Origin Materials, Inc. (Nasdaq: ORGN)

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Participants

Ryan Smith, CTO and Co-Founder

John Bissell, Co-CEO and Co-Founder

Rich Riley, Co-CEO

Matt Plavan, CFO

Ryan Smith: All right, to get started. So first, I'm going to introduce myself. No one knows who I am. And then I'm going to describe how we came to be conducting an interview like this in the first place, and sort of, you know, we're trying something new here, and why we're doing that. So to kick off, I'm Ryan Smith. I'm a co-founder with John of Origin Materials, and through most of the company's history I was CTO. And over the last several years I've been focusing increasingly on products. So today I'm our Chief Product Officer.

And this interview grew out of an interest from many of our retail investors. There's a community comprised of Origin retail investors, and they reached out and they said, "Can we have some kind of interview, or live AMA session, or something like that for the community that's been asking a bunch of things." And so we were intrigued by that. And we've been wanting to up our communications game and develop more communication channels outside of just our earnings calls and press releases. But there are challenges with a live session, with a limited investor audience which triggers disclosure issues with the SEC and 8-K filings, etc. And so, in addition to that, we thought an interview would also benefit from having you guys interviewed by someone who knows the engineering, the chemistry, the technology, the business and knows you. And so, that's me.

And then the questions that I'm going to be using are questions that the investors submitted themselves. So they listed out, you know, 40 to 50 questions, and then I engaged with them to really understand what was driving and motivating the questions that they had. So I did spend some time with investors talking about that. And so while today, in this particular segment, we're not going to get to everything, I did distill it down to, I think, what are some of the core issues and questions that they had raised. And we'll get to that. And then we'll have some follow-up to make sure that we really get to everything, because that's important. So, to kick us off, I'm going to start with a question to you, Rich.

And before I launch in, I do want to read our safe harbor statement, which we read before every earnings call, so here goes. Please note that some of what you will hear during our discussion today will consist of forward-looking statements and, based on current expectations and assumptions which are subject to risks and uncertainties, these statements reflect our views as of today, should not be relied upon as representative about views of any subsequent date, and we undertake no obligation to revise or publicly release the results of any revision to these forward-looking statements in light of new information or future events. These statements are subject to a variety of risks and uncertainties that could cause actual results to differ materially from expectations. And that's as of today, 4/11. And so, we've got a set of topics we're going to hit. I think, you know, Rich and Matt, I think you've seen some of this. And, John, I don't think you've seen any of these questions.

John Bissell: I have seen none of them. No.

Ryan Smith: There's a little bit of an element of sport associated with this, perhaps. Alright. But we're going to start with – and I'm going to put this to you, Rich, and then, and Matt and John feel free to weigh in. But it comes down to this question around the $1 minimum share price. And essentially, you know, there were several questions that were pertaining to this. People were wondering how we were treating it or thinking about it. People were wondering if we're going to consider a share buyback, if we're expecting a reverse split, or if we're just simply confident that it's going to grow above a dollar over the time period that it needs to do that. And so I wanted to ask you specifically, can you describe how you're thinking about this? The stock price, I looked this morning, sort of between 60 and 70 cents. And what are the options that you're anticipating to kick it up over this minimum for the Nasdaq minimum bid price.

Rich Riley: Sure. Well, maybe I'll start with how the delisting process works just to sort of set the stage. So, a company has two 180-day grace periods, basically.[1] We're in the first one and the second one would start in July, which effectively gives us until the end of this year for the stock to trade above a dollar for 10 consecutive days. And if that were to not happen, we would do the very standard reverse stock split which moves the stock above a dollar. And that's the standard way a company lifts their share price above a dollar and comes back into compliance with the listing requirements. We're optimistic it won't get to that because we laid out a game plan on our last earnings call that, with our existing cash on hand and our incredibly promising caps and closures business, which is a very near-term, high-margin business, that we can get people excited about the stock. That excitement would lift the stock above the dollar and, you know, to who knows where, and so we wouldn't have to do the sort of gymnastics of reverse stock splits and things like that.

And so, I could talk a little bit more about that plan. And so we laid out a plan to be in market within 12 months with a very exciting breakthrough. First cap made from PET that's been commercially produced. We have partnerships coming in place with our manufacturing partners. Tremendous customer interest. And what we hope to do over the coming months and quarters is, you know, really, fill in that picture more for people. And as investors see that story coming true, the stock price will follow their confidence that we will get to, you know, to profitability on our cash flow, and we won't be trading below our cash value. And so we think the stock is exceptionally undervalued at these levels.

[1] Assumes Nasdaq consent to second 180-day period.

And I saw that there were even questions about considering share buybacks. And so I'll touch on that. Some of you have probably heard us say that we think we have an absolute world-class board. It's really a competitive advantage of Origin, is the incredible talent and experience around our boardroom table. And allocating capital is a core part of our board's responsibility, and we take that really seriously, and so share buybacks are something that we talk about, and at the appropriate time, something that we would absolutely consider. And so nothing to announce on that now. But that is an active topic of discussion.

Ryan Smith: That's great. So, we want to get more into the caps business. I think what you're describing makes sense. And you sort of see these different options, whether it's reverse split, or even share buyback. These are all, sort of, under consideration, and they represent sort of backstops and forward-looking activities that we could engage in.

John Bissell: Yeah, that's kind of the way I – you know, Rich laid that out really nicely, and you just mentioned again. But I think thinking of these as different options that can be used in different cases, right, is really valuable. You know, it's first, of course, we think that as we progress on these businesses, that's going to organically raise the price of the stock above the point that we're concerned about, right? And we've already seen a little bit of that with the announcement that we had last week around – or by the time this publishes, maybe a couple of weeks ago – around putting wood into OM1, right. That showed quite a bit of trading activity. And we think it was the right kind of trading activity. And we think that as we progressively announce progress on these sorts of things, on our various businesses, that that's going to keep happening, right? That's not a one-off kind of thing. So that's one. You know, two: the reverse split is really a lever that we can deterministically pull when we want to, and that's sort of it.[2] You called it a backstop. I think that's a really nice way to think about that.

Ryan Smith: Perfect. Alright, and I don't want to spend too much time on share price. I want to get into the content of the business. Let's talk about core Origin stuff. John, I'm going to put this one to you first and, Rich, I hope to get your input as well. But John, you just mentioned it, about the idea of announcing new businesses over time and the impact that has on stock price. But I want to kind of zoom out a little bit on that idea a little bit more, because we've already been doing that. We've been announcing things. And I noticed that a lot of the questions that investors had, whether it was about OM1, or OM2, or the caps business, or the bio conversion process that, you know, as I was tracing through the questions, I noticed, "I would have asked that slightly differently." And, as I kept trying to uncover what was sort of unique about some of them, it's that there still is some persistent confusion or ambiguity about Origin's broader business model. So, while we'll get into some of the details of the technology and OM1 and caps and closures business, I wanted to give you a chance to talk about how those pieces fit together. Like, in the jigsaw puzzle of Origin, what's the picture that we're left with, what's that larger vision? Whether it's the strategy or the business model. I think a lot of questions are sort of rooted in trying to understand how all of that fits. So, whether it's biomass conversion process, caps and closures, OM1, I think, sort of zooming out, what does someone need to understand in order to understand what Origin is doing?

[2] Assumes shareholder approval of potential Origin reverse stock split proposal.

John Bissell: Yeah. So, I think, at its core, what we're doing is really quite simple to communicate. But there's a lot to unpack from it. So, the really simple thing that we're doing is we are commercializing the furan opportunity. Furans as a monomer that can be made available to the chemical industry. That's really the drive. It just turns out that a lot of these things are hooked onto that core concept.

So, if we look at PET, or sometimes I'll say more broadly, polyester, right? We connected the furan opportunity to polyester via our technology to convert CMF into MF, and then dimethyl furan and then into paraxylene, using that particular chemical technology. So suddenly, those two are associated when they wouldn't intuitively be otherwise. Similarly, as we look at the various kinds of products off of CMF, right, that's an expansion of this furan concept, right? This commercially available furan being used in all these other applications, paints and coatings, right? Even fuels. It turns out the fuels business that we're talking about is a co-product of the production process we think makes the most sense for making commodity-scale furans. And so all of this stuff is linked by either the furan product or the process to make furans. That's sort of the key linkage between all these things.

But then, of course, as you explore that production process, and the product on the other side, you run into opportunities. That's just the way this works. And you can't always see exactly what all those opportunities are going to be up front, or you certainly can't see them all, and you can't see which ones are going to end up being interesting or not. And so, what I think in some ways people are seeing is us walking down the path of that furanic commercialization. So, when you look at OM1 and OM2, that's the scale-up of the production process that we think makes the most sense for making furans at scale. As you look at FDCA and fuels and HTC, this is the commercialization of the co-products that come with the production of furans at commercial scale. As we look at specialty chemicals and other kinds of applications, that's us discovering how furans can be used in different ways to make different kinds of products that really aren't available in the same way right now, or at least with the same performance and renewable content.

And then, as you look at the caps business, it's the one that I think sometimes people have the most trouble understanding. But really, that's an opportunity that is connected to this core capability we built around PET and polyester and how to use those things, and we had the confidence to go into it because we knew that furans could enable the production of polyester caps, if you can use furans in the polymer – it turns out that you don't have to, but that was why we got into it in the first place. So, this whole thing is a thread. The thread that goes through everything is the exploration of furans as a core material that's available in a general sense, and everything is around that.

What's difficult, I think, is that if you don't have sort of the technical thread that is intuitive to go through this, it looks like a random smattering of stuff, but it's not, not at all. It's very tightly linked to the logical commercialization of furans as a material. And you see this, by the way, historically, also. So, if you go back and you look at the development of prior chemical platforms, which typically haven't happened recently. Most of the time they happened a while back, decades ago. But if you go back and look at that, you can see the same kind of walk that was being taken by the people who are developing those kinds of chemical platforms. So that's sort of my view on what we're doing and how it's working out this way.

Ryan Smith: Can I double click on something here. Because the way you're describing it – and I agree, by the way – but the way you're describing it is "furans are unlocking all this opportunity" for you. Why

weren't the big chemical companies doing this 20 years ago? Or what is it? How did we identify this as a sort of a unique unlock for the industry? If you want to speak to that a little, I think that will sort of help contextualize even further.

John Bissell: Sure. Well, I think that they were, they were just doing it for different platforms, right? So, you saw it with the olefin platform, and you could even more specifically say the ethylene platform. So, with ethylene, you saw exactly this thing, right? So, you started with high-density polyethylene and then low-density polyethylene, then linear low-density polyethylene. Then you had ethylene glycol production, which of course, also comes from ethylene. And so you had this same sort of platform expansion. Well, what's the relationship between ethylene glycol and linear low-density polyethylene? Not much, except that they're linked by the core technology that's used and that enables both of them. And yet, if you go back and look at the development of the ethylene platform, they were both developed by the same companies. And of course, once you have ethylene glycol, you start looking at other things you can do with ethylene glycol. Once you have linear low-density polyethylene, you start looking at other things you can do with linear low-density polyethylene, right? And so I think the other companies were doing these things, and in fact, their exploration of those core chemical platforms took them decades. And, in fact, that's what they've been doing is exploring those. That's, you know, many of the big chemical companies that we think of – our experience of their history is them developing these platforms that they initiated back in the '40s, '50s, '60s, '70s.

Ryan Smith: So to put it another way: this pattern of unlock isn't new, this is a pattern that's been around. It's just that furans don't come out of a refinery, right? And so the discovery is that, hey, there's this great molecule that also has these properties that you can grab a hold of, and sort of has this potential to turn into a bunch of stuff.

John Bissell: Right. And you asked another question, which I think is germane, which is, why hasn't this been done before? And your point that you just made right now, I think, is the key one. Which is that for the last 100 plus years, the big wave that the chemicals industry has been riding was fossil sources of carbon, right? And so the question has always been, "What can I make from oil?" And then subsequently, "What can I make from natural gas that is useful, easy, and inexpensive?" And I think it's only relatively recently that everybody has said – well, maybe not everybody. Most people have said, "Okay, maybe this whole fossil thing is not a great idea, and there are some trade-offs, some meaningful trade-offs, and we should have another platform of feedstock that's available." And so we have to ask the same question: What is the right thing to make that is effective and inexpensive, and easy to make, from other feedstocks? And those feedstocks are, you know, I think, effectively, biomass and CO_2, right? Those are the two that matter at this point.

Ryan Smith: Because that's not an incremental innovation from what they've all been doing. It required an Origin. So, I want to ask Rich sort of the same question here, right? Because there's all this sort of technical underpinning, right? But Rich, as you see it, and how these elements sort of connect up to the same vision or the same mission... I'm interested in your view there.

Rich Riley: Yeah. So I'll zoom out more just partially based on lack of technical aptitude. But you know, I see us really solving some of sustainability's hardest problems. We have a company full of advanced, you know, furanic chemists, as John was describing. We have people with incredible expertise in molecular materials. And so the things we're doing are really hard. This is like hard tech.

You know, *The Hard Thing About Hard Things* is a book that really resonates with us, and if you think about it, everything we do, from our caps, to our CMF, to HTC, it's all never been done before, right? And so we don't have competitors and things like that because we are blazing new trails. And I look at it as the world makes this, you know, once in a planet transition. We have this entire petrochemical complex today, powered by oil and gas, you know, that's the feedstock for all of this, and it will transition over time, and it may go at different speeds and in different ways, or whatever. But I don't think there's much dispute that it will transition. And, like John was saying, it's going to transition, we think, to biomass as the feedstock, which is the most plentiful thing on the planet and is readily available and inexpensive and has a bunch of great attributes.

And so we have the leading platform to convert that biomass into many of the things that are made today from oil and gas. When you're commercializing a revolutionary technology like ours, you know, it doesn't always go in the exact, straight path, that you originally thought, and in our 12-year history we've certainly make plenty of twists and turns. But the north star remains unchanged in terms of tackling the really hard challenges in sustainability and transitioning into a biomass feedstock for a huge part of today's petrochemical complex. So people can get the things in their lives that they need, and we just have got to get them from somewhere other than oil and gas over time.

Ryan Smith: That makes sense. So as we get off of the beaten path that the oil and gas guys have created, and we're sort of, you know, out hacking away in the jungle there are some twists and turns, but that north star is clearly there for us, and guides us that way.

John Bissell: And it's been the same for, whatever, 15 years now, right? I mean, it really hasn't changed. It's pretty shocking.

Rich Riley: We just have a lot more talent and a lot more capital.

John Bissell: Yeah.

Rich Riley: And so we're finding is, it's been amazing, even at my time at the company, that 2 years ago our products were sold 100% based on sustainability, right? You know, competitively priced, sustainable replacement. And that resonated hugely. You fast forward and now, yeah, we've still got that. But we just keep finding more and more functional advantages. And I think that's the result of having all this talent compounding and working with these molecules and finding higher and higher value things. But it's really incredible to see the value proposition of what we're doing move so quickly.

Ryan Smith: Yeah. So, nope, I can – I'm sort of pulling back from jumping in, I totally agree. But, yeah, so let's go ahead and connect this. So I think that's actually very useful vision and context to connect up some of these specific businesses and the activities that we're engaged in. So that's kind of where I want to take the conversation next is, let's talk about some of these strands. And I think this one's going to be squarely in John's camp.

There were a number, not a bunch, but a few questions that were focused on certain technical issues. And it was sort of OM1 biomass conversion technology types of questions, things like feedstock, and a lot of those were answered with the demonstration of wood feedstock recently. But also questions about, you know, does HCl actually affect, does it show up in the intermediates that are produced from the technology? And so I basically put it to the group of investors. I said, “What's, you know, why

are these the most popular questions? What's driving this? And the motivation there?" They really came back to us: "We just want to understand the milestones," right? And so I'm not going to ask you to commit to a particular sort of milestones that we're going to share with everyone. I don't think that's the focus here. It's more like helping us, helping investors understand. What are the milestones that we see for the biomass conversion technology, and particularly in the context of OM1 and if you could speak a little bit about that sort of being as general or specific as you think is appropriate for the development of the technology.

John Bissell: Yeah, sure. So I think, maybe, first I'll actually just respond specifically to the HCl comments, because I think those are interesting anyway. How much does the HCl or chlorine more specifically end up in our products? Well, it certainly ends up in CMF, right? So, CMF is chloromethyl furfural, and a big part of what we do downstream is catalytically convert the CMF into the next intermediate. There are a couple of different options there. Obviously, when it's going to paraxylene, it's going to methyl furfural, and then dimethyl furan. But the goal is to recover that chlorine so that we can put it back in the front of the process.

But characteristically, again, you never have perfect recycling on all this kind of stuff, right? There's always going to be some leakage. Now, is it inorganic chlorine? Is it organic chlorine? How are you recovering it? What are you doing with it? That's always the case. Your mass balance is never perfect, but these are things that we just manage. This is the work of running a chemical process, period – is that you're managing these kinds of things and making decisions and trade-offs around them.

And I think, you know, that leads to one of the challenges in communicating around technical milestones like that, especially to the public, is that we can't always predict what the right trade-offs are going to be for a given plant or instantiation of the technology. You know they're going to show up. There are always trade-offs in these kinds of technology development paths. But what we do know is what the, sort of, let's call them, more boring financial and commercial milestones are going to look like—

Matt Plavan: Hey! Hey! Hey! Hey!

John Bissell: Like more boring to me, I guess. But you do know how those are going to maybe work out, or roughly, what you think those are going to look like. But there may be lots of different ways that the technology path can sort of tortuously organize itself to meet those.

And I think, you know, one of the challenges that we've had as a technology development organization that is public is, we want to be transparent on these sorts of things. But, at the same time, I don't want to be setting out tons of milestones, and then have to be constantly explaining why we made a slightly different technical decision on something. Right? So that's one side is just there's a level of play in the way that we make decisions around a particular instantiation that, you know, it doesn't make sense to communicate out and constantly be adjusting.

The second part of that, of course, is that technology is also our differentiator, right? So unlike in the pharmaceutical industry where I can get a composition of matter patent. And at that point it sort of doesn't matter what I tell you. I own that molecule for that period of time. That's not how it works in our industry. Right? There's enormous amounts of know-how and trade secrets and, of course, patents that prevent somebody from going and duplicating what we're doing. And a big part of that is

understanding the journey through all of these different technical decisions. If we communicate that journey, it makes it that much easier for somebody to come in and say, "Oh, that's what they were doing." If they're trying to replicate what we're doing, they may run into a whole smorgasbord of different issues. And knowing which ones are important and which ones aren't important is enormously time-saving and effort-saving. And we don't want to be time-saving and effort-saving for people who are trying to do what we're doing. And that's not just true for right now, right? But in 10 years, if people – or 5 years, or however long – if people want to go back and re-walk the journey that we've gone through on technology development, we don't want to make it any easier for them.

And so, the more we – if we were to spend, I should say – time explaining that technology journey publicly, it makes it that much easier for somebody to go back and try to do the same thing. Even if it seems like they're immaterial, it's often not immaterial for somebody who's quite technical and engaged in the project. We're even careful about exactly what angles we take of pictures of OM1. So that we're not too flagrantly, you know, showing sophisticated people exactly what's going on in some of the parts of that plant. And so that's a big part of why we don't communicate more specific technical milestones on this kind of stuff. It's just difficult to do while retaining the proprietary knowledge of the, like, idea maze around a technology like this.

Ryan Smith: Yeah, I think that's really helpful. It's definitely not a checklist of binary things where you're just sort of like: check that one, check that one –

John Bissell: “I did that one. Now I'm good.”

Ryan Smith: Right. No. I think trade-offs is a good way to think about it. You know, there are combinations of settings of different parameters that work, and many that don't, and sort of tracing out that maze, as you call it, I think it's useful. I wonder, though, can you—

John Bissell: You know, one more comment that I think might be helpful is, obviously, we're not the only company that's ever developed a chemical technology while we were a public company, right? What I think is helpful for people to understand is there's actually not a precedent, despite the fact that there are other companies that have developed chemical technologies while they were a public company. There's not really a good precedent on how to communicate on a lot of these technology issues, because when the technology was being developed inside of a public company elsewhere, it was almost always small enough that it was immaterial to the overall story of the company. And that was a really big difference for us, right? So, talking about how we proceed with and how successful we are with our various technologies is something that investors care about. Right? That's not often the case. And in fact, I can't think of a time when that's been the case for another chemical technology.

Ryan Smith: Yeah, that makes sense. I was going to actually ask about that. But I'll change my question a little bit. I wonder if maybe there's – and this might just be, I don't know, chemical engineering 101 or something – but I'm wondering if is there like, can you describe categorically the types of things that one would expect to look at, at this level of scale with a plant the size of Origin 1? Is it equipment? Is it fundamental chemistry? Like, I think maybe...

John Bissell: With OM1, it's rarely fundamental. Something that scale, you're not looking at fundamental chemistry. You're looking at: What are the unexpected – Well, “unexpected”? Maybe not

fair. What are the known unknowns? How do those manifest in your equipment and process selection, right? How are your parameters being affected? That can be something that's, you know, can change as you change scales. So it's those kinds of parameters. It would be very, very – In fact, I don't think I know of a single story where the fundamental chemistry changed as you scaled it. It just doesn't, you know?

Ryan Smith: Great, makes sense. I'm going to switch gears. I'm going to take us to the next strand, which is the caps and closures business. I'll start with John. Certainly, Matt and Rich, if you want to chime in here, too, I think that'd be useful. One thing that I noticed is a couple of investors used very actually, sort of, very similar language that I've heard you use, John, with respect to the caps and closures business. They asked, "Is this a savior or a side quest?" Which I thought was kind of interesting. I've heard you use that. And someone had a follow on question where they said, "Maybe it's neither. Maybe this to Origin what explosives were to DuPont." Which I thought was a really insightful way to follow up the question. Definitely want to ask that. How does caps and closures fit into the larger model you're describing? You talked about that a little bit. But what role is it playing, specifically, for us right now?

John Bissell: Yeah, I think that that explosives analogy was probably tied from a comment that I made at some point or referenced from there. But I think that's right. It's sort of... It's even a little different than that. Well, I was going to say making nylons from nylon for Dupont. But that's probably not quite right, either, but it's... The caps and closures business is a lower risk business that relies on the same differentiated capabilities that we have in the organization which is strategic to our broader furan technology platform. But is not dependent upon it. So "it's strategic but not dependent upon" is an important combination. And I think that some of the context for people on the "side quest" piece is, you know, a lot of these things are – because of the thread that I drew through in the beginning on furans – most of these are not really side quests. The question is what order do you do them in and what order is optimal? And you're going to end up doing all of them eventually, right? As you develop the furan chemistry platform. And we have lots of things that have shown up that are, let's call them potential quests. But this one makes sense in this context right now. Because it can generate that consistent cash flow with much lower risk profiles per capital project and is still strategic to the, sort of, core business. Core technology business, I should say. I don't know, Rich and Matt, you guys probably...

Rich Riley: Yeah, I would just maybe add that, you know, as we develop our platform, we uncover some short-cycle opportunities in addition to our sort of longer-cycle, you know, when you're building massive chemical plants, it takes years and, you know, it costs a lot of capital. And so as we're doing this, and we're constantly finding new things and seeing new opportunities, we identify some, some what I would call sort of short-cycle ones where, yes, they're consistent with the long term strategy, but we have the ability to execute them in the near-term and get to market in advance of our biomass plants being built. And so that's really exciting to us from a, you know, financing the business, and continuing to grow the company. And so caps and closures is the first notable one where we can be in market within 12 months — into a huge market with a highly differentiated product. It's really exciting. And there's a few more in development that have the potential to be similar. And so you'll expect to see us take advantage of these shorter cycle opportunities while we continue to advance the overall platform and work on the longer cycle opportunity.

John Bissell: I think that's a great point. So there's the characteristic time scale component, which is the shorter time cycle. There's actually another one that I don't think – the caps and closures doesn't quite fit this, but I think it fits your, like, opportunity identification piece, which is that there are actually opportunities that... Well, let me back up. The core biomass conversion technology hypothesis is that if you can get furan cost of production into the same general range as petrochemicals, I should say, then there are an enormous number of opportunities. However, there are also furan opportunities that don't require that same level of low cost of production. There are furan application opportunities that are so high value that it almost doesn't matter what the price of furan that you produce is. That's another, like the caps and closures one, that's another abstract class of opportunity that might be out of cycle with – OM2 or OM whatever, OM asset light, I don't know what you call it, that's where you get to really low cost furans. But there are opportunities that are available that are adjacent to our technology, or part of our technology, before you get to low cost furans. And so the sequencing matters a lot, both because of the short time cycle and because the required characteristics that make the opportunity worthwhile are different.

Ryan Smith: I think that's really helpful, especially as we think forward, as we announce new opportunities, contextualizing it, I think, in terms of, you know, these short cycle opportunities, which I think makes a lot of sense, and then I'll call it higher-value opportunities on furans. Really, you're sort of charting a course strategically to get to the place where you've got these large, I'll call them OMX plants that have low-cost furans, and then everything opens up and is available. I think that's a very useful way of putting it.

Matt Plavan: At the risk of not stating the obvious, job one for us right now is getting to profitability. And caps and closures, of all the opportunities that we have, is the one that has the highest probability of driving us there the soonest. So that is, in fact, what we tried to communicate on the earnings call, and why this has come to the forefront. It's totally on mission. It's an enormous market, which is wonderful. But it gets us where we need to be to do all the other things that we want to do.

John Bissell: And to that point, right? I always like to tie in the history on this stuff. But Dow Chemical did the same thing, right? They were making bromides even though the vision for the chlor-alkali process was making chlorine and caustic. But that wasn't where they started. They started with bromides because it was a cash flowing side quest, you could call it, right? If you want.

Ryan Smith: So let's talk about the cash flowing piece here, Matt. I'm going to ask you: you know, as I was chatting with the investor set, there was a lot of very strong sentiment, a lot of energy around this idea of trying to characterize what that business is in terms of how much revenue is it going to produce, this kind of thing. And I was sort of pushing them, like, "Why is everyone so animated around this particular topic?" And then someone just kind of came out and said, "Ryan, we like the mission. We think John's a genius. But can someone just give us something to build a model with?" That really was the way they stated it. And so, and you and I talked about this a little bit, Matt, but I guess, can you help explain: Will Origin be able to provide something? Or what have we been providing that can be used to build a kind of economic model of the caps and closures business, or the enterprise as a whole? What are the relevant pieces there that we've been putting forward, and that we would plan to put forward in the future?

Matt Plavan: Yeah, sure, that's a great place they are right now in terms of wanting to know that information. And we're eager to share more as we get further along in the business. But it's important,

I think, to start with the guidance that we did give. Because I think it says a lot, and you can infer from it even more. The guidance we gave at the earnings call in February was that knowing that we ended 2023 with about 160 million in cash, we said that we would be able to get to profitability off of those funds alone. We gave further guidance that cash burn would be between 55 and 65 million in 2024 and two other important points. One was that we wouldn't need to go to the capital markets and raise additional equity. And that we would be able to get to profitability – strong sustained profitability – based on this plan, while maintaining a pretty healthy cash balance at all times. And you could say, "Okay, what is that?" Well, a lot of folks think of having at least a year's worth of runway in the bank is a good thing to serve as a cash deck, so to speak, or bottom deck. And so that guidance, if you kind of think about it and say, "Okay, well, that means they're probably going to end the year at around a hundred million in cash, that's going to get them to profitability. And they were burning between 55 and 65 in 2024," and kind of draw a line to see what kind of margin we'd have to generate, to be able to do that. And you know what our operating expenses are coming out of the year. So you can kind of interpolate with some assumption around gross margin what the quantum of revenue is going to be. So there's more there than maybe people really understand, or appreciate. So it's important to kind of provide that recap because at the macro level, that's almost all you need to know. And if you assume that most of that margin and revenue will be driven from caps and closures – which is what we also indicated – you start to get a feel for the amount of visibility we think we have into that business. Furthermore, if you think about those businesses and what we said about the group of prospects that we have in letter of intent stage, and in our pipeline, they represent a lot of cap production and sales globally. And we said, you know, tens of billions. It's a big number. It's also existing business. Okay? So when we think about how we're going to be adopted into those volumes, it's really pretty predictable. It's recurring revenue. And it's going to be produced on manufacturing lines that are pretty standard and consistent. So the metrics are going to be pretty simple.

We want to be careful not to go into too much detail too quickly, because we need to preserve competitive propriety around this because it's very competitive. And this is a very unique opportunity we want to stay as far in the lead of as we can. So as we start to really close out these agreements, spend more time with our analysts aligning them around this being kind of the tip of the spear over the next 3 years. Yes, we expect more of these metrics will start to come out and be available. But I think it's premature to go any further into it than that. But I think, you know, we have given a fair amount of really, I think, meaningful guidance that that should hopefully satisfy folks that we've got a good sense for where we're going, how long it's going to take us to get there. And that as we announce some of the news coming forth about how we're doing, I think we can start to put this together, and people feel a lot better about being able to envision what this looks like in the next 12 to 24 months.

Ryan Smith: I think that's great. So, you've laid out some of the dots that could be connected today, and there are more dots to connect in the future, as the metrics emerge. I think that's actually very helpful. So alright, I think, you know, I've only got one other question I wanted to make sure we hit in this segment, and then we'll have a follow-up to really run through the remaining questions that we weren't able to get to in this segment today. And this can kind of go to anyone, Rich or John. But you know. we heard a couple of times that investors hear about products. Think carbon black, biofuels, some of the FDCA stuff, as well as partnerships. But then we don't always know what happens to those after those get announced.

So, for example, last year, there was a technical announcement around performance in a carbon black environment that was really exciting. You know, we talked about biofuels. We've talked about some of the partnerships. And I think that's starting to make – should make more sense in the context of what we were discussing before about these sort of short term cycle opportunities and high value. But as announcements like that continue to pop up, how should investors or anyone tracking Origin think about those in the context of the larger business.

John Bissell: Yeah, it's an interesting question. I mean, so, it is difficult to see – and we, you know frankly, we kind of make it intentionally a little bit hard to see this – you know, the connection directly between an individual customer, a white paper like that, that carbon black white paper from a while back, and an off-take increase, right? And the fundamental challenge there is that, you know, we don't want, and our customers don't want, us to point to exactly the price that they're paying for a particular volume of a particular product. And in some cases – and this is more and more true as we get to more performance-differentiated products. Our customers really don't want us necessarily even talking about the specific product we're providing them, right? Or that they're going to make out of an intermediate. I can understand why it doesn't feel like a nice straight-line path to people. I don't know if it ever will. I think that the intent is for people to say, “Okay, look, I understand that you have these customers, and I can look at them, and maybe I can get a feel for what Origin is probably selling them. And I can do that because Origin’s told me, sort of, this suite of products that are possible to make from Origin intermediates and technology. And I even understand really, sort of, how they're making some of those products, from either the white papers that Origin specifically publishes, or something along those lines. Could be, you know, journal articles, or whatever else or just from general industry knowledge, right? I sort of look at, Origin has told me what HTC Is, and so I can take that plus, you know, Kirk-Othmer chemical encyclopedia, and I can say, “When they say they're making this, they're probably doing it kind of like this.” Something like that, right? That's kind of the intent of laying all those things out.

The challenge is that requires a lot of industry and technical knowledge. It may not be specific Origin industry and technical knowledge. But it is chemical industry-specific and technical knowledge. And of course, we would like to remediate the need for people to have all that stuff. But if we start pointing to specific things to help people put those together, well, then we're actually, you know, we're giving more information just by privileging the fact that we're pointing to that thing. And so it's a little bit challenging on that front. I think part of this is just having a sufficient body of information out there. People will start to understand what are the sorts of classes of things that we're doing. And we're trying to figure out how to teach that more, too. So that people can connect those dots on their own a little bit better. But it is – I'll say it is challenging, right? In the same way that it can be challenging for people to see how all of these businesses are connected, because in many ways they're actually connected technically, right? They're not necessarily connected in any other way. If you don't have that technical skeleton, it seems incoherent, right? But when you have the technical skeleton infrastructure for it, it's very coherent, right? And so I think we're getting better at that. We're trying to figure out the right ways to talk about those things so that people can connect customer announcements to white papers to products. But it's, you know, it's fundamentally sort of a hard thing.

Rich Riley: Yeah, I would just add, you can think about it as we're constantly trying to upvalue the platform. And so, for example, with HTC, two years ago we assumed that our early HTC would go into

fuel pellets and be sold effectively for its Btu value. We had reason to believe we can get to carbon black, but we weren't ready to say that, and hadn't sufficiently proven it. And so when we did sufficiently prove we can get to carbon black, we sort of plant that flag and dramatically upvalue our HTC intermediate. And then what happens from that is now we go engage the carbon black world: existing manufacturers, customers of carbon black, you know, tire companies, and all these kinds of folks, because now we've kind of crossed the technical milestone and said, “We're here, carbon black world, with a highly differentiated solution to a big problem you're trying to solve.” And so then you go through a period of, you know, how do you take that to the next level? And that requires, you know, more samples. And more complex relationships and stuff like that.

We did a similar thing with caps and closures when we planted the flag and said, “We have figured out the PET cap.” And the phone rang off the hook. The people from the caps and closures world, who we didn't know as well as we knew, you know. So, a whole new world. And so then we start figuring out, who should we partner with for this part and that part? And then, what you'll see, likely, is the output of those conversations and us taking that to the next level. And so, you know, some of it is really planting a flag on upvaluing some aspect of the platform. Which is really exciting for our techno economics and really exciting in terms of addressable market, and all the places that our intermediates can go.

Ryan Smith: And so planting that flag, there's also sort of an iterative quality to this, where there's sort of a call and response. You put it out there. The phone starts ringing. You're like, okay. Now we, you know, put more strategic weight on that particular approach.

John Bissell: That's a good point, too. I really like the way you just said that. Both of you guys. Because I think it’s probably helpful for people to understand sometimes that we may talk about something in an investor communication. And yes, of course, the investors are part of the audience. But the most important audience may actually not be investors for that particular communication. The most important audience may be customers or partners.

Ryan Smith: Right.

Rich Riley: And what's great is then we, you know, we bring in partners. I'll just stay with carbon black. So, we know a lot about our carbon black, but there are entire companies who do nothing but carbon black, and have done nothing but carbon black for a really long time, and are full of really talented people who are world experts in carbon black. And so, you know, that up levels the conversation, that brings more talent working with our platform and figuring out the best places for it to go, sequencing, and all that kind of stuff. And so those are more ways that you build a really robust platform, is by, you know, exposing it to these different companies and partners and having them join the journey.

Ryan Smith: That's great. So, planting flags, other kinds of communications, figuring out how to tell the story. I think this conversation has done a lot of that. I think there's a lot of context that was built here. I'm excited to have some follow up segments with you guys to really sort of pick through the remaining items that that came forward in the question sets, but I think this was a good start, so really appreciate it. Thanks.

Rich Riley: Thank you.