrastructure, deploying more energy-efficient network devices, and standardising power settings within our computing environment. And, using better collaboration tools has meant we've reduced business travel and enabled remote working across the organisation.

12. Customer contract liability

GLT sponsor: Nick Cooper



Risks, opportunities and impact

Unfavourable customer contract terms could lead to significant loss or damage and expose us to high or unlimited liability.

Quality management needs to be effective across the entire end-to-end process within our business, i.e. from raw material supply through to product delivery to customer expectations.

It could also lead to broader negative consequences, such as damage to our reputation or losing customers.

Key mitigations

- We continue to operate our quality management programmes
- We continue to provide legal training to raise awareness of this risk
- Our in-house legal and commercial teams work together to negotiate terms and liabilities for our customer contracts
- Our Legal Risk Committee reviews and approves contracts that meet specific high-risk triggers
- The general counsel for each sector are part of our sector executive committees. They advise senior management on legal risk within their sectors

Changes since 2021 annual report

We continue to proactively monitor and track this risk. We work closely with each business to identify opportunities to improve the risk profile of our customer contracts. And, where possible, we implement a standardised methodology to manage that.

This is supported by a robust governance framework that helps us align and oversee contracts. We are maintaining frequent communication and training efforts to keep our people aware and engaged with contract liability.

Links with climate change and sustainability

The physical effects of climate change on our assets and supply chains could mean we're unable to meet our contractual obligations to supply our customers.

For details about how we're assessing the risks of physical climate change to our operations and supply base, see risk 4 Supply failure and risk 8 Asset failure.

Going concern

In adopting the going concern basis for preparing the accounts, the directors have considered the business activities as set out in the Strategic report and Financial review on pages 1-82 as well as the group's principal risks and uncertainties as set out on pages 74-79. As part of this assessment, we have considered a base case and severe but plausible trading scenario. Both scenarios showed sufficient headroom under our committed facilities and financial covenants.

The directors are therefore of the opinion that the group has adequate resources to fund its operations for the period of 12 months following the date of this announcement, and so determine that it is appropriate to prepare the accounts on a going concern basis.

Further details on going concern, viability and facilities can be found in Note 1 on page 154 respectively of the accounts.

Viability

We have assessed how viable we are as a business over a three-year period, in line with our annual planning horizon. During the year, the board carried out a robust assessment of the principal and emerging risks affecting our business, particularly those that could threaten our business model. The risks, and the actions taken to mitigate them, are described in the Risk report on pages 70-79.

We assess our prospects through our annual strategic and business planning process. This process includes a review of assumptions made and our ongoing assessment of annual and longer-term plans – as well as an appraisal of our strategy and significant capital investment decisions. The Group Chief Executive and Chief Financial Officer lead these reviews, in conjunction with the chief executives of each sector.

The board also reviews each sector's strategy throughout the year, looking at our current position and prospects for the coming years. This allows us to reaffirm our overall strategy and reassess the risks that could affect executing it successfully.

We do not expect climate change risks to have a material near-term effect on our forward-looking forecasts for going concern or viability. See scenarios below for more details of our analysis.

Analysis through four stress scenarios

In making the viability assessment, we have analysed each of the principal risks facing the group – as described in the Risk report on pages 74-79 – and identified the items within each principal risk category that might significantly affect cash flow and viability. We have then modelled these in four stress scenarios.

Scenario 1 – Strategic growth: business transition to low-carbon economy

In this viability scenario, we considered a smaller light duty market and a faster transition from internal-combustion-engine to zero-emission vehicles, which would lead to a decrease in sales between 2022/23 and 2024/25 in our Clean Air business compared to the base case.

In this scenario within Efficient Natural Resources, there is a decrease in sales in our PGM Services business as metal prices are assumed to be lower than the base case. This is partially offset by increased sales in Catalyst Technologies.

With faster transition to low carbon, we also considered the effect of higher carbon prices because of new government legislation. This is partially offset by improvements to working capital as a result of decreased metal prices.

Scenario 2 – Maintaining competitive advantage of our products and operations

This scenario considers the failure to maintain our competitive advantage in existing markets, mostly because of poor execution of key initiatives or operations. It includes the effect of delays to key capital projects; failure to deliver the transformation savings and associated higher costs throughout the period; and failure of a refinery, which leads to higher working capital and lower profits.

Scenario 3 – Managing our metal commitments

This scenario considers the failure to source sufficient metal to manage and satisfy our internal and external obligations. We modelled a shortage in the supply of metal, an increase in individual metal prices to 2021 highs of our key metals, and an increase in our metal holdings.

Scenario 4 – Other risks

This scenario includes the effect of all our other principal risks – outlined in the Risk report on page 74-79. For each risk, we have estimated a financial effect, which considers the impact and likelihood of the risk. Given the wide range of risks we face, we have then applied an overall probability weighting to this set of nine risks, from which we can derive a potential financial impact. This scenario also considers the physical risk of climate change – including the effect of extreme weather events at a sample strategic site, based on internal and external analysis (see page 154).

Conclusion

In evaluating our viability under each of these scenarios, we considered our current financing arrangements (see page 154) and assumed we would not refinance any maturing debt – although, in practice, we would expect to refinance our debts well ahead of maturity thereby increasing headroom. Our stress testing shows that, under each of the scenarios described above, we had headroom under our committed facilities and financial covenants.

As a final review, given we are entering a period of greater political and economic certainty, we have also undertaken a reverse stress test to identify what additional or alternative scenarios and circumstances would threaten our financial covenants or headroom. This shows that we have headroom against either further decline in profitability, well beyond the severe-but-plausible scenario, or a very significant increase in borrowings. In this unlikely scenario, we still have other mitigating actions available, including reducing capital expenditure, renegotiating payment terms or reducing our dividend.

Based on this assessment, the directors have a reasonable expectation that the company and group will be able to continue operating, and meet its liabilities as they fall due, for at least three years.

Non-Financial Information Statement

The table below outlines how we meet the non-financial reporting requirements set out in the Companies Act 2006. Our business model is set out on page 7. Our purpose set out on page 10 and our sustainability strategy on pages 34-59 set out how we act as a responsible business. Our non-financial key performance indicators which support the delivery of our strategic priorities are shown on pages 31 and 35. We have a range of different policies and standards in place to manage our principal risks (pages 70-79), which form part of our internal control framework.

Reporting requirement	Information necessary to understand our business, policies and due diligence activities and outcomes	Policies, guidance and standards which govern our approach. Some of which are only published internally
Environmental matters	Sustainability – see pages 34-59 Task Force on Climate-related Financial Disclosures – see pages 60-69 Societal Value Committee Report – see pages 98-99	Environment, Health and Safety Policy Procurement Policy Supplier Code of Conduct
Employees	Culture – see pages 55 and 90 Mental wellbeing commitment – see page 53 Health and safety – see pages 49-52 Employee engagement – see pages 55 Gender pay gap report – see pages 54 Board diversity – see pages 54 and 103 Speak Up process – see page 56	Code of Ethics Flexible Working Policy Board Diversity Policy Environment, Health and Safety Policy
Human Rights	Suppliers – see page 58 Diversity and inclusion – see pages 53-54 Modern Slavery – see page 57	Code of Ethics Modern Slavery Statement Data Protection Policy and Employee Privacy Notice Procurement Policy Supplier Code of Conduct
Social matters	Our stakeholders – see pages 32-33	Employee Volunteering Policy
Anti-bribery and corruption	Suppliers – see page 58 Our people – see pages 55-56 Tax strategy – see page 29	Anti-Bribery and Corruption Policy Code of Ethics Modern Slavery Statement Supplier Code of Conduct Financial Crime Policy Conflicts of Interest Policy

Section 172 statement

Our Section 172 statement comprises this section and pages 94-95 of the Governance report, it describes how the directors have had regard to stakeholders' interests when discharging their duties under Section 172 of the Companies Act 2006.

The mechanisms used to engage with shareholders are described on pages 32-33.

You can also read more on how the board considered each matter during the year as follows:

s.172(1) considerations

The likely consequences of any decision in the long term

During the year, the directors considered our strategy to ensure we are positioned to create long-term value for shareholders. This recognises the role we play in wider society helping the transition to a greener economy.

Interests of employees

The directors recognise the importance of attracting, retaining and motivating high-performing individuals. The directors consider the implications for our people where possible. They also seek to ensure we remain committed to promoting a safe and inclusive working environment for all our people.

Fostering the company's business relationships with suppliers, customers and others

Our relationship with customers, suppliers, governments and partners is essential to ensure the success of our strategy. The board receives updates on engagement across the group at meetings.

Impact of operations on the community and the environment

Sustainability is at the heart of our strategy, and the impact we have on the community and environment is carefully considered by the board. The board recently formed a new committee to further support decisions relating to our sustainability strategy.

Maintaining a reputation for high standards of business conduct

Our Supplier Code of Conduct, Code of Ethics and Modern Slavery Statement are reviewed regularly by the board. This ensures the high standards of conduct we expect are upheld by all levels of the business. The board monitors compliance with these through the internal control framework.

The need to act fairly between members of the company

Following careful consideration of all relevant factors including the effect of our stakeholders, the directors assess the course of action that enables the delivery of our strategy and the long-term success of the company.

Relevant disclosures

Page reference

Our purpose	10
Business model	7
Our strategy	4-9
Financial review	20-29
Our people	49-59
Employee engagement	55
Financial review	20-29
Modern slavery	57
Business model	7
Sustainability	34-59
Market review	18-19
Our purpose	10
Sustainability	34-59
Taskforce on Climate-related Disclosures	60-69
Our purpose	10
Speak Up	56
Internal controls	108-109
Modern slavery	57
Ethics and compliance	55-56
Stakeholder engagement	32-33
Board activities	92-93
Annual general meeting	133

The Strategic report from pages 1 to 82 was approved by the Board on 26th May 2022 and is signed on its behalf by:

Liam Condon
Chief Executive