

BASF R&D Webcast: Driving sustainability with microorganisms – Transcript Q&A

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1 Corporate research in general

Christian Faitz, Kepler Cheuvreux: What is the rough geographical distribution of your 10,000 employees in R&D?

Dr. Detlef Kratz: I think it's an important question. First of all, to me, R&D is always a global topic because where we actually do the research doesn't matter if it's fundamental, if it's close to customers. We obviously are close to our customers.

But I can give you an indication for the Group research. We have a very good global footprint. In my unit, which is close to 4,000 people, we have roughly 300 people in the U.S., and 200 people in Asia Pacific and rising. Most of R&D employees are in Ludwigshafen. But that's historic and the legacy we have here because we have always been a German and science-based company. But also elsewhere in Europe we have 400 people.

So, it's quite dispersed and I think that's a good sign. We also mentioned: We tap the university know-how. Through our locations across the regions, we can do this. And it's also important for talent resourcing.

Michael Schäfer, ODDO BHF: You announced a reorganization of your R&D platform a year ago, embedding research units into operating divisions, among others. Can you update us on the progress you've made in the meantime? And what tangible results can you share with us?

Dr. Melanie Maas-Brunner: We are very happy with how this restructuring is working out. The embedding of the customer-focused R&D activities into the operating divisions is really paying off. We see that we are now faster in answering customer needs. We are closing the loop faster. With this – maybe it's a little bit overshadowed by the current situation – I can also assume that the results and also the growth we are anticipating from this innovative strength are really speeding up.

Specifically, the bundling of the core competence into one global platform is also very useful because of all the challenges that we have – we need to do the transition, we need to work on completely new technologies, we have to pilot something which we never have done before – this is all easily done from a single unit. And also here, we see that we are gaining speed.

Dr. Detlef Kratz: Let me give you some distinct examples of what we want to do differently. Remember last time, we introduced the fact that our legacy research facilities, for example, Basic Research or Polymer Research or what was known as the Ammonia Laboratory Process Research, were distinct entities. Now it's all in one.

If you look at the complexity of the task that Melanie introduced, you will always need a different mix of people. So what we have done in the new Group Research division is: We have mixed up engineers, chemists, bio-scientists to work distinctly on projects together. So, we don't have silo thinking. We've integrated them within Group Research.

We have also done this structurally by devising programs, for example for bio-catalysis, for example for renewables, but also for process engineering or for catalysis. I think this is really a growing together of a large community, which I think is unique in the industry. I don't think another company has this footprint, and we managed it through this integration.

Michael Schäfer, ODDO BHF: Your number of patents filed dropped to 820 in 2021 from 950 reported in 2020. Is this an important KPI for you? Is this an area of concern? Are there any targets going forward?

Dr. Melanie Maas-Brunner: Yes. This is, of course, also an important KPI for us. I think the number sometimes is not really the only aspect we have to consider. It's also about the quality and the impact a patent might have. So this is not really immediately visible from the number.

I think we also have to say: Corona was also not very helpful, especially for being creative, for being innovative, and for working on something that you can later patent. I think we are now back to a situation where people are working closely together, not sitting in home offices. I think this is a dip you might also relate a little bit to the pandemic.

Dr. Detlef Kratz: I agree. It's temporary, if at all. The new sustainability topics that were highlighted, not only the biotech part, but also what we need to do in terms of the energy transition, will automatically actually give us a new space to write patents. That has a lead time because you see the patents maybe slightly later than the invention.

Martin Evans, HSBC: In a weaker trading environment, companies often cut back on capex. Do you feel that the R&D budget would also be at risk if conditions worsen?

Dr. Melanie Maas-Brunner: Conditions are already worsening. And that's what we obviously see. I think R&D is a very, very important pillar of the future success of the company – this is acknowledged by everyone here in the company. I think we need to constantly work on filling the innovation pipeline. And we can only do this if we really constantly work on certain projects. Innovation is not something you can just switch on and off.

So, significantly reducing the R&D budget would really mean a drop and an empty pipeline at a certain point in time, not necessarily within the first one, two, three years, but we would see it then in five or ten years. That's something we absolutely need to avoid. There's always a little bit of volatility, spending a little bit more or less. But I think that the order of magnitude of our spending on R&D every year will still stay the same.

Christian Faitz, Kepler Cheuvreux: Can you talk about retrofitting costs to move from a gas-heated steam cracker to an electrically heated steam cracker? Will the eventual retrofit lead to any operational disruptions at the Ludwigshafen cracker you are deploying?

Dr. Melanie Maas-Brunner: A cracker has many ovens, a couple of them at least. So we are now trying it out with one oven. You can basically run a cracker by running them all or running only a few of them, so you can just switch them off. You redo this and then you start again. This process is very easy to implement, and also to multiply. If this works as expected – and I would think so – then we can just multiply it to the other ovens, and we would then, at a certain point in time, have a completely electrified cracker.

Chetan Udeshi, JP Morgan: How do you assess that BASF is not overspending on R&D? 2.2 billion euros R&D spend is a lot. And I'm not sure if this is valued by investors, as we don't see as much evidence of upside on a Group level.

Dr. Melanie Maas-Brunner: I mentioned also the 11 billion euros in sales that we are doing with products aged less than five years.

You need to take into account that what we are currently doing is also a big transformation of all the technologies. We are spending heavily on getting into a situation to ensure that we really have climate-neutral sites. Developing these production technologies is work that requires a lot of effort, and the results are not necessarily seen immediately. This takes some time.

The good thing is: We started some things very early. We will implement the e-cracker next year. Some other things are just starting now. I think it's a continuous way of really bringing this forward. But, specifically, with this heavy technology impact that we are facing right now, some of the things might only be seen a little bit later.

Dr. Detlef Kratz: To put the 2.2 billion euros into perspective – a rate we've been running for some time: Typically, the people look at research spending of countries as a percentage of GDP. For example, in Germany, it's around 3%, in numbers around 100 billion euros. So you could argue that BASF is a very strong player, accounting for 2% of Germany's R&D private and public spend. I think that's a good sign for the chemical industry, since the number I mentioned includes everything: Siemens, automotive, etc.

I think this is good value if you look at it as an R&D percentage of our spend and the diversity of our portfolio and, as Melanie pointed out, the sustainability topics we have on our agenda. If we were not to do this in the long term, we would not be able to solve these key topics of electrifying our industry, of CO₂ savings and meeting our 25% CO₂ reduction target.

2 White biotechnology

Chetan Udeshi, JP Morgan: Why do you talk about “white” biotechnology? What does “white” stand for and what are alternative color biotech processes, if any?

Dr. Melanie Maas-Brunner: White biotechnology: That's industrial biotechnology. So that's where we basically try to change chemical processes that are either energy-intensive or not viable because they would be too complex. Too many steps would be used in chemical synthesis or they are based on fossil feedstock. That's something we can change with white biotechnology. We can make it easier. We can create complex molecules using those microbes. We can also start from renewable resources immediately. We don't need the fossil feedstock, so we get rid of the CO₂ footprint of the resulting product immediately.

And we can also – this is also the beauty here – nicely combine chemistry and biology, white biotech. The example I showed is the detergents enzymes, where the chemical competence that we have together with the enzymatic powerhouse that we are creating here really helps people in reducing their water and energy use for washing their laundry.

There's also obviously green and red biotech. Red biotech is pharma, for pharmaceuticals. Green biotech is more towards the agricultural systems.

Dr. Detlef Kratz: If you want more colors: Blue is for marine and there's still brown for wastewater sciences. But our focus is industrial. I think this is the point.

Andrew Stott, UBS: How “young” is the C1-based fermentation technology? Are there any key milestones that you want to talk about?

Dr. Detlef Kratz: I have to recollect exactly the date since when we have the C1 technology, but we started the white biotech platform some time ago. I would have to guess now. But it has been grown since, I guess, ten years or so.

This is something that doesn't happen in a day and it's a continuous optimization. You start with a strain, you find a hit, and then you start optimizing this C1. And it's true for all of these strains, irrespective of where we have them. So, the C1 strain is easily ten years back.

Chetan Udeshi, JP Morgan: Are there enough bio-based raw materials available to enable a mass transition to bio-based chemicals?

Dr. Melanie Maas-Brunner: This is a very good question. It is something we need to consider. For the time being, yes, there's enough raw material available, but the concept is just starting. We need to be very careful not to compete with food and feed. I think it is also our obligation that we find different sources. And there are different sources. There is waste material, also in nature, which is not being used. And also the LanzaTech example is really, really great, showing that there is off-gas that we can use as a renewable carbon source for the production we are doing.

So there are enough things, but we have to make the technologies happen, and we have to play a little bit to determine what kind of solutions are really the right ones.

Michael Schäfer, ODDO BHF: On your participation in and collaboration with LanzaTech, how is this gas fermentation technology deployed by BASF and what are the targets?

Dr. Melanie Maas-Brunner: LanzaTech is a company that we are observing very closely. We have also invested via our venture capital subsidiary. For the time being, there are complementary capabilities. They are very good in fermentation. They know their microbes. We are good in the downstream processing, in process technology, and we can also then help them in whatever kind of molecules they are producing.

Octanol, for instance, is a molecule that we want to bring into our value chains by using the LanzaTech technology. I think this is just the starting point. First of all, we need to really prove that large scale, huge variety, different raw materials, different resulting products are really capable for us.

Dr. Detlef Kratz: The history with LanzaTech goes back ten years. We started twelve years ago to observe and work together with the company. Then, as Melanie pointed out, we invested in LanzaTech through our venture capital subsidiary. We have a couple of research projects. Octanol is one example, but we are expanding that because there's a whole suite of molecules that fit wonderfully into our value chain.

So, this is at an early stage, and you must understand: The ethanol production with LanzaTech is now state of the art. They are building large-scale plants, so we know it works. If we want to use that for BASF, for example with our own off-gases, which we can ferment, then we look at it for products that we need and that we can feed into the value chain.

Ethanol is an easy one. It is a naturally occurring product. If you go to octanol, this is a different product. And, of course, the microorganisms have to learn, to understand that they don't see this as a toxic substance, or we have to extract it. This is the art. If you ask when we will have this: It's early days still, but we see there's a huge opportunity because it's really a fundamental change.

Chetan Udeshi, JP Morgan: Some of BASF's core competitors in crop protection are working with other biotech enzyme companies on biologicals, e.g., Bayer Novozymes. Is BASF doing everything captively?

Dr. Melanie Maas-Brunner: No. We have also here biologics. I think they will play a major role in the transformation of the agricultural solutions business worldwide because they're really helping to reduce the consumption of pesticides, insecticides and herbicides, etc. It's about the clever combination.

We are licensing-in products that we see as valuable for us. We have lots of cooperations, also in Japan, for instance, where we can use the know-how of products that are coming out of universities or from other companies. I think it's really a clever combination, like other companies are doing as well, to bring this together and then have these powerful agricultural solutions based on biologics and some chemicals.

Andrew Stott, UBS: You mentioned that biotech sales of 3.5 billion euros should grow above average for the long term. Do you have a range in mind for the sales growth potential of the overall business?

Dr. Melanie Maas-Brunner: At this point in time, it's hard to say. I expect that there is really significant growth above chemicals' growth. Why? We have started this journey in some of our segments. So it's way more pronounced now in the Nutrition & Care segment, for instance, and in the Agro segment. But also now with consumer demand and, let's say, the fact that consumers are asking for renewable-based materials with a low carbon footprint, this will also slowly sneak into the other segments. And then I think, with this, the growth comes automatically.

Retail investor: Can you tell us a bit more about your cooperation with LanzaTech?

Dr. Detlef Kratz: I already mentioned our joint research projects, as we have, for example, to adapt the portfolio from ethanol to more value-adding products – for us, octanol, butanol, acetone, those are the typical ones. If you heard the press conference earlier, there was a nice presentation that gives you an idea of what is possible. That then feeds into our value chain. So this is one topic.

Let me give you another example: With the new technology in ethanol, we are interested in ethanol as a starting point for our raw material value chains. So just think about it: We can take ethanol and dehydrate it to ethylene. It is an alternative to an electrified steam cracker, if you like, and then could also be a niche to bring in a bio-based molecule or even a waste-based molecule into our value chain. And that is good for our product carbon footprint. So that is a simple sourcing strategy.

Another one is: There was a discussion on the need of hydrogen for this production. We also have hydrogen technologies. We are investing in this and also in technologies to convert these gases that are needed, where we have the whole Catalysts division, and the research is in my department. So, we co-operate also on these points.

So, there are many touch points. I think it's a nice symbiosis between a company that's really proficient in understanding these anaerobic microorganisms and BASF in the downstream and scaling process technologies. This is where I see the future.

Georgina Fraser, Goldman Sachs: What do you see as the key barriers to entry in biologics? Are there any major differences between the "moats" of cultures and enzymes from a competitive standpoint, for example?

Dr. Melanie Maas-Brunner: I think there are no kind of hurdles or obstacles to bring this in. Yes, there is some proprietary knowledge or products that we can't use and we won't use, obviously. But also there's lots of space to do something on our own. That's also why I said, we are doing lots of licensing-in of those technologies. But, otherwise, I think there's room to grow significantly and there are no restrictions.

Retail investor: Can you explain a little bit more how many people are involved in biotechnology? How do you see this developing?

Dr. Melanie Maas-Brunner: I think we have a couple of hundred people working in biotechnology. And because this is, as Detlef mentioned, kind of cross-functional work we are doing, we are now establishing a much more agile way the teams working on this based on engineering competence, on biology competence, on biotechnology competence, on chemistry competence. Therefore, it's sometimes really hard to say exactly how this is really increasing.

I think the whole story today is really: This is a new way in which a chemical company can bring together chemical competence, sustainability targets and a move away from fossil resources in a very good way. Therefore, you can expect that this platform will grow.

Dr. Detlef Kratz: We structured along different lines. You saw the diversity of the white biotech, the industrial part. We have close to 500 people worldwide in this community. They are in R&D, they are in technologies and in production, and it's across the globe. We have assets and early research in the U.S., we have the downstream processing here in Ludwigshafen, where we bring this together.

It's a couple of things. We decided to invest heavily into enzymes and we have shown the results, for example, for the detergents business. Now we have these enzymes, so we make it into a business. This is one strong pillar.

But then we have biocatalysis, which is an enabler. You use enzymes to do catalysis instead of heterogeneous catalysis. So another lever.

Then we also looked at modes of action, for example, to transfer biomaterials into new materials. And we use derivatization of polymers. All of this is structured and that's why we will grow this white biotech platform over time. It's a direct and distinct investment in our portfolio in R&D.