

Business model



Macrotrends that impact our business model



Transition to sustainable agriculture



Energy transition



Shifting demographics and urbanization



Water scarcity



Digitalization of the global economy

Our business is about turning science into sustainable biological solutions in a growing world. We use enzymes and microorganisms to unlock business opportunities. From enabling farmers to feed animals more efficiently to giving ethanol producers better control over difficult production processes, our innovations are paving the way for a better tomorrow.

Our business model and our strategy form the framework for how we use our resources to live up to our purpose, meet our long-term goals and develop meaningful partnerships.

A model for sustainability

The very nature of our products means that sustainability is in our DNA as well as being a key part of both our value proposition and business model.

We believe that it is important to optimize our use of resources and minimize our footprint, which is why we set targets for reducing resource consumption and CO₂ emissions. From the moment we enter into agreements with our suppliers and partners through to the production process and beyond, sustainability is a key priority.

And our customers appreciate this. Combining our innovative products with a strong sustainability ethos creates the kind of differentiator that our customers value.

We also demonstrate our commitment to green solutions by estimating the annual impact savings from our customers' applications of our products.

From the moment they were established in 2015, the UN Sustainable Development Goals (SDGs) have been integral to our business. These goals guide our purpose and our long-term targets.

Customers

Because we work so closely with our customers and know that our products often have a tremendous impact on their production processes, we see them as partners.

By using Novozymes' enzymatic and microbial solutions, our customers can save on costs and reduce the environmental footprint of their products and processes. Our solutions have the potential to lower the need for raw materials, conserve resources and improve product quality and effectiveness.

Excellent results are achieved by working closely with our customers to gain a deeper understanding of their needs and those of their consumers. That is how we develop solutions that enable customers to enhance their impact.

Partners

Our Partnering for Impact strategy drives us to seek out and build meaningful partnerships with other influential industry players, for example Monsanto (now Bayer) as part of The BioAg Alliance, and DSM and Adisseo in Animal Health & Nutrition.

These partnerships enable Novozymes to explore and enter new business areas faster and more efficiently by combining our strong innovation know-how and manufacturing expertise with our partners' strong skills in areas such as screening, testing, data processing and commercialization.

Innovation

With R&D facilities in multiple regions and commercial teams with strong insights into different markets, we are able to identify enzymes and microorganisms capable of meeting global and regional needs. More than 23% of our employees work in R&D. Every year, our researchers screen thousands of microorganisms to track down the one that produces the enzyme with the exact characteristics we need for a specific product. Most of our products take between two and five years to progress from idea to market.

We have anchored our specialized application development units in the commercial side of our organization within the Household Care & Technical Industries, Agriculture & Bioenergy and Food & Beverages divisions. This creates a strong connection between the commercial side and R&D. The result is a solid pipeline of impactful products with the characteristics our customers are looking for.

A Portfolio Board manages the R&D pipelines and prioritizes funding across Novozymes' divisions. This board ensures that the innovations we bring to market have strategic and financial impact, and that they help us to deliver on the SDGs.

Production

In order to produce large quantities of enzymes, we use fermentation techniques that enable our microorganisms to multiply.

Fermentation is a core part of our production process. After recovering enzymes or microbes from the fermentation process, we prepare them for use by our customers, either in the form of liquids or granulates. We produce our enzymes and microbes at 16 plants on four continents, and continuously endeavor to optimize and innovate our production processes to ensure that we get the most out of our production capacity. Thanks to these efforts, our capacity utilization is very high.

Suppliers

By using an efficient supplier management system, we support and encourage our suppliers to apply the same rigorous standards to their processes as we do. We work closely with them to innovate and implement responsible and sustainable solutions.

Quality

At Novozymes, we pride ourselves on our high-quality solutions, services and processes. Our close relationships with our customers allow us to anticipate and understand their needs and, consequently, deliver the quality expected of us.

Continuous monitoring and improvement are an integral part of our quality system and a cornerstone of how we advance the products and services we offer our customers.

Technical services

Our technical service teams set us apart from the competition because they optimize product use and make the necessary adjustments tailored to the needs of individual customers. This ensures that our customers realize the value they expect.

Our service does not come to an end when our teams leave the customer's plant. The knowledge our teams gain from working closely with customers feeds back into our product pipeline and goes into improving future innovations. In this way, our relationships with customers are key to measuring our progress and helping us to rethink tomorrow.

Commercial execution

Every interaction we have with our customers is an opportunity to learn more about their needs and engage in dialogue about our solutions. We leverage this in-depth understanding of our customers' products and production processes when selling our enzymes and microorganisms, because we know exactly how our solutions can make a difference to the customer. Take Bioenergy as an example. Here we provide tailored solutions to ethanol plants where we supplement the technology we sell with technical know-how, bringing additional value to the customer.

With facilities such as our Innovation and Technology Center in Turkey and our Detergent Design Center in India, we are able to showcase to customers exactly how our products work for their specific product or industry. The close proximity to customers in these regions is also a great advantage when

presenting new products to existing and new markets.

Traditionally, we market most of our products in direct interaction with customers, but digital go-to-market strategies are becoming increasingly important, and we are constantly looking to optimize how we make customers aware of the benefits of our products and services. We are available and open for dialogue through social media, at trade events and via our owned digital channels such as Novozymes.com.

Distribution

Distribution of Novozymes' products differs from one industry to the next. In Bioenergy and Household Care, most products are dispatched directly from Novozymes to our customers. Within Agriculture & Feed, distribution is carried out by our industry partners. Food & Beverages and Technical markets are more fragmented, with a mixed distribution setup.

Monetary streams

Novozymes' revenue comes from sales of enzymes and microorganisms. Product prices include the cost of technical services.

Around 13% of our sales revenue is reinvested in R&D, benefiting both product innovation and production economy. Novozymes' largest costs are direct production costs and R&D.

When it comes to shareholder returns, we have a target dividend payout ratio of around 50%. We also conduct regular share buyback programs to provide returns for investors.



Novozymes' SDG Governance Board

In 2018, Novozymes established the SDG Governance Board to build a shared understanding of the opportunities and risks associated with the UN Sustainable Development Goals (SDGs) and to translate this knowledge into corporate priorities and targets. The SDG Governance Board consists of an Impact Board and a Foundation Board.



Impact Board

The Impact Board sets Novozymes' strategic global direction and ambition in respect of the SDGs. The board also develops and executes a strategy for integrating sustainability into business strategies and management processes.

The Impact Board consists of the Executive Leadership Team as well as a number of SVPs and VPs from different areas of the business.

Foundation Board

The purpose of the Foundation Board is to provide the internal foundation for ensuring that Novozymes' sustainability performance in our operations, supply chain and other functions allows us to build on and maintain our sustainability leadership position.

The Foundation Board consists of SVPs and VPs representing a variety of Novozymes' functions.

Macrotrends that impact our business

Novozymes' growth and long-term success are influenced by developments around the world that translate into global macrotrends. Some of these trends present potential opportunities while others present potential risks, all of which inform and shape our innovation and operational strategies.



Description	Transition to sustainable agriculture	Energy transition
Our response to the trend	A growing population, shifting consumer preferences and climate change-related supply chain disruptions are putting increased pressure on global food supplies. At the same time, agriculture is in competition for land with other uses (e.g. urbanization). For these reasons, the agricultural sector is seeing growing demand for new and innovative sustainable food production solutions.	Rapid urbanization and a growing population are driving up demand for electricity, heat and transportation. The global movement toward a low-carbon economy and the fight against climate change are triggering a major shift in the global energy system. The cost of renewable energy is falling, and the world is increasingly exploring low-carbon alternatives to fossil fuels.
Example	Many of Novozymes' solutions are making a significant contribution to the transition to sustainable agriculture, and this remains a key focus area for innovation.	Novozymes' response to the global energy transition is supported by our commitment to increase the share of renewables in our energy mix as well as by our Bioenergy solutions, which address the need for low-carbon alternatives in the transportation sector, which is still heavily dependent on fossil fuels.



	 Shifting demographics and urbanization	 Water scarcity	 Digitalization of the global economy
Description	The global economy is currently driven by three key demographic factors: rapid urbanization, a growing middle class in emerging economies and an aging population in most developed economies. Patterns of consumption are also becoming more varied and complex, particularly with the widening socioeconomic gap. Consumer-based markets are looking for sustainable solutions that can keep pace with these shifts.	Global demand for clean water is expected to outstrip supply by 2030, aggravated by climate change-related weather crises and severe pollution. Several regions of the world are experiencing severe water crises. Governments are responding with stricter regulation and surveillance of water management practices, which is driving demand for solutions that reduce water consumption, increase efficiencies and improve wastewater quality.	Digitalization is transforming the world we live in – from the fabric of society to markets and businesses. This disruptive technology enables companies to adopt new ways of manufacturing, boosts production efficiencies and increases the agility and customization of their products and solutions.
Our response to the trend	Novozymes is partnering with our customers to develop tailor-made solutions to address these changing consumer needs effectively.	Novozymes is exploring the feasibility of using biotechnological solutions to address key challenges within water and wastewater treatment. We already have a number of wastewater solutions in our portfolio, with more expected from our innovation pipeline.	Novozymes is focused on meeting customer needs better, faster and in a more impactful way through industry-leading digital capabilities.
Example	Progress® In: Novozymes' first product designed specifically for the broad market of unpenetrated detergents and to help detergent producers in emerging markets develop better detergents.	HelloScience: An open innovation platform, launched in partnership with UNICEF and pump manufacturer Grundfos, with the purpose of finding new answers to some of the world's most pressing water challenges.	DigiPro: A project that uses data analytics to improve yields, particularly from our fermentation and recovery processes – which are vital stages in the production of enzymes.

Innovation pipeline update

Area	Innovation	Feasibility	Discovery	Development	Launch	Commercial
Household Care	Freshness solutions for laundry detergents	✓	✓	✓	✓	→
Household Care	Tailored emerging-market solutions	✓	✓	✓	→	→
Food & Beverages	Vegetable oil processing	✓	✓	✓	→	→
Food & Beverages	Grain milling	✓	✓	✓	✓	→
Agriculture & Feed	Animal health	✓	✓	✓	→	→
Agriculture & Feed	New transformative BioAg solutions	✓	✓	✓	✓	→
Bioenergy	Biomass conversion	✓	✓	✓	→	
Technical	Solutions for water	✓	→	→		

Arrows denote progress over the past 12 months.

Novozymes' innovation pipeline features more than 120 research projects across the business, with many more active leads. Our divisional structure is enabling us to bring new innovation to the market at a higher rate than ever, at the same time as leveraging significant cross-segment R&D synergies.

The table shows the eight priority innovation platforms, each with revenue potential of DKK 500 million or more. These areas represent significant market-expanding growth opportunities, most with the potential to impact the world in a sustainable way, enabling us to live up to our purpose of delivering biological answers for better lives in a growing world.

In 2018, progress was made across most programs – three of which resulted in product launches.

In **Household Care**, the first product from the freshness platform is now available on supermarket shelves in the Philippines as well as in other markets. Our freshness solution delivers completely new functionality, meaning that consumers can experience cleaner and fresher clothes. Available exclusively to one of our largest customers, this is only the first product to emerge from this platform. The overall potential of the freshness platform is expected to be in the region of DKK 1 billion, and we are already off to a very good start.

In **Food & Beverages**, we saw good development within the grain-milling program with the continued rollout of Frontia®, a solution enabling grain-milling processors to obtain significantly more starch and gluten during the grain fiber-milling process, yet with lower water and energy consumption. In vegetable oil processing, we ramped up our trialing activity for Palmora®, which improves yield and process performance in palm oil production by reducing viscosity and improving the separation of oil from the palm fruit pulp.

In **Agriculture & Feed**, both innovation platforms progressed according to plan. The animal health platform covers a broad portfolio of projects – including Balancius™ for improved chicken gut health, which we launched

successfully together with DSM. The development with Bayer of new transformative microbes for corn, soybeans and wheat resulted in the launch of the Acceleron® B-360 ST (BioRise 2) corn inoculant.

In **Bioenergy**, the market for second-generation ethanol has not developed as expected over the past years, but we remain positive about the future and the potential for Novozymes to contribute to a more sustainable world through second-generation ethanol. Our enzymatic technology for biomass conversion is ready to be commercialized as soon as the market for second-generation ethanol is ready.

In **Technical**, we were able to launch the first product from the water platform as early as in the fourth quarter of 2018, despite only adding "solutions for water" as a new innovation program in 2017. Our new enzyme technology enables wastewater plants to reduce the water content of their sludge – a by-product of wastewater cleaning. This helps plants to reduce chemical usage, energy consumption and overall disposal costs. This technology brings significant benefits to wastewater operators and to the environment. We are exploring the feasibility of biotechnological solutions that target key challenges within water and wastewater treatment, as we see the water treatment space as an exciting opportunity for Novozymes to leverage our core technologies to help address one of the world's most pressing challenges.