

# TECHONOMY NYC

## **Novozymes: A Multinational Company with a Strategy Centered on the Global Goals**

### **Speaker:**

Peder Holk Nielsen, CEO, Novozymes

### **Interviewer:**

David Kirkpatrick, Techonomy

(Transcription by [RA Fisher Ink](#))

**Kirkpatrick:** Peder Holk Nielsen is the CEO of Novozymes, which is a Copenhagen-based multinational biotech company, He'll tell you about and then he and I will have a little bit of a discussion. So you're going to start out with your slides.

**Nielsen:** Thanks very much, David. The shirt I put on this morning was washed at 80 degrees Fahrenheit. A decade and a half ago, I think it probably would have been washed at 140. You may not think about the difference between 80 and 140 but it's a tremendous amount of energy. And the solution that enables this, the technology that enables this, is actually biotechnology. It's enzyme technology and something that the company I work for is very proud to spearhead. It's a fantastic piece of technology that's been around for quite a few years. We are one of the companies. We were a startup three decades ago, today we are an international company with a—give and take a bit of the dollar exchange rate—about a \$17 billion U.S. market cap. So this is also business, is just a point I want to make. We're working on a lot of really exciting, cool stuff. I think laundry is pretty exciting too, but I'll try to excite you about a few other things, too.

[LAUGHTER]

We're trying to enable a corn plant—so now you have to travel to the Midwest—a corn plant or a soybean plant to actually recruit the right microbes in the soil to produce more with the same inputs. We're also trying to develop fine microbes that will, if we are lucky, and I think we will be able to replace all the antibiotics that we're using prophylactically in animal feed. Those are a couple of really interesting, cool opportunities that I hope will keep you alert, excited, for the next seven or eight minutes.

Before I go there, I probably just want to take you down a bit of the biology lessons that you had in school. So everything we do comes from nature; it's based on nature's own technologies. It's enzyme technology. We harness the power of fungus like the one you see on the screen.

Like in any other form of life, it is enzyme technology that actually drives it. Your breakfast is right now being chopped apart, digested, by enzymes from your digestive system. Eventually, it will, as small components, travel into your bloodstream. It will become energy for your cells because there are enzyme systems in the cells that convert it into the energy and the power you need. That goes for everything in nature. Any process in nature is using these systems. And as I'm sure you're aware of, nature is a pretty unique invention. It doesn't waste anything. It's almost a perfect definition of a circular economy. So it's a real cool place to go looking for solutions that can help us become more circular and more sustainable in our activities.

It's actually not new. I mean, we've used these technologies for thousands of years. They actually go back to old food conservation systems, old systems for preserving our foods that were developed by the ancient Greeks and Egyptians. We know it from fermentation of beer—there are so many things that we used to do and still do with the use of these technologies. And yet, we are here today to talk about how these technologies can also become a real, significant contributor to the future. And the journey has been a pretty long one. I mean, we've known it for years; we've been trying to develop these things and we've been successful in developing these things for industrial use. Nature never invented or evolved a laundry machine. That's something we did. But we have taken nature's technology and put it into the laundry machine to do exactly the cleaning of this shirt at 80 Fahrenheit and not at 140 or 200.

The power of nature is really unique and the thing that's moving so fast right now—yesterday we heard so much about connectivity and how the digital world is moving really fast—this world is moving faster. And the reason it's moving so fast is that we now have access, we can get access, to genetic codes in a way that we never could before. This world is exploding right now, it's exploding with genetic information on nature. We actually understand nature now through understanding the genetics of microbes and plants. And the future is one of coupling the genetic information with functionality. And that holds an awful lot of promise.

So think about Moore's law in the digital world. This is like two times Moore's law so it's exponential and it's exploding right now. That gives us a wealth of opportunities—so I talked about laundry, it may sound a bit mundane. You meet it every time in food manufacturing to get more with less, better use of the raw materials. That's particularly true on husbandry and animal farming, where you get maybe two, three, four, five percent extra yield; you get more uptake of the feed. And you may think of that in cost terms but it's also a sustainability thing because you then have the four or five percent less acreage to actually produce the stuff you want to produce.

The last thing we're working on here is on agriculture, where it's really cool and I'll admit we do not understand the science yet but just wait until we understand it. It's really cool that a corn plant is recruiting the right set of microbes in the soil. And if you can make available the right microbes in the soil, you actually get much higher yields. So when the U.N. calls out a quest for 17 percent more food by 2050, our way of looking at that is to say, okay, if we can do six, seven percent more on some of the major row crops, that's a pretty significant contribution,

everything else being equal. Last year, we saved the planet through our technologies 76 million tons of CO<sub>2</sub>. We have a target of 100 by 2020. Seventy-six million tons of CO<sub>2</sub> corresponds roughly to 35 million cars on the street. So it's not everything but it's a pretty significant contribution. And that brings me to the way we think the Sustainable Development Goals. We think of them as an inventory of business opportunities.

As Jeffrey Sachs pointed out before, they are really, really inspiring challenges for all of us, they are inspiring goals. But they are also a list of business opportunities. So to us, this is business. We have taken these goals; we have looked at them [and] we've said, where can we make a positive contribution? Where can the technology that we work with make a contribution? And then we try to focus on that. It's not going to save the world but it's going to help. And then we try to do as little harm on the others as we possibly can. And I think if there were a lot of other companies, just to get back to Jeffrey Sachs' point, that did the same, then we would actually move much faster in that direction.

We call it our purpose, the many colorful ways of expressing purposes. I'll just point to a couple of things in this purpose statement that drives the company. The first one is together. This is a world where the speed by which we need to move is so daunting, in particular when you get to climate change, that this is going to require a very strong collaboration between regulators and companies who hold or who develop the technologies. So this is not a company that can do it or a government that can do it or a city that can do it. This is going to require that we work together.

The other thing I would like to call out is the last piece, let's rethink tomorrow. I think often when we think about these things, we are marginal in our approach; we think marginally. And very often, the right way to think about these systems changes is actually to think about if not a revolution then at least to rethink processes. So my point here is that if companies, governments, and cities would actually work together, I think we have the solutions for quite a bit of the challenges that is expressed in the 17 SDGs. But it requires that collaboration.

This purpose statement gets some of the most brilliant scientists to work for our company. They will not work their butt off to create shareholder value but they will work their butt off to change the world. So this is a very strong driving force for a company.

But let me close it here, David. Thank you so much.

**Kirkpatrick:** That was really, really helpful and I guess the thing you say about working together is something I'd like to have you discuss a little further. And I don't know how did you respond to Jeffrey Sachs? Is the working together idea a reasonable, promising way for us to respond to the very bracing challenge that he put to us?

**Nielsen:** I'm trained as an engineer, as a scientist, and I'm probably addicted to technology, as I understand we're going to talk about over lunch. But I'm quite passionate about using technology to actually achieve these goals. I'm very passionate about it. And I think if we work

together, I actually think when you look, for example, at climate change, all the reports that are coming out would indicate that if we put technology to work that we actually know of today—and Novozymes is just a part of that—if we put that to work, we actually have about two-thirds of the solutions.

**Kirkpatrick:** For what, all the SDGs?

**Nielsen:** For climate change.

**Kirkpatrick:** For climate change.

**Nielsen:** I think that's the most—

**Kirkpatrick:** Just current technology, you think.

**Nielsen:** Yes. We don't have it all but we have quite a bit of it. And actually I think we've been at a standstill ever since the financial crisis. We've lost about 10 years and I think the issue is one of speed rather than one of technology. I think when it comes to speed, it's really important to get, I mean, the Paris Accord, as Jeffrey was referencing, but to get governments and companies to work together because otherwise we're not going to make it with that with the required speed. Now am I optimistic? I'm pretty optimistic about the SDGs. I think climate change is a tall order and we really need to move fast. So as a company, we're doing everything we can to make sure that governments, including this one, understand the potential of the technology so that they can regulate around the technology and bring it to market.

**Kirkpatrick:** Yes, well, for example, I suppose—one thing you didn't go into detail on is what you started about lowering washing temperatures and the temperature that your shirt was washed at, that your enzymes, which go into cold water laundry detergents, are able to get clothes just as clean as if they were washed with hot water but the temperature differential between 140 and 80 degrees requires so much less energy that the carbon production is dramatically reduced.

**Nielsen:** Right.

**Kirkpatrick:** So meanwhile, there's still tons of laundry detergents being sold that require hot water. So not that I'm saying regulation should help your business per se but it is an implicit—I mean, one way one could just interpret your thought in a concrete context here is that we really could legislate, for example, that all laundry detergents could be capable of washing in cold water—for example.

**Nielsen:** There are many things we could do, on energy efficiency there are so many things where regulators could promote technologies. That would actually be economically beneficial for societies. It just doesn't happen because of the slowness of the system. You're absolutely right, for example, in the U.S., if just all of you washed your shirts at 80, then the U.S. would save another two million tons of CO<sub>2</sub>, which would be quite significant. And in a decade, we'll all be

washing in tap water. Now, actually I think the big sustainability task on laundry is that where we went up to 140, in some cases I guess 190, was because of hygiene issues. And it's an issue you can deal with today in detergents. The big task is to make sure that Asians do not move from cold water wash up to 140 because that's—the four and a half billion in Asia, if they move up, then we have a real issue. So the big sustainability issue is really to keep that at cold—

**Kirkpatrick:** Because they've historically not felt it necessary to use hot water but you can offer them an alternative to stay with more or less the same technique.

**Nielsen:** That's right. I think the government intervention is really about speeding up technologies. I'm not an advocate of subsidies and all that, I'm just asking to make technologies available. In many ways, chemistry, energy as we know it today in our world today was invented by German scientists in the 1880s. The last century was one of energy, fire, and brimstone. That's not sustainable with nine billion people on the planet, as Jeffrey pointed out so eloquently before. I think biology—and it's not the only technology but that and a couple of other technologies—can actually pave or create a road of more sustainable development as we phase out the use of fossil fuels, which is one of the main sources of the climate change issue.

**Kirkpatrick:** So completely phasing out fossil fuels you think should be one of our goals.

**Nielsen:** Completely is a very—I mean it's a harsh word, I'm not sure we'll ever be completely—again, just look at what the experts are saying. The International Energy Agency has this simple model, which is behind the Paris Accord, which says that we have to be carbon neutral by 2050. So by 2050, we have to emit zero. So right now, we have to go on a journey where we get from where we are today and then down towards zero emission. And then we have to stay at zero from 2050 to 2100, all if we have the aspiration of being below two degrees C temperature change over preindustrial. Now, to get to the point where you're zero by 2050 and keep that up until 2100, I don't think that necessarily requires a total emission of fossil fuels but it requires that you develop technologies that can somehow compensate for the use of fossil fuels that you might still have and it's certainly going to require dramatic reduction.

**Kirkpatrick:** Well, there are carbon reduction techniques that you can apply.

**Nielsen:** Yes.

**Kirkpatrick:** Of course, you're from one of the very small number of countries that Jeff said is thinking right about human habitation on the planet, basically. You're from Denmark, a Danish company. So in your country, in Scandinavia, is this collaboration between government and business and regulators and production at the level you'd like to see or is there, even there, a need for a higher level of awareness? And tell me how you would categorize efforts in Scandinavia vis-à-vis, say, the United States in that regard?

**Nielsen:** I'm not sure I can make a call on the U.S. per se, but when you look at Scandinavia—first of all, when you travel the international scene as I have the chance of doing once in a while, you see that government-industry relationships are usually much better in the smaller

countries. I think probably, at least in my country, it's working very well. That doesn't mean that companies like mine always agree with government. We would like to see Europe, we would like to see the country of Denmark—because it happens to be our kind of backyard—move faster.

**Kirkpatrick:** To be part of the EU, you mean.

**Nielsen:** Yes.

**Kirkpatrick:** It's so weird that it's not, actually. Why isn't Denmark part of the EU, anyway?

**Nielsen:** I'm here to say that I think we'd always bitched a bit about government and I think your question about "so what would you do?" is the right one because it's not always that easy. But I would like to see the European Union move faster than they do. In the U.S., the U.S. has actually made some pretty great strides, particularly under Bush, actually, in terms of making inputs more renewable. I'm hoping that that will—that the journey continues. Of course there are worrying signs but I'm hoping the journey continues.

**Kirkpatrick:** One thing I know you're concerned about is technical education in the Western world generally, United States and Europe. Talk about that and what it leads you to conclude about China.

**Nielsen:** Well, I think the realization of the need for sustainable growth as is expressed in the 17 SDGs may be higher in northern Europe than it is in other parts of the world. I mean, I think that's probably true. But as that spreads—and we're here to spread that message—the next one is okay, so what do we do about it? And then it's just a simple fact that the OECD countries, these wealthy countries, they have a significant deficit of science, technology, engineering, and math resources. We're simply not producing enough candidates. So while the realization may happen in this part of the world and in Europe, we are probably going to look to China and India to actually recruit the competencies that can help us deal with it.

**Kirkpatrick:** And Nigeria, as we just heard. But certainly there's a lot more people in China and India.

**Nielsen:** And China produces about four million engineers every year, it's just an amazing amount of engineers that comes out. So we'll be looking to these countries to help us decide these solutions. Now I don't think that's necessarily bad. But it just means that the OECD countries are foregoing job creation opportunities and also, I think, long-term value creation because we simply don't have these resources and we're short of these resources. So anything we can do together, businesses can do, to excite young people about going into science or technology or math or engineering, we'd all be better off.

**Kirkpatrick:** Well, good. Thank you so much, Peder. I look forward to more conversations and your company is a role model and I think helps us understand how we could respond to Jeffrey Sachs more.