



# **Capital Markets Day 2022**

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## **Introduction**

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### **Safe Harbour**

Good morning, everyone, to Umicore's Capital Markets Day here in London, and also a warm welcome to those of you who are joining us today. And I realise I don't have the clicker with me. So if we could go to the next slide already? So today's presentation will continue contain forward-looking statements, so please do have a look at our cautionary statements online.

### **Agenda**

Now let's move to the purpose of today. Today, our Management will present to you our Strategic Roadmap towards 2030. They will share our ambition. They will explain how our technology positions and our market positions in the different activities will allow us to leverage these positions and create sustainable value and growth.

So if we have a closer look at the agenda, our CEO Mathias Miedreich, will start today's presentation and he will explain how our strongly rooted strategic foundations put us in an excellent position to write the next exciting chapter of Umicore. He will present both the ambitions and the pillars of our strategy.

Then Frank Daufenbach, our Chief Strategy Officer, will walk you through the strategy drivers of Umicore. He will outline the opportunities ahead, particularly in mobility transformation, and he will also explain how all Umicore activities have their role to play in the next chapter of our strategy.

We will then move over to Filip Platteeuw, our CFO, who will provide the financial overview and who will outline how our strategy is designed to create sustainable value by balancing growth, returns and cash flows.

We will then move over to Géraldine Nolens, EVP, ESG and our Chief Legal Counsel, who will demonstrate how we go for Zero. In particular, she will walk you through to the climate action plan here at the Umicore. And you will see that at Umicore, it's not only about minimising the impact of our operations, it is about maximising the positive impact we have on society. And in fact, you will see that sustainability is a common threat throughout the day, and that is not a coincidence.

After these group presentations, we will dive into the strategic drivers and ambitions of our different activities. And the rest of the presentation is actually built around the mega trends that are driving our businesses.

Starting with the accelerating need for advanced materials, Denis Goffaux, our EVP, Recycling, will show how our advanced materials are key enabling technologies in today's life. He will then also explain how Precious Metals Refining is excellently positioned to continue creating substantial value.

This afternoon's presentations are all about our activities that are not only driven by, but also enabling mobility transformation. We start with Ralph Kiessling, who will explain how we aim to capture profitable growth in Rechargeable Battery Materials.

Then, we have Bart Sap, EVP, Catalysis, who will first talk about our catalysis activity – Automotive Catalyst Activity. He will explain how we aim to capture the market's peak and how we will constantly maximise business value for his activity throughout the plan. He will also then take the opportunity to explain how our technology leadership in PEM fuel cell catalysts puts us in an excellent position to capture growth in that emerging market.

And we then move over to Kurt Vandeputte, who will close the loop and who will showcase that, thanks to our front-runner position in battery recycling, we are gearing up for profitable growth in that area too.

And then, at the end of the day, Mathias will close the presentations with his closing remarks.

So a full day, and just a few practical things before I hand over to Mathias.

### **Q&A**

We hope you have plenty of questions for us, so we have organised four Q&A sessions. We will first prioritise the questions in the audience here, but we also invite the audience at home to submit their questions through the chat and we will try to answer these questions as well today.

The presentations that will be shown today will also be put on our website every time at the beginning of each presentation. You have the QR code on the tables, which brings you directly to the relevant page on our website. And then, please note that the event is being recorded and that as of tomorrow, you will find the replay on our website.

And with this, I would like to ask Mathias to come on stage.

## **Excellent Starting Position**

Mathias Miedreich

*CEO, Umicore*

### **Opening remarks**

Thank you very much, Evelien. And also from my side, a very warm welcome to all the audience here in London and, of course, to everybody who is connected via livestream to this hybrid event today.

This is a big day for us because we will share with you our strategy for 2030, a strategy for a decade that is characterised by transformation and change. So what we will try to explain to you is what are the drivers that we see, the megatrends that we base our strategy on? What is the financial ambition, the financial mechanics that work so we can create value with all the investments that we are doing to the extent that we earn more than the cost of our capital? And finally, how do our different businesses, the business units that we have, contribute to that strategy individually, but also as a grand total of Umicore with a complementarity of their properties?

### **Umicore Leadership Overview**

Before doing that I am very happy that I can introduce the speakers of today again quickly, the Management Board of Umicore, all of them are here today. Each of my colleagues will cover a different part of the presentation.

Starting with Filip Platteeuw, who I think I don't need to introduce to you, a long-term member of Umicore and long-term CFO of the Group.

Next in line is Frank Daufenbach, our Chief Strategy Officer. Frank joined the group beginning of 2022. With ten years' experience in automotive, ten years' experience in strategy consulting, he is now driving the strategic agenda of the Group and he will share that just after my presentation with all of us.

Géraldine Nolens will talk about ESG because she is responsible for the ESG initiative of the Group. But in other responsibilities, she is the Chief Legal Counsel and responsible for Health, Environmental and Safety as well as for Purchasing and other important Group processes that we have lined up.

Then, we have our three business group EVPs that are each responsible for one of the business groups.

Bart Sap, who is heading the Catalysis business group. Bart joined the Management Board beginning of 2021, also with a long career in Umicore in different steps and different management responsibilities.

Then, we have Ralph Kiessling, covering E&ST (Energy & Surface Technology). Ralph also took that position beginning of 2021. Before that, he was responsible, as EVP, for the Catalysis business group, also with more than ten years' experience in the automotive industry.

And last but not least, Denis Goffaux, who is running the Recycling business group. And Denis had several roles before, being responsible for the Battery Materials and E&ST as well as having been the Chief Technology Officer of the group.

And you will hopefully see after this presentation, how positively diverse this team is, in terms of experience, profiles, industries, functions, but also international exposure, and that there is a strong complementarity between the different team members. Complementarity is a word that you will hear more today from me and my colleagues in several aspects.

### **Structure of the Group**

I want to remind ourselves on the structure of the group. We are organised in 11 business units. Those business units are grouped in three business groups, as we said: Catalysis, Energy & Surface Technology, and Recycling. We have all of those business units embedded in our strategy. They play an important part in our way to 2030.

However, today, we have selected five that we will dive into more detail: Automotive Catalysts, Fuel Cell, Rechargeable Battery Materials, the Precious Metals Refining as well as the newest kid on the block, which is the Battery Recycling Solutions that we have just founded beginning of the year. And that is headed by Dr Kurt Vandeputte, who will also share the strategy of the group. He's with us here today and he will give us all the insights on Battery Recycling future for Umicore.

### **Take-aways after Nine Months: Excellent Starting Position, Clear Next Steps**

I'm now nearly nine months in the role as CEO of Umicore and I want to share with you very quickly, what are my key takeaways, what are the strong points that I found when I arrived

in the group, and what are the next steps, the points we still need to improve in order to be able to successfully deliver the strategy that we are presenting today.

### *Strengths*

The strengths for me are pretty clear. Technology is deeply rooted inside of Umicore. There's a long tradition. There's a strong portfolio of innovations of IP, of technologies in the whole Group. Probably what we did not do so much is to talk about that and for today, hopefully, you have some good surprises as well, in this regards, how strong our technology portfolio is.

Secondly, and I've talked about it on multiple occasions already, the people in Umicore. The level of competence and expertise, paired with the humbleness, is really outstanding in the industry. And also, the great sense of purpose that we have that is in every of our locations, in every our business units is really outstanding.

The portfolio of Umicore you will hear me talk about today in several ways. The portfolio is a strong one because it has the right business units. Each of them individually, but the complementarity and the value creation model especially is something that is what I think one of its kind in the industry and puts us in a privileged starting position.

And last but not least, the sustainability aspect. Sustainability is, and was, always a key part of Umicore, Umicore being a frontrunner in many of those items. And also, here, you will see that our ambition is not stopping there.

### *Next steps*

So what are the things that we need to look at in the next time to be able to deliver our 2030 strategy? There are three things that I want to mention.

First of all, it is transparency and visibility. We have to share more with our partners, with our customers, with this – the supply chain ecosystem that we have; and with the capital markets, give more details of what we are planning, how we are planning it and why. And please see this today as the next step in the evolution of this process.

I have received, when I started my journey as CEO, several feedbacks in this regards and I will be very interested in your feedback, after this day, if we have made a next step-up in disclosure and transparency.

Size and speed is something very important. We are presenting a very ambitious plan. This plan is to grow our company in a very short period of time. Umicore is known for its robust operational model, but we have to prepare the company for this scale-up.

We have to make sure that we can deliver the promises to our customer – that we make to our customers. So we have to look to all of the organisation, the processes, the staffing, to make the group fit for this fast growth that we think will be value creative into the future.

Secondly, it's – thirdly, it is the ecosystem that we have. We believe in an ecosystem to carry the load of this highly changing and transforming industry, an ecosystem that is across the value chain and drives also new models that we have with our customers – we will talk about it throughout the day. Models that have not been thinkable of a couple of years ago that even include co-investments, but also a very strong cooperation on the R&D side. So I think this is something Umicore has started to be more open to it, and we see already that we can harvest the fruits of that journey.

## **Rooted on Sound Foundations**

*Driving success and allowing continuity in our strategic journey*

Before we talk about the future, let us spend two to three minutes to talk about the past. Over the last 20 years, Umicore has been built on very sound foundations.

If you look to the previous strategic plans and what have been the conclusions out of that, the unique business model that includes circularity and metals couldn't be more actual than today in the electrification transformation.

The megatrends that have been the background of the strategy, they are more than confirmed. They're not in question anymore.

And last but not least, sustainability is not thinkable to be removed of any company's strategy, especially in the field that Umicore is located in.

## **Building on Horizon 2020 Achievements**

*'Fit' and ready for the future*

So this has been also proven by the successful delivery of the Horizon 2020. That was the name of the last strategic plan that was launched in 2015, with, in 2021, the disclosure of the 'Let's Go for Zero' strategy. And finally, by the record results that have been delivered in 2021.

So what better platform, what better foundation could you want to start now a 2030 journey?

## **Ready to RISE**

### **Umicore 2030 – RISE: Scaling up our winning strategy**

But we don't stop there. We have an ambition to rise. We have an ambition to rise above the successful past. We have an ambition to create an even bolder and even faster Umicore into the future. And I want to share with you now the key pillars of that strategy forward. We will always come back to the same strategic rationales of this plan that we have.

*Strategy supported by powerful megatrends, especially mobility transformation*

The first thing is we have strong megatrends that carry this strategic plan. I think there's nobody in this room or online that would doubt that the trend of electrification is confirmed that it's going forward. And this will transform our addressable markets, fundamentally, in terms of size, tripling, versus 2030.

This is a very strong driver of our strategy. We don't have to ask ourselves the question, 'Where to play?' We are playing exactly in the right field. It's more the 'how'. How are we implementing a value creation strategy with all of the difficulties that you have in such a fast-growing market?

*Our portfolio drives unique value proposition for customers as a reliable transformation partner for mobility customers*

The core of our strategy is centred around our customers. We think that Umicore has a value proposition like nearly no other company in this field, being a true transformation partner of our customers. We will talk about that value proposition in a second. But it's something that is unlocking new ways of partnership. We have communicated on some of them already. You

will hear throughout the day more details on our plans forward. But this is very important to understand that this is an important part that sets us apart, if you want, from the rest of the market, that we have an accumulation of assets and an accumulation of abilities that exactly address the pain points and the problems that the automotive OEMs have in the energy transition. And we will talk about that in detail.

*Execution of strategy supported by the four implementation pillars*

Then, we have the word of RISE and we said RISE is an expression of our ambition to rise above previous levels, but it's also an expression of four important pillars. Each of these letters stands for one of the pillars that is carrying the strategy forward.

We will explain those pillars in a second; I will not go into detail, for the moment. I will share now what is the result of this plan.

*Our strategy will deliver fast, profitable growth with uninterrupted value creation to 2030 and beyond*

And this result of this plan is a fast growth, a fast growth with us being able to more than double the revenues of the group towards 2030 with a constant value creation and an EBITDA over 20% and the ROCE ambition in 2030 of 15%.

And you can see the whole Management Board presenting today. We have a strong conviction that this might be an ambitious target, but it's a realistic target because we have the right measures in place to make it happen. And this will be – these this four points, they will follow us through the presentations of today to explain our underlying rationale.

**Anticipating Accelerating Megatrends and Embracing Them as Our Business Drivers**

Megatrends. So we have seen what are the megatrends of the past. These are the three megatrends that we built our strategy on.

*Mobility transformation*

Mobility transformation on the one hand; we have combined what we have formerly been calling the need for emission control technologies and electrification. This is the mobility transformation.

*Growing need for advanced metal materials*

And then, there is a growing need for advanced materials – advanced metal materials that are part of many industries and many application: electronics, aerospace, food industry, pharma industry. So Umicore has a lot of positions in those value chains in advanced materials. We will talk about that. And this is really something that we want to selectively further invest to harvest the good returns that we can get from this business.

*Circularity for critical metals*

And then, the overarching trend is circularity. Circularity for critical metals is something that is touching all of our 11 business units and that is a strong driver of, also, our value creation proposal that we have.

**Unique Value Proposition to Automotive Customers**

Now, I've talked about our unique value proposition to customers. So what is this value proposition? Why are we sure that we have a privileged starting point versus others? If you

put yourself into the shoes of a car manufacturer, of an OEM, you have to ask you some very critical questions to which Umicore provides the answer.

*Upstream: Expertise in metal sourcing, trading and transformation*

Your first question is, 'Where do I get the metals from?' Metals are at the core of the electrification transformation. So if you do not have a secured supply chain of the metals that you need for your batteries, you will not be able to put this into the round. So in the strategic roadmaps of the OEMs, securing that supply chain has reached a very important stage.

Umicore is very well positioned. We have a history of mining. We have been a mining company before. We understand very well the upstream – how we call it? – the upstream processes. We have ambition from mine to battery, so from refining to the battery material, to have not only the capabilities, but also the capacities to support the OEMs. And we see a lot of traction from that side, OEMs coming to us asking us if we can support them, help them secure the supply chain. And this drives also the co-investment model that I have been talking about.

*Proven: Industrial scale supplier in AC and RBM since decades*

The second question you have to ask yourself when you have secured your metals, 'Will I have the plants that produce the cathode active material for me?' Each of the OEMs have ambitious plans for electrification fast ramp-ups in all regions of the world, and the cathode material market has to follow. So they have to trust partners that have a proven ability to scale up, in large size, in the quality, the reliability and the cost that is needed.

Umicore is a pioneer in battery materials; since over 20 years, we are in this game. We have launched several gigafactories. The experience we have since nearly 50 years in the automotive catalyst business as a reliable operational partner to deliver high quality in absolutely the right conditions to our automotive customers, give us a very strong reputation in that point. We see that also reflected in the discussions we have with them.

*ESG frontrunner: CO<sub>2</sub> commitments and sustainability DNA*

The third question of the OEMs is, 'Okay, I have secured my metals. I know where to produce it. But how can I make sure that the electric car I'm producing is really CO<sub>2</sub> neutral? How can I work on the supply chain that I have also in the production of the car? The majority of the CO<sub>2</sub> is created by the battery and in the battery, it's the battery material. How can I decarbonise that?'

And Umicore has always been a frontrunner in sustainability, in decarbonisation, in sustainable sourcing. And what we will present today, our ambition on the Scope 3 roadmap, our plan to decarbonise the battery supply chain, where we think we have not only a good position but also an obligation because of that – and Géraldine will touch that in the later presentation – is something that the OEMs and also, I have to say, our supply chain partners (so the ones that are actually doing the mining upstream) are very, very receptive to the proposal that we have. And this is a strong linkage point that we have with them.

*Closing the loop: Technology leader in metal recycling*

So after you have solved all of these equations, the next question is, 'How can I solve my circularity problem?' And this circularity problem is twofold. First of all, I need to do recycling to secure materials. Because recycling – without recycling, we will not have the



right amounts of materials available. And the second question is, 'How can I meet regulatory requirements, laws that will be in place that require me to put so-and-so much percentage of recycled material in my products?'

And Umicore has been, since many decades, in the business of recycling, has a very good technology position, understanding of the business model; everything that is around the recycling of metals. And we have been able to transfer this now into battery recycling. And you will see our plan, going forward, through Kurt's presentation, where you will see how we are proposing what we think is the best-in-class technology at large scale, early to the market, which will help us to secure market shares pretty soon.

*From ICE to EV: Supporting the powertrain transition as a trustworthy partner*

The second – or the last – the fifth, in this case, question, is, of course, 'Are my partners in for the long run?' Each OEM has the question of combustion engines going down. There's a transfer to electrification. And what they want is a partner that has skin in the game.

So now, we have skin in the game because we have Automotive Catalyst business, we are in fuel cell catalysts and we are in battery materials. So we are not either/or, we are all in. And this is something that really resonates with the car manufacturers to have one partner they can trust to be with them in the holistic view, and not only on separate slices where there are dynamics that they don't – that they cannot control.

So, taking all of this together, we truly think we have a privileged starting position. Before now going into the details through my colleagues of the different strategies in the business groups, I would like to give you a high-level overview on the three business groups or businesses that we are going forward, starting with the battery materials, then talking about automotive catalysts and, finally, recycling.

### **Rechargeable Battery Materials – the Plan to 2030**

First, let's have a look to Rechargeable Batteries. And when we want to understand our strategy for Rechargeable Batteries, you have to go back in time.

*Pioneering Battery Materials*

Umicore was a pioneer in delivering cathode active materials for mostly consumer electronic applications, since decades already in the game, working directly with our customers and at that time, nearly exclusively have been the cell makers from a commercial, but also from an engineering point of view. And this phase was an important phase because we have been laying the foundations of our global production footprint and the chemistries of our Battery roadmap.

*Reshaping*

Now, something like in 2020-2021, something changed. The OEMs realised that they need to play a bigger role in the battery supply chain. They have to do that to secure the supply of materials, of metals. They have to do that because they want to influence more the properties, the technical properties of the battery, and you can only do that through the battery material. And they need to do it because of the CO<sub>2</sub> equation because they have to have a grip on what's going on to reduce the CO<sub>2</sub> in the supply chain.

That's why we saw this swing, as I have already pointed it out, where now the OEMs, in different degrees, are themselves involving them in batteries – the extreme case to produce

batteries themselves, but also by designing and determining the properties. And then giving these requirements to the cell makers that then work with the cathode material makers.

So there is a much bigger involvement and this drives new ways of partnership. We think that we are pioneering this type of partnerships, even with co-investments with customers, with partnerships that go beyond a pure supplier-customer relationship. It's a true partnership on several aspects, and Ralph will go in more detail in his presentation.

#### *Ramping-up*

And this is the phase that will go this this year, next year. And starting 2024, we will go into the next phase of Battery Materials. We call it ramping-up. We will be ramping up not only the manufacturing capacities globally, the manufacturing capacities also along the value chain. We see a big value to have not only the last step of cathode manufacturing, but to really go upstream to refining, to influence the supply chain from a securitisation point of view, but also from an influence-able point of view, CO<sub>2</sub>. But also, the cost of the whole supply chain can be better addressed if you have the things in hand and this is something that we are doing.

And secondly, it is the ramping up of the Battery Material chemistry roadmaps. So we will not talk about anymore mid-nickel, high-nickel and so on. We have done this. We'll talk about much more the future. We have new chemistries coming into play, HLM. So manganese-rich technologies that are contender to the LFP technologies for design-to-cost applications, solid-state battery materials where we are already active since 2017.

And you might not know that, we never said that also, that we are already today nearly with 15 running programmes in predevelopment and to get qualifications with OEMs on the solid-state side. And there is a new exciting development that is called catholyte and this will also be explained later by Ralph.

#### *Value-creative growth*

And then, we go into the phase beyond 2026. We call them the acceleration phase, where there will be significant growth, paired with the sweet spot of returns and you will also see that we can harvest the fruits of our Scope 3 roadmap in this timeframe.

### **Catalysis: Capture peak in Automotive Catalysts and Emerging Growth in Fuel Cells**

#### *Automotive Catalysts*

Catalysis is characterised by two things. On the one side, it's the Automotive Catalysts that have, other than it might be intuitive, still a growth in front of them. The peak of our business will be in 2026, while the market is expected to peak in 2023. And the reason why this is the case is because we have a very preferential product mix in terms of gasoline technologies versus the upcoming new emission legislations. And secondly, we will gain market share in heavy-duty China and in Europe, and that will help us to even grow to 2026. But even in 2030, we expect to be at a level of 2021.

So you see that this is a business that is very much contributing to our value creation model that I will explain in a minute. And that will help us to create about €3 billion of free cash flow that we will be able to invest into the future businesses of Umicore, and Bart will explain all the mechanics behind.

### *Fuel Cells*

But we'll also explain the other part of this business, Fuel Cell, that has a totally different equation, where we have a very strong position today. We are the market leader in PEM fuel cell catalysts. We have a very strong technology offer, in terms of performance, but also cost to our OEMs. And we are pioneering with capacity investments. And this will be also explained by Bart how we will be further growing our strong market positions in fuel cells.

## **Recycling: Precious Metals Refining as Solid Platform To Enable Success in Battery Recycling**

### *Precious Metals Refining*

Last but not least, recycling. Here there are two elements of recycling: Precious Metal Recycling or Precious Metal Refining, where we have built in the plan, I would say, a conservative assumption or a realistic assumption of precious metal pricing normalising over the period. Filip will give you the details of the mechanics behind. So we do not bet on the high levels that we have today. But even with this assumption, through operational excellence and the improvements measure that we're doing every day, we will be able to yield very significant returns from that business over the period.

And then, secondly, there is the equation of CO<sub>2</sub>. We are positioning ourselves as the world leader in low-carbon recycling. And the premiums that we will be able, we believe, to harvest out of that are not even included in our today's equation.

### *Battery Recycling*

The second part is Battery Recycling. Battery Recycling would already represent 30% of the EBITDA of recycling in 2030, or more than 30%. And we have an ambitious plan to scale up our capacities, that will also be explained later in this presentation, but also here in Recycling, a good self-balancing of the activities.

## **Complementary Portfolio Enables Value Creation during the Entire Plan**

I have talked about some of the elements of strategies of the different business units and business groups. And you can see here them listed again. They're individually strong, but also they have something in common. They have themes that go across the different business groups.

Everything regarding to metals – how to manage metals, how to do engineering, R&D technology with metals – is very clear. The circularity aspect is going through all of the different business groups and business units. Sustainability is a common thread that you will see everywhere.

So there are a lot of synergies that you have with those business groups and a lot of complementarities on a business and technology side. But on top of that, those business groups, because of their different position in the lifecycle, they represent a very strong value creation model that I'd like to explain to you today.

### *Scale up: Invest to capture profitable growth*

So some of our businesses are in a clear scale-up phase. Battery Materials, Battery Recycling and Fuel Cells, they are growing a lot and they need funding, they need to be invested in to be able to grow, and we are operating those units exactly with this mindset.

*Free cash flow: Operate for Cash*

Automotive Catalysts is in a different state. As I have just told you, Automotive Catalysts is in a cash production mode, a free cash flow cycle that I would like to show you as well, if my clicker would work. Yes, it's working now. So Operate for Cash is the paradigm that we are running this business with a detailed strategy that will be explained. And that will, of course, help to fund, to a very strong extent, the investments that we have into the future.

*Cultivate: Develop for ROCE and diversification*

And then, we have a third part of our portfolio, that are business units that are champions in their respective markets. They have very strong returns today, very strong value creation, very strong ROCE. We want to keep that. We want to even selectively invest that not only because we want to enjoy the returns, but also as a means of diversification of the group towards a broader industrial base. And with these mechanics altogether, we truly think that we have found a way that all of the pieces in the puzzle are fitting together in the right setup to build the big picture that we want to achieve for 2030.

Now this picture, how does it look like, in terms of growth?

**Mobility Transformation Unlocking Transformational Growth for Umicore***Profitable growth with adjusted EBITDA margins more than 20% throughout the period*

I said it before, the plan that we are presenting today, we are convinced it will unlock growth for Umicore – very significant growth, nearly or more than doubling our revenues to 2030, between €5 billion and €6 billion of revenues on top.

Now, when I said it will unlock significant growth, it is not an unrestricted growth. There is one paradigm that you will see throughout our strategy today, that is value creation. We will only invest in businesses that will create value, that will create returns above the cost of capital. We will not go into contracts with customers – and with no exception – that is not holding up to this threshold.

You will see this explained later on also in Filip's presentation, but all my colleagues have this same paradigm. So we are not looking to maximise our top line, we are looking to maximise the value creation. And I think with what we have here, we have the right setup.

*Uninterrupted value creation at Group level*

And another very important thing to mention. Uninterrupted or continuous value creation. What does that mean? It means that, of course, our businesses have different positions in the lifecycle. Some of them are more value creative than others today, but some of them are also more growing. That's what I have shown you in the other slide.

So it's a puzzle that is moving. But as a Group, in the envelope of Umicore, because we have this very strong value creative model, we will always be value creative and we will always earn our cost of capital throughout the plan. And this is something that is enabled by the strong portfolio that I have just lined out. So this is the strategy.

**Umicore 2030: RISE**

Now, we have talked a lot about RISE and I want to share with you, before I hand over to my colleagues, what exactly means RISE. It's an ambitious word. We want to rise above the

ambitions of the past. But each of the letters stands for one of the pillars that we need to execute to be successful.

*R: Reliable transformation partner*

So the first letter is R. We want to be a reliable transformation partner for our customers. We want to help them with their own transformation, with the value proposition that I have just explained on the slides before. And this is really something that, in this changing world, is a key asset that, in all of our strategies, is very high on the agenda.

*I: Innovation and technology leader*

Secondly, innovation and technology leader. We have the ambition to continue to be an innovation and technology leader, to be a frontrunner in the fields where we are. And you can see here, this nice ball that you see in the background, it's not a new planet that we found. It is a GSP, a genuinely spherical precursor, that has been micro-engineered. And with that, it's perfectly round so the package density can be much higher. You have higher energy density. You see this porosity is where you can do something called doping already in the precursor process that avoids to do that in the CAM production, which is a cost saving as well.

So it is a technology that if you would just look at the black powder that you see Umicore plant shipping, you would never think that this high-tech micro-engineered product is in this black powder that you – scooping in the bulk. So the attention is to the details. And one of the takeaways is also we have to talk more about the technologies that are underlying our strategies.

*S: Sustainability champion*

Sustainability champion, I think this is not a surprise. This is in the DNA of Umicore. This is our tradition. This is our history. And we have the ambition to even accelerate above what we have done in the past, helping to reduce the battery material equation – the battery supply chain.

The plan that we are presenting today is to reduce the carbon footprint of our Scope 3 emissions in battery material over the whole supply chain until 2030 by 75%, compared to the industry average today. Or, in other words, we will be able to save around 8 million tonnes of CO<sub>2</sub>.

Now, we are doing this because we want to contribute to the decarbonisation of the planet, but also because it's a strong competitive lever. And I'll leave it up to you, whatever CO<sub>2</sub> price you want to take into account, what the valuation of this reduction would be worth in our value proposition to the customers.

*E: Excellence in execution*

Excellence in execution. I talked about our customers and that they are trusting in us. We are making a promise to our customers, 'We will be there for you. We will execute. We will ramp up. And we will deliver.' And this is very important for us that we are honouring the promises we do unto our customers.

Umicore is very well positioned in operational execution. But the ambition of the plan and the growth and the speed requires special attention on excellence and execution. So this is a pillar that in each of our strategies, we are looking at. And on our corporate level, we have

an initiative that is covering that into the future, that we can scale up with the demands that we put ourselves, in terms of growth.

### **Writing the Next Chapter of Umicore As The Circular Materials Technology Company**

Now, if I want to summarise all of that, before handing over to my colleagues, we have a strategy that is ambitious, that is bold, that is based on strong megatrends. And one KPI I forgot to mention earlier, I want to do it, when I talk about growth and the mechanics of the underlying market, the market is growing a lot but also, the mechanics are great. The CPV, the content per vehicle, that we have on a combustion engine car is around €100. And if you compare this to a CPV that we have on a battery electric vehicle, it goes up to €700.

So you can see it's not only the market itself is growing, also the mechanics below. So we don't have to doubt in the drivers for our growth. At the same time, we think that we have a specific, privileged value proposition to the OEMs of the automotive market. I have explained why we think this is the case. And with that, we are sure that the value creative investments that we're looking for is something feasible that we can do. And our current traction proves this for us.

### **Our Journey towards 2030 has Started**

We have the RISE pillars that I have just explained to you, that are each of them will be an important part of our strategy forward. And with all of that, I hope at the end of the day, you will share our conviction that we have an ambitious, but realistic plan. And now, a short movie to... No? No movie? Okay. The movie comes later.

So I hand over to Frank Daufenbach, who will now explain more details on the strategic drivers behind our journey. Thank you very much.

## **Strategy Drivers**

Frank Daufenbach

*Chief Strategy Officer, Umicore*

Thank you, Mathias. Good morning, everyone. I was hoping to surf the wave of the nice movie, but we'll do without that. So happy to be here this morning. Hello as well to everybody who's watching from home or from their offices. My name is Frank Daufenbach. I'm in charge of Strategy for Umicore. I joined the Group six months ago. And I'm very happy to be sharing with you today the key drivers of our Strategy 2030 plan.

### **External Strategy Drivers**

So we will be addressing two questions today, essentially. We'll be looking at the external drivers of our strategy and we'll be addressing the question, are we in the right markets, are we in the right place? And then, we'll be looking at internal drivers and we'll answer the question, do we have the right assets, do we have the right portfolio to seize the opportunity from the markets we're in?

Let's start with the right markets, with the external view.

## **Accelerating Megatrends Drive All Activities**

### *Growing need for advanced materials*

So Mathias mentioned three megatrends that we are benefitting from and that we are embracing. The first of these three megatrends is the growing need for advanced materials. What do we mean by that?

Advanced Materials are engineered metals that we make in order to enable technologies. These are metals or materials that you find in technologies we use every day in our day-to-day life. There are in our smartphones, in fertilisers, in healthcare products, in optic fibre cables, etc. Every day, each of us is using Umicore inside products.

And the seven business units you see here on the right-hand side of this page are the ones that are really embracing this trend of growing need for advanced materials. They are the ones that are enabling the products I just mentioned. So that's the first trend and that's the first illustration of how we are embracing this first trend.

### *Mobility transformation*

The second trend that Mathias highlighted is mobility transformation. Now, what is mobility transformation? Mobility transformation is essentially our willingness to have cleaner ways of transportation with a lower CO<sub>2</sub> footprint and with less pollutants. And the ways to do that are threefold today.

You can electrify your powertrain. And this is mostly made through battery electric vehicles, which are supported by our Rechargeable Battery Materials business unit. You can make cleaner combustion engines, which is done by our Automotive Catalysts business unit. And you can leverage hydrogen as a fuel for transportation, which is what our Fuel Cells business unit is supporting.

So as you can see, we are facilitating, we are enabling every aspect of this mobility transformation. On top of that, our newest business unit, Battery Recycling Solutions, is closing the loop on electrification, making sure that the essential and critical metals that are used for battery electric vehicles can be reused a number of times. And that will further reduce the CO<sub>2</sub> impact of electrification.

### *Circularity for critical metals*

Finally, the third trend that Mathias highlighted is the circularity for critical metals. And this one is really embedded in every single of our 11 business units. It's not only in our Recycling business group, it's across all of these business units. All of them are either using or making second life materials.

So as you can see, we are really ideally positioned to take full advantage of these three megatrends. And what I would like to do now is a double-click or a deep dive on the mobility transformation trend to illustrate how beneficial it can be to be supported like this, to embrace one of these megatrends. So let's look at mobility transformation.

## **Mobility Transformation is radically Accelerating...**

The main impact of mobility transformation is electrification. Electric vehicles represent around 5% of the new vehicles sold today. By 2030, they will represent 34%. This is an extremely fast growth. And this is a growth that is not only driven by regulation anymore, it's

driven by a customer pool, we have seen that the customers want this product, and it's driven by OEMs as well, who are all investing massively to support this change.

This is a global phenomenon, but it has some regional differences. And right now, we see, for instance, that Europe and China seem to be electrifying slightly faster. We have all heard about the announcement of the EU Parliament banning the sale of new combustion engine vehicles in Europe, starting in 2035. So Europe and China are slightly ahead. But this is really a global phenomenon.

So one-third of electric – of vehicles will be fully electric in 2030. This means two-thirds will still have a combustion engine. And that's the other important message on this page. The transition towards cleaner mobility cannot be done without clean combustion engines because they will still represent two-thirds of the vehicles sold in 2030.

Now, what does that all mean, in terms of business opportunity for Umicore?

### **...Resulting in High-Growth Potential for Umicore**

*Shift to cleaner mobility will drive a 3x increase in Umicore's mobility-driven addressable market by 2030*

This chart is showing the growth of our addressable market in mobility between now and 2030. Today, we have an addressable market in mobility of around €9 billion per year. And this is growing to €25 billion to €30 billion in 2030, so times three.

So this is what the impact of this megatrend is on our addressable market. Let's look at the details. What is driving this growth?

#### *Automotive catalysts market*

The blue bars at the top the automotive catalysts market. And you see that these bars are roughly staying the same between 2021 and 2030, so it's a stable market. And in between 2021 and 2030, you see that the bar is slightly bigger. This is the peak that Mathias was mentioning and that Bart will explain in his presentation.

#### *Cathode active materials market*

After that, you see three segments that are electrification-related: fuel cells, battery recycling, cathode active materials. Cathode active materials is by far the biggest of these segments. Why is that? This is because of the content per vehicle that Mathias highlighted before. We have a content per vehicle. For battery electric vehicle, that is seven to ten times bigger, compared to our content for a combustion engine. This is why this is driving such growth.

But what's interesting about this growth is that it's not only a big market, it's also an attractive market, and Ralph will explain that in his presentation. But it's not just the sheer size of this market that's interesting, it's also the attractiveness, as a whole, and the ability for the players in this market to create value.

#### *Fuel cells and battery recycling markets*

The other two markets on this page are fuel cells and battery recycling. You see that they're still relatively small in 2030. And that's because most of their growth is actually happening after 2030. For instance, in battery recycling, between 2030 and 2035, the size of the market is going to be multiplied by three.



So you see a lot of the growth is happening after this chart. And Kurt will tell you more about the drivers of battery recycling and why it will grow after our time horizon. So this is, I think, a good example of the benefits there is to being positioned on the right markets, supported by powerful megatrends.

Now, we have established that we are in the right place. We are supported by these three megatrends. We are on growing markets. We are meeting the needs of everyone. Anyone who needs clean transportation, or who needs technology, or who aspires to a more sustainable world will have a value proposition from Umicore.

Now, do we have the right portfolio to address these market opportunities?

### **Synergistic Portfolio with Acceleration Potential from RISE Pillars**

So what's a good portfolio? A good portfolio is a portfolio with synergies. Mathias highlighted before the complementarity of our different businesses in terms of value creation. You remember the scale-up versus cultivate versus free cash flow. So this is a complementarity in terms of value creation.

What I would like to highlight on this page is more the complementarity, the synergies, in terms of operations, in terms of managing the businesses. It's a long and wordy slide. I will only touch on a few points.

#### *Commercial: Metal management*

First point, metal management and metal technology. We are a metal company, at the core. This is shared by all our 11 business units. So we know the technology of metals – the chemistry, the science – and we know the business models of metals – sourcing, trading and financing. That's one area of clear synergies. All of our business units are using this.

#### *Commercial: Material circularity*

A second area of synergy is the circularity. As Mathias said, this is embedded in every single of our 11 business units. And this necessitates a certain expertise as well in terms of your sourcing, the management of your supply chain, management of your customer, and just managing this very unique business model of circularity.

#### *Commercial: Customer intimacy*

A third area of synergy is the customer intimacy. And that's really a critical one, this ability that we have to be a reliable transformation partner for our customers. We are, we think, uniquely positioned to support our automotive customers in their complete journey from internal combustion engine towards electrification. We think this is really a unique value proposition.

For a number of these synergies, you see that there is the RISE logo in front of it. And it means that we believe there is acceleration potential for this synergy. And I'll take a couple of examples of areas where we think we can accelerate, we can do more, in terms of synergies.

#### *Operational: Operational efficiency*

Operational efficiency. We have started digital initiatives, but we will accelerate them. And there is a lot of potential there that is still untapped.

*Operational: ESG*

Another area where we will accelerate is ESG. Sustainability is at our core. Mathias said that we would repeat it, and I repeat it, all my colleagues will repeat it as well: Sustainability is at our core. And we think we will continue to use it as a differentiator. This is not a must-have. This is not a box we need to check. For us, it's a competitive advantage.

And concretely, what does it mean? It means we want to be the company that will enable the decarbonisation of the battery supply chain. It's that type of commitment that we want to make. And this is what we mean by sustainability champion.

So to illustrate a little bit our unique value proposition, I will, again, do a deep dive on the mobility side of things to show how we are uniquely positioned to support the electrification journey of our customers.

**Unique Combination of Metals Expertise and Automotive DNA Create Unique Value Proposition***Criticality of sourcing*

Electrification is mobility powered by metals. If you don't manage metals correctly, there's no electrification. It's as simple as that. Batteries are really metal-hungry animals. So you need to be able to source the metals in an environment where demand is accelerating and, therefore, sourcing is not obvious.

*Criticality of transformation*

You need to be able to transform efficiently these metals in a cost-efficient way and also in a performance-oriented way because performance will be completely dependent on how you manage these metals, from durability to safety. Managing the cost is critical as well. I remind you that more than half of the cost of a battery pack is metals today.

*Criticality of recycling*

The last thing you need to be able to do with metals is recycle them. This is going to be mandated by regulation. Very soon, you will have to recycle at least 90%, or even more, of your critical metals in the battery. This is also an imperative from a sustainability commitment standpoint. We don't want to dig the earth for all these metals. We want to recycle as much as we can.

*Our portfolio has all the right materials expertise, combined with auto DNA*

So to support electrification for our customers, you need to know metals. But of course, you also need to know the automotive industry. At the end of the day, this is our – these are our customers. So you need to be at the intersection of these two worlds, and this is precisely what we are.

We've been a metal company for a couple of centuries and we've been in the automotive industry for 40 to 50 years. So it's hard to think of a company that is better positioned to support electrification as the intersection between metals and the automotive industry.

**RISE Pillars Enabling All Activities to Thrive, Making Umicore A Net Beneficiary from Megatrends**

So we are in the right markets. And as we've seen, these markets are growing extremely fast. And we are there with the right assets, a complementary set of business units. So we have all it takes to take full advantage, full benefits from the opportunities ahead of us.

In that context, the role of the RISE pillars is to accelerate our success. I will go through these pillars again because they will be a structuring element in the presentations of all my colleagues. Each and every of the business unit presentations you will hear today will refer to these as a way to achieve success.

*R: Reliable transformation partner*

So the R is for reliable transformation partner. This is our willingness to always listen to our customers and meet their needs. This is illustrated in mobility by the fact that we support from combustion engines to electrification, both fuel cell and battery electric. It's also the case in our other activities, where we are always working with our customers to enable the next upcoming technology.

*I: Innovation and technology leader*

Innovation and technology leader. This is something that is deeply rooted and that we will continue to nurture and accelerate simply because the markets we are in, are also accelerating.

*S: Sustainability champion*

Sustainability champion. I gave the example of the decarbonisation of the battery supply chain. This is the kind of commitment that we want to make. This is what we mean by sustainability champion.

*E: Excellence in execution*

Excellence in execution. This is a must because we have so much growth ahead of us that we need to execute in an excellent fashion in order to create the value that we expect and that you expect.

## **Net Beneficiary of a Changing World**

*Umicore RISE 2030: Writing the next chapter of Umicore as the circular materials technology company*

Now, that's the wrap-up page that's trying to capture a lot of what we have said so far on just one page.

What did we say? We have an excellent starting point. We are supported by powerful megatrends, we have the right portfolio to benefit from these megatrends, and we are purposed within company. That's our excellent starting point.

The RISE execution pillars will enable our success and I've just detailed the four axes of this. So these pillars will enable our success.

What success? Well, it's here. And these are the numbers that Mathias already shared briefly before. Very high growth, growing like a start-up company. But at the same time, always creating value in every step of the way. We believe it's a pretty unique combination to have a start-up-like growth with uninterrupted value creation as part of a credible plan.

And to give more details about this value creation journey, I will now hand over to my colleague, Filip, who will tell you everything about the financials. Thank you.

## **Growth, Returns and Cash Flows**

Filip Platteeuw

*CFO, Umicore*

### **Opening remarks**

Thanks, Frank. Good morning, everybody, and thanks a lot for your interest in Umicore. I almost feel like apologising for this very innovative, creative title of my section. At the same time, I think it covers everything there is to say in this strategy.

What I would like to talk to you about in this section is, first of all, give you an insight in the value-creating framework we have in Umicore. That is how the different businesses actually fit together also, not just from a technology point of view, market point of view, but also financial point of view. So really, the synergies within these businesses from a financial point of view.

Secondly, obviously, share with you the ambitions we have in terms of our growth. And we will do that by looking at 2026 and 2030 because we really feel these are two distinct periods. And then, obviously, in order to generate that growth, we'll have to invest. So also explain you a bit about the investments, and how those relate to our returns and to our cash flows.

Now, before we look at the future, allow me to look, only with two slides, to the past in the rear-view mirror because I think accountability is important. In 2015, we were standing here as well with an ambitious strategy. So I think it makes sense to explain to you and see whether what we promised then, what we achieved of that.

And secondly, because as mentioned already by Mathias, this plan again builds a lot on the previous plans. So I think in order to also understand the ambition, it's important to calibrate where we start from.

### **Horizon 2020 Strategy Financial Targets**

*Delivered on financial targets*

This first slide talks about the financial targets we had set in our Horizon 2020 strategy communicated in 2015. Two legs: accelerating profitable growth, sounds familiar, you see the targets here; and secondly, higher investments but also a return on those investments.

So what did we achieve 2020, with a bit of a difficult reference here, given COVID. But you see that we achieved those targets. In 2021, obviously, with the recovery, and then with record metal prices, we over-achieved again.

The only caveat on this slide is you see the return on capital employed. We set a target at 15%. We did reach it in 2021. But in 2020, we were below that. Again, not the easiest of reference, yes, but I think this relates also to, as you know, the headwinds we have in the delayed capacity utilisation of our Chinese plant in Rechargeable Battery Materials. But overall, I would say that we have overreached our target.

### **Horizon 2020 Strategy Drove Step-Change**

*Doubled in size: earnings, capital employed and value*

The second slide is meant to look at absolute values because growth rates are important, but sometimes, you lose track of what it means in absolute values. You'll hear a lot talking – us

talking about transformation. This is a transformational strategy. I just want to highlight, actually, between 2015 and 2021, this Company, this Group already went through an important transformation.

We basically doubled the size of the Group through different metrics, except for the number of colleagues which increased by 26%. But for the rest – you see revenues, EBITDA – even if you correct for the 2021 record metal prices, we have doubled this Group. Capital employed, you know that part of that still has to fully yield its payback.

But also from a market value perspective, we have increased enterprise value by about €5 billion. And approximately 90% was translated in shareholder value in market cap, corresponding to 15% annual total shareholder return. Acknowledging that the last few years, we've seen quite a lot of volatility in our share price. And clearly, this is something we want to avoid as much as we can in our future strategy.

You'll see a lot of balance in these numbers. If you look at the growth rates by different business section, you'll see that there's been a lot of balancing in the Group, which is important as well to keep the equilibrium overall.

Right. Let's look forward into the strategy. Before we do so, I need to talk about metal prices. I know this is a complicating factor also from a financial communication perspective. But this is who we are, this is what our business is, how we create value.

### **Metal Price Assumptions, Going Forward**

Right. Let's look forward into the strategy. Before we do so, I need to talk about metal prices. I know this is a complicating factor also from a financial communication perspective. But this is who we are, this is what our business is, how we create value.

*Anticipate non-linear price changes interlinked to the pace of electrification*

So we wanted to share with you the assumptions on metal prices that we have used. We still haven't found the crystal ball. However, we felt that particularly related to the precious metal prices, it was probably not appropriate to just say, 'We take metal prices where they are today,' given that today, we're still pretty close to record peak level.

*Strategy is not predicated on today's high precious metal prices*

So what we have assumed again, we are positive. You see that because especially for PGMs, there are some structural supply-demand tightness elements. You have the platinum which will benefit from fuel cells. But what we have assumed in this plan is a gradual normalisation of PGM prices, going forward.

You see it on the graph, shows you the average historic precious metal prices. And you see what we composed as a consensus in the market. And the message is that what we assumed in our plan follows that trend; if anything, it's probably a bit more conservative.

The key takeaway for you is that the numbers I will show in a minute, therefore, do include quite a substantial headwind, earnings headwind, because of this normalisation effect, particularly in recycling.

*Battery material metals (Co, Ni and Li) simulated at average 2021 prices*

Now, what will become much more important in the future, given the growth of rechargeable battery materials, is, obviously, the battery material metals and those prices. We expect

some volatility, as we've seen in the last few years. Instead of trying to predict that volatility, we have assumed in the plan prices at the average level of 2021.

Interesting as well is that most likely, there will be an interlink between precious metal prices, and particularly PGM prices, and these battery material prices, related to the pace of electrification.

### **Differentiated Sources of Value Creation**

#### *Balancing growth, returns and cash flows for the Group*

Okay. Now, we're really going to look forward. What I wanted to say at the outset of the numbers is that we always have a bottom-up planning. That means that it's our business units that come with a plan. We think that's important from an internal ownership perspective. So this is not a corporate plan. And obviously, we link that up with our Group value creation framework. And that framework, I would like to explain a bit more in detail.

We have structured it through three drivers: earnings growth, defined as EBITDA growth; the return-driver, which is we need to earn a return above our cost of capital defined by return on capital employed; and thirdly, free cash flow – free operational cash flow generation.

It's really the combination of these three, not the exclusivity of one or the other, that drives the value. And we would like to do is, first on the Group level and then on the business unit levels, show how each of these drivers really add to the value creation.

#### *Earnings growth*

So this is the Group. Let's start with earnings growth. No surprise, I mean, that is on the high side because we – I mean, with our plan, we have attractive earnings growth, driven mostly by, obviously, Rechargeable Battery Materials and then also, especially in the second half of the decade, Battery Recycling Solutions. And again, the caveat on the metal prices that will impact exactly the growth. But as Frank mentioned, very strong growth is the basis of this plan.

#### *Return-driver*

Secondly, and this is obviously related to returns, not isolated, is that we see in this plan, our Group returns above the cost of capital across the plan. Our cost of capital pre-tax, we have somewhat below 10%. That's a reference. And you'll see that, just like we've realised in the past, that across this plan, despite the fact that we will have significant growth investments for the Group, we see that return above the cost of capital.

#### *Free operational cash flow generation*

And then, lastly, free cash flow generation. Clearly, that's a more challenging one, given the growth we have in RBM. That's why you see that it's relatively on the low contribution side.

You see arrows. I should have explained that. The arrows is where we see the trend between 2026 and 2030. And you clearly see that from a free cash flow perspective, we do see the payback also from Rechargeable Battery Materials, but also from the Battery Recycling Materials. You see that in the second half of a decade, hence the trend. And also on the returns, you see that we do see between 2026 and 2030, a further increase of the returns from the business.

On free cash flow generation, if you – and I will show that – look at Catalysis and Recycling, clearly there, we have a lot of free cash flow. So this is, again, the Group perspective.

### **Umicore Group Earnings Growth Ambition**

#### *Secular earnings growth while maintaining attractive historical margins*

So a bit linking it to what Frank said, it's the combination of extremely high growth, start-up growth, I would say seasoned start-up because we've been around for a long time. But at the same time, combining it with return on capital employed – we're not leaving that metric, it's very important to us – and then a lot of free cash flow generation that we will invest in our growth businesses.

#### *2026 ambition*

Quantifying this, in terms of the growth ambition – and we have taken here for earnings EBITDA because we feel that's really the KPI that probably best will track that path and is also, from market perspective, most used.

So this is where we start from, between 2015 and 2021, 18% growth. If we move to 2026, our ambition is to be at approximately €1.5 billion EBITDA for the Group. Again, this includes the normalisation of PGM prices already in there. And from a revenue perspective, we expect to have €2.5 billion to €3 billion of revenue growth between 2021 and 2026. So the way to read it is that by 2026, revenues are expected to be somewhere between €6.5 billion to €7 billion. At the margin EBITDA, marginal Group level above 20%.

Metal prices. So, in our base numbers, we have a normalisation of PGM prices. But just to show you the underlying growth, what we have also done, and that's the shaded bubbles, is to give you the like-for-like if we would take precious metal prices at the average levels of 2020. Okay?

So this is just – for the rest, you don't have to pay too much attention. But you see that underlying this, there is quite substantial growth, double-digit growth rate at 2020 levels. It also shows that the metal prices we have used in 2026 are below the average that was there in the market in 2020.

#### *2030 vision*

Now, let's look at 2030. The vision we have for 2030 is an acceleration on the top line, basically having the same increase in revenues between 2026 and 2030 – so that's four years, compared to the previous five years – and to maintain an EBITDA margin of above 20%.

This growth, whether it's between 2026 and 2030, or 2021 and 2026 will not be linear – I think it's bit of an obvious one, but still important to mention – because the businesses we serve are not linear because the metal prices are not linear. So that's an important thing to note.

Maybe the most important thing on this slide is at the bottom. That is phased growth conditional upon value creative returns from contracts. What it means is this growth will be phased. That also means the investments will be phased. And clearly, it only makes sense for us to go after this growth if we are convinced that we will have a return above – and sufficiently above – our cost of capital, not just in an Excel sheet in our offices, but through the agreements we will reach with our customers.

If we map the margin, from a historic perspective, you'll see that the margins we have on the Group level in this plan are actually, let's say, close to the average levels we've seen over the last ten years. So attractive margins, even including the normalised PGM prices, which are at play here.

So now, we'll try to do the same thing for each of the business sections so you can see also the synergies between them.

### **Catalysis: Balancing Growth, Returns and Cash Flows**

Catalysis, we see and we start this plan as a growth business. Bart will explain that.

#### *Earnings growth*

We're really convinced that there's a real opportunity to capture what we call an unprecedented value peak in Automotive Catalysts in this decade, especially in the first half of the decade. What we'll also do, clearly on the Fuel Cell side, is prepare for the growth acceleration in that business.

We see that payback mostly in the second half of the decade – not because we're late, but because of the market – and then, further increasing after 2030. You see the arrow, which I think is an obvious one. That is the internal combustion engine towards the end of the decades, yeah, moving out, in terms of the mix and that, obviously, from a growth perspective, will have an impact.

#### *Return-driver*

Return-driver. The Catalysis business has consistently, with the exception of the COVID year, generated a return well above our cost of capital. And in this plan, that is absolutely to continue. And you see the arrow, we see that increasing towards 2030 because of a reduction in capital employed in Automotive Catalysts.

Again, about Fuel Cells. The good thing about Fuel Cells is that the capital intensity is relatively limited. And in terms of payback, we see the payback in Fuel Cells more towards the end of the decade. Again, nothing because of our position, but because of the pace of growth in this market.

#### *Free operational cash flow*

Free operational cash flow. Clearly, Catalysis will be a very important high free cash flow driver. Again, Bart will explain that. And we'll transition its business model from a growth model to a free cash flow model, not too early, not too late.

### **Catalysis: Committed to Capture Medium-Term Growth while Driving Efficiency and Cash**

So if you look at Catalysis, it's very clear, I think, how Catalysis will contribute to the value creation, which is a return well above cost of capital, free cash flow, which will fund our growth opportunities. And then, we're going to prepare for the growth in Fuel Cells to take over. Quantifying that, in terms of growth, EBITDA, so history, last five years, 15% growth. You see again some of the metal price impact in that.

#### *2026 ambition*

The ambition for 2026 is to have an EBITDA of close to €0.5 billion in this business, which equates to mid-single-digit growth rates. Again, if we plot metal prices onto this – so again,



like-for-like average 2020 metal prices – you see that the underlying growth is actually more closer to double-digit growth rates. And maintaining margins, you see that EBITDA margin of more than 20%, which is less than 21% but I think we all acknowledge that 2021, from that perspective, was a pretty exceptional year.

#### *2030 vision*

If we would have put ourselves in 2030, we expect revenues to be somewhere between 2021 and 2026 level, and with a margin which is comparable to 2026. So basically, EBITDA margin above 20%.

We've also put here the expected contribution of Fuel Cell catalysts in percentage of the Catalyst EBITDA. And you see by 2030, that's less than 30%. That's a lot of money because Catalyst is a big segment. The message is that there's really – most of that, I would say, growth acceleration in Fuel Cell, we expect to see after this decade, after 2030.

### **E&ST: Balancing Growth, Returns and Cash Flows**

#### *Earnings growth*

E&ST (Energy & Surface Technologies). Growth, that's an obvious one, unprecedented transformational growth in Rechargeable Battery Materials. And by the way, not just to 2030, but beyond because of the revolution that is happening.

#### *Return-driver*

Important, the return-driver, looking at E&ST and RBM, because we have a concentration of investments in this plan basically running up to 2026 – think about the expansion of the footprint in Europe and North American side, which is included in this plan. It does mean that if we take the picture, in terms of return versus capital – cost of capital, that in 2026, we expect E&ST to be somewhat below that hurdle rate. But you see the arrow, that is the payback of that, is in the second half of the decade. And shortly after 2026, we see – we do see E&ST going to value creative territory, from that perspective.

#### *Free operational cash flow*

Free operational cash flow, also quite obvious. The first part of the decade will be a lot about funding so we will have a negative free operating cash flow in E&ST. The arrow shows that the payback is expected more in the second half of that decade.

Quantifying it, 15% growth the last five years.

### **E&ST: Rechargeable Battery Materials to drive transformative growth**

#### *2026 ambition*

Quantifying it, 15% growth the last five years. 2026, the ambition is to have an EBITDA somewhere between €0.6 billion and €0.8 billion. Clearly, there's a bit more range here because of the dynamics in this market. And you see that, in terms of revenues, we expect to add something like €2.5 billion to €3 billion from 2021, which gives a margin somewhat below 20% EBITDA.

Why is that? Because also in that period, we'll have quite a lot of start-up, ramp-up growth costs, basically, that are not fully, yeah, paid off by 2026 because a lot of these investments will start to yield around that time.

*2030 vision*

And that you will see coming through in 2030 because there we see margins higher than we have in 2026. And we do see, in terms of growth – top line growth, again, an acceleration because of a short period of time, we expect to have more earnings growth.

Again, please mind the bottom comment. It's phased growth conditional upon value creative agreements.

We don't have a lot of time to – almost no time to talk about the other businesses than Rechargeable Battery Materials. There's some real jewels in there. The message is they will continue to do very well with margins above 20% and to capture the growth opportunities in their respective markets.

**Recycling: Balancing Growth, Returns and Cash Flows***Earnings growth*

Recycling, to finish off. So in terms of growth, Recycling is really two tales. On the one hand, you have the PMR business, if I can simplify it, which will obviously come up from its peak earnings from 2021 because we have assumed to go back to normalised precious metal price.

It doesn't mean there is no growth in PMR – I mean, Denis will explain that – but the effect of metal prices is there. But on the other hand, you see Battery Recycling coming through – Kurt will explain that – especially in the second half of the year. So how do you map that on this graph?

Normalising PGM prices, which, again, is our assumption, you have, obviously, in terms of growth, that is a headwind. If you would take stable metal prices, you will see that looks different. And then, you have Battery Recycling, where we will have the – in the plan, we have the first industrial scale plant to be commissioned by 2026 of 150,000 tonnes, with the payback clearly in the second half of the decade and then further growth beyond.

*Return-driver*

Return-driver. Recycling, irrespective of the investments in Battery Recycling, is a business that will continue to generate returns well above the cost of capital.

You see the arrow from 2026 to 2030, a bit moving to the middle. That is just, I would say, some dilutive effect, from an accounting perspective, because we will have the investment in Battery Recycling. And obviously, we also have the impact of the PGM prices normalising – continue to normalise after 2026. So nothing structural.

Free operational cash flow, again, Recycling will be, next to Catalysis, a very strong free cash flow generator, which we intend to invest, reinvest in our growth businesses. Quantifying Recycling, you see the peak, again, driven by metal prices.

**Recycling: Strong Margins, Returns and Cash Flow and Battery Recycling Kicking in Mid-Decade***2026 ambition*

Quantifying Recycling, you see the peak, again, driven by metal prices. So we expect this business in 2026 to have an EBITDA of close to €0.5 billion with revenues of more than €1 billion, which implies an EBITDA margin of more than 50% – more than 40%, sorry. If we, again, do the like-for-like to show you the underlying growth that is in the business,

based on average 2020 metal prices, you see the shaded bubbles, we have, actually, a high-single-digit growth rate.

#### *2030 vision*

2030, approximately the same kind of revenues, and that's really the effect of these metal prices continuing to play. And EBITDA margins somewhat below 40%. So very healthy margins. And if you look at the absolute level of EBITDA and you put that on the historic perspective, you see that we're well above the historic earnings.

You see there Battery Recycling in percent of adjusted EBITDA for the segment. We wanted to also show that. And you see by 2030, it's already more than 30%. There is more growth opportunity than we have put in this plan in Battery Recycling. But we feel this is – to start from a realistic view, and clearly after 2030, but Kurt will explain that, there's much more growth opportunities ahead of us.

#### **Growth Investments to Accelerate**

##### *Over three-fourths of Group CAPEX in Battery Materials, Battery Recycling and Fuel Cells*

Right. An important slide, investments. So what have we, just as a recap, invested in the period 2015 to 2021? €2.8 billion. And you see most of that went to the E&ST business to, basically, the expansion in Rechargeable Battery Materials, but also quite a lot still in Catalysis to capture the growth in that market. We expect to see CAPEX, based on the ambition we have in the plan between 2022 and 2026, to be at €5 billion. And you see that the split is different.

We have a significantly higher portion in E&ST, which is, again, the increase in footprint in Europe, the North American plant, which is all in there. You see that Catalysis is substantially lower. That's the free cash flow kicking in and that will accelerate, again, after 2026. And you see the green part remains quite important. And that includes the investment in the industrial plant in Battery Recycling, which accounts for about €0.5 billion in the total.

RBM – the expansion of RBM is approximately €4 billion in the more than €5 billion, which means that if you look at the three most important growth engines of the Group, which is Fuel Cells, Rechargeable Battery Materials and Battery Recycling, together, in terms of CAPEX, they account to more than 75% of the Group CAPEX.

##### *Discipline in CAPEX*

What is very important on this slide, in terms of interpreting it, is discipline. This is very big amount. So first of all, this CAPEX will not be spent in one go. So it's a phased investment plan, which means that there's a number of decision points along the way. Secondly, you know, our commitment to returns. So we will only spend this money if we have enough visibility on having a return above – sufficiently above our cost of capital. And thirdly, what I think is really strategic and unique is the partnership model that was already referenced earlier on in Rechargeable Battery Materials; you do not spend €5 billion based on annual contracts.

So I think this is really predicated on the traction we see with customers with ongoing discussions to have a true partnership with our customers to have also a co-funding aspect

into that. So that's – I think the word of discipline needs to be with this slide and definitely is in the ambitions we have, going forward.

### **Capital Allocation Shift to Accelerate: Doubling of Capital Employed Subject to Value Creative Returns**

In terms of capital allocation, what it means is that we have, between 2015 and 2021, again, already doubled the capital and the size of the Group. If we put ourselves in 2026, we are expected to close to double again. You see the – relatively, sizes are different.

So the main driver behind this close to doubling is obviously Rechargeable Battery Materials and Battery Recycling.

In Catalysis, we expect to see a stable capital base up until 2026 because there's still growth to be captured. We have the investments also in Fuel Cells. But then, towards the second half of the decade, we should see a substantial reduction in the capital base in Catalysis, partly also because of substantial working capital releases.

E&ST will grow to something like two-thirds of the total Group average capital employed base, obviously driven by the RBM expansion.

And then, in Recycling, you see that is going up. This is the investments we have in Battery Recycling, the €0.5 billion which is to come onstream in 2026, in addition to some ESG investments in Hoboken.

2030, further growth, without any doubt, because of the growth opportunity. However, not in every segment. In E&ST, that's the growth we expect to be able to capture – continue to capture in Rechargeable Battery Materials. Again, for Catalysis, we see that going down. And for Recycling, it will really depend on the ambition we put in after 2026 in Battery Recycling.

### **Capital Allocation Shift to Accelerate: Group Returns above Cost of Capital with Some Temporary Dilution in E&ST**

Capital allocation shift to accelerate. So we need to talk about returns.

Let's talk with – or start with Catalysis. This is the historic view on the top of the return on capital employed of the Catalysis business. You see it's been consistently, with the exception of 2020, creating a lot of value. We expect that absolutely to continue. So in 2026, the ambition is to be approximately at 20%, and to further grow that in the second half of the decade because of a decrease in the capital employed base.

E&ST. We expect E&ST, again, because of the concentration of investments between now and 2026, based on the caveat that the returns in the agreements are there, to be at something like 8% return on capital employed in 2026, with the payback coming in the years thereafter, in the second half of the decade. So that the ambition is, by 2030, that we are above the 12.5%.

Recycling continues to be well above cost of capital, 2026, 30%. Again, the normalisation of metal prices is in there. And 2030, something like 20%, well above our cost of capital so well into value creative territory, despite the price assumption. Which means that for the Group – across the plan, the Group is expected to be in value creative territory, to have return on capital employed above our cost of capital – well above our cost of capital – and to go to 15% by 2030.

## **Operational Cash Flow Profile**

*Substantial free cash flows in Catalysis and Recycling reinvested into E&ST*

Cash flows. In the period 2020 to 2026, the plan we see is a total EBITDA generation of something like €6 billion to €7 billion. We draw your attention to the quite balanced distribution here between the three segments. That will change in the second half of the decade, clearly, with E&ST becoming much more important.

If we put next to that the investments we foresee in the plan in CAPEX, in working capital, also taking into account, again, the metal prices, what has happened in Catalysis, we expect to have roughly the same amount of investments, if I can put it, in that first part of the decade, which means that we have a very strong free cash flow generation in Catalysis and in Recycling, irrespective of the investments, for example, in Battery Recycling. And we intend to fully utilise that to fund our growth projects and mainly to fund the growth in Rechargeable Battery Materials – again, conditional upon the returns, obviously.

## **Funding Levers**

Then, with these numbers, funding is very important. We start with a strong balance sheet. We've been around for a very long time so we understand the importance of a strong balance sheet, the volatility that we have in our markets.

The first thing to mention that in this plan, our funding policy remains unchanged, in the sense that we want to maintain investment grade status across the plan. We believe that we have a much more diversified funding opportunity and funding levers to pull than maybe in the past.

*Strong free operational cash flow generation*

First of all, on the free cash flow perspective, I just showed you that the generation of free cash flow from our different businesses, and especially in Catalysis and Recycling, is much more significant than in the past. So that will contribute.

*ESG-focussed debt funding appetite*

Secondly, there's clearly a lot of appetite to fund sustainable ESG projects, running into transition of the energy market, electrification. We feel if there's any company that ticks a lot of those boxes with our projects that we have, whether it's in Battery Recycling or in Rechargeable Battery Materials, that we want to capture that.

*Co-funding partnership model*

And then, very important, and I think really strategic, is the co-funding, the partnership model in Rechargeable Battery Materials.

*Joint venture investment sharing*

So that's – the traction we feel with customers is that they are willing to participate in the funding in return for the capacity commitment, the technology commitments. That could take the form of joint ventures, like the MOU we have with Volkswagen, or different other forms of, I would say, co-funding partnerships.

*Grants and other funding incentive mechanisms*

And then finally, we have grants and incentive mechanisms. I mean, the growth that we have had in this business requires support and does receive support from governments and

other agencies. And so, clearly, that is going to be an important source of funding as well for us.

### *Capital market funding*

And then we have, I would say, the optional one. We're a listed company. We always have the option to go for capital market funding in different forms, conditional, obviously, on the fact that it's a good proposition from a business and from a return perspective. But again, that is optional. It's really the other levers and the different levers we have that we intend to pull to the fullest extent.

With that, and before going into the Q&A, I hope, going back to the initial title of the section, we covered everything and hope that we've convinced you that we're really looking to balance the growth, the returns, the cash flows, with a focus on value creation of this company, not on the short term but on the medium and the long term. Thank you.

## **Q&A**

**Evelien Goovaerts:** Thank you, Filip. You can stay on stage.

**Filip Platteeuw:** Okay.

**Evelien Goovaerts:** And then, I will ask Frank and Mathias to also join you. We will open the floor for questions. Here, we don't need a microphone in the room, but we do need it for the people following online. So when you have a question, raise your hand, and then either me or my colleague in the back, we'll bring the microphone your way.

For the people who have raised questions online, please continue to do so. I saw there were already some questions on sessions that we will be hosting this afternoon. So I will park these questions. And I see some people laughing here in the audience. Please keep your questions on Rechargeable Battery Materials and the other businesses for this afternoon.

And then, we are ready for the first question.

**Gunther Zechman (Bernstein):** Thanks very much. If I can just start with two, please? You speak about uninterrupted value creation. Can you just outline for us, please, what that means for ROCE progression between now and your 2026 ambition, and also when it's trough ROCE in your projections?

And then, secondly, just a clarification point, Filip, on your last slide about the funding of the investments. You speak about the optionality of capital markets funding. Can you just clarify whether you're talking about debt capital markets or also potentially equity capital markets, please?

**Filip Platteeuw:** Yeah. Sure, two financial questions. So on the first question, so what we mean is that in the plan, we see our return on capital employed on the Group level being above our cost of capital, basically above the 12.5%. So what you see happening is that there is still a dilution in E&ST because of the investment so that will continue. But you see the other businesses making up for that, despite even the metal price assumption, the investments in Battery Recycling. So it means that across the plan, on a Group level, we have a return above 12.5%. And that we see increasing then in the second half of the

decade, once RBM comes onstream and will, by itself, also go to 12.5%, that on a Group level, your return in the plan goes to 15%. If that clarifies?

**Gunther Zechman:** So the cost of capital you put at 12.5%?

**Filip Platteeuw:** No. So the cost of capital, pre-tax, is somewhat below 10%. That's what we have assumed. Return on... There's something wrong with my mic, sorry. The return on capital employed in the plan is above 12.5% across the plan, on Group level, with the dilution still in E&ST; and increases to 15%, based upon the payback in the second half of the decade in Rechargeable Battery Materials. Is that clear?

**Gunther Zechman:** Yes.

**Filip Platteeuw:** Okay.

**Gunther Zechman:** And on the funding, please?

**Filip Platteeuw:** And on the funding, indeed, it's capital markets. So it means it can be, yeah, equity side. It can be debt side. So, indeed, as you know, there's quite a lot of instruments available to us. Again, this is the optional. I think we don't want to – we really want to focus on pulling all the levers – the good levers we have. But we're listed, so it is a certain optionality, but it can be different forms, indeed. It doesn't have to be an equity raise or...

**Sebastian Bray (Berenberg Bank):** Thank you. Good morning. Could I ask about the definition of EBITDA being consolidated and potentially the impact of the co-funding arrangements? Because my understanding of what happens with the VW [inaudible] 50-50 sales and EBIT joint venture. If it turns out that partners step in to fund a large amount of the €5 billion CAPEX guided, is there a chance that they actually are allocated some of the EBITDA that you've been talking about in the slides, in the sense that if they say, 'Okay, we put up €2.5 billion,' or however much it is, 'Therefore, we get 50% of the EBITDA that's shown on a fully consolidated basis.' Or am I interpreting this all wrong?

**Filip Platteeuw:** Yeah. If I get your question right, then my answer would be that because, indeed, there is certain uncertainty in terms of the accounting treatments. What we have done here for the plan, just to simplify it, is apply a look-through, if you can call it. If there would be 50-50 or whatever, it will be proportional. So we presented things in a proportional way because I think that's the economic reality behind that.

And then, what the actual accounting metrics will be, that is too early to tell. That will depend on the ongoing negotiations and maybe future partnerships. Again, partnership does not only mean joint ventures. It can be other forms as well. But so, in the numbers, we've applied a look-through from that perspective.

**Sebastian Bray:** So it's not 100% of the EBITDA that you expect to come on that?

**Filip Platteeuw:** No, no, no, it's just a proportion. At the Umicore, I would say, part is included, yeah.

**Sebastian Bray:** But is the €5 billion the Umicore part of the CAPEX or...?

**Filip Platteeuw:** Exactly, that is the same approach. That is what we need to fund as Umicore.

**Sebastian Bray:** So just to clarify, the total CAPEX and the EBITDA that would be associated with the totality of the projects in which Umicore is involved would be higher than what is shown on the slides, as a result?

**Filip Platteeuw:** That would be higher.

**Sebastian Bray:** And sorry, then two quick follow-up questions. The free cash flow target for Autocatalysis, is that pre-tax, pre-interest, pre-adjustments?

**Filip Platteeuw:** Yes.

**Sebastian Gray:** And secondly, the gigawatt hours that Mathias showed in his earlier presentation, is that capacity or production, on a historical basis?

**Mathias Miedreich:** This is capacity.

**Sebastian Gray:** It's capacity?

**Mathias Miedreich:** This is capacity.

**Sebastian Gray:** Thank you.

**Mathias Miedreich:** And we have – Ralph will give a more in-depth view on that capacity ramp-up as well.

**Riya Kotecha (Bank of America Merrill Lynch):** Hi. I have two initial questions, please. So first, I'd like to understand the decision and your rationale for ramping up investments four times versus your historical cutbacks in the RBM space. Was it from a perspective of increasing competition, where you have Asian players coming into the European market and your need to defend market share? Or is it from the demand side where you're getting OEMs really coming to you and asking for volumes or offtakes?

And then, related to that, you mentioned that strong contracts underpin through your value creation and growth prospects. But in 2018, when you raised capital to fund the first expansion, you guided that there would be contracts too. However, in December 2021, we saw that that wasn't the case. And actually, the contracts and orders were cancelled. So is not a massive blow-up, increase in CAPEX somewhat more of a risky approach? Or how are you able to secure those volumes?

**Mathias Miedreich:** Right.

**Riya Kotecha:** Thanks.

**Mathias Miedreich:** Yeah, very good question, indeed. So the – what we have done here in the plan forward, in terms of capacities, and then underlying CAPEX for the E&ST is a bottom-up approach. So it's exactly what the customers – and mainly the OEM customers, but also the cell customers – tell us what is their need in the different regions. So we have not been doing that from a top-down view, in terms of we had a certain market share assumption in mind and that's why we need to do it. It's a bottom-up approach.

And that's very much linked to your second question as well; what is different to previous announcement of that kind? The contracts we're talking about have much more skin in the game, if you want, with the counterpart. So when we – in the extreme case, if we talk about the joint venture where, in theory, you have a, let's talk about a 50-50 joint venture with a customer, the customer has as much skin in the game as Umicore. And this is a much



stronger, first of all, bond, but secondly, also a securitisation of, if you want, market share or offtake.

**Riya Kotecha:** Okay, thanks very much. I just have one quick follow-up. So I understand from the volume perspective that perhaps you're able to secure that, but how are you thinking about it from the pricing perspective?

**Mathias Miedreich:** Right.

**Riya Kotecha:** Is that something you're able to lock in? And how do you see the trajectory of that going across a decade then?

**Mathias Miedreich:** Yeah, that's also a very good question. Because we had – not so much now, but maybe six months ago, there was a debate if, is – and Ralph will address it in detail – is the cathode active material market, is it a commodity market with low returns and a low prices and a price pressure that the OEMs traditionally apply to the Tier-1 suppliers?

Now, what I've tried to explain in the beginning is that there are several new points to this equation. The pain points that the OEMs need to solve: availability of materials, the ESG constraint, circularity, all I mentioned. And what we currently see is that companies that can solve these points, they can achieve a premium also on pricing. And this is not an assumption, it's the reality we see. And I'm personally involved in some of the discussions, of course, because of the magnitude of that kind of agreements.

And so, I would say we are quite confident that agreements we are doing, and that's what Filip said many times, those significant CAPEX are conditional to those agreements. And with that, if you question about risk, I think we have a quite good feeling that we can secure the risk with these agreements in a good way.

And now, we have to prioritise this section because we have been so much over there already.

**Jean-Baptiste Rolland (Crédit Suisse):** Hi. Thank you for taking my question. I wanted to ask you what has changed, versus 2018, for you to decide, as it sounds, use equity as the last resort towards your primary funding strategy, versus in 2018, it was to resort to capital raise? That's my first question.

And the second one is in relation to the CAPEX that you're talking about, if you're going to share the CAPEX, I'm wondering how will your returns be split. Because logically, if you take less risk, your returns may be compressed. Otherwise, it's not clear to me what would be the interest of your customers to have a skin in the game in the JV. I appreciate if you could elaborate on that.

**Mathias Miedreich:** I will take the second question if you take the first one because I wasn't here in 2018.

**Filip Platteeuw:** No, indeed. I think what changed is that the – everything that was on the left-hand side of the slide is substantially different than what we had in 2018. If you look at the free cash flow generation, I mean, we explained that the businesses are changing now. Catalysis, then, was still very much in investment phase. Now, it's really transitioning to a free cash flow model. And in Recycling, we have a – clearly more free cash flows there as well. But then, it's really, I would say, the – yeah, and you have the market, in terms of the

support for electrification clearly there, and the appetite from an ESG perspective. Those are also things that were not yet there in 2018.

But probably the most significant one is the one in the middle, that this partnership model. And we did not have that in 2018. You referred to it, we had contracts. What we're talking about now is something quite fundamentally different, the skin in the game, the, really, joint interest, and Mathias can tell you that. So I think it's the mix of funding instruments is quite different than what we had in 2018.

**Mathias Miedreich:** Yeah. And coming to the second point, isn't that a dilutive factor for us if we have less burden on the financing because the customer is co-financing, they want something back from it?

I think it's even – it's true. They want something back. But it's not so much that they want something back which is financially, they want security of supply. They want to have access to our circularity business model. They want to have access to our sustainability roadmap that we can offer to them.

And that's the premium that we can unlock. And it's really counterbalancing the – your perception that we had maybe – the market had a couple of months ago, that this is purely a commodity play, where the more you produce on a low scale, this will be a winning trajectory. No, it will not be. It will be to secure the customers.

You can believe me, in the discussions we have with all of our automotive customers, this topic of how to secure the supply chain is dealt with at CEO level or at a Management Board level of the big OEMs. It's such an important. So to secure that, they're willing to go in these kind of partnerships without a dilution of premiums on our side because we can bring a lot of the solutions to their problems.

And even at the start, when I had my slide at the beginning, I said we have to embrace more this ecosystem approach as Umicore, as a point, we need to work on. Because traditionally, Umicore was not willing or open to this kind of partnerships, right? It was not necessary at a certain point in time, and it was more protective mechanism. But now, as we have shown the willingness to open up, which was not the case in the past, this is really appreciated by our customers.

**Nicola Tang (BNP Paribas Exane):** Thank you. I wanted to clarify on the CAPEX, specifically talking about North America and RBM. What is factored into that number, you know? Is it this co-funding agreement? And I was just wondering that if actually, a co-funding agreement doesn't materialise, is there a risk that the CAPEX could be higher, for North America specifically?

And the second question is thinking about OPEX more than CAPEX. As you talk about that scale-up, how have you thought about the need for more OPEX potentially in those growth businesses against the reduction in fixed – or in costs in the Catalysis side?

**Mathias Miedreich:** Yeah, that's a very good point. So the North America expansion is today factored in as an Umicore standalone activity. We, of course, have included other elements of the chart. The – how you call it, your last column? – the funding – public funding opportunities that are available. But it's an Umicore finance, so it's included in that envelope.

If we would find co-funding opportunities, which we are not excluding at this point in time, it would be an upside to the number.

Now, the question of OPEX. You see that in our RISE strategy, the last one is E: excellence in execution. And this is exactly addressing two things. It's to keep the promise to our customer that we can deliver the promise we give to them, in terms of yes, we will put the capacities in place, but also it takes care of the operational excellence and the OPEX side of things.

You will see later in the presentation of Ralph – and in all of the presentations, but it's especially in Ralph, we will look at this – is how can we – by not only – every time we build a new plant for cathode material, to invent it new, but to build a standardised manufacturing system with standardised footprints – not footprints, layouts in the plants, standardised operating models.

And then, we take the lessons learned and the improvements we have done in other factories from the beginning to have a lower starting point in OPEX for the new activities. And in Automotive Catalyst, of course, this has been a long tradition, being exposed to the automotive OEMs. That reflects to, every year, go down with your operation costs.

Now, on the last topic on Recycling. Precious Metal Recycling is under, if you want, pressure in a certain way, by normalising PGM prices. So also, there, we're not starting now. It's already a journey that has happened. We started two years ago to work on further improvements of the logistic flows in our Hoboken plant, for example, to reduce the cost that we have in internal handling, etc. All that we can do to influence also the OPEX cost.

And, again, here with Battery Recycling, we already start on the lessons learned that we've taken away. So we made the math on the cost development. And we see that we have quite a good plan to reduce also OPEX over time and not have the OPEX – leave it out of the equation because we believe growth will be so much, we don't have to care about it. No, it's from the beginning, very tightly managed.

**Farzad Kassam (Millennium Capital):** Hi. Just a couple of questions. One is on your margin headwind. So in terms of percentage, could you just tell us how much could be allocated to normalising PGM prices until 2026? And how much could you allocate to underutilisation costs because of the ramp-up of the CAPEX?

**Mathias Miedreich:** Difficult to really quantify. But I would say, starting last year, in 2021, we quantify the exceptional, I would say, tailwind from record precious metal prices at €270 million on the Group level. And that you see in the shaded bubbles in 2020, that's basically the difference that is shown. So that gives you an idea of the orders of magnitude if you bring that down.

So I would say in Recycling, the dilution you see is basically that, with the exception of return on capital employed because there we have the capital employed from Battery Recycling. But if you take 2026 and Recycling, that is metal prices, and that continues then into 2030. For Catalysis, that is also partly at play, but I would say less important.

The other side of the equation, which are the start-up costs, the investments, etc., that is really concentrated in E&ST. I would say if you talk about dilution, that's in E&ST. There is some, obviously also, in Battery Recycling – in Recycling. But in the overall scheme of things,

that is the dilution effect in E&ST. The metal prices are mostly in Recycling and somewhat in Catalysis, but to really pull it apart is not as straightforward.

**Farzad Kassam:** And on the contracts for E&ST, you mentioned it's going to be multiple years. I guess the suggestion is not going to be one-year contracts. Could you just give us an idea on when you need to secure these contracts before which you start hitting the ground, in terms of CAPEX, etc., and so on?

**Mathias Miedreich:** Right.

**Farzad Kassam:** Could you just give us some colour?

**Mathias Miedreich:** So this is an extremely good question because you've seen that we have put the phase that we're currently in now, 2021, 2022, 2023, as the key phase of change in the market where we can utilise our value proposition. And I think this is exactly the time. It's this year and next year where we will secure these contracts to be ready, to be ramped up with the ambitious plans that we have, going forward. And I'm confident that we can, over the course of this year already and then beginning of next year, share more about that step-by-step, as we go down the road.

Now, if you want to quantify it in a time horizon, then you could say the pure length of a project, you can say it's two and a half years; two and a half years from we decide to do it and it's operational.

Now, as we have said, we have a staged approach. So that does not mean at the moment we decided to do an investment or to do a capacity expansion, that we need to put the investment. There is a significant amount of engineering that you do before. And that takes a very good time, during which, you can still – you could still say, 'No, I stop,' and you have not spent a lot of money.

And then, the real CAPEX investment is coming much more closer to the step-up. And one part, of course, of our, if you want, risk management model for the whole equation is also to have very frequent gateways to check on the assumptions that we did when we have launched those projects, if they are still in place or if they need to be adjusted. Because as we said, we have one threshold that we will not pass, which is value creation for the investments.

**Farzad Kassam:** So one last question, which is, in terms of return on investment, what sort of pricing are you assuming, going forward? Because up till now, we've – I mean, we've seen one major exit from the industry who were late to the game. But in the past, we've seen a lot of value being eroded because of pricing. What's changed now that you're confident that you can put in €5 billion of CAPEX and gain that?

**Mathias Miedreich:** Right, right. Absolutely. And that's a repetitive question that we have also asked ourselves a lot when developing the strategy. And the answer to it is that, of course, there is an element of the price will go down if the market demand is increasing because you have more production, more players in the market, etc. That's a general – that's a law for the industry.

But in this specific case, this industry works – as we see now in the last six months or so or the 12 months – works a little bit different because it's not only to be able to buy something on the spot market, it's to secure supply, sustainable supply, that has a circularity – meets

the circularity requirement. And there are not so many options the market can go in this full attempt.

What we have tried to say in the beginning and we will, through the course of the day, give you more examples of what are the reasons on the different pain points of our customers, why we can achieve a premium versus just the underlying raw market dynamics. And for us, a proof of concept of that is those agreements we do with customers that go beyond a pure one-year short-term spot, I think this – we will not see this at all into the future. It will be always long term. It will be secured. It will be skin in the game. And it will be based on a value proposition that is more than just the production of bulk material.

**Geoff Haire (UBS):** Hi. I've got a couple of questions. I was just wondering, in terms of the offer of circularity within Battery Materials, there's obviously a few other companies that are starting to do that, who probably have deeper financial pockets than Umicore does and may not need partnership. So why would OEMs want to be spending their own money, whenever they don't, with other players who offer the same offer?

Filip, I was wondering if you could give us some idea of where you think maximum leverage for the Group would be, where you feel comfortable with that on the investment grid.

And then just on the VW joint venture, can you confirm whether that's signed up and completed? If not, will you come back to give us financial details once it is? Thank you.

**Mathias Miedreich:** So I will take the first and the last question and the middle is – maybe I answer both of them first. So Battery Recycling, I don't want to steal the thunder of Kurt later but what we have today is technology that is, as we think, superior in the market, in terms of ability to pay – so it means the cost side of things – but as well, in terms of an ESG perspective, the CO<sub>2</sub> footprint of the activities. And that's already one of the reasons why – but not only OEMs, OEMs and cell makers are interested to be part of our ecosystem.

The second part of it is because we have decades of experience in that field – in recycling, in itself, and in lithium-ion battery recycling since ten years. So we think we know what we talk about and our customers see that as well.

And the last thing is that for us, you cannot – or, let's say, the winning model cannot be to separate cathode active material manufacturing and battery recycling. Why? Because the requirement of the output of battery recycling needs to be battery-grade material. And you need to understand what is battery-grade material and you have to have the ability to close the loop. On the other hand, the input streams that you will have for battery recycling will be so diverse, so you will have different stuff that you have to recycle – and Kurt will focus on that – so that your technology has to be able to convert a very broad stream of input in something that is very, very narrow, which is battery-grade material. And I think this could be combination between our know-how in CAM production and the long recycling activities is very attractive for our customers.

But Kurt, again, will go in much more detail on that. We have a deep – we have also – we will show you a benchmark of technologies that we have done – a study on the market that probably will speak for itself.

Here's a question, maybe just on the average question, Geoff.

**Filip Platteeuw:** I wouldn't want to put a straight number on it, but investment grade, typically it's, I would say, 2.5, 3 times. I think the interpretation of that will depend also on the underlying business, on the contracts, on the risk appreciation of what is in that funding. So that's, I think, what is investment grade.

**Mathias Miedreich:** Right. Coming back to Volkswagen topic, today, we have not closed that activity yet. I can tell you that we are well on track versus what we have communicated earlier, the timelines we had in place. It was just a matter of when we have positioned this Capital Market Day versus our timeline that we have agreed. So it's a little bit early. It would have been great if we would be able to share more. I can only give you so much confidence that we are – on the milestones that we have set ourselves with our partner, we are on track. And as soon as it is signed and announced, we will give you more details.

Now, of course, more details than today, what is that level of details will also depend on the agreement we have with our partner in this regards, but it will be more than today.

**Stijn Demeester (ING):** Yes. Good morning. Two questions. First one is maybe a clarification on capital employed. Does the old rules still apply that €1 of CAPEX equals €1 of working capital investment? And is that included in your definition of capital employed?

And then the second question is on CAPEX intensity. Can you talk about how you see that CAPEX per gigawatt hour for North America versus past expansions in Asia and in Europe? Has that fundamentally changed over time?

**Mathias Miedreich:** I will take it. I will take the second one. And if you can go for the first.

**Filip Platteeuw:** Yeah. On the first one, our capital employed includes working capital, that's, I would say, indeed an obvious one. That rule does not apply as a rule anymore. That's the thing with – once you give that guidance, it's valid for a certain point in time, and that was for RBM, right? This was only for RBM. Recycling, we have a model which is very light in working capital. And we think, for example, battery materials – battery recycling should be something similar in terms of business model.

But it does not, as such, apply as a rule because when we talk about partnerships, it covers the supply chain. So it's not just limited to the investments in the CAPEX. It can be also on raw material sourcing, on – so no, that rule does no longer apply. In any case, also, it's dependent on the underlying metal prices. So that's the thing with once you give a rule, there's so many factors into that. But no, I would not apply that rule anymore.

What you've seen in the numbers is when you take CAPEX and working capital together for the Group, you're at €6 billion to €7 billion. So that gives you an indication, let's say, of the relative proportion of CAPEX versus working capital. Also, don't forget that working capital in Catalysis and Recycling is subject to metal prices. And the model that we have in Catalysis going forward is a free cash flow model so clearly, also, there will be a release of working capital just from that factor. So there's quite a number of moving parts into that guidance.

**Mathias Miedreich:** To answer to your second question, then we will have these two gentlemen because they were already raising their hand for a long time. I think we don't have a lot of time for more questions. Yes, the CAPEX density in North America will be lower than previously. But it's nothing to do with North America. It's the progression of our

developments. And Ralph will explain that also with our standardised model of cathode manufacturing plants that we will then not reinvent in North America, but we will already use – we have several steps of investments planned. We will already use an advanced step of that implemented as a baseline in North America, which will – compared to an average in the Group, will be lower than that. But we have more details in the presentation.

So let's have the two last questions over there.

**Charles Bentley (Jefferies):** Thanks. So if I take the 2030 targets, assume €6 billion of incremental revenue, 20% EBITDA margins, and then assume the incremental investment, I get to EBIT lower or perhaps equal to 2021. Would you agree with that?

And then, secondly, just a couple on cathode materials. So how many players do you think this market can hold? So, if I take something like a three terawatt hour market by 2030, assume a third of that's LFP, it gets you to something like a 20% market share. Do you think that's realistic?

And then also just a point of clarification on the conversion that you're using for gigawatt hours to kilotons for these periods, that would be really helpful.

And then kind of finally, sorry, on CAPEX. The slide says greater than €5 billion. Is that – it says €5 billion in the floor and it could be higher. Could it be materially higher? Just any views on that? Thank you.

**Mathias Miedreich:** Do you want to start?

**Filip Platteeuw:** Yeah, I can start. And sorry, because I now forgot your first question.

**Mathias Miedreich:** First question was EBITDA question.

**Filip Platteeuw:** Yeah, yeah, EBITDA question. Sorry for that. So, look, it's given me... depreciation 2026, around €0.5 billion. I think that's what I would give today as a guidance. Again, it's a plan, which means that we said €1.5 billion of EBITDA, €0.5 billion of D&A. So you get to something which is similar, slightly above what we had in 2021, that would be in the plan. And then in 2030, definitely higher. So higher EBIT. So no, there is EBIT growth in the plan, I will say, obviously, for 2030.

**Mathias Miedreich:** So coming back to your market question of how many players can this market digest. And I have to admire the model that you have calculated our market share, because it's pretty well aligned with what we see ourselves. And we think this is a realistic value. So you could project yourself into a much higher market share from the market growth and the potential that you have.

But as we said, it is a selective strategy forward. We have selected several regions, first of all, and then several value propositions that we have our market segments – so LFP, for example, not others – where we say there is a very big chance for us to win, to win at attractive margins. And if you add all this up, bottom up, you come to something close to 20%. And we think that the overall market is absolutely able to digest it. There will be different segments and Ralph will come to that as well.

Remind me of your last question.

**Charles Bentley:** It was just on CAPEX [inaudible].

**Filip Platteeuw:** Yeah. It means what it says but I mean, it's somewhat above €5 billion, so we're not – otherwise we would have used a different metric on the slides.

**Charles Bentley:** Sorry, [inaudible].

**Mathias Miedreich:** I want to put this to Ralph's presentation to answer in his Q&A, because it's not so straightforward. There's not one value, is my point. There are several values. I promise that it's the last question.

**Ranulf Orr (Citi):** Thank you. I'll just keep it to one. So could you just help understand what proportion, going forward, of the 2026 and the 2030 capacity volumes are actually covered by contracts that you consider skin in the game and clarify what that actually means with your customers? Is that co-investment? How much will be take-or-pay contracts and the like? Thank you.

**Mathias Miedreich:** Yeah, that's a good question. And I would like to answer it in the following way. If you just look to our ambition that we have for 2030 of, we say more than 400 gigawatt hours of capacity and if you look to – you mirror to that, the ambitions that we have communicated with the partners that we have already been announcing to be partnering, you are already around 50% of the 2030 value. So that's, as we think, a quite strong value.

The other portion that I want to say, we have said earlier this year that the year 2022 is the year where we are progressing very successfully on advanced qualifications. And at the time, we said high nickel – it was more focused on the high-nickel questions but advanced qualifications with several customers. And after we have said that, the first one that we have announced was ACC. And I can tell you there's several more in the queue and they will then, as we said, continue after or starting in 2024, to ramp up towards 2026, and then we have this 50% that you can take into account, as ambitions from our partners, in 2030.

**Evelien Goovaerts:** Thank you. I'm afraid we will have to wrap up this Q&A session. For the people who ask questions online, we will come back to you at a later time. And please continue to raise your questions. We have a bit more than a 15-minute break before we continue with the rest of the presentations. Thank you.

**Mathias Miedreich:** Thank you.

[BREAK]

## **We Go for Zero**

Géraldine Nolens

*Chief Legal Counsel, Executive Vice President, Umicore*

### **Let's Go for Zero**

*The ambitions behind being a Sustainability Champion*

Yeah. Okay. Good morning, everybody. I hope you enjoyed your break and that you're ready for the second part of our presentations. So, also good morning to everybody online.

One year ago, we presented to you our Let's Go for Zero ambitions. And I'm really excited to be here today and talk to you about what we're doing and what we will be doing in the years



to come. And I hope that by the end of my presentation, you will be as convinced as me that ESG is really an important factor in the commercial success of Umicore.

Now, let me maybe start by reassuring you, the ESG presentation is the only one – and I'm clicking – is the only one where we will be striving for zero. I'm not a bomb, so it's just a click, click of this thing. We're the only ones striving for zero. In all the other presentations, my colleagues will be striving for a whole different set of numbers. So no concerns there.

So let's talk ESG. Now Matthias and Frank have already introduced to you the RISE pillars. And the cool thing about RISE is that it spells out literally how we are going to realise our strategy. And the 'how' is as important as the strategy is itself. And I should stop apparently for a second.

Okay. So, as I said, the RISE is the way how we're going to realise our strategy. And that is as important as the strategy itself. And the S in RISE stands for Sustainability Champion. And being a sustainability champion encompasses our Let's Go for Zero strategy. So that really means that Let's Go for Zero is embedded in Umicore 2030 RISE strategy.

Now, sustainability really is at the core of Umicore's DNA. It's what we've been doing for many, many years. It's in our products. It's in our services. And more importantly, it is in how we do things, how we run our operations. And I have to admit that maybe in the past, we have not always been immediately seeing returns for the efforts we've been doing on ESG. But things have changed in the past years.

ESG has come much more to the forefront of things, it's become much more broad. And as a result, our customers are looking for a true ESG partner. They're looking for suppliers that can help them realise their ESG ambitions. And so when we discuss with customers, they don't only talk to us anymore about financial terms or about volumes, or even technology. They also ask us about our carbon footprint. And they ask us about whether we're sourcing our raw materials in a responsible way. So these are topics that are very important to them.

And they even say, 'We're approaching you exactly because you can differentiate yourself from many of the other players on the market from an ESG perspective.' So I think that makes it very clear that ESG is an important factor in the success of Umicore.

Now, if we talk about our Let's Go for Zero strategy and ambitions, there is three pillars that we are really focusing on. The first pillar is our zero inequality pillar. The second one is zero harm. And the third one is zero greenhouse gas emissions. Now, I would like to focus today with you on the third pillar, zero greenhouse gas emissions. Now if you have any questions on either of the other two pillars, please feel free to ask me and, of course, I'd be happy to answer your questions.

### **Net Zero GHG Key Element in Umicore's Climate Action Plan**

So zero greenhouse gas emissions is really a key element of how Umicore acts for climate. And when we talk about climate and climate action, there is two broad considerations that need to be made. The first question is, how does climate impact Umicore? And there we will be thinking about physical climate-related risk and transition-related risk.

And then the second question is, how does Umicore impact climate? And here, I'll be talking about eliminating our Scope 1 and 2 emissions and reducing our Scope 3 emissions. Now, let me just quickly jog your memory. Scope 1, those emissions that are generated through our

processes. Scope 2, the emissions generated mostly through electricity. And Scope 3, those that are generated in the value chain, both upstream and downstream.

### **Managing Climate's Impact on Umicore**

So if we start with how does climate impact Umicore, it's very important if we want to manage the risks, that we understand what they are. And if we look at Umicore, there's a number of things that we take into consideration. First of all – safety. Okay. We have a very broad geographical footprint and we are present on many of the continents. Secondly, we have a very broad supplier base. And thirdly, many of our plants are very, very close to our customers.

So taking all these elements into account, we realise that our physical risk is actually very limited. And I know that when we're talking physical risk, the main concern out there is the availability of water. So let me quickly touch upon that, is that we have a defined water stewardship programme, where we have run the scenarios, we've assessed the risk, and we have identified two plants, which are located in a water stressed area and have a relevant consumption. And that's our plant in Hoboken, our precious metals refining plants, and our plant in Olen. And we have local action plans for each of these plants.

### **Uniquely Positioned to Maximize Opportunities in the Transition to a Low-Carbon Economy**

But let's focus more on the transition risk. And I should really start by saying that this is the wrong word. Transition risk is not really what we should be talking about. I know that many companies in many industries have a transition risk as a result of global warming. But Umicore, it would be much more accurate to talk about transition opportunities.

Now, if we look at the composition of our portfolio, it's really very, very well chosen. We have Recycling, we have Catalysis, we have Rechargeable Battery Materials, we have Fuel Cells, and all of these activities are ideally positioned to tackle the challenges that society is facing today. And the fact that we have been in sustainability for so many years, has allowed us to build a reputation in sustainability. And it has also allowed us to get a head start and have a competitive advantage compared to other players.

Now, it's exam week in Belgium this week, and one of my daughters was studying biology over the weekend, and she was talking about symbiosis. And it came to me that actually there is some kind of a symbiosis between climate change and Umicore. As long as climate change is a concern, there is a place for Umicore to contribute to reduce climate change, and this in a mutually beneficial way and irrespective of the speed of the transition to low carbon. So that's very important.

And so when we talk about being a sustainability champion, we're not only talking about being a sustainability champion in driving the transition to a lower carbon society through our products and our services; and we're not only being a champion in driving the acceleration of the decarbonisation of the value chain through how we do business; but we're also a champion at seizing the opportunities that the transition is offering. And we're also a champion at offering sustainable low carbon products and solutions to our customers, which they need in turn to realise their ESG ambitions.

## **Minimizing Umicore's Impact on Climate**

### *Net Zero Scope 1&2 GHG emissions by 2035*

So maybe now let's turn to how Umicore impacts climate. And last year when we launched our Let's Go for Zero, we talked to you about our Scope 1 and 2 ambitions. They're very, very ambitious goals. We said we want to be carbon neutral by 2035. And that's a lot earlier than many other companies out there. We take the responsibility now. And we want – with respect to our 2030 strategy, we want to reduce our Scope 1 and 2 emissions by 50% by 2030, and this compared to our 2019 baseline.

Now, if we look at that baseline, we see that there is about 800,000 tonnes of Scope 1 and 2, and it's about equally divided between 1 and 2, a little bit more in 2 than in 1. And Scope 1 is mostly generated by – for about 85%, by our plants in Hoboken and in Olen. And our Scope 2 is mostly generated by the use of electricity. And that's mostly the case for our rechargeable battery activities on a worldwide basis.

## **Leveraging Operational Excellence & Innovation**

### *To reach our decarbonisation goals*

Now, if we want to reach these very ambitious goals, we're banking mainly on two things: our extreme strength and experience in R&D and innovation, that's the I in RISE, and our operational excellence, the E of RISE. And we have defined a hierarchy of levers that we're going to be using to reach these ambitions. And there's a hierarchy of three.

First of all, we want to avoid the emissions. Now, if we can't avoid the emissions, then we need to replace the sources of the emissions. And only if we can't replace the sources, and we can't avoid, if we can't design it out of our processes, then we will capture the emissions. So let's maybe start with the avoiding.

## **Defining the Pathway to Net Zero**

### *Avoid emissions*

Now when we talk about avoiding emissions, the first thing that comes to mind is improving the efficiency of our electricity and heat. And there, it's about doing things better. It's an evolution. And our cogeneration plant in Olen, for instance, is a very, very good example of this.

The second element, which is particularly important for us, considering the growth that is ahead of us that you've seen in the presentations of Mathias and Filip earlier today, it is that that growth is carbon neutral. And that's a very important one. And you may recall the announcement we did not so long ago about our plant in Nysa, our cathode manufacturing plant in Nysa, Poland, which is going to be entirely carbon neutral when it starts up in a few weeks from now, both Scope 1 and Scope 2. So very, very important.

### *Replace emission sources*

The next one is if we can't avoid the emissions, then we have to replace the sources. And here, our R&D department is working very hard on replacing the sources, like fossil fuel into biofuels and electric furnaces. And this is actually more of – it's not only doing things better, but it's also about doing things differently. So it's more of a revolution than an evolution, and it takes a little bit more time. And we expect our R&D projects to come to fruition by the second half of the decade.

The second point here is making sure that we generate renewable energy on site. And here we already have plenty of projects out there. We have solar parks, windmills in Shirwal in India, in Americana in Brazil, in Olen in Belgium, in Kobe in Japan. So all over the world, we're producing renewable energy on site already.

But the third one is probably the most important one after the innovation. It is the long-term green PPAs. And again, if we look at our growth, this is super critical. We expect that our needs in electricity will quadruple by 2030. And so it's very important that we can source that electricity through green electricity. And this will be the first one that comes up in the timeline. So it's important also for our 2025 ambition of reducing by 20% at that time. And we've already signed many green PPAs in Belgium, in Poland, and you probably already know of those, but also in Finland. And that's a new one that we haven't announced yet.

And our ambition is, and we aim to be sourced 100% renewable in Europe by 2025 already. And that's pretty big deal because if you think about it, our cathode manufacturing in Europe is going to be entirely carbon neutral from a Scope 1 and 2 point of view. And if you add to that the green PPA of our plant in Finland, where we make precursor material, then you come to the fact that we will be able to offer the lowest carbon footprint material in Europe already in 2025. And I think that the customers will really appreciate that. And Ralph will go into much more details later today in this presentation as well.

#### *Capture remaining emissions*

So we've done the avoiding. We've done the replacing. And if we really can't design it out of our processes, then the third thing that we can do is capture greenhouse gas emissions. Now, we already have experience with this. And this drew our nitrous oxide capture plant in Hoboken. Now what do we do there? We capture the nitrous oxides from our processes, and we transform them in nitric acids. Now, it's very important that you know that nitrous oxide is a very potent greenhouse gas. It is actually 300 times more harmful for global warming than carbon dioxide. So very important that we're able to capture that.

And then, typically, for our closed loop model internally, we use that nitrous – that nitric acid, and we use it in our precious metals refinery. And even if we would have too much of that, it can always be sold on the market. And through the process, we can save 40,000 tonnes of carbon equivalents. And we can valorise an otherwise wasted resource. So a very nice project indeed. And to our knowledge, we're the only one that can do that on an industrial scale.

Now, the capture of CO<sub>2</sub> is something that is still at the drawing table of our R&D department. They're working with organisations and institutions. And again, we expect results by the second half of the decade.

### **Managing Carbon in the Value Chain**

#### *Overview of the Umicore Scope 3 footprint*

Now, maybe I've talked about Scope 1 and Scope 2. And now, very importantly, Scope 3, and you've probably been waiting for that as well. Scope 3 is actually 10 times the amount of our Scope 1 and 2 combined, so it's 8.3 million tonnes. And again, if you look at the growth that Mathias and Filip presented, if we do nothing about this Scope 3, it will more than double by 2030. So very important.

Now if we look at the Scope 3, you see the biggest part is upstream, 7.3 million, and a little bit downstream, 1 million. So we're going to focus on the upstream. And what's the biggest part in the upstream is the purchase of goods and services, is more than 90% of that. So the purchase of goods and services is what we will be focusing on.

### **Prioritising Supply Streams to Deliver Low-Carbon Battery & Catalyst Materials**

Now, if you look at our 2019 baseline, about 34% of that Scope 3 came from our rechargeable battery materials business and about 27% came from PGMs. Now with the growth, again, that will change. More than half will originate from our battery materials activities. So the nickel, cobalt, manganese and lithium will play an important role.

Now that is why, of course, if we want to be a front runner in decarbonising the value chain, this is where we need to focus on. And so we have just recently submitted, a couple of weeks ago, our targets to SBTi. And now what have we submitted?

### **Leveraging Our Raw Materials Approach to Drive Decarbonisation in the Value Chain**

Now you see on this graph, our starting position. You see if we don't do anything, you'll end up with double as much. And we have submitted a target of minus 42% carbon intensity. Now, as Mathias already said, this means that we would reduce by 8.3 million tonnes at least. And we would end up exactly at the same level as 2019, and this, despite the tremendous growth that we're going to go through. And this means, in practice, that we would be able to reduce by 75%, the carbon emissions compared to today's estimated market average. And that's really a lot.

#### *Increase internal reuse of recycled metals*

So that you wonder, probably, how are we going to do this? Now we've identified a number of levers to realise this 42% reduction. The first lever is really making use of our unique and strong closed loop model that we have internally. And we will use more of the recycled metals that we have in our activities. And Denis and Kurt will talk about this a little bit more this afternoon when they talk about this – this afternoon and later this morning – when they talk about precious metals recycling and battery recycling.

#### *Increase secondary materials in input mix*

Now, the second part is that we want to increase the input of secondary materials in our mix. And we already do more than 50% of our secondary – of our input mix is already secondary materials. And as you know, these have a much lower footprint than primary materials.

#### *Source from decarbonizing & low-carbon suppliers*

The third element is working together with our suppliers, of course. And here, we will also give preference to those suppliers that have a low carbon footprint or that have a clear roadmap towards a lower carbon footprint.

#### *Upstream integration of services*

And the fourth one is moving further upstream into refining.

So these are a number of the levers together with our operational excellence, to make sure that we reach this 42% reduction in carbon intensity. And again, we see that sourcing really is a key differentiator. And we've always been a front runner in sustainable sourcing. And of course, due to our history, we have quite some experience with sourcing.

Now, again, as I said previously, Scope 1, 2 and 3 will allow us to reduce by 75%, compared to today's estimated market average with respect to battery materials.

### **Umicore Combines Technological Know-How, Performance as Sustainability Champion, Unique Position and Business Model to Deliver**

Now this brings me to my last slide. And I think it's important just to recap, one, two, and three, the essence of Umicore's RISE strategy, and we will accelerate the decarbonisation and deliver sustainable and low carbon products to our customers.

But let's not forget that already today, through our products and services, we are able to avoid 11 million tonnes of CO<sub>2</sub> equivalent, thanks to our e-mobility, thanks to our recycling services. And 11 million tonnes of CO<sub>2</sub> is about the same as 2.5 million of combustion engine vehicles standing parked in the garage for a year. And in addition to that, we're able to avoid nearly 3 million tonnes of NO<sub>x</sub> emissions in the air, thanks to our catalysis business, that Bart will be talking about later.

So that leaves me just concluding that I think it's clear from our strategy that ESG is really part of that. And you will see that each of my colleagues of the business units later today will be briefly talking about the S slide as well and highlight some sustainability elements that are specific for their business units. And that's something I'm really looking forward to.

So Umicore for me is not only the company that is supplying materials for a better life, it is also the company that is able to offer low carbon, sustainable products that customers need today. And so I would say that for Umicore, the future is green, in all senses of the word.

And I think that now I can pass the word to my colleague, Denis, who will talk to you about Advanced Materials. Thank you.

## **Advanced Materials: As a Key Enabling Technology in Various Sectors**

Denis Goffaux

*Executive Vice President, Recycling, Umicore*

Thank you, Géraldine. Good morning, everyone here in the room and also those following from home or from the office. Hope you're not too angry. I'm going to tell you more about advanced materials.

First of all, advanced material is actually what we do at Umicore. We start from metal. We use technology to transform them into materials. These materials allow our customers to bring functionalities to their own customers. But at the end of the road, we take them back and we recycle them. So that's what we do. And that's why some of our materials are on Mars and some of our materials will allow you to see in the dark.

### **Foundation of a Circular Materials Technology Company, with Synergies in Mobility Businesses**

Now – and sorry for a busy slide – let me introduce you the magnificent seven, the seven business units that are at the core of what Umicore does. So dealing with metal, more than 30 metals, serving very specific markets, but always with a very strong recycling content. Recycling is nearly always part of the value proposition of these businesses. A few examples, I won't go through the full list.

*Cobalt & Specialty Materials.*

They're producing metal chemicals and distributing them to a very diverse group of customers. And actually, they are the origin of the success story of Battery Materials, because back in the 1990s, we were producing metal chemicals that were used to make – that was the very beginning of lithium ion. And then we realised that there was a big opportunity there. And that's where – why we got into battery materials. So this is pretty nice offspring, if you want, from this business, Cobalt & Specialty Materials.

*Metal Deposition Solutions*

Now, a totally different business, but also dealing with metal, Metal Deposition Solutions. So precious metals have fantastic properties. I mean, they can – they resist against corrosion. They have fantastic mechanical properties. And that makes them used, for example, in connectors. Problem is that you cannot make a connector full of precious metal. It would be way too expensive. So what Metal Deposition Solutions does is that they put a very tiny amount of precious metal on the surface of some another metal. And this gives the functionalities without the cost.

So think about it every time you plug your cell phone for recharging in the evening or whenever you plug your car. And you will have to plug them hundreds of times, thousands of times, but the functionality needs to remain the same. So that's the value proposition that Metal Deposition Solutions provide to their customers.

*Jewellery & Industrial Metals*

Third example, Jewellery & Industrial Metals. I mean, recycling is the basis of what they offer to their customer. They sell products, the recycling service, the value proposition about the recycling of the product is always part of what they offer to their customer. One example, we make big parts out of platinum, pretty expensive stuff, that are used in refining high-purity glass, so the glass that is used in TV screens and things like that. So the value proposition we make to our customer is something that is going to last longer than what our competitors are supplying.

And when I'm talking longer, we speak about years, more than a year. At plant, refining glass, temperature of 1,500 degrees, the material needs to last for that. But long life does not mean infinite life. So at the end of the day, they also want these metals to be recycled. So that's what we propose to the customer. We are going to sell you something that has fantastic functionalities. And at the end of the day, you will recover the metal which is in it.

So these are three, I think, examples of what these business units are doing.

The icing on the cake is that many of them also play a role in mobility, because if you talk about electronics, if you talk about connectors, they're also in mobility applications.

**Electro-Optic Materials: State-Of-The-Art Applications in a Sustainable Closed-Loop Model***Germanium substrates*

Now, maybe jumping in into a specific case, Electro-Optic Materials, which is a business unit, which is actually the one making the product that are on Mars. We make germanium substrates. These germanium substrates are used to make in semiconductor application and mostly to make solar cells. Solar cells that have the highest yields, highest performance, and

are therefore mostly used in space application. Most of the satellites circling the earth are using germanium-based solar cells. And the Mars Rover is also using these solar cells. So that's why we are on Mars.

#### *Optical Fibre Cable*

Another application of Electro-Optic materials, just to show you that we can serve sometimes with a very strong leadership position, very different application, optical fibres. When you make optical fibres, you need to start from a very pure germanium tetrachloride. And that's what we make. The recycling is also part of the equation. I remember in my early years at Umicore, I was a young researcher, and we visited a customer. And the customer had a headache, because the yield of the production of the optical fibre was not so good and they were producing quite a lot of scrap. And they were concerned because this scrap was costing them money. They needed to pay someone to get rid of these scraps.

And we figured out that this scrap contained quite a lot of germanium. So we offered them a solution, where not only they could avoid the cost of disposing the scrap, but also recovering part of the germanium. And these days, this customer still buys from us, 20, 25 years later.

#### *IR optics*

The last example is infrared optics, again, a completely different application. You may remember that all these cameras that were scanning of temperature during the COVID times, most of the time use infrared optics which can be made by Umicore. In the future, this is also going to be used in pedestrian detection. More than 50% of the metal used by this business is recycled. So, I mean, it is illustrative, but it gives you an idea of what we do in this advanced material group.

### **Key Take-aways: Supporting Our Success As A Circular Materials Technology Company**

So key takeaways for this business unit, big synergy with Umicore. Why? Always about metals and the chemistry around metals. Recycling is always part of it. And very often, we also serve mobility applications.

Technology is key. Customers are buying functionalities. They are really – so we have an application knowledge. We have strong interaction with our customer, because they come to us because we provide this technology.

And very good returns. I mean, these are application where we have a strong leadership position and that translates into good returns. There are growth opportunities in this market. So when they appear and are value creating, we are going to encourage, of course, the business you need to phase them.

### **Advanced Materials: Precious Metals Refining - Leadership in Sustainable and Complex Recycling**

Now, let me dip – dive a little bit deeper in precious metals, Precious Metals Refining, which is a big contributor to Umicore results and a very important landmark into our recycling story.



**Agenda**

I will go through two topics. First, explain you a little bit what we do and why we are the world leader in complex and low carbon recycling; but also how we are going to use the RISE pillars to further improve this business.

**Key Enabler of Low Carbon Economy**

Now, first of all, what precious metal refining does is really at the heart of the closed-loop model of Umicore. You can see that there is ore over there so there is mining because mining – you need to start from mining. You need to prime the pump. The metal can only be recycled once they have been put in the system.

So there is always this mining part, which brings the first metal in the application and then needs to be smelted, refined, incorporated in the applications. And here, you can see the three examples, automotive catalyst, battery materials, fuel cells, using these metals. And at the end of life, we bring them back. So there is a true complementarity with our other divisions.

When we interact with our customers on battery materials, the recycling part is really part of the discussion from day one. That's what Mathias explained this morning. And the same is true for fuel cells. The same is true for catalysis. There, too, the icing on the cake is that recycling already today reduces the carbon – the CO<sub>2</sub> footprint of this metal by about 50%. So when people buy metals that are recycled, they save 50% of CO<sub>2</sub> compared to metal that would come from a mine.

**Unique Technology, Touching the Full Value Chain**

Now, looking into more detail in what precious metal refining actually does. So we are recovering 17 metals. We do complex metallurgy. If it is complex, it is for us. So we recover 17 metals out of more than 200 types of complex waste streams. So we are not a smelter dedicated to one or two or three feeds. We are a smelter which is intrinsically flexible to take these 200 different streams.

So we cover the full value chain. We can go from mines. We can take stuff that are very specific and complex into mine. This is not a major part of what we do, but we can do that as well. But we take a lot of stuff from smelters. We are sometimes defined as the refiners' refiner, because the refineries, when they are copper smelter or lead smelter or zinc smelter, they are really focusing on what they do. They need to be the best in transforming ores and concentrate into metals at the lowest cost possible and achieve the right impurities.

And in the process, sometimes impurities accumulate somewhere, and it's an annoyance. It's something that disturbs their flow sheet. So their metallurgist, they could take them back and put them in the smelter, but it would disturb and actually increase the complexity and the cost on their side. So what we do is that we take that and we process it for them. It's a better value proposition for the smelters than doing it by themselves.

And sometimes we even interact to change their own processes to optimise the full picture, to optimise the ecosystem. So that's something we do on a daily basis with our smelting and refining customers. But we also go deeper down the value chain, to refine – recycle the waste of the manufacturing industry, making the product themselves but also the end-of-life

– the consumer end-of-life product, spent automotive catalyst, electronic scrap and things like that.

I think this line that you see here, is very important because it offers a lot of flexibility. So market conditions are changing, metal prices are changing and the products that we process today are not the product that we processed five years ago or 10 years ago. We use this flexibility to always focus on the raw materials that bring the most value to Umicore.

### **Profitable Revenue Model with Significant Metal Price Upside**

#### *Treatment & refining charges*

How do we generate revenue? We have two streams of revenue. On the one hand, our customers – they own their stuff, the raw materials and the metals that are in their raw materials. And so we get paid to extract the metals from these materials. So they pay us, what we call a treatment and refining charge to extract the metal for them, which is more or less determined by the complexity of materials. The more complex they are, the more you need to pay for that.

And this is done with an agreed recovery rate. We cannot recover 100% of the metal present, sometimes in a very dilute form. So typically a customer would come and offer us to process, I don't know, 500 tonnes of something containing a few gram per tonnes of precious metals. So we would process it and reconstitute a contractual restitution of metal; could be 90%, 95% depends on the metal.

This is a commitment we take. Once we have said you are going to get, let's say, 90% of the metal that is in your stuff, we cannot say, 'Sorry guys, but we got only 89%. So the 1% is missing.' No, this is a commitment that we make. On the other hand, if we can get a better recovery than the contractual one, the metal is ours.

#### *Metal revenue*

And that's why we have also this second stream of metal – of revenue, which is the metal revenue. Of course, the metal revenue is not come falling from the tree. It is simply because we are better at recovering these metals than the competition. The agreed, the contractual recovery rate is defined by the market. And if we do better than the market, then we can basically get that revenue for ourselves.

So these are the two value drivers, the fixed fee and the value of metal revenue. Needless to say that the value of the metal revenue depends on the metal price and that's why we see a boost when the metal price is high.

### **Very Attractive Market for Umicore: Opportunities with Increasing Complexity of Recycling Feed**

#### *Regulatory requirements*

Okay. Why is this a very attractive market for Umicore? It is today, it was yesterday and it's still going to be a very attractive business for Umicore tomorrow. First of all, they are a little bit new. There are very strong regulatory requirements. We were doing recycling already 25 years ago when it was not mandatory, because there was value in the product that we processed, value for customers. But today, it's even mandatory. You need a recycled content in the product. There are – there is societal pressure and societal needs. There is legislation. So this is going to support our business further.

### *Sustainability*

There is the intrinsic sustainability part, which is driven by metal scarcity. I mean, you are reading newspaper, you know that metals are getting scarce. And this is also by the way supporting the price, which also helps more extraction but also more refining. There is this circular economy component and the greenhouse gas footprint that I just mentioned, which is incentivising people to use recycled metals.

### *Economic value*

And last but not least the economic value. There was already an economic value in the past, the metals that are contained in the stuff have a value. And if we can extract that value, it makes sense to recycle them. And this is true regardless of the metal price. Of course, if the metal price would be zero, that would not be attractive, but it's not zero. So, even at the metal price of the past, it was – it did make sense to extract them. And it will make sense again, even if the price normalise in the future.

Something that we have done in our plan, we have not taken any – and Mathias mentioned that – we have not considered the premiums that are going to come for recycled metals. We have considered that the metal prices are going to go back to where they were. There is a likelihood that a market will develop where people want to pay more for recycled metal. But today this market does not exist, this is not yet available, so it's very difficult to quantify. So there is definitely an upside for us, because if at some point in time, people would be ready to pay more for something that comes from recycled content, we would pocket obviously this value. The same if they would pay more for metal containing a lower CO<sub>2</sub> content. But that's not factored in the plans.

## **Leadership in Sustainable, Complex and Low Carbon Recycling**

### *Where to play?*

Now where are we going to play? I mean, we are going to do more of what we do well. That's leverage our leadership position in complex low carbon recycling. That's going to remain our focus. That's the focus of precious metal refining I'm talking about. Of course, we're also going to support the new kid on the block that Kurt will develop later, the Battery Recycling Solution. Why? Because this is an adjacent business. This is not the same, but the metals are different. But the key ingredients are the same.

It's all about maximising recoveries, having the lowest cost and the lowest emission. So I mean, that can be transferred; all the logistic issues, the dealing with the complexity of the materials, this is something that we can definitely transfer and support at Battery Recycling Solution.

### *How to win?*

And how are we going to win? That's through RISE. You are starting to get used to that I believe.

## **Leadership in Sustainable, Complex and Low Carbon Recycling: Sustainable Value Creation for Customers**

Reliable, Hoboken, precious metal – the precious metal refining business unit needs to be as reliable as a bank. And some of you work for banks, so you know what it means. Reliability can come from several factors.

First, our flexibility. We are treating waste and by-products. So the customer does not know for sure what the composition of this waste or by-product is going to be. And if, from one day to the other, the composition is slightly changing, we are not sending them back home and saying, 'Sorry, I can't process it anymore because you have added that impurity that I cannot process anymore,' which is very typical for other players on the market. No. We tell them, 'Look, let's look at it and let's try to solve that problem together.' So this is really something that our customer value a lot.

Trust. There is a lot of value in what our customer entrusted us with. Sampling is always an issue because I mentioned before, sometimes it's 500 tonnes of materials that they have on their hands with a few grams per tonne of precious metals. So there is a lot of value, but it's difficult to define how much it is. So we are a world leader in sampling heterogeneous complex feed. Our customer can witness but they also trust our ability to make a representative sample of a very large amount of materials. So that's something very valued by our customers.

Reliability. We are entrusted with big value of precious metals. We need a few weeks or months to process them. The customer wants to make sure that they will get back their metal at the end of the road. So that's the bank side of it. We are talking about millions, tens of millions, hundreds of millions of value. So that's something where you want a partner which is really reliable.

And the last one is a bit new, is this enablement through – to reduce the CO<sub>2</sub> footprint of our customer so they will be able to count on us. Mathias mentioned that for the OEMs and for the battery materials. This is also somewhat true for other metals.

### **Leadership in Sustainable, Complex and Low Carbon Recycling: Innovative Metallurgy and Chemistry**

Now, innovation. I think it's fair to say that we are mining – we used to be a mining company. We came into materials through the metals, so we have a long experience in refining and – recycling and refining methods. So we have what you call the pyro and hydro expertise, which is needed, and I will come to that later on. So we are going to keep this innovation and technology.

You can come every single day at the large plant in Hoboken. There are teams of PhD in metallurgy, PhD in chemistry, improving the processes. Debottlenecking something, adjusting a process to a new feed, changing completely break – making a breakthrough process to do something in a different way, in a more efficient way. So that's something we do. We are – we will keep doing that, of course.

What is new is that we are going to use this technology as well to develop – to solve the CO<sub>2</sub> reduction – to achieve the CO<sub>2</sub> reduction journey that Géraldine just described.

#### *Leverage our unrivalled pyro and hydro expertise*

First, on this expertise. I mean, you can't convert – refine 17 metals and convert very complex and low grade materials into metal in one step. You need many, many steps. And the two main categories of processes that you have at your disposal when you're a metallurgist is the pyro, which is a smelting process, high temperature process; and the hydro, which is more putting the metal into solution and using these categories.

So, at Hoboken, half of the processes are pyro, half of the processes are hydro. I think this is not always well known, because we always see ourselves as a smelter, and we see the big smelting furnace. There is quite a lot of hydro processes. So why do we do combination? Because they all have their specific advantages. If you think about pyro, you have a very high rate of reaction so you can do a lot of stuff very fast. You have a very large robustness to impurities because you have this averaging effect of the smelting. The physical footprint is actually lower. Because if you can – if you have a high rate of reaction, you can do a lot of stuff in a very limited space.

If you do hydro, the metals are often very diluted in solution and you need huge farms of, let's say, equipment to process it. So on the other hand, hydro has a very big advantage in terms of selectivity. So by combining the two, you get the best of both worlds. This is what we do on a daily basis in Hoboken. And actually, this is also what Kurt will propose to do later on.

#### *'Next Gen' technology to reach our decarbonisation goals*

Looking at decarbonisation goals, you have been seen this avoiding emissions, let's say, tool in Géraldine's presentation. This is actually something that we do for quite some time already, by using the synergies between the feed. Some of the feed that we put in the smelter in Hoboken have heat content, so they create heat when you process them. Some of them consume heat. You put them together, you don't need a fuel, and you get the best efficiency. So that is something that we have been doing for cost reason for a lot of time. But it's also going to be very helpful in reducing the energy consumption and hence the CO<sub>2</sub>.

The second one, when we cannot avoid them is to replace. Replacing, let's say, fossil fuel by electricity looks straightforward. In our case, sometimes the fuel, the fossil fuel is also reagent. So it's a bit more complex than simply replacing a heat source. It's also – but we are going to do it and we have good R&D people to find out how this can be done.

And the last one is capturing the greenhouse gas. Géraldine mentioned the nitrous oxide capture that we do in Hoboken. Of course, the right investment will be required. I mean, we have – we are going – we want to be a net-zero so we are going to do it. Again, this should, on the long-term, translate into margins and premium.

#### **Leadership in Sustainable, Complex and Low Carbon Recycling: Key partner for the Circular Economy**

Now let's look at the S, maximising the closed-loop benefit. The smelter is 25 years old and has always done this. So we have a majority of our input mix coming from secondary sources and we have this very much embedded also, the responsible sourcing is part of Umicore DNA. So we will keep doing that. We also know that urban mining is not straightforward. I mean, you need to deal with the coexistence with the neighbouring communities so we don't spare any effort to improve continuously on that.

#### *Maximising closed-loop benefits*

So, on the first part, already more than 90% of our PGM metals are coming from secondary sources. So that's what we do at the smelter. You have all the range of certification that we have. And as Géraldine mentioned, we are already saving huge amount of greenhouse gas just by doing more recycling compared to primary extraction.

*Sustainable co-existence with our neighbours*

If you think about sustainable coexistence with neighbours, what are we doing? We are, first of all, minimising impact. That's the real red line that what we need to do. Using best available technology, for example, full encapsulation of our lead refinery. Our lead refinery is a huge building. It is put under negative pressure, so that no single dust can escape the building without being processed. So that's something we have been doing a few years ago.

Smart logistics. We actually steering our logistic activities depending on the weather conditions. So if the weather is not favourable, we avoid doing stuff that could generate emissions. And we also have real-time measurement, not only of the quantity of dust emitted, but also the composition of the dust. You can see that this reduction has been a fact and we have achieved significant reduction between 2015 and 2021.

We're not going to stop there. But move over something that we have been – announced and doing is the creation of a buffer zone between our plant, which you see at the right side – by the way, you see this lead refinery, which is fully encapsulated in grey. So we have already a one hectare green zone on our site. We are creating a five-hectare green zone. And the purpose is to create a buffer between the industrial activity and the residential activity on the on the left side.

**Leadership in sustainable, complex and low carbon recycling: Strong focus on Operational Excellence**

And then excellence. We have an industrial operation, so operational excellence is not something new for the people. They are doing it, but we need somewhat to put the turbo on that. Mathias mentioned about the logistics. Logistics is a big part because we have these 200 categories of materials but if you multiply that by the number of suppliers, we handle a lot of stuff on the – in the plant. So we are going the extra mile in terms of digitalisation, automation to reduce significantly, reducing the breakeven points, reducing costs, increasing efficiency. So I think this is pretty straightforward.

*Continuous debottlenecking and value creation*

Something we do as well, and which has a very strong lever, a very strong leverage is debottlenecking. And I will give you an example. This is, on the left side, what we have done between 2010 and 2018 in terms of material processed input to the plant, to the furnace. We had already increased compared to the design capacity – the plant was built at the end of last century, quite some time ago. But, let's say, 90 in – between 2000 and 2010, we had already multiplied the capacity by – increased by 80%.

So the design capacity, what we did in 2010 was already 80% higher than the design capacity, because of better methodologies, like engineering, better refractories, I mean, technical levers. And between 2010 and 2018, we have increased by another 50%. So all in all, it's nearly multiply by three between the design capacity and what we achieved in 2018.

So you would ask me, but why did you then suddenly do badly in 2019, 2020 and 2021. Something happened in 2019. The precious metal price started to increase a lot. And then we made a trade-off between value and volume. And we decided that it was much more profitable for Umicore to process very complex stuff containing a lot of precious metals at the cost of a little bit of volume, but creating a lot more value. This is the kind of flexibility that we use in Hoboken. We are driven by value; we are not driven by volume. But of course, if

you can get the volume, you get all the benefit in terms of cost. We can always go back to the 2018 situation in case the market situation would require it.

### **RISE: Leadership in Sustainable, Complex and Low Carbon Recycling**

Now, let me summarise how RISE is going to help us. I give you all the elements. So we don't change the business model. RISE is going to help us to get better. So what we will get is sustainable returns and very strong cash flows, even at normalised PGM price. They are in the plan and PMR continues to deliver outstanding return on capital employed and very strong cash flow.

And as I mentioned it before, there is an upside potential, first of all, if the metal price would be higher than what we have put in the plan, but also if there are premiums associated with more recycled or low CO<sub>2</sub> content. There can also be both, because probably the recycled demand and the low CO<sub>2</sub> will have also a positive impact on the metal price. But that's – in the plan we've been pretty conservative and even being conservative, we generate quite a lot of value.

Thank you. This is – and yeah, last but not least, putting some figures on it. So what we mean by providing strong cash flow and good value is EBITDA margins getting close to 40% and guaranteeing 20% return on capital employed even by 2030, when the metal price are going to be back to very historical level. We have been doing more, but 20% is something that we can sustain.

Thank you for your attention.

## **Q&A**

**Evelien Goovaerts:** Thank you, Denis. And then we have our next Q&A session. So Mathias and Géraldine, you're invited back on stage. Maybe for the people in the audience, you need to bring the mic very close to your mouth when you speak because we had some feedback from the webcast that it was not always easy to understand the questions. We have about 20 minutes before we will be breaking for lunch.

**Ranulf Orr:** Hi. Just two questions for me, please. It's been mentioned a few times now, the move to further upstream integration in cathode materials. Could you please expand a little bit on that and the plans there?

And then a second one just on recycling. You talk about 200 complex waste streams, but presumably there are only a couple that really matter, auto cats comes to mind for instance. Could you give some clarity around those and the different dynamics within those sort of sub-sectors? Thanks.

**Mathias Miedreich:** Very good. Let me take the first one. So – and again, this will be very much detailed in Ralph's presentation. Yes, we today are already – if we compare us with our competitors, we are probably the most integrated on the value chain upwards. That means going up to refining. This will take even more importance in the future, because two reasons for that.

The first one is if you have exposure to the full value chain, you can influence also the value creation. With that also, the cost performance and the – as I have shown to you, as well the

more upstream – try to showed you – the more upstream you are working on innovations on the processes, the micro engineered precursor that I have shown you, that can even be, let's say, influence in the further stage, gives you an upside on your competitiveness over the full value chain.

And the second thing that's coming more and more, it is a matter of securing supply. For example, there are several regions in the world where you cannot just extract, let's say, nickel and ship it to somewhere. You have to have a value add in the region and you have to commit to do something with the nickel that you get out of the earth, to be able to have a supply stream. And this is something that we are engineering, together with our customers, how we can do it in the best way to further strengthen on that. So – and that's a very important point.

When we talk about the phase of expansion, it is also the expansion and the ultimate goal in each of the regions where we are active to have a full value chain approach, mine to battery – excluding the mine and excluding the battery, of course.

**Denis Goffaux:** Yeah, on the scope of what we can process, yeah, spent automotive catalysts would be one of these categories, obviously a very important category nowadays with the PGM price of today. Now, when you do recycling, you don't have basically a long-term contract like you could have with mining – with a mine. So you have – you are dependent on the market availability. So what we have seen is that spent automotive catalysts, there is a big incentive to recycle them because of the precious metal price.

We do – this is also influenced by the scrapping of cars. If you have less car scrapped, there are less automotive catalysts available on the market. So this is a bit negative for the time being. But all in all, spent automotive catalyst is a very important part of what we process but it's only a part of it. And even in terms of PGMs, spent industrial catalysts are also playing a role, industrial by-products are also bringing PGM to the plant.

**Geoff Haire:** Hi. Just two questions. First of all, on the sustainability. Is the cost of the sustainability captured within the CAPEX plans that were outlined earlier?

And then secondly, specifically on carbon capture. You mentioned that that's still work in R&D, but carbon capture is a well-established technology, so why is Umicore not using an off-the-shelf option in that area?

And then secondly, just on recycling. Do you ever have situations where you only have contracts that just take the treatment charge and you don't have any benefit from metal revenue or all the contracts within recycling have both elements?

**Denis Goffaux:** Yeah, I will answer the second question. And I will – yeah, or I can take both?

**Géraldine Nolens:** Probably start with the last one.

**Denis Goffaux:** Yeah, I start with last one. On the contracts, always have a metal component, but sometimes it's a tiny one. They always have a metal component, because recovery rate is a fact. I mean, nobody can make 100% recovery rate and then the market defines more or less what the usual recovery rates are. And if the usual recovery rate is very high, there is limited margin to do a metal contribution on top.



But if the recovery rate that is defined by the market is rather low, then you have a big potential. So there is – the two components are always present. Usually, the more complex the material, the more room there is to make metal margins, because there are not many people able to recover the metals with a good rate. And then on the...

**Géraldine Nolens:** Okay. Maybe the first question, with respect to whether it's included in the plan. So yes, the big – the main ticket item for our ESG is the CAPEX required for the Scope 1 emissions, and that is clearly included in the plan in our strategy. So that's an easy straightforward answer.

With respect to the carbon capture for our R&D department, yes, there are carbon capture technologies out there, and [inaudible]. But we are confident that by the end of the decade, we will have advanced in that and we'll be able to show results.

**Mathias Miedreich:** Now there isn't much I can add to that. Indeed, there are off-the-shelf technologies, but which are not developed for the non-first metal smelting. So we need to adapt them to the kind of gases that we get, the impurities that are contained in the gases. So yes, it's work in progress, but we are going to bank as much as we can on established technology, of course.

There was a question also over there exactly.

**Wim Hoste (KBC):** Yes, good morning. I have a couple of questions. Maybe first, you're offering a lot of additional transparency, but recycling is still a bit of a back box in terms of profit generation and the drivers. So can you maybe split the profits by metal and also by, let's say, TCs and free metal? That's the first question.

Then the second one is, can you maybe elaborate on the visibility of your input streams? You indicated that there is differences for end-of-life materials, auto cats versus maybe mining. So what is the average visibility you have in terms of input streams in recycling?

And then a third question would be ESG related. There's some stringent regulation for blood in lead levels of children that becomes more stringent over time. So how confident are you to reach that two micrograms per decilitre levels in a few years' time? Can you maybe elaborate on that? Thank you.

**Denis Goffaux:** On the first question, I'm afraid that I cannot detail per metal or even between TC and RC. It's first of all a very complex thing, and this is not the level of detail we want to disclose.

Your second question is on the visibility. What we have – we still mostly do mid to, let's say, mid-term contracts. So we have often relationship with our customer where they expect to send us a certain amount of, let's say, spent automotive catalyst. But they also face the reality. And so there is a band in which they can have some flexibility.

So we – and we need it also for the mix of the plant. We need certain quantities, but you sometimes have a bit less than you had expected in the budget. So it's less predictable in a way. But we have – we would have typically – we do a bit of spot contract, but we would have typically yearly contracts with most of our suppliers with a certain margin for more or less volumes.

And then on the emission part, I mean, we are very confident that we have the technologies in place. We have – this is the highest priority on the plan – in the plans right now. They are doing whatever it takes, first of all to reduce emissions, because this is what we have under control. We can reduce our emissions. And if that is done, obviously, it's going to be much easier to reach the targets in terms of lead in blood.

**Géraldine Nolens:** Maybe I can add to that.

**Mathias Miedreich:** Exactly.

**Géraldine Nolens:** So, as Denis said, our operations today are really state-of-the-art technology. And we have, in the past years, always respected all the legal requirements, and the requirements of our permit with respect to the emissions. And we go way beyond those requirements. In addition, we have set much more stringent targets voluntarily and we are complying with those as well. As you know, the permit is going down, year per year, in what it is allowed to do.

And based on all the technology advancements that we're making, we're really beating the curve every single time. So we're confident that by 2026, we will reach those targets as well. And what's important as well is that, obviously, we don't – we also have a historical past. But what we're doing with that as well is that we have built a green zone of five hectares between the plants and the local community on the side. And that will significantly contribute as well. So we're feeling confident that we will reach those requirements by 2026.

**Georgina Fraser (Goldman Sachs):** Hi. Denis, I've got a question for you that is maybe a bit more technical and just a point of general interest in metal recycling. Why is it that you can't have 100% recycling rates of metals? And which metals have the lowest recovery rates and are also scarce in nature, and therefore, we should be worried that we're going to completely run out of them even with recycling in the future?

**Denis Goffaux:** Yeah, I think the 100% recycling is what we strive to and – but even in mining industry, you will be surprised how much of the metals are staying in the tailings of the mines just because they cannot be extracted physically. They are embedded in another mineral. They are lost. And so I think that the metal industry never has 100% because you start with, let's say, 500,000 tonnes of materials, and you need to extract a few tonnes of the metal you're looking for.

And so the vast majority is something that you need to dispose or – in tailings in case of mine or as [inaudible]. And this may contain a little bit of metal. So the 100% is what we strive to, but it's difficult to achieve. Obviously, the highest value of the metal, the more incentive you have to use additional steps to recover them.

Yeah, so that's a dream but unfortunately, this is not possible. And if you are better than the competition, and I think we can say we are better than competition, then you can benefit from that additional yield.

**Mathias Miedreich:** Over there, we have one question.

**Riya Kotecha:** Hi. My question is about some news that came out, I think, in December 2020 about higher radio activity levels that Umicore's Olen site. And I think in May 2022, there was a news release that said that there's new legislation that allows the imposition of financial burdens on users and owners of these potentially contaminated sites. So is this

something that's on your radar in terms of a potential ESG risk? Or do you consider it to be a case closed? Like, how are you thinking about this? Thanks.

**Géraldine Nolens:** Thank you for the question. Yes, indeed, there is draft legislation out there and actually, we're very happy with that legislation. That legislation will allow us to move forward. So we've had activities relating to radium in the past in the 1920s to, I think it was, 1970s. And we have, how do you call it, residues of that. And we have encapsulated those in our – in the bank in the Olen site, but it's completely encapsulated. So there is absolutely no danger. We all work in the Olen site, so that it's completely safe.

And the regulator – the authorities follow this up also with us on a constant basis. So we don't see this as an issue. And the legislation will actually allow us to move forward because we had to wait for the final storage of those tailings, or of those residues, until legislation was in place. And so with the legislation and the implementing acts that are going to come hopefully soon, we expect that by 2024, we will be able to develop a final action plan to find the final destination for these things, but there is no harm to environment or people or any risk of that at this moment in time at all. So we don't really see that as a problem, no.

**Evelien Goovaerts:** Okay, perhaps one final question. I wanted to slip in one from the webcast. But go ahead, Sebastian, the floor is yours.

**Mathias Miedreich:** Well, no, it's okay. We have enough time.

**Sebastian Bray:** Thank you. Could you just – can we touch on hedging with the – what is the level in multiyear terms that you feel comfortable with at this stage? So another way of putting this question is, are you hedged now for certain metals to 2025-2026? Or is there a hard stop at which we should start thinking about using spot prices again for the recycling segment? Thank you.

**Denis Goffaux:** Filip, do you want to take that?

**Mathias Miedreich:** Yeah, I think it's a good time to bring our CFO back in the game here. He was a little bit too relaxed.

**Filip Platteeuw:** Well, I wouldn't really want to add anything. Yeah, it's on. Okay. Anything except for what we mentioned, what was it, with the full year results. So we haven't significantly increased that, Sebastian. So we're talking about two years out. We're talking about precious metals, mostly. So we can update you in July, but so there is no fundamental increase. So obviously, we will, like the roll forward, try to increase the hedging proportion for those metals going forward, but compared to what we said in February, or the update at the AGM in May, there's no fundamental news on that one. Is that okay?

**Evelien Goovaerts:** And then –

**Mathias Miedreich:** So, first question from the audience. Evelien?

**Evelien Goovaerts:** Yes, first opportunity for a question. And Filip, I feel you have to stand up again, because it's about the PGM prices. So it's linked to both Denis's piece and Filip's piece. You talk about normalising PGM prices. How do these price levels compare to long-run average prices – above, in line, below? What are your expectations on the price and earnings contribution of the minor and specialty metals? And do you expect these to also normalise?

**Filip Platteeuw:** Okay, Denis, we can make it a team answer. But I will start. So when we talk about normalisation, it's a gradual normalisation. You've seen the graph we put out, like what is more or less a consensus which is out there. We follow that. We're a bit more conservative actually than what is on the slide. It continues after 2025. So to answer the question directly, what you mean with normalisation? It means that we expect, or that we have assumed, I should say, precious metal prices, and specifically PGM prices to go back to their historic low, I can say, levels.

And most of that change continues to happen after 2025. So you have a first, I would say, correction up to 2025-26. And that continues, which you saw in the numbers in recycling. That's the kind of headwind we talk about. If it doesn't happen for, I mean, good reasons, it means there's an upside to our plans. So we really went down to historic levels.

And the second question, Evelien, can you help us, sorry, or part of the question?

**Evelien Goovaerts:** On the minor and the specialty metals and how –?

**Filip Platteeuw:** On the mix for Hoboken, you want to take that, Denis?

**Denis Goffaux:** Yeah, I think we have 17 metals so we extract value from the 17 metals. Nowadays, the precious metals are making the lion's share, and this is what – where our focus is. We do refine the other metals and we do get revenue from the other metals. But nowadays they are not changing – they are not moving really the needle.

**Filip Platteeuw:** Yeah. The PGMs and it's even –

**Denis Goffaux:** PGM, gold, silver, these are the main contributors.

**Filip Platteeuw:** And then making the bridge with the question on the hedges, in terms of hedging for palladium, for example, we're pretty high hedged, platinum to a certain extent well. For rhodium, that is more difficult metal to hedge. So in terms of, I would say, the sensitivity of metal prices over the PGMs, rhodium is the most important one.

**Evelien Goovaerts:** Was there still a question from the audience here? If not, then we are ready for a longer break. So we will come back and reconnect in one hour and 10 minutes from now, so 14.00 London time. Thank you.

**Mathias Miedreich:** Very good. Thank you.

**Denis Goffaux:** Thank you.

**Géraldine Nolens:** Thank you.

[BREAK]

[VIDEO]

**Evelien Goovaerts:** So this is the video that we wanted to show this morning, but I think it fits very well here as well, because it summarises somewhat the messages that we have been bringing so far. And there is still an important part to come, because this afternoon, we will focus on all the activities that are driven by an enabling mobility transformation. And I gladly hand over to Ralph for his presentation.

## **Mobility Transformation: Rechargeable Battery Materials – Capture Profitable Growth and Create Sustainable Value**

Ralph Klessling

*Executive Vice President, Energy & Surface, Umicore*

Yeah, good afternoon to everybody here in London and from wherever you are joining us. I hope you're all re-energized by the break and ready for Rechargeable Battery Materials. Rechargeable Battery Materials are at the heart of Umicore's 2030 RISE strategy and they are at the heart of the mobility transformation. While there is consensus and there is no doubt that this industry has exponential growth, there are at times questions whether the industry and Umicore can manage it in a sustainable and in a profitable manner? And yes, we can and we will.

### **Agenda**

I will now walk you through, in the next 45 minutes or so, how the mobility transformation creates exponential growth for Umicore's demand in cathode active materials; how Umicore, with its unique business model, will differentiate itself and create values for its customers, for its partners; and how we will translate it in profitable and in sustainable growth.

#### **1. Mobility Transformation Driving Accelerated Demand for Cathode Materials**

Let me start with the market.

#### **Electrification Increasing At Fast Pace, Triggered By Regulatory Push and OEM Commitments**

As Frank already mentioned, this exponential growth is driven by a couple of levers. One is the regulatory push in all major regions, but most pronounced in Europe, where the European Union just announced two weeks ago to ban internal combustion engine sales as of 2035.

But we see even stronger OEM commitments. Stellantis, for instance, announced recently to have their fleet 100% electrified in Europe by 2030, and 50% in the US. Mercedes Benz is going in a similar direction with 100% electrification, except for niche markets and application. And in North America, GM is also pulling, by decarbonisation, the fleet by 2035.

And of course, you have the ever stronger consumer sentiment going into electric vehicles. We have translated this for light duty vehicle in our forecast in our market model, starting with BEV ratio of 5% in 2021, up to about 34% in 2030. The remainder still for plug-in hybrid vehicles and of course internal combustion engine vehicles.

For medium- and heavy-duty vehicles, we see also clearly an uplift in battery electrical vehicles but here it's more differentiated. It's more in the medium-duty vehicle and the short-haul, heavy-duty vehicles. Why for the long-haul, heavy-duty vehicles? It's more the fuel cell driven electrification, where Umicore has also very strong offerings via the fuel side catalyst. So we translated this in about 17% battery electric vehicle penetration by 2030.

While there is clearly an upside potential for the medium- and heavy-duty segment, we have focused right now our strategy on the growth of the light-duty vehicle segment.

## **Umicore Chemistries Addressing ~75% of Total Light-Duty EV CAM Demand**

What you can see here are our estimates, our expectations in this massive growth from 2022 to 2030, with an average CAGR of 25%. And we see this rather on the conservative side, and this may even further accelerate.

To give you an example, we have projected at our Capital Market Day in 2018, for the light-duty vehicle cathode active materials demand, 500 gigawatt hours. Now we project one terawatt hour for 2025, so doubling it. So there's enormous growth in the market. We are addressing, with our technology portfolio, all major design-to-performance and design-to-cost segments with our high-nickel, mid-nickel and the emerging manganese-rich technologies. So with that, we see that we are covering about 75% of the total addressable market. So there will be a remainder for LFP but with a clear regional differentiation most pronounced in China.

The 75% also addressing emerging technologies, like solid-state batteries, where we have an innovation and a development pipeline for cathodes and for catholytes, and this we see ramp up still to a one-digit percentage by 2030.

### **>20% Annual Market Growth across All Regions**

While we see a growth of annual, more than 20% in all regions, there are three major regions who account for about 90% of the total demand. This is China with about 40%; Europe with about 30%; and North America with roughly 20%. 10% will then – between different countries and regions, such as developed economies like Korea, like Japan, or more emerging economies like India. So we see the growth rather accelerating in the second half of the decade here, more pronounced even, but coming from a much lower basis. So three major regions account for 90% of the total worldwide demand.

What we also see is a clear trend in regionalisation. And that has different reasons. Reasons are from economy side, from countryside that they have local content requirements. We see also in a geopolitical context, that imports from one to another country may become prohibitive, due to tax and duty requirements and restrictions. This is the one hand. On the other hand, it's coming from the customers, from the OEMs, clear requirements, a) on security of supply, and this backward integrated, and b) also have sustainability requirements. So to ship all raw materials and intermediates around the world is really becoming also prohibitive in the quest of the decarbonisation of the value chain.

## **2. Rechargeable Battery Materials Well Positioned To Capture Profitable Growth And Create Sustainable Value In Fast-Growing Market.**

And this brings me already to the next point, how will Umicore, with this offering, be profitable and be sustainable with this growth?

### **Cathode Active Materials Crucial for the Mobility Transformation...**

Let me take a step back, what is it about cathode active materials? Cathode active materials are a key component in terms of technology for the battery, it determines, for instance, range, it determines energy density. Safety is a critical feature. You have also site life or from the cost side, is recyclability.

Cathode active materials account for one-third, of the value of the cost of a battery. So, it's very clear that this is a very critical component on the cell technology roadmaps of OEMs and of cell makers.

### **...Requiring Critical Competencies and Skills for CAM Producers to Succeed**

To produce cathode active materials, along the value chain, requires very specific competencies and skills around three areas; product and technology, process and operations, and supply and value chains. We emphasised this already in our Capital Market Days in 2018, but it becomes more and more relevant and further refined now.

#### *Product*

Starting with product and technology, you need to have the right and higher performance technology produced with the right quality requirements, to meet the customer specifications. So you need to have the right chemistry, but also the right processes for it. Joint development with the customer give you access to the right specification to the requirements of the customers but also to their technology roadmaps. So this is another important angle.

And of course, to provide this offering, you need to have the right technology portfolio, also backed up by IP, to develop with the customers the innovation roadmap for this generation, but also for the next generation and for the next cycles.

#### *Process*

Then process and operations. Here it's really to master the complexity of the operations, be it industrialisation, be it scaling up, producing at economies of scale, and do it with the right efficiency and quality. Efficiency determines the productivity and, finally, also the profitability.

And another very important criteria is quality and purity. While on the one hand, with the cathode active materials, you have CAPEX requirements, like for larger chemical plants or refineries; you have purity requirements, like in the pharmaceutical industry. So this requires really specific skills to manage this spread.

#### *Supply*

And last but not least, it's the supply and the value chain to really have access to the right raw materials that means meeting all ESG requirements, but also with a local carbon footprint, which becomes more and more critical in the future with the requirements of the customers. Having refining and leaching competencies, and the right footprint for it, further facilitates that, because it gives you more flexibility and supply security for your in-feet.

And last but not least, having the value chain, a backward integrated value chain, in these three major regions. We were talking about 90% in three major region, so having the regionalised footprint approach is also critical for the supply and value chain.

And Umicore has these skills along the value chain to really create benefit for its customers and partners, for their own success and can really differentiate itself versus competitors for that.

## **Capture Profitable Growth and Create Sustainable Value**

### *Where to play?*

And with that, we have a clear strategy to establish this backward integrated value chain in all the major regions. To start with Europe, to extend our leadership that we have in Europe, we have been an early mover with the setup of the operations in Poland, for cathode materials, but also in Finland, for precursor and for refining. We have set up agreements with our customers – Mathias spoke about the JV intention for Volkswagen, we have a long term agreement with ACC – and this really provides the basis for our footprint development backward integrated in Europe and further grow from here.

The next pillar is entering North America with a local footprint along with our customer qualifications and with platform awards. So, we are in the very final phase to acquire land in North America and we expect this to announce it before the half year results. And this land will give us the capability to do the backward integration with our footprint in North America, as we have in Europe. The start of production is planned towards the end of 2025, starting with cathode active materials, but also then backward integrated with precursor, and later on also with refining and with leaching.

And thirdly, it's reinforced our position in the Asian market by expanding our platform exposures with more customers and towards 2025, then fully utilising our footprint, our backward integrated footprint in Asia, and then further develop and grow from there.

### *How to win?*

So, how we will do this along the RISE strategic and execution pillars?

## **Capture Profitable Growth and Create Sustainable Value: Value Creative Strategic Partnerships across the Value Chain**

Let me start with the R, the reliable, the go-to transformation partner. Going forward, this means to create, to set up partnerships along the value chain, and this is clearly different from the traditional supplier customer relationship that have been dominating in the past.

### *Mobility transformation radically accelerating uniquely positioned to help the world transition to clearer mobility*

You still will see this slide a few more times, and that is not a coincidence, because this shows how Umicore is uniquely positioned to be a transformation partner for the whole mobility transformation, be it internal combustion engine, including plug-in hybrid electric vehicles, be it battery electric vehicles, but also be it fossil driving battery electric vehicles. We have decades long experience, close customer interaction, customer intimacy, and understanding with all major OEMs as well as with cell makers. So for the automotive catalysts, the experience goes almost back 50 years; for cell making for the battery materials, about 25; and roughly the same also for the emerging fuel cells. So we are uniquely positioned to serve our customers along the whole mobility transformation.

### *Supporting customers on the path to electrification, right from the start*

Let's have a bit more closer look for the cathode materials and the rechargeable battery materials. I don't want to go through all the years here, of our long-standing track record, just explain that we have over 25 years' experience to develop cathode active materials, first for portable electronics application, then for EV application; have built a backward integrated manufacturing footprint, with the experience to produce at scale, and with the highest quality.



And we will now accelerate it and have already started with it, with our entry into Europe with providing the latest technologies to our customers and partner, and setting up the right partnerships.

*Strategic partnerships key to accelerate decarbonisation and electrification*

And this brings me to a key element of our RBM strategy. This is partnerships for the decarbonisation and for the electrification along the value chain. We have started this and you can read this already with the announcement around VW and ACC.

This creates value for Umicore, and also for the partners of course. It gives access to long-term demand, and with that, security to scaling up to economy at scale, with the capacity roadmaps of the customers. And for the customer, it provides security of supply.

We recently were in a discussion with a major OEM who said, 'We need security of supply, we don't want to face a second chip crisis.'

The next one is really to industrialise, and to develop technology roadmap, based on our technology portfolio and our industrial know-how, while keeping, of course, our FTO and our IP. And so defining together with the customers, the technology roadmaps for the shorter, but also for the longer term.

Having partnerships models means working along the value chain, to really decarbonise the battery value chain. And that can start from sourcing, the wire refining, and of course precursor into cathode manufacturing production.

And last but not least, having the investments, having co-funding for the customers, having customer commitments, and our own commitment, of course, which will be value creative for both partners.

*Upstream know-how and integration closing the loop*

But our value chain proposition doesn't stop here. I just mentioned critical access to raw materials, which we have with our long-term agreements on the raw material side, low carbon footprint, and ESG requirements covered. Having a proven footprint for refining leaching, and the competencies, of course. And also having the same for precursor and cathode materials. But what is critical is that we are able to close the loop with recycling, and Umicore, has the clear competencies and Kurt Vandeputte will give you more details later on about that.

So with closing the loop, having the full requirements of the customers, which includes, meanwhile, recycling as well, recycled materials, so we got these first requirements from OEMs, so we really will provide peace of mind to our customers from sustainable sourcing to security of supply.

You may now ask, yeah, how will Umicore this now translate in our – in its footprint ambitions? Let me explain this right now to you.

*Expanding our global manufacturing and R&D footprint along the value chain, close to customers*

This is our Asian footprint, Korea and China – again, backward integrated from cathode materials to refining. It includes also our R&D footprint. With our headquarter in Korea, we just announced two months ago, that we have an expansion with a new R&D centre to really

even serve our customers better and faster. So we have also applied technology competencies for Asia, for Europe and for North America as well.

This we complemented with our early moving approach into Europe, being early on in Nysa, for cathode materials, and in Kokkola, for precursor and refining, and also having set up a process competence centre in Olen in Belgium. And here we have the same centre for R&D incubation for our long-term roadmap, and I will come to this in a minute.

The next step is that we set up plans, a clear roadmap, to expand our European footprint by the – starting by the end of 2023, by further expanding into cathodes, precursor, as well as setting up for the nickel refining and leaching competencies. And also establishing in Europe, a battery technology centre to be even closer to our customers here, and to serve them faster and better along their technology roadmaps.

Our North America ambition, and I just said it, is clearly to be local by the end of 2025, starting with cathode materials, but then also backward integrating, and also from the technology, applied technology side, having a battery centre in North America to also serve our customer there.

So with this footprint approach, we will cover all major markets. So the 90% all major markets and the other 10%, because, of course, also from there – which we do, by the way, because we are located in Korea. And serve them backward integrated from cathode materials into refining, and have also R&D footprints in all regions. In Asia, we will complement this investment, as of 2024, with selected investment and plan to further growth then in CAPEX in the second half of the decade.

#### *Transformation growth serving our customers in all regions*

How do these ambitions translate in capacity? And this is what you see on this slide. We started last – as the basis from last – 65 gigawatt hours in Asia, with a clear ambition to go to 230 gigawatt hours by 2026. Most of the growth will be accounted for in Europe, but also complemented with our entry in North America by 2025. And then with the vision to further grow towards 400 or above 400 gigawatt hour by 2030.

You may ask now, is this just a linear projection and growing with the market? No, it's more concrete behind. As you have already seen from the announcement for VW and for ACC, their clear ambition is to go combined to over 200 gigawatt hours by 2030. So having 50% of the envisioned capacity already in the roadmap eight years ago is a very strong signal.

#### **Capture profitable growth and create sustainable value: Technology & IP Portfolio Covering Performance & Cost**

This brings me to technology and innovation leadership. Technology and innovation leadership will be, and remain the core of Umicore. It will not be – and this is clearly confirmed by the customer roadmaps they are sharing with us - that there will be one size fits all solution. No, there will be customised offerings for design-to-performance, for the design-to-cost elements for different applications.

Umicore is covering this, and is very competitive right now, with this design-to-performance offerings in high-nickel and design-to-cost offerings in mid-nickel high voltage and also the emerging manganese-rich technologies. And of course, we are also early on working on the next generation of technologies like cathodes and like catholytes for solid-state batteries.

*Broad technology and IP portfolio covering current and future's chemistry spectrum*

To give you a bit more detail, you see short- and medium-term, the focus is in high-nickel. So, this is from 80% nickel to the mid-90s percent on nickel, with further developments like on low cobalt, like additional safety features for instance. On design-to-cost, it's mid-nickel high voltage and also manganese-rich. And manganese-rich, that really gains attraction by the customers. So, we have development cooperation with numerous customers, with OEMs but also with cell makers.

But we don't leave it here. We are proactively preparing also the long-term roadmap. So, working, I mentioned it already, on cathode and catholyte materials for solid-state batteries, having an [inaudible] for silicon carbide anodes, but also for further cathode – longer-term cathode development, like sulphur-based cathode, like disordered rock salt or sodium ion based cathode. These, of course, are currently still in a more exploratory phase.

*Complete portfolio for performance and cost on short- to medium-term*

Here, a snapshot about the introduction schedule of our high-nickel technology based on the current customer qualifications roadmap starting towards the end of 2023 and then, depending on the customer, in a staged approach towards 2025. For the design-to-cost with mid-nickel in a similar fashion and manganese-rich, we see emerging towards the second half of the decade, so, with a roadmap projection currently starting in 2026.

And of course, the next generation R&D developments and so on, on these different technologies are continuously ongoing and also shared with our customers with early sampling and so on.

*Manganese-rich/HLM leading technology portfolio for design-to-cost*

A word on manganese-rich as a very promising technology for the design-to-cost segment. It has, on the one hand, features like for NMC – that means energy density – like recyclability and very important, is the footprint reach, so, the supply chain. Manganese-rich can be produced with Umicore's acid bases that we have for high- and for mid-nickel. That means with our footprint development globally, we will be able to produce it in every region of the world. And it has also the advantage that especially outside China, it's really cost competitive with LFP, and LFP needs a totally different manufacturing footprint.

*Leading in next generation performance technologies - Zoom in on Solid State Batteries*

Zooming in on solid-state batteries. Here, the introduction schedule with smaller programs or demonstration programs we see emerging towards the mid of the decade, and then further also in a staged approach, emerging in the second half of the decade with a final market share, to be seen, but we estimate somewhere between 5% and 10% towards 2030.

We have numerous agreements in place; Matias said it already, about 15 agreements with partners, with OEMs, with start-ups. We are proactively working with academics, so we can really claim to be in a leading position for our cathode development, but also, we are working, in detail, on catholytes.

Catholytes, provide a pre-integration, a chemical bonding early on between cathode and electrolytes, and has a clear potential for that, to further boost and increase the energy density, and finally also reduce costs.

And so I'm very excited that I can inform you right now, that we will do an announcement today to cooperate with Idemitsu, who is a leading technology manufacturing – leading technology company in the area of sulphur-based, solid-state battery electrolytes. So, we will put our forces here in the development together, and this will further accelerate our leadership for the catholyte development and for the industrialisation.

Again, a word on the manufacturing footprint. Also cathodes and catholyte, with some additions, can then be produced with Umicore's global manufacturing footprint. So these materials will be available for our customers in all regions.

### **Capture Profitable Growth and Create Sustainable Value: Key Partner in Transition to Low Carbon Mobility**

Sustainability. Also, at the risk to repeat what has been said a couple of times, sustainability is really close to our heart and it's in our DNA. We have been pioneering in responsible source materials, setting up a cobalt framework and really increasing the standards for Umicore on the one hand, but for the industry on the other hand as well. And going forward, our clear ambition is to be pivotal to be a leading partner for the decarbonisation of the battery value chain.

#### *Decarbonising the battery value chain*

But decarbonisation of course, first of all, starts on our end. So we do it on all scopes. Scope 1 is to further optimise increased efficiency by energy efficiency improvement. For Scope 2, Geraldine already provided you details on that, for each and every green and brownfield investment, it is mandatory from the beginning on, that we are 100% provided with green energy.

So we started with that, with our operations in Nysa with the power purchase agreement, and about renewable energy, we complement this right now in Kokkola for our precursor, for our refining operation. And we will, of course, extend it wherever possible also to our existing operation. But very clear, every expansion will be 100% fed by renewable energy.

And in Scope 3 we have signed already contracts in the past, looking at a very low CO<sub>2</sub>, a very low carbon footprint, of course, meeting all the ESG requirements, with cobalt, with nickel, and also having the first zero-carbon agreements in place for lithium.

And we have set up a clear ambition and roadmap to reduce the carbon intensity for our cathode materials. Industry average right now, it is about 30 CO<sub>2</sub> equivalents per kilogram. We are today at 20 and we have a clear ambition and set up a roadmap to go to about eight. So reducing the carbon intensity by more than 50%, and this will, of course, be supported for areas like recycled material coming then also from Umicore. And with that, we can have a reduction potential of more than 3 million tonnes of CO<sub>2</sub> by 2030.

### **Capture Profitable Growth and Create Sustainable Value: Step-Change in Process, Operational and Organizational Excellence**

Last but not least, excellence in execution. And here, I have to clearly state for rechargeable battery materials, excellence in execution – be it innovation, be it operations, be it supply, be it transformation of the organisation to cope with the huge growth requirements – is really mandatory for the success.

*Continuous improvements delivered... and further to come...*

Let me give you examples on continuous improvement. Operational excellence and continuous improvement, of course, will not only start tomorrow. We have a 20 years' experience in Asia to efficiently operate our cathode active material plants and to continuous improvement.

And to give you some examples, we have reduced the – or increased the energy efficiency by about 15% over the last five years. With the introduction of the latest technologies in Nysa, we will further reduce it. We have looked in downtime optimisation in other areas, and we have increased our output by about 20% on a comparable asset basis.

One area to mention, there is a very close link between R&D development and process development. Step changes in process require a close link with the R&D product development. This is a reason that we also spent sizable amounts for our R&D process development. So, R&D product process development go hand in hand and this will translate it then step-wise for the next step changes into engineering, into footprint and into industrialisation. And here, we have concrete programs set up to really optimise our operations footprint with the latest process technology.

*Set up for further optimisation and innovation*

So, we have, around innovation, continuous improvement, three levels. I just mentioned the process development, which is closely linked also with the product development. We have operational excellence, which includes of course, de-bottlenecking. Also Denis mentioned it already today for the refining business. We have – we are doing this for a year, and this is part of the business model for long time in Automotive Catalysts as well. Then it's, of course, CAPEX optimisation; like for sourcing, its digitalisation. If it's digitalisation, on having automated KPIs, having HEVs, having also the analytics digitalised, because with the high purity requirements, you have very high quality requirements.

Last but not least is the plant design with the expansion to really leverage the economy of scale; with modular plant design – I come to this in a minute; and also having of course, the right footprint selection, which allows you green energy access from the beginning on, which allows you to have the right logistics for the customer, to have the right permits in place when you have a backward integration from cathode material to precursor and to refining. So this is very critical, access to talent and other areas.

So, we have the clear ambition and roadmap to improve our CAPEX efficiency by 30% for the next years until 2030, and also substantially optimise and reduce our OPEX. So this will be a key lever for our efficiency, and finally for our profitability.

*Modular plant design leverages footprint expansion*

Here, an example of our innovative modular plant design. Traditionally you have a more line-by-line design really tailored to a specific battery grade, to a specific technology. We have now introduced, for our Poland operation, a modular design which gives you flexibility between the different building blocks and also optimise, individually, the different building blocks. That means with this modular plant design, we have flexibility for all the different grades we produce now and will be producing in the future. High-nickel, mid-nickel, manganese-rich cathode, catholytes for solid-state batteries. It allows also for

standardisation, and then the transferability to scale, let's say, in a quick time manner. And also that innovation can be transferred to these different building blocks.

So, this is part of our roadmap of efficiency here right now to reduce the CAPEX density by 30% over the next years.

### **3. RISE 2030**

And this brings me back to the key takeaways into what you should remember from today.

#### **Rechargeable Battery Materials - RISE**

*Capture profitable growth and create sustainable value*

Umicore has a unique value proposition. And our strategy is to roll this unique value proposition out to all the major regions for Europe, extending our leadership; North America with an entry plan for 2025; and to further reinforcing our position in Asia. And we will do this along the four RISE pillars. Reliable transformation partner means clearly having value creative partnerships along the value chain. Innovation and technology will remain at the core of our doing – innovation and technology is always the entry card for the customers. And that will not change for the foreseeable future. Sustainability, really work with our partners to decarbonise the value chain. And last but not least, and this is bringing everything together, really excellent in everything what we do, and to be very supportive in this area, to reach the right profitability.

And with this value proposition, we have the clear ambition for sustainable EBITDA growth, going up to a 20 – having a 20% EBITDA margin, and becoming value accretive after 2026. Thank you very much.

And with this one, I would like to hand it over to my colleague, Bart, who will give you an introduction and our roadmap for the Automotive Catalyst business.

### **Mobility Transformation: Automotive Catalysts – Capture Peak Profitability and Maximise Value**

Bart Sap

*Executive Vice President, Catalysis, Umicore*

Very good, thank you. Okay, good afternoon, also, from my side. And I'll do one slide more, transiting from the exciting future that Ralph is showing and the credible plan that we have, I'm now going to talk to you about another exciting, still very promising business that we already have today, which is Automotive Catalyst.

#### **Agenda**

And after this presentation, I hope that you – that I was able to convey the message that this is still a business where we do expect quite some growth, where we do still see a lift up in value, and that we will have a credible plan throughout this 30 year – towards 2030, on how we're going to execute and actually make sure that we capture this value here at Umicore.

## **1. Mobility Transformation: ICE Gradually Declining, but Remaining Dominant Powertrain for LDV and HDV by 2030**

So, let's get started.

### **Accelerating Mobility Transformation**

*ICE remains dominant powertrain solution in 2030*

We're going to start off with the markets. And you see the graph has been flipped. And it's not a coincidence that you will see that here, of course, for the light-duty vehicles, we're still expect 66% internal combustion engines in 2030. And if I go to the heavy-duty vehicles, we're still talking about 78% of vehicles. So this is still very sizable market shares and the internal combustion engine remains the dominant powertrain.

And why is this important? Because on our road to clean mobility, there will still be a lot of internal combustions being built. And that means that if the last internal combustion engine is sold in 2034, these vehicles will still be on the road until 2050. So what we do really does matter and that's why there's still a lot of value in this business with the upcoming legislation, which I will touch upon later on.

### **Light-Duty Vehicles**

*Peak in ICE car production expected in 2023*

Now, if we look forward and if we look in our plan, we still see a peak coming for light-duty vehicles. We can debate whether it's 2023/24; when will the post-COVID ramp be there; when is the chip shortage finally resolved; will inflation have an impact, of course, on the customer demand? Yes, questions out there. Does that fundamentally change our plan? No, it does not, but we still see higher vehicles in the next years, also for the internal combustion engine.

You also see that the gasoline section is by far the largest segment, and, guess what, that's where we are really good and where we have a really good position. If you look to light-duty diesel, it's not so obvious on the graph, but this segment is dropping fast in Europe, yet remains important in Southeast Asia. And there we also have the important customers in our portfolio. So, in 2030 we will still have 60 million internal combustion engines being built globally.

### **Heavy-Duty Vehicles**

*Continued growth in ICE HDV towards 2030*

Transiting to the heavy-duty vehicles, or the HDD, here we still see a growth from 4 million to 5 million vehicles. And here I'm not including the non-roads, so not talking about the tractors or the big machinery which is also going to be emissionised. That comes on top; that's really additional value which you will not see on this graph. And big markets are, of course, China, the largest market, the fastest growing, but also India becomes important and Europe will also still have growth.

## **2. Emission Control Catalyst Market: Attractive Value to Capture the Next Decade**

### **Light-Duty Gasoline Vehicles**

*Substantial tightening of emission norms in Europe and China*

So, if you're talking about automotive catalysts, you really have to talk about legislation and what the impact is of that legislation, so let's have a look together. And here I'm focusing on the light-duty gasoline. And, as you all know, Euro VI – Euro VII and China VII are still coming up. And while we expect that Euro VII will be introduced earliest in 2026 and China VII probably a year later, we are expecting some news hopefully next month on the 20<sup>th</sup>. Then we should know what the emission standards are. At the same time, the Commission has surprised us already several times because we were expecting it end of last year, we were expecting it in April. Let's see if they really give us a target. And if you look, again, in 2030, light-duty gasoline vehicles, in China, 16 million vehicles still there; in Europe roughly 8 million vehicles, very sizable numbers.

What do we expect from the legislation? We expect – and this is on broad consensus with the market – that a reduction of 50% of the main pollutants; I'm talking here about, of course, the NO<sub>x</sub>, the carbon monoxide and the hydrocarbons. But also, there will be more stringent cold-start requirements. There will be stringent legislation on the particles, both in number as well as in the size of the particles, and there's going to be a requirement for secondary emission abatement, so you will be seeing secondary emission three-way catalysts coming in.

From a system point of view, what does that mean? This means – and in a Euro VI system typically you have three bricks. If you go to new legislation, the loading on these bricks will increase going towards 20 – to the Euro VII, and, on top, we do expect additional bricks to come in. So what does that result in? Well, this results in a minimum value uplift that we see for the gasoline section of 20%.

### **Heavy-Duty Vehicles**

*Upcoming tightening of emission norms in Europe and China*

On the heavy-duty vehicle side, there the timelines are more or less the same for Europe and China, with the big difference that in China, first we will see for the HGV the Tier 1, and later on – in the Tier 1 cities, and only later on we'll see it in the entire country. And here, this is also still a market of more than 2 billion vehicles in China, 0.6 in Europe, large numbers. And also, here, the focus – okay, we're talking HDD – it will be on reducing the NO<sub>x</sub> emissions under the best, where possible, conditions, while keeping fuel consumption low. Tighter particulates will also be there, cold start, increased durability. Trucks will have to be able – the system will have to be able to sustain 1 million kilometres, 1 million kilometres, and, of course, we still also have the focus on lower ammonia and nitrous oxide is also coming in.

So, from a system layout, what does that mean? Well, basically it means that we are transiting from a one urea dosing system to a two urea dosing system, basically to manage that we don't get, basically, too much ammonia slip into the environment. So, the two-dosing system will help with that. Ultimately, this will also result in an uplift of 20% in value; that is what we believe and that's what we will see.

### **Attractive Value to Capture the Next Decade**

*Emission catalyst market moving towards unprecedented value peak*



So if I combine all of this together, and now I'm switching, actually, from vehicles to catalytic leaders, so here I'm really talking in volume of the catalyts. Then you see that there's still significant growth, and with our projections, actually the market in 2030 is as big as it is today. Same size, so still very attractive, yet the weight of the heavy-duty vehicles is more outspoken than what it is in 2021.

### **3. Umicore: Well Positioned to Capture Peak Profitability and Maximize Value**

Automotive catalyst emissions, emission abatement, a real technology business. So let me then also now explain a bit how we're going to do this. And I'm going to, now, transit, basically, to the section where I'm going to explain to you how we're going to capture this value.

#### **Capture Peak Profitability and Maximise Value**

##### *Where to play*

So, where are we going to play? We're going to capture the value by keeping our strong position in the light-duty gasoline and we will continue the growth path that we have started and the qualifications that we have under the belt in the HDD segment. And, therefore, our market share will also continue to go up, both in Europe as in China.

##### *Maximise business value through the plan*

We're going to maximise the value. At Automotive Catalysts, the teams are obsessed about capacity utilisation and process efficiency; we have always been in the past and we'll continue to do so. So that means we have always been aligning our footprint, be it either with investments or planned closures in line with market developments, and this is what we're going to do. We're even going to put more focus on it.

##### *How to win?*

And how? I'm going to tell you right now.

#### **Capture peak profitability and maximize value: Embarking the Mobility Transformation together with our Customers**

Reliable transformation partner. The internal combustion is not out, so our customers will still need lots of these engines. And they will want somebody to be there for us in the long run, even when they are transiting to battery electric vehicles. And guess what? Our focus will be we are going to stick with our customers, we're going to do this with them side by side.

##### *Committed and Reliable Partner for Our Customers*

And how were we able to do this? Because we have, already, very longstanding relationships with these customers. With some we work more than 50 years, 50 years. This means that, in our view, we're going to keep on serving them globally and we will actually be delivering products to them from regional plants where their engine manufacturing is, so we'll stay close to them.

We're going to be reliable and credible. That means, as mentioned before, we're going to stick with them throughout the journey, throughout the transformation. And why is that important? Because, yes, we all know what the ultimate goal is, yes, there will be, of course, electrification in the end. However, we don't know exactly how that road will be, and that means that we will need to create visibility together. If the speed changes, how will we

adapt? And this is what we want to do, and that's why we are also developing and actually going into a different relationship in the sense that we want to create visibility for each other, work closely together and be agile together as the market moves.

Of course, we're going to remain a technology leader, not only to capture the value which is coming today and make sure our customers have peace of mind on the new legislation, we're also going to be there for them for cost-reduction programmes, unlock value for them, value for ourselves, and therefore, actually, value for the industry. And, of course, clean air sustainability is in everything that we do.

So, as mentioned, we're going to enter into different type of relationship with our customers; much closer, much more partnership-like. And it's not a coincidence that some of the names that you have seen in Ralph's presentation are also some of our key customers today, because they feel that we're going to stick and they feel that we're going to help them in their transformation.

### **Capture Peak Profitability and Maximize Value: Strong Technology in Light of Upcoming Emission Legislation**

*Proven innovation leadership...*

Innovation, I was a bit fast, earlier on, going to the innovation because, maybe, while I'm not a scientist, maybe I was too passionate about this topic. But also, innovation, we do have a good track record, we have industry-leading, benchmark technologies for gasoline engines – gasoline catalytic systems. And that's why we have this solid market share, that's why we are so strong in this market. We are extremely strong in the GPF section, both in Europe and in China, and we have been developing closed-coupled GPF systems together with Volkswagen, as an example.

But also on the heavy-duty side, we are, technology wise, competitive, and this is proven by our market share gains that we are experiencing right now; the platforms which are ramping up with our technology. And here as well, we have co-development projects with Scania, where we introduced together the first dual-dosing system which will be the standard for Euro VII. You have seen that coming on the slide earlier.

*...With the right technology to grow*

Now, you're only as good as your last technology, right, so you always have to keep on working on the future, and that is what we are doing. And the good news is that we have the new technologies in place for Euro VII and China VII, which are coming up right now.

We've been working on reduced rhodium technologies, reducing palladium, and therefore introducing platinum in the mix to lower the overall cost of the system. And guess what? These technologies are running today on the road; we have qualified with global OEMs with our FlexMetal technology already today. So this is not a plan, this is reality.

Secondly, we're now introducing the secondary emission three-way catalyst brick to avoid ammonia slip, also for gasoline engines. The feedback that we're getting from our customers is just great, they're really happy with the product. So it gives me confidence that this is also a brick which will be landing in our basket as we go to Euro VII.

If I go to the heavy-duty diesel side, there we also have a very interesting development. Actually, something unique that we have, nobody else in the industry has it, and this basically

is our UmiCOR catalyst technology. And what is this? We make our own substrates, substrates made from – paper substrates, basically, I should say. And, of course, it's not the paper that you have right there, that's quite clear, but it's fibreglass paper. And if you say paper, that means it's light, right? Light means less weight, means less fuel consumption. If you imagine a monolithic ceramic-based substrate, it's heavy, it takes time to heat up when you start up the engine. And the paper heats up very quickly. So cold start, very important; the engine has to perform less – less fuel consumption, less harmful gasses towards the environment. And, lastly, also these substrates have less back pressure, again less fuel consumption, and in HGV, it's all about the CO. So we're really enthusiastic about these products.

And I was also talking about durability, you go to 1 million kilometres now. That means that also your filters have to be washable. They have to be ultra-high filtration, they have to be washable, so basically they get taken out after 200,000-300,000 kilometres, they get washed and they have to still get that functionality. Sounds easy, difficult to implement, but we have it.

So the next-generation technologies are in our basket and therefore we are confident for the upcoming Euro VII and China VII NOx.

### **Capture Peak Profitability And Maximize Value: Longstanding Partner in Delivering Cleaner Air**

*Embedded sustainability value: Through sustainable operations and closed-loop services*

Sustainability, I said it. We're talking about clean air, clean mobility. Of course, sustainability is part of what we do, how we think, how we breathe and what motivates us. And also here – one more click, yeah – also here we look at ourselves first, so we're focusing on reducing our own Scope 1 and Scope 2 emissions. Our plant in Bad Säckingen, for instance, is running on hydro energy. Our plant in Americana was designed with the eco spirit right at the beginning in the team; they were passionate about it and very proud to bring it, also, to the management board, so that really lifts into the organisation.

We have been talking about spent automotive catalysts earlier and what the proportion was in our refining business. Well, we have been refining and recycling a lot of these catalysts already for a long, long time. And these PGMs, therefore, go back into our products. And that's not only great from a value point of view, it's not only great from a resource-scarcity point of view, but it also allows to lower the Scope 3 emissions of the entire value chain.

I was talking about technology, and if you talk about automotive catalysts, you want to meet the emission legislation. At the same time you also want to lower, to the maximum amount, the PGMs that are required. Again, unlocks value for the customer, unlocks value for ourselves, but also lowers the Scope 3 emissions. So this is all in the same spirit; we want to bring these emissions down.

*Cleaner Air at the Core of Our Business: Delivering to the strictest emissions standards*

Géraldine mentioned it earlier, approximately 3 billion tonnes of NOx emissions are prevented by our products already today in 2021. For some it's just a number; for us it makes us proud and makes us get up in the morning and say we're making a difference, not only for our business, but also for our families and the community in general.

**Capture peak profitability and maximize value: Organisational Agility***Organisational Agility to Manage the Different Transformation Stages*

Excellence. So all this is great, but how are we going to do this, right? So, in the next chapter I'm going to talk about the operational agility that we have and that we will focus more in the future. But also about the mind-set that we are going to implement, are further implementing, and how we're going to switch our brain from technology and growth to really going to efficiency, cost and cash. And we're starting that now and luckily we have time because the market will still peak.

So, mentally we're putting it, somehow, in three blocks, and of course these are not exact, hard periods, but it's just to give some structure in our thoughts. And in the short term we are focusing on capturing the peak and growth, so that means that we will still have selected capacity investments and we expect that our CAPEX will be roughly 20% higher than in 2021 in that period. In the peak, you will see that as of 2025/26, our CAPEX will start dropping below our depreciation level; and in 2030 will be down below 50% of our depreciation run rate at that time.

Capacity utilisation, over lunch I had quite some discussions with some of you and we are really passionate about capacity utilisation in the past and what we have been doing now. So, we will continue to align our operational footprint in line with the market developments. That can mean investment, but also, of course, plant consolidation.

Cost reduction. We still have to capture the peak. Technology is still extremely important in a first phase. We are still running our plants at full capacity or above 85%, so our cost base will be stable at the start. Yet, today, we are starting with the efficiency [inaudible], we're thinking much more end-to-end processes. We're introducing digitalisation to be ready to go down in our cost curve already in the second stage, and definitely in the final stage. So that means that in the maturity stage, in 2030, we will bring down our fixed costs, our annual fixed costs, with €100 million compared to 2021. So our fixed costs in 2030 will be €100 million lower than in 2021; a big number and please do remember it.

*Net working capital evolution*

Net working capital, it's going to increase because growth is great. Unfortunately you have to invest for it. It would be easier [inaudible] if you could invest without the CAPEX, I think, because that's a big topic in the room it seems. Now, working capital will move up at the start. Later on, it will start declining, not necessarily because our business is going down, but because we assumed a normalisation in the PGM prices, as Filip explained earlier. And ultimately it will be 40% lower in 2030 than it is today.

If we do all these things right, and we will do all these things right, we will be generating €3 billion cash over the 2022-2030 period, so in nine years – not 10, in nine years.

*Fostering an agility mind-set throughout the different transformation stages*

So, these are all great numbers and they all work well in an Excel sheet, and it's all very nice, but you need people to do it, you need to act on it. And that's why we have launched, already half-year ago, a cultural change programme. So we're going to transition, as I said earlier, from a growth technology, or pure growth and technology mind-set, to a cost-efficiency mind-set in the end. And it's a matter of perspective. So our colleagues are

motivated by targets, they are motivated by what we measure and what we do, and if we engage, we do it with passion. So it's a matter of, also, transiting these minds, and that's where we're going to.

Now, maybe something that I didn't stress enough during this presentation right now is that Automotive Catalysts is much more than just cash, it's much more than just revenues, we have a great talent pool. And at Automotive Catalysts, we know how to talk to OEMs; we speak their language, we know their systems, we know their quality requirements, we have the network. And that makes a hell of a difference for Ralph and also for my colleagues in Fuel Cells because you really see these links coming up and you're talking to the same people.

That means we also have lot of talent, of course. And that means that this talent will, of course, will meet them still in the short term here at Automotive Catalysts. There's also a lot of talent that can help the growth of Fuel Cells and RBM. And we'll be launching active programs actually to move that talent, basically, from AC and Catalysis in the long run to either Fuel Cells and RBM. So also for our colleagues, there's a real good future ahead of us.

#### **4. RISE 2030**

##### **Automotive Catalysts – RISE: Capture Peak Profitability and Maximize Value**

So if I now wrap this a little bit up, what I would like that I was able to pass to you is that we are going to capture the market peak. We're going to stay this leader in gasoline. We are continuing to grow in the HGD segment, both in Europe and in China. We are going to be the reliable partner. We're going to be their weather customer. We're going to be side by side with them through this transformation.

Innovation remains at the core of what we do both in the short-term, but also for the cost optimization programs later on. Sustainability is really very close to us and also helps us going every day of the week. And we do have a plan and excellent execution.

So let me remind you, €100 million in fixed cost reduction in 2030, working capital going down by more than 40%. CAPEX below depreciation level, 50% below actually M2030. And all this together, of course, will allow us to generate these €3 billion cash flow, which I have been talking about earlier. We have great returns, ROCE approaching 20% in 2030 and, of course, still very solid EBITDA margins.

So I think, at least in my mind, I would like to conclude that this is still a very sexy, attractive business that gives me energy every day. And I would like to work with my colleagues on this one in the next 10 years to make this real success. So thank you.

#### **Q&A**

**Evelien Goovaerts:** Thank you, Bart. We are a little bit ahead of schedule, which is, I think, not a bad idea because something tells me that we will have quite some questions during this Q&A session. There are already a lot of questions lined up from the webcast. So let's see if you can do better here in the venue.

So Mathias, Bart and Ralph.

**Ralph Kiessling:** I need a chair. Yeah, Mathias?

**Mathias Miedreich:** You see our flexibility is not only in our manufacturing system for CAM but also in the setup of the stage, to be always to the moment.

**Gunther Zechman:** Good afternoon. Two hopefully quick questions. Can you give us a feel for how much you're looking to invest in the greenfield, in the North American rechargeable battery materials greenfield site, please? And secondly, just on the last point that came up, the €100 million fixed cost reduction in the auto cat's business. What's the cost split between fixed and variable cost in the business today, please?

**Mathias Miedreich:** Yeah, maybe you start with the last one and then we –

**Ralph Kiessling:** I would say 70%, 75% variable.

**Mathias Miedreich:** So coming back to the first question, what is the CAPEX for North America you have seen? Filip has said before, from the €5 billion or more than €5 billion that we have said before, €4 billion will be invested in the E&ST and Battery Materials side. And I would say of that, if you would take around one-quarter of that should be the North American number.

**Gunther Zechman:** Thank you.

**Wim Hoste (KBC):** Good afternoon. I have two questions, please. First, the discussion, LFP versus NMC. I was wondering to hear your thoughts about LFP outside of China. I think there was a slide mentioning 25% globally market share for LFP and then 75% for NMC. So what's the regional breakdown of the market shares of the technology?

And then also for your business in China, how profitable is it today versus the rest of the NMC operations and also, what's your profitability outlook for that business? I think there's probably some fixing still to do on the pricing side, etc., but could you maybe elaborate a little bit on that as well? Thank you.

**Ralph Kiessling:** Yeah, starting with the first question on, let's say, global LFP share. Yeah, let's say, we estimate about 25%. We see that it will be substantially higher for China. It's already higher right now. While, of course, also in the customer roadmaps, there's certain mention about LFP for the other region.

There are not established footprints and, at least from today's point of view, we also don't see announcement on established footprints. And as we see that the different regions regionalised and there's really a request on regionalisation, we believe that the market penetration and market share for LFP in China will remain higher than it is for the other regions.

**Mathias Miedreich:** And then there was a final question on pricing, right?

**Ralph Kiessling:** Yeah, there was a question on China. Yes, our China assets are currently still underutilised. And as I said, in our strategy going forward, with the customer programmes, with the qualification, we see that our utilisation will increase towards 2024. And then we have, let's say, clearly utilised plans, which will then also bring us sufficient and the right returns.

**Riya Kotecha:** Hi. These questions are the Ralph. I'd like to understand your rationale for seemingly increasingly focusing on the design-to-cost segment with a manganese-rich versus the higher performance segment with high-nickel. I understand that manganese-rich is a bit

more of a competitor to LFP given the pricing per kilowatt hour. And is Umicore facing the decision to somewhat trade off margin for market share by entering into a bit more of the mass market?

And then how confident are you that you can achieve the premium pricing, which was discussed in the first couple of sessions, with entering into section of the EV market that's more price sensitive? And related to that, can you give us an idea of what mix you will have in terms of the manganese versus high-nickel versus mid-nickel?

**Ralph Kiessling:** Yeah, I think for manganese-rich, coming to your question on price sensitivity, I think you need to look at this from the total equation of the pricing from manganese-rich, including the metal manganese-rich. The nickel content is substantially lower than, for instance, for a high- or even a mid-nickel technology.

So from a system, from a cathode material system point of view, so it has clearly advantages. When it comes to the added value for Umicore, we do not see major difference for that, but, as I said, for the total system pricing.

When it comes to shares right now between high- and mid-nickel and manganese-rich, this is reaching out mostly in the second half of the decade. I said that we estimate manganese-rich kicking off into mass production scale requirements after 2026 or in 2026 right now. So it's a bit too early to pre-empt what the shares between high-nickel and between mid-nickel and manganese-rich will be. We see growth in the nearer term, first of all, for high-nickel, but on the longer-term also then the design-to-cost segment further evolving.

**Mathias Miedreich:** Maybe I can add to that. It is not the case that we have decided to sacrifice the high-nickel or high energy density segment for the sake of manganese-rich. The manganese-rich, the HLM applications are specifically designed to address what would be design-to-cost market, which is a contender towards LFP. And you have seen before that we estimate this market segment to be around 25% of the total market. And as Ralph has laid out, from a customer side, OEM side, this is great because HLM as a cost of everything, including the metals, it's significantly lower, and they will save money.

Now, from an Umicore side, so our value creation part, the things we are doing with the metals there is not such a significant difference. So even that we are entering that segment, we do not see a negative impact on our average profitability.

**Riya Kotecha:** Thanks. That's really clear. And my second question is to do with the value chain localisation of HLM. I understand that about 80% of the manganese sulphate and about 35% of the electrolytic manganese is still produced in China. So how easy is it to relocate the value chain towards European markets?

**Ralph Kiessling:** Yes, that's true that, let's say, a maturity right now for the manganese is coming from China. We see also certain footprints coming up for manganese in Europe, for Euro manganese ramping up about 2025 and others. There is also the possibility to go via manganese leaching, for instance, from the metal side. So there are opportunities clearly to more regionalise the value chain also for manganese in the longer term.

**Charles Bentley:** Thanks. So a question I asked earlier was gigawatt hours to kilotons conversion; can I get the answer to that one? You said earlier the CAPEX intensity of the US is going to be lower than other regions. Is that just because the efficiencies you've talked

about? I mean, I guess if I think about cost of steel equipment, so on and so forth, surely is going up. So just get a little bit more on that.

And then one more thing that Filip said earlier was that the relationship between the CAPEX intensity and working capital requirements no longer holds. I was just interested in why that no longer is the case because I guess previously, you said half to one. And then obviously if we look at lithium prices, cobalt price, nickel price are all very, very high. So you would think that's even more the case. So anything more on that. Thanks.

**Ralph Kiessling:** Yeah. Coming to your first question to the conversion factor on gigawatt hours into tons right now, it depends, of course, on the technology to be applied. But if you take between 1.2 and 1.5, this is a fair range.

Coming to your question on CAPEX efficiency and CAPEX density reduction, this applies, of course, in every region where we do. So yes, you have certain differences on construction equipment, on infrastructure in this area, depending in the country where you invest, this is clearly. But this roadmap is across the board and is applicable for all regions.

**Mathias Miedreich:** Maybe I can add to that because I was answering that first topic. As we said, it's more a function of time than of region. So when we are – as we said, our ambition of 2025 launching the North American plant, we will be at a more advanced stage in the standardised manufacturing system than we had been a couple of years ago when we started at Nysa.

So that means at this point in time, there will be already a lower CAPEX density. And later investments will have even lower CAPEX density versus the 30% plan that Ralph has mentioned.

**Ralph Kiessling:** Yeah. Working capital equation. Yeah, the reason why this is maybe counterintuitive because you would say the prices are going up of the metals. While we say, no, that's not anymore the case – it's more less than that, the percentage – is because we see that more and more, we are able to convince our customers to carry some of those items on their balance sheets. So consignment models or other things like that. This is a tool that we are successfully using in the market.

**Nicola Tang:** Hello. Actually following up on that point, you mentioned earlier this long-term security of supply of low-carbon nickel, I think you mentioned, and maybe on the lithium side as well. Can you talk a little bit about the agreements there? Is it secured volumes, but flexible in terms of pricing? And then in terms of offering the closed loop to your customers, how do you reflect that in terms of price? Is it again a straight pass-through and how exactly does that work?

And then the second question was on the Auto Catalyst side of the business. Could you talk a little bit more about how KPIs for some of your employees are changing to now focus more on value and free cash flow rather than growth? And I was curious, you talked about those new partnerships or new types of partnerships with OEMs. Could you explain a little bit more, I guess what you're doing there and what it means in terms of visibility and contract structure? Thanks.

**Ralph Kiessling:** Yeah. On the nickel contracts you mentioned right now, low-carbon nickel contracts, I think it's a difference between on the – we are talking about low-carbon nickel



contracts and you relate it also to nickel pricing. So we have business models in place where, let's say, the price, the metal price itself is a pass-through. So it's not part of our value add. So it's not a direct link here between the nickel pricing, on the one hand, and also about the carbon footprint of the nickel on the other hand.

**Mathias Miedreich:** And it's lithium as you mentioned, right?

**Ralph Kiessling:** And lithium as well.

**Mathias Miedreich:** Yeah. And sustainably sourced.

**Ralph Kiessling:** Absolutely.

**Bart Sap:** So on the Auto Cat, there were two questions, right? There was the partnership structure and the KPIs.

**Mathias Miedreich:** KPIs.

**Bart Sap:** Well, today, our colleagues are – well, our colleagues are always value-driven. That's one. So that's the main KPI and that's also the KPI that stays in place right now because we still have to capture the peak, we still have to qualify the business.

Of course, already today, we have very strict targets in our operations: capacity utilisation; PGM efficiencies; the number of passes a product needs to go through the furnace, how can we increase that? So these KPIs will stay.

Now, of course, as we transit further, it'll be really – I mean, what is now the weight of our SG&A, for instance, in the overall? I mean, what's the R&D weight that we going to have in our portfolio? How many FTEs we really sometimes need in certain sections?

So these KPIs we're currently designing and they will be designed and function, of course, of the strategy which we are now doing. But here we are at the start of the process because we are focusing right now on capturing the peak.

If you're now talking about these partnerships, then it's much more to have an open discussion in the sense that today, it's mainly you qualify for a platform. And, of course, there's some tolerant bands, for instance, on the amounts that you have to deliver and, basically, off you go with the market. In the future, this will not be so easy because you cannot really predict where the volume is going to be. So you really have to talk, okay, how are volumes evolving and what is the consequence for your pricing, for instance? How are you going to deal with spare parts? How do I make sure I really get good visibility on your demand so I can optimise my footprint? Then I can – I'm doing something wrong I guess, or okay. Then I'm optimising my footprint –

**Mathias Miedreich:** It's your beard.

**Bart Sap:** It's my beard. Whoa. Look, I'm looking dangerous, am I? No, it's about if I want to have a high capacity utilisation, I need to have a good visibility. So it's a much tighter cooperation. And as these platforms will last longer than typically four or five years, I mean, now we're talking seven, 10 years, it's frankly a different relationship. And not just to roll over with continuous cost decline, this will not be any more the case.

**Jean-Baptiste Rolland:** I wanted to come back on what you mentioned about co-investment and I was wondering if you could give us a picture of what your ideal partner looks like – size,

reputation, whether more of an OEM type or a battery supplier, whether potentially European or Asian. And if I'm correct thinking that for your future partners, that exit costs would probably be higher on your side than on the side of your partners. How do you intend to protect yourself? That's my first question.

Second question with regards to technologies. I understand that you anticipate to extract the same value between manganese-rich versus NMC, regardless of whether mid-nickel, high-nickel. Does this suggest that you have, from the onset, started to discuss returns and pricing in your discussions with your prospective clients you're in qualification with? And I'm also, I guess, tying in with the co-investment model, how does this co-investment model, I would say, change the traditional qualification process that you used to go through?

Third question in relation to your market share. If I heard correctly that you are aiming between 5% and 10% of market share by 2030. I remember that BSF is aiming for 10% of market share by 2030 in battery materials. I'm not sure what is the critical size that's necessary to extract the most economies of scale, but how do you intend to extract economies of scale in that business knowing that from the – I would say, by design, because as you point out the localisation model caps in nature the economies of scale? How do you intend to extract these?

**Bart Sap:** Yeah, let me answer the last question first, because I think there's a misunderstanding we had in the discussion before. We said the global equation that we have in our capacity versus the market that we see versus the bottom-up customer demand, we think we are around 20% market share, right? And we concluded before that this 20% market share could be higher, but we deliberately want to prioritise value creation in front of growth. And the roadmap, how do we come to that number is not a top-down equation. It's a bottom-up accumulation of customer demand in a certain way that we think that we should be going forward.

And now let's come back to the first question. What is the ideal partner? I think there is no ideal partner per se and the partners that we have, are great partners already because we're not starting from scratch, right? So we have already announced a couple of those companies. Per se, we see that the value proposition to do such kind of partnerships is more on the OEM side.

Now, when I say on the OEM side, it doesn't mean it needs to be an OEM who is partnering with Umicore because you know that the OEMs have different strategies, how to integrate in the value chain. Some of them do the batteries themselves, others invest maybe together with other OEMs in battery manufacturers. ACC is one of those examples where Mercedes, Stellantis and Total have invested together. But at the end of the day, it's their vehicle through which they're doing partnerships.

And I think for us, the market, we have three types of customers. First are these OEMs where we talked about the importance of partnerships. Second are battery cell players that are in the very strong ecosystem of an OEM; example of ACC that we mentioned. And the third, and still very important part for us as customers, are the cell makers themselves.

But if you want, basically, a degree of integration, partnership will be more on the OEM related side. And on the cell-related side, it will go more on our value proposition on the

technology roadmap that Ralph has explained, but also our reach into the value chain. But these are different type of partnerships then.

Your question is the costs of exit, aren't they more on our side than on the partner side? And here again, I repeat what I said before. A requirement for us is to have value creation. Otherwise, we wouldn't do a partnership. This also includes guardrails in terms of what if this could be contractual by mechanisms or by agreements so that we would not be in a position to have a one-sided exit cost side because this is never good for any kind of joint venture or activity if it's not a balanced approach going forward.

Towards the question of qualifications, I think there are two elements of it. The integration of our R&D teams into the R&D teams of our customers, in that sense, those qualifications are different because there's a much more frequent and deep exchange on what is needed and how this has to be engineered. But from a pure quality point of view, because you do qualification because you follow a standardised process of quality assurance to mass produce certain things, we do not compromise on those processes, be it a joint venture, a partnership or a singular customer. This, we will not compromise on in a certain way, but the R&D cooperation, indeed, has a much deeper character than before.

**Ranulf Orr:** A question around the capital intensity of the RBM business. So maybe you could start by giving an idea of what your average CAPEX per tonne or gigawatt hour is. And then following that, talk us through the journey and how you expect that figure to evolve over time. Under a previous management, the idea was presented that the greenfield investments are done and ongoing. It should be up to 30% lower almost immediately. You're now saying 30% reduction by 2030, so a lot further away.

And secondly, on recent calls, there were comments around technology step changes coming to manufacturing process that would also bring down the cost of –

**Bart Sap:** Yeah, CAPEX density.

**Ranulf Orr:** So why is it only 2030 and why does it not come sooner, I guess is question one. And then just on technology as well, if you don't mind. Could you give an idea of, are all your eggs in one basket now with solid state and your new partnership? And what's happened to silicon anodes? Because they were previously fairly prominent in your materials, but it's gone quiet. Thanks.

**Bart Sap:** Maybe you start on the technology side and I will answer then on the CAPEX density side.

**Ralph Kiessling:** Yeah. As I said, on the technology side right now, we're intensively working along the value chain between academics and also with OEMs, with start-up, on the development in cathode right now. With our announcement to work closely with Idemitsu, we will accelerate on the catholyte side and we are also going in other areas like silicon carbide.

Here, we are not, let's say... And we are still more in an elaborative phase right now, like with other technologies, like we have, for instance, for sodium iron, we have for this [inaudible].

So we are in parallel really on the one hand monitoring, on the other hand, developing also the long-term developments. But I think it's fair to say that solid-state batteries is on the most advanced side, yeah.

**Mathias Miedreich:** Yeah. Maybe one comment also to the announcement that we have done to have this partnership on the catholyte. So catholyte is one step into solid-state batteries. That doesn't mean that we are stopping our activities on the cathode active material, the traditional CAM for solid-state batteries. In the opposite, we are accelerating that. But what we had in mind is to partner with the best in the world.

And we think that our partner is one, if not the best in the world, looking to the patent portfolio and technological strengths to unlock that next step, that next big thing that could be there in solid-state batteries, this catholyte. But that's not closing doors or not putting all eggs in one basket, I just wanted to clarify that once more.

Now coming to the CAPEX intensity, deliberately we have not disclosed these detail numbers on CAPEX density because it's a very important aspect of our competitive position. But you could take a result of the partnerships we have been able to do and the contracts we've been able to close, that our current CAPEX density or the CAPEX density that we are including in the offer forward, is quite competitive.

Now, why are we saying 30% towards 2030? This is because we also have scaled up our ambition and we have scaled up our ambition in terms of footprints. But then also, as I said before, the value chain integration. And it's true if you have – once you have a greenfield and we have that now in Europe, we have that in Asia, the additional CAPEX or the CAPEX density will be more than 30% even faster. But we took an average number that takes into account our overall ambition that we have presented here today.

**Ranulf Orr:** Silicon anodes.

**Bart Sap:** Yes, silicon anodes is something that we have reached a certain position in IP and in product maturity but you have seen that our plan going forward is an ambitious one. It is ambitious also in terms of CAPEX. So we have to make the decisions that we think are most value creative for Umicore.

And today we have prioritised in this plan on others. It doesn't mean that we will not at one point in time industrialise what we have created here, either alone or with partners, but at this point in time, our focus is on the roadmaps that you have seen and that we have highlighted. And that's also part of our CAPEX plan.

**Evelien Goovaerts:** Maybe some questions from the webcast. I'll take one question from the webcast and then we'll hand over to you. So you mentioned a lot about significant footprint expansions. We saw that on the slide. To what extent is this based on contracted business?

**Ralph Kiessling:** What we do, we are in continuous and advanced qualification with the different customers, with the different partners. And we will then have a staged approach to really transfer – once we have the confirmation from the partner, to realise and to translate this also in CAPEX commitments.

So when it comes to the outer years, this is based on the top-down approach, but not our approach, that of the customers. That means for our bottom-up approach, what let's say the capacity ramp-up is, but the execution of the capacity ramp-up with, let's say, the CAPEX commitment will come at this point in time when, let's say, we have final commitments, be it contracts with partnerships, so with our customers and partners.

**Mathias Miedreich:** But what we said earlier today is also that if you just make the math and look to the over 400 gigawatt hours in 2030, and if you mirror against that, the ambitions that have been communicated already with the customers that have already been communicated, we are already at around 50% of that 2030 ambition.

**James Hooper (Bernstein Research):** A couple of questions. The first one is about the joint development of the batteries tech. So for example, as Ralph mentioned earlier in the presentation, roughly half of your 2030 capacity is already taken up. To what extent is that technology going into that capacity being agreed with your customers and is it part of the joint development projects? Or are you still very much on the hook and paying for it yourself, thinking through what technology is going to be required by the customers?

And the second question is about the cash profile of the Auto Catalyst business, the €3 billion target for the next 90 years, FCF makes sense. But is this going to be more backdated towards the later years when you start to see the ramp down? Because obviously, with €5 billion CAPEX in the next few years, that might be when there's going to be clearly some need to use the balance sheet in the next couple. Thank you.

**Ralph Kiessling:** Maybe we start with...

**Bart Sap:** Yeah.

**Ralph Kiessling:** When we talking about joint developments going forward, that does not necessarily mean that we're talking about joint chemistry developments because this is our core of our competencies, but it's joint developments when it comes to have specification and to integrate it really in the cell design. And here we are closely working with the OEMs, with our end customers. And this is what we said, also the partnership directly have access to the OEMs, is really accelerating to have the right specification and to have the right design.

**Mathias Miedreich:** And maybe also, let me make one more point to that. I'm not sure if we said it very clear in the discussion so far. When we talk about partnerships, that means partnerships to produce cathode active material and upstream integration. That does not include IP and technology that we have on the product side. So all of the agreements that we are about to make, and that we have made, is absolutely securing the IP of Umicore. This IP will be valorised but is under our protection.

I just wanted to make it sure. Partnership doesn't mean that we are diluting our intellectual property all over the place. No, that's very much concentrated. In that sense, we are also independent of these customers. And then there was the question of the cash flow profile.

**Bart Sap:** Yeah. So thank you for the question because it also allows me to get across a message that actually I forgot to pass during the presentation, is that while we do see the value peak in the market around 2024, I said, we expect that more end 2025, 2026. So as we looked in PGM normalization at that point in time, and as only at that point in time, the peak has passed, indeed, it will be 2026 onwards that we really start seeing the big free cash flows.

At the same time, we will continue to generate already quite substantial cash flows in the – let's say, in that stability transformation phase because the growth is happening in the next years, but then it will decline further to the end.

**Riya Kotecha:** Hi. Some of the OEMs like Tesla are talking about cathode flexibility to mitigate raw material volatility. Do you think that's credible or practically possible? Are you having similar conversations with the other OEMs that you're seeking partnerships with and how does that fit in with the strategy of trying to secure contracts and volumes when they seem to be looking for a bit more flexibility? Thanks.

**Ralph Kiessling:** I think when it comes to cathode flexibility, of course, you can have, let's say, with the OEMs, developing technology, roadmaps, and qualification around different cathode material formulation. And you may be able between platforms, then switch a little bit forth and back. But you have rather long qualification periods with the highest quality requirements. So it's not really a commodity where you can plug and play, and cathode material A in and B out. And the other way around, because metal prices are fluctuating, I don't see this

**Georgina Fraser:** Hi. I've got two questions. One of them is, you've got quite different strategy in Catalysts compared to your competitors, or the two big competitors out there. Just wondering how you see that in terms of a competitive advantage. Is it easier to get the best talent in the market at this point already?

And then my second question is Umicore, therefore, still being committed and leader in catalyst, but also in batteries? Is your go-to customer strategy evolving? Do you have, Ralph and Bart, the same customer meetings? Is it EV or next generation catalyst?

**Bart Sap:** Should I take that one?

**Ralph Kiessling:** Absolutely.

**Bart Sap:** Yeah. Indeed, I mean, we're pretty outspoken that we want to be the transformation partner and that we are sticking with our customers. Again, because the visibility in the market will highly vary. I mean, also for the OEMs, I think they're really looking for a partner to rely on and help them doing that transformational transition. So we are convinced about that and we're going to stick with that few.

If you say then do we work together with the same customers, Ralph and myself? Well, I'm coming from the Battery side before and Ralph is coming from the Auto Cat side before. So it makes discussion really easy amongst ourselves. And we're also already exchanging talent.

So to give you a concrete example, I think – how long is it now, nine months ago or something, the sales head of Automotive Catalysts actually moved to the Battery Material business because he has the network, he knows how to talk to these colleagues. And actually, I'm also receiving talent from the Battery group because they bring this focus on how can we be more agile because the Battery business is a bit more dynamic?

So they can learn in both aspects. And ultimately, we will have this, indeed, talent flow from one to the other and ultimately, of course, from Catalysis to the Battery. So I really think it's an asset.

**Ralph Kiessling:** Yeah. And also coming back to the first part of your question, do you think it's a competitive advantage or is there any consequence out of the different positioning of the three main players? We think, yes, it is because if you imagine, and again, put yourself in the shoes of a car manufacturer and you can choose whom to give the business. First of all, company A that has only that type of business left and might be constrained into the future

with that, I mean, in general, as a general segment. Or company B that is actually trying to, in certain way, carve out that business. It's not very clear what will happen, maybe nothing, but maybe something not good.

Other than – in the Umicore case, everybody knows what will happen because we, and I used that word before, have skin in the game. We have future business on battery. We have current business on the catalyst side and we have even more far-out business on the fuel cell side. So therefore the long run, the customers see that as well and we see the first positive sentiment in that direction.

**Bart Sap:** Yeah. And if I can add another concrete example, we have OEMs coming to us and asking, 'How is your future revenue profile looking? If ultimately long term the Cat business is going down, do you have other revenues because we need a partner?' And then we see that the revenues stepped up in Battery Materials and Recycling is gigantic. And these OEMs make these big eyes. 'Wow, I mean, this is really a differentiator.' And again, I explained that's why some of our partners at Automotive Catalyst are now also the partners of Ralph.

**Ralph Kiessling:** Absolutely.

**Mathias Miedreich:** Yeah. And then over there, exactly, or the other way around, it's okay.

**Sebastian Bray:** Thank you. Can I come back to the 200 gigawatt hours? Mathias, as you mentioned as being covered by existing agreements. And it comes back to the question I asked earlier this afternoon on how much of this is Umicore versus how much is the partners? Because the VW JV, at the time it was announced late last year was up to 160 gigawatt hours, or roughly that by 2030 if I remember.

And Stellantis ACC gave a figure of up to 46 gigawatt hours, I believe was the number by the same period. And if you add those two together, you get close to 200. Does the 200 gigawatt hours include the 80 gigawatt hours of capacity that VW would 'claim for itself' within that JV? Or is there an 80 gigawatt hour additional that you view as signed and is included within that 200 gigawatt hours?

**Mathias Miedreich:** Just to be clear, that when we talk about this ambition of 160 gigawatt hours for VW, meaning – that means that the ambition of the joint venture to be created has a capacity of 160 gigawatt hours towards 2030, which represents around two-third of the demand of VW in Europe, which is around 230 gigawatt hours, I think, which was the number.

So the strategy is to secure this part of the supply for Volkswagen with this joint venture, together with Umicore. So, all of these 160 gigawatt hours is in the joint venture and will deliver to Volkswagen. And on the ACC side, it's the same logic with a little bit different setup.

So that's why I was referring to already those two partnerships ambitions that have been said, give us already about 50% of the ambition that we have articulated. That was my logic that I have put forward.

**Sebastian Bray:** The 400 gigawatt hours, it's not a fully – it's not a prorated consolidated figure, it's a total of all the projects in which Umicore would be involved. Because my understanding of the VW project is that Umicore's share is 'half of that.' So it –

**Mathias Miedreich:** No, no, the way we – okay. So the way we are projecting it is as a capacity, including the full 160 gigawatt hours, not half of that, the full 160 gigawatt hours.

**Sebastian Bray:** And the CAPEX of the €5 billion is for all of the 160 gigawatt hours or just for half of Umicore's – or the € 4 billion, pardon me for –

**Mathias Miedreich:** It's only for the Umicore part of that, as we have said earlier.

**Sebastian Bray:** That's understood. So when you say the 200 gigawatt hours, it's purely referring to the ACC and VW announcement?

**Mathias Miedreich:** Exactly. Exactly.

**Sebastian Bray:** That's understood. Thank you.

**Speaker:** Hi, just coming to the co-investment bit that you mentioned before, looking at your cash flows, it doesn't look like you really need money from outside. And you mentioned access to capital markets, your debt and equity co-investments. Would the equation, in terms of your locking in the pricing profitability margins, change if an OEM or somebody had to co-invest with you? Is that some sort of quid pro quo that you're offering?

**Mathias Miedreich:** Maybe let me answer the question about turning it around a little bit. The rationale for us to do this kind of partnerships, one element of that is co-investment. You're right that we have very strong cash flows and we have financing means of different kinds but the more important thing for us is – the other elements of that is to lock in or secure demand as well.

So it's a very good and a very significant side effect, if you will, that there is a co-investment, but the ability to, with a very high likelihood, prescribe the future demand of the CAPEX that you are investing, and the strong and very close cooperation from an engineering and R&D point of view that you can imagine in such a partnership, is much more open and gives us much more foresight on what this specific customer is needing. These are the key elements outside of it.

So it's not – we are not doing this because we are at the mercy of the customers to get their money to make it. We're doing this – and as I said before, it was not a process we just said, oh, now let's go to partnerships. It took us some time to accept also that fact that it is a strategic – it is actually a value up for us doing a business through a partnership with an OEM versus doing it on a standalone business. That's how we look at it. And the positive side effect is the impact on financing.

**Speaker:** And the second question is, as you said, 50% of your capacity is spoken for in a way. How do you come up with the other 50%? Is it already some sort of negotiations that are ongoing that might come to fruition?

**Mathias Miedreich:** Absolutely. Absolutely. And there, it's very important to – if you can memorize again, the picture that I've shown at the beginning with those four phases, we are now in the phase two. In this phase two, we are benefiting from the work that has been done in the last two years in work on high-nickel chemistries. And as we said, we are currently in what we call advanced qualifications, so that's very far in the process. We have said that also a couple of months ago that we are in this process and that we would inform about good news on the way. ACC was one of the first, or was the first announcement and there will be



more to come. So there is a funnel, if you will, that will further go into 2022, 2023. This will be the two pivotal years to make that happen but then we'll start to fill the other half of the capacity.

**Speaker:** Can I just ask in terms of probability of the funnel, what percentage you're using?

**Mathias Miedreich:** This is a very detailed question, probably. So when we talk about this, we have a high confidence that it will happen, but I wouldn't want to express this in a percentage.

**Speaker:** Thank you.

**Evelien Goovaerts:** We have a bit more time for a few questions from the audience dialling in online. So you talk a lot about closer partnerships in the form of JVs or other partnerships. Are there any risks that Umicore could lose business with existing or even future customers who may not be comfortable with what could be seen as a lack of independence?

**Mathias Miedreich:** This is a very good point, actually, and this is something that the customers are also addressing to me when I talk to them. And what my feedback is at this point in time, of course, this model has a limit. This model has a limit that we cannot do this kind of partnerships with unlimited partners. And if you look to our ambition and the ratios that we have just discussed, you see that we have scoped our ambitions also in a way that we probably will not have 10 partners in this kind of way, it will be less of them.

We will always make sure that each of the companies – what we are demanding on the one hand is value creation. So the type of contracts and the type of agreements we are doing, we want to make sure that this creates value for Umicore. But what we have to give, on the other hand, is an unrestricted attention of that activity towards the respective customer.

So we will not compromise for further growth if we are not convinced that we are able to serve our customers that we have selected or that have selected us. I think that's a very important point to do. We don't compromise on profitability and value creation, and we cannot ask our customers to compromise on excellence of execution and dedication of our teams.

**Evelien Goovaerts:** And then a question on the single versus multiple sourcing of cathode materials. So recently, we have been saying that customers have been shifting from typically single sourcing to dual or multiple sourcing. Has anything changed recently? And if not, if it's still multiple sourcing, what is then the visibility that we have in terms of platform share?

**Ralph Kiessling:** I think for specific platforms, we do not see really multiple sourcing, but we are, let's say, working on certain platforms with our customers. And usually, these platforms are not shared, let's say, with different cathode makers. So it's clearly dedicated platforms, let's say, with our partnerships.

**Mathias Miedreich:** Yeah. And just to make clear, it is a very big effort to do a qualification. It is impossible to say today the weather is like this, I change the cathode material supplier. It is a two to three-year project that a lot of cost is involved. When we talk about multiple sources, then it is OEMs or cell makers work together with different and not only one cathode manufacturer. But on the selected platforms, it's very rare that you have this multiple sourcing because it will mean that you have to spend double the cost to qualify it if you do it from the beginning; or even more, if you want to introduce it throughout the running of the

platform. So when we talk about multiple sourcing, it is multiple sources over the portfolio of a customer, but not in a single specific platform.

**Bart Sap:** And maybe that brings us, again, back to the partnership model because that's creates commitments for these platforms from both sides.

**Mathias Miedreich:** Absolutely.

**Evelien Goovaerts:** Thank you. Time is officially up of this Q&A session, so we will take one final break of 20 minutes before we kick off the last set of presentations. So we will be reconvening at 16.15 UK time. Thank you.

[BREAK]

## **Mobility Transformation: Capturing the Emerging Growth in Fuel Cells**

Bart Sap

*Executive Vice President, Catalysis, Umicore*

### **Agenda**

Very good. Thank you. So I'm back and let's go now back to the future. So for the one that was part of the 1980s, that might still mean something. So let's now talk about another part of mobility transformation, which is called fuel cells. And actually, this is a business that may be flew a bit under the radar here may be in your view at Umicore, but it's a business actually where we are pretty successful in it.

And right now, we would like to explain a bit more on what we are doing here at Umicore and why we think that fuel cells, especially towards the end of the decade and definitely beyond, will be an important business for us, an interesting business and that we're starting from an excellent position today.

### **1. Mobility Transformation Driving Exponential Growth in Hydrogen Fuel Cell Catalysts**

#### **PEM Catalyst Market to Witness Exponential Growth Towards 2040**

So in good tradition, let's start with the market because that's where everything begins. In general, one can say that there's a strong regulatory support, both in Europe and APAC for a hydrogen economy. And we have carefully studied the full value chain, the hydrogen value chain, and we came to the conclusion that for Umicore, the area where we want to play, the area where we want to capture the value and where we think the value is, which is also very close to what we know very well, is actually the proton exchange membrane fuel cell catalyst. And I will abbreviate that throughout the presentation, just fuel cell catalyst, but then I'll be talking about this specific type of catalyst.

And if we now have a look at the markets, the market's already 7 tonnes today, small, but yet it's already on a tonne scale. It's growing to 90 tonnes in 2030. And we see that the heavy-duty vehicle section is the largest portion, typically long-haul, heavy-duty vehicle. So the big loads stuff. But there's also a light-duty vehicle and there will also be green hydrogen electrolysis.

## **2. Umicore's Fuel Cell Activity Well Positioned to Capture Emerging Growth as Leading Fuel Cell Catalyst Provider**

### **Capture Emerging Growth as Leading Fuel Cell Catalyst Provider**

#### *Where to play*

Now, if I start off by explaining where we are and what we are going to do in fuel cells. So we intend to capture the near-term growth in fuel cell mobility. So the mobility section, as you saw in the market is the biggest section. And that's also where we are strong today. We are going to capture that growth both in the long-haul, heavy-duty, but there's also mid-duty and light-duty out there. We are going to further expand our footprint, our production footprint, and we're going to maintain our technology leads and further develop for the next generations.

There's also adjacent markets and adjacent opportunities. And for us, clean hydrogen electrolysis is an adjacent opportunity and we will use our knowledge or developments from the mobility segment, yes, there it is, also for these adjacent markets.

So here as well, we want to be a reliable transformation partner and I'll make it concrete for our fuel cell business. And we are going to work on our footprints and our processes.

### **Capture Emerging Growth as Leading Fuel Cell Catalyst Provider: Building Customer Cooperations across the Value Chain**

#### *Focus on customer intimacy to further grow customer base*

So reliable transformation partner. We all, and everybody probably has a different view on how the future will look from mobility. Yes, there will be electrification. Yes, there will be combustion engines. Yes, it will differ regionally, but there will also be fuel cells and they are complementary, for instance, to battery electric vehicles, especially in the heavy-duty segments. So, also, our heavy-duty vehicle customers see this, that we now also have the fuel cells; hence we have, of course, the battery electric vehicles in our portfolio.

#### *30 years of experience in fuel cell catalysts, serving the full value chain*

We're in this business since 1990. So over 30 years, we even have been in MEA production. So we did that around 2006 and we left actually, again, that space a bit later on because we felt actually, this is nothing for us. This is not where we want to be. I think we think the value is more on the PEM fuel cells. I would even say more.

If you would look at the value chain today, we see that our customers, the OEMs actually want to move upstream. They want to design their own plans, their own stacks, their own cells, and design their own MEAs and even CCMs. So our strategy is to work with all actors in the value chain. So we are working with the OEMs, we are working with the cell makers, with MEA makers. So really we try to tune our products and function of the components or the design that our OEMs are having. So we're listening to our customer and the customer says, 'You focus on the chemical side. That's where you are strong. That's where we need you. We'll do the assembly, the design. That's where we are strong.'

We also have focused very early on partnering and developing actually fuel cell technologies together. And we did that successfully with Hyundai motor company. And that's why we're already at mass production scale also here in this field and we have a sizeable plant in Korea.

Now, we also have news today, and you might have read it already, is that we're going to make another investment. Beside our footprint in Germany, in Korea, we're going to build the largest fuel cell catalyst plant in the world and we are going to build it in Changshu in China, in the Suzhou district. This plant will be online by the end of 2024 and will guide us in our growth, help to serve our customers towards 2030.

*Working with customers at the forefront of fuel cell technology*

I talked about the Hyundai motor company corporation, and we have already, with our product, more than 10,000 vehicles on the road. So we left the lab, right? We are not designing – we're still designing for the future, but we're on the road today. And we are producing already at tonne scale.

*Leading supplier of fuel cell catalysts*

It's good to have a customer, it's better to have a lot of customers. And we can say that we are qualified with the more than 10 OEMs worldwide. And if you would wonder, yes, indeed, the big names are on that both in Europe, North America, but also China. So the big, heavy-duty names are on those slides and all these bubbles that you see on these slides, they represent start of production dates.

And you see, for instance, HD, definitely heavy-duty vehicle application. You also see the S of stack and light duty. So really working on all segments and the different steps in the value chain.

You see that we have quite some qualifications in China and that they are coming first and later on, we'll also be seeing a lot of volumes coming in into Europe. So it's quite natural – and I should not say only Europe, actually the rest of the world, because we have customers beyond Europe. So naturally, as the volumes and the demand is kicking in the strongest in China, it's natural that we built our plant over there. And that's why we have chosen this location.

These are start of production dates. We have further ongoing qualifications with more customers and for more future platforms. So it's fair to say that with a 40% market share in the mobility segment already to date, not a bad starting position.

*Expanding global footprint to serve growing customer demand*

I talked about our footprints. We have production in Hanoi in Germany, we have Korea and now we'll also have Changshu. We also have applied tech and R&D centres mainly in Europe and Asia, because I said we want to be close to our customers, we want to develop together to design the right stuff for what they need. We want to listen and you have to be close.

Secondly, we are going to leverage our experience in the fuel cell industry – or experience, I should say, in the precious metals industry that we have also for the fuel cell business. It's quite similar to what we do upstream in the Auto Cat side. And we are closing the loop. Yes, we can recycle fuel cells. Small quantities today, but the [inaudible] is ready to take them in.

**Capture Emerging Growth as Leading Fuel Cell Catalyst Provider: Market-Leading Technology**

Innovation remains important. We have a very strong position today, but we have to keep it because this market is growing end of 2030, growing into 2040. And I will show you on the

next slide, some metrics where we are compared to our closest spheres and industry average on certain important components.

*Benchmark PEM catalysts for heavy-duty*

So if you look for instance at efficiency, our fuel cell catalyst at the start of the run. So when you use for the first time the fuel cell stack, the customer immediately gets a 3% hydrogen efficiency. Basically, you consume already 3%, and we're talking here at HGD markets so every percent is important.

Durability. This stack has to last a long period of time, 10,000 cycles, ideally. At the end of the run, we even have higher efficiencies and we definitely have the number one durability in the market. And this is based on feedback from customers. I mean, they analyse the different specs, they show results and we really always come out on top.

On the platinum loading, compared to the general industry we're 25% lower for the same performance. So that means our customer can either increase the performance with the same amount of platinum or have a cheaper stack. So that all turns into a great cost reduction potential for our customer from the stack point of view and, therefore, fuel cell adoption, but also in the total TCO of it. And the TCO, the total cost of ownership, will be key for fuel cell adoption, which is expected in the second half of this decade, especially for HGD. So this is an important driver.

*Benchmark PEM catalysts*

As said before, we have great technology today, but we are already working on the future because 2030, the game is only really starting. And our focus here mainly is on PGM reduction in our catalyst. That's where you will have the technology edge. So how can you lower PGMs with the same or better durability and efficiency?

So no wonder that we spent a lot of time on research that we create IP. And that basically, we have more than 250 patents; we have six locations where we work on apply tech and R&D. But we also are open to work with leading academia and universities in these fields because we want to stay and keep that edge.

**Capture emerging growth as leading fuel cell catalyst provider: Key Partner for the Transition to Zero-Emissions Mobility**

*Embedded sustainability value*

Sustainability, clean mobility, sustainability, I said it also in the ACs, in the AC section. That is what we live for and that is core of every offering that we do. So also here, we're focusing on ourselves. First, what can we do on the Scope 1 and Scope 2, and we're designing the plans from day one. So also the Changshu plant to have the lowest possible CO<sup>2</sup> footprint right from the start.

The closed loop, again, will in the future also contribute to lowering the Scope 3 emission and help in resource scarcity, because I showed you a market of 300-400 tonnes of fuel cell catalyst, towards 2040, right? This is a lot of platinum. And if you want to serve that market, you will have to bring out that platinum level. So it's value unlocking for the customer, for ourselves and Scope 3. Same story as for Automotive Catalyst.

*Delivering high-performance solutions*

So with our product on the roads, while maybe other companies are still in the lap, the vehicles on the road today already allowed us to avoid, basically, or prevent, I should say, probably based on what the Sustainability department would tell to me, 150,000 tonnes of greenhouse gases. Maybe not massive, but we're talking here about fuel cell vehicles. And in that space, this is truly impressive.

**Capture Emerging Growth as Leading Fuel Cell Catalyst Provider: Scalable Volume Production***Scaling-up of production footprint**in most cost-efficient way*

On the excellence part, I will talk about our new investments, and also the fact, basically, that we already have proven production capacity at scale. Remember, the total market in 2021 was 7 tonnes, mainly mobility; we have a 40% market share. You can read that, of course, we are at tonne scale, and there are not many companies out there that are at tonne scale, because they're still in the lab, talking about what they're going to do.

Of course, the [inaudible] cost competitive processes are now also incorporated in our new investment in Changshu. And this plant will be modular so if the markets would be bigger than what we expect, we could easily add more modules. And of course, at a relatively modest CAPEX. And, by the way, I don't know if I said it already, but this will be the biggest fuel cell catalyst plant in the world.

**Conclusion**

So if I just wrap it up, we want to capture the short-term growth in fuel cell and beyond 2030, of course, we want to capture the big markets. We have – we're also going to – we're focused right now mainly on mobility. However, we don't ignore the adjacent markets; we don't ignore those. We're going to be reliable, because we were long in the business and we're going to work closely with our customer, and we will be part of the full clean mobility offering that we have as a group.

We're leading on technology and our focus is there to stay there and we have a clear roadmap to do it. Sustainability is at the core of what we do and, again, we have left the lab and our production producing already at mass production scale.

So we think that we have a head start. And we can say that we're already profitable in this business today and that over the 2020 to 2030 period, we will be value accretive. So, again, a small gem at Umicore; we have to foster it, grow it, but certainly towards 2030 and beyond with a lot of potential.

Thank you. Kurt, welcome. Another future business that we will see.

## **Mobility Transformation: Capture Profitable Growth in Circular Battery Value Chain with Battery Recycling Solutions**

Kurt Vandeputte

*Senior Vice President, Battery Recycling Solutions, Umicore*

Thank you, Bart. Thanks a lot. Good afternoon. I have to start by really thanking you here, thanking everybody online. This has been a long and, I think – a long and very informative day. But nevertheless, I know after two years of being eight to ten hours after a PC screen at home how hard it is. So thank you for being online. Thank you, colleagues, following us here on this exciting day.

Indeed, I have the honour to accept a small gem. I like raising teenagers at home and I like to raise teenage businesses in Umicore. I like to bring them to life, to grow them, and then hand over when the time is right. I'm here today to close the loop, in good tradition of the company, and that's also what I'm very passionate about. I'm going to really guide you through the journey of Battery Recycling Solutions in the next half hour.

### **Agenda**

I will start by explaining why battery recycling matters. And I will explain how we will do that. And then, last but not least, try to wrap up and print some key messages in your head before you first enjoy a drink and then you go home.

#### **1. Mobility transformation driving growing battery recycling needs**

##### **End-of-life EV Batteries Surging in the Second Half of the Decade**

I'm kicking in an open door when I'm saying that the market of end-of-life batteries ready to be recycled is growing dramatically in the next decade. That is true.

However, how the business models will develop on how these end-of-life batteries will come to our plant or come to the company, there is still some debate, some discussion and really some different business models are being discussed. I would like to stress that there is also a market pull because from a regulatory perspective, new batteries will have to contain a recycled content in the future. And that will actually also create clearly demand for battery recycling and a need for that.

##### **Production Scrap Primary Source of Supply Towards 2030**

Now, end-of-life batteries is an interesting market but underlying in the next decade, there's also production scrap. There is a huge battery industry emerging in the world. And many people challenged me often on how is it possible that so much scrap is being generated. Now, frankly speaking, if you look at it proportionately, the amount of scrap to be recycled for me as a recycler, is huge compared to the end-of-life batteries. But in the end, battery industry is preparing now for future electro-mobility and I'm getting the batteries at end of life that were put on the market ten years ago. So there is a huge baseline difference.

What does this mean for me? Or for Umicore? Well, we have to, first of all, prepare for a very flexible and mixed feed. Secondly, we have to be capable to manage flexibility. Today, I'm getting maybe a much higher fraction of production scrap, and tomorrow, I'm getting modules, or packs, and I have to be ready for that. The technology that I will apply will be – will have to be robust, to cope with that flexibility. And it has to be fast scalable.

### **Global Recycling Need Accelerating Significantly Post 2030**

You saw the numbers until 2030 but look at what happens beyond 2030. The recyclable volumes are going to triple in the five years beyond that. So, in other words, I'm preparing a mass scale – or the company is preparing now a mass scale technology that is going to be scalable to accept these huge volumes beyond 2030.

The graph is also showing the geographical split of the volumes. No surprise here as well. The biggest volumes you see in China. China is the region with the highest battery manufacturing today and in absolute terms, also the highest electric vehicles in the market. So, by consequence, this is a very important market. Look, however, at Europe and the US. These markets will develop very fast and will form 45% of global volumes.

As mentioned, the next decade, we need to be ready to accept quite a bit of production scrap. But around 2030, 2031, we really see a flip, a turnover and end-of-life volumes take the majority of the volume.

### **Recycling is Crucial for the Mobility Transformation...**

Recycling is absolutely crucial in the mobility transformation for very, very different reasons. I would like to stress, first of all, that recycling will help to reduce the need for virgin raw materials. Every atom that we can recycle, that we can get back to recycling is an atom that we don't have to mine. That's, of course, the first and foremost reason.

On the other hand, every atom that is being recycled, is an atom of known source, is 100% traceable, so we can really confirm what the origin is. In that context, you heard a lot about a battery passport being developed. Umicore is a very strong supporter of that and it's introducing this concept in the industry.

And last but not least, recycling will really help to develop the regional supply chains. Because natural resources are not equally spread all over the world so certain regions will definitely focus on recycling for geopolitical reasons.

Recycling is also important from ESG perspective. Through recycling – like Géraldine mentioned, through recycling, we can reduce the environmental impact of the battery supply chain. I'm often explaining to people who really ask, why is this now, this energy; what is happening? Well, very fundamentally, what is happening is that we are – on the world, we are changing single-use fossil energy resources by multiple-use mineral resources. On the largest scale, this is what's going on. But of course, multiple use of metal means you have to recycle.

### **...Requiring Critical Competences and Skills for Battery Recyclers to Succeed**

What are the requirements to be successful in battery recycling? I tried to split in three blocks.

#### *Process*

The first block is everything about the process: production process. We need a process that is capable to reduce the sheer volume, the sheer size of what is coming to us. And we have to reduce that mass and volume as soon as we can. The process needs to be able to extract the metals, the critical metals, with a very high yield. Of course, from an ESG environmental impact view, this is important. But it's also important from an economical point of view; the more you extract, the more value you can recover.



The process has to be flexible, because you need to treat a wide diversity of mix – of feed mix – and it has to be sustainable. I will get to that in much more detail later in my talk.

### *Product*

A recycling process yields also a product, and for battery recycling, we are in a very strange situation. Today, for cobalt, for nickel, and various – for lithium, and very soon for nickel, the volume coming out of recycling will be too big to be accepted in any other application for these metals.

What does this mean? You have to produce a product that has a battery grade. The quality requirements are very high. That's what we have to produce. This is really the contract that I have with Ralph and his team. For less, we don't go.

The way we do that is actually focusing on efficiency. I need to come up with a product that is capable to kick into the virgin raw material flow of our colleagues of cathode active material production as soon as possible. Because let's not forget, let's see things in perspective, the next 15 years, the virgin raw material flow is going to be bigger than what comes out of recycling. If I want to enjoy cost efficiency scale effects, I have to be capable of bringing these atoms as soon as possible in that virgin flow.

### *Services*

Thirdly, recycling, it's about services. We offer a service to our customers. Are we going to present ourselves in the market as a total service provider? We are there for the different raw materials in a different business model, as is required by the different type of customers. We haven't in the meantime, an Umicore closed-loop operating system – reminds me even a bit of Microsoft. So basically what we are doing is we are offering an administrative system for our customers that allows them to demonstrate that they comply with regulations, which is quite important in this recycling industry.

And last but not least, when you recycle, when you receive packs at end of life, you will learn a lot about mistakes that have been taken in design. I invite all of you, if you're ever around, in our Battery Dismantling Competence Centre in Germany and have a look what is needed to open a pack. This is not designed for recycling. And what is the consequence? It takes time, it takes cost and the TCO of the battery usage is higher. And that's the feedback loop that we want to establish with our partner OEMs. And they appreciate that. We have ongoing running R&D programmes where we help them to give input and make easier to dismantle battery packs.

## **2. Frontrunner Gearing for Profitable Growth**

How are we going to take this on in the next decade?

### **Capture Profitable Growth in Circular Battery Value Chain**

#### *Where to play*

Umicore is an absolute frontrunner in this industry. We can start from a model that works. We are recycling today. It's a matter of scaling up now. We are going to do this first in Europe, and we were going to roll this out further in North America. We have a plan to build a 150,000 tonne treatment plant in 2026. This will be the biggest battery recycling plant in the world. We are going to use a technology, a combination of high temperature pyrometallurgy and hydrometallurgy.

I'm going to explain you later on why we take this equilibrium and why we combine these two technologies. This is a proprietary technology that we worked on for more than 15 years, it is applied today, and now we are going to scale. And we are going to do this for different input materials. End-of-life batteries are obviously the focus, but we have also a service to deliver now to people that need to recycle their battery scrap, or their production scrap.

#### *How to win*

How are you going to do that? You already know by now, RISE is going to help us. RISE is going to be the hand trail of how we do things.

### **Capture Profitable Growth in Circular Battery Value Chain: Supporting Our Customers with a Circular Offering from the Start, Ready to Accelerate Together**

#### *Industrial-scale operation since 2011*

We are already a reliable partner for car OEMs. When we initiated our battery recycling operations more than a decade ago, one of the targets and one of the objectives was to certify the battery packs that the car OEMs were bringing to the market at that moment in time already. Battery recycling is not new for us; I still recall in 2006, I went to a battery show and my colleague for battery recycling was joining me. That was the first appearance for battery recycling. So this is more than 15 years ago.

We learned a lot. We made mistakes but we learned from mistakes. And in the last couple of years, we've really worked hard, tirelessly hard, on the technology to improve it; to improve efficiencies, to improve also the practicability and to improve the scalability. With this experience, with this experience, our presence is currently demonstrated with more than 15 running commercial partnerships, both for car OEMs and cell makers.

In the course of the second half of this year, we will start to implement the improvements that we've prepared for our scaling up. Improvements focus a lot on recycling efficiency. And I'm actually extremely proud to say that for lithium, we have now received the highest recycling efficiencies with our technology. And this will prove to be market leading if you compare that with other options in the market.

#### *Reliable transformation partner in emerging market*

I would like to stress how important it is that we close the loop for battery recycling in the transformation exercise that is going on with our strategic partners. There is a huge uncertainty about supply of critical raw materials and with our recycling – battery recycling offer, we can reduce that anxiety and that uncertainty on the raw materials. So in that sense, we form actually a strategic partner, both on the upstream – they know us, in the meantime, from cathode active material production, and that we can refine these metals. But in the meantime, they know that we are a trusted and reliable partner for battery recycling.

### **Capture Profitable Growth in Circular Battery Value Chain: Science Meets Business – Long-Standing Materials and Process Technology Know-How**

#### *Leveraging historical competence*

Innovation. Innovation goes literally to my heart, as some of you probably will know, but I like really when science meets business. And that's where we actually excel. We have chosen for the right arguments, for fundamentally good arguments, for a combination between high temperature and hydrometallurgy for our process. Being a chemist, I see no

way how you can ever treat an end-of-life battery, which is a hazardous chemical factory, and how you would make out of that waste a high-quality cathode material, unless you use a high temperature step and a chemical purification step. Without that combination, we will never get there as an industry.

Let me spend two minutes on what we do, and what we see that others are doing, and where we maybe have the same approach or where we differ. On the left side, this is the process that Umicore is going to apply; and on the right side, I try to generically explain what others are doing.

We both have to start by making an assessment of what we get in our plant. A pack is not necessarily very safe, you do not necessarily know the health, and you sometimes have to discharge that. So there are a number of manipulations, pre-treatment steps, that are equal for all of us. The Umicore process starts with a high temperature process, which means that we don't have to dismantle or crush or make powder out of that. It goes right away in a high temperature process. Remember, you have to reduce the weight and the volume as soon as you can.

Other companies start to have different processes, either or not with an intermediate temperature treatment, shredding, mixing, powders, separation. And after all this being happened, you end up with a black mass. And in the end, from my point of view, battery recycling still has to start.

At the left side, you see, less stuff happens there. So you have a pyro step, complemented with a straightforward but shorter hydrometallurgy. We do things fast and good with the pyro. And then we basically clean up and do the very last steps to make battery grade with hydrometallurgy.

I would like to give a couple of very talking numbers. If one truck of end-of-life batteries enters our plant, I need one truck of reagents to clean up, all the way, the critical metals to battery grade. If one truck enters the other process, people need four trucks of reagents to enter their plant to get to battery grade. This, of course, translates into an environmental impact as we will see later on.

#### *Umicore's battery recycling technology*

Umicore's technology is really looking at an optimal balance between high temperature and the selectivity of hydrometallurgy. The technology is proprietary. It's protected in the meantime by over 20 patents, of which 15 have been granted worldwide.

Why have we now chosen for this technology? There is a lot of discussion in the market about that and I want to set the record straight with this slide. The technology gives us input with flexibility; I think it covered this already a lot. The reason why we have to do it, and how we manage that. It's thanks to the robustness of pyrometallurgy.

Secondly, the process needs to be effective; it has to be reliable, robust, scalable, and very efficient. And like I mentioned already, I'm extremely proud that for lithium recovery, we are reaching industry-leading recoveries. And for the chemistry round, you, in the meantime, know what kind of strange element this is of the table of the elements.

The investments and the cost of the technology are striking. A detailed benchmark has revealed that we can invest for a same amount of input material at roughly 20-30% cheaper

than alternative treatment ways. And like I mentioned, every truck that needs to come to your plant needs to be paid. We can do this at probably around 1/3 lower OPEX. Combining high yields with lower investment costs and lower operational costs, this is an audience that I don't have to explain that this creates the highest value potential.

Last but not least, the environmental impact of this process is better than any other alternative we see in the market. I'll get to that in even more details.

#### *Benchmarking recovery and valorisation rates closing the loop*

Regulation is ambitious. Battery regulation in Europe is setting pace and other regions are copying the targets. The table on the right gives you an overview what's currently under debate and will be decided and signed off, voted, towards the end of this year. The number of batteries that will need to be recycled has to increase, so there is clearly a market for battery recycling. But then if you look at the regulatory details that are being specified, the metal recovery efficiency of recycling process is going to be specified; you will have to meet that hurdle. The governments, the regulatory bodies really force people to use best available technology, and this is what we do.

Like I mentioned this is for cobalt, this is for nickel, this is for lithium; not a coincidence that these elements are specified because these are the value drivers in battery recycling. The targets that are currently under discussion for 2030 are ambitious: 95% for nickel, and cobalt; and 70% for lithium. The technology we have chosen is future proof. We have today demonstrated, we are demonstrating in our plant that we can meet these targets.

### **Capture Profitable Growth in Circular Battery Value Chain: Key Enabler for the Circular Economy**

#### *Embedded sustainability value*

Sustainability, really a very important differentiator for Umicore. The most important element in the overall lifecycle analysis for battery recycling is the CO<sub>2</sub> emissions. Allow me to take a couple of minutes to explain this because here, as well, there is a completely wrong perception in the market. We have studied in depth with external partners, and using the ISO 140040 guideline – and I'm giving this detail because it is really important. This ISO guideline dictates you to let the studies validate by a third party, which we did. We used the German Eco Institute to do that.

The results of our study of our lifecycle analysis for CO<sub>2</sub> emissions is the following: we compared three different processing technologies, Umicore technology, an intermediate temperature, hydromet treatment, and a full mechanical hydrometallurgy treatment of batteries. What is the result? CO<sub>2</sub> emission per kilogramme module input – apples to apples comparison – our technology shows the lowest CO<sub>2</sub> impact of the three different methods.

But look at the details between Scope 1, Scope 2 and Scope 3. First conclusion, the energy requirements, so Scope 2, is almost the same; we do a little bit better than the others, but is almost the same. Completely wrong perception in the market because people say, you do high temperature, you're using a lot of energy. Wrong. We use the energy that is already in the battery. That's what we do.

But look at Scope 1. Our Scope 1 is biggest of all the technologies. But we take a commitment, a responsibility to go to zero and it's in our control. So in ten years from now, this will be about zero.

The light blue is a different story. The light blue is of course, the CO<sub>2</sub> that is in those trucks that arrive in your plant. And this is something that is far more difficult to decarbonise. So this is where the wrong perception lies. People see – when they come to us, they see a stack but they have forgotten that there are four stacks at the chemical plants that indirectly arrive when you use reagents.

#### *Responsible and circular sourcing*

Battery recycling is actually the best way of responsible and circular sourcing. It's under your control, it's a secondary source, and we can reduce the CO<sub>2</sub> burden for the products of Ralph to the highest extent. This is a huge lever to decarbonise the battery value chain. And last but not least, it's fully traceable. There is a lot of debate about where things are coming. I always like things that I control really myself, then there is no question about that.

### **Capture Profitable Growth in Circular Battery Value Chain: Scalable Technology Delivering On Market Requirements**

#### *Frontrunner ready to accelerate*

Excellence and execution, we still have a long way to go. We do this – we do battery recycling for close to 15 years. But if you look at the volumes, we have a challenge in front of us. Thanks to the experience of our operations right now, we are confident that we can scale to a 150,000 tonne unit. This is roughly a scale factor of 15. The engineering teams feel comfortable about that. They feel comfortable, because we have experience in those pyro technologies at that scale.

Oops, sorry, that was first.

We start from our existing presence in Europe. And we are going to roll out a similar model in North America. We will follow there the market as it will grow. And during that growth phase, we clearly see a synergy between our activities in Europe and North America. The engineering track for the 150,000 tonne unit is on an accelerated path and I really like this kind of engineering CAT/CAM designs rather than the artist renderings that I often see in a lot of announcements.

#### *Linking variability with product consistency*

Talking about excellence, we have to combine water and fire here in this closing the loop exercise. What we get is usually variable in composition, in chemistry, in shape, and format. And in the end, what we need to produce as a cathode material has to be, quality wise, [inaudible] flat.

How do we merge these things? We merge these things through experience, competence and skills. That's what we excel at. And we're going to apply this to create a reliable industrialisation path for our customers. This is what we commit to with the team.

### **3. RISE 2030**

#### *Battery Recycling Solutions – RISE*

Let me come to the conclusion slide. With battery recycling solutions, we are going to really capture profitable growth in the next decade. The market is going to grow fast. We are

going to scale up from Europe by building a first 150,000 tonne unit. Like I mentioned, I hope I could convince or I hope I could explain why we opt for high temperature hydrometallurgy combination. And the most important thing, battery recycling, in the end, it's a service that we need to provide to our customers, and service means you have to be service minded. You have to be able to accept what is available, what comes to you, and you take the burden out of the hands of your customers. And that's really what we're going to focus at with the team, scale with them and offer them the service they need.

And with that, I think we get to the Q&A session.

## Q&A

**Evelien Goovaerts:** Yes, indeed. Thank you, Kurt. So Bart will be joining you again for the final Q&A session, Mathias as well. And then after that session, we will have the closing remarks of Mathias before formally ending today's set of presentations.

**Mathias Miedreich:** So, first question over here.

**Geoff Haire:** Hi. Just wanted to ask Bart, who are your customers in the Fuel Cell business? Are they OEMs? Are they people like Ballard and Plug Power?

The other question I had was, why not build battery recycling in China given it's the biggest market? You said that in your presentation. And then just on the European plant, how difficult is it going to get – is it going to be to get environmental approval to build the scale up the plant, I assume in Olen, given obviously the issues that have been around the Hoboken recycling plant?

**Bart Sap:** Yes. Okay. I cannot give you concrete names. But I think if you saw the funnel that I was presenting with the start of production dates, you have [inaudible] the HD, the [inaudible], etc., etc. So yes, indeed, it's OEMs. I mentioned, it's really leading OEMs in that sphere, in China, and rest of the world. But there are also stack makers there. So we're really focusing along the value chain in these.

**Kurt Vandeputte:** Thank you for the questions, Geoff. Why not the battery recycling plant in China? Maybe I focused a bit too much on that. But you know we have certain activities in China already, with our joint venture partners; battery recycling is part of the scope. So we will, in China, of course, leverage these capabilities there. I didn't really put too much stress on that, but this is an existing capability that we already have there.

Then on the environmental side for a smelter in Europe. Well, it's the fact that regulation is stringent, it is true, but if you look from an overall emissions point of view, I really dare to say that a smelter on total emissions is even better than a lot of the alternatives that I see coming up right now.

And, I mean, the technology is designed to meet regulation. We know what the targets are, and I'm convinced that what we have currently developed will meet these requirements. This being said, permitting is – the speed of permitting is not always, in every country, the same. And that's for sure going to be one of the key criteria that we will apply in a site selection exercise.

**Mathias Miedreich:** But I want to also be clear, we didn't say that this will happen in Olen, right, this is not a conclusion you should take. It is still one part of the project to find the right location in Europe.

**Nicola Tang:** Hello. I wanted to ask a few more around battery recycling. Firstly, I think you hinted at potentially expanding in North America at a later date. I was wondering whether that was something that's factored into your €5 billion or greater than €5 billion CAPEX guidance? And, if so, or if not, should we think about the capital intensity to be similar to what you've talked about with this European investment that you're making? So the €500 million for 150 kilotons.

And the second question, you painted a very exciting picture about your technologies on the recycling side and how it is really superior to peers. Would you consider licencing it out at all or not?

**Mathias Miedreich:** Let me take the first question, the second is then for Kurt. No, it is not included in the CAPEX yet, because – and you have seen that – the primary market for that will be Europe, and we are focusing on that right now. But we – what we wanted to express is that, when we select a site in North America for our cathode material production, we want to make sure that this is already enabled to have a full closed-loop setup going forward. But all of our concentration right now is on Europe, to build the world's largest battery recycling facility. And we have – the plans are not as concrete as that yet for North America. So to make that clear.

And in terms of CAPEX density, I think the same applies for battery recycling that we said earlier for cathode material – it's more a function of time versus location. So the second battery recycling facility we will build, our ambition is to have even less CAPEX density because we include all the lessons learned and the improvements that we had from the first one.

**Kurt Vandeputte:** Indeed. On the question on licencing, I've never seen ever in life. But the key priority is to roll out our battery recycling solutions independently, that's for sure.

**Mathias Miedreich:** But the question is, why should we? That's... Right?

**Wim Hoste:** Good afternoon, three questions from my side, please. The first one is on the yields, the recovery yields. I think on battery recycling, you showed some percentages of lower capital intensity, lower OPEX, etc. But the recovery yields of the metals, you showed, the 95% I think on lithium was mentioned. Can you compare that to peer technologies and at least what you know, or what is available of the peer technologies? How are you scoring versus them?

Then the second question is, do you have already offtake agreements for recycling – battery recycling, promises from potential customers? And how important is it in the overall discussions in – for cathode business, this recycling option or availability that will come on stream?

And then the last question is on the availability of metals, be it recycled or virgin. Is there any threats? And on what materials is there potentially a threat in your electrification roadmap, all the details you showed from shortages of materials or metals?

**Kurt Vandeputte:** Thank you Wim. That's a lot of questions in one shot. We're used to that for you, right? On the recycling efficiencies, like I mentioned, we are future proof, regulation future proof; this is telling a lot. And compared to peers, from our analysis, this is best in the industry. So this is really best in industry for all the critical metals, being it cobalt, being it nickel, and definitely for lithium. I feel really – I'm even proud about what we can achieve for lithium.

On the availability of metals, let me take that one first. It's a fact that the transition will require a lot of metals. This is really clear. But on the other hand, there are a huge number of projects ongoing to increase the availability of metals. I personally see more like temporarily, let's say, this balance in, for instance, mining or transformation or refining, but in the end, that's, = that's really going to be – I think this is going to turn out fine.

And thank you for the second question. Actually, it allows me to stress, again, that we are already a battery recycler. I think this is overlooked too often. We have existing customers; like I mentioned, we have over 15 running contracts with car OEMs, with cell makers. So I mean, it's not about promises. This is an existing business already. But we start from a very small level and we want to scale now in the next decade, extremely fast.

**Mathias Miedreich:** And one thing is into – okay, 'What customers are these, tell us the names?' Just to anticipate this question, what – there's one name that we can tell you we have already announced, this is ACC as well, where we have an agreement with them.

The others we cannot clearly mention at this stage, because you must also understand that battery recycling and how they – those customers – and these are mainly automotive customers – want to set up this in the future, this will be part of their value creation model as well. And they want to make sure that they have set all of the right mechanisms to be able to harvest the batteries, and – we had the discussion in the break – to get back those batteries in reality.

Because what you want to do as an OEM at the end of the day, when – once you have purchased or produced a battery, you will never want to let go of that; you will always want to keep the metals inside in your own closed loop, because they are so scarce. And that's why all of the OEMs are a little bit shy to communicate about it because they need to have, first, convincing mechanism to make that happen.

But you can be sure within this 15, they are the same names that we talk about in Ralph's case on our cathode manufacturing. And I can confirm that this is a key request of many to, let's say, to combine that. There is even some customers that make a very concrete request that say, 'We want to – if we would give you a business on cathode material, our requirement is already, today, 50% of recycled content.' And, that's one example, some of you might recognise that announcement from an OEM, but we expect this to be even more prominent in the next time to continue.

**Speaker:** I have a quick question on sourcing the scrap or the end-of-life batteries: how does that process work? Is it – do you pay the OEMs a fee to get the batteries or do they pay you something? How does that dynamic work?

**Kurt Vandeputte:** Thanks for the question. There are, at this moment in time, really different schemes on how we source material. I mentioned you have battery scrap and then,



of course, there's the direct sourcing with a cell maker. You have end-of-life materials that really come from the OEM, or authorised treatment facilities. I mean, you have dismantling car shredder companies right now, that have received, in the meantime already, electric cars and they want to – of course, they want the battery to be recycled.

On the commercial terms, obviously, there is – we heard already earlier today how recycling business work: part is fixed fee, part is linked to the value recovery you can create for the customer.

**Mathias Miedreich:** So it's a very similar model that has been explained on precious metal recycling where you have a recycling fee, and you have a yield component of your revenue. Now, what we expect is that the market is developing. Because of the OEM closed-loop aspect is not – the bulk of the market will not be the same, like in precious metal recycling, where there is an open market feed of batteries to be recycled and you can do it or not.

It is more ecosystems will form around those OEMs where those batteries always will circulate and the business model is including the treatment of it, but not [inaudible] as a recycler, not buying or selling these materials, or these batteries in this case. We are working – basically we're treating it for a customer and we are reimbursed by the two revenue streams that we have explained.

**Speaker:** I just have questions on – both on recycling as well as fees [inaudible]. On recycling I was just wondering – on lithium – at what lithium, at what price is lithium recycling viable? Say at current price, lithium price is very good. Are you recycling LCOs as well? And at what lithium price does it become no longer economically viable? But I understand you probably recycle it anyway just because requirement.

And then a bit more technical, do you use recycle lithium to lithium metal or lithium hydroxide or carbonate? And when you talk about 150 kt, is it 150 kt of, say, [inaudible] material or is it individual metals?

On fuel cell my questions are, are you are selling just fuel cell catalysts or CCMs? And you've just catalyst, then why is that the decision?

And then in terms of – you talk about PGM capability being very important for your fuel cell presence. I was wondering if you can expand a bit more on your presence in minor metals like iridium, ruthenium, what sort of market share you have currently in those and from your current lithium mines?

**Mathias Miedreich:** Yeah, first of all, thank you. It's – the question shows it's not the first time that you talk about battery recycling, that's for sure. And Kurt will be able to give you all the answers. But maybe we start on the fuel cell side.

**Bart Sap:** Yes. So you were talking about for instance, iridium, etc. And I think there, we would have the same focus indeed on trying to lower the iridium content. And it's also a supply chain focused, I would say, because we all know that iridium is a relatively scarce metal. The iridium was used as, let's say, a catalyst on the anode side of the system to avoid that – if water goes through the membrane, that you get corrosion, right?

And you can do that with lithium – lithium? Iridium. And at the same time, you can also do it with balancing the plants. So it's a combination of optimising the plant design, so the system

design of the stack, as well as lowering the iridium content. And there again, you have to work closely with your customer.

So if you talk about why and what is our position in the value chain, we are determined that our position should be on the PEM fuel cell catalyst only. And why is that? Because that's what our customers want. They want our expertise in this domain. They don't want us to design CCMs, they don't want us to make MEAs, they want to do them themselves. And we will provide the right product so they can optimally use their design and, therefore, have the best performing stack.

**Kurt Vandeputte:** The questions on the battery recycling. So let me start on the input material. The 150,000 tonne that we mentioned, or that we indicate, is actually a market conform mix that we foresee of packs, modules and black mass. So because the throughput of these products is, of course, different; you can imagine the value density of black mass is higher than other pack.

The output of lithium, it's foreseen as a lithium salt. So lithium salts that we then – in a closed loop agreement, we can convert into the lithium chemical that we will need in our plants. So we will not go to lithium metal, we will also create a closed loop for the lithium chemical.

And then thirdly, on the, let's say, what does the price level of lithium has to be, to be economically viable? I would like to really tackle that question differently. Because in the end, you're not doing recycling for, like, one element or one element's – price of one element makes the equation positive or not. It doesn't work like that. You get a certain scrap amount to be recycled at a certain condition. And you create value at the sum of the metals. And that is of course determining what is economically viable or not. This is the equation that you have to look at. And without any doubt, the market value of the metals plays an important role in that.

**Speaker:** [Inaudible].

**Kurt Vandeputte:** Yeah, thank you for reminding on that part of the question. I mentioned that we will indeed focus on a flexible input. Our key focus is indeed NMC or LCO – I mean, layered oxides, allow me as a chemist, but really layered oxides, this is what we like. And this is what we're also going to recycle.

Let's not forget, there is a recycling obligation from collection schemes, I think. I mean, people living in European region, probably, you know well that we all collect batteries; there are country-wide collection schemes. And these batteries also end up at our plant and we recycle them.

**Charles Bentley:** Just a follow-up on that. I mean, I guess, that raises the question of, obviously, all of those metals, you've flagged are a lot higher than they were in 2020. I guess if you think about – or 2019. If you think about the metal prices today versus then, what's the kind of profitability that you're expecting? Are they profitable processes in those kinds of conditions? Is it a case of when you get 150 kt of scale, then you would expect them to be profitable? And I guess what the levers are to actually achieving that. Is it simply just the fact that you've got an economy of scale of having a larger footprint?

And secondly, I guess, the indication on Filip's presentation earlier was that these two would be material contributors to recycling and [inaudible] EBITDA like 30% of the division by 2030. I guess what I didn't really get a sense of was the steps towards that, and how you expect them to scale. So if you just give any more of a sense for both the fuel cells business and...

**Kurt Vandeputte:** Okay. I think Charles, the theme of the day is very clearly that we are looking at profitable growth. And for battery cycling, it's not any different. We are – I mean, I'm not here to chase 150,000 tonnes materials to fill my furnace, I'm here to serve all the stakeholders of the company, right? So this is for us crucial. Is it in the end 20,000 tonne less, because it doesn't generate the necessary margins, or the targets that we have? Then it's going to be 20,000 tonne less.

On the scaling, I will take the first part on the battery recycling. So I mentioned we're going to use our existing plant. We will debottleneck, we are currently doing some upgrading, and in the second half, we refile and reach a higher scale that we have had in the past. And, of course, I mean, 2026 is currently the year where we will have the SOP for the next plant. And second half of the decade, of course, that should be contributing to the recycling segment.

**Mathias Miedreich:** And I want to bring in another aspect on your question, profitability. And what happens if – and this is how I understood the question, what happens if the equation on the metal prices are changing, and we put in place a 150,000 tonne plant, is something changing in our value perception?

The big difference that you saw on the slide of Kurt is that recycling will be mandatory, will it be regulated, has to be there. And then there are some other levers outside of the metals, which, for example, is the CO<sub>2</sub> efficiency that will drive the price. And when you look to that period, okay, nobody knows how these metals will develop. But if you are in an overall scarcity situation, and you have a situation where – that we think is pretty likely, there is a difference in price for metals – the recycled metals – and we said it before also in Denis' presentation – the recycled metals, we think in the future, will have a premium versus the virgin metals. So even if there would be a price erosion, we would think that this erosion would be less on the recycled metric, which is another buffer in the value equation.

**Bart Sap:** And do allow me to chip in on that one, because I did spend a lot of time in the battery raw materials before I was heading the Catalysis – Catalyst business group. And if you – for instance, nickel will be one of the big elements out there. And we all know that, let's say the cheap sources of nickel, they're practically gone. Right? So I mean, if you would look at the C1 cost curve of new projects, it's definitely at a much higher level, for instance, than the nickel prices we would have seen maybe three or four years ago when the market had huge overhang. Also reflected on the stocks on the LME. So I think there will be a substantial floor on the nickel price that at least will allow for this element.

Now, you were also asking question on fuel cell catalyst. And yes, our plant will be up and running as of 2024. Right? And I said also that normally this capacity should be able to carry us towards the end of the decade. So indeed, we'll be filling up that capacity. And of course, at the end of the decade, that will be more outspoken really in 2025, 2026, when we are ramping it up. So it's more to the outside. And you also saw it on the growth curve, of

course, of the market. If the markets beats us, because some people say that maybe we are a bit conservative, then we'll happily accommodate these volumes, obviously.

**Evelien Goovaerts:** We have a few questions also from the audience online, on battery recycling as well. Tesla and other cell producers are looking at battery recycling as well. Is there any chance that this process will be internalised?

**Kurt Vandeputte:** We see already right now that different companies focus on different strategies. We really made an in-depth market analysis on what is captive and what is non-captive. And we strongly feel that there is a need for the capacity that we put in place. First of all in Europe, but we see the same thing happening in North America. So at this moment in time, we are pretty comfortable, and pretty convinced that that capacity will be absolutely needed.

**Mathias Miedreich:** Let me add to that as well. It would be counterintuitive for the strategies of the OEMs, the final customers of battery, battery materials and recycling at the end of the day, if they would – while being more present in the value chain of battery materials, they would leave the recycling to the cell makers, for example, while they would like to be more invested into the battery itself.

Having said that, the likelihood that the car manufacturer – and I would maybe excuse – exclude Tesla here because they are doing a lot of interesting things. But a normal car manufacturers, as we know them, they have decided not to produce cathode material themselves because it's too far away from what they know as a value chain. They go only as far as battery cell manufacturing, which is much more mechanical than a chemical.

And the same is valid also for battery recycling. So there, our value proposition is similar to – in cathode materials that we are the preferred partner, we want to be the preferred partner of the OEMs to be the recycler in their ecosystem, which is a solution to the problem of captive market.

**Evelien Goovaerts:** And then maybe a little bit related to that, but not captive capacity, but other competitors. Aren't we too late to the market with battery recycling at scale? Because we have seen multiple companies, including Li-Cycle, Redwood Materials, Battery Resources, BASF, announcing significant CAPEX and expansions, including customer contracts.

**Kurt Vandeputte:** Thank you for the question. I'm afraid I'm going to repeat myself. I mean, how can you be too late in this market if you have been the first and biggest so far? We have an accumulated experience – industrial experience – in battery recycling that far out, really exceeds all the players we see currently in the market. That's one thing.

Secondly, a lot of the announcements are actually, to my opinion, not end-to-end recycling announcements. So it's really important to be critical on what has been published in these ambitions. Somebody announcing pre-treatment all the way to black mass, frankly speaking, this is not recycling. This is a pre-treatment step but then the hard work still has to start from black mass onwards. So in that case, I mean, having said that, of course, it's – clearly it's an attractive market. So you will see more and more people looking into that. This also confirms our conviction. But I'm confident where we are, what we've done, the experience that we used, that we have now something to offer to the market, which is absolutely [inaudible].

**Mathias Miedreich:** Let me add to that, because I think we have to be a little bit – also the blame is on our side. Because as you – as I fully agree that we have all of the steps that Kurt just said, how can the market know this, if we don't talk about it, right? I mean, that's a little bit self-criticism here, and today is the moment we talk about it, we share the plans.

It's not the plan that we have developed, that we say we will do something, we just tell you where we are in this process, which we have started many, many years ago, and now the ambitions going forward. So I think there is a truth in saying that we have not clearly waved our flag in battery recycling. But with today, we're doing that.

**Evelien Goovaerts:** And then perhaps one final questions on fuel cells, Bart, so you have a 40% market share in automotive applications now, which is very high. Is it the purpose or your ambition to keep that percentage?

**Bart Sap:** I have to look at our Legal Counsel. No, no. I mean, as I said, we want to keep on banking on our leading position and continue to develop new technologies and the market will be efficient. We're not going to be the only one – I'm really not allowed to talk about this, I guess. We're not going to be the only one. But at the same time, I think we will be one of the big players. That's our ambition. And that's also where you're going to see us.

**Mathias Miedreich:** And again, here, the growth dynamics are in play in a very strongly growing market. There is room to give away some of the market share, and you still will be very important player and benefit from the strongly growing market. I think that's the conclusion that we have made.

**Bart Sap:** Absolutely, and our qualifications that you have seen on the funnel also show that we actually have a great basis to be ambitious.

**Evelien Goovaerts:** I believe there are no further questions, also not here from the audience. So that concludes the Q&A session. And then Mathias, we hand over one final time to you for your closing remarks.

## Closing Remarks

Mathias Miedreich

*Chief Executive Officer, Umicore*

Thank you, Evelyn. Yeah, a big thanks to all of you, to all of you in the room. But I have to say maybe even a bigger thank to everybody online who has really followed through. As we said in the beginning, it's not easy to have the discipline to do that. But we would like to thank you for your attention on the day to day. We have shared with you our strategy, our ambition towards 2030. We think it is a bold ambition. It is ambition that will change Umicore. But at the same time, we think it is a realistic ambition, because we have based it on a platform that has proven to anticipate megatrends and to work into the future.

Megatrends is the key word in our strategy. We do not have to think about where to play. Our strong foundations are in the wrong – in the right place. And we have to define the how: how are we going to do that? How are we scaling up in that market? And how are we doing that by always being value creative?

The portfolio is something we have talked about a lot today, the diverse portfolio that has a lot of synergies and has a lot of things in common that make it stronger than just the different business units. And make it stronger also from a value creation model, where we have tried to explain to you that by the different modes we are running our business – growth, cash flow, ROCE – all of that together, we have the right system to propel our company into the future.

Growth is important, but we have stressed several times, it is a conditional growth. We will be growing whenever we can be value creative, when the contracts that we're doing with our customers meet those requirements, and when the investments that we are doing are contributing to returns significantly about cost of capital.

We have shared with you today our ambition in CAPEX. I think we have surprised some of you with those ambitions. But for us, the equation is clear. When we see a fast-growing market, when we see ourself with a value proposition to capture significant parts of the market at favourable terms, we need to invest. It doesn't work without it.

But we think that this investment is a very good investment into the future. And based on the RISE strategy, the pillars that we have explained to you – the core one being the reliable transformation partner to solve the problems of our customers with the unique value proposition of Umicore – this really makes us think that our proposition to grow like a start-up company with more than doubling our revenues to 2030 – at the same time being constantly value creative, like an established company – is a good offer.

And I hope also that you have seen that my colleagues from the Management Board that we all – we radiated confidence, we have the conviction that this plan is working, that it's a plan that is based on our ambition to be the circular material technology company.

Thank you very much for your attention.

And now, of course, we have to have a separation between us online and the ones here. So we invite everybody who is here in London now to continue our discussion with something to eat, drink, and then I say goodbye to everybody online. Thank you very much and have a great evening.

[END OF TRANSCRIPT]