



Johnson Matthey Plc Catalyst Technologies Seminar

Tuesday, 27th June 2023

Introduction

Liam Condon

Chief Executive Officer, Johnson Matthey

Welcome

Good afternoon, everyone. And thank you for joining, and welcome to our Catalyst Technologies Seminar.

Our CT business is core to JM strategy. And today, we'll explain why we're even more excited about CT's prospects than a year ago.

As the world accelerates its transition to net zero, our opportunities are bigger and coming at us more quickly. In a moment, Jane Toogood, Chief Executive of Catalyst Technologies, will explain our markets, drivers of growth, and the business. Then Stephen Oxley, our CFO, will take you through the financials.

But first, let me start with a short introduction to put this session in context. Johnson Matthey's technologies and solutions are completely aligned with our challenge as a planet to reach net zero. Sustainability is our business. That's why we're targeting high-growth, high-return opportunities in hydrogen and in the decarbonisation of chemicals and fuels, all based on a circular business model.

I hope you will see today how our leading technologies, strong market positions, and deep customer relationships position us well for success. We are the world leader in Platinum Group Metals, and our metals expertise is at the core of what we do. It's been developed over many years. And this, combined with our expertise in catalysis, is fundamental to our past and future success.

It underpins our competitive advantage and it's critical to developing the new technologies needed to tackle climate change. To maximise growth, we are improving execution, driving greater efficiency across the Group, allocating capital in a disciplined way and aggressively commercialising our growth opportunities. This is a critical juncture for JM as we position ourselves to take advantage of growing demand, driven by regulatory trends for new technology and solutions built on the scientific expertise that has been at the core of our business for the last 200 years.

Catalysing the net zero transition First, a reminder of our strategy to catalyse the net zero transition. We have four core businesses, our foundational business, Platinum Group Metal Services, which is the beating heart of JM. It enables our other businesses, Clean Air, and our growth businesses, Catalyst Technologies, and Hydrogen Technologies through the supply and recycling of critical PGMs.

There are huge synergies within our portfolio and across all these businesses. We have leading positions based on innovation, and we're playing to win.

Portfolio transitioning and growing over time

Now you'll likely recall this slide from our full-year results a few weeks ago. It's an illustration of how our portfolio and underlying profitability will shift and transition over time. And you can see that growth will be driven by Catalyst Technologies and Hydrogen Technologies.

What really stands out is the effect this will have on the size of JM. By the early 2030s, we expect these two businesses alone to have a combined operating profit greater than JM today.

So, what we're going to do today is unpack the Catalyst Technologies piece of this and explain how the significant changes in the market and regulatory landscape, driven by the net-zero transition, will open up tremendous opportunities for JM.

Catalyst Technologies is a key pillar of our strategy

Our Catalyst Technologies business is a core growth driver for the Group. Alongside Hydrogen Technologies, these businesses span the hydrogen value chain from hydrogen production to use of hydrogen and transport, as well as conversion of hydrogen into fuels. Together, they underpin the transition to sustainable fuels. A really important synergy as the common reliance on catalysis; CT uses deep catalysis expertise to provide solutions for customers in the energy and chemical space. And CT benefits tremendously from access to JM's PGM ecosystem, benefiting from PGM sourcing, management, and recycling capabilities.

Catalyst Technologies

I'm going to hand over to Jane now to tell you about Catalyst Technologies in more detail. For those who don't know Jane, she has been with JM since 2016 and has over 30 years' experience in the chemicals industry, much of it outside the UK. Last year, she was also appointed the UK Hydrogen Champion to advise government and industry on the development of the UK hydrogen economy.

Over to you, Jane.

Catalyst Technologies

Jane Toogood

Chief Executive-Catalyst Technologies, Johnson Matthey

Today's agenda

Thank you, Liam. I'll start with an overview of our Catalyst Technologies business. Then I'll talk about how regulatory change is driving the energy transition, how this is creating new growth opportunities for us, and how we're capitalising on those opportunities in sustainable fuels and low-carbon or blue hydrogen.

Catalyst Technologies is a global leader in licensing process technology and supply of catalysts

Last year, sales in Catalyst Technologies were £560 million, 13% of Johnson Matthey sales. Catalyst Technologies is a leading provider of process technology, which we license to our customers. This accounts for around 10% of sales. We also supply the catalysts for these processes, which represents the remaining 90%.

We have a leading position in syngas. I'll explain why this is so important later. And we're a trusted partner with decades of experience and a strong reputation. This is a key reason for our success today and underpins our future growth.

As you heard from Liam, this is an exciting time for Catalyst Technologies. The markets we're operating in have changed significantly in the past year. This is creating new growth

opportunities. In particular, with the net zero transition, we're participating in a new developing sustainable solutions market. As a result, over time, we expect our portfolio to see a significant shift towards higher-margin licensing.

At the same time, we're working to improve margins in the near term, with a detailed plan covering top-line growth, cost reduction, and greater efficiency. We'll talk more about this later. But first, let me explain in more detail what we actually do.

JM offers an attractive combination of licensing and catalysis to optimise our customers' performance

We have two core revenue streams from licensing and catalysts. It's the combination of these that optimises the performance of our customers' plants most effectively. We licence process flow sheets that play a critical role in the design of large-scale chemical plants. And since our customers need to generate maximum returns on their investment, our designs optimise plant footprint to minimise their CapEx.

Once the plant starts operating, the chemical processes that take place need a catalyst to make them happen. Our catalysts increase both plant efficiency and yield, and they're specifically developed to work in synergy with our process designs, so customers can produce more chemicals at lower cost to achieve the most efficient and sustainable chemical process. This integrated offering makes us hugely valuable to customers and differentiates us from other players.

While our catalysts deliver a large benefit, they're a small part of our customers' costs. For example, our methanol catalysts are about 1% of their total production costs, but they can increase annual revenue per plant by millions of dollars. So, we have a long track record of delivering high-quality process engineering for new plants and sustained technical services over the life of the plant.

The energy transition creates significant new opportunities

Today, we operate in markets with enormous opportunities. Our industry is on the cusp of a transformation, driven by the need to address climate change, and several key trends are opening up large new markets for us. As a result of the need to cut carbon emissions, we're moving away from dependence on fossil fuels. This means a major upheaval in energy markets, and it's driving strong demand for hydrogen and sustainable fuels.

Hydrogen is an essential part of the energy transition: first, to decarbonise sectors that are difficult to decarbonise; second, as a building block for sustainable fuels and chemicals; and third, to help balance power grids in an increasingly renewable world. I'm going to focus on the first two of these today, our role in hydrogen and sustainable fuels.

These trends are driving real change in the end markets we serve. Over half our sales have traditionally been to the industrial and consumer chemical sectors. The remainder has been in traditional fuels. But as we move from chemicals to energy markets, this is unlocking significant opportunities. Energy markets are about 15 times larger.

Regulatory environment and incentives support low-carbon hydrogen demand

Growth in these new markets is being driven by incentive and regulations. Policies such as national and regional hydrogen strategies, carbon pricing, and sustainable fuel mandates are key to adoption. And in the past year, there has been a very substantial change.

The 2022 US Inflation Reduction Act, the world's largest incentivisation package for clean energy is a fundamental game-changer, driving investment and demand. Europe has responded with legislation to drive investment in energy security. And China is expected to be the world's largest market for green and low-carbon hydrogen by 2060.

There are other similar initiatives in geographies around the world, whether it's the UK, the Middle East, or Japan.

This slide summarises the most important regulatory and incentive drivers of low carbon or blue hydrogen demand. And on the next slide, we've done the same for sustainable fuels.

Regulatory environment, incentives, and customer commitments support sustainable fuels demand

Many key regions are mandating minimum requirements to sustainable aviation fuel. The EU are targeting 6% of aviation fuel to be sustainable by 2030, rising to 70% by 2050. The US and UK go further, with targets equivalent to 10% for 2030, rising to an estimated 100% by 2050 in the US.

Many of the big airlines also have ambitious targets. Together, they have committed 35% of global air traffic to use a sustainable fuel blend by 2030. IATA expects 65% of all aviation fuels to be sustainable by 2050. So, change is happening through a combination of incentives, regulatory pressure and customer demand, and Johnson Matthey is in a very strong position to capitalise on this.

Syngas is a key gateway to sustainable fuels and low-carbon hydrogen

We operate from a position of strength for several reasons. First, we're a leading player in syngas, which is a key gateway to sustainable solutions. At the top of this slide, you can see that traditional fuels are mainly made from fossil-based inputs, oil, and gas. Put simply, you take oil and gas and break down or crack the hydrocarbon chain, a chain made from hydrogen and carbon.

In the future, we need to develop fuel from new sustainable feedstocks. And instead of breaking down the hydrocarbon chain, you need to build them up, a bit like Lego. This is most easily done by a syngas, as you can see on the lower half of this slide. Syngas is a mixture of basic chemical building blocks: hydrogen, carbon monoxide, and carbon dioxide. And you can make syngas from electrolytic or green hydrogen and sustainable carbon from sources such as biomass, waste, or captured CO₂, carbon dioxide. So, syngas really is the key step in producing both sustainable fuels and low-carbon hydrogen.

Leading market position in syngas and building partnerships for future

Syngas technology has been at the heart of our business for many decades. We have built leading positions in all the major syngas processes. We are the global leader in methanol. We're the global leader in hydrogen. We're the global leader in formaldehyde. We are top three in ammonia. And our segment shares typically range from around 25% to 40%.

We also have longstanding relationships with our customers and partners based on mutual trust and value. That trust has been built over many decades due to our strong track record of delivery, and it means that customers will also have the confidence to work with us on new sustainable solutions.

JM is one of the few players in syngas with an integrated offer

Our integrated proposition, licensing process technology and supplying catalysts, also gives us a competitive advantage. As you can see on this slide, we are one of very few players with an integrated offering. Customers benefit not just from an optimised operation, delivering greater efficiency and yield, but also from security of catalysts supply in a market that will see growing demand.

For Johnson Matthey, the advantages stem from a closer and more strategic relationship with our customers. This means greater longevity and value creation as we work with them to improve processes and catalyst design. As a result, it is more likely that we will supply the catalyst refills typically every three to four years. This gives us sticky recurring revenue. So, we're well positioned for success as the market shifts to sustainable solutions.

Winning early projects and a large pipeline

Since May last year, we have won five sustainable solution projects. We have two low-carbon hydrogen projects, one in North America and the other in Europe; and three in sustainable fuels, two in North America, and one in Europe. These five projects are expected to generate sales of around £120 million. So, you can see the potential for our business.

With over 100 projects in our pipeline and more to come, we expect the scale of Catalyst Technologies to be transformed.

Today's main pathway to sustainable aviation fuel is feedstock limited

Sustainable fuel represents a big opportunity. Today, I'm going to focus on aviation fuel, which is a good example of a sector that's difficult to decarbonise, where market regulation is already coming into play.

Sustainable fuel can decarbonise the aviation sector without making any change to the existing aircraft and fuelling infrastructure. The main process today for the production of sustainable aviation fuel is the conversion of oils and fat derivatives, in other words, HVO and HEFA. We do not have a position here. This process is limited by feedstock availability, as you can see on the right-hand side. This compares feedstock supply with projected demand for sustainable aviation fuel in 2050. So new pathways are needed, and this is where our technologies play a critical role.

JM Plays in three of the main growth pathways for sustainable aviation fuel production

We have leading positions in three major growth pathways. First, we've developed an award-winning Fischer-Tropsch process with BP, called FT CANS, which converts syngas from multiple sources, including waste and biomass into sustainable fuels. The second process enables the conversion of renewable energy and captured CO₂ into E-fuel using our FT CANS process or through methanol. Our technology here has been selected for Haru Oni, the world's first climate-neutral methanol plant in Chile.

And third is BioForming, which produces the same hydrocarbon molecules found in traditional fuels but from renewable feedstocks, such as waste from corn syrup production. BioForming is critical. All fuels are made from blends and BioForming creates a molecule that's the final element in a blend delivering fuel that's 100% sustainable. Our BioForming offering with Virent has already enabled the first commercial airliner flight using 100% sustainable fuel in

one engine when United Airlines flew 115 people from Chicago to Washington in December 2021.

Sustainable aviation fuel: strong competitive advantage

So, what is our competitive edge in sustainable fuels? First, our leadership in syngas is critical. As I said, it is the gateway to sustainable fuels. Second, our solutions reduce production costs. For example, the CapEx required for our FT CANS technology is 50% lower than a conventional Fisher-Tropsch plant.

And third, we have a suite of technologies across three major processes that draw on a broad range of feedstocks. These markets are at an early stage, but they are evolving rapidly. Having a leading capability across three of the main processes for developing sustainable aviation fuel puts us in an excellent position.

And we have a first-mover advantage. As I just mentioned, our BioForming offering with Virent has enabled the first passenger flight using 100% sustainable fuel.

We also have a first mover advantage commercialising the use of methanol as a sustainable fuel. As I mentioned, our technology has been selected for the world's first climate-neutral methanol plant, Haru Oni in Chile.

The opportunities opening up in these new markets are very exciting, and we have a growing pipeline of more than 65 potential sustainable aviation fuel projects.

Strategic Biofuels Louisiana Green Fuels project: sustainable fuels

I'd like to bring this to life with an example of one of our current projects in the US. Earlier this year, we announced that our FT CANS technology, co-developed with BP, has been selected by Strategic Biofuels for their Louisiana Green Fuels project in the United States. This project plans to build a plant that produces the world's lowest carbon footprint liquid fuel from forestry waste.

To be more precise, our FT CANS technology will convert syngas from forestry waste into long-chain hydrocarbons suitable for the production of synthetic crude. This can then be further refined to create renewable fuels. Over 10 to 12 years, the intention is to produce over 165 million gallons a year of renewable diesel and sustainable aviation fuels.

Main pathways to low carbon hydrogen production

So, let's turn now to low-carbon hydrogen. Low-carbon or blue hydrogen is produced from natural gas. This process also generates carbon dioxide, which is captured and stored permanently underground to decarbonise the process and deliver low-carbon hydrogen. There are a number of pathways to achieve this. We have offers in three of them.

The first route, Steam Methane Reforming, typically delivers a 60% carbon capture rate that becomes very expensive if you want to achieve higher rates to meet low carbon hydrogen standards.

The second route is called Autothermal Reforming, or ATR. This delivers a much higher carbon capture rate of up to 99% and required less CapEx than Steam Methane Reforming.

The third route was first developed by Johnson Matthey and combines Autothermal and Gas Heated Reforming. This process not only enables up to 99% carbon capture but also reuses

the energy it generates. So, it's highly energy efficient, reduces feedstock consumption, and lowers customers' operating costs.

Low carbon hydrogen: strong competitive advantage

Again, we have a strong competitive advantage in low-carbon hydrogen. Importantly, our technologies are based on our track record in syngas. As you've heard, this is something we've developed over decades, where we have established market-leading positions.

The range of technologies I've just described is designed to meet different customer needs. Our ATR plant performance has an excellent reputation and track record of reliability with world-class uptime. And our pioneering technology, combining Autothermal and Gas Heated Reforming, in many cases offers customers the lowest cost of hydrogen with the least carbon intensity. It also has the potential to qualify for the highest incentives under the US Inflation Reduction Act.

The strength of our technology is already bearing fruit, which you can see from our business wins and pipeline of over 35 projects.

H2H Saltend: low carbon hydrogen project

I'd like to tell you about one project in more detail. H2H Saltend is a 600-megawatt hydrogen production plant, with over 95% carbon capture, one of the first of its kind and scale in the UK. This project is located at the Saltend Chemicals Park, East of Hull, and will help to reduce the park's emissions by one-third.

To achieve this, low-carbon hydrogen will replace natural gas in some of the park's industrial facilities, as well as being blended into the gas at the Saltend Power Station. This project will capture around 890,000 tonnes of CO₂ a year, the equivalent of taking around 500,000 cars off the road annually. We are licensing our low-carbon hydrogen technology to Equinor and partnering with Linde Engineering to deliver it.

This is the first phase of Equinor's ambition to deliver 1.8 gigawatts of low-carbon hydrogen to the Humber region, delivering almost 20% of the UK's national 2030 production target. So, this is one of the UK's largest low-carbon projects and an important validation of our technology.

We were chosen after a rigorous selection process for two main reasons: first, our technology delivers a high carbon capture rate in an energy-efficient process, which reduces feedstock consumption and operating costs; and second, we have a relationship of trust with Linde, based on a track record of delivery that spans decades.

Our priorities

Before I conclude, I'd like to share with you our key priorities as we drive the business forward.

Our first priority is to deliver on our financial commitments and improve margins. Stephen will talk more about this in a moment.

With a wealth of opportunities opening up in sustainable solutions, we're working hard to develop new business. As you know, one of our goals is to win at least for large-scale projects this year. And we've already announced one in May.

We're actively setting ourselves up to capture and deliver on these opportunities, with a particular focus on strengthening our commercial and engineering capability. For example, we've increased our number of engineers by more than 20% in the last 12 months.

Finally, the future of this market depends on collaboration with partners, as you can see from some of the initiatives we've already announced. So, we continue to develop the strategic partnerships needed to deliver large-scale projects in new sustainable solutions.

Thank you very much. I'll now hand over to Stephen to cover financials.

Financials

Stephen Oxley

Chief Financial Officer, Johnson Matthey

Significant incremental revenue pool from two growth opportunities

Thanks, Jane. So, you've heard Jane talk about the opportunities. I'll now frame these with some numbers to help you model and value the business.

We're showing you here just two market opportunities: low-carbon hydrogen and sustainable aviation fuel. As you can see, the total addressable market for our existing technologies is large, scaling rapidly to £6.5 billion by 2030. That's around 270 new plants. And these markets grow even more strongly after 2030. This doesn't include opportunities in other sustainable fuels and chemicals, such as BioForming, e-methanol, ammonia cracking or our low-carbon solutions. So lots more potential beyond.

We've updated these projections since our CT seminar last year, reflecting significantly increased opportunity for sustainable fuels. And we have narrowed the range for low-carbon hydrogen.

Today, in our pipeline, we have over 100 projects compared to 70 a year ago. So, we've seen great momentum. And importantly, the scale and quality of projects has also increased. And of course, we don't look at every opportunity. We are targeted in our approach. Our pipeline of over 100 projects represents opportunities where we are in active discussions with our customers.

Driving sales towards licensing

As the world transitions to net zero, there will be significant investment to decarbonise existing plants and build new ones that produce sustainable fuel, chemicals, and low-carbon hydrogen. As we win more of these projects, the nature of our business will change to become more licensing-led, in other words, focused on engineering design and intellectual property, which is much higher margin with lower capital consumption.

Jane talked about the business being 90% catalyst and 10% licensing today. We expect this to change to more like 60%-40% by 2030. As a reminder, we've included here the revenue model, which illustrates how we recognise income from a project. This is for the five sustainable technologies we've won in the last 12 months, generating revenue of around £120 million, excluding future refills.

You can see that the licensing revenue generates revenues of around £10 million per project, and first fill catalysts for new plants between £10 million and £20 million. So, each project generates around £20 million to £30 million in the first five years.

Refill catalysts deliver a further £10 million to £20 million for each refill. And these take place every three to four years. Over time, we would expect higher revenues per project as average plant size increases. So, the shift to licensing fundamentally repositions the profitability of the business.

Creating a stronger platform for growth

These are great opportunities, but we need to make sure we capture the maximum value from them. So, we're focused on building a stronger platform for growth.

In the short term, this is about strengthening capabilities and returning the business to a mid-teens margin, which we expect to achieve within two years. As we heard from Jane, on the catalyst side, we're improving pricing, procurement, and manufacturing efficiency, with detailed activities behind each.

On the top line, we've already done a lot to recover cost inflation, but we still have some longer-term contracts to work through. We've strengthened our commercial team in line with Johnson Matthey's approach to commercial rigour. We're working with our customers to help optimise the use of our catalysts to help them drive greater efficiencies. And by adding more value, we can command higher prices.

On the cost line, we are re-evaluating our supplier base and substantially reducing the number of suppliers we work with by a third. And we have a range of detailed initiatives at each of our sites to improve manufacturing efficiency and increase output. We're making limited capital investments to upgrade certain assets and increasing uptime with changes, such as adjusting shift patterns.

By way of example, in one of our UK plants, we've spent a few hundred thousand pounds replacing the conveyor, which has increased our production rate by 20%. At the same plant, we're upgrading an element of our process, again, for a small amount of money that reduces water consumption and the energy bill by 30%. So as you can see, we're taking a rigorous approach, with each initiative tracked on a regular basis, and with single-point accountability.

This is what takes the margin to mid-teens within two years, after which we'll also start to see the benefits of more licensing, which drives the margin to high teens and beyond.

Financial guidance

I've summarised our financial guidance here to help you model the cash flows and value our Catalyst Technologies business. We continue to expect high single-digit sales growth in the short term, so no change here. But as our new opportunities scale, we expect sales to accelerate to mid-teens growth over the medium to long term.

We are targeting operating margin in the mid-teens within two years, increasing to high teens over five years and more beyond as the proportion of licensing income continues to grow.

Depreciation and amortisation will be in the region of 5% of sales. Our CapEx to sales ratio was high single-digit in '22-'23. In the near term, it's expected to remain around this level. Then, as the proportion of licensing income increases, we expect both capital and working

capital intensity to decrease over time. So, you can see clearly why we're excited about the opportunity for CT.

And with that, I'll hand back to Liam.

Conclusion

Liam Condon

Chief Executive Officer, Johnson Matthey

We have clear milestones in Catalyst Technologies

Thanks, Stephen. Hopefully, that's given you a good insight into Catalyst Technologies and our exciting growth potential. We've got plenty of time coming up for Q&A shortly. But before that, I'll summarise.

You should hopefully recall our milestones for the Group. And we're making good progress against those, as I talked about at our results a few weeks ago. The idea was to give strategic and financial targets for you to track our progress on a regular basis.

On this slide, we've done the same thing but for Catalyst Technologies only. This is the scorecard that we've set ourselves for you to track business wins, capacity expansion, and financial progress. So far, I'm pleased that we're on track and we will report to you on these every six months.

Catalyst Technologies is enabling the net zero transition

So to wrap up, I'm really excited about the future of our Catalyst Technologies business. We're in a strong position in the right growth markets, and we have a tremendous opportunity. We're absolutely committed to delivering on our financial commitments and strategic milestones. We're focusing on getting the basics right, driving efficiency and material margin improvement, whilst also delivering strategically and setting ourselves up for future success.

The net-zero transition is gathering pace due to regulation and incentivisation. And we'll see an acceleration of growth in our CT business, as we capitalise on these developments.

And with that, we'll hand back to the operator for the Q&A.

Q&A

Operator: Thank you. As a reminder, to ask a question, you will need to press star one and one on your telephone and wait for your name to be announced. To withdraw your question, please press star one and one again. If you wish to ask a question via the webcast, please type it in the box and click submit. Once again, if you wish to ask a question, please press star one and one on your telephone. We will take our first question. Your first question comes from the line of Kevin Fogarty from Numis Securities. Please go ahead. Your line is open.

Kevin Fogarty (Numis Securities): Hi there. Afternoon, all. Thank you for the opportunity and thank you for the seminar. Just to start off, when you think about the kind of regulatory drivers here and what's happened in terms of incentives, etc., over the last 12 months or so, how have your views changed around where the sort of greatest opportunities are for the Group regionally? And does this influence sort of who or the profiles of people you may wish to partner with within this space?

And secondly, if I could just – a question on just on the business model itself. Obviously, we've seen a greater shift towards or higher share at least of licensing income within the model. Just for clarity here, does this assume these are all kind of new build plans? Is there any retrofit opportunity here? And does it matter if it's a sustainable aviation fuel or a low-carbon project? I mean, how does that sort of change the licensing component of the model?

Liam Condon: Okay. Thanks a lot, Kevin. I'll take the first and Jane will start on the second. And we might have some additional comments from either Alberto or Stephen as well.

So, the regulatory incentive drive that's been going on around the world in the last 12 months has been really accelerating at a phenomenal pace. I think the single biggest impact on our side has been the relevance of the US from the Inflation Reduction Act. It simply makes investment opportunity and demand in that market even more compelling than it already was.

So if anything, that means that we're doubling down on opportunities in the US probably faster and in a bigger way than we had originally anticipated. I think that's the single biggest impact.

Second element is, at the end of the day, we're a global business. So, we're going to be in all geographies. So, of course, Europe, China, and India, other regions in the world will remain highly attractive for us. But I think the single biggest impact is rather in the US that we're going to be moving faster there and tapping into more opportunities. That's the way I would frame it them on the first one.

On the second one on business model, Jane will start to address that one.

Jane Toogood: Thanks, Kevin. So, in terms of the business model, we talked a lot today about the opportunities for new builds, indeed, for low carbon hydrogen, and sustainable fuels, where there is a great deal of opportunity, and which we're seeing a huge growth in, as you've seen from our pipeline, which has gone from over 70 last year to over 100 now. And so that's what we've talked about today.

But of course, there is an opportunity as well to decarbonise existing plants. And that's something that we also see as a chance for us to progress our technologies. I'll let Alberto just describe a little bit about one of those examples. And then perhaps, we might comment on the financials.

Alberto Giovanzana: Yeah. Jane, thank you. And thank you for the question. Retrofitting is very high on the agenda of our customers. One very prominent example, which we announced recently in March is Project Air with Perstorp in Sweden. This project is the first large-scale sustainable methanol plant and it's actually been implemented retrofitting in existing assets.

What makes it interesting in terms of decarbonising the existing structure is the availability of its feedstock from local ecosystem. So the project is going to use off gases, industrial CO₂, biogases, green hydrogen, all available in the region.

To give you a size of the impact of this project, what does it mean to decarbonise the chemical value chain – this project is going to reduce CO₂ emissions by 500,000 tonnes per year, which is the equivalent of around 340,000 new cars running on fossil fuels. And the project has been awarded by significant support from the EU and the Swedish Energy Agency. So again, there is a strong driver here from regulation.

Stephen Oxley: Hi, Kevin. It's Stephen.

Kevin Fogarty: Hi there.

Stephen Oxley: Just to add on the financials. So, on slide 28 of my presentation, I just set out the typical revenues, and this is the average for each of our sustainable technologies projects. There will, of course, be larger ones and smaller ones. But the feature of this last 12 months is that we're generally seeing larger projects than previously. And of course, it's that mix of licensing that drives up the margin and profitability of the business in the way that I discussed.

Kevin Fogarty: Great. That's helpful. Thanks, Stephen. And presumably, obviously, the difference between last year's CT seminar just reflects the sort of scale of the projects you're seeing there.

Stephen Oxley: Absolutely.

Kevin Fogarty: In terms of the revenues. Okay. Perfect. Thank you.

Operator: Thank you. We will take our next question. Your next question comes from the line of Sebastian Bray from Berenberg. Please go ahead. Your line is open.

Sebastian Bray (Berenberg): Hello. Good afternoon. And thank you for taking my questions. I have three, please. The first is on the dynamics in the US market that were mentioned earlier. I'm looking at the larger project awards amongst low-carbon hydrogen projects in the US. And if I add up what Haldor Topsoe has announced thus far with Air Products, Exxon, and a handful of other names and the one undisclosed project from Johnson Matthey, it seems that Haldor Topsoe is taking market share on a relative basis in the US in low-carbon hydrogen. I also see that the accessible market has been at the upper end narrowed down since JMAT last gave its update. Is there anything to read into this? And how are the competitive dynamics developing between the two? That's my first question.

Liam Condon: Yeah. Thanks a lot, Sebastian. Jane will take the first one.

Jane Toogood: So yeah, the US has been evolving, obviously, quickly. I think what I'd say around the competitive dynamics is that we're winning share commensurate with our existing share levels, which is around 30-40%. So that's the dynamics that we have going on there.

Sebastian Bray: That's helpful.

Jane Toogood: Can I just comment, actually, I think you also asked Sebastian about the market size effectively. And there, what we've done is rather than giving a range of the market size, we've been focused on a sort of conservative midpoint. We still, and exactly as we did before, are using a reference for our market scenario. So we use IEA for the hydrogen

scenario. We use IATA for the sustainable fuel scenarios. And so that doesn't change. And so those are references that you'd be able to check into as well if you wanted to. Of course, I mean, we don't know exactly how it's going to turn out. There'll be some upsides and downsides, whatever. We've chosen a conservative middle point to it. So that's why we've got the market share – sorry, the market size more specific this year.

Sebastian Bray: That's helpful. Thank you. My second question is on the long-term profitability historically of this business. Because the reporting structure has been changed at Johnson Matthey a few times over the last few years, it's sometimes difficult to tell what the catalyst business was actually making on a comparable basis to today. What was the historical average profitability for this business? And how does it compare to the mid to high teens percentage EBIT margin target for that?

Stephen Oxley: Hi, Sebastian. It's Stephen again here. So, the business has historically reached mid-teens margin on a comparable basis. So, the recovery that I've talked about within the next two years does take us back to historic levels. And we're obviously confident for the reasons that I've outlined that we can push beyond that.

Sebastian Bray: That's helpful. Thank you. And just to be clear, that historical mid-teens level was a peak level, or it was an historical average level?

Stephen Oxley: Yeah, average, Sebastian. Hence why we're confident we can get back to that. It wasn't a one time.

Sebastian Bray: That's great. Thank you. And my last question is just one on quantification of targets. I think it was mentioned at the start of the presentation that if you add up Hydrogen Tech and Catalyst Technologies potential EBIT by 2030 and exclude the impact of Value Businesses that are likely to be divested, these two businesses today and in 2030, and operating profit terms could be larger than JMAT Group was as a whole in '23. In absolute terms, that seems to suggest a number of about £420 million. And just looking at the graph that could suggest a number £250 million to £300 million of EBIT for Catalyst Technologies by 2030. Is that right? And what holds you back from just setting an absolute numerical target for both of those businesses? Thank you.

Liam Condon: Yeah. Great question, Sebastian. Yes, look, we said the infamous chart '25 was illustrative. But all I'd say is that with your extrapolation, you are not a million miles off on either front.

Sebastian Bray: That sounds very good to me. Well, thank you for taking my questions.

Operator: Thank you. We will take our next question. And the question comes from the line of Tristan Lamotte from Deutsche Bank. Please go ahead. Your line is open.

Tristan Lamotte (Deutsche Bank): Hi. Thank you for taking my question. I was wondering if you could provide an update on the overall total addressable market that you provided before? Should we just add on the remaining parts to the updated markets that you've given here to the specific parts? So that's my first question.

And then second is, what is the split of assumed margin improvement from licensing versus efficiencies? It sounds like in your answer to the previous question, you're saying efficiencies get you back to 15%, roughly, and then licensing does give you a number of percentage

points on top of that. And going on from that, what kind of margin is the licensing business generally at?

Liam Condon: Thanks a lot, Tristan. So, I think we'll take the first one – sorry, the second one first, the split of margin improvement as Stephen will talk about that. I just asked you to repeat the first question because the acoustics were bad in the room, about the TAM update. We didn't exactly get the question. If you could just repeat that, that will be very helpful.

Tristan Lamotte: Yeah, so on the first question, my understanding is you've given an updated TAM for two portions of Catalyst Technologies. Should we assume that the third portion is the same as before?

Liam Condon: Yeah. Thank you.

Stephen Oxley: Yeah, Tristan. I'll deal with both of those. So yes, assume the TAM for the low-carbon solutions is the same as before. Just on margin, so just to recap, the business is 90-10, 90% catalyst. And therefore, over the next two years, the improvement is largely on that side of the business. It's beyond that that we get the further accretion.

The licensing business, think of that as a consulting type business. It's people and technology and therefore is commanding a margin of more than 30%.

Tristan Lamotte: Great. Thanks. Very helpful.

Operator: Thank you. We will take our next question. And the question comes from the line of Riya Kotecha from Bank of America. Please go ahead. Your line is open.

Riya Kotecha (Bank of America): Hi. Thanks for taking my questions. I have a couple of questions, please. My first one refers to slide 16 that states that Johnson Matthey is the only integrated player in licences and catalysts. I'm wondering whether licensing only players like Air Liquide who I understand do their licences in-house procure their catalysts from? And can you speak a bit about the competitive landscape just for the blue hydrogen catalysts, regionally and among incumbent catalyst producers?

My second question is about your margin compared to peers. And this is historically. So, if I look at WR Grace's catalyst technology business, for example, they delivered a 25% EBITDA margin in the first quarter '23 and 26% EBITDA margin in 2022, and even higher before that at more than 30%. So, can you explain this existing difference between JM's Catalyst Technologies business, which has achieved mid-teens EBITDA margin versus what seems like a best-in-class margin? Is it a reflection of products mix or geographical focus or licensing? Or was more on the cost side?

And my third question is with regard to the operational improvements that Stephen mentioned, such as replacing a conveyor belt for modest amount, that then increased production rates by 20%. Given that this business has been restructured several times before, I'm wondering why such changes are being implemented just now and haven't been thought of before? Thank you.

Liam Condon: Okay. Thank you, Riya. So on the first one, the competitive catalyst space and whether or not licensing companies can just buy in the catalyst, and whether that's a real competitor? Maybe you can frame a little bit the competitive dynamics again, Jane, the advantage of having that integrated play, and who the relevant competitors are again?

And the second on EBITDA margin, and relative to competitors, Stephen, you start out on that one. And operational improvements, we'll take as a team then.

Jane Toogood: Okay. So just, I'll start with the integrated play, if you like. And I think what I'd do is to firstly just reflect for a minute about what's going to happen here because we're going to have a lot of new build facilities to create these new sustainable fuels, sustainable chemicals facilities, and the low carbon hydrogen facilities. And the investment in those projects is clearly a substantive investment. And what developers are doing is trying to minimise the risk of anything going wrong with those projects.

So, what they're looking for are technology providers with a strong track record. And they also want to be sure that the operator – operations are going to be very smooth as they run. And that's where it makes really good sense to have a very well-tuned asset, which is not only using the process, but it has been optimised to work for optimum efficiency, and that maximum sort of uptime as it operates once it actually operates. So it is a really important advantage to have the two together, okay, as you generate these – particularly this new industrial landscape.

I think – I'll just pass across to Stephen briefly. And then I can comment.

Stephen Oxley: Yeah. Riya, hi, there. I'll pick up the margin comment relative to competitors. Of course, we don't comment on individual companies. You see a range of margin across the sector, some higher, some lower, but it perhaps gives you – gives you an indication of why we're confident of improving the profitability of the business, so that's why we've set the targets that we have. Do you want to do the historical?

Liam Condon: Yeah, maybe on the – also, you asked about the things that have been identified. Now the business has gone through various restructurings over the past. And now we've identified opportunities for improvement, significant opportunities for improvement on the operational side. And why is that only happening now?

My take on it very simply is, Riya, we've – on CT, this business was in the past – in the recent history was absolutely less in focus. I don't mean the last 12 months. I mean, the years before that. This business was not in focus. There was very little, I think, effort going into looking at true underlying operational improvements. It was a kind of a sleepy GDP growth type business. And we identified last year as part of the strategy review, that this business could have tremendous potential on the one side from a growth perspective, which we've outlined today. But we also saw tremendous opportunities to actually improve the margin through a stronger focus on efficiency and operational improvements.

And I think it's that new managerial focus now on optimising the business and tapping into the market opportunities are there. That's the real difference versus what, let's say, that the historical track record of the business was because it simply wasn't in focus at JM. That's just my honest opinion on it.

Riya Kotecha: Thank you for that. I've one follow-up question if you don't mind. And that's more on near-term trading and demand. So going into the second quarter, we've seen significantly lower chemical and industrial demand compared to expectations at the beginning of this year, where it suggests that industry production utilisation rates will be lower this year than planned. Does that impact the consumption of your refill catalysts in the near term?

And can you give us any colour about the order backlog or demand you're seeing year-to-date? Thank you.

Stephen Oxley: Yeah, Riya, I wasn't going to give any update on current trading today – the focus is very much on CT. Obviously, if there was anything to update you on, then we certainly would. But we are tracking to expectations.

Riya Kotecha: Okay. Thank you very much.

Operator: Thank you. We would take our next question. And the question comes from the line of from Kenneth Rumph from Goodbody. Please go ahead. Your line is open.

Kenneth Rumph (Goodbody): Hello, everybody. Thanks for taking the question. Three questions. Firstly, perhaps following on with that point that Liam just addressed. You're trying to cut costs and grow in new businesses at the same time. Do you feel that you've got the team at all levels to do that? That's clearly a challenge.

Secondly, on a long-term question about hydrogen, do you see – to characterise it – blue hydrogen as a bridge technology and it all going electrolytic ultimately, or the majority?

And finally, how does the existing hydrogen catalysis business look? Is it mostly SMR, which I understand to be nickel catalysts, and the other catalysts, the new catalysts for ATR and ATR plus Gas Heated are PGM. And yet is cheaper? Is that – am I understanding the materials part of it correctly? Thank you.

Liam Condon: Okay. Thanks a lot, Kenneth. So I'll take the first one. And Jane will start with number two and number three.

It is clearly a pretty big lift to drive the business, both from an efficiency point of view and accelerate high growth at the same time. However, these are different parts of the business. As we said, the efficiency play is primarily in the catalyst space. The high growth part is primarily initially in the licensing process technology space. So, where we clearly are adding capabilities – and with that people because you asked if we have the right team – we are adding to our process technology and licensing team, particularly on the engineering side. There we're constantly enhancing capabilities and doing whatever we can to enable that growth.

I think on the efficiency side, within Catalyst Tech, we will be adding some people with specific capabilities. But this is rather minor. I think, by and large, we have the team that we need to succeed. So, it's rather about augmenting here and there. But we've spent quite some time now on defining what the strategy is that we need. We've been defining the structure we need, the capabilities.

And I think we don't have many gaps. A few gaps that we have, we've identified them, and they'll be filled very quickly. So, we feel like we're very much on track from an ability to execute point of view. So, I hope that frames that a little bit where we are and how comfortable we feel with the team around that.

On the second one and particularly that the bridging question is blue only temporarily or interim and eventually everything is going to be green? I think Jane has a very clear view on this as well. Me too, by the way, I think that interim period could be very, very, very long.

Jane Toogood: So, the real question is – we do need hydrogen. And we're going to need a lot of hydrogen actually, for the reasons I described in the presentation. And we won't be able to scale the green hydrogen production rapidly enough to meet the demands around the world. So actually, low-carbon hydrogen, blue hydrogen, is going to be a really important enabler of decarbonisation overall.

So then the question comes, is that merely a transition technology? Or how long will that take? And of course, it's difficult to predict exactly how long it will take for everything to go green. But I think it's going to take us a very long time. It is helped now by the fact that we have this technology that enables you to do 99% of the carbon capture. So, what you achieve is a very large degree of decarbonisation with blue technology.

And I think that some years ago, you wouldn't have dreamt of that. So, I think that the discussion was very different some years ago. Having this technology and the toolkits which enables you to decarbonise to extremely high levels, so you can access those high levels of incentives in the US, and enabling you to produce efficiently at scale makes a big difference.

And when I talk about scale, I mean, the sort of average size of an electrolytic, or green hydrogen project today is about 165 megawatts. The sorts of green projects we're talking about are anything from 600 megawatts to 1.2 gigawatts. Okay. So that's the blue hydrogen story there. So that's that piece of it.

And then you asked a little bit about the – how grey hydrogen is produced today. And most of it today is produced through an SMR route. Okay. And that then is a bit of the dilemma. So how do you decarbonise existing refinery production? And so, I think that's a dilemma for producers right now.

In terms of the use of hydrogen, the dominant use of hydrogen in the future will not just – it won't be in refineries. Refineries are really the use of hydrogen today. In the future, hydrogen will be used for decarbonising other industry and for the power balancing. And so, the market is growing quite substantively. And so that means you need these alternative routes I described. I described the challenges with SMR earlier.

Kenneth Rumph: And sorry, Jane, just on the materials. It's a switch from a kind of predominantly nickel catalysis of SMR to a PGM ATR. Is that right?

Jane Toogood: No. So, it's not PGM in the ATR. So no, it's not. It's not a switch to PGMs. So PGMs aren't key for the blue hydrogen production.

Kenneth Rumph: Okay, that makes sense on the cost point. Thank you.

Operator: There seems to be no further questions from the phone lines. So, I would like to hand back to Martin Dunwoodie, Director of Investor Relations for webcast questions.

Martin Dunwoodie: Great. Thank you very much, Heidi. Now turning to the webcast, I'll take the first questions from Lacie Midgley at Panmure Gordon. She has two questions. I'll start with the first, they are both on blue hydrogen. First one is if the ATR LCH technology is lower CapEx than traditional SMR, and the technology is mature, and given the detailed data on uptimes, what is holding customers back from deploying this faster?

Jane Toogood: Okay. So let's just – so really what's holding back industry from deploying blue hydrogen faster is where the industry is at the moment. All of this does require the

regulatory incentives or the mandates to go forward. So, we've seen that important evolution in that landscape over the last year. And that is actually driving now a faster pipeline of projects. And so, we're seeing that accelerate. But that is the key driver for this market, basically.

Martin Dunwoodie: Thank you, Jane. And the second question Lacie has is specific on the project that you've mentioned in the presentation, H2H Saltend. What are the milestones of the H2H Saltend project? And will you be updating on these and other key projects?

Jane Toogood: So typically, we don't give individual detail on the specific projects. But what we will do is to be updating on the key milestones that Liam talked about. So, we will talk about the number of projects that we're winning, so you'll get the confidence in what we're doing. And you can see that we're already winning at the rate that we want to win, but we'll make sure that that's reported so you have that visibility.

Martin Dunwoodie: Thank you. Now we'll move to Geoff Haire at UBS. Again, two questions. The first one is what percentage of licences use JMAT catalysts? I assume this is both across LCH, low-carbon blue hydrogen, and also sustainable fuels?

Jane Toogood: That's easy basically. All our licences use JMAT catalysts.

Martin Dunwoodie: Very clear, 100%. Yeah.

Jane Toogood: We define the catalysts for our licences.

Martin Dunwoodie: And then the second question. In ATR technologies and blue hydrogen, do you supply the industrial gas customers? Or are they competitors of JMAT?

Jane Toogood: So, we supply the industrial gas customers, and they can be a competitor of ours as well. But what we don't do is go into downstream production.

Martin Dunwoodie: Great. Thank you. Now, moving on to the next question. It's from Natalia Luna at Columbia Threadneedle. Two questions, again. The first one number of parts, what would you say is the technology risk for hydrogen and sustainable fuels, and also the risk of competitors to develop more efficient and cost-effective technologies than yours?

Jane Toogood: So, well, there's two things. So first part is about the technology risk, okay. And at the heart of the technologies in both cases for hydrogen and sustainable fuels is our syngas experience. And in fact, the sort of unit that helped us to build up these technologies, our unit operations we've been operating for years, decades. And so it means that we are very confident in our technology, are able to provide our regular guarantees and warranties. And so, the technology risk is low.

When you think about the evolution of this space, and I think, actually our LCH technology, which you just described where we've combined the autothermic and the gas heater reforming, sorry, together is a great example of us taking the technology further to drive further performance to the customer. So, every year we invest about 5% in R&D. And we expect that over time, we will continue, as we do already, to be evolving technologies and catalysts together with our customers.

Martin Dunwoodie: Thank you. Then the second question Natalia has, what do you see as the hurdles for the projects in the pipeline materialising, for example, permitting, funding or storage availability?

Jane Toogood: How does the project – okay, so the – yeah, so that's interesting. If you take – in terms of the hurdles, it differs by category. So, for hydrogen, actually, the infrastructure piece is important. Storage is important. And so, planning permissions are important. And you've seen that, for example, in the US and also in Europe, there have been, again, changes where governments are saying we will accelerate the way that planning permissions are granted to accelerate that energy transition and to attract the projects to those locations. So that's something that's been quite vocally transmitted across the world at the moment. And that is quite an important part of that.

For sustainable aviation fuels, it's probably more about just the planning, permitting side of things. They tend to be more discrete projects at the moment located near to the off-takes. And so that's more of the issue. Hydrogen wants to link into the infrastructure.

Yes, I should add as well, actually, in both cases, linking to electricity infrastructure is important, of course.

Martin Dunwoodie: Great, thank you. Next question is from Alex Stewart at Barclays. Why is sustainable aviation fuel considered sustainable and low-carbon? You're still emitting carbon dioxide when you combust sustainable aviation fuel, and the process still starts with hydrocarbons.

Alberto Giovanzana: Thank you, Alex. It's a question I very often get. The real game is played in the feedstock and not fundamentally by using feedstock, which has a very low carbon footprint with the whole value chain benefits out of that.

Just to give you a sense of what it means, so the project that Jane referred to before with sustainable biofuels, not only is reducing – or is a low carbon footprint but they are able to be at negative carbon footprint because on top of using forestry as a biomass in the feedstock, there is also the step of capturing the additional CO₂, which is produced.

So not only starting at the very low level but by capturing this, the project can generate a negative CO₂ footprint.

Jane Toogood: Just to build on that a little bit, because I think we talk about the sources of sustainable carbon. Look, of course, in the end, the ultimate thing to do with an aeroplane would be to try to fly on a battery or to fly on hydrogen, pure hydrogen. And that will come over time, but it's going to take a really long time to get there, because it's quite hard. But people are working on that today.

What I say – and hydrogen is the most likely one for long-distance flights. In terms of what you do in between, you want to be using what we would call sustainable carbon. And waste, of course, is something that's sitting in the ground that's going to break down. It's going to emit this CO₂. It's better to reuse that carbon. So it's – I would think of it like a sort of recycling of carbon, rather than just using it once. And that's probably the best way to think of it.

Martin Dunwoodie: Thank you. Next question is from Martin Evans at HSBC. Much of the current enthusiasm for Catalyst Technologies arises from the planned implementation of the US IRA Act, which has clearly given a welcome boost to confidence. Although the IRA is bipartisan in nature, could the US election next year and the possible change in

administration, along with a possible US economic slowdown, potentially slow down or derail some of your internal expectations for continued momentum?

Liam Condon: Yeah. Thanks, Martin. So, I think what's really important and what you've already mentioned in the question – it is bipartisan that has very broad support. I think this is really important. I think it's also clear that the way the incentives are set up if you sign up now, you're basically guaranteed for the next ten years. So even in a worst-case scenario, if there was an administration change, and something was to happen to the Inflation Reduction Act, it would only be forward-looking and not retroactive.

So that ironically, actually gives an incentive for companies to move fast and now to lock in the incentives. So that's also part of the acceleration that you're seeing specifically in the US now. But I think practically, nobody believes that this will be revoked or turned around. It's simply too important. And don't forget that you have a tremendous acceleration also ongoing at the state level, because the states are most interested in getting jobs into their states. So, they are also throwing some very significant funding at it. And that's basically an irreversible path right now.

Jane Toogood: And if I can just add a couple of other points. We talk about IRA, because, of course, it was absolutely game-changing. But in fact, what's happened is that other people are responding to that, and also playing their part in trying to accelerate their own energy transition. And that's been particularly pushed by energy security questions, of course.

So, Europe has also moved quite quickly now in terms of what they're wanting to do on hydrogen. It's – I use the example of Japan, which is a small but really important example actually, of how a country needs more security clearly has had an issue with the nuclear power generation and is looking and is at the leading edge now of finding routes to import hydrogen into the country to deploy around the country.

So, the momentum is there in the industry, the rate and it could adjust slightly year to year, which is why these scenarios are important. But then the momentum is absolutely there now.

Martin Dunwoodie: Thank you. Next question is from Thomas Streater at Streater Research. Regarding 100% SAF BioForming, does this require special or adapted jet engines? If so, which engine OEMs are you working with on this?

Alberto Giovanzana: Thank you, Thomas. Actually, the BioForming solution is a fully drop-in solution. That's the beauty of this offer. And fundamentally, the reason is the high content of aromatics that makes this blend very unique and enables to go straight away into the engines as they are today. And Jane referred to the first flight already happened a couple of months ago.

Jane Toogood: Page 21.

Martin Dunwoodie: Great. Thank you, Alberto. Next question is from Stuart Penson at the Gulf Energy Information. How do you see the split between the blue and electrolytic green hydrogen in the medium to long term globally?

Jane Toogood: Okay, so I think there's quite a lot of data around on how this might look. I think it's worth having a look at those scenarios. I mean, a lot of this will depend on location and geography/geology. Because the blue, you clearly need to have the right ability to store the carbon dioxide. For green, you need good solar and wind.

I think the question is, is it about production or is it about use, okay? And what will happen over time, it will take some time is, of course, the hydrogen will be shipped around the world. So will be traded eventually in different forms. And so, it's going to – there will also be the need to make sure you can deploy that hydrogen when you receive it.

So, it's going to be an interesting split, because the electrolytic green part will grow over time. And the blue will grow quite quickly, I think, in the first instance, to get the scale.

Martin Dunwoodie: Great. Thank you very much, Jane. And I'll say thank you to Liam, Stephen, Jane, and Alberto because we have no more questions on the line. So, thank you very much, everybody, for joining the call today. I hope that explains more about Catalyst Technologies, and why we are so excited about its prospects.

If you have any further questions, then, of course, please do come back to us in investor relations. And with that, we will end the call today. Thank you.

Operator: This concludes today's conference call. Thank you for participating. You may now disconnect.