



Capital Markets Day 2022

Wednesday, 22nd June 2022

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 CO₂ 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.