

Materiality and value chain assessment

Novozymes' annual report is based on the concept of materiality, to ensure that the content is significant and relevant to readers.

Our approach to materiality

Novozymes' materiality assessment is a systematic and rigorous process that integrates inputs from trend analysis and external stakeholders. It also involves internal engagement with relevant functions, including leaders from our business divisions, Investor Relations, Risk Management & Controls, Public Affairs and Corporate Sustainability. This process results in the identification of 1) key relevant macro trends and 2) material economic and environmental, social and governance (ESG) issues, which are illustrated through a materiality matrix.

Materiality assessment

Novozymes conducts a comprehensive materiality assessment every two to three years to identify current issues material to our stakeholders and our business. This comprises a review of the assessment methodology, detailed desktop research to identify the latest trends and ESG issues, and active and extensive stakeholder engagement. Between assessments, we conduct annual materiality refreshes, where we review our existing material issues for their relevance and importance to Novozymes and our stakeholders by means of evidence-based research and analysis of stakeholder opinion through proxy sources.

Our materiality assessment process:

- **Identification:** We compile a comprehensive list of relevant trends and ESG issues by studying expert reports on global trends (Global Risk Report by the World Economic Forum, State of Green Business by Greenbiz, etc.), investor and customer questionnaires and peer analyses
- **Prioritization:** We engage in dialogue with relevant internal stakeholders from different functions, including Investor Relations, Corporate Sustainability, Corporate Strategy, Public Affairs, Risk Management and business divisions, to prioritize trends and ESG issues and understand how they evolve every year
- **Validation:** We compare the trends and ESG issues that come up in Prioritization with priority themes highlighted by key ESG rating agencies and recalibrate those with relevant stakeholders, including leaders from different functions. This results in a final list of material issues that go into our materiality matrix
- **Disclosure:** We disclose our performance in relation to key material issues in our annual report. The primary audience for these assessments and disclosures is Novozymes' investors, customers and employees

Our 2018 materiality matrix

Our materiality matrix highlights the 16 most material financial and nonfinancial themes and acts as a guide for determining the topics we include in our annual disclosure. The illustration is a snapshot of the upper-right quadrant of Novozymes’s materiality matrix and represents issues in the high material category only. A full list of all material topics can be found on “Disclosure of material issues”.

In 2018, we studied relevant macro trends and changes in the internal and external environment to understand the impact they have on our current materiality matrix. As a result of this process, we identified one new issue in the economic category: Trade policies. Changing global trade policies are impacting businesses all over the world. Therefore, it is important that we manage this issue to minimize the impact it may have on Novozymes’ business. All other issues remain unchanged.

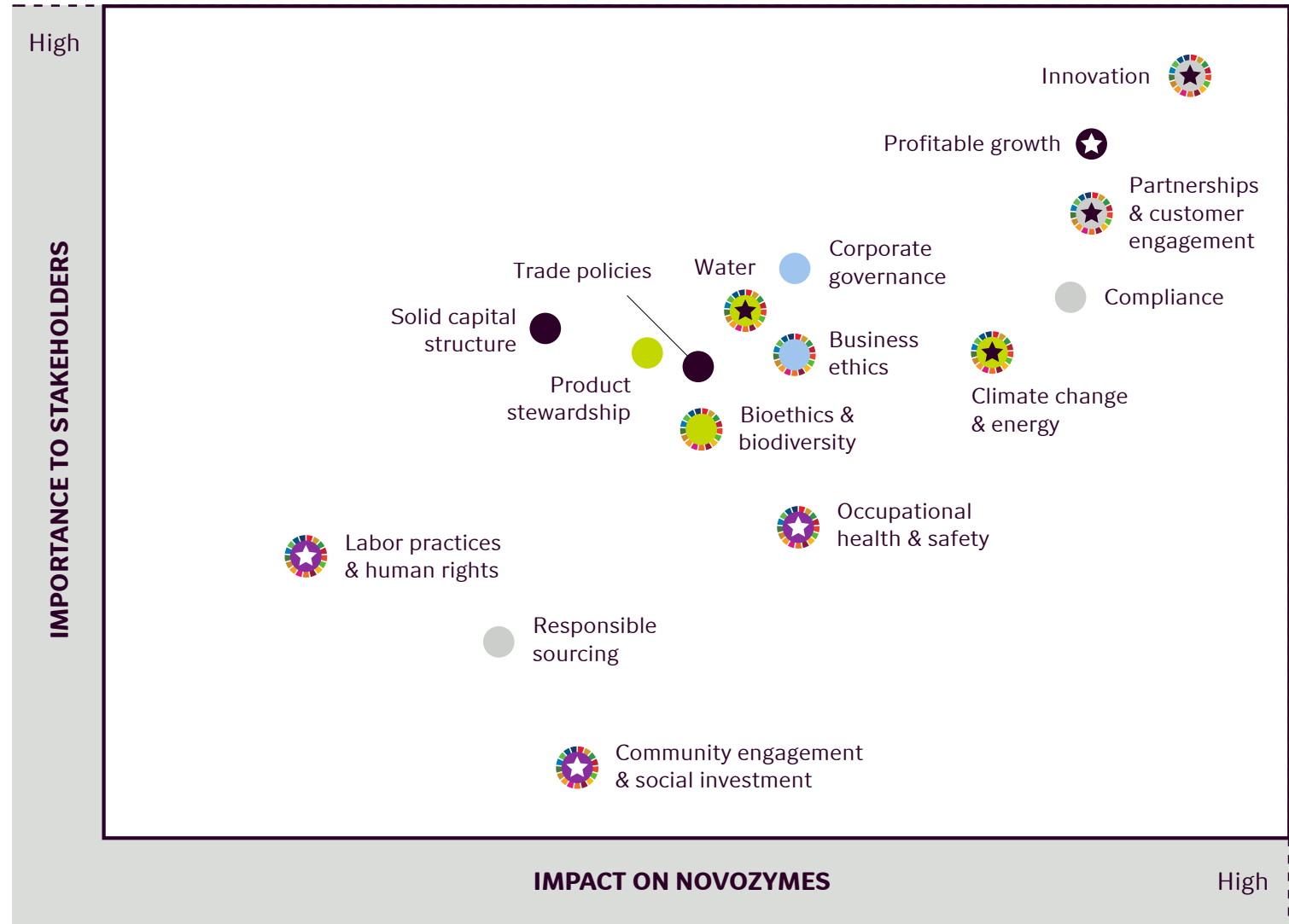
We also strengthened our assessment approach to determine which SDG goals and targets we could contribute to by addressing the material issues through our business. We now highlight material issues where we believe our actions and initiatives to address the issue can significantly contribute to specific SDG targets. Read more in “Value chain assessment”, which lists all our material issues.

Issue category






- All
- Environmental
- Social
- Economic
- Governance

Corporate focus areas





- ★ Targets/Flagship initiatives
- 🌈 Contributes to SDG target(s)








Value chain assessment

ESG issues	Stakeholders to whom the issue is relevant	Where we address this issue in our business model						Contribution to the SDG target(s)		
		Innovation	Sourcing	Production and quality control	Technical services	Distribution and sales	Customer use			
Innovation	Academia, investors customers, partners	●		●	●			●	9.4 Upgrade all industries and infrastructure for sustainability	
Profitable growth	Investors, employees	●	●	●		●				
Partnerships & customer engagement	Investors, suppliers, partners, customers	●	●	●	●	●	●		17.14 Enhance policy coherence for sustainable development 17.17 Encourage effective partnerships	
Compliance	Suppliers, government, NGOs	●	●	●		●				
Climate change & energy	Investors, customers, multilateral organizations, government	●	●	●		●	●	●	7.A Promote access to research, technology and investment in clean energy 7.2 Increase global percentage of renewable energy 7.3 Double the improvement in energy efficiency 13.2 Integrate climate change measures into policies and planning	 
Business ethics	Investors, suppliers, employees	●	●	●	●	●			16.5 Substantially reduce corruption and bribery	
Corporate governance	Investors, customers, suppliers, employees	●		●		●				

Value chain assessment

ESG issues	Stakeholders to whom the issue is relevant	Where we address this issue in our business model						Contribution to the SDG target(s)	
		Innovation	Sourcing	Production and quality control	Technical services	Distribution and sales	Customer use		End Consumer use
Water	Investors, customers, employees, communities	●		●	●		●	●	<p>6.3 Improve water quality, wastewater treatment and safe reuse</p> <p>6.4 Increase water-use efficiency and ensure freshwater supplies</p> <p>14.1 Reduce marine pollution</p>  
Trade policies	Investors, suppliers, customers		●	●		●			
Product stewardship	Investors, suppliers, employees, customers, end consumers	●	●	●	●	●	●	●	
Solid capital structure	Investors, employees	●		●		●			
Occupational health & safety	Investors, suppliers, employees, contractors	●	●	●	●	●			<p>8.8 Protect labor rights and safe working environment</p> 
Bioethics & biodiversity	Investors, customers, end consumers, government	●	●				●	●	<p>15.6 Promote access to genetic resources and fair sharing of benefits</p> 
Responsible sourcing	Investors, suppliers, customers, government, NGOs		●				●		

Value chain assessment

ESG issues	Stakeholders to whom the issue is relevant	Where we address this issue in our business model						End Consumer use	Contribution to the SDG target(s)	
		Innovation	Sourcing	Production and quality control	Technical services	Distribution and sales	Customer use			
Labor practices & human rights	Investors, suppliers, employees, contractors, government, NGOs	●	●	●	●	●			<p><u>8.5</u> Full employment and decent work with equal pay</p> <p><u>8.7</u> End modern slavery, trafficking and child labor</p> <p><u>8.8</u> Promote labor rights and safe working environments</p> <p><u>5.5</u> Ensure full participation in leadership and decision-making</p>	 
Community engagement & social investment	Employees, communities, government, NGOs	●						●	<p><u>4.7</u> Education for sustainable development and global citizenship</p>	
Data security	Investors, suppliers, customers, government	●		●						
Waste	Suppliers, customers, employees, communities, government, NGOs	●	●	●				●	<p><u>12.5</u> Substantially reduce waste generation</p>	
Deforestation & land use change	Investors, suppliers, communities, government, NGOs	●	●					●	<p><u>15.2</u> End deforestation and restore degraded forests</p>	
Tax	Investors, government, communities			●						
Animal welfare	Investors, customers, end consumers, communities, NGOs	●		●						

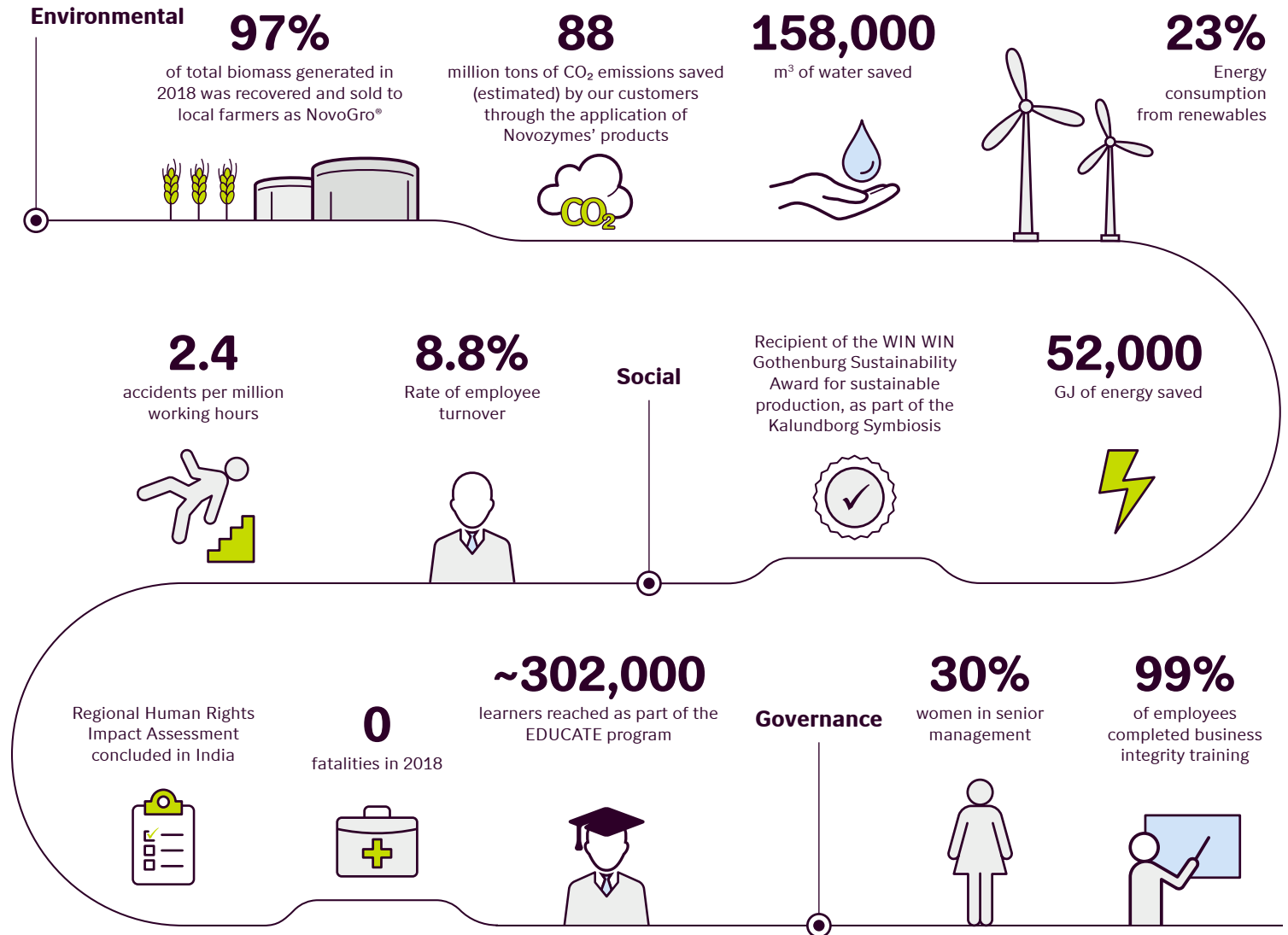
Sustainability highlights

Sustainability is at the core of Novozymes, and the triple bottom line is fundamental in terms of how we do business.

Sustainability is embedded in our business and is a key component of our products, strategy and management processes. Novozymes' key growth driver is to deliver solutions that improve the sustainability performance of our customers and partners. To ensure that we add value across our stakeholder ecosystem, we actively engage with our stakeholders across a variety of sustainability-related themes. Read more in "Engagement".

Our dedication to sustainability goes beyond our products and is integrated into our purpose and long-term sustainability targets. We launched our six long-term sustainability targets in 2015, inspired by the UN SDGs. Read more in "Novozymes and the Sustainable Development Goals" for more information on how we deliver on the SDGs.

Sustainability is an integral part of our operations, and the triple bottom line is fundamental in terms of how we do business. Novozymes' ambition is to continuously improve business operations across our value chain, making them more efficient, environmentally friendly and socially responsible. We manage our performance through relevant targets and KPIs across various themes. We also believe in sharing our performance in the most transparent way. Our sustainability leadership has been recognized by many indices and awards.



In the spotlight

Biorefining for a better future

Biorefineries and other green technologies play an important role in the pursuit of a carbon-neutral world. A new report from Novozymes explains how.

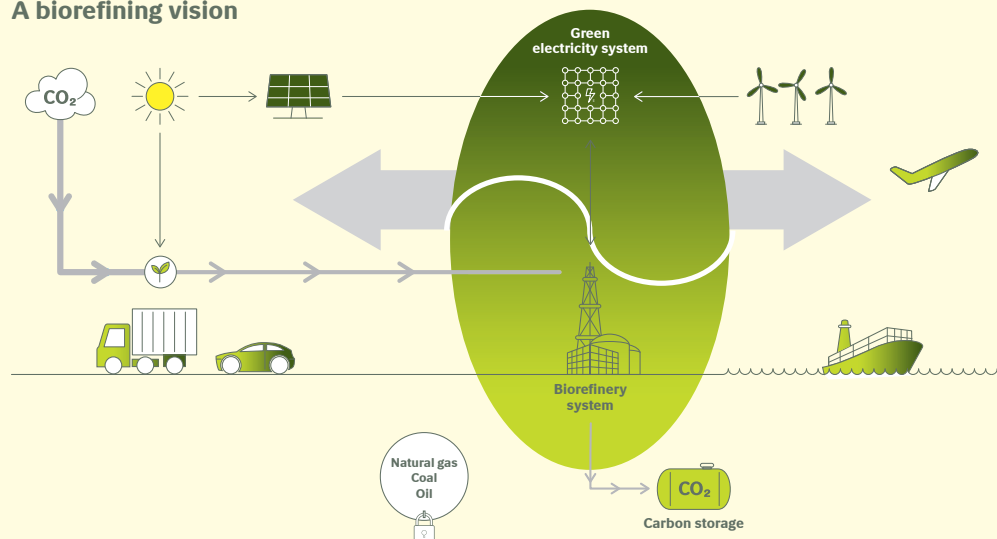
On November 6, 2018, Novozymes published a report describing our vision for net-zero emissions energy systems. The report – “Bridging the gap to a sustainable future” – highlights how biorefining is an essential part of the solution and invites

stakeholders to work together to address climate change. It is available at novozymes.com/bioenergy.

Need for a pragmatic yet radical vision

Climate change is a serious and growing threat

A biorefining vision



to our world. We need to reduce greenhouse gas (GHG) emissions drastically – and fast. A key sector facing challenges in terms of decarbonization is transportation. This sector accounts for 25% of energy-related GHG emissions – a share that is only expected to grow in the coming decades.

“Bridging the gap to a sustainable future” describes how biorefining addresses three key challenges routinely identified by observers of the climate debate.

1 Challenge: There is no silver bullet to reach net-zero emissions

Solution: The optimal solution is a mix of green energy technologies. Biorefining is key to this mix – not only because its products are sustainable but also on account of its unique synergies with other green technologies. For instance, carbon-neutral electrification of transport holds great promise as a solution, but it cannot succeed on its own in the time we have to mitigate climate change. Biofuels are needed to achieve sufficient carbon emission reductions across all transport segments.

Biorefineries also complement other types of renewable energy generation. For example, coproducts from biorefineries such as lignin and biogas can supply electricity to balance intermittencies in a renewable energy grid.

2 Challenge: There is no crystal ball to determine the extent and speed at which different technologies will succeed in the future

Solution: Accurate prediction is not needed as long as the future energy system can adapt to market needs. In this context, biorefining

is valuable because of its ability to adapt its outputs over time to meet future requirements for fuel and materials. Today, biorefineries primarily produce liquid fuel for passenger cars, but in the longer term they can be adapted to cater to other segments such as shipping, aviation and other applications, including biochemicals.

3 Challenge: There is a need for negative emissions to meet the international climate targets

Solution: The Intergovernmental Panel on Climate Change (IPCC) highlights the need for negative carbon emissions as soon as possible to keep the temperature rise below 2°C. Biorefining offers one of the easiest and cheapest forms of achieving negative emissions. The fermentation process emits a CO₂ stream that is relatively clean and concentrated, thereby enabling its cost-efficient capture and storage.

A future built on partnerships

The full potential of this transformative vision can only be achieved through collaboration. “We urge industry, government, financial institutions and research organizations to accelerate the continued development and deployment of sustainable synergistic technologies in biorefining through collaborative efforts and long-term policies,” says Thomas Schröder, Vice President, Biorefining.

Novozymes and the Sustainable Development Goals

Novozymes has aligned our strategy with the SDGs. The section below highlights our initiatives and actions toward six goals where we have the potential to deliver material impacts.

Novozymes is the global market leader in biological solutions, producing a wide range of industrial enzymes and microorganisms. The intrinsically sustainable nature of Novozymes' products enables us to contribute to many of the Sustainable Development Goals (SDGs) agreed by world leaders in 2015.

Novozymes' purpose and long-term targets are inspired by the SDGs. We assess the potential impact on the SDGs of all the projects in our innovation pipeline. This enables us to advance solutions that have the potential to have a high impact on the SDGs. In 2018, Novozymes set up the SDG Governance Boards to build a shared understanding of SDG opportunities and risks, and to ensure that this knowledge is incorporated into corporate strategy and targets.

Below are six examples where Novozymes' technology and actions can deliver significant contributions to the SDGs.

See also "Novozymes and the Global Goals" on Novozymes.com for more details about how we contribute to 13 out of the 17 SDGs.

GLOBAL GOAL #2: ZERO HUNGER



Many Novozymes solutions contribute to sustainable food production and resilient agricultural practices. Together with our partners, Novozymes helps farmers around the world to make their production more sustainable and increase their productivity. Through The BioAg Alliance, Novozymes works to improve crop harvests through products containing naturally occurring microbes.

We also provide animal health and nutrition products that enable the world's poultry and swine farmers to produce more from less in a sustainable way. Many of our Food & Beverages solutions address specific food and nutrition challenges, for example lactose intolerance and nutritious infant foods.

GLOBAL GOAL #4: QUALITY EDUCATION



Education is a high priority for Novozymes. We believe that raising awareness about biology, biotechnology and the environment will lead to more people adopting and developing sustainable solutions in the future. Novozymes aims to educate 1 million people about the potential of biology by 2020. Since 2015, Novozymes has educated more than 612,000 people about biology and how it enables a sustainable future, by engaging with local schools, universities and communities.

In 2018, we conducted several educational activities aimed at external audiences. One example is the Mobile Science Lab, which was set up by Novozymes as a step toward making quality education accessible to remote schools and communities in the vicinity of Bangalore, India.

GLOBAL GOAL #6: CLEAN WATER AND SANITATION



Many of Novozymes' solutions help customers to save water and reduce wastewater, for example in the production of textiles, leather and pulp & paper. We develop biological solutions for wastewater treatment and sludge reduction for municipal and industrial applications.

Through our open innovation platform HelloScience, Novozymes and pump manufacturer Grundfos explore the development of new solutions and partnerships to address water challenges.

In 2018, Novozymes launched BioSec®, a wastewater treatment solution which targets sludge dewatering. Read more about the product in "Every drop counts".

Novozymes and the Sustainable Development Goals

GLOBAL GOAL #7: AFFORDABLE AND CLEAN ENERGY



Novozymes supports the development of and actively promotes the increased use of renewable energy. Our solutions enable the development of low-carbon fuels in transportation, which represents a significant share of the global energy mix. Novozymes is an active member of the UN Sustainable Energy for All (SE4All) initiative. In collaboration with WBCSD and other partners, we helped launch below50 – a partnership to promote the use of more sustainable low-carbon transportation fuels. Our vision is to bring together green technologies in a synergistic energy matrix. Read more about our vision and pathway for a global green energy matrix in “Biorefining for a better future.”

In 2018, through our engagement with the Brazilian Association of Industrial Biotechnology (ABBI), we provided input for RenovaBio – a program designed to stimulate biofuel production and use in Brazil to help meet the country’s commitment to reduce greenhouse gas emissions.

Novozymes is committed to increasing the use of renewable energy in our own operations. In 2018, 23% of our energy came from renewable sources.

GLOBAL GOAL #13: CLIMATE ACTION



Novozymes’ solutions help address climate change by enabling our customers to reduce their CO₂ emissions. We have set a target of saving 100 million tons of CO₂ in 2020 through the application of our solutions. In 2018, our customers avoided an estimated 88 million tons of CO₂ emissions by applying our products – equivalent to taking approximately 37 million cars off the road.

Novozymes invests in increasing the share of renewable energy in our energy mix and has said goodbye to coal-based energy at our largest production plant in Kalundborg, Denmark. Novozymes has also set an internal carbon price to evaluate our global portfolio of operational eco-efficiency projects and drive decarbonization in our operations.

GLOBAL GOAL #17: PARTNERSHIPS FOR THE GOALS



As part of our strategy Partnering for Impact, we partner with global and regional influencers, policymakers, industry organizations, academia and NGOs to promote the development of sustainable solutions. Novozymes also actively engages in other partnerships aimed at developing sustainable solutions, for example the Partnering for Green Growth and the Global Goals 2030 (P4G) initiative and the Bio-Based Industries partnership in Europe.

In 2018, Novozymes joined heads of state and leaders from business and civil society for the inaugural P4G summit convened to promote partnerships delivering inclusive growth and measurable progress on the SDGs.