



Essential
Solutions

Sustainable
Future

Sustainability
Report 2023

Nouryon

Content

The purpose of this report is to explain how we partner with our customers, suppliers, employees, and other key stakeholders to deliver solutions and drive sustainable progress. This report documents Nouryon’s sustainability performance in alignment with the Sustainability Accounting Standards Board (SASB) disclosure requirements and the Global Reporting Initiative (GRI).



Click on the chapter title for the the first page of the corresponding chapter

Cautionary Statement: The information in this publication is believed to be accurate at the date of its publication and is given in good faith, but no representation or warranty as to its completeness or accuracy is made. Statements in this publication are merely views based on the best knowledge available to Nouryon. Some statements and in particular forward-looking statements, by their nature, involve risks and uncertainties because they relate to events and depend on circumstances that will or may occur in the future and actual results may differ from those expressed in such statements as they depend on a variety of factors beyond Nouryon’s control. Minor corrections to historical data may be made to improve accuracy or based on methodology updates.

Message from our Chairman and CEO



I am pleased to present an in-depth overview of Nouryon's sustainability progress and achievements over the past year in our 2023 Sustainability Report. Nouryon's commitment to sustainability is embedded in our strategy, core values and business operations. The report highlights the significant strides that we took during the year to deliver on our Company purpose: Your partner in essential solutions for a sustainable future.

Our Commitment to a Sustainable Future

At Nouryon, we are committed to providing our customers with sustainable solutions and to making positive contributions to the environment and society. Our ability to adapt and innovate for our customers, and collaborate closely with partners, has served as a foundation for Nouryon's leading safety, sustainability, and financial performance within our industry.

In 2023, Nouryon received an A- score for global climate leadership from CDP, a company that is considered the gold standard of environmental reporting and maintains the world's most comprehensive collection of

corporate environmental data. Additionally, we earned an EcoVadis Gold rating for our sustainability achievements, placing Nouryon in the top 5% of companies then rated by EcoVadis, the largest global provider of business sustainability ratings.

Highlights of Our 2023 Performance and Sustainability Progress

Our dedicated efforts in 2023 resulted in progress across multiple areas of our sustainability commitment and contributed to our financial performance. In 2023, nearly 32% of our full-year revenue was derived from our portfolio of Eco-Premium¹ Solutions, affirming our commitment to sustainable innovation and the development of products with sustainability benefits. Other notable achievements in 2023 include:

Continuously Improving Our Safety and Environmental Performance:

- Top quartile people safety performance according to the most recent American Chemistry Council (ACC) benchmark data with a 78% decrease in our process safety incident rate and a 3% decrease in our OSHA Incident Rate (OIR) versus our 2019 baseline.
- Industry recognition including the 2023 Responsible Care Company Award, 13 awards from the Texas Chemical Council (TCC) and Association of Chemical Industry of Texas, US, and a Safety Award by the Association of International Chemical Manufacturers (AICM) in China.

- We achieved a 14% reduction in total absolute Scopes 1 and 2 greenhouse gas (GHG) emissions between 2019 and 2023, with 54% of our total electricity now being derived from renewable and low carbon sources. 42% of our total electricity consumption was derived from solely renewable sources, compared to 36% in 2019, and 33% of total energy, including steam, coming from renewable sources compared to 30% in 2019.
- Additionally, in 2023, 25 of our locations are now sourced with 100% renewable and/or low carbon electricity.

Growing and Innovating Our Essential and Sustainable Solutions:

- 74% of our R&D product pipeline² was focused on solutions with sustainability benefits.
- We introduced innovative products with sustainability benefits, such as antimicrobial active Triameen® Y12D, Kromasil® 100Å diC4 spherical silica, Bero!® Nexxt surfactant, and Dissolvine® GL Premium chelating agent.
- We achieved the International Sustainability and Carbon Certification standard ISCC PLUS for green monochloroacetic acid (MCA) production at our Delfzijl site in the Netherlands.
- We started full-scale production of our new Expancel® expandable microspheres plant in Green Bay, Wisconsin, US, complementing our existing full-scale plant in Sundsvall, Sweden, and product expansion facilities in China and Brazil.
- We were awarded the prestigious Ringier Technology Innovation Award for two of our new, innovative personal care products, Amaze® SP 100% natural polymer and ElfaMoist® AC humectant.

¹ Our Eco-Premium Solutions are products that offer significant sustainability benefits over mainstream alternatives in the market while providing the same or better functionality. For more information, see [page 64](#).

² In 2023, we introduced a new metric for our product innovation pipeline, called Eco-Solutions in order to highlight the crucial sustainability value drivers, such as bio-based and biodegradability, which are vital components of product sustainability in our end-markets. More details available on [page 65](#).



32% of revenue from
Eco-Premium Solutions



74% of our 2023 R&D product
pipeline is focused on solutions
with sustainability benefits



78% decrease in our process
safety incident rate, compared
to 2019



3% decrease in our OSHA
Incident Rate, compared to
2019



14% reduction in total
absolute Scopes 1 and 2 GHG
emissions, compared to 2019



54% of our total electricity
from renewable and/or low
carbon sources



2023 Responsible Care
Company Award and 13
awards from the TCC



66% of our supplier spend
assessed for sustainability
by EcoVadis

Engaging and Partnering with Our Stakeholders and Communities:

- We expanded the proportion of our supplier spend assessed for sustainability by EcoVadis to 66%.
- We joined Together for Sustainability (TfS), which enabled us to strengthen our supplier audit capabilities and gain access to industry best practices, enhancing sustainability in our supply chain to benefit our customers and business partners.
- We grew our employee-led Business Resource Groups and Mentorship program.
- We expanded our community partnership, volunteerism, employee and community engagement, and philanthropy in the US through initiatives including the Eagles Autism Challenge and Nouryon All-Pro Teachers program.
- We also continued to support Vatsalya Trust Balikashram, an orphanage for underprivileged girls in Navi Mumbai, India, providing shelter, nourishment, medical care, education, and developmental support to approximately 50 girls, ages 6 to 18 years as well as several other initiatives around the world that are focused on engagement and support for our local communities.

Progress through Partnerships and Investments

Our commitment to sustainable growth and innovation extends beyond our internal operations to strategic investments and collaborations with customers and partners. We continued to foster growth through various initiatives, including substantial capital investments, expansion of our business operations to support regional and emerging markets, and the acquisition of ADOB to enhance our product offering to customers.

Appreciation and Encouragement

I extend my gratitude to our customers, suppliers, and other stakeholders, including our employees, for their unwavering commitment throughout 2023. Their passion and dedication have been instrumental in the progress we have made and continue to make.

In closing, I invite you to read more details of these achievements and other key milestones in this report. Comprehensive annual sustainability reporting data is also included on [pages 87-95](#), providing a transparent view of our performance.

Charlie Shaver

Chairman and CEO

1. About Nouryon

Highlights



Operating in more than 80 countries³



\$5,188 million revenue



13 Innovation and Application Centers globally



\$1,047 million Adjusted EBITDA⁵



Approximately 8,200 employees worldwide⁴



\$655 million Adjusted Free Cash Flow⁶



60 manufacturing sites in regions around the world



Most of our customer relationships exceed 10 years



Two business segments serving customers and markets worldwide



Retention rate of more than 95% over the past six years of our top 250 customers



³ Headquartered in Amsterdam, the Netherlands.

⁴ Headcount and similar metrics may differ slightly depending on exact collection date due to timing of reporting schedules, divestments, and acquisitions, as well as regular workforce fluctuations.

⁵ Adjusted EBITDA consists of (loss)/profit for the period before finance costs-net, results from joint ventures and associates, income taxes, depreciation and amortization, non-operating income or expenses items, the impact of certain non-cash, or other items that are included in profit for the period that we do not consider indicative of our ongoing operating performance. A reconciliation of adjusted EBITDA to (loss)/profit for the period is presented below.

⁶ Adjusted free cash flow is calculated using Adjusted EBITDA less capital expenditures, in Property, Plant and Equipment and Intangible Assets for continuing operations, for the applicable period and is a measure we utilize to assess our operating performance and to assess the amount by which our operating cash flows exceed our working capital needs and capital expenditures.



GRI 2-1, GRI 2-6

Nouryon is a global leader in specialty chemicals, serving a diverse set of customers, end-markets, and regions around the world. Our business model is customer-centric, aiming to provide customized solutions that enhance the performance, quality, and sustainability of our customers' products. With our approximately 8,200 employees, we serve a wide range of industries, including personal care, cleaning goods, crop protection, crop nutrition, paints, coatings, natural resources, polymers, and packaging.

Innovative chemistry is the cornerstone of a sustainable future. We form partnerships with some of the world's leading organizations to develop essential solutions, many of which offer sustainable benefits. This underscores why sustainability is woven into the fabric of our Company's purpose, strategy, and values. Throughout our nearly 400-year history, our attention to customer needs and societal trends, coupled with our ability to transform these into business opportunities, has positioned us as a leader in our industry in terms of safety and sustainability. This focus has consistently yielded robust financial performance, even in challenging market conditions.

Success Through Partnerships

At Nouryon, our purpose is to be your partner in essential solutions for a sustainable future. We strongly believe in fostering robust relationships and view collaboration as the cornerstone of our success. Our unwavering commitment lies in understanding the needs of our key stakeholders including customers, employees, governments and policy makers, industry associations, investors, suppliers, and the communities in which we operate. By collaborating with them, we integrate their perspectives into our strategic decision-making process, driving us towards enhanced value for our customers. We actively engage with our customers, suppliers, and employees to deliver innovative solutions, shaping a safe and sustainable today and tomorrow for all.

1.1 Strategy for Growth

GRI 2-22

Nouryon's growth strategy is designed to accelerate expansion and enhance performance. Our goal is to reinforce our leading position in the specialty chemicals sector by surpassing our customers' expectations with innovative and sustainable solutions that cater to their present and future needs. We accomplish this by maintaining a customer-centric approach and focusing on their requirements in attractive and growing end-markets. Accordingly, sustainability is an integral component of our purpose, strategy, and values. Our vision is to be the world's leading specialty chemicals company.

We achieve our strategy by enhancing our customer offerings and consistently adding new, sustainable solutions to our existing portfolio. Our strategy aims at growth in new applications and geographies through acquisitions and with our existing customers. It also encompasses further expansion of our sustainable product offerings. Moreover, we strive to maximize the capacity, utilization, and flexibility of our production facilities to boost productivity.

Our Vision



To be the world's leading specialty chemicals company

Our Purpose



Your partner in essential solutions for a sustainable future

Three-Pronged Strategy to Drive Growth



Deliver innovative and sustainable solutions that answer customers' needs – today and in the future



Focus on attractive and growing end-markets as well as emerging markets



Drive commercial and cost productivity

1.2 Our Code of Conduct and Values

Nouryon's commitment to ethical conduct and our values are integral to our operations and culture. These values are:



We aim high

Nouryon encourages a culture of ambition and high performance, setting high standards and striving to exceed them.



We own it

Employees at Nouryon are encouraged to take ownership of their work, being accountable for their actions and decisions.



We do it right

This value emphasizes the importance of integrity and ethical conduct. It means doing the right thing, even when no one is watching.

These are reflected in our Code of Business Conduct & Ethics, which outlines our Company's guiding ethical principles. Every employee is expected to understand and comply with these principles, in addition to all policies and applicable laws.

We cultivate a culture of high performance, which includes being highly accountable, acting with integrity, and embodying ethical business practices. We also continuously scrutinize our internal practices through internal and external assessments and have procedures for taking appropriate corrective action when we identify conduct that falls below our high standards. Similarly, we have high standards for business partners, as evidenced in our Business Partner Code of Conduct, which our partners are expected to adopt. This ensures that Nouryon's commitment to ethical conduct extends beyond our Company to our wider network of partners. This commitment is essential to Nouryon's strategy for growth and success.



Our Key End-markets:



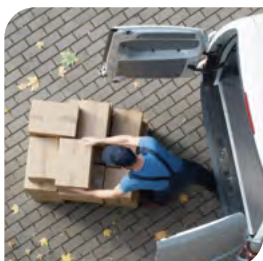
Agriculture and Food

- Crop protection (includes adjuvants and formulation aids, as well as intermediates for pesticides)
- Crop nutrition (includes chelated micronutrients and other specialty water-soluble nutrients)
- Food performance (includes thickeners, emulsifiers, and antioxidants)
- Food nutrition (includes micronutrients such as fortified iron)
- Feed (includes animal feed and specific animal feed solutions)



Home and Personal Care

- Personal care (includes skin care emulsions, emollients, and active specialties), hair care (conditioning and styling), and general personal care
- Home care (includes laundry, dishwashing, and preservatives applications in home hygiene and cleaning)
- Industrial and institutional (I&I) cleaning (includes surfactants, disinfectants, and other cleaning formulations for industrial, institutional and transportation uses)
- Pharma (includes purifiers for active pharmaceutical ingredient production, excipients functioning as fillers, thickeners, coatings, and binders for the dosage of pharmaceuticals)



Natural Resources

- Oil field production chemicals (includes chemicals to enhance oil/gas field production and mid/downstream formulation processes)
- Lubes and fuels (include additives for transport lubricants, metalworking fluids, grease and fuel mainly driven by transportation and machinery markets)
- Mining chemicals (includes flotation collectors, demulsifiers and blasting emulsifiers)
- Water treatment (includes water treatment and desalination chemicals used in food and beverage, electric power generation, water, and sewage and waste)
- Pulp and paper (includes paper and packaging chemicals used in pulp making, coatings and finishing, and associated water treatment)



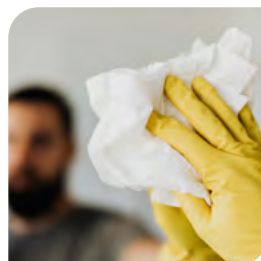
Paints and Coatings

- Paints (includes specialty additives such as pigment dispersants and preservatives used in waterborne paints with strong penetration in architectural and decorative paints)
- Building and construction (includes additives for concrete production, sealants, and adhesives)
- Roads (includes non-polymeric asphalt additives and bitumen emulsifiers, adhesion promoters/antistrips, and warm-mix additives used in road construction and maintenance)



Polymer Specialties

- Construction (includes window profiles, initiators for acrylic coating resins, essentials for insulation panels and high-performance ingredients for insulated power cables)
- Packaging (includes food-delivery packaging and take-away)
- Transportation (includes lightweight solutions enabled by our curing agents for the composites industry and essential ingredients for new types of elastomers for electric vehicles)
- General Polymer Applications (includes essential ingredients in electrification, lightweighting, and energy conservation)



Renewable Fibers

- Sodium chlorate for a variety of applications, including:
 - Specialty (includes food packaging made with renewable and biodegradable materials)
 - Tissue
 - Fluff (includes hygiene products such as diapers)
 - Paper
 - Board (includes packing materials such as board and packaging paper)

2. Strong Governance and Risk Management

Highlights



Board-level oversight of all sustainability-related areas



Task Force on Climate-related Financial Disclosures (TCFD)



Carbon Disclosure Project (CDP)



Global Reporting Initiative (GRI)



Sustainability Accounting Standards Board (SASB)



Nouryon is committed to operating responsibly and with integrity. This commitment is reflected in our decision-making process, our unwavering compliance with regulatory requirements, our proactive approach to risk mitigation, and other enforcement of our ethical standards. These standards not only apply to our relationships with customers and suppliers, but also define the ethos of our Company. Our robust Governance and Risk Management capabilities ensure that we consistently uphold these high standards.

2.1 Governance

GRI 2-9, GRI 2-10, GRI 2-11, GRI 2-14, GRI 2-17, GRI 2-18

Nouryon's Board of Directors (Board) and Nouryon's Leadership Team share oversight of our Company's sustainability performance, including sustainability-related target setting and the monitoring of progress against targets. To support the Board in its duties, there are several committees:

- The Corporate Responsibility Committee provides Board-level oversight on matters of sustainability, health, safety and environmental (HSE), product quality, social policies, and programs, and other issues that may affect the Company's reputation.
- The Audit Committee oversees the integrity of our financial statements, the effectiveness of our internal controls over financial reporting, risk management, cybersecurity, tax, and ethical conduct.
- The Compensation Committee manages the compensation of key employees and other aspects of the company's total rewards philosophy and strategy.
- The Nominating & Corporate Governance Committee is responsible for recommending the nomination of individuals to serve on our Board and for setting up our corporate-governance practices. They ensure that the Board has the necessary expertise and diversity in terms of, experience, qualifications, knowledge, abilities, gender, age, and ethnicity.

Charlie Shaver serves as the Chairman of the Board and the Chief Executive Officer. His dual role, backed by his experience in the chemical industry, provides a unified leadership structure and promotes swift strategic decision-making. Out of the 12 members of the Board of Directors, five are independent members⁷.

Together with our Risk Management Committee, the Board is the highest governance body involved in risk management. The Board is regularly updated on strategic priorities and initiatives and receives quarterly updates on our sustainability progress.

In 2023, the Board received briefings from internal Company experts on several areas, including updates related to our global corporate strategy, business performance, sustainability performance, capital allocation, enterprise risk management, digital and generative artificial intelligence strategy, cybersecurity, and people development and talent acquisition. The Audit Committee received additional briefings on cybersecurity, tax matters, internal audit, risk management and internal controls, and the IT program. The Board and Committees also receive regular policy briefings by management as well as quarterly updates about compliance issues.

Nouryon conducts an annual self-evaluation process whereby Directors complete a survey related to the Board's performance and effectiveness. These anonymous evaluations are presented to the Nominating & Corporate Governance Committee of the Board and are discussed in interviews with the General Counsel. More information about our Board and its Committees can be found on our website.

The implementation of our sustainability strategy throughout our organization is a collaborative effort involving Nouryon's Corporate Sustainability team, as well as experts in our businesses and functions. To reinforce our sustainability governance, we engage both internal

and external auditors. Furthermore, we conduct an annual review of our policies, incorporating both internal assessments and external consultations.

Sustainability-related progress is included in our Company dashboard and is applicable to all businesses and functions. We are currently evaluating the opportunity to include climate-related targets in our leadership incentive scheme in the coming years. Approval will be required by the Compensation Committee.



⁷ Definition of independent determined pursuant to the rules and guidance set forth under EFRS guidance.

Key responsibilities:

GRI 2-11, GRI 2-13



[Charlie Shaver](#)

Chairman and Chief Executive Officer, overseeing all sustainability-related responsibilities.



[Sean Lannon](#)

Executive Vice President, Chief Financial Officer, is the Chair of the Disclosure Committee and oversees Financial Reporting and Tax, and Enterprise Risk Management.



Governance matters, including with respect to our Board, our Delegation of Authority policy, Cybersecurity, and Executive Compensation, are the responsibility of our Executive Vice President, Business Affairs, General Counsel and Corporate Secretary, [Michael Finn](#).



Product Stewardship and sustainable product offerings to customers for both the Performance Formulations and Technology Solutions business segments are overseen by our President, [Larry Ryan](#)



Nouryon's strategy and asset planning, including the Company's carbon management strategies, initiatives, and goals are the responsibility of Executive Vice President Strategy & Asset Planning and President Europe, [Johan Landfors](#).



Human Resources, including development and empowerment of our people, is overseen by our Senior Vice President and Chief Human Resources Officer, [Tift Shepherd](#). In addition, she shares executive sponsorship of our Nouryon Women's Network Business Resource Group (BRG) with Vivi Hollertt.



Operational and environmental, safety and sustainability is managed directly by the Integrated Supply Chain (ISC) function, under the responsibility of Senior Vice President and Chief ISC Officer, [Paresh Bhakta](#). This includes overseeing our safety performance, greenhouse gas (GHG) emissions and energy use, eco-efficiency program, and water-management strategy, which ensures that our sustainability performance is supported at all our manufacturing sites. Paresh is also the executive sponsor of our Nouryon Pride BRG.



Senior Vice President, South America and Global Carbon Business Leader Eduardo Nardinelli leads Nouryon's globally coordinated strategic planning to meet our GHG emission reduction goals.



Senior Vice President and Chief Technology Officer (CTO) [Philip Clark](#) is responsible for the Company's global technology and innovation strategies in alignment with the Company's sustainability and growth targets. He also serves as the business leader that builds research capabilities in support of the Company's strategic direction.



Nouryon's global sustainability strategy is overseen by Vice President, Chief Sustainability and Communications Officer, [Vivi Hollertt](#). Vivi shares executive sponsorship of our Nouryon Women's Network BRG with Tift Shepherd.



Sustainable Sourcing is managed by our Vice President and Chief Procurement Officer, Stephen Hester.

2.2 Risk Management

GRI 2-12, GRI 2-13

Effective risk management is crucial to achieving Nouryon's strategic goals. We employ an Enterprise Risk Management (ERM) approach to identify potential rewarded and unrewarded risks and take suitable mitigating actions. Our ERM approach enhances the decision-making process within the Company. Nouryon's approach to risk management and internal control is based on the Committee of Sponsoring Organizations of the Treadway Commission (COSO⁸) reference model. It encompasses strategic, financial, IT, legal, and business continuity components as well as security measures to help ensure that we operate in an ethical and responsible manner. We drive transparency and accountability through various cycles of monitoring and audits, to ensure all mitigating actions are completed.

Our comprehensive ERM approach compels us to consistently question whether we are acting appropriately to minimize risks and capitalize on growth opportunities, including those related to sustainability. It empowers us to identify and manage the strategic, operational, financial, and compliance risks. These include sustainability-related risks and opportunities, including those related to climate, to which Nouryon is exposed. This approach shapes how we work and strengthens our culture of ethical and sound decision-making. It also allows us to enhance the effectiveness and efficiency of our operations, report financial results accurately, and ensure compliance with relevant laws and regulations. Collectively, these aspects reinforce Nouryon's reputation and our capacity to be a consistently reliable business partner.

The ultimate responsibility for oversight of Risk Management and Compliance lies with Nouryon's Board. Our ERM and internal control activities are organized into three lines of defense:

- **First line:** all business and operations managers. They are responsible for owning and managing risk, which includes identifying and mitigating risks.
- **Second line:** oversight functions such as Internal Control, Legal and Compliance, and the Risk Committee, support business and operations management. They help ensure that the risks are identified, properly mitigated, and that monitoring control procedures operate as intended. Additionally, the second line oversees the complete risk program.
- **Third line:** Internal Audit. They provide an independent and objective assessment to enhance the effectiveness of governance, risk management, and internal controls. This includes evaluating the leadership of business and operations, and how oversight functions manage and control risks.

⁸ COSO is a joint initiative of organizations that provides comprehensive frameworks and guidance on enterprise risk management. For more information: <https://www.coso.org>



Identifying and Mitigating Risks to Leverage Growth Opportunities

Our risk management capabilities and resources are designed to align closely with Nouryon's strategic objectives. The ERM process incorporates sustainability risks with a two-to-five-year outlook. We review sustainability-related risks and opportunities at three levels: (1) macro (generic, including political, regulatory, legal, sociocultural, ecological, demographic, technological, and economic environments); (2) meso (industry); and (3) micro (Nouryon). These evaluations encompass strategic, financial compliance, and operational aspects.

Cybersecurity

Cybersecurity is a crucial part of our overall risk management program, aimed at reducing risks to our systems and preventing production outages or loss of sensitive information. Our goals are to:

- Continually improve Nouryon's security posture
- Mature our response preparedness
- Advance our security foundations
- Enhance our security operations

Our Chief Information Security Officer, along with a dedicated team of cybersecurity specialists, continually work to strengthen Nouryon's digital defenses and cybersecurity infrastructure. They focus on enhancing our security operations and perpetually improving the Company's ability to ensure uninterrupted operations and business continuity. This is accomplished through robust monitoring, targeted technology enhancements, and frequent employee awareness campaigns, including internal testing.

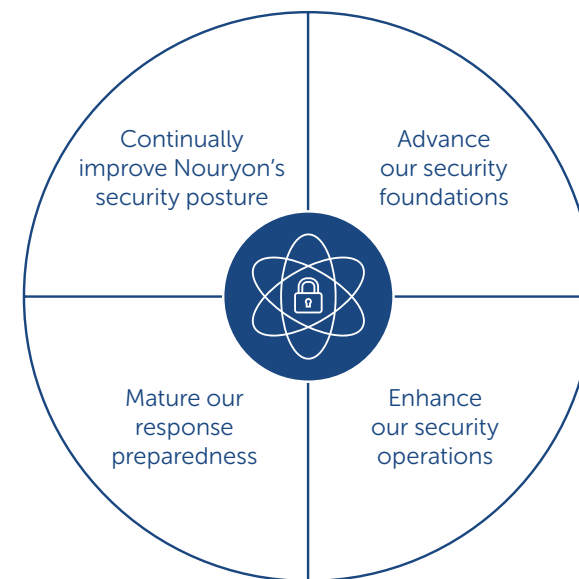
Task Force on Climate-related Financial Disclosures (TCFD): Our Approach to Assessing Climate-related Risks and Opportunities

Climate change is among the most urgent challenges of our era, and the shift towards a net-zero-carbon economy presents significant risks and opportunities. In 2021, we carried out a comprehensive qualitative analysis using the TCFD framework. We view this as the starting point of our journey to integrate climate scenario analysis into our reporting and planning processes, and we expect the guidance and tools to advance over time. In 2024, in line with Corporate Sustainability Reporting Directive (CSRD) requirements, we are completing a new Double Materiality Assessment, and this process incorporates the TCFD results.

Our qualitative analysis encompassed both transitional and physical risks and opportunities, and it referred to leading climate models and scenarios. We utilized publicly available data from the peer-reviewed climate models of the United Nations Intergovernmental Panel on Climate Change (IPCC). We considered a variety of scenarios to pinpoint potential risks and opportunities for the Company. We evaluated potential risks over short, medium, and long-term time horizons, across our entire value chain – upstream, downstream, and within our operations. The results of this analysis are described below and throughout this report. In addition, we provide a summary table of how we align with the TCFD framework.



Continually strengthening our cybersecurity



Nouryon TCFD Index and Additional Information

Core element	Recommended disclosures	Reference to Nouryon 2023 Sustainability Report	Reference to Nouryon's CPD Climate Change 2023 questionnaire ⁹
Governance Disclose the organization's governance around climate-related risks and opportunities.	a) Describe the Board's oversight of climate-related risks and opportunities.	2.1 Governance 2.2 Risk Management	Governance C1.1a, C1.1b
	b) Describe management's role in assessing and managing climate-related risks and opportunities.	2.1 Governance 2.2 Risk Management	Governance C1.2
Strategy Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long-term.	Included in our TCFD project as mentioned in "4.6 Transparent Reporting".	Risk and Opportunities C2.1, C2.1a, C2.1b, C2.2, C2.2a.
	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.		Risk and Opportunities C2.3, C2.3a, C2.4, C2.4a Business Strategy C3.1, C3.2, C3.2a, C3.2b, C3.3, C3.4
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	4.1 Stakeholder Materiality 4.2 Our Ambitions and Targets and How We Aim to Achieve Them 4.3 Alignment with United Nations Sustainable Development Goals Included in our TCFD project as mentioned in "4.6 Transparent Reporting" 5.3 Mitigating Climate Change	Business Strategy C3.1
Risk management Disclose how the organization identifies, assesses, and manages climate-related risks.	a) Describe the organization's processes for identifying and assessing climate-related risks.	2.1 Governance 2.2 Risk Management	Risk and Opportunities C2.1, C2.2, C2.2a.
	b) Describe the organization's processes for managing climate-related risks.	2.1 Governance 2.2 Risk Management	Risk and Opportunities C2.2
	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	2.1 Governance 2.2 Risk Management	Risk and Opportunities C2.2 Business Strategy C3.1, C3.3, C3.4
Metrics and Targets Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	4.2 Our Ambitions and Targets and How We Aim to Achieve Them 5.3 Mitigating Climate Change 5.4 Eco-Efficiency and Circularity	Risk and Opportunities C2.1b, Targets and Performance C4.1, C4.1a
	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	4.2 Our Ambitions and Targets and How We Aim to Achieve Them 5.3 Mitigating Climate Change 5.4 Eco-Efficiency and Circularity 5.5 Environmental Datasheet	Emission Methodology C5.1 Provide your base year and base year emissions C5.2 Emission Data C6.1, C6.2, C6.3, C6.5, C6.10 For additional information on historical emissions breakdown, see CDP C7 with sub questions.
	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	4.2 Our Ambitions and Targets and How We Aim to Achieve Them 5.3 Mitigating Climate Change 5.4 Eco-Efficiency and Circularity	Targets and Performance C4.1, C4.1a

⁹ 2023 CDP climate change questionnaire was based on 2022 operations

Climate-related Risk Analysis Findings

Nouryon conducted its first in-depth qualitative scenario analysis with the support of an Environmental Resources Management (ERM) consulting firm in 2021. The results of scenario analysis help inform Nouryon's understanding of substantive climate-related risks and opportunities and will assist in support planning, resource allocation, investment, and management decisions.

Through a series of workshops, discussions were conducted to better understand climate-related impacts, categorized according to the TCFD guidance: Transition Risks (Market, Policy, Technology, Reputation) and Physical Risks (Acute, Chronic).

Physical Scenario: Nouryon conducted a climate-related scenario analysis by drawing upon publicly available data from the IPCC's peer reviewed climate models to extract indicators for future climate exposure across a range of site locations. SSP3-RCP7 is the scenario that Nouryon considered for this analysis, which represents a pessimistic outlook of both a 4°C warming by 2100 as well as global demographic projections that are unfavourable for climate mitigation and adaptation efforts. Nouryon used geographic system modelling to extract climate indicators for each site, warehouse, or port.

Time Horizon: This analysis extracted data and identified trends to 2050. This time horizon was chosen to provide a sufficiently long-term horizon to incorporate all potential risks and opportunities into Nouryon's risk management strategy.

Area of Organization: The chosen locations were deemed as critical to Nouryon's key enterprise while additional sites were included that represented three priority outplant warehouses. Also included in the analysis were six global ports that are vital to the transport and storage of Nouryon's products. The scenario analysis covered all parts of Nouryon's business including products and services, operations, and the value chain.



Eight priority risk topics were identified through research and engagement with Nouryon: 1) carbon pricing mechanisms; 2) regulation of end markets; 3) raw material prices and availability; 4) high investment cost of transition technology; 5) flooding; 6) hurricanes; 7) water stress; and 8) extreme temperatures. Three priority climate-related opportunity areas were identified through research and engagement: 1) products and services for helping customers achieve climate goals; 2) markets for access to new opportunities; and 3) resource efficiency focusing on circular economy.

Insights Informing our Business Strategy

We also consider climate risks and opportunities as we build and refine our strategy around new market opportunities – including aligning investments in products that serve markets that will expand to meet the transition to a low carbon economy. These include sales into renewable energy markets (wind turbines) and crop solutions to improve yields to battle potential soil depletion.

One example is sales of our amine related products such as piperazine used in carbon capture. Piperazine / MDEA formulations are recognized as a preferred gas treatment solution for capturing carbon dioxide in industrial applications. Thus, carbon capture solutions to mitigate climate change present a business opportunity. For our financial planning, we work with our customers and align future production to the estimated growing demand for piperazine and amine-related products that is foreseen for the coming years. Piperazine helps our customers capture several million metric tonnes of carbon annually. The time horizon for this planning is short and medium-term.

We actively plan investments around our Eco-Premium Solutions both in product development as well as facility investments and production capability to meet market demand, including consideration of low carbon and emission reduction policies impacting our customers and affecting potential market demand. Additionally, we consider raw material sourcing plans as part of these market strategies.

3. Compliance and Ethics

Highlights



SpeakUp! Hotline and Non-Retaliation Policy



Code of Business Conduct & Ethics and Business Partner Code of Conduct



100% of our in-scope¹⁰ employees completed mandatory Compliance trainings



Conflict-minerals risk assessment and due diligence



Modern-slavery and forced-labor risk assessment

Relevant policies and programs

- Acceptable Use of Nouryon Systems and Devices Policy
- Anti-Corruption Policy
- [Animal Testing Policy](#)
- [Business Partner Code of Conduct](#)
- [Code of Business Conduct & Ethics](#)
- Competition Law Compliance Policy
- Conflict of Interest Policy
- Employee Privacy Policy
- External Spend Policy
- Global Travel and Expense Policy
- Diversity Commitment
- Media Policy
- Meal, Gift and Business Entertainment Policy
- Quality, Health, Safety, Environment and Security Policy
- Record Retention Policy
- Sensitive Country Policy
- Social Media Policy
- [Sourcing Sustainable Palm Oil](#)
- SpeakUp! and Non-Retaliation Policy
- Sponsorship and Charity Policy
- [Statement on Sustainable Procurement](#)
- [Tax Strategy](#)



¹⁰ Office-based employees and site management

Our global presence subjects us to increasingly strict laws and regulations on a wide array of topics. These include the safe use of hazardous substances, operational impacts, historical soil and groundwater contamination, product liability, human rights concerns, economic sanctions, antitrust laws, and anti-corruption laws.

Legal and Regulatory Compliance

GRI 2-23, GRI 2-27

Our internal subject-matter experts monitor compliance with laws and regulations and offer guidance and training as required. We also establish expectations for ethical behavior through our Code of Business Conduct & Ethics. This training is required annually for all of our office-based and site management employees. We also have a Business Partner Code of Conduct, which is applicable to all business partners. As a global company and employer, we adhere to local regulations including the General Data Protection Regulation (GDPR) in Europe.



Emphasis on Ethics

GRI 2-23, GRI 205 3-3, GRI 205-2, GRI 2-23, GRI 2-24

Our Compliance program comprises mandatory annual training, policies, and procedures; third-party due diligence and monitoring; as well as the investigation and remediation of unethical, illegal, or inappropriate conduct. This approach assists our employees and other stakeholders in understanding and adhering to Nouryon's high standards of ethical business conduct, complying with legal and regulatory requirements, and embodying our value 'We do it right.'

We regularly conduct audits of our operations. Additionally, Nouryon's office-based and site management employees review and acknowledge our high expectations by completing an Annual Policy Certification and mandatory compliance training. As part of our anti-corruption measures, employees are also required to abide by our Meal, Gift & Business Entertainment Policy.

Our commitment to compliance and ethics is also supported at the highest levels of our Company, beginning with our Chairman and CEO. The Executive Vice President and Chief Financial Officer, Executive Vice President, Business Affairs and General Counsel, and Senior Vice President and Chief Human Resources Officer provide executive oversight of our compliance performance through the Compliance Committee, which is chaired by our Chief Compliance Officer. The Board of Directors and Audit Committee receive regular updates on our Company's compliance program and our Board approves any changes to our [Code of Business Conduct & Ethics](#).

Employee Awareness

GRI 2-15, GRI 2-23, GRI 205-2, GRI 205-3

Nouryon's [Code of Business Conduct & Ethics](#) requires all employees to always act ethically and in compliance with all applicable laws. These include anti-bribery, anti-corruption, antitrust and competition laws, anti-discrimination/harassment laws, data protection laws, and economic sanctions. The diversity of our workforce is a tremendous asset. We are committed to providing equal opportunity in all aspects of employment and will not tolerate discrimination on the basis of age, race, color, national origin, religion, sex, gender identity, sexual orientation or any other protected status. We will not tolerate discrimination or harassment of any kind, including derogatory comments based on race or ethnicity or unwelcome sexual advances.

The Code applies to all employees, and every office-based and site management employee completes compliance training related to ethical business conduct each year. In 2023, 100% of these employees completed assigned training. Training in 2023 included topics such as anti-bribery/anti-corruption, conflicts of interest, ethical decision making, and respectful workplace. In 2023, Nouryon had zero substantiated complaints concerning breaches of customer privacy or losses of customer data.

Our Legal and Compliance organizations review training curriculums annually and policies periodically, or as changing laws and requirements dictate. They regularly report on and communicate with employees regarding related topics, while interacting with other parts of our business to fulfill regulatory and customer requirements. Updates to policy commitments and changes to policies are communicated via Leader Updates, Quarterly Ethics Newsletters or other Global Compliance communications.

Compliant Partners

GRI 2-23, GRI 2-24

Our commitment to ethical business conduct extends beyond our employees. We expect our business partners to adhere to Nouryon's [Business Partner Code of Conduct](#). This covers compliance with laws and regulations, safety, standards for ethical and responsible business conduct and practices, treatment of individuals and fundamental human rights within supply chains, exclusion of conflict minerals, and fraud prevention. We only conduct business with suppliers, customers, and other business partners who share and support our standards. Certain third parties must also undergo a due-diligence process to provide information about their ownership, compliance programs, and any past relevant legal/regulatory issues, including economic sanctions. We continually monitor these third parties digitally for sanctions, regulatory fines, or adverse media. Any breach or violation can prompt Nouryon to reassess business relationships.

In 2023, we repeated our risk assessment regarding conflict minerals for all our suppliers and identified those that could pose risks. Conflict minerals are tantalum, tin, tungsten, and gold (commonly referred to as 3TG), which are used in Central Africa to finance armed conflict, often fought with child soldiers. Nouryon currently only leverages tin and has a very limited number of suppliers, allowing for increased due diligence and limited risk exposure. For any sourced materials containing 3TG, we ask our suppliers to complete the Conflict Minerals Reporting Template as part of our due diligence to ensure that conflict zones and groups are avoided, so that in turn, we can be sure that Nouryon is not inadvertently contributing to such conflict and practices.

Nouryon's Code of Business Conduct & Ethics states we will not engage in, or do business with any third party engaging in, the use of forced or involuntary labor, human trafficking, or child labor. Generally, our manufacturing operations require skilled employees with education requirements at a high school level equivalent and thus

pose a lower risk of child or forced labor. We comply with all local labor laws, which require us to confirm the age of our employees when joining the Company. We also evaluate potential forced labor and modern slavery in our supply chain through a risk assessment of inputs and suppliers and supplier questionnaires, and we follow up appropriately on any concerns raised.

Encouraging Everyone to SpeakUp!

GRI 2-25, GRI 2-26

When it comes to reporting any kind of concern, all stakeholders, including Nouryon employees, suppliers, customers, and other business partners can report all suspected policy violations, inappropriate behavior, and illegal or unethical practices through SpeakUp!, our global reporting hotline. To ensure that our employees and external parties are aware of SpeakUp!, we promote contact information on our intranet, on the Nouryon website, through periodic training, on posters in offices and manufacturing sites, and in our Company Code of Business Conduct & Ethics and Business Partner Code of Conduct. We also have a SpeakUp! and Non-Retaliation Policy (whistleblower protection) for good faith reporting of concerns that applies to all employees. We will not tolerate retaliation against any employee who makes such a report, and ensure employee confidentiality in compliance with local regulations, including the GDPR in Europe.

Our 2023 Performance

SpeakUp! reports can be made anonymously and confidentially, via telephone hotline and email, as allowed under applicable law, in any of 30 languages. In 2023, all SpeakUp! concerns were registered and resolved within an average of less than 30 days. We also recently introduced the following SpeakUp! Process to our employees to make the reporting process flow clear to them.



SpeakUp! process

When it comes to reporting ethics and compliance concerns, Nouryon employees have a variety of options, including our global SpeakUp! hotline. Incidents can be reported anonymously and confidentially (as allowed under applicable law), via telephone and online, in any of 30 languages. This infographic describes the SpeakUp! Process flow for potential reporters and highlights how the reporting and investigation processes works. Questions about this process can be directed to nouryoncompliance@nouryon.com.



Submit a SpeakUp! report – If you see something, say something

Reporting options:

- Manager
- HR
- Legal
- Compliance
- SpeakUp! hotline

If reported via the SpeakUp! hotline, check back regularly in case the investigator has additional questions and remember to save your case number.



Determine whether investigation is necessary or possible

- Is there sufficient information?
- Is the report an allegation or inquiry?
- All reports of possible violations of our [Code](#) or applicable laws will be evaluated promptly and investigated as appropriate

If you decide to submit anonymously, remember to provide sufficient details (e.g., Who, What, When, Where?).



Assign investigator by issue

- Legal
- Compliance
- HR
- Internal audit

The majority of reports we receive involve how employees treat each other (e.g., respect in the workplace). These matters are typically referred to HR.



Conduct confidential investigation

- All reports are kept as confidential as possible
- You may be asked to cooperate during an investigation. Refusing to do so, is a violation of our [Code](#)
- If you ever feel you have been retaliated against for submitting a SpeakUp! report, you should promptly contact the Compliance team

We aim to address and resolve all reported SpeakUp! concerns within an average of 30 days.



Determine outcome

- Substantiated – policy violation found
- Unsubstantiated – no policy violation found
- Cases may be closed due to insufficient information if a reporter does not answer follow-up questions within two weeks



Where appropriate, take remedial action

- Examples of potential remediation include site temperature checks¹³, coaching, training, verbal or written warnings, and termination

¹³ General questions to inquire about employee perceptions, professionalism, management actions, etc.

4. Our Commitment to a Sustainable Future

Highlights



Our Sustainability Commitment: We partner with our customers, suppliers, and employees to deliver innovative solutions, drive progress, and create a safe and sustainable today and tomorrow for everyone.



2030 GHG emission reduction target and 2050 net-zero aspiration



2030 targets on water and waste



Aligned with and supporting United Nations Sustainability Development Goals (UN SDGs)



Independent Limited Assurance¹⁴ by ERM Certification and Verification Services

Our 2023 Ratings



Carbon Disclosure Project
A- Rating Climate Change



EcoVadis Gold Rating



¹⁴ Selected 2023 information and data in this report has been assured by ERM CVS. For more information, refer to the Independent Assurance Report on [page 95](#).

At Nouryon, sustainability is embedded in our strategy, operations, and product portfolio. We believe the right chemistry can pave the way to a more sustainable future, and we are committed to developing products that contribute to this goal. Nouryon's Company Purpose is: Your partner in essential solutions for a sustainable future. This purpose, and our values, are closely connected, embodying our identity. They help strengthen our performance-oriented culture focused on customers and growing our business, including through seizing opportunities related to sustainability. By living these values, we position ourselves as a reliable and responsible business.

Our "Commitment to a Sustainable Future" is how we embed and measure sustainable practices in our business approach. It is based on three clear commitments to:

- **CONTINUOUSLY IMPROVE** our safety and environmental performance.
- **GROW AND INNOVATE** to create sustainable solutions enabling customers to be more sustainable.
- **ENGAGE AND PARTNER** with employees, customers, suppliers, and society to drive sustainable progress.

Our "Commitment to a Sustainable Future" is based on our materiality assessment that helps us identify and focus on the sustainability topics where we can have the greatest impact. It is also designed to support the goals of the United Nations (UN) Paris Agreement on Climate Change and the UN Sustainable Development Goals (SDGs). We monitor our progress and report metrics in line with the Global Reporting Initiative (GRI) and Sustainability Accounting Standards Board (SASB). For more detailed information, including a comprehensive overview of data as well as a GRI and SASB index, please refer to [pages 88-96](#).

		
<p>CONTINUOUSLY IMPROVE our safety and environmental performance</p>	<p>GROW AND INNOVATE to create sustainable solutions enabling customers to be more sustainable</p>	<p>ENGAGE AND PARTNER with employees, customers, suppliers, and society to drive sustainable progress</p>
<p>Key Sustainable Development Goals:</p>    	<p>Key Sustainable Development Goals:</p>     	<p>Key Sustainable Development Goals:</p>    
  	  	  



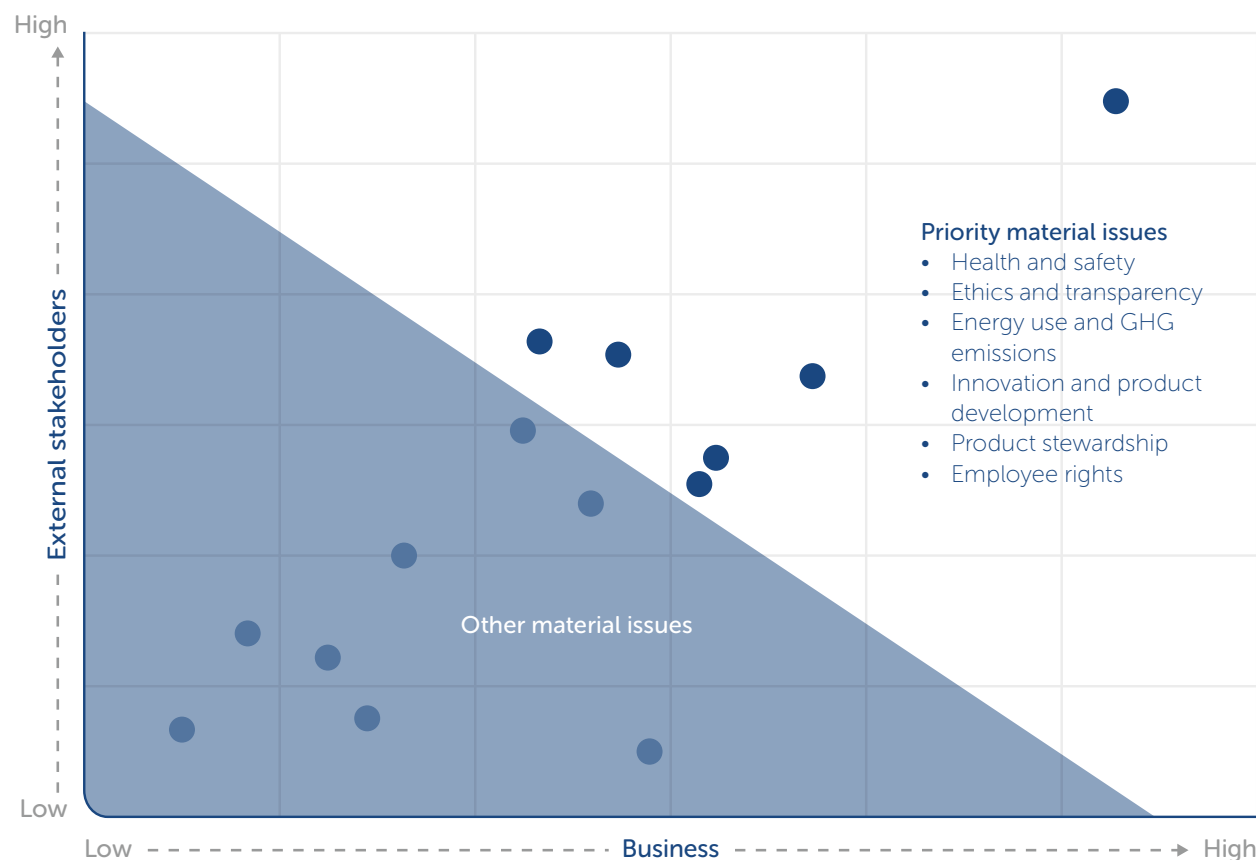
4.1 Stakeholder Materiality

GRI 3-1, GRI 3-2

We conducted a materiality assessment in 2019, with the support of an independent consulting firm. The assessment identified health and safety in all aspects of our operations

and climate change, including energy use and greenhouse gas (GHG) emissions, as issues of key importance to our business. In 2024, in line with Corporate Sustainability Reporting Directive requirements, we will complete a new Double Materiality Assessment that includes assessing sustainability-related impacts, risks, and opportunities.

Nouryon Materiality Assessment



Engaging with Our Stakeholders

Making progress on our sustainability commitment involves continual engagement with our stakeholders. These include our customers, suppliers, employees and candidates, communities, including governments, as well as potential investors. Below are some highlights from 2023.



Customers

- Sustainability targets aligned with our growth strategy
- Carbon Business Strategy and Roadmap to reduce GHG emissions
- Close collaboration between key account managers and strategic customers
- Ratings questionnaires including CDP and EcoVadis
- Member of the United Nations Global Compact
- Substantial offering of products with sustainability benefits
- 13 Innovation and Application Centers around the world and robust R&D product pipeline focused on sustainability benefits
- ISCC PLUS certification for green monochloroacetic acid (MCA) production



Suppliers

- Supplier key account management
- Supplier commitment to Business Partner Code of Conduct
- Supplier of the Year Awards Program
- EcoVadis assessments of a percentage of our core suppliers
- Access to third-party audits and industry best practices through Together for Sustainability (TfS)
- Supplier engagement program requesting product carbon footprints
- Scope 3 green raw material alternative market intelligence and ISCC PLUS supporting strategy
- Conflict-minerals risk assessment and due diligence
- Modern-slavery and forced-labor risk assessment



Employees and Candidates

- Regular communication between CEO and Senior Leadership Team with employees
- Leadership Capabilities Framework and regular dialogue between managers and employees
- Ensuring a living wage - we successfully completed a Global Living Wage analysis for 70% of our direct manufacturing population
- Social dialogue with employee representative bodies in relevant countries
- Five employee-led Business Resource Groups (BRGs)
- Internship and Mentorship programs
- Learning and Development—both in person and online
- Annual Safety Day and Nouryon Cares initiative including volunteer opportunities for employees
- Employer Brand
- SpeakUp! Hotline and Non-Retaliation Policy



Communities

- Open-to-Public programs across China sites and Bring Your Family to Work day in the Netherlands
- Inspirational chemistry project in local schools, Sweden
- Philanthropy and volunteerism initiatives around the world, including:
 - Our partnership with Philadelphia Eagles and Eagles Autism Foundation in the US
 - Supporting Vatsalya Trust Balikashram orphanage in Mumbai, India
 - Donating vital laboratory equipment to a local college serving underprivileged rural communities near our Mahad site in India
 - School supply donations in the US, including Fill the Bus school supply drive and Kids In Need Foundation



Potential Investors and Lenders

- Sustainability-related risk management approach
- Equity analyst and lender engagement via meetings, earnings calls, and conferences
- Responding to ratings agencies, credit rating agencies
- Annual financial results published on our website
- Quarterly results shared with our lenders
- Task Force on Climate-related Financial Disclosures (TCFD)
- Closing acquisition of ADOB to expand offering in crop nutrition

4.2 Our Targets and How We Aim to Achieve Them

GRI 2-25, GRI 305-1, GRI 305-2, GRI 305-3, GRI 305 3-3

Sustainability Goals

We are committed to improving our environmental footprint and have established specific targets to support this goal. We have set targets for 2030: a 40% reduction in absolute GHG emissions (Scopes 1 and 2), a 10% decrease in total waste intensity, and a 10% decrease in freshwater consumption intensity, all versus a 2019 base year. We aspire to become a net-zero organization by 2050.

Our Carbon Business Strategy and Roadmap to Reduce GHG emissions

GRI 305 3-3, GRI 305-5

Our Carbon Business Strategy has a long-term horizon and aims to reduce GHG emissions while growing the Company.

It is guided by the following strategic pillars: Carbon Operational Excellence, Energy Transition, Innovation, and Value Chain Collaboration, and includes:

- **Scope 1:** We aim to enhance the efficiency of our operations and optimize our fuel mix.
- **Scope 2:** We are committed to expanding our use of renewable energy via on-site renewable projects, power purchase agreements (PPA), and other green energy programs.
- **Scope 3:** We are actively analyzing indirect GHG emissions from activities throughout our value chain, which includes evaluating potential lower-carbon raw materials with suppliers.

Our 2023 Performance

We achieved a 14% reduction in our absolute Scopes 1 and 2 emissions versus 2019 driven by the successful implementation of projects from our carbon roadmap, lower production activity versus previous years and changes in our production mix. A notable contributor was our shift towards renewable energy, with 42% of our total electricity consumption now being derived from renewable sources (compared to 36% in 2019), and 33% of total energy, including steam, coming from renewable sources (compared to 30% in 2019).

Scopes 1 and 2

At the facility in Kvarntorp, Sweden, our partner Adven, a company that specializes in industrial energy transitions, installed a new steam boiler that relies primarily on locally sourced residual products from the forestry industry, such as chipped branches and tops, to generate the heat required for our production processes. The new steam boiler replaces liquefied petroleum gas with biofuel, resulting in a 38% decrease in Scope 1 emissions in 2023 compared to 2022, and an anticipated 90% eventual reduction in Scope 1 emissions at this site. See case study on [page 50](#).

Additionally, in 2023, 25 out of 60 manufacturing sites operated by Nouryon are now sourced with renewable and/or low carbon electricity, comprising 54% of the total electricity we use globally. Notable related highlights in 2023 include:

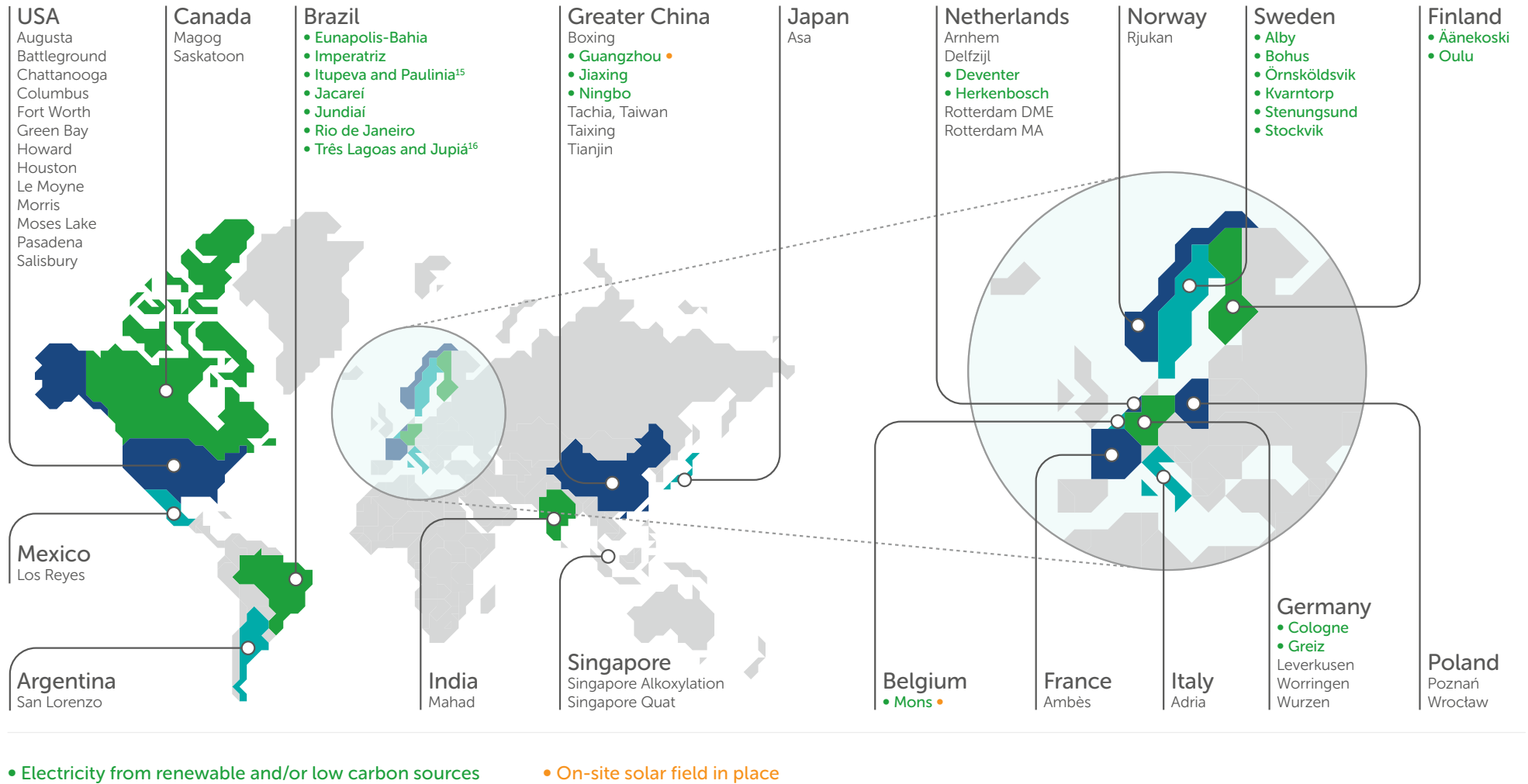
- In South America, all nine locations we operate in Brazil used electricity from renewable sources. Additionally, our site in Jundiá, Brazil, achieved the status of carbon neutral from operations (Scopes 1 and 2), joining the other five carbon neutral from operations sites Nouryon operates in the country. See case study on [page 26](#).
- In Europe, all our sites in Belgium, Sweden and Finland use 100% electricity from renewable and/or low carbon

sources. In addition, Cologne and Greiz in Germany, and Deventer and Herkenbosch in the Netherlands, are also using 100% renewable or low carbon electricity.

- In North America, we signed a 30-year power purchase agreement (PPA) with Convergent Energy and Power to supply 2-megawatt (MW) of solar power to our manufacturing site in Morris, IL, US. The onsite solar field is expected to be operational in the second half of 2025, subject to local permits and approvals. We also signed a contract with NRG Energy, Inc., under the brand Direct Energy, to start receiving renewable electricity at three of our four sites in Texas, US, beginning at the end of December 2024.
- In Asia, 100% of our electricity consumption in Ningbo and Jiaxing, China, originated from renewable sources in 2023. Another site in Guangzhou, China, runs on 100% electricity from renewable energy and includes an onsite solar field.



25 locations at our 60 manufacturing sites are being sourced with 100% renewable and/or low carbon electricity



¹⁵ This location is a distribution center managed by the Itupeva site

¹⁶ Two locations operated as one site



Nine locations in Brazil are now using 100% electricity from renewable sources

We made significant sustainability progress in 2023, with nine locations we operate in Brazil now powered entirely by electricity from renewable energy sources. They include: Eunapolis-Bahia, Imperatriz, Itupeva, Jacarei, Jundiá, Jupiá, Paulínia, Rio de Janeiro, and Três Lagoas. These locations represent 27% of our total global electricity usage, marking a crucial step in reducing GHG as emissions and transitioning to a low-carbon economy.

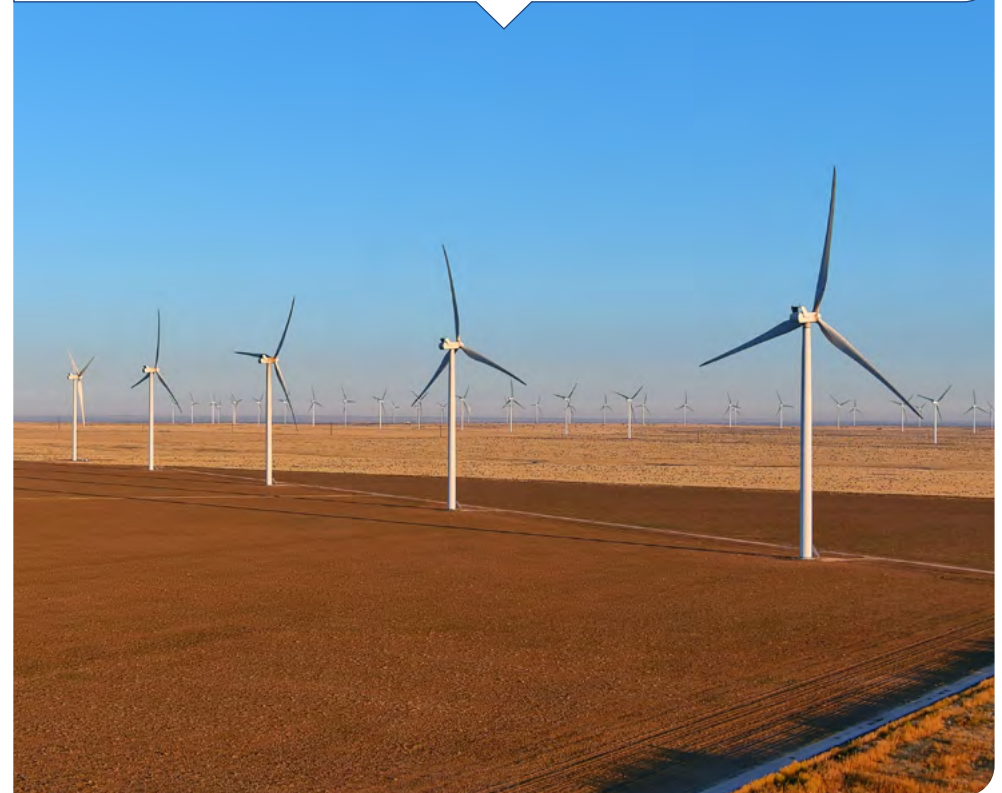
Our sustainability commitment and effort to reduce our carbon footprint extends to our entire manufacturing network. We continue to explore opportunities to transition other global sites to electricity from renewable energy sources as part of our long-term Carbon Business Strategy.

In 2021, we achieved carbon neutrality from operations at five locations we operate in Brazil (Imperatriz, Eunópolis, Três Lagoas, Jupiá, and Jacarei). These locations are part of Nouryon's Integrated Manufacturing Model, which offers on-location sodium chlorate and/or chlorine dioxide production to our customers. In 2023, we also achieved carbon neutrality from operations in our Jundiá site in Brazil.

Renewable energy agreement at three sites in Texas, US

In 2023, Nouryon announced a long-term agreement with NRG Energy, Inc. brand Direct Energy. This agreement will ensure that our manufacturing sites in La Porte, Fort Worth, and Houston, US, are powered with electricity 100% from renewable sources. This will be achieved through the purchase of renewable energy certificates sourced from wind farms across Texas, with the delivery term beginning at the end of December 2024.

This agreement marks a significant step forward in our mission to reduce our global carbon emissions and aligns with the sustainability targets of our customers.



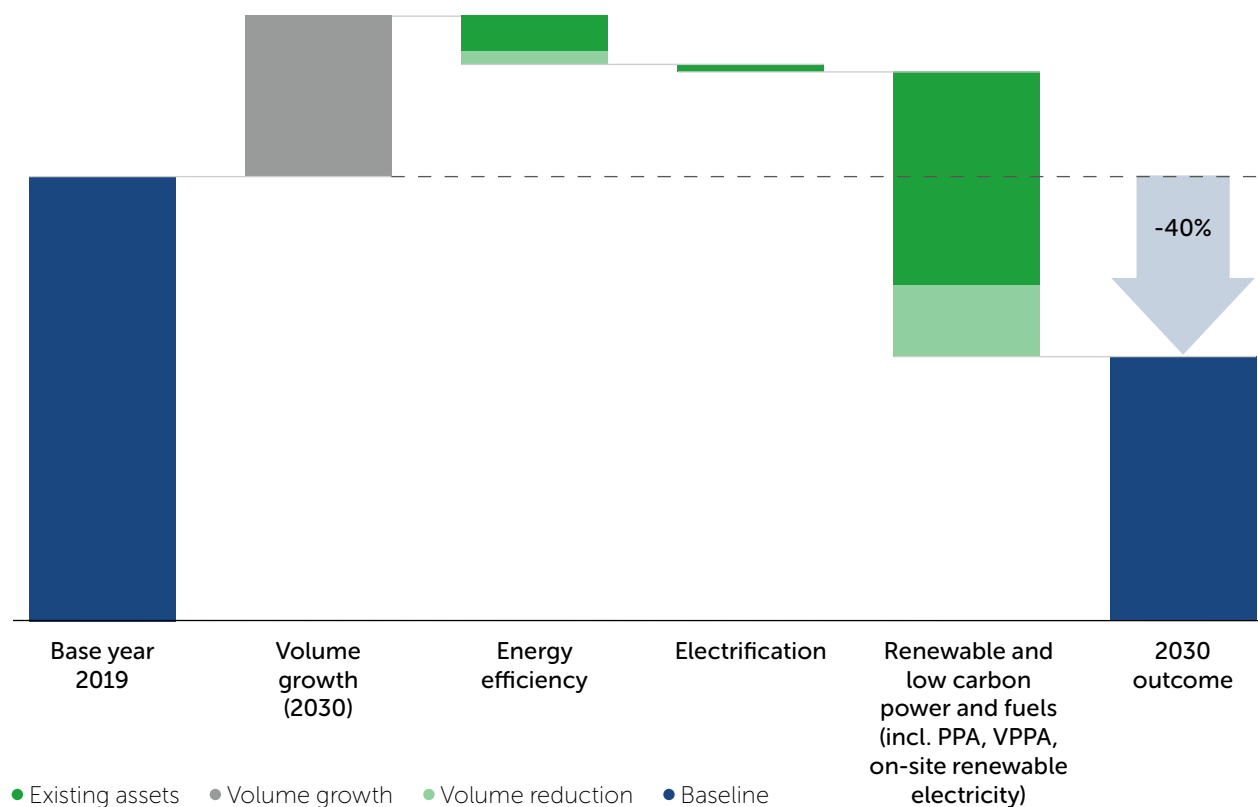
Looking Ahead

The diagram below illustrates our pathway to meet our 2030 GHG targets. In line with much of 2023 progress, the key driver is transitioning to renewable electricity, investing in long-term PPAs, and other renewable energy programs to lower our Scope 2 emissions. Additionally, we are exploring capital-efficient projects to decrease Scope 1 emissions at our plants, including equipment upgrades

or replacements and design enhancements such as pre-heating, pressure, and temperature optimizations, using lower carbon fuel in steam boilers and energy recovery.

Achieving our net-zero aspiration depends on several factors, including site evaluations, increased use of renewable energy, the pace of innovation, developments in our value chain, and regulatory requirements.

Scope 1 and 2 GHG absolute emissions reduction pathway



Secured first power purchase agreement for a US-based onsite solar project

We entered into a 30-year PPA with Convergent Energy and Power in 2023, ensuring the supply of 2MW solar power to our manufacturing facility in Morris, IL, US. The onsite solar field associated with this agreement is anticipated to be fully operational by the second half of 2025 subject to local permits and approvals.

This marks the first onsite PPA for Nouryon in the US, demonstrating our commitment to reducing GHG emissions. The agreement is seen as another milestone towards enhancing our renewable energy footprint.



Scope 3

In developing our Carbon Business Strategy, it is crucial to take emissions across our entire value chain into account. This holistic approach provides us with deeper insights into potential reduction opportunities and allows us to compare these with the reductions achieved in Scopes 1 and 2. Furthermore, it guides our Scope 3 reduction plans, including potential collaborations.

In 2023, Nouryon joined Together for Sustainability (TfS), a global initiative of 53 chemical companies committed to raising sustainability standards throughout the chemical industry. As part of this initiative, members pledge to make sustainability improvements within their own – and their suppliers’ – operations. TfS is also advancing methodologies and standardization in calculating Scope 3 (upstream) GHG emissions, which constitute a significant share of the chemical industry’s carbon footprint.

As of last year, we are also certified to the International Sustainability and Carbon Certification standard ISCC PLUS to produce green monochloroacetic acid (MCA) at our site in Delfzijl, the Netherlands. We are proud to be the first and only producer of green MCA that is derived from sustainably sourced raw materials. Green MCA offers a significantly lower product carbon footprint versus traditional MCA, which reduces our Scope 3 emissions and those of our customers.

As we continue to develop new and innovative products using more sustainable raw materials, we will further explore how these initiatives can contribute to improvements in our Scope 3 carbon footprint.

2023 Value Chain Collaboration

As part of our Carbon Business Strategy, aligned with our commitments, we are looking to collaborate with our suppliers as we tackle the challenge of climate change together. As we pursue opportunities to develop additional low carbon and sustainable solutions, we are requesting from suppliers lifecycle assessment (LCA) data. In 2023, we launched an initiative to request product carbon footprint (PCF) data from suppliers of our top raw materials on products they provide, which we use as raw materials. These will improve the accuracy of our data and can help us identify potential opportunities to reduce emissions and meet the growing needs of our customers for low carbon solutions. We understand this will be an ongoing process. As time progresses, we will monitor progress and further develop plans to deliver on our commitments.

Our value chain collaboration also includes:

- Collaborating with our customers and suppliers.
- Providing product carbon footprint data to customers.
- Incorporating net-zero and climate change considerations into our customer and supplier relationships.

Achieving our net-zero aspiration depends on several factors, including site evaluations, increased use of renewable energy, the pace of innovation, developments in our value chain, and regulatory requirements.

Waste and Freshwater

From 2019 to 2023, our freshwater consumption intensity increased by 1%. Our total waste intensity decreased by 1% between 2019 and 2023. For example, our Ningbo site implemented a sludge dryer project that is estimated to avoid approximately 1,500 tons of waste in 2024. We remain committed to achieving our 2030 water and waste targets and are developing a plan to ensure these targets are met.

4.3 Alignment with and supporting UN Sustainable Development Goals

GRI 2-6, GRI 305 3-3, GRI 405 3-3



Nouryon's sustainable solutions align with the UN SDGs and are well-positioned to meet the demand and opportunities created by several societal trends. These global trends include a growing population, a rising and increasingly health-conscious middle class, climate change, and the need to preserve natural resources.

We believe our Company and sustainable solutions make the most significant contributions to the following 10 SDGs:



End Hunger, Achieve Food Security and Improved Nutrition, and Promote Sustainable Agriculture

Our portfolio offers crop nutrients, adjuvants, and biodegradable solvents, promoting plant growth and improving soil health. Investments in ADOB and AGEYE support our goal of sustainable agriculture.



Ensure Healthy Lives and Promote Well-Being for All, Regardless of Age

We prioritize health and safety and excel in people safety. Our solutions encompass cleaning, personal care, pharmaceuticals, and food, utilized in bio-based products, pharmaceutical excipients, fortification, and water treatment.



Ensure Inclusive and Equitable Quality Education and Promote Lifelong Learning Opportunities for Everyone

Nouryon supports employee growth through diverse development programs, including internships, learning opportunities, and employee-led Business Resource Groups. Additionally, the company emphasizes STEM education and fosters diversity.



Achieve Gender Equality and Empower All Women and Girls

Nouryon prioritizes respect and diversity, reinforced by the Company Code of Business Conduct & Ethics. Training focuses on fostering a respectful workplace. The Nouryon Women's Network globally supports women in chemistry and manufacturing.



Affordable and Clean Energy

Nouryon is dedicated to increasing renewable¹⁷ energy use, aligning with our GHG reduction targets. Our solutions contribute to energy efficiency and the transition to renewable energy sources like solar panels and windmills.



Promote Sustained, Inclusive and Sustainable Economic Growth, and Full, Decent, Productive Employment

Nouryon values the synergy between business performance, safety, and sustainability, to create employment opportunities. We prioritize employee empowerment, safety, and high performance in an inclusive, diverse workplace that mirrors our global presence and customers.



Build a Resilient Infrastructure, Promote Inclusive and Sustainable Industrialization, and Foster Innovation

Nouryon is dedicated to sustainable innovations, offering bio-based ingredients and specialized components for infrastructure durability, energy efficiency, and the transition to renewable energy, actively contributing to global sustainability through our customers.



Reduce Inequality Within and Among Countries

Nouryon focuses on sustainable growth in emerging markets, exemplified by the significant expansion in Mumbai with a new Global Service Center. We invest in facilities, provides diverse workplaces, and engages in philanthropy and volunteerism to support local communities.



Ensure Sustainable Consumption and Production Patterns

Nouryon prioritizes sustainable innovation and circular production through eco-efficient processes and renewable, bio-based products. Furthermore, our integrated manufacturing sites reduce transport emissions.



Take Urgent Action to Combat Climate Change and Its Impacts

Nouryon aligns with the UN Paris Agreement to reduce GHG emissions across its value chain through innovative technologies, efficient processes, low-carbon energy, and products that enhance customer sustainability.

¹⁷ Energy from sources that are inexhaustible and sustainable, such as wind, solar, hydroelectric, biomass, and others.



New Global Service Center launch in Mumbai underscores commitment to India

In 2023, Nouryon announced the significant expansion of its office footprint and workforce in Mumbai, India, with the launch of a new Global Service Center. This development aligns with our Company's global growth plans, with the center serving as a hub for commercial teams focused on business development in India and supporting functions. It also emphasizes Nouryon's long-term, continued commitment to the country as a strategic growth market and talent base. The expanded office and Innovation and Application Development Center in Mumbai will house a growing workforce of nearly 350 employees, occupying a space of approximately 50,000 square feet.

Operating in India since 1991, Nouryon's Mumbai-based commercial team focuses on key end-markets, including personal care, cleaning, crop nutrition, paints, coatings, and packaging. In addition to our Mumbai operations, Nouryon also operates an organic peroxide and metal alkyls production site in Mahad. We also have a joint venture with Atul that includes India's largest monochloroacetic acid (MCA) plant in Gujarat.

Innovation insights for employee families in the Netherlands

On the occasion of International Day of Women and Girls in Science 2023, the Nouryon Women's Network, together with our Deventer, Netherlands site, organized a "Bring your Child to Work" event. The program offered the opportunity for employee children (of all genders) to learn how chemistry is essential for everyday life and how Nouryon is contributing to a sustainable future. Many of our Deventer staff volunteered during the event, and the children and guests participated in experiments based on Nouryon's innovative and sustainable solutions in a safe and inclusive environment.



4.4 Memberships and Partnerships

GRI 2-28

Nouryon proudly maintains several key memberships, including being a signatory of the [UN Global Compact](#), the world's largest initiative dedicated to corporate sustainability. This international program unites corporations, UN agencies, and labor and civil society organizations, fostering collaboration to uphold universal principles concerning human rights, labor, environmental protection, and anti-corruption. Our Company strategy, sustainability goals, and Code of Business Conduct & Ethics are meticulously designed to align with and support these principles.

Additionally, Nouryon is a member of [Together for Sustainability](#), the [Roundtable on Sustainable Palm Oil](#) and [Responsible Care](#)®, demonstrating our commitment to ethical and sustainable practices. We also partner with [Hållbar Kemi](#) (Sustainable Chemistry), a Swedish regional corporate cooperative, further emphasizing our dedication to sustainability.

For more detailed information regarding our memberships, please refer to [page 82](#).



4.5 Solid Industry Ratings

In 2023, Nouryon was recognized with an A- score for climate leadership from CDP, a global non-profit that runs a leading environmental disclosure system for companies, cities, states, and regions. This places us in CDP's leadership band (top quartile) and above both the European region and Chemical sector averages.

Thanks to our efforts to improve our environmental performance in areas such as 'Targets', 'Value Chain Engagement', and 'Opportunities Disclosures'. This score improvement reflects the progress made with our Carbon Business Strategy last year, including the transition of several sites we operate across our regions to electricity from renewable sources, as well as the significant reduction in our Scopes 1 and 2 GHG emissions.

Additionally, Nouryon earned an EcoVadis Gold rating in 2023 for our sustainability achievements, placing us in the top 5 percent of companies then rated by EcoVadis, the world's largest provider of business sustainability ratings. The rating encompasses four dimensions: Environment, Labor and Human Rights, Ethics, and Sustainable Procurement. We submit an extensive annual questionnaire to EcoVadis, with the specifics of this achievement available for member review on the EcoVadis website.

Our continued commitment to transparency and environmental responsibility is reflected in these ratings and our ongoing participation in these initiatives. Additionally, in our Procurement sustainability strategy, we also monitor the EcoVadis ratings of our suppliers (refer to Chapter 7 for more details).

Our 2023 Ratings:



CDP A- score
Climate
Change



EcoVadis
Gold
rating



4.6 Transparent Reporting

Nouryon is committed to transparency in reporting, and we are proud to share the latest strides in our sustainability journey through this annual Sustainability Report. The report includes our sustainability data fact sheet, and we report metrics with reference to GRI ([page 93](#)) and in alignment with SASB disclosure standards ([page 92](#)).

Additionally, we have reported to the Task Force on Climate-related Financial Disclosures (TCFD) (see [page 14](#)). We conduct internal audits and engage an independent firm, ERM CVS, to conduct limited assurance for selected 2023 information and data in this report. For more information, please refer to the Independent Assurance Report on [page 95](#).

We also ensure that our sustainability progress is communicated internally to our employees and executives through several channels:

- Corporate Responsibility Dashboard: This includes key sustainability metrics that are measured and tracked quarterly and reported to the Corporate Responsibility Council and the Corporate Responsibility Committee of our Board.
- Regular communications to employees, including town halls, Leader Updates, intranet posts, our internal social media platform, Viva Engage, and all-staff emails.



World Environment Day 2023 in Asia Pacific

In June 2023, Nouryon's Health, Safety, and Environment (HSE) team for the Asia Pacific region led an internal campaign in recognition of World Environment Day. The campaign focused on increasing awareness and promoting activities to reduce pollution from plastic and was linked to the United Nations Environment Program's on the same topic.

Ten Nouryon sites across the Asia Pacific region participated in various activities throughout the month, with the support of the regional Integrated Supply Chain (ISC) leadership. Activities included: leadership speeches, poster campaigns, environmental training, employee children's drawing competitions, and drills on chemical leakage control. Some sites also conducted eco-friendly site tours, distributed reusable cloth bags, and hosted a "No Vehicle Day", encouraging employees to opt for public transport to commute to work.

5. Continuously Improving Our Safety and Environmental Performance

Highlights



78% Process safety incident rate decrease between 2019 and 2023



Eco-efficiency tracking in place at 100% of manufacturing sites



Six carbon-neutral locations operated by Nouryon



20% of organic raw materials are bio-based



33% of total energy is based on renewable sources

Relevant Policies and Programs

- Life-Saving Rules (LSR) for all employees and contractors
- Safety training for all employees and contractors, including Frontline Leader Safety training
- Behavior-Based Safety (BBS) program
- Process Safety Management (PSM)
- Annual Safety Day
- Health, safety, environment, and security (HSE&S), including product stewardship



14% reduction in total absolute Scopes 1 and 2 greenhouse-gas emissions



42% of our total electricity consumption from renewable sources



CONTINUOUSLY IMPROVE
our safety and environmental performance

Key Sustainable Development Goals:





Nouryon's Integrated Supply Chain (ISC) Function presides over our worldwide supply network. ISC's primary focus areas are enhancing customer satisfaction and operational safety. ISC's role is pivotal in ensuring rapid customer response, reducing logistical complexities, guaranteeing supply reliability, and maintaining superior product quality. ISC accomplishes these objectives by promoting operational excellence, robust safety measures, productivity enhancement, and cost control, thereby contributing to profitable growth.

As a responsible operator and reliable supplier, safety is our highest priority. Our objective is to maintain responsible operations by continuously improving our performance in people safety, process safety, and product safety.

Additionally, we are dedicated to reducing our environmental footprint. We strive to achieve this by taking measures in line with our Quality, Health, Safety, Environment and Security Policy (QHSE&S), while enhancing operational efficiency and increasing the procurement of renewable energy. Our QHSE&S Policy includes preventing or minimizing the impact due to our facilities, activities, and products (potential dust, noise, odor, air emissions, road congestion, spills), activities and products; through innovation in design, manufacturing, maintenance processes, and distribution, while optimizing resource efficiency along the value chain (e.g. minimizing and converting waste in valuable material). Furthermore, we maintain a robust QHSE&S management system, consistent with rules and procedures and global standards that incorporates the commitments set forth above.

Our 2023 Performance

In 2023, our process safety incident rate was 78% below our 2019 baseline and our OSHA Incident Rate (OIR) was 3% below the 2019 baseline. Our people safety performance continues to rank in the top quartile according to the most recent American Chemistry Council benchmark data.

Of our 60 global manufacturing sites, 95% have certified Environmental Management Systems, such as ISO 14001 or RC 14001. In addition, our ISC approach resulted in a 1% increase in asset uptime (excluding downtime due to weather events and global supply shortages), yielding approximately \$77M in combined reductions in operational and raw material costs. This has allowed us to reallocate resources towards creating a more agile organization.

5.1 Continually Improving Our People and Process Safety

GRI 403-3

Our value 'We do it right,' encapsulates a culture of safety awareness that serves to protect our employees, contractors, customers, communities, and the environment. Our continuous goal is to enhance our performance with the ultimate ambition of achieving zero injuries and harm. We have set internal objectives aimed at eradicating workplace injuries and have a robust safety management program to consistently improve our safety performance. The program includes numerous initiatives such as LSRs, Risk of the Quarter, and incident investigation and reporting, among others.

Our 2023 Performance

As a result of these strategic initiatives, we have seen a significant reduction in incidents from 2019 through 2023. As previously mentioned, our OIR decreased by 3%, and our process safety incident rate saw a reduction of 78% compared to 2019. We remain committed to making further improvements in our safety performance. For example, we are focusing on leading indicators, emphasizing hazard recognition, and enhancing incident learning to preemptively address potential safety issues.

People Safety

GRI 2-25, 403-3, 403 3-3, 403-1, 403-2, 403-4, 403-5, 403-9, and 403-10

Nouryon ensures that safety is an integral part of our culture at every level. We have workplace accident prevention policies, including our extensive HSE&S Procedures including LSRs, and strong management systems to drive continuous improvement in this area. To elevate awareness and reinforce our safety culture, we actively report on leading parameters such as:

- **Near misses:** These are events that, although they did not result in any immediate impact, had the potential to cause injury, ill health, or damage to assets or the environment.
- **Hazards:** These are any conditions or situations that could potentially harm people, products, or the environment.

By focusing on these parameters, we ensure that safety remains at the forefront of our operations, thereby minimizing risks and enhancing the overall safety of our operations. We conduct audits on each site to ensure compliance with regulatory and internal requirements. Regular safety-related trainings and emergency drills are conducted at every site at least once annually, with thorough documentation of outcomes and lessons learned to continually improve our processes.

Each incident that occurs at our sites is subject to a thorough investigation and root cause analysis. Health, Safety and Environment (HSE) alerts are developed for all focus events, outlining root causes as well as key learnings from the incident. Our regional HSE managers engage in weekly calls to review our focus events, which include near misses. These incidents are then reviewed with ISC leadership and HSE teams. We do not differentiate between employees and temporary workers when it comes to occupational health and safety hazards.

Furthermore, we implement a BBS program at all our locations. The purpose of this program is to identify unsafe behaviors, provide training to frontline leaders, and inspire behavioral change among employees and contractors to minimize potential hazards in the workplace. These observations are conducted regularly and systematically. Suggestions for improvement and employee feedback are integrated into the program and utilised for the continuous improvement of our sites. Our Internal Audit team conducts regular audits of BBS programs, with each site being audited every three years to assess effectiveness. Additionally, our sites must internally audit the effectiveness of their BBS program themselves each year.

Every recordable injury is thoroughly investigated to identify root causes and determine appropriate corrective actions to prevent future incidents. We conduct a comprehensive workplace risk assessment of hazards and implement mitigation actions to prevent injuries. Our basic procedures outline the hierarchy of controls to mitigate potential hazards. We adhere to this hierarchy in our design and operational procedures to ensure that we respond to potential hazards at the earliest possible stage.

Chemical hazards are identified at each site location and maintaining a list of the chemicals used and produced along with their safety data sheets (SDS) is compulsory.

We organize an annual company-wide Safety Day to boost employee awareness and fortify our global safety culture. You can find more information on this on [page 36](#). We conduct corporate compliance audits for QHSE&S, including process safety, in a three-year cycle at our production sites.

At sites where ISO 14001 and 9001 certificates apply, the corporate audit encompasses the requirements for these standards and others, including applicable regulatory requirements, Nouryon HSE Procedures, ISO 9001, 14001, and 45001, RC 14001. These rigorous audits ensure that our operations meet the highest safety and environmental standards.

Our HSE&S procedures include:

- Leadership and managing HSE&S improvement
- Health and Safety of employees and contractors
- Security of people and assets
- Product stewardship
- Emergency response and community awareness
- Asset integrity and process safety
- Site environment protection and pollution prevention
- Competency management
- Reporting of sustainability and HSE&S performance data



Nouryon Global Safety Day 2023

At Nouryon, we prioritize safety and dedicate an annual Safety Day to share ideas, experiences, and best practices in support of our collective responsibility to prioritize safety in all our endeavors. Safety Day 2023 was particularly special as it coincided with the launch of our new initiative, Nouryon Cares. This initiative extends beyond a single safety aspect, emphasizing our commitment to ourselves, our colleagues, and our communities.

Nouryon Cares aims to highlight real-life achievements, programs, and experiences that underscore our core commitments, including safety, employee well-being, and sustainability. This comprehensive focus reinforces not only how but why we show our care.

From the safety angle, Nouryon employees and contractors worldwide shared compelling stories online about prioritizing safety in the workplace and highlighting importance of employee well-being. From the caring perspective, teams volunteered together in their local communities. Employees also participated in interactive workshops and team-building exercises.

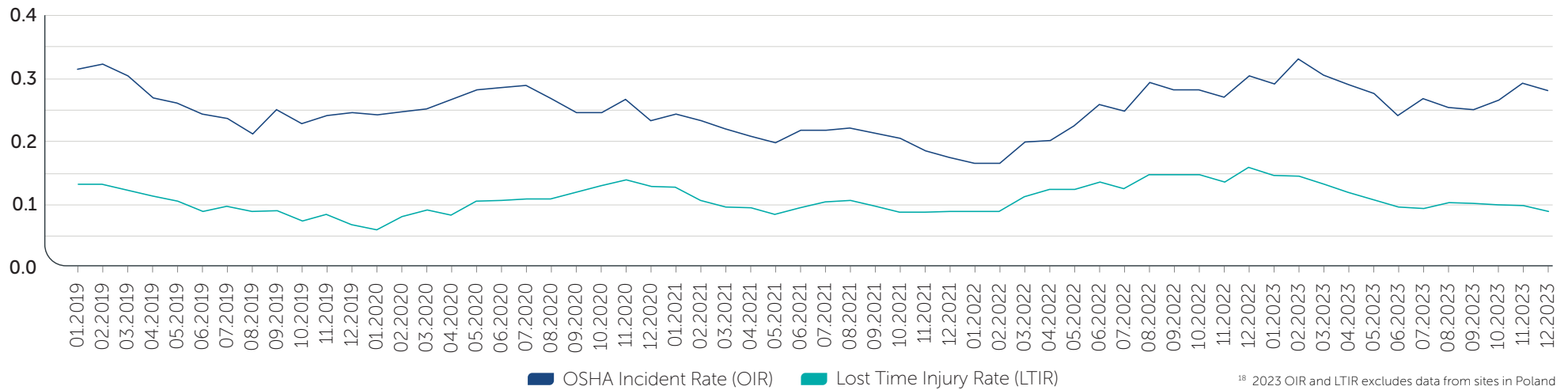
Safety Day highlights from around the world included:

- In China, our Shanghai office hosted a health lecture by a traditional Chinese medical practitioner.
- In India, the Mumbai office organized a group skit on safety scenarios to emphasize the importance of a proactive safety culture.
- In the US, employees from our Battleground and Pasadena sites volunteered at an annual Safety Fair for students, partnering with local community groups.
- In Brazil, our Jundiaí site hosted a week-long series of workshops on topics related to health and well-being.
- In the Netherlands, Rotterdam site employees collected food and essentials for their local food bank.

Together, these initiatives serve as a reminder that our core commitments are not merely concepts, but a way of life at Nouryon. Our commitment extends beyond this special day, influencing our actions and decisions throughout the year.



Safety statistics: employees, temporary workers, and contractors¹⁸



Regular Safety Training

GRI 403-5

At Nouryon, we conduct regular health and safety training beyond the initial induction for new joiners. Here are some examples:

Training on Specific Health Hazards

- Management and employees with production-related roles receive instructions and skills training on specific health hazards at work, such as dust, noise, ergonomics, chemical safety, and health risk assessments.

Site Managers' Training Requirements

- Site managers must complete HSE Leadership and Process Safety Fundamentals training.
- Safety drills are conducted at least annually.

Life-Critical Procedures (LCPs) and Key Hazards Management

- Each site must have mandatory Life-Critical Procedures (LCPs) to manage key hazards and reinforce Life-Saving Rules (LSRs).
- Additional operational procedures cover areas such as maintenance and inspection plans, machine guarding, electrical safety, and lifting.
- All employees and contractors exposed to potential risks associated with LCPs are trained in site-specific procedures, including testing and validation for required competence, with refresher training provided.

Change Management Training

- Formal management of the change process is required when assets change, resulting in specific training requirements.

Mandatory and Online Safety Courses

- Online safety courses are accessible to all employees through the learning platform.
- Comprehensive training programs ensure that all employees are equipped with the necessary knowledge and skills to maintain a safe working environment.

Crisis Communications Training

- Every three years, Crisis Communications (Media) Training is conducted for appointed spokespersons and 52 employees were trained in 2023.

Hazard Recognition Tools and Training Council

- Tools are provided to improve hazard recognition capabilities, such as the HSE&S Good Practices tool.
- In 2022, a Training Council was established to set global fundamentals related to safety and update training with relevant topics for the company that continued throughout 2023.

Our Life-Saving Rules

The purpose of our LSRs is to ensure a safe work environment and safe behavior among our employees, contractors, and visitors. Each employee and contractor is trained on these rules as part of their company onboarding and on a regular basis thereafter. These rules are continually communicated throughout our organization.



Golden Principle:
Stop work if conditions or behaviors are unsafe



Work with a valid work permit when required



Check equipment is isolated before work begins



Use fall protection when working at height



Obtain authorization before disabling safety equipment



Obtain a permit for entry into a confined space



Wear a seatbelt in motor vehicles when provided



Make sure moving machinery is guarded



Do not use alcohol or drugs at work



Incidents

Every safety incident is investigated through a formal process to identify root causes and implement appropriate corrective actions. Nouryon has an internal platform for learning from incidents, aimed at improving hazard awareness and reducing risk tolerance at all our sites. Incidents are reviewed weekly by the global HSE organization and monthly by the ISC organization, including site leadership and the ISC leadership team. These sessions review and discuss incidents and analyze root causes, aiming to raise awareness and share best practices to reduce recurrences across all our sites. The shared learnings help Nouryon improve both people and process safety by allowing each site to assess selected incidents and their root causes and implement action items that reflect scenarios such as those at incident sites.

Our commitment to safety has resulted in 32 years without incident at our Paulinia site and our Mahad site in India marking 12 years injury free ([page 39](#)).

Our 2023 Safety Performance Awards and Recognition

In 2023, as in previous years, Nouryon's strong safety performance was recognized by external organizations worldwide. Nouryon was recognized with several safety-related awards in China ([page 39](#)), Japan ([page 41](#)) and the US ([page 39](#)).

The awards included 13 from the Texas Chemical Council and Association of Chemical Industry of Texas, acknowledging our US efforts in continuous improvement in safety, emergency response, security, and environmental stewardship in the previous year. We are extremely proud of our teams in Texas for consistently meeting or exceeding safety standards and environmental performance. For more information, please see [page 40](#).

Consistent safety practices result in 12 consecutive injury-free years at Mahad site, India

Nouryon's Mahad site in Maharashtra, India, which produces organic peroxides and houses a refilling station for organometallic substances, achieved an exceptional safety record of 12 consecutive years without injuries as of 2023. This achievement underscores the site's commitment to robust safety practices and management systems. Our dedication to employee and community safety has been recognized by the Mahad Manufacturers Association and neighboring chemical manufacturing firms, for whom we also provide safety training.



Recognition as 2023 Responsible Care Company by AICM in China

Nouryon was honored with the 2023 Responsible Care Company Award and a Safety Award by the Association of International Chemical Manufacturers (AICM) in China. This recognition is a testament to our consistent efforts in environmental protection, health and safety improvements, product safety, energy conservation, and carbon reduction.

As part of the global chemical industry initiative, Responsible Care, we have been actively working to enhance our performance in environmental protection and safety. Our commitment to this cause is reflected in our signing of the latest International Council of Chemical Associations Responsible Care Global Charter. Since 2019, we have been recognized with three Responsible Care awards. We also host the AICM Open-to-Public program at all our China manufacturing sites annually, showcasing our chemical innovations and maintaining transparent communications with our employees' families and local communities.



Achieving excellence in safety and environmental stewardship with several safety awards in Texas, US

In 2023, Nouryon was recognized for its commitment to leadership, safety, and environmental stewardship with 13 awards from the Texas Chemical Council and Association of Chemical Industry of Texas:

- Caring for Texas award was given to our Houston site.
- Honorable Mention Excellence in Caring for Texas was awarded to our Fort Worth site.
- Sustained Excellence in Caring for Texas Awards were presented to both our Pasadena and La Porte sites for their consistent care for Texas.
- Our La Porte site received the Zero Incident Rate Employee Award for having no employee Occupational Safety and Health Administration (OSHA) recordable injuries or illnesses.
- The Zero Incident Rate Contractor Award was given to all our four sites (Houston, Fort Worth, Pasadena, La Porte) for having no recorded contractor injuries.
- The Occupational Safety Distinguished Service Awards were given to our Fort Worth and Pasadena sites for their active participation in safety meetings and improved injury and illness rates.
- Our Fort Worth and Houston sites were recognized with the Sam Mannan Award for Zero Process Safety Incidents, indicating no Tier 1 or Tier 2 incidents.
- Our La Porte, Pasadena, and Houston sites were recognized as STAR sites under the OSHA's Voluntary Protection Program after a thorough evaluation process by OSHA.



Association of American Railroads Grand Slam Award for exceptional rail tank car safety performance

In October 2023, Nouryon was presented with the prestigious Association of American Railroads Grand Slam Award for our exceptional Rail Tank Car Safety Performance during 2022. Unlike other companies that might use external programs, Nouryon has developed its unique in-house Engineered Sealing Program. This program is incorporated within our Tank Car Specifications and monitored through the Fittings and Flange Form, which was designed by us and implemented by Alltranstek. This award not only acknowledges our excellent safety performance but also validates the effectiveness of our program. Of all shippers transporting hazardous materials by rail in the Americas, only nine, including Nouryon, were recognized for this high level of safety performance.



President's Excellence Award for Kayaku Nouryon Corporation, Japan

Kayaku Nouryon Corporation in Japan was awarded the esteemed President's Excellence Award by the Yamaguchi Prefectural Labor Standards Association in 2023. The award recognizes Kayaku Nouryon Corporation's persistent efforts to enhance the working environment, industrial safety, and HSE practices. This accomplishment underscores our commitment to safety in the workplace, driven by daily safety initiatives undertaken by our employees.

Several Safety and Environmental Protection Awards in Ningbo, China

In 2023, Nouryon's Ningbo site was recognized by the Administration Committee of Ningbo Petrochemical Economic and Technological Development Zone for stellar performance in safe production and environmental protection for the previous year. The site received four company awards and an individual award in acknowledgment of its efforts:

- Excellent Site of Safe Production
- Excellent Site of Environmental Protection
- Excellent Site of Safety Digitalization Reformation
- Excellent Site of Special Equipment Management

Over the past year, the Ningbo site team made significant safety strides, implementing several safety campaigns. The team also made substantial investments in environmental protection, including upgrading wastewater treatment facilities, implementing a sludge dryer project to reduce waste, and utilizing renewable electricity.





Process Safety

We constantly strive to achieve leading performance in HSE&S. In 2015, Nouryon established a Process Safety Management (PSM) program for all operations, in line with regulatory requirements, industry standards, and best practices. Our PSM framework is designed to prevent incidents and safeguard our facilities and people. PSM applies a management system and controls at our manufacturing sites to ensure hazards are assessed, understood, and managed. In 2023, we continued to raise awareness and improve reporting of process safety indicators. As our performance in process safety has improved, we have shifted our focus to leading indicators. We review all incidents and near misses on a weekly basis.

Our 2023 Performance

Between 2019 and 2023, the total number of incidents involving a process-safety event (levels 1 and 2) decreased by 78%.

Our Global Central Engineering Center of Excellence, a crucial element of process safety and overall safety, supports equipment and application integrity across Nouryon's global operations. A core group of engineering and environmental experts are responsible for global oversight of:

- Rotating equipment, such as pumps and compressors
- Fixed equipment, including pressurized and relief vessels
- Instruments and electrical components
- Turnarounds

Our team of maintenance, reliability, and environmental technology experts is tasked with establishing and maintaining global engineering standards and ensuring their alignment across our Company. The resulting enhanced equipment integrity is expected to bring greater efficiency, reliability, and consistency, and ultimately, improved safety – as well as profitability.

Continuously Improving Our Transportation Safety

We continue to closely monitor Nouryon logistics in terms of both environmental impact and safety. Transportation, including handling and storage, remain priority focus areas. The Global Logistics team conducts gap analysis in our warehouses, terminals, and depots, as well as our processes and associated technology. As a result, additional investment in resourcing and IT has been allocated for the ongoing evolution of our transportation strategy, while accelerating safety performance in this area.



	Unit	2019	2020	2021	2022	2023	Absolute Change 2022-2023
People Safety¹⁹							
Total OSHA incident rate (OIR) for employees, temporary workers and contractors	Per 200,000 hours worked	0.26	0.23	0.17	0.30	0.25	-0.05
Lost time injury rate (LTIR) for employees, temporary workers and contractors	Per 200,000 hours worked	0.07	0.13	0.09	0.16	0.07	-0.09
Total OSHA incident rate (OIR) for employees, temporary workers	Per 200,000 hours worked	0.23	0.27	0.21	0.31	0.28	-0.03
Total OSHA incident rate (OIR) for contractors	Per 200,000 hours worked	0.33	0.13	0.05	0.29	0.19	-0.10
Lost time injury rate (LTIR) for employees, temporary workers	Per 200,000 hours worked	0.04	0.17	0.11	0.17	0.10	-0.07
Lost time injury rate (LTIR) for contractors	Per 200,000 hours worked	0.16	–	–	0.12	–	-0.12
Number of transport incidents ²⁰	# of incidents				20	7	-13
Lost time injury severity rate for direct workforce ²¹	Per 200,000 hours worked				8.25	1.76	-6.50
Process Safety							
Process Safety Incident Count (PSIC)	# of incidents PSE1	20	4	5	3	7	4
	# of incidents PSE2	40	20	13	11	6	-5
	# of incidents combined (PSE1+PSE2)	60	24	18	14	13	-1
Process Safety Total Incident Rate (PSTIR) PSE1 + PSE2	Per 200,000 hours worked	0.59	0.25	0.20	0.16	0.13	-0.03
Process Safety Total Incident Rate (PSTIR) PSE1	Per 200,000 hours worked	0.20	0.04	0.05	0.03	0.07	0.04
Process Safety Incident Severity Rate (PSISR)	Per 200,000 hours worked	0.20	0.04	0.09	0.08	0.16	0.09

¹⁹ 2023 People Safety data are excluding the sites in Poland, see our [Reporting Principles 2023](#) for additional explanation.

²⁰ Reporting started in Q3 of 2021. The partial year results in 2021 were 6.

²¹ Based on number of days lost due to injuries x 1,000 / total hours worked.

5.2 Product Stewardship

GRI 416 3-3, GRI 416-1

At Nouryon, we understand that our important role and contribution to society and sustainability go beyond mere regulatory compliance and span all regions of our operations. We are committed to managing our products responsibly throughout the entire supply chain – from raw materials to product disposal – while consistently reducing our impact on human health and the environment. We create business value by offering safer alternatives and more sustainable solutions through our product stewardship programs. This aligns with our goal to develop and deliver Eco-Premium Solutions to our customers and the broader market.

Our comprehensive product stewardship process consists of eight key elements (see table below) and is diligently

monitored at each stage. Our manufacturing sites are consistently evaluated through the Nouryon Assessment Tool.

For Nouryon, this entails:

- Supplying our customers with ample safety information about our products through safety data sheets.
- Implementing processes that ensure HSE aspects are integral to our new product development and design.
- A proactive program to manage priority substances ahead of legislation, including a global approach to reviewing and safely managing hazardous substances in our products and processes. This could result in phasing out and/or substituting substances in cases where safe use and handling cannot be guaranteed.

Nouryon utilizes a global monitoring system to stay informed of regulatory developments, allowing us to

advocate for and implement activities promptly. We support initiatives such as the European Green Deal, the European Union (EU) Chemical Strategy for Sustainability, and the US Toxic Substances Control Act legislation, among others. We contribute to the development of chemical management legislation worldwide through our membership in industry associations.

Elements of Product Stewardship		Responsibilities	
		Lead function	Support function
1. Leadership		Nouryon Leadership Team (NLT)/ Product Stewardship and Regulatory Affairs (PSRA)	NLT/PSRA
2. Product design and development		Research and Development (R&D)	PSRA
3. Product manufacture, distribution, use and disposal by customers	3a – Product manufacture	ISC Manufacturing	PSRA
	3b – Product distribution	ISC Logistics	PSRA
	3c – Product use and disposal by customers	Marketing and Sales	PSRA
4. Purchase of materials, equipment and services, including toll conversion		ISC Procurement	PSRA
5. Materials inventory and hazard data for substances in produced products		PSRA	PSRA
6. Product regulation and advocacy/hazard, exposure and risk assessment	6a – Product regulation and advocacy	PSRA	Government Affairs
	6b – Hazard, exposure and risk assessment	PSRA	HSE
7. Consumer information/product liability		Marketing and Sales	PSRA
8. Business integrity and managing reputation-related issues		NLT	Communications / PSRA

Ensuring Safety for Our Customers and Their Products

Our commitment to safety extends beyond our products to include our customers and all stakeholders. We provide comprehensive training on how to safely use and handle our products. Taking the Polymer Specialties business as an example, our Innovation Center, located in Deventer, the Netherlands, serves as a hub for this training as well as for innovation, where highly skilled scientists from around the globe create advanced molecules. These products are designed to address the evolving needs of the plastics and rubbers industry, prioritizing customer safety during handling and minimizing environmental impact.

A standout feature of our Deventer Innovation Center is our premier Safety Testing Laboratory. Here, we rigorously test our products and processes for safety, not only in their use but also during transportation and handling. This state-of-the-art facility, combined with our expert-led training, ensures that our employees and customers are well-equipped to handle our products safely.



Hazard Assessment and Communication

We manage many distinct substances²², including raw materials used in our production and samples for research and development. Of these, 2,800 are distributed and utilized globally. In 2023, 81% of Nouryon's net revenue came from products containing substances that are classified as Globally Harmonized System (GHS) Categories 1 and 2 Health and Environmental Hazards²³.

Our expertise lies in handling intricate and hazardous chemical reactions and managing highly reactive chemicals. We ensure the safe use of all substances at our production sites and by our customers through meticulous management. Our company-wide protocol ensures that every substance manufactured by or for Nouryon has undergone a hazard assessment. This assessment is based on data related to physical chemistry, toxicity, ecotoxicity, and environmental fate.

All information needed to create labels and SDSs is stored in a centralized global database. We continually update this database with new regulatory information. The system generates labels and SDSs in accordance with each shipment's requirements, including the language and format specific to the destination country.

Nouryon is committed to avoiding vertebrate animal testing unless it is a legal requirement. We support the development of alternative testing methods that do not involve vertebrate animals and have implemented a policy to this effect. When vertebrate animal testing is mandated, we adhere to the '3Rs' principle: Replace, Reduce, and Refine animal testing.

Adherence to EU REACH Regulations

GRI 416 3-3

Nouryon is dedicated to ensuring the safe use of our products in compliance with EU REACH (Regulation (EC) No 1907/2006). This regulation aims to enhance the protection of human health and the environment from potential risks associated with chemicals. REACH, which stands for Registration, Evaluation, Authorization, and Restriction of Chemicals, outlines procedures for gathering and assessing information on the properties and hazards of substances.

As part of our compliance with REACH, we conduct chemical hazard, exposure, and risk assessments, and communicate safe usage through extended safety data sheets (e-SDS). We require new suppliers within the European Economic Area to provide e-SDS documentation (along with other necessary data). Our site and procurement teams collaborate in this process, with our PSRA teams providing advice on REACH aspects and conducting regulatory checks.

Nouryon is a member of the European Chemical Industry Council (CEFIC) REACH Action Plan for Review/Improvement of Registration Dossiers. We are also actively engaged in new chemical REACH-like regulations and are conducting registrations in Taiwan, South Korea (K-REACH), Turkey (KKDIK), and Great Britain (UK-REACH).

²² This includes raw materials for our manufactured products, intermediates and R&D samples from innovation projects. This does not include products and materials purchased that are not directly employed in our manufacturing processes, e.g. lubricants or laboratory reagents.

²³ GHS category 1.1 Health hazards include the following criteria: acute toxicity, skin corrosion/irritation, serious eye damage/eye irritation, respiratory or skin sensitization, germ cell mutagenicity, carcinogenicity, reproductive toxicology, target organ systemic toxicity – single exposure, target organ systemic toxicity, or repeated exposure aspiration toxicity. GHS category 1.2 environmental.



Responsibly Managing Substances of Concern

GRI 416-1

Substances of concern (SoCs) are chemicals that carry severe hazard classifications and could potentially have long-term effects on human health and the environment. They typically include classifications such as CMR category 1A and 1B, PBT, and vPvB.

At Nouryon, we have established a Priority Substance program to proactively identify and manage substances that require special attention. This global program includes a risk assessment such as the methodology used in EU-REACH to determine safe usage of these substances. Management measures may involve substitution, restriction to certain uses, or providing specific and mandatory handling instructions. See [page 45](#) for examples of substitutions due to the phasing out of hazardous substances. To further ensure product safety, we provide a 24/7 year-round service to offer immediate advice in local languages in the unlikely event of an emergency. We also offer interactive online customer training in 12 languages, covering the latest safety practices for handling some of our products, including thermoset, crosslinking, organic peroxides, metal alkyls, and Expancel® expandable microsphere products. This training covers hazardous properties, proper storage techniques, and safe use. More information about Nouryon's Safety Services can be found on our website.

Our 2023 Performance

In 2023, products containing more than 0.1% of a substance of very high concern accounted for 2.8% of Nouryon's net revenue. As mentioned, these substances of very high concern are meticulously managed to ensure their safe manufacture and use, with all undergoing a risk assessment in line with the REACH methodology.

Innovating Sustainable Alternatives: Examples of Product Substitution

The call for sustainable alternatives to SoCs is on the rise. Nouryon has a proven history of developing such alternatives to meet the evolving needs of our customers and regulatory requirements. In recent times, we have introduced safer substitutes such as Elfan® AT84, Redicote® E-47 NPF, and a safer alternative to Di-Cyclo HexylPhthalate (DCHP).

In the cleaning market, we have introduced innovative products such as the chelating agent, Dissolvine® GL, and wetting agent AG 6206. Berol® 260 is part of Nouryon's low dioxane portfolio, which also includes degreasers and cleaners from the Berol® and Ethylan® surfactant product lines. These products are manufactured using a unique process that minimizes the amount of 1,4-dioxane produced as a by-product.

Not only does our innovative process lower environmental impact, but it also makes the formulation process more cost-effective for our customers. It offers the potential for optimizing raw material purchases, reducing inventories, and simplifying production. All products within our low-dioxane portfolio are listed in the CleanGredients database, thereby meeting the US Environmental Protection Agency Safer Choice standard. These include:

- Berol® 226 SA: a synergistic surfactant blend that optimizes cleaning and ensures easy handling
- Berol® 260 and 266: high-performance degreasers
- Berol® 609 and 611: surfactants free from nonyl-phenol ethoxylate
- Berol® DR-B1: an effective cleaner for outdoor use, qualified for direct release into the environment
- Ethylan® 1005: a low-foam, low-aquatic-toxicity primary surfactant degreaser

In 2023, Nouryon also [introduced Triameen® Y12D](#), an antimicrobial active for advanced disinfection for the US cleaning market. Read more about this innovation on [page 66](#).

5.3 Mitigating Climate Change

Goals and Prospects

GRI 305 3-3

At Nouryon, we understand the profound impact of climate change on the global environment, society, and economic systems. As such, we are committed to reducing greenhouse gas (GHG) emissions across our entire value chain. As the shift towards a net-zero-carbon economy gains momentum, we are continually pushing to lessen our climate-related impact, mitigate risks, and seize growth opportunities.

We have set specific targets to continue reducing our environmental footprint. To expedite and support Nouryon's journey towards achieving these goals, we further refined our Carbon Business Strategy in 2022 by developing a roadmap with concrete action steps, and in 2023 we continued to make progress. Last year, we achieved a 14% reduction in our absolute Scopes 1 and 2 emissions versus our base year of 2019.

Our 2023 Performance



33%
of our total energy consumption²⁴
is renewable²⁵



42%
of our electricity consumption
is renewable²⁵

²⁴ Includes fuel, electricity, and purchased steam.

²⁵ Energy coming from sources such as wind, solar, hydro and from biomass.

²⁶ 'Scope 1' absolute GHG emissions refers to the total direct emissions CO₂ equivalent (for example, CO₂ emissions due to combustion of fuel at our production facilities to generate steam) and is calculated as the sum of direct CO₂ emissions and CO₂ related to non-biomass fuels.

²⁷ 'Scope 2' absolute GHG emissions refers to the total indirect emissions CO₂ equivalent (for example, CO₂ emissions at a power plant delivering electricity to our production facilities) and is calculated as the sum of indirect CO₂ related to purchased electricity, steam and hot water.

Monitoring and Reporting Our GHG Emissions

Nouryon has a robust Carbon Business Strategy and roadmap to reduce GHG emissions. This is described on [page 24](#) in this report, including more about the progress we are making to reduce GHG emissions. We report GHG emissions in CO₂ (carbon dioxide) equivalents across three levels: emissions from our own operations (Scope 1)²⁶, emissions from purchased energy (Scope 2)²⁷, and emissions across our value chain (Scope 3, both upstream and downstream).

We calculate our GHG inventory (Scopes 1 and 2) and other energy and environmental metrics on a quarterly basis, reporting the results to our Corporate Responsibility Council and Corporate Responsibility Committee at Board level. This allows us to track our progress against our targets. We have also developed dashboards with GHG and eco-efficiency data, enabling each of our global sites to monitor their performance using a site-at-a-glance tool. Additionally, we have developed internal reports and guidance procedures that outline our calculation methodology to ensure consistency from year to year.

To assist our customers, Nouryon uses life-cycle assessments (LCAs) to evaluate and enhance the environmental performance of our products within the value chain. A product carbon footprint (PCF) is one of the many environmental impact categories derived from the LCA. It calculates total GHG emissions – CO₂ and other GHG emissions (expressed as CO₂ equivalent) – generated by a product throughout its life cycle. PCFs provide our customers with valuable information for assessing GHG emissions and offer transparency regarding the GHG emissions associated with our products.





Monitoring and Reporting Our Scope 3 Emissions

With assistance from an external consulting agency, we have improved our methodology for our Scope 3 emissions inventory, which covers calculated emissions across the entire value chain. We have reviewed primary and secondary data sources and refined our approach to increase the rigor of our calculations and methodology.

We aim to utilize data sources that are temporally relevant and geographically representative. Whenever possible, we prioritize physical quantities (such as the mass of purchased raw materials and generated waste, miles traveled) overspend-based data. Specifically:

- For purchased goods and services (category 1), particularly raw materials, and waste generated in operations (category 5) – we identified emission factors that represent our global operations and supply chain.
- For business travel (category 6) – we transitioned to using a distance-based method for flights, rental cars, and personal cars, and the number of nights for hotel stays, as opposed to generic spend-based estimates.
- For employee commuting (category 7) – we used average country commute data and applied the specific [DEFRA emission factor](#) for traveling by car.
- For use of sold products (category 11) – we added our high purity CO₂ sales from Stenungsund.
- For the end-of-life treatment of sold products (category 12) – we incorporated recycling and wastewater treatment pathways and based calculations on sales volume instead of production volume to better approximate regional waste fates for our products.
- For multiple categories – we used more recent database sources.

Our 2023 Performance

- For fuel and energy-related activities, not included in Scopes 1 and 2 – we included transport and distribution and well to tank losses for purchased steam.
- For upstream transport and distribution (category 4) – we used detailed spend data per region and transport mode (ship, train, truck, and plane). We included the leasing of warehouses, depots, and tanks not in operational control by Nouryon as well as third-party transportation and distribution services purchased by Nouryon.
- For employee commuting (category 7) – we improved our calculations by including remote employees and shuttle traveling in Brazil and China.
- For the end-of-life treatment of sold products (category 12) – we conducted a deeper dive into the sales volumes for solid waste treatment (landfilling, incineration, and recycling). Water contained in the end products was excluded from solid waste treatment and assumed to be part of the wastewater treatment.

The calculated Scope 3 emissions account for 76% of Nouryon's total emissions, with purchased goods and services making up the largest category.

By considering emissions across the entire value chain, we can develop a comprehensive climate strategy. It provides insights into the relative footprint of different parts of our value chain as well as potential reduction opportunities and how these compare with Scopes 1 and 2 reductions. It also informs our Scope 3 plans, including potential partnerships. A Scope 3 analysis inherently involves certain assumptions, and the methodologies and tool usage will evolve over time. We will continue refining our Scope 3 calculations based on available data and use the results to guide our journey towards reducing our GHG emissions across our value chain.

Calculated size of Scope 3 categories²⁸

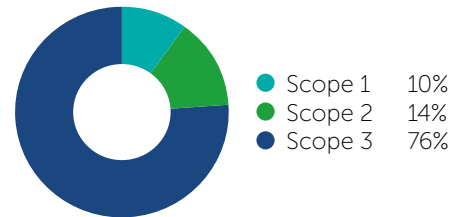
Purchased goods and services Category 1	
Capital goods Category 2	
Fuel, energy-related activities²⁹ Category 3	
Upstream transport and distribution Category 4	
Waste generated in operations Category 5	
Business travel Category 6	
Employee commuting Category 7	
Upstream leased assets Category 8	
Downstream transport and distribution Category 9	
Processing of sold products Category 10	
Use of sold products Category 11	
End-of-life treatment of sold products³⁰ Category 12	
Downstream leased assets Category 13	
Franchises Category 14	
Investments Category 15	

²⁸ The following categories are excluded from our calculations: Category 8: Nouryon does not have any upstream leased assets which we operate nor does operate the warehouses that are storing their products. Category 9: Outbound transportation and distribution services that are purchased by Nouryon are excluded and included in category 4 (upstream transportation and distribution). Category 10: Given the wide variety of intermediate products sold by Nouryon, obtaining data for this category is prohibitive. Results would be based on broad assumptions, lack accuracy and lead to a potential misrepresentation of our Scope 3 footprint. Category 13: Nouryon does not have any downstream leased assets. Category 14: Nouryon does not own or operate any franchises. Category 15: Nouryon's only investments are with other companies through joint ventures. However, data is not available due to competitive reasons.

²⁹ Not included in Scopes 1 or 2.

³⁰ Includes intermediate products.

Scopes 1, 2, and 3 calculated emissions (2023)



Lowering Customer GHG Emissions

GRI 305-5

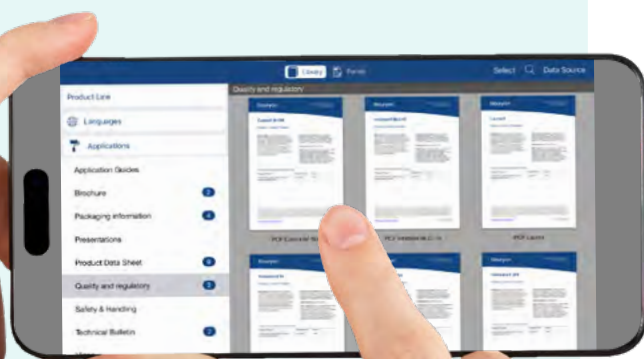
Many of our solutions are essential in reducing GHG emissions for our customers. For instance, our Expancel® expandable microspheres can lighten packaging, which improves transportation fuel efficiency and reduces transportation-related emissions. Similarly, we offer solutions which are crucial to renewable energy-related products. These include lightweight composite parts in wind turbines and insulation for high-quality, high-voltage cables, as well as aiding in making solar panels durable and highly efficient. Another strong example and [2023 testimonial from our customer E5 Incorporated](#), includes that E5® products manufactured by Nouryon provide significant environmental benefits, including: (i) a properly cured, denser concrete matrix for substantial improvement in concrete durability and, therefore, longevity; (ii) reduction of cement and supplementary cementitious materials in concrete mixes; (iii) elimination of curing compounds, burlap, visqueen and scarce water resources required for wet cure and higher volume supplementary cementitious material (SCMs and the trucks that haul these materials); and (iv) potentially, based on on-going research being conducted at Purdue University, active absorption of more greenhouse gases from the atmosphere (without negative carbonation impact on the structure) by concrete structures containing E5® as compared to structures without E5®.



Did you know?

Advanced sustainability efforts with more than 400 product carbon footprint sheets

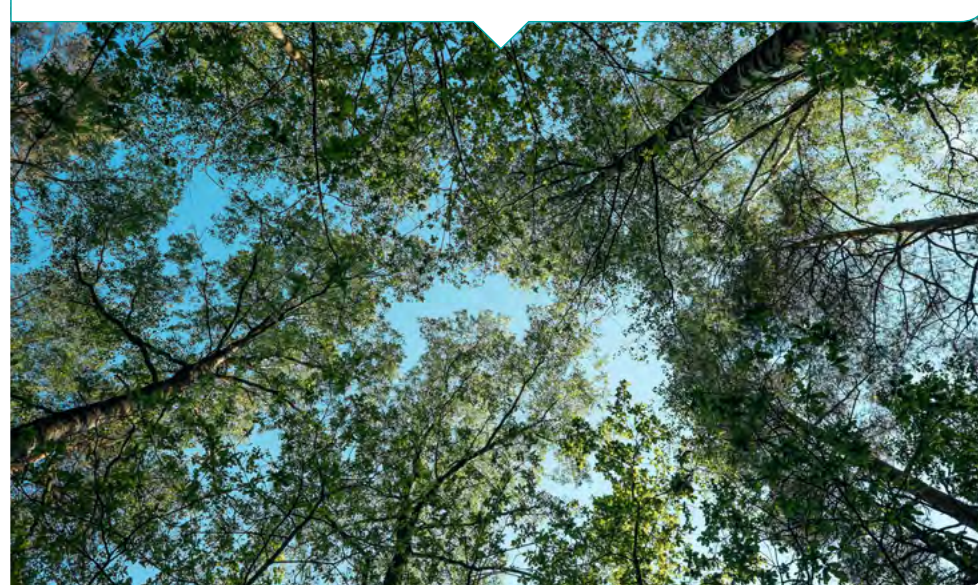
The Nouryon Polymer Specialties team developed more than 400 Product Carbon Footprint sheets, which are available on our Sales Support Portal, Sales app, and Distribution app. This initiative is in response to customer requests for carbon data related to our products. The sheets have been generated using a semi-automated approach, providing important carbon data while we develop a Nouryon-wide tool.



Innovative steam boiler operational at Kvarntorp, Sweden production facility

Nouryon successfully started operating an innovative steam boiler at the Kvarntorp, Sweden production facility in 2023. The new boiler, installed by industrial energy transitions specialist Adven, is expected to reduce the site's Scope 1 carbon dioxide (CO₂) emissions by 90%, as it uses biofuel from local forestry residuals such as chipped branches and tops, replacing liquefied petroleum gas. The switch to biofuel will also save energy by reducing the need to heat lake water. This will, in turn, increase the production capacity at the facility.

Our Kvarntorp site produces chelates used in applications such as efficient bleaching in the pulp and paper industry and increasing crop yields in agricultural applications by combating iron deficiency in high pH soils. This initiative is partially funded by Klimatklivet, a Swedish Environmental Protection Agency project. The anticipated CO₂ reduction is equivalent to 8,000 metric tons of CO₂ annually, or the annual energy use of approximately 1,000 average homes in Sweden, under normal production conditions.



5.4 Eco-Efficiency and Circularity

The chemical industry plays a pivotal role in facilitating more sustainable and circular production. Enhancing the eco-efficiency of our facilities is a vital component of our sustainability approach.

Our global HSE procedures set requirements to help foster environmental protection at all our sites. For instance, site management continuously seeks ways to reduce environmental impacts, waste generation, and energy consumption through objective plans and targets outlined in each site's Improvement Plan. Each site management team is responsible for maintaining an Environmental Management System that identifies significant environmental impacts and ensures they are appropriately managed.

In line with Company goals, each location sets annual targets for energy reduction and considers the best available technologies. Each site completes a water balance assessment and is aware of the sustainability issues associated with the water supply at the facility. Additionally, sustainability reviews, including carbon efficiency, are conducted for capital-expenditure projects above a certain monetary threshold.

Nouryon uses a dashboard to monitor eco-efficiency parameters. Our sites track these to measure performance. We are also constantly innovating to develop more sustainable and circular products. This includes using renewable feedstocks such as cellulose instead of fossil-based feedstocks, and circular production methods, like co-locating with customers to minimize transport and create shared resource models. We use bio-based steam and electricity in our Integrated Manufacturing Model sites in Brazil.

Our 2023 Performance

From 2019 through 2023, the intensity of our freshwater consumption increased by 1%, and our total waste intensity decreased by 1%. Between 2019 and 2023, we decreased our total absolute Scopes 1 and 2 GHG emissions by 14%.

Products from Recycled and Bio-Based Feedstock

To meet the growing demands of our customers for enhanced product sustainability, we develop products using bio-based raw materials that are partially or fully derived from natural sources. Sustainably produced bio-based sources enable a more circular economy and can also have a lower carbon footprint compared to alternatives across their life cycles, thereby reducing GHG emissions.

We utilize co-product materials as inputs for higher-value products, including tallow and cotton linters, among others. For instance, we manufacture rheology modifiers for the paint industry based on cellulose made from cotton linters.

Improving Recyclability

Our products can assist our customers in enhancing the recyclability of their products. For instance, we provide polymer catalysts that can modify the properties of mechanically recycled polymers, enabling them to be upscaled and used in applications currently reserved for new virgin polymer streams. Our products also help maintain high quality in finished products made from recycled plastics.



Reducing Waste through Green Shipping

In addition to product design, we seek opportunities to reduce waste in our value chain. For instance, at our Asa site in Japan, our customers return empty containers for products, so that these can be reused or recycled. In 2023, the site received nearly 170,000 containers from our customers for reuse or recycling.

We also use onsite expansion of our Expancel® expandable microsphere product and point-of-use mobile expanders to decrease shipping volumes and costs. Every truckload of material our customers expand onsite saves 30 to 40 truckloads.

Nouryon is constantly seeking ways to ship more efficiently to save costs and reduce our environmental impact. This includes utilizing warehouses closer to customers and reusable dunnage, which provides a dual benefit by reducing packaging waste and eliminating the need for special cleaning at customer sites. We are also exploring the use of electric trucks in transportation, as with the pilot project we launched in Sweden in 2023, in partnership with Volvo Trucks and Den Hartogh. Additional details can be found in the case study on [page 52](#).



Collaborating to address air emissions in the pulp and paper industry

In response to stricter global regulations on nitrogen oxides (NOx) and sulfur dioxides (SOx) emissions, Nouryon has developed a cost-effective solution which effectively reduces these emissions from the pulp and paper industry. Since 2022, Nouryon has partnered with Valmet, a leading technology provider, to offer chlorine dioxide (ClO₂)-based NOx reduction (De-NOx) technology to customers.

Pilot tests have shown significant NOx reduction, with trials achieving between 80% and 97% reduction. The technology also reduced sulfur dioxide (SO₂) and hydrochloric acid (HCl). Valmet has successfully installed full-scale De-NOx installations in Asia, where ClO₂ is dosed as a liquid. The first such installation has been operating continuously for six years at Sun Paper in Shandong Province, China, achieving significant reductions in NOx and SOx emissions.

The development of this technology has been supported by a research group at Chalmers University of Technology in Sweden and funded by the Swedish Energy Agency. The technology is suitable for industries with large NOx emissions and where other reduction technologies are not effective. It is also suitable for industrial boilers requiring multi-pollutant purification. The technology is flexible and an "end-of-pipe" technology, meaning it does not interfere with boiler operations.

Sustainable transportation pilot project in Sweden

Nouryon embarked on a journey towards a more sustainable future by participating in a pilot project in 2023 by Den Hartogh. The pilot, which involves Den Hartogh's purchased electric truck from Volvo, commenced with the first load of Nouryon product in Stenungsund, Sweden. The pilot aims to gather data and experience from the use of battery electric trucks in the chemical industry. It will assess opportunities and identify limitations, thereby contributing to electrification of road transport and Nouryon's efforts to reduce carbon across the value chain.



Waste

Approximately half of our sites successfully reduced their waste intensity by finding alternative uses for waste streams and effectively converting waste into by-products. As a result, our total waste intensity decreased by 1% between 2019 and 2023. We remain committed to achieving our 2030 total waste intensity target and are formulating a plan to ensure that it is met.

Water

Nouryon conducts an annual water risk assessment. We utilize the WRI Aqueduct tool every three years and conduct an annual survey of all sites globally. This forms the basis of our assessment of sites with high water stress, as reported in our environmental data. We previously identified two sites – Ningbo and Boxing, in China – as water-stressed, and other sites to be monitored. This process also informs potential improvement opportunities. These two sites are exploring ways to improve their water management, such as reviewing projects to include reuse or recovery of wastewater or wash water, reducing water consumption, enhancing washing efficiency with less water, and exploring the use of alternative types of water.

Sites not identified as water-stressed are also initiating measures to improve water management by reducing water use or using alternative water sources. For instance, at our Salisbury, NC, US, site, certain wastewater is recycled within processes for reuse rather than being sent to wastewater treatment. Our Fort Worth, TX, US, site has implemented measures to improve water management, including:

- Extending production cycles to reduce water consumption in the spray dryer.
- Decreasing the quantity of water added to in-process material to minimize the amount of water required to be dehydrated to achieve the desired finished-production solid concentration.

- Lowering process temperatures to reduce water evaporation in cooling towers.
- Increasing the target solid concentration for certain products to minimize dehydration rate and water addition during production.
- The introduction of a new filtration system, which reduces the frequency of changes and the quantity of water required to clean the filtration and reduces water discharge.

Our 2023 Performance

A rainwater harvesting system was successfully implemented at the Mahad site in India. This system involves the collection of rainwater from a rooftop area of 100 square meters and its diversion into a water storage tank. The system is designed to collect approximately 300 cubic meters of rainwater annually.

Between 2019 and 2023, our freshwater consumption intensity increased by 1%. We are in the process of formulating a plan to ensure we achieve our 2030 freshwater consumption intensity target.



5.5 Environmental Data Sheet (1/2)^{31,32}

GRI 305, GRI 305-1, GRI 305-2, GRI 305-3, GRI 305-4, GRI 305-7

	Unit	2019	2020	2021	2022	2023	Progress toward target ³³
Company carbon footprint							
Total absolute direct and indirect emissions market-based (Scopes 1 and 2)	Thousand tonnes CO ₂ e	1,506	1,488	1,467	1,498	1,294	-14%
Carbon intensity (Scopes 1 and 2 combined)	Kg CO ₂ e/Tonne of production	408	416	395	411	384	n/a
Direct absolute GHG emissions (Scope 1) ^{34,35}	Thousand tonnes CO ₂ e	588	604	620	636	563	n/a
Direct GHG emissions (Scope 1) intensity	Kg CO ₂ e/Tonne of production	159	169	167	174	167	n/a
Indirect GHG emissions market-based (Scope 2) ^{36,37}	Thousand tonnes CO ₂ e	918	884	847	862	731	n/a
Indirect GHG emissions market-based (Scope 2) intensity	Kg CO ₂ e/Tonne of production	249	247	228	236	217	n/a
Indirect GHG emissions location-based (Scope 2)	Thousand tonnes CO ₂ e	1,276	1,196	1,199	1,254	1,241	n/a
Calculated Scope 3 total absolute GHG emissions	Thousand tonnes CO ₂ e				4,427	4,097	n/a
Total absolute GHG emissions (Scope 1, Scope 2 market-based, and Scope 3)	Thousand tonnes CO ₂ e				5,926	5,391	n/a
Direct emissions, covered by emissions-limiting regulations	% of direct emissions	22%	25%	25%	27%	24%	n/a
Energy Management							
Total energy consumption ³⁸	Mln GJ	30.4	30.7	32.7	33.4	31.5	n/a
Total energy consumption intensity ³⁸	GJ/Tonne of production	8.24	8.59	8.81	9.15	9.34	n/a
Percentage renewable energy consumed ³⁹	%	30%	38%	38%	34%	33%	n/a
Percentage renewable electricity consumed	%	36%	48%	49%	39%	42%	n/a
Percentage energy from grid electricity	%	62%	61%	60%	59%	61%	n/a
Energy consumption from unbundled RECs ⁴⁰	MWh				40,312	59,554	n/a
Carbon offsets purchased ⁴¹	Tonnes CO ₂				200	127	n/a
Total self-generated electricity	Mln GJ	-	-	-	-	-	n/a
Air Quality							
NOx absolute emissions	Tonnes	471	482	513	527	468	n/a
NOx emission intensity	Kg/Tonne of production	0.13	0.13	0.14	0.14	0.14	n/a
SOx absolute emissions	Tonnes	3,533	3,135	3,288	3,333	3,446	n/a
SOx emission intensity	Kg/Tonne of production	0.96	0.88	0.89	0.91	1.02	n/a
VOC absolute emissions	Tonnes	669	1,172	1,938	1,792	1,853	n/a
VOC absolute emission intensity	Kg/Tonne of production	0.18	0.33	0.52	0.49	0.55	n/a
Hazardous air pollutants	Tonnes			374	357	408	n/a
Hazardous air pollutants intensity	Kg/Tonne of production			0.10	0.10	0.12	n/a

³¹ For all figures, minor corrections to historical data may be made to improve accuracy or based on methodology updates. Environmental and Energy metrics have been updated to include data from the acquired Polish sites, including historical data back to 2019. This provides a consistent basis for comparing performance on our targets (carbon water, and waste) vs. the base year. In our internal reporting procedures, we recalculate base year data in cases where the change is material (5% or more).

³² All metrics are calculated according to our [Reporting Principles 2023](#).

³³ Percentage change 2019-2023.

³⁴ Scope 1 does not include process emissions from other greenhouse gases (CH₄, N₂O, Hydrofluorocarbons, and Perfluorocarbons) and their CO₂ equivalents. For 2023 in Scope 1, this was estimated to be less than 2% and not included.

³⁵ Including Carbon offsets purchased to compensate for Scope 1 emissions in our carbon neutral sites.

³⁶ Scope 2 does not include process emissions from the other greenhouse gases CH₄, N₂O, Hydrofluorocarbons, and Perfluorocarbons, as per Nouryon's [Reporting Principles 2023](#).

³⁷ Including RECs retired on our behalf for utility supplied renewable electricity and other utility contractual instruments.

³⁸ Energy consumption is expressed in mln GJ which is the sum of the actual consumed by the sites.

³⁹ Renewable-energy data include renewable fuels such as biomass, purchased renewable steam, and renewable electricity from solar, wind, and hydro power.

⁴⁰ RECs retired on our behalf for utility supplied renewable electricity and other utility contractual instruments.

⁴¹ Carbon offsets purchased to compensate for Scope 1 emissions in our carbon neutral sites. Offsets are not included in our emissions inventory (Scopes 1, 2, or 3). These offsets have been certified by the Verified Carbon Standard (VCS), administered by Verra, and retired.

For more information, see www.verification.org. Offsets are applied to prior year emissions.

5.5 Environmental Data Sheet (2/2)

	Unit	2019	2020	2021	2022	2023	Progress toward target ⁴²
Emission to Water – Chemical Oxygen Demand (COD)							
COD absolute emissions to surface water	Tonnes	845	768	896	854	836	n/a
COD emission intensity to surface water	Kg/Tonne of production	0.23	0.21	0.24	0.23	0.25	n/a
COD absolute emissions to external wastewater treatment	Tonnes	15,257	16,515	17,917	18,447	15,380	n/a
COD emission intensity to external wastewater treatment	Kg/Tonne of production	4.13	4.60	4.81	5.04	4.56	n/a
Water Management							
Absolute freshwater intake	Thousand m³	134,868	147,270	161,652	153,407	151,543	n/a
Freshwater intake intensity	m³/Tonne of production	36.5	41.1	43.4	41.9	44.9	n/a
Percentage in regions with high water stress	%	2.3%	2.0%	1.6%	2.0%	2.0%	n/a
Absolute freshwater consumption ⁴³	Thousand m³	15,427	14,786	14,349	14,497	14,295	n/a
Freshwater consumption ⁴³ intensity	m³/Tonne of production	4.18	4.12	3.85	3.96	4.24	1%
Percentage in regions with high water stress	%	19%	20%	18%	18%	21%	n/a
Waste Management							
Total absolute waste	Tonnes	62,587	59,449	63,243	68,959	56,393	n/a
Total waste intensity	Kg/Tonne of production	17.0	16.6	17.0	18.9	16.7	-1%
Absolute non-hazardous waste	Tonnes	45,143	41,718	42,146	44,652	35,368	n/a
Non-hazardous waste intensity	Kg/Tonne of production	12.2	11.6	11.3	12.2	10.5	n/a
Absolute hazardous waste	Tonnes	17,444	17,731	21,097	24,306	21,025	n/a
Absolute hazardous waste to landfill	Tonnes	417	465	268	548	193	n/a
Percentage hazardous waste reused	%	24%	28%	33%	24%	26%	n/a
Production							
Performance Formulations	Thousand tonnes	2,028	1,964	1,996	1,912	1,686	n/a
Technology Solutions	Thousand tonnes	1,662	1,622	1,729	1,747	1,689	n/a
Sustainable Sourcing							
Percentage suppliers screened using Risk IQ ⁴⁴	% of spend			96%	94%	90%	n/a
Percentage suppliers measured on EcoVadis performance ⁴⁵	% of spend			50%	60%	66%	n/a
Percentage suppliers acknowledging our Business Partner Code of Conduct ⁴⁶	% of spend			98%	99.74%	99.81%	n/a
Percentage of bio-based raw materials (portion of organic materials)	% of organic portion (by mass)	20%	21%	22%	22%	20%	n/a
Management Systems ⁴⁷							
			Per April, 2021	Per February 28, 2022	Per March 23, 2023	Per December 31, 2023	
Percentage of manufacturing sites with ISO-14001/RC-14001 certifications	%		77%	84%	98%	95%	n/a
Percentage of manufacturing sites with ISO-9001 certifications	%			88%	88%	82%	n/a

⁴² Percentage change 2019-2023.

⁴³ Total freshwater consumption (excluding once through cooling water intake) [1,000m³].

⁴⁴ In terms of all external spend (product, non-product, energy, logistics, etc.) The Risk IQ tool considers industry segment risk, country risk and EcoVadis scores from the complete EcoVadis database.

⁴⁵ Based on policies, actions, results. For more information: <https://ecovadis.com/>

⁴⁶ Tracked by acceptance of a Nouryon Purchase Order or a signed Nouryon contract.

⁴⁷ Our ISO certification percentage metric includes sites that have been in our portfolio for one year. This is to allow sufficient time required for activities reviewed by the certification process (e.g., pre-start up safety reviews, management reviews, production, and/or internal audits if relevant). Any exceptions will be identified.

6. Innovating and Growing our Sustainable Solutions

Highlights



32% of revenue from Eco-Premium Solutions⁴⁸



13 strategically located Innovation and Application Centers



Retention rate of more than 95% over the past six years of our top 250 customers



74% of our R&D product pipeline⁴⁹ is focused on solutions with sustainability benefits in 2023

Relevant Policies and Programs

- Quality, Health, Safety, Environment and Security Policy
- HSE&S Rules and Procedures



ISCC PLUS certification for MCA production at our Delfzijl site, the Netherlands



Started full-scale production of our new Expancel® plant in Green Bay, Wisconsin, US



Ringier Technology Innovation Award for two of our personal care products



GROW AND INNOVATE
to create sustainable solutions
enabling customers to be more sustainable

Key Sustainable Development Goals:



⁴⁸ Our Eco-Premium Solutions are products that offer significant sustainability benefits over mainstream alternatives in the market while providing the same or better functionality. For more information, see [page 64](#).

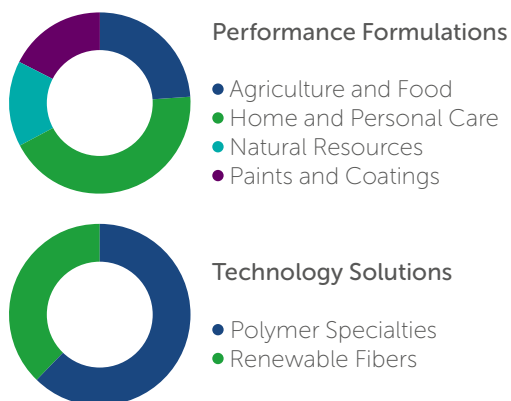
⁴⁹ In 2023, we introduced a new metric for our product innovation pipeline, called Eco-Solutions in order to highlight the crucial sustainability value drivers, such as bio-based and biodegradability, which are vital components of product sustainability in our end-markets. More details available on [page 65](#).

6.1 Our Business

GRI 2-1

Our business is divided into two segments and aims to deliver market-focused, innovative solutions with sustainable benefits to meet our customers' needs. This has contributed to a retention rate of more than 98% over the past six years for our top 250 customers.

Revenue split by business lines per business segment



We provide expertly designed and customized solutions for a variety of everyday products that support our customers' growth and sustainability targets. Our customers include large multinational corporations, regional market leaders, and distributors aligned with our addressable end-markets related to Agriculture and Food, Home and Personal Care, Natural Resources, Paints and Coatings, Polymer Specialties, and Renewable Fibers.

Our offerings include, among others:

- Biodegradable pods: A biodegradable solution for automatic dishwasher pods, and biodegradability in liquid laundry detergent pods effective at lower water temperatures.
- Sustainable hairstyling: Improved products to meet demand for "silicon-free" products.
- Biodegradable laundry polymer: Biodegradable polymers for laundry detergents.
- Biodegradable binders: Biodegradable binder for seed treatment and encapsulation technology for actives and sustainable adjuvants under development.
- Water-soluble polymer: Bio-based water-soluble polymer with applications in personal care, mining, food, and pharma.
- Green demulsifiers: A series of green demulsifiers for a wide range of applications.
- Renewable energy: Solutions for solar panels with long durability and high efficiency; lightweight composite parts in windmills for renewable electricity; insulation for high-quality, high-voltage cables.
- Circularity and recycling: Renewable fibers that are transforming the textile industry, improved plastics recycling through upgraded polymer properties, and efficient and circular Integrated Manufacturing Model (IMM) facilities.

Some examples of notable product launches in 2023 include antimicrobial active [Triameen® Y12D \(page 66\)](#), [Kromasil® 100Å diC4 spherical silica \(page 68\)](#), [Berol® Nexxt surfactant](#) and [Dissolvine® GL Premium chelating agent \(page 67\)](#).





Below are examples of what we offer our customers according to their end-market needs:



Agriculture and Food (~22% Eco-Premium Solutions):

- Solutions for crop protection, including biodegradable co-formulants and green solvents.
- Crop nutrition products that enable efficient water use.
- Diet fortification.
- Food and beverage preservation solutions.
- Improved crop yield solutions.
- Water conservation solutions.



Home and Personal Care (~44% Eco-Premium Solutions):

- This business line holds the number two position worldwide for green chelate production in our industry.
- We offer naturally based and biodegradable products used in cleaning and personal care solutions.
- We provide cleaning products for homes, hospitals, and more.
- We supply natural ingredients for hair and skin care.



Natural Resources (~30% Eco-Premium Solutions):

- We favor natural materials over fossil based.
- We contribute to lightweighting.
- We provide lube additives that lower emissions and increase fuel efficiency.
- We support recyclability/secondary use.
- We assist in water management.



Paints and Coatings (~62% Eco-Premium Solutions):

- We target the faster-growing applications, including cool roof coatings. These innovations are driven by the demand for more efficient and sustainable solutions.
- Our environmentally friendly antimicrobial agent enables the formulation of a robust and tintable anti-viral paint.
- We provide low volatile organic compounds (halogenated and non-halogenated).
- We supply expandable microspheres that increase solar reflectance performance of cool-roof coatings.



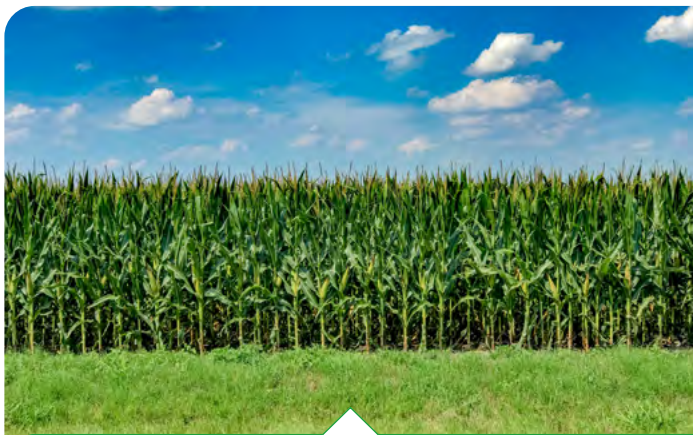
Polymer Specialties (~22% Eco-Premium Solutions):

- PVC (polyvinyl chloride) window profiles
- High-voltage cables
- Paint resins
- Insulation panels
- Solar panels
- Recycling enabler to plastics
- Composites for end-products such as wind turbines



Renewable Fibers (~57% Eco-Premium Solutions):

- Recyclable packaging
- Pulp, paper, and packaging products
- Textiles and apparel



ISCC PLUS certification for green monochloroacetic acid (MCA) production

In December 2023, Nouryon achieved the International Sustainability and Carbon Certification standard ISCC PLUS for green MCA production at our Delfzijl site in the Netherlands. As a global leader in MCA supply, we are the first and only producer of green MCA, which is derived from sustainably sourced raw materials. We produce green MCA using a mass-balance approach as defined by the ISCC standard.

MCA, a vital ingredient in the production of chemical building blocks such as carboxymethyl cellulose, agrochemicals, and surfactants, plays an essential role in many industries, including construction, crop protection, food additives, personal care, cleaning goods, and pharmaceuticals. Our green MCA offers a sustainable alternative that significantly reduces the product's carbon footprint without compromising on quality or performance.



Expansion of partnership with IMCD for our lubricant and fuel solutions

In 2023, Nouryon expanded its channel partnership with IMCD, a leading global distribution partner and formulator of specialty chemicals, for our lubricant and fuel solutions. This includes the distribution of select Armolube® and Armeen® additives in the US and Europe. The strategic alliance aligns with our goal to better serve customers through innovation and enhances our ability to create lubricants and fuels that meet evolving legislation and original equipment manufacturer requirements.

Our broad portfolio of lubricant and fuel additives, backed by dedicated research and development labs worldwide, includes friction modifiers, corrosion inhibitors, grease thickeners, detergents, and anti-wear components for application across multiple segments such as automotive, marine, industrial, and metalworking. We also offer ash-free and naturally derived additives to help customers comply with new regulations.

6.2 Innovation Based on Insights

GRI 2-6

Nouryon's global team of 600 scientists and engineers leverage our market-leading product and application development expertise in addition to our technology platforms to provide innovative and sustainable, high-performance solutions that meet the needs of customers in our prioritized end-markets. Our capabilities include novel machine learning models to accelerate our ability to deliver application and formulation solutions to customers and guide engineers to where we can explore next.

Research and Development

We operate 13 Innovation and Applications Development Centers around the world to continuously develop advanced products for the markets we serve. Our Innovation Centers are designed for large, global platform development, while our Application Development Centers are regional, allowing us to tailor solutions to local market needs and global rollouts. This dispersion enables us to continuously innovate our solutions to meet customer needs today and in the future. As customers prefer local supply chains and are moving away from single-source suppliers, this approach also improves our ability to rapidly serve our customers and develop localized solutions.

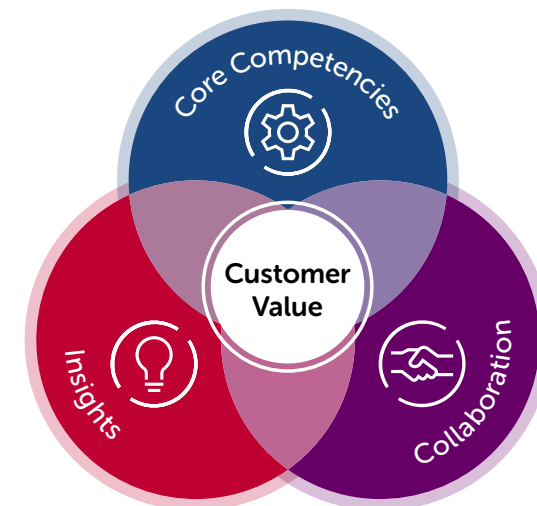
Nouryon continually invests in products, applications, and technology improvements. Our global R&D and Technology organization has been designed to enhance creativity, collaboration, and the development of forward-thinking solutions aimed at rapidly bringing innovative products and services to the market. Our Innovation Model leverages Insights based on our strong understanding of industry and market trends to identify the challenges that we can uniquely solve. Our Periodic Table (see [page 61](#)) illustrates our product lines, capabilities, and the key end-markets we serve with the priority applications customers in these markets demand. Between our product lines and the

end-markets we serve are our capabilities. We apply our Core Competencies based on our technical platforms and application expertise to continuously innovate and deliver differentiated solutions to our customers. The Collaboration across our global laboratories, with our suppliers, partners, and our valued customers, enables both a 'technology push' and 'market pull' in our R&D process, resulting in robust product portfolios that meet market demand and thereby create Customer Value. This includes new innovations that deliver on our customers' increasing demand for more sustainable solutions.

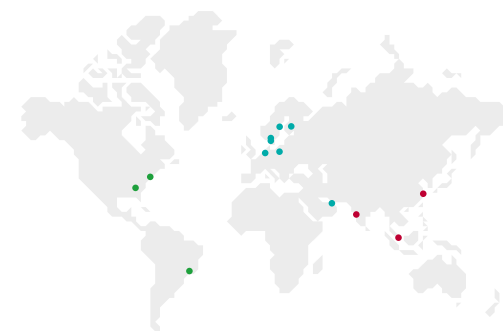
Our product innovations are aimed at providing benefits for our customers and the environment. Our process innovations reduce waste, wastewater, and emissions to air, and we are continually striving to increase yields and reduce energy consumption. Our large number of Product Lines and Capabilities combine to yield solutions to Markets & Applications challenges in the segments we serve. We engage leading universities and partners around the globe to identify and develop new "elements" to add to our periodic table so that we can continue to provide competitive solutions in the markets we serve.

Our 2023 Performance

In 2023, 74% of our product innovation pipeline came from our Eco-Solutions and 32% of revenue came from our Eco-Premium Solutions. Read more about Eco-Solutions and Eco-Premium Solutions in the next chapter. We expanded our Application Development Centers in Deventer, the Netherlands, and Chattanooga, Tennessee, US, to offer advanced technical service capabilities dedicated to the cleaning end-markets in Europe and North America. The expansion accelerated meaningful and sustainable innovation to meet the evolving needs of the cleaning market. Read more on [page 62](#).



13 Innovation and Application Centers worldwide



Americas: 3
EMEA: 7
Asia-Pacific: 3

The Nouryon Periodic Table

															Home & Personal Care	
															Hc	Hair Care
															Xe	Skin & Sun Care
															Tc	Hard Surface Cleaning & Disinfection
															Os	Automatic Dishwashing & Laundry
															Pv	Pharma
															As	Packaging
															El	Electronics
															Pr	Polymer Recycling
															Fe	Feed Additives
															Bm	Battery Materials
															Tx	Textile De-inking & Processing
															Im	Integrated Manufacturing Model
															Ca	Chemical Analysis
															Ba	Biodegradation Assessment
															Hr	Highly Reactive Chemistry
															Pp	Particle Processing
															Op	Organic Peroxides
															Ee	Ethylene Amines & Ethanolamines
															Ma	Metal Alkyls
															Gc	Green Chelates & Micronutrients
															Hm	High Purity Metal Organics (HPMO)
															Ps	Polysulfides
															Ns	Naphthalene Sulfonates
															Ap	Alkali Pellets
															S	Sulfur Products
															Sc	Chlorates
															Co	Condensation Reactions
															Cy	Catalysis
															Pe	Peroxides
															Sa	Product & Process Safety
															Ms	Modeling & Simulation
															Ds	Data Science
															Ak	Alkylation & Alkoxylation
															P	Solution and Emulsion Polymerization
															Al	Alkoxyates
															Am	Amine Surfactants
															Ce	Cellulose Materials

Product lines

Capabilities

Markets and Applications



Initiating full-scale production at Expancel® expandable microspheres plant in the US

Nouryon achieved a significant milestone in 2023, with the initiation of full-scale production at our new Expancel® expandable microspheres plant in Green Bay, Wisconsin, US. This new facility aims to better serve our North American customers within the packaging, construction, mining, and automotive sectors, and complements our existing full-scale plant in Sundsvall, Sweden, and product expansion facilities in China and Brazil.

Expancel® expandable microspheres enhance the performance of our customers' end-products by making them lighter, improving insulation, and reducing energy consumption and environmental impact. These features are highly sought after across various applications, including cool roof coatings, automotive coatings, and body fillers. Expancel® is also used in applications such as recyclable packaging materials, freeze- and thaw-resistant concrete, and construction industry sealants and coatings. These applications require prevention of cracks and water absorption to extend the lifespan of weather-exposed building materials.

We are committed to developing solutions that support our customers' sustainability goals and improve their products' performance. With more than 40 years of expertise under the brand Expancel® expandable microspheres, Nouryon remains a leading producer of expandable microspheres worldwide.

Application Development Centers expansion in Europe and North America to benefit cleaning end-market

In 2023, Nouryon expanded its Application Development Centers in Deventer, the Netherlands, and Chattanooga, Tennessee, US, to offer advanced technical capabilities for the cleaning sector in Europe and North America. This move supports our global network of centers and accelerates sustainable innovation to meet changing market needs, including growing consumer demand for eco-friendly automatic dishwashing and liquid laundry products.

We now provide advanced performance testing supporting enhanced analytical competencies, ecotoxicity development, and regulatory compliance. This investment enhances our resources, equipment, and technical competency, allowing us to deliver more value to our customers.

The expansion strengthens our customer collaboration and advances sustainable innovation. Nouryon has application development centers for the cleaning end-market in Deventer, the Netherlands, Stenungsund, Sweden, as well as in Bridgewater, New Jersey and Chattanooga, Tennessee, US.



Accelerating sustainability with investment in Icos Capital Fund IV

In 2023, Nouryon made a strategic investment in Icos Capital Fund IV to explore a wide range of start-ups and budding technologies pertinent to our primary markets, with a particular emphasis on accelerating sustainability. This fund is a collaborative venture-capital initiative aimed at connecting corporations and financial institutions with high-growth potential start-ups, with a focus on emerging technologies in areas such as sustainable industry, decarbonization, the circular economy, and sustainable food systems.

Our corporate partnership with Icos Capital began in 2017, with our investment in Icos Capital Fund III. This relationship has enabled several strategic partnership discussions and has given us valuable innovation insights. As a corporate partner, Nouryon plays a role in shaping the fund's strategy and in identifying and evaluating potential start-ups. This partnership remains a crucial part of our commitment to driving innovation and sustainability.



New Levasil® colloidal silica binding system boosts high-temperature productivity for magnesia refractories

Nouryon is a leading global producer of colloidal silica products, and in 2023, we extended our Levasil® colloidal silica portfolio to the global refractories market, specifically for magnesia-based systems. These materials line and protect vessels and are utilized in industries requiring high-temperature processes, such as steel, glass, and cement production.

Colloidal silica, a versatile product made from sand and water, is an excellent binder for refractory materials. However, its use in magnesia-based refractories was previously limited due to rapid setting. In collaboration with Professor Dr. Rafael Salomão from the University of São Paulo, Nouryon developed Levasil® FX401, a modified colloidal silica that overcomes rapid setting while improving hydration and corrosion resistance of magnesia-based refractories.

This patent-pending binder technology enhances drying efficiency, reduces CO₂ emissions, and leads to energy savings in high-temperature processes. Moreover, Levasil® FX401 creates a high-density, more durable refractory material, reducing the carbon footprint through better resource efficiency. The material's increased resilience to thermal shock and chemical erosion results in lower maintenance costs and reduced consumption of magnesia-based refractories. This is a great example of how we can apply our solutions to help drive carbon reductions even in some of the most energy-intensive, industrial applications.

6.3 Eco-Premium Solutions and Eco-Solutions

Nouryon's product development processes are designed to drive continuous sustainability improvement in the overall portfolio as products are updated or replaced. Eco-Premium Solutions and Eco-Solutions are fundamental drivers of our sustainability agenda for creating more value from fewer resources, of the products we sell, and of the processes we use to manufacture them.

Eco-Premium Solutions

At the heart of our innovation philosophy are Eco-Premium Solutions that offer substantial sustainability benefits over mainstream alternatives in the market, while still delivering the same or superior product performance.

The sustainability benefits of our Eco-Premium Solutions can include one or more of the following:

- Improved energy efficiency (consumption)
- More efficient or lower use of natural resource/raw materials
- Lower emissions and waste
- Lower toxicity
- Reduced risks (for accidents during production, transportation, etc.)
- Lower land use
- Improved health/well-being effects

When an impact can be quantified, we classify our products as Eco-Premium Solutions if an underlying sustainability benefit demonstrates at least a 10% lower impact on a given criterion when assessed along the total product life cycle. For example, products that help customers lower their energy consumption may represent Eco-Premium Solutions based on reduced energy or fuel use. In addition to having one or more of the benefits, Eco-Premium Solutions do not have significant adverse effects in any of the other categories.

Among others, Nouryon's Eco-Premium Solutions include:

- Bio-based polymers
- Dissolvine® M and GL – readily biodegradable chelating agents for more sustainable detergents.
- High-performance chelated micronutrients that deliver essential metals to plants, increasing agricultural productivity and crop quality.
- Proven high-quality products for asphalt applications, which lower energy consumption for our customers.
- Expancel® expandable microspheres, which allow paper and board manufacturers to dose a higher content of recycled fibers without losing bulk in the board.
- Levasil® colloidal silica, which works exceptionally well as a stabilizer, durability enhancer, and strength developer in construction applications.
- Kromasil® spherical silica used for high performance purification of APIs (active pharmaceutical ingredients).

Our 2023 Performance

In 2023, 32% of revenue came from our Eco-Premium Solutions.

We started full-scale production of our new Expancel® expandable microspheres plant in Green Bay, Wisconsin, US. This was an important milestone to better serve specialty additives customers in North America in the packaging, construction, mining, and automotive industries, and complements our existing full-scale plant in Sundsvall, Sweden, and product expansion facilities in China and Brazil.



Personal care industry awards for Amaze® SP Polymer and ElfaMoist® AC Humectant

Nouryon achieved notable recognition in the Chinese market in 2023, as two of our personal care products, Amaze® SP Polymer and ElfaMoist® AC Humectant, were awarded the prestigious Ringier Technology Innovation Award in the categories of Functional Ingredients and Effective Ingredients, respectively.

Amaze® SP Polymer, a 100% natural, bio-based, and biodegradable hair control polymer, offers weightless, invisible styling. ElfaMoist® AC Humectant is lauded for its superior penetration and deposition properties, providing non-sticky, quick, and long-lasting skin moisturizing efficacy.

Launched in the China market in 2006, the Ringier Technology Innovation Awards are among the most respected awards in the Chinese personal care industry. This recognition highlights Nouryon's innovative capabilities and commitment to support the sustainable development of the Chinese personal care industry.

Eco-Solutions

To highlight the crucial sustainability value drivers within our end-markets, we have introduced a new metric for our product innovation pipeline, named Eco-Solutions. These are product and product line innovations that we plan to introduce in the future based on success. They emphasize key sustainability drivers such as whether product innovations in our research and development (R&D) pipeline are bio-based or biodegradable, as these are vital components of product sustainability in our end-markets.

Product innovations are assessed by product safety and regulatory criteria. Solutions are not expected to be regulated in a way that restricts their intended application over the next five years.

In addition, Eco-Solutions have either:

- a sustainable feedstock index greater than 50%⁵⁰;
- are biodegradable⁵¹;
- bring a significant environmental footprint advancement⁵².

If products meet more strict criteria, they may be considered circular⁵³.

We continue to reduce our overall environmental footprint throughout the life cycle of a product, including in our customers' applications. In this updated metric, when we consider environmental footprint performance, we focus on emissions (including climate-related GHGs and other air emissions), resource consumption, energy efficiency, and toxicity.

The scope of the Eco-Solutions metric includes all active New Product Introduction projects in stages 3 (creation), or 4 (scale-up), and excludes stages 1 (screening), 2 (feasibility), and 5 (launch and monitor).

Our 2023 Performance

In 2023, 74% of our R&D product pipeline included Eco-Solutions.

Natural Demand

Our product innovations are increasingly focused on bio-based, biodegradable, and circular solutions, including natural polymers in Home and Personal Care and cellulose-based raw materials in Paints and Coatings. Other innovations include our range of biodegradable and bio-based products, such as chelating agents, surfactants, and polymers based on natural materials. Many of the products we offer are recognized in our industry for product safety and sustainable benefits, including by EU Ecolabel, Nordic Swan, COSMOS APPROVED, and US Environmental Protection Agency Safer Choice.

In recent years, we received the Cosmetic & Toiletries Allê Award in the category of Base Ingredients for our SolAmaze® Natural. This is a novel bio-based, biodegradable product containing a film-forming polymer that offers superior water resistance and pleasing aesthetics for a broad spectrum of sunscreen applications.

Our 2023 Performance

Nouryon achieved notable recognition in the Chinese market as two of our personal care products, Amaze® SP Polymer and ElfaMoist® AC Humectant, were awarded the prestigious Ringier Technology Innovation Award in the categories of Functional Ingredients and Effective Ingredients, respectively. Amaze® SP Polymer is a 100% natural, bio-based hair control polymer that offers weightless, invisible styling, while ElfaMoist® AC Humectant has superior penetration and deposition properties, providing non-sticky, quick, and long-lasting skin moisturizing efficacy. Read more on [page 64](#).



⁵⁰ The sustainable feedstock index is calculated based on the content of the final Nouryon product and is an assessment of what share of the product is derived from either bio-based organic materials, abundant inorganic materials and/or recycled materials.

⁵¹ The biodegradability criteria apply to all intentionally added components in the product and is applied only for solutions that will be used in applications which have been assessed to be relevant such as home and personal care applications and agricultural applications. It does not apply for example to certain applications in which our products are used as intermediates.

⁵² Sustainability advancement is the improved environmental impact of the solution as compared with the incumbent solution along the full life cycle. The improvement must be significant, meaning greater than 10% when comparing the Nouryon product's cradle-to-grave impact vs. the incumbent solution.

⁵³ The circularity criteria are that products must have a Sustainable Feedstock Index of 100% and will be either biodegrade or do not contain substances that inhibit the possibilities for recycling in their respective application.

Did you know?

Celebrating sealing excellence: Thioplast® polysulfides turn 60

As one of the world's largest liquid polysulfide polymer producers, Nouryon celebrated 60 years of Thioplast® polysulfides production in 2023. Launched in 1963 in Greiz, Germany, this product revolutionized industries such as construction, automotive, aerospace, marine, and energy, given its exceptional performance in extreme environments.

Thioplast® polysulfides have evolved from a single resin into an advanced solution offering a range of possibilities, including thiol-terminated Thioplast® G polysulfides and epoxy-terminated Thioplast® EPS polysulfides. Thioplast® polysulfides have been crucial in aerospace, enhancing aviation safety and reliability due to their unparalleled adhesion, flexibility, and durability. They withstand extreme subzero temperatures and exposure to jet fuel, making them ideal for critical applications like fuselage and fuel tank sealing. In the building and construction sector, polysulfide-based sealants and adhesives have been revolutionary, with their gas-tight properties and UV resistance, contributing to improved energy efficiency and indoor climate control.

Thioplast®



Triameen® Y12D enables efficient disinfection in the US cleaning market

In early 2023, we expanded our antimicrobial portfolio with the US launch of Triameen® Y12D. This innovative and highly efficient antimicrobial active enable customers to create effective disinfectants for diverse applications, from household to institutional and industrial uses.

Triameen® Y12D, which effectively combats a broad spectrum of bacteria, including mycobacteria, fungi, as well as select viruses, stands out for its sustainability profile and lower dosage requirement compared to quaternary ammonium products. It employs non-quaternary ammonium technology, is free of aldehydes and halogens, and is non-sensitizing. The product, as marketed, is a user-friendly, predominantly bio-based (with a 67% renewable carbon index) liquid concentrate that boasts high activity (92%) and is easily biodegradable. The performance of Triameen® Y12D can be further enhanced with Nouryon's green chelating agents, such as Dissolvine® M-40 and GL-47-S products. The introduction of Triameen® Y12D in the US, following its availability in the Asia Pacific and Europe, underscores Nouryon's commitment to expanding our innovative antimicrobial portfolio globally.

Berol® Nexxt surfactant and Dissolvine® GL Premium chelating agent offers sustainable product innovation

In 2023, Nouryon introduced two innovative products: Berol® Nexxt, an advanced surfactant and multifunctional hydrotrope, and Dissolvine® GL Premium, the industry's most potent GLDA-based chelating agent.

Berol® Nexxt is a high-performance surfactant that offers a unique cosurfactant solution in the cleaning market, with particular effectiveness in tackling tough stains in cold water laundry cycles and automatic dishwashing. Derived from bio-based, naturally occurring amino acid, it stands out for its sustainable properties. On the other hand, Dissolvine® GL Premium is the most concentrated liquid GLDA-based chelating agent available, with high solubility over a wide pH range, making it particularly useful in concentrated liquid formulations.

This launch highlights Nouryon's commitment to providing high-performance, sustainable solutions for our customers and to ensuring that our products meet or exceed industry benchmarks.



Enhancing organic peroxides production in China to propel growth of polymer industry

We committed to a significant investment in our Ningbo, China facility in 2023 that will double the production capacity of organic peroxide products Perkadox® 14 and Trigonox® 101 to 6,000 tons each by mid-2024. These vital products will cater to growing regional and global demand across various sectors, including hygiene products, non-woven healthcare textiles such as face masks, plastics recycling, and an array of rubber goods including rubber hoses, seals, cable insulation, athletic shoe soles, and yoga mats. Both Perkadox® 14 and Trigonox® 101 can enhance the properties of recycled polypropylene, allowing for its use in applications previously limited to virgin plastics. This aligns with Nouryon's strategy of maintaining a leading position in organic peroxides and supporting the growth of our customers.

With a history in the development of organic peroxide solutions dating back to the early 1920s, Nouryon operates seven production sites in Greater China, with the Ningbo site being the largest. On a global scale, our organic peroxide production spans Asia, Europe, and the Americas, with sites in Ningbo and Tianjin in China, Asa in Japan, Mahad in India, Mons in Belgium, Pasadena in the US, Los Reyes in Mexico, and Itupeva in Brazil.

Kromasil® 100Å diC4 Spherical Silica advances pharmaceutical purification

We launched the patent-pending Kromasil® 100Å diC4 spherical silica in 2023. This high-efficiency chromatography media is used for the purification of peptide-based pharmaceuticals in the GLP-1 agonist class, including treatments for type 2 diabetes and obesity.

The addition of Kromasil® 100Å diC4 spherical silica to our product range provides pharmaceutical manufacturers with an efficient purification method for GLP-1 agonists such as liraglutide and semaglutide. This development enables our customers, both in China and worldwide to significantly enhance their purification processes while still maintaining the necessary purity levels.



Finnfix® BBR: a revolutionary and sustainable new alternative for recyclable food packaging

In the wake of growing environmental concerns and consumer demand for more sustainable solutions, Finnfix® BBR emerged as a groundbreaking and eco-friendly alternative to synthetic and plastic barriers in food packaging in 2023.

Finnfix® BBR revolutionizes food packaging with its cellulose-based design. It forms a grease and moisture-resistant barrier on paper, enhancing protection for food. A thin layer of Finnfix® BBR turns regular paper food packaging into a recyclable, microplastic-free solution with a reduced environmental impact and minimal carbon footprint.

Nouryon & E5 Incorporated: Partnering for sustainability in the built environment

Concrete is the most consumed material on the planet – second only to water – and the production of cement, a primary component of concrete, is responsible for over 8% of the world's carbon emissions.

Our customer, E5 Incorporated, a highly innovative concrete technology company, has leveraged Nouryon's excellence in manufacturing to ensure the highest quality nano silica materials for its proprietary admixture formulations. E5® proprietary products and processes enable production of concrete that is not only higher performing but is also more environmentally friendly than traditional concrete.

E5® Internal Cure® is the world's first admixture to provide for self-curing of concrete. Internal Cure® controls water within the concrete mix to ensure a proper cure, densifies the concrete, and allows for easier placement and finishing of the concrete – all of which results in a more durable concrete structure. This increased durability extends the service life of concrete, resulting in less cement required for replacement of deteriorating concrete structures.

E5® Liquid Fly Ash® (LFA) is a ground-breaking supplementary cementitious material (SCM), which, like Internal Cure, densifies the concrete, but also allows for reduction of up to 15% of cement in concrete mixes. This decrease in cement usage directly translates into a substantial reduction in CO2 emissions. Furthermore, the use of LFA® significantly reduces the need for transportation. In fact, one full truck load (FTL) of LFA equates to 28 FTLs of traditional fly ash – meaning 27 trucks are taken off the road for each FTL of LFA used, thereby avoiding the associated emissions, and contributing to cleaner air.

One of the largest cement and ready-mix concrete producers in the world said it best – "The most sustainable concrete is the most durable concrete." "Put simply, a more durable concrete means a longer lifespan, reducing the need for frequent replacements. This, in turn, means less resource consumption and waste generation, thus reducing the overall environmental impact of concrete consumption," stated Joe Shetterley, CEO of E5 Inc.

E5® products manufactured by Nouryon provide significant environmental benefits, including: (i) a properly cured, denser concrete matrix for substantial improvement

in concrete durability and, therefore, longevity; (ii) reduction of cement and supplementary cementitious materials in concrete mixes; (iii) elimination of curing compounds, burlap, visqueen and scarce water resources required for wet cure and higher volume SCMs (and the trucks that haul these materials); and (iv) potentially, based on on-going research being conducted at Purdue University, active absorption of more greenhouse gases from the atmosphere (without negative carbonation impact on the structure) by concrete structures containing E5® as compared to structures without E5®.

Dr. Luna Lu, Associate Dean for the Faculty at Purdue University, Reilly Professor at the Lyles School of Civil Engineering, and Inaugural Director of the Center for Intelligent Infrastructure, who leads the research at Purdue University, elaborated on this point. "Our initial study indicated that concrete containing E5® nano silica has a potentially substantially greater sponge effect than concrete without E5® nano silica. We are currently undertaking an expanded study of this phenomena, which, if further validated, presents a significant opportunity for the concrete industry to contribute to world-wide carbon reduction efforts."

In short, E5® products improve the sustainability and durability of concrete. The effectiveness of E5® products has been proven in the field in hundreds of Department of Transportation projects and millions of square feet of commercial structures and validated by multiple, highly reputable, independent laboratories.

E5 Inc. is actively developing Environmental Product Declarations (EPDs) for its products and is in the process of registering for carbon credits. Both initiatives will provide substantiated and verified data on the carbon impacts and benefits of its products and operations, providing transparency and accountability in its sustainability efforts.

With the help of superior quality Nouryon manufacturing, E5® has risen to the top as the industry leader in nano silica utilization in concrete, which is driving sustainability in the built environment and setting a benchmark for others to follow.

In Partnership with



7. Engaging and Partnering with Employees, Suppliers and Society to Drive Progress

Highlights



36% gender and ethnic diversity represented on our Board of Directors⁵⁴



66% of suppliers were assessed for CSR risk by EcoVadis⁵⁵



23% of mid-level managers and above are female⁵⁶



Global Mentoring Program



Five Business Resource Groups (BRGs)⁵⁷ supporting our Diversity Commitment

Relevant Policies & Programs

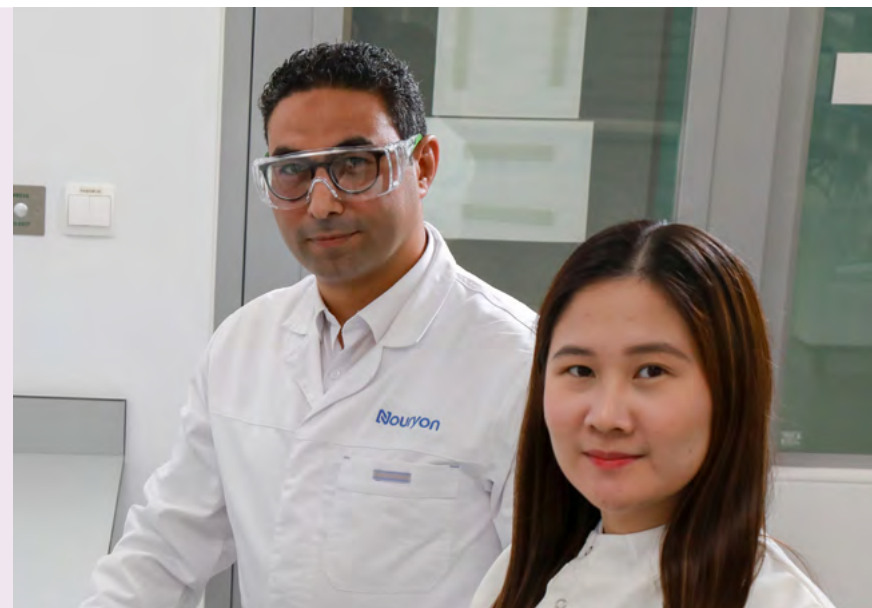
- [Code of Business Conduct & Ethics, including anti-discrimination and anti-harassment](#)
- Anti-corruption, anti-bribery
- [Business Partner Code of Conduct, including suppliers](#)
- Quality, Health, Safety, Environment and Security Policy
- [Palm Oil Statement](#)
- Sensitive Country Policy
- Sustainable Sourcing Statement

⁵⁴ Board Members who are female and/or of a US racial/ethnic minority.

⁵⁵ In terms of all external spend (product, non-product, energy, logistics, etc.) The Risk IQ tool considers industry segment risk, country risk and EcoVadis scores from the complete EcoVadis database. Based on 2023 spend.

⁵⁶ Mid-level managers are defined as the management paygrade below the first senior executive level. Source data, December 2023.

⁵⁷ Nouryon Women's Network, Pride, Veterans, Boost, and Kaleidoscope.



ENGAGE AND PARTNER

with employees, customers, and suppliers to drive sustainable progress

Key Sustainable Development Goals:



Did you know?

Maharashtra State Best Employer Brand Award 2023 for Nouryon India

Nouryon India was recognized with the Maharashtra State Best Employer Brand Award 2023, a prestigious recognition endorsed by the World HRD Congress, CHRO Asia, and the World Federation of Human Resources Professionals. The award acknowledges organizations in Maharashtra, India, that demonstrate exceptional Human Resources practices and effective use of marketing communications for HR development. The award assessment considered factors such as HR strategy alignment with business goals, future readiness, talent management, recruitment strategies, employee engagement, wellness initiatives, empowerment of women, and Corporate Social Responsibility initiatives undertaken by Nouryon India.



At Nouryon, we prioritize working in an environment that is safe and that mirrors the unique experiences, viewpoints, and potential of our entire workforce. We are steadfast in our commitment to equip our employees with the tools needed to hone leadership skills and propel their professional advancement by offering specialized learning opportunities while also ensuring that our employees embody our Company's values.

We value the cultivation of a culture in which diverse thoughts and perspectives are expressed and acknowledged, as well as harnessed to enhance our business performance. This approach is instrumental in achieving strategic objectives such as driving innovation and attracting and retaining the best talent in the industry. We have established partnerships with premier learning institutions and universities worldwide, facilitating internships, talent acquisition, research collaborations, and continuous learning and development opportunities for our existing workforce.

We engage and partner with our suppliers, ensuring that they evolve in sustainability in tandem with Nouryon and our customers.

Our commitment to our communities is reflected in our Corporate Social Responsibility (CSR) framework. This pragmatic, volunteerism-based approach, supplemented by corporate donations and engagement, allows us to actively participate in community engagement initiatives.

7.1 Human Resources – Attracting, Developing, and Retaining Talent

Our global Human Resources (HR) function is consistently shaping an employee experience where transformational leadership and individual growth are our business enablers. We are relentlessly engaged in establishing priorities, setting the course for our future endeavors related to our culture, development of our talent, and recruiting new joiners, and making process improvements, all to support the overall business delivery.

Attracting New Talent

As part of our ongoing efforts, we are refining our talent acquisition framework to have a strategic approach to how we attract and retain top-tier talent. Our team is also continually improving our talent development and performance framework to ensure we create an employee experience in which current and future employees find purpose and growth. This is a crucial part of our commitment to advancing a high-performance culture within our organization.



Our 2023 Performance

In 2023, Nouryon welcomed approximately 1,411 new hires worldwide, marking an increase of almost 4.5% compared to 2022.

To reinforce our recruitment initiatives, we enhanced and internally communicated our employee referral program under the dynamic tagline, “Who do you KNOW, to help us GROW?”. This program, aimed at leveraging our employees’ networks to build a diverse and dynamic team, is essential for realizing our growth objectives. We motivate our employees to become proactive “talent scouts”, seeking out highly competent and high-performing candidates, and reward successful referrals in alignment with Nouryon’s Employee Referral Program policy. In 2023, this revitalized focus on the Employee Referral Program resulted in 42 new hires.

We launched a new Talent Acquisition strategy that enables Nouryon to differentiate by adopting a global approach to attracting and recruiting talent in the local markets where we operate. With the new strategy, we define and make a prioritization of current and future demands based on talent availability, strategic relevance, and demand from Nouryon in the various geographies in which we are present.

Our successful recruitment of diverse talent reflects our market appeal as an agile, forward-thinking, growth-focused company with a high-performance culture rooted in shared values and strong leadership. To articulate our Employer Value Proposition to both prospective and current employees, we introduced our new global Employer Brand, Changemakers, which specifically appeals to individuals driven to make positive change in our industry, regardless of their role. Changemakers encapsulates our culture and employer offerings, provides a compelling platform for our employees, and supports us in attracting the best talent within the industry in a competitive market. Moreover, we have transformed our career pages on our website to express the Changemakers value proposition, making our recruitment-focused webpages more accessible and

informative. This has further refined our talent acquisition strategy, ensuring that we continue to attract leading talents in our industry.

We also remain committed to enhancing our talent pool and expertise through partnerships. In 2023, we continued partnering with several local universities and organizations for talent attraction and diversity. We are particularly proud of our associations with the Society of Women Engineers, National Society of Black Engineers, and Society of Hispanic Professional Engineers, which resulted in multiple new hires and career opportunities.

We offer various internship opportunities at many of our locations as part of our efforts to identify Changemakers and offer valuable experience and potential employment opportunities. This enables us to further enhance our Employer Brand and talent pipeline.

We believe a robust onboarding process is crucial for integrating new hires into our Company. New employees, particularly those early in their careers, or with less than seven years at Nouryon, are invited to join BOOST, a BRG that provides internal networking and learning opportunities.

Employees are also able to participate in Nouryon’s Global Mentorship Program, which contributes to increased overall employee engagement and workplace belonging. More information about our Global Mentorship Program can be found later in this chapter.

Our Employer Value Proposition, Compensation and Benefits

GRI 2-7, GRI 2-8, GRI 2-30

Our employee offering is embodied by our new global Employer Brand, Changemakers. Nouryon's success is driven by Changemakers who take positive action to create essential solutions. A common passion for innovative, sustainable solutions, partnership, collaboration, and problem-solving thrives across our global production facilities, offices, and innovation centers. We are Changemakers.

Our total rewards framework is globally aligned and versatile to support the diverse needs of our employees. Our programs are periodically reviewed to assess competitiveness in line with local and industry standards.

We are committed to making decisions that are based on objective criteria, free of bias, and adhere to fair employment practices. Leadership reviews compensation programs and decisions to ensure our employees are fairly rewarded for performance-based contributions. Nouryon believes that by offering country defined programs, such as employee assistance, parental leave, preventative health check-ups, and paid leave for blood or bone marrow donations, we contribute to the health, well-being and financial stability of our employees and their families. This, in turn, enables us to be an employer of choice.

Central to our talent acquisition and retention strategy is the continuous evolution of our employees and leaders. We promote both immediate and long-term skills development, encouraging our employees to embody our values. We support and encourage employees to seek opportunities and to learn and grow, while also inviting them to take ownership of their individual career paths.



Headcount ⁵⁸		Gender			
Region	Female	%	Male	%	Grand Total
Asia-Pacific	473	26%	1,376	74%	1,849
Europe	408	21%	1,548	79%	1,956
Nordics	569	32%	1,190	68%	1,759
North America	399	25%	1,203	75%	1,602
South America	217	21%	853	79%	1,070
Grand Total	2,066	25%	6,170	75%	8,236

Headcount ⁵⁸		Full-Part Time ^{59,60}			
Region	Full Time	%	Part Time	%	Grand Total
Asia-Pacific	1,847	100%	2	0.1%	1,849
Europe	1,722	89%	234	11%	1,956
Nordics	1,721	98%	38	2%	1,759
North America	1,601	100%	1	0.1%	1,602
South America	1,070	100%			1,070
Grand Total	7,961	97%	275	3%	8,236

⁵⁸ Data includes regular employees and expatriates.

⁵⁹ Full/part-time is defined as: less than one full-time employee (FTE) is part time, otherwise full-time.

⁶⁰ Temporary staff is defined as employees having a 'Fixed Term Contract' contract type.

Our 2023 Performance

Changemakers was introduced and brought to life through a campaign with testimonials from our global workforce. These spotlight their unique backgrounds, professional expertise, innovative mindset, and commitment to sustainability, painting a vivid picture of culture at Nouryon.

In October 2023, we commemorated Nouryon's five-year anniversary by inviting our employees to participate in a #Changemakers quiz, to inspire additional unity and engagement. We also invited employees to share their personal stories about how they are #Changemakers in their roles, promoting individual pride and collective advocacy for our Employer Brand.

In 2023 we successfully completed a Global Living Wage analysis, within our 5 largest counties, representing 70% of our direct manufacturing population. This analysis utilized benchmarks from the Fair Wage Network and indicated that no employee is paid below living wage, as defined by the Fair Wage Network, within this segment.

Our sustained success hinges on our ability to attract and retain dynamic leaders who support and safeguard a culture of high performance, ownership, delivery, and process excellence to exceed customer expectations. In the past three years, we have brought 64 senior executives on board to complement our existing team and propel performance.

Moreover, we are introducing our Leadership Capabilities Framework, which is the foundation of Nouryon's integrated system for building a strong pipeline of leadership talent. This framework focuses on enhancing five key leadership capabilities – driving performance, serving customers, thinking critically, collaborating proactively, and developing people – depicting the behaviors, knowledge, and attributes needed to be a leader at Nouryon. Integrating the Leadership Capabilities Framework into our business practices will provide clear, objective criteria that will support our ability to assess, select, and develop leaders for current and future roles.

Leadership Capabilities Framework



Learning, Leadership, and Development

GRI 2-7, GRI 2-8, GRI 2-29, GRI 2-30

Nouryon's performance and growth are sustained by our commitment to continuous learning and skill development for our employees and leaders. We provide a diverse array of learning opportunities, including leadership and employee development programs, practical work experiences, blended programs, online learning, (virtual) classroom training, and compulsory compliance and cybersecurity courses. Our global digital learning platform enables employees to easily access relevant training, enroll in scheduled courses, and avail 24/7 online training, providing the flexibility of learning in a way that best meets their preferences and schedules.

Our 2023 Performance

A new cohort of managers were trained under our Senior Leadership Program (SLP). This program will give the participants an opportunity to grow and prepare for more senior leadership roles in the future as the program is designed to embed the unique skills and attributes required for a senior leader to be successful at Nouryon. In addition, 57 participants completed our 18-week digital, global leadership program, LEAP (Lead, Engage, Accelerate, Perform). The program focuses on leadership skills including coaching on personal bias awareness and cultivating a culture of high-performance. All program topics are tied to Nouryon's values, strategy, and focus areas, enabling leaders to apply their learnings in their daily work.

We also continued with our leadership development training, JUMP, initiated in 2021 for potential leaders who are not currently in managerial roles. In 2023, 46 participants enhanced their self-awareness and improved their coaching and networking skills. Our STEPS training, aimed at leaders with direct reports, was also repeated in 2023, with 194 participants. This training provides essential knowledge of people, processes and systems.

For our Information Management staff, we continued to offer a training curriculum in 2023, focused on core information management competencies. These competencies encompass broader topics such as security and compliance, connecting people, ensuring delivery, driving productivity, data utilization and reporting, and catalyzing growth.

In response to the increasing interest in Generative Artificial Intelligence (Gen AI), our Information Management function introduced an internal version of ChatGPT for all employees, supported by a training on the safe usage of generative AI tools. The link to Nouryon's Gen AI platform was made available to employees once they completed the training and accepted the protocol.

We place a high emphasis on cybersecurity awareness and training. We believe that a well-informed workforce is the first line of defense against cyber threats. Therefore, we regularly conducted cybersecurity training sessions to equip our employees with the knowledge and skills to identify and respond to potential cyber risks, ensuring the security and integrity of our digital infrastructure.

We have a comprehensive sales development program, the initial phase of which begins with an understanding of the Company's story and growth strategy. An introduction to our organizational objectives is achieved with a diverse array of learning modalities, including instructor-led, virtual, and e-learning modules. The curricula are geared toward instilling selling principles and fostering skill development among our sales teams, and in 2023, we had 47 instructor-led classes with 522 employees participating and 1,093 staff members taking e-learning courses.

This year, we enhanced our Integrated Supply Chain learning programs, introducing multilingual courses, interactive classroom sessions, and online modules, including updates to Asset Integrity and Process Safety Management e-learning. Notably, we launched our first online Advanced Statistics training and promoted Lean

Six Sigma certification for 160 candidates. In Finance, we provided open online courses on nine key topics. Our comprehensive onboarding program continues to emphasize safety and compliance. This includes mandatory safety and compliance training sessions conducted online and offline to ensure thorough understanding and adherence to our protocols.

We have also implemented a three-year rotational program for engineers in the Americas within our Integrated Supply Chain function, known as the Engineering and Developmental Program. This initiative identifies and cultivates promising early-career engineers, preparing them for various leadership roles in manufacturing across multiple sites and disciplines. In 2023, we had six full time rotational engineers in the Americas. In addition to the rotational program, we also offer internships and co-ops.

Performance Management

To maintain the momentum of our Company's growth and our employees' performance, we employ a Continuous Performance Management methodology. This approach involves setting dynamic objectives, conducting regular reviews, and providing ongoing feedback. It serves as a catalyst to keep our employees and leaders engaged and performing at their best.

Our 2023 Performance

In 2023, 96% of our workforce participated in the full annual performance management cycle.

7.2 Diversity Commitment

At Nouryon, we are committed to creating a workplace that taps into the full potential of our global team, fostering collaboration and innovation, and enhancing our understanding of our customers' unique needs. Our culture is ingrained in our workforce and is anchored in our values and Code of Business Conduct & Ethics. These guiding principles encourage us to 'Aim high' and 'Do it right', inspiring us to continuously strive for a workplace where every individual feels valued, heard, and encouraged to contribute their ideas and challenge the status quo. This ongoing commitment ensures that our employees uphold the principles of equality, treating all colleagues with respect and dignity, irrespective of age, race, nationality, gender identity, or sexual orientation. Our commitment extends beyond our workforce, reflected in our relationships with customers, suppliers, and communities. We believe that by fostering a culture of belonging and embracing diversity of perspective, we can drive business growth by unlocking the full potential of our teams and contribute to a more sustainable world.

Nouryon's Commitment to Workplace Diversity



Our Business Resource Groups (BRGs)

Nouryon's BRGs are led by our employees and offer a platform for them to connect with peers, gain insights into Nouryon's businesses and functions, and benefit from the knowledge of both internal and external speakers. With the introduction of Kaleidoscope, Nouryon now boasts five Company-wide BRGs, all led by our employees. These include the Nouryon Women's Network, Nouryon Veterans Network, Nouryon Pride Network (LGBTQ+), Global BOOST (focusing on career development and those new to Nouryon), and Nouryon Kaleidoscope (BIPOC - Black, indigenous and people of color community). Together, these five BRGs have more than 1,500 members, and are open to all employees, reflecting our commitment to inclusivity.

Our 2023 Performance

Our BRGs organized 40 employee events, both virtual and live, across geographies. These events aimed to strengthen connections among employees while supporting their professional development and growth. For instance, in March, the Nouryon Women's Network spearheaded the Company's celebration of International Women's Day, orchestrating events across 10 locations in 5 countries. Further, in June, Nouryon Pride took a leading role in the Company's recognition of Pride Month, leveraging digital content as a medium to raise awareness. In the spirit of Pride Month, we organized the Great Nouryon Baking Celebration wherein employees were invited to bake and share a delectable treat ahead of their regional event in June, offering an enjoyable platform for displaying their culinary skills while celebrating Nouryon Pride.

The Nouryon Veterans Network is dedicated to furthering a sense of community among service members, veterans, and their families while enlightening our employees about the value of military experience and its alignment with our Company values. In 2023, the network expanded its presence to our 17 US locations and appointed 12

Veteran Network Advocates to guide its members at a grassroots level. On US Veterans Day 2023, the network commemorated its 125 members with Challenge Coins engraved with Nouryon's values and an appreciation message. The Nouryon Veterans Network newsletter published editions on military service in Norway and Finland to further educate employees about the relationship of military service to Nouryon's values in other cultures.

Nouryon also sponsors and provides mentors for American Corporate Partners (ACP), with approximately 40 Nouryon leaders serving as mentors for post-9/11 veterans and their spouses. In 2023, Nouryon leaders Kristopher VanKleek and John Callaway and their ACP proteges jointly presented at ACP's online forum, "From Service to Success", sharing insights on navigating career progression in the civilian world post-military service. Since Nouryon's affiliation with ACP in 2020, our mentors have provided invaluable advice, support, and encouragement to 84 ACP proteges with 100% recommendation in post-mentorship surveys, from both mentors and proteges.

Global Mentorship Program

Our Global Mentorship Program, accessible to all employees, is designed to broaden employee networks, introduce fresh perspectives and experiences, develop new skills including critical thinking techniques, and foster new professional relationships. This, in turn, enhances employee engagement and a sense of belonging.

Our 2023 Performance

Our global mentorship program included 75 paired participants, with 60 new pairings compared to 2022. Some mentors also had more than one mentee. The program introduced a learning series that focused on goal setting, development, and cross-cultural collaboration. Read more about our Internship and Mentoring Programs on [page 77](#).



Cultivating changemakers with internship and mentoring programs

We're looking for tomorrow's Changemakers, today. To identify future Changemakers, Nouryon offers an Internship Program at many of our locations. This initiative provides interns with valuable real-world experience, leadership skills, and the chance to present their findings to Company leaders. Successful interns may be evaluated for future employment based on their performance. This program supports interns while also enhancing Nouryon's employer branding and strengthening our talent pipeline.

Additionally, Nouryon's 2023 Global Mentorship Program provided a platform for employees to engage in reciprocal learning by either becoming a mentor or a mentee, thereby fostering professional growth and development. This program includes learning segments and virtual seminars that facilitate knowledge exchange and skill enhancement. Mentors and mentees schedule regular meetings, promoting continuous learning and development. The program also encourages cross-functional interaction, broadening the participants' perspective of the organization. This mentorship initiative is a testament to Nouryon's commitment to nurturing talent and cultivating a culture of continuous learning and improvement.

Nouryon's Diversity Progress

GRI 405 3-3, GRI 405-1

Nouryon values the contribution of employees with diverse backgrounds, experiences, and perspectives, recognizing their vital role in understanding, anticipating, and fulfilling the needs of our global customer base, today and in the future. With 36% representation of gender and racial/ethnic diversity on our Board of Directors⁶¹ and 23% female representation among mid-level managers and above⁶², we are steadily making progress.

Our 2023 Performance

We continued offering multiple courses in leadership, including inclusive leadership training, to our leadership teams and budding leaders through our Senior Leadership Development Program.

We gained a deeper understanding of the existing diversity within our organization by analysing data. In addition, we continued our support to several initiatives aimed at promoting diversity in science, technology, engineering, and mathematics (STEM) fields, such as:

- Encouraging the growth of the Nouryon Women's Network, which is dedicated to connecting and empowering women in chemistry through networking and professional development opportunities.
- Celebrating International Women's Day and International Day of Women and Girls in Science.
- Collaborating with the Society of Women Engineers, National Society of Black Engineers and the Society of Hispanic Professional Engineers to offer career opportunities to female engineering students and professionals.

⁶¹ Board Members who are female and/or of a US racial/ethnic minority.

⁶² Mid-level managers are defined as the management paygrade below the first senior-executive level. Source data December 2023.

7.3 Sustainable Sourcing

We encourage our suppliers to join us in our journey towards a sustainable future, ensuring that they evolve in sustainability in tandem with Nouryon and our customers. Every business partner, including our suppliers and customers, is required to comply with our Business Partner Code of Conduct. This outlines our expectations in terms of compliance, safety, ethics, human rights, fraud prevention, and sustainability support.

In 2023, we expanded the proportion of spend assessed for sustainability by EcoVadis to 66%, up from 60% in the preceding year. Additionally, in 2023, we became a member of Together for Sustainability (TfS), which has enabled us to strengthen our supplier audit capabilities and gain access to industry best practices, which we believe will benefit our customers and business partners by enhancing sustainability in our supply chain. TfS, founded in 2011, unites more than 50 member companies committed to elevating sustainability standards in the chemical industry.

TfS supports the principles of the UN Global Compact and Responsible Care® and partners with several industry councils. Membership provides access to TfS Assessments and Audits, enabling companies to evaluate and enhance sustainability performance. These tools measure supplier performance in environmental, labor, and human rights, ethical, and sustainable procurement areas, bringing about change beyond the chemical industry. The TfS Scope 3 greenhouse gas (GHG) emissions program assists members in reducing their emissions, offering tools to calculate and share high-quality product carbon footprints of chemical materials.

Driving Sustainability with Our Suppliers

We employ EcoVadis and EcoVadis Risk IQ to evaluate and monitor the sustainability performance and risk of our suppliers across multiple categories, including environment, labor and human rights, ethics, and sustainable procurement. EcoVadis scores are based on the Company's policies, actions, and results. If a supplier fails to meet specific performance criteria, we implement a corrective action process with such non-compliant suppliers to stimulate improvement or explore alternative sourcing when necessary. In 2023, 91 suppliers were engaged by global procurement to either participate in an EcoVadis assessment or implement a corrective action plan resulting in positive conversations and engagement to promote supplier's sustainability journeys.

As outlined in our Sustainable Procurement Policy, suppliers that remain non-compliant and do not improve beyond our defined threshold are identified for phasing out. This approach gives us an opportunity to engage our suppliers on sustainability matters and promote improvement.



Commissioning chlorine dioxide plant for Arauco in Chile, boosting pulp production capacity

Nouryon successfully commissioned a chlorine dioxide plant at the Arauco pulp mill in Chile in 2023. This milestone project, known as the MAPA project and the largest of its kind in the Biobio region, represents a \$2.35 billion investment by Arauco and has significantly expanded the mill's capacity by an additional 1.56 million tons of eucalyptus pulp per year. This will bolster Arauco's manufacturing capabilities and position to better meet the growing global demand in the paper and pulp market.

Nouryon led the design, commissioning, and start-up services of the onsite chlorine dioxide plant, providing Arauco with the supply of essential raw materials for their pulp production. This strategic supply not only optimizes Arauco's systems and cost controls but also increases their production reliability.

Our 2023 Performance

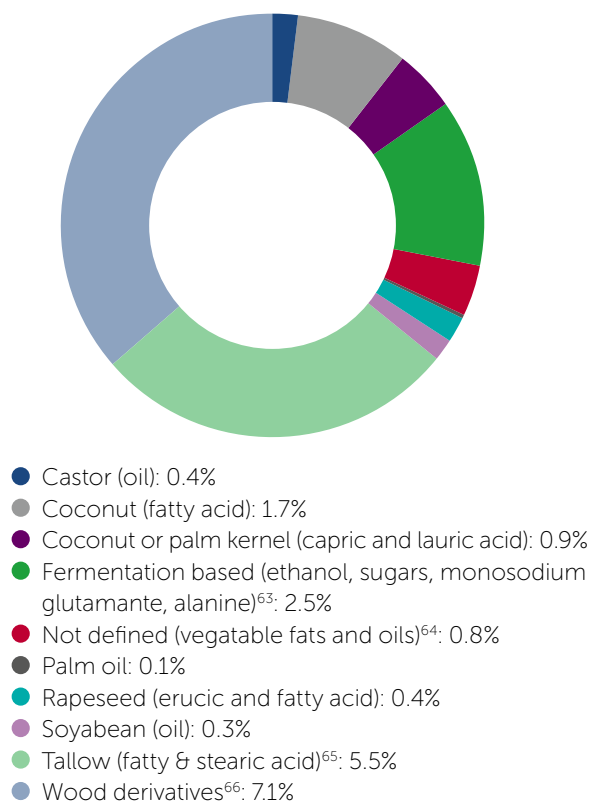
We continued to educate Nouryon category managers about sustainable sourcing and supplier requirements, including our sustainability approach and goals, with plans for new training opportunities. The goals and metrics supporting our EcoVadis sustainability assessment and rating are integrated into the individual performance objectives of our Procurement team.

We assessed 90% of our suppliers for CSR risk using the EcoVadis Risk IQ tool (% of external spend), and 66% of suppliers were evaluated on their CSR performance by an EcoVadis score (% of external spend). This practice enables us to promote sustainability within our supply chain and serve our customers with credibility and confidence.

Through this supplier assessment, we are also able to reward compliance with our sustainability standards, taking their EcoVadis raw materials score in addition to exceptional partnership in sustainability, reliability, and strategic partnership into consideration. Our 2023 Supplier of the Year Award recognized LyondellBasell, Altivia, Sabic, Borregaard, Brenntag, Geodis and Independent Container Line (ICL) for outstanding collaboration. For more information, see [page 80](#).

We continued to explore market availability of lower-carbon alternative raw materials prioritizing materials that contribute the highest emissions in our production processes. By prioritizing our top emission contributing raw materials, we are able to make the largest positive impact as we look at reducing the product carbon footprint of our customers and lowering our upstream Scope 3 GHG emissions. We will continue this practice as we progress our Carbon Business Strategy and explore how these initiatives can contribute to improvements in our Scope 3 carbon footprint.

Bio-based raw materials purchased by Nouryon



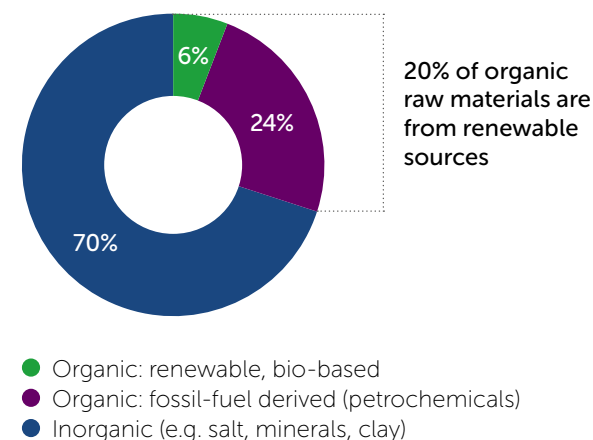
⁶³ Ethanol (crop depends on region, but ~70% of world production is derived from sugar cane, sugar beets, and molasses); monosodium glutamate; alanine (from sugar beets, sugar cane, tapioca, molasses, and corn); sugars (glucose and others, from corn, rice, wheat, cassava, corn husk, and sago); acids (dimer, gluconic, citric, sebacic, tartaric, etc., from various sources)

⁶⁴ Other fatty acids (e.g. in surfactants, from coconut, cotton seed, soybean, sunflower, dehydrated castor, linseed, tung, palm, tall oil (TOFA), and other sources); glycerin (mainly a by-product from bio-diesel; biodiesel can be made from a variety of vegetable oils and animal fats, including soybean, rapeseed, palm, jatropa, sunflower, algae, used cooking oil, tallow, etc.); fatty alcohols (from plant sources such as palm and coconut trees)

⁶⁵ Stearic acid is predominately produced from tallow; however, it can originate from other fats and oils.

⁶⁶ Cellulose, tall oil, gum rosin, etc.

Share of total raw materials



Genetically Modified Organisms

Nouryon does not manufacture genetically modified organisms (GMOs). We neither sell products that utilize GMOs to deliver any specific functionality, nor employ GMOs in manufacturing processes to impart variability. Certain raw materials that we use, such as soybean oil and cotton linter cellulose, are derived from crops that are produced from GMOs prior to our usage.



Supporting Responsible Palm Oil

Palm oil is a key bio-based feedstock in our operations. We support the industry benchmark for sustainable palm oil, represented by the [Roundtable on Sustainable Palm Oil \(RSPO\)](#), and have secured [RSPO Mass Balance \(MB\)](#) certification at five of our facilities. We use processed palm oil products, which means that we do not have any direct interaction with palm mills or plantations. However, through continued engagement with our suppliers, we strive to source from suppliers that do not contribute to further deforestation or violate the rights of workers and local communities. We believe that palm oil can be cultivated in a responsible way, and we remain committed to options that are not associated with environmental or social issues within the supply chain.

The EU Deforestation Regulation, [regulation (EU) 2023/1115], reporting requirements begin in December 2024. Nouryon is preparing all required due diligence surrounding any imported product as declared on Annex I [of regulation (EU) 2023/1115] to ensure we are compliant to all regional and global legislations.



Partnering to Offset CO₂ with Reforestation

Through our collaboration with Tree-Nation, a non-profit entity enabling individuals and corporations to plant trees globally and neutralize CO₂ emissions, we have successfully planted 7,462 trees. This initiative led to the reforestation of six hectares and the capture of a total of 2,298 tonnes of CO₂.



Our 2023 Supplier of the Year Awards

We recognized seven of our top global supply chain partners through Nouryon's annual 2023 Supplier of the Year Awards event held in Miami, FL, US. The suppliers were selected and assessed based on business criticality, growth, reliability, and sustainability performance as well as actions taken to improve our competitiveness in 2023.

The winners were:

- Altivia
- Borregaard
- Brenntag North America, Inc.
- Geodis
- Independent Container Line (ICL)
- LyondellBasell Industries
- Sabic

7.4 Policy Engagement and Memberships

We engage with legislative and regulatory authorities, industry and trade associations, and non-governmental organizations in our key markets. We also contribute to policy dialogue on sustainability within our sector through trade associations, focusing on areas such as climate mitigation and adaptation, energy, carbon reduction, water management, waste management, product and process safety, and circular chemistry.

Managing Engagement on Policy

We manage our direct and indirect interactions with policy makers and associated organizations. The scope and business impact of specific policy issues are evaluated during our annual business review meetings and our Enterprise Risk Management assessment process. This ensures that any public-policy-influencing activities align with our business strategy. If inconsistencies arise, they are promptly flagged for action by the Government Affairs team, which then communicates with the relevant businesses and functions within Nouryon.

In accordance with the Nouryon Code of Business Conduct & Ethics and our Company policies, Nouryon does not provide any financial contributions or endorsements to political parties or politicians. Nouryon does not operate a political action committee (PAC) in the US, nor does the Company contribute to the PACs of industry and trade associations to which we belong.

We engage with governments, regulators, and legislators on the development of proposed policies relevant to our business. These policies can pertain to a wide range of areas, from tax and employment issues to safety and chemicals management policy. We aim to support policies that are adequate, clear, stable, predictable, comprehensive,

economically efficient, and well designed to achieve societal goals at the lowest cost. Moreover, we seek to support policies that align with and bolster our positions, including our sustainability aspirations.

In the US, we are a member of the American Chemistry Council (ACC), and we have voluntarily contributed to the development of ACC sustainability metrics.

In Europe, as a member of the European Federation of the Chemical Industry (CEFIC), we have proactively engaged within industry and trade associations to adopt a constructive and proactive approach to the EU Green Deal and the EU Chemicals Strategy for Sustainability. We not only concentrate on the risks and challenges these new proposals pose for our industry, but also focus on opportunities via new business models and innovation and have been a proponent of a value-chain approach.

In China, we are actively involved in the advocacy efforts of industry and trade associations related to the ongoing development of Chinese legislation on chemicals management and a cap-and-trade system for carbon emissions. For example, we are a member of the China Petroleum and Chemical Industry Federation (CPCIF). We have actively engaged through CPCIF on the advocacy of Chinese legislation and regulatory developments related to chemicals' management, particularly environment protection and safety. Most recently, we collaborated with CPCIF, to include China Organic Peroxide Safety Group, an independent group of organic peroxide producers in China to better promote safety excellence and best practice of sustainability. In parallel, one of our regional leaders has been a Board Director of the Association of International Chemical Manufacturers (AICM) since 2023, and a Sponsor Director of the Responsible Care Committee of AICM.





Our memberships

GRI 2-28

Americas

American Chemistry Council (ACC); American Cleaning Institute (ACI); Council of Producers & Distributors of Agrotechnology (CPDA); American Coatings Association (ACA); Texas Chemistry Council (TCC); Association of Water Treaters (AWT); American Composites Manufacturing Organization (ACMA); Chemistry Industry Association of Canada (CIAC); Brazilian Association of the Chemical Industry (ABIQUM).

Asia

China Petroleum and Chemical Industry Federation (CPCIF); Association for International Chemical Manufacturers in China (AICM); EU Chamber of Commerce in China (EUCCC); American Chamber of Commerce in Shanghai (AmCham Shanghai); China Cleaning Industry Association; Ningbo Petrochemical and Chemical Industry Association; Taizhou Energy Saving Technology Development Association; Suzhou Society of Environmental Science; Suzhou Chemical Industry Association; Singapore International Chamber of Commerce (SICC).

Europe

European Federation of the Chemical Industry (CEFIC); European Committee of Organic Surfactants and their Intermediates (CESIO); European Biocidal Products Forum (EBPF); Association for the German Chemical Industry (VCI); Association of the Dutch Chemical Industry (VNCI); Confederation of Netherlands Industry and Employers (VNO-NCW); Dutch Association for Energy, Environment and Water (VEMW); Samenwerkende Bedrijven Eemsmond (SBE – 'Cooperation of businesses in the Eemsmond area'); Association for Innovation and Chemical Industries in Sweden (IKEM); Chemical Industry Federation of Finland.

Nouryon executives holding board-level positions with trade associations include:

- **Larry Ryan**, our President, serves as a board member of the ACC.
- **Johan Landfors**, our Executive Vice President Strategy & Asset Planning and President of Europe, serves as a board member of the executive committee of CEFIC, and a board member of IKEM.
- **Egbert Henstra**, our Senior Vice President, Transformation and Strategy Performance Formulations, serves as a board member of the Association of VNCI.
- **Suzanne Carroll**, our Senior Vice President, Home and Personal Care serves as a board member of the American Cleaning Institute (ACI).



7.5 Engaging Our Communities and Employees

At Nouryon, our CSR framework is firmly rooted in volunteerism, active participation, and corporate donations, aimed at fostering positive change within the communities we serve. As a global organization, we place a high value on interacting with diverse groups and establishing alliances with like-minded organizations that uphold our principles.

Our 2023 Performance

The celebration of Safety Day included the launch of Nouryon Cares, an embodiment of many of the aspects previously mentioned. Nouryon Cares is a fresh approach that highlights how we exhibit care for ourselves, our colleagues, and our communities. The community initiatives under Nouryon Cares are centered around STEM education (science, technology, engineering, and mathematics), sustainability and environmental stewardship, safety and health, and cultivation of an innovative culture of responsible citizenship and global business collaborations. When it comes to caring for our communities, we have witnessed an exceptional display of volunteerism and philanthropy from our global locations. For additional details, see [page 84](#).



Expanding our community partnership with Philadelphia Eagles

In 2023, Nouryon expanded our community partnership with the Philadelphia Eagles in the US. This collaboration includes volunteerism, employee and community engagement, and philanthropy through the Eagles Autism Foundation, Eagles Autism Challenge, and Nouryon All-Pro Teachers program. The 9/11 Meal Pack Day was added in 2023. We also sponsor Eagles home games at Lincoln Financial Field.

Nouryon supports several Eagles-led initiatives. The Nouryon All-Pro Teachers program recognizes outstanding school teachers in Greater Philadelphia region. Each of the 10 teachers are recognized at an Eagles home game, and celebrated with a formal induction ceremony where one honoree is named Nouryon All-Pro Teacher of the Year.

Nouryon also partnered with the Eagles Autism Foundation and Popcorn for the People to provide job opportunities in the Philadelphia area to members of the neurodiverse community. A concession stand was activated in 2023, where Nouryon employee volunteers sold popcorn to Eagles fans during football games. This partnership also contributed to opening a new popcorn manufacturing location in Philadelphia that employs members of the local neurodiverse community.

In 2023, Radnor office employees participated in the Eagles Autism Challenge, raising more than \$18,000 for the Eagles Autism Foundation. Nouryon employees also joined the Philadelphia Eagles and the 9/11 Day organization for a meal pack event at Lincoln Financial Field, packing meals for a local food bank, Philabundance, during Hunger Action Month.

Other examples of 2023 CSR engagement activities at our locations around the world included:

Supporting STEM education:

- Enhancing a rural college's science lab infrastructure, India: Our Mahad site donated vital laboratory equipment to a local college serving underprivileged rural communities, strengthening infrastructure, and enriching students' scientific learning experiences.
- Inspirational chemistry project in local schools, Sweden: Nouryon sponsors Molekylverkstan Science Center in Stenungsund, promoting science education among children and youth. We also provided lab coats to high school students involved in KemInspiration, a program where they visit local primary schools to teach younger students about the exciting world of chemistry.
- Fill The Bus Program, US: Battleground site employees contributed to the La Porte School District's Fill The Bus school supply drive, a collective initiative by the Local Emergency Planning Commission, where donated supplies were packed into backpacks and distributed to students. The Pasadena site continues to support the Fill the Bus program since its inception in 2018.
- School supply drives, US: Morris, IL site employees donated more than \$1,000 worth of school supplies to support families in the Minooka School District. Alameda (Houston) site employees provided school supplies for the students of Alameda Elementary.
- Kids In Need Foundation: Four office locations in the US – Radnor, Chicago, Houston, and Bridgewater – volunteered to pack backpacks with essential school supplies. Since 2021, Nouryon has partnered with the Kids in Need Foundation, an organization that collaborates with teachers and students in under-resourced schools to offer the necessary support for effective teaching and learning.

Community service initiatives:

- [Open-to-Public \(OTP\) programs, China](#): In a series of OTP programs from July to September 2023, Nouryon focused on community care activities across its China manufacturing sites. Notably, Ningbo site employees visited a local elderly welfare home and those from the Guangzhou site led a park cleanup initiative. Read more on [page 85](#).
- [Vatsalya Trust Balikashram, India](#): We extend our support to this orphanage that provides shelter, nutrition, medical assistance, education, and developmental aid to approximately 50 underprivileged girls ages 6 to 18 years. Beyond financial contributions, Nouryon employees frequently volunteer their time to interact and engage with these children.
- Holiday support to the needy, US: Employees and contractors from the Battleground site, Fort Worth site, and employees from our Chicago office in the US generously supported local toy donation drives by contributing a range of toys, games, and bikes, bringing holiday cheer to the underprivileged children. Additionally, the Morris site team raised \$4,350 in their annual fundraiser, providing holiday support to local families facing hardships.
- Cooking meals for families in need, Sweden: Our Gothenburg team cooked meals for families at the Ronald McDonald House, using ingredients donated by Nordic Business Center employees, offering support to these families with seriously ill children undergoing treatment at the nearby hospital.
- Supporting local sailing school for children and teenagers with functional disabilities, Sweden: Berget site employees assisted the Stenungsund Sailing Society's "Access Sailing" program, helping coach and ensure safety for children and teenagers with functional disabilities.
- Easter Solidarity Campaign, Brazil: Employees from Jundiai and Itupeva sites collected over 400 boxes of chocolate candies for needy children. The donations, supported by the NGO Abraçando as Ruas, were distributed in impoverished communities, including Meias Aço.



Supporting Vatsalya Trust Balikashram orphanage in Mumbai, India

Aligned with our commitment to engage and collaborate with our communities, Nouryon India supports Vatsalya Trust Balikashram, an orphanage for underprivileged girls. Established in 2000, the Balikashram provides shelter, education, and developmental support to about 50 girls aged 6-18, aiming to foster self-reliance through higher education and vocational training. Nouryon employees also volunteer, interacting with the children and participating in various activities.



Open-to-Public (OTP) programs across China sites

From July to September 2023, Nouryon, in collaboration with the International Association of Chemical Manufacturers (IACM), hosted a series of Open-to-Public (OTP) programs across our manufacturing sites in China. The programs, themed "Chemistry Enables Sustainable Future", engaged over 300 participants in activities like family days, community care, and safety programs. Highlights included Employee Family Day at Tianjin, Taixing, and Boxing sites, community outreach at Ningbo, and a park cleanup at Guangzhou. Nouryon's decade-long participation in IACM's OTP program culminated in the Best OTP Practice Award in 2023, with this year also marking Nouryon's fifth anniversary with the program.

Sanitation drives:

- Litter collection drive, US: Chicago office employees participated in a beach cleanup event under the Alliance for the Great Lakes Adopt-a-Beach program, collecting 56 pounds of litter to help protect the environment.
- Household hazardous waste collection day, US: Our employees volunteered at LaPorte's annual household hazardous waste collection day and helped collect and recycle various waste items from 250 cars, contributing to environmental sustainability.

Health and safety initiatives:

- Volunteering at Chattanooga and Houston Food Bank, US: Our US employees regularly volunteer to sort and repackage food items during collection drives for community distribution. Thousands of pounds of food have been repackaged for food banks in the Houston and Chattanooga area.
- Collection drive for the local food bank, Netherlands: With enthusiastic support from management and staff, Rotterdam employees initiated a food/non-food collection drive for the local food bank benefiting those in need in the community.
- Volunteering at the annual Safety Fair Day, US: Employees from the Battleground and Pasadena sites volunteered at the annual Safety Fair Day, an event organized by the La Porte Local Emergency Planning Commission.
- Blood donation drives, US: Our employees have donated blood, and their support has been vital in helping the Gulf Coast Regional Blood Center save numerous lives. Especially during the summer months, when the need for blood donations escalates, Nouryon employees have consistently stepped up, demonstrating their dedication to this commendable cause.
- Earthquake relief fund, Turkey and Syria: Nouryon donated to the International Committee of the Red Cross and Global Giving Earthquake Relief Fund in response to the earthquakes in Turkey and Syria. We also encouraged our employees to contribute to these relief efforts directly.

- Community partnership with the Philadelphia Eagles: Since 2021, Nouryon has collaborated with the famed National Football League team on several initiatives, including the Eagles Autism Foundation, the Eagles Autism Challenge, and the Nouryon All-Pro Teachers program. In 2023, we also participated with the Eagles on the 9/11 Meal Pack Day helping to package millions of nutritious meals for Americans at risk of hunger. Read more on [page 83](#).

Nouryon continues to foster a strong relationship with local communities where we operate, emphasizing the importance of education, promotion of science, environmental protection, healthcare, and sanitation. We also encourage volunteerism among our employees, contributing to societal need, thus reflecting our commitment to holistic community development and ecological sustainability.

Closing Word from Our Chief Sustainability and Communications Officer



Thank you for reading about Nouryon's ongoing sustainability commitment and the impactful initiatives within our Company, and around the world, supporting our progress last year.

This progress would not be possible without our partners, including our appreciated customers, our suppliers, our communities, and certainly not our valued employees. The collective progress we have achieved in 2023 reflects our dedication to making a positive impact.

Each year, we take pride in presenting the tangible data and case studies that underpin our focus areas and progress. We invite you to explore the fact sheets and tables in the following pages, which offer quantitative insights and serve as a testament to our continued effort to contribute to a sustainable future.

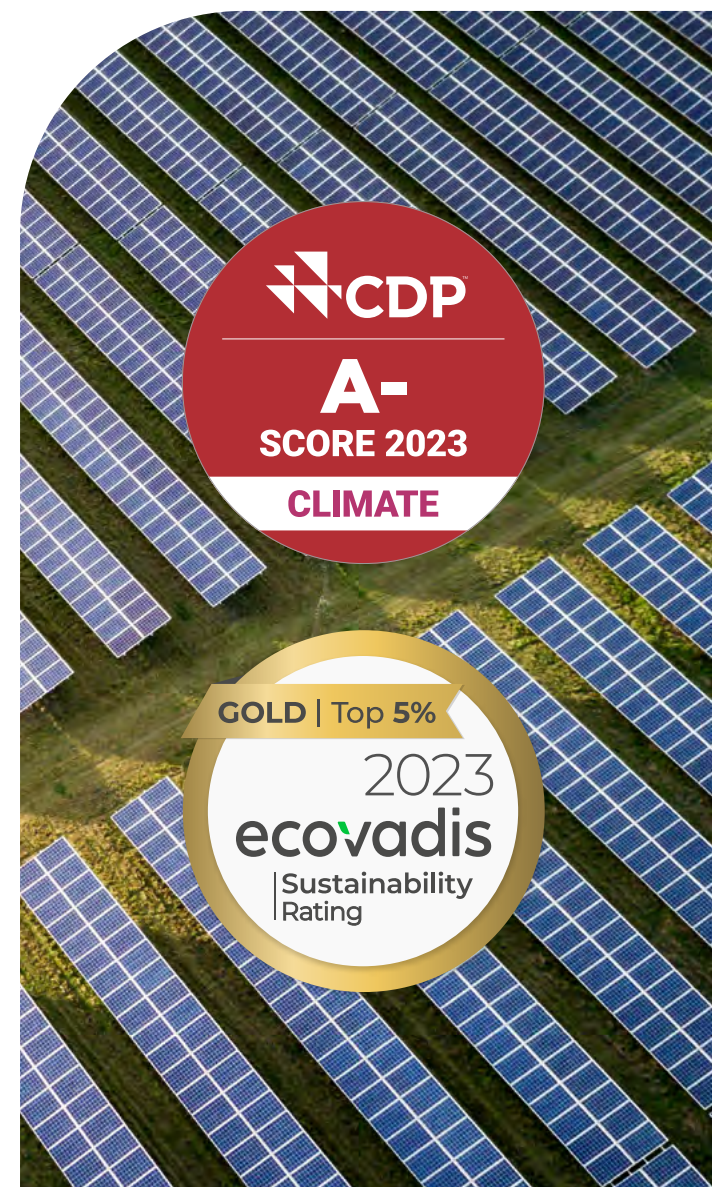
For a more in-depth understanding of Nouryon, we encourage you to visit [Nouryon.com](https://nouryon.com). There, you will discover extensive information detailing our commitment to a sustainable future, as well as more about our product offerings and the markets we serve.

Once again, we express our gratitude for your interest in Nouryon. Whether you engaged with our 2023 Sustainability Report as a customer, supplier, employee, candidate, business partner, or community stakeholder, we take pride in being your partner in essential solutions for a sustainable future.

Thank you and best regards,

Vivi Hollertt

Vice President, Chief Sustainability and Communications Officer



Fact Sheet^{67,68}

Environment (1/3)

	Unit	2019	2020	2021	2022	2023	Progress toward target ⁶⁹
Company carbon footprint							
Total absolute direct and indirect emissions market-based (Scopes 1 and 2)	Thousand tonnes CO ₂ e	1,506	1,488	1,467	1,498	1,294	-14%
Carbon intensity (Scopes 1 and 2 combined)	Kg CO ₂ e/Tonne of production	408	416	395	411	384	n/a
Direct absolute GHG emissions (Scope 1) ^{70,71}	Thousand tonnes CO ₂ e	588	604	620	636	563	n/a
Direct GHG emissions (Scope 1) intensity	Kg CO ₂ e/Tonne of production	159	169	167	174	167	n/a
Indirect GHG emissions market-based (Scope 2) ^{72,73}	Thousand tonnes CO ₂ e	918	884	847	862	731	n/a
Indirect GHG emissions market-based (Scope 2) intensity	Kg CO ₂ e/Tonne of production	249	247	228	236	217	n/a
Indirect GHG emissions location-based (Scope 2)	Thousand tonnes CO ₂ e	1,276	1,196	1,199	1,254	1,241	n/a
Calculated Scope 3 total absolute GHG emissions	Thousand tonnes CO ₂ e				4,427	4,097	n/a
Total absolute GHG emissions (Scope 1, Scope 2 market-based, and Scope 3)	Thousand tonnes CO ₂ e				5,926	5,391	n/a
Direct emissions, covered by emissions-limiting regulations	% of direct emissions	22%	25%	25%	27%	24%	n/a
Energy Management							
Total energy consumption ⁷⁴	Mln GJ	30.4	30.7	32.7	33.4	31.5	n/a
Total energy consumption intensity ⁷⁴	GJ/Tonne of production	8.24	8.59	8.81	9.15	9.34	n/a
Percentage renewable energy consumed ⁷⁵	%	30%	38%	38%	34%	33%	n/a
Percentage renewable electricity consumed	%	36%	48%	49%	39%	42%	n/a
Percentage energy from grid electricity	%	62%	61%	60%	59%	61%	n/a
Energy consumption from unbundled RECs ⁷⁶	MWh				40,312	59,554	n/a
Carbon offsets purchased ⁷⁷	Tonnes CO ₂				200	127	n/a
Total self-generated electricity	Mln GJ	-	-	-	-	-	n/a

⁶⁷ For all figures, minor corrections to historical data may be made to improve accuracy or based on methodology updates. Environmental and Energy metrics have been updated to include data from the acquired Polish sites, including historical data back to 2019: this provides a consistent basis for comparing performance on our targets (carbon water, and waste) vs. the base year. In our internal reporting procedures, we recalculate base year data in cases where the change is material (5% or more).

⁶⁸ All metrics are calculated according to our [Reporting Principles 2023](#).

⁶⁹ Percentage change 2019-2023.

⁷⁰ Scope 1 does not include process emissions from other greenhouse gases (CH₄, N₂O, Hydrofluorocarbons, and Perfluorocarbons) and their CO₂ equivalents. For 2023 in Scope 1, this was estimated to be less than 2% and not included.

⁷¹ Including Carbon offsets purchased to compensate for Scope 1 emissions in our carbon neutral sites.

⁷² Scope 2 does not include process emissions from the other greenhouse gases CH₄, N₂O, Hydrofluorocarbons, and Perfluorocarbons, as per Nouryon's [Reporting Principles 2023](#).

⁷³ Including RECs retired on our behalf for utility supplied renewable electricity and other utility contractual instruments.

⁷⁴ Energy consumption is expressed in mln GJ which is the sum of the actual consumed by the sites.

⁷⁵ Renewable-energy data include renewable fuels such as biomass, purchased renewable steam, and renewable electricity from solar, wind, and hydro power.

⁷⁶ RECs retired on our behalf for utility supplied renewable electricity and other utility contractual instruments.

⁷⁷ Carbon offsets purchased to compensate for Scope 1 emissions in our carbon neutral sites. Offsets are not included in our emissions inventory (Scopes 1, 2, or 3). These offsets have been certified by the Verified Carbon Standard (VCS), administered by Verra, and retired. For more information, see www.verification.org. Offsets are applied to prior year emissions.

Environment (2/3)

	Unit	2019	2020	2021	2022	2023	Progress toward target ⁷⁸
Air Quality							
NOx absolute emissions	Tonnes	471	482	513	527	468	n/a
NOx emission intensity	Kg/Tonne of production	0.13	0.13	0.14	0.14	0.14	n/a
SOx absolute emissions	Tonnes	3,533	3,135	3,288	3,333	3,446	n/a
SOx emission intensity	Kg/Tonne of production	0.96	0.88	0.89	0.91	1.02	n/a
VOC absolute emissions	Tonnes	669	1,172	1,938	1,792	1,853	n/a
VOC absolute emission intensity	Kg/Tonne of production	0.18	0.33	0.52	0.49	0.55	n/a
Hazardous air pollutants	Tonnes			374	357	408	n/a
Hazardous air pollutants intensity	Kg/Tonne of production			0.10	0.10	0.12	n/a
Emission to Water – Chemical Oxygen Demand (COD)							
COD absolute emissions to surface water	Tonnes	845	768	896	854	836	n/a
COD emission intensity to surface water	Kg/Tonne of production	0.23	0.21	0.24	0.23	0.25	n/a
COD absolute emissions to external wastewater treatment	Tonnes	15,257	16,515	17,917	18,447	15,380	n/a
COD emission intensity to external wastewater treatment	Kg/Tonne of production	4.13	4.60	4.81	5.04	4.56	n/a
Water Management							
Absolute freshwater intake	Thousand m ³	134,868	147,270	161,652	153,407	151,543	n/a
Freshwater intake intensity	m ³ /Tonne of production	36.5	41.1	43.4	41.9	44.9	n/a
Percentage in regions with high water stress	%	2.3%	2.0%	1.6%	2.0%	2.0%	n/a
Absolute freshwater consumption ⁷⁹	Thousand m ³	15,427	14,786	14,349	14,497	14,295	n/a
Freshwater consumption ⁷⁹ intensity	m ³ /Tonne of production	4.18	4.12	3.85	3.96	4.24	1%
Percentage in regions with high water stress	%	19%	20%	18%	18%	21%	n/a
Waste Management							
Total absolute waste	Tonnes	62,587	59,449	63,243	68,959	56,393	n/a
Total waste intensity	Kg/Tonne of production	17.0	16.6	17.0	18.9	16.7	-1%
Absolute non-hazardous waste	Tonnes	45,143	41,718	42,146	44,652	35,368	n/a
Non-hazardous waste intensity	Kg/Tonne of production	12.2	11.6	11.3	12.2	10.5	n/a
Absolute hazardous waste	Tonnes	17,444	17,731	21,097	24,306	21,025	n/a
Absolute hazardous waste to landfill	Tonnes	417	465	268	548	193	n/a
Percentage hazardous waste reused	%	24%	28%	33%	24%	26%	n/a

⁷⁸ Percentage change 2019-2023.

⁷⁹ Total freshwater consumption (excluding once through cooling water intake) [1,000m³].

Environment (3/3)

	Unit	2019	2020	2021	2022	2023	Progress toward target ⁸⁰
Production							
Performance Formulations	Thousand tonnes	2,028	1,964	1,996	1,912	1,686	n/a
Technology Solutions	Thousand tonnes	1,662	1,622	1,729	1,747	1,689	n/a
Sustainable Sourcing							
Percentage suppliers screened using Risk IQ ⁸¹	% of spend			96%	94%	90%	n/a
Percentage suppliers measured on EcoVadis performance ⁸²	% of spend			50%	60%	66%	n/a
Percentage suppliers acknowledging our Business Partner Code of Conduct ⁸³	% of spend			98%	99.74%	99.81%	n/a
Percentage of bio-based raw materials (portion of organic materials)	% of organic portion (by mass)	20%	21%	22%	22%	20%	n/a
Management Systems⁸⁴			Per April, 2021	Per February 28, 2022	Per March 23, 2023	Per December 31, 2023	
Percentage of manufacturing sites with ISO-14001/RC-14001 certifications	%		77%	84%	98%	95%	n/a
Percentage of manufacturing sites with ISO-9001 certifications	%			88%	88%	82%	n/a

Social

	Unit	2019	2020	2021	2022	2023
Workforce Data⁸⁵						
Global headcount Nouryon employees	#	10,389	9,730	7,771 ⁸⁶	7,909	8,236
Percentage female in workforce	%	24%	23%	25%	25%	25%
Percentage female mid-level managers and above ⁸⁷	%	25%		20%	23%	23%
Percentage employee turnover rate (voluntary and involuntary)	%	17%	14%	14%	15%	13%
Safety⁸⁸						
Total Recordable Incident Rate (TRIR) – Nouryon Employees, temporary workers and contractors	Per 200,000 hours worked	0.26	0.23	0.17	0.30	0.25
Lost Time Incident Rate (LTIR) – Nouryon Employees, temporary workers and contractors	Per 200,000 hours worked	0.07	0.13	0.09	0.16	0.07
Management Systems			Per April 2021	Per February 28, 2022	Per March 23, 2023	Per December 31, 2023
Percentage of manufacturing sites with OHSAS-18001/RC-18001 and ISO45001 certifications	%		39%	39%	44%	42%

⁸⁰ Percentage change 2019-2023.

⁸¹ In terms of all external spend (product, non-product, energy, logistics, etc.) The Risk IQ tool considers industry segment risk, country risk and EcoVadis scores from the complete EcoVadis database.

⁸² Based on policies, actions, results. For more information: <https://ecovadis.com/>

⁸³ Tracked by acceptance of a Nouryon Purchase Order or a signed Nouryon contract.

⁸⁴ Our ISO certification percentage metric includes sites that have been in our portfolio for one year. This is to allow sufficient time required for activities reviewed by the certification process (e.g., pre-start up safety reviews, management reviews, production, and/or internal audits if relevant). Any exceptions will be identified.

⁸⁵ Workforce data prior to 2021 includes Nobian employees (Nobian's separation from Nouryon occurred in 2021). 2021 workforce data excludes Nobian employees.

⁸⁶ Headcount and similar metrics may differ slightly, depending on exact collection date, due to timing of reporting schedules, divestments, and acquisitions, as well as regular workforce fluctuations.

⁸⁷ Mid-level managers are defined as the management paygrade below the first senior executive level. Source data, December 2023.

⁸⁸ 2023 People Safety data are excluding the sites in Poland, see our [Reporting Principles 2023](#) for additional explanation.

Governance

	Unit	2019	2020	2021	2022	2023
Board		Per December 31, 2019	Per December 31, 2020	Per December 31, 2021	Per December 31, 2022	Per December 31, 2023
Directors	#	9	10	11	11	12
Average director tenure (years)	#	1	2	2	3	4
Independent directors	#	8	9	10	10	11
Percentage independent directors (%)	%	89%	90%	91%	91%	92%
Board Diversity		Per December 31, 2019	Per December 31, 2020	Per December 31, 2021		
Women on the Board	#	0	1	3	3	3
Percentage women on the Board	%	-	10%	27%	27%	25%
Board members of racial/ethnic minority	#	0	0	1	1	1
Percentage board members of racial/ethnic minority	%	-	-	9%	9%	8%
Percentage board diversity	%	-	10%	36%	36%	33%
Board Coverage of Sustainability-related Issues						
Frequency of Board updates on sustainability-related issues		Quarterly	Quarterly	Quarterly	Quarterly	Quarterly
Board oversight of climate strategy	Y/N	Y	Y	Y	Y	Y
Policies and Statements						
Code of Conduct, anti-discrimination, anti-harassment	Y/N	Y	Y	Y	Y	Y
Anti-corruption, anti-bribery	Y/N	Y	Y	Y	Y	Y
Business Partner Code of Conduct, including suppliers	Y/N	Y	Y	Y	Y	Y
Health, Safety, Environment and Security, including product stewardship	Y/N	N	Y	Y	Y	Y
Palm oil statement	Y/N	N	Y	Y	Y	Y
Sensitive Country Policy	Y/N	N	Y	Y	Y	Y

Sustainable Accounting Standards Board Index

Sustainable Industry Classification System® (SICS®) RT-CH | Sector: Resource Transformation| Industry: Chemicals

Topic	Metric ⁹⁰	Code	Page
Greenhouse gas emissions	Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations	RT-CH-110a.1	54
	Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	RT-CH-110a.2	24
Air quality	Air emissions of the following pollutants: (1) NOx (excluding N2O), (2) SOx, (3) volatile organic compounds (VOCs), and (4) hazardous air pollutants (HAPs)	RT-CH-120a.1	54
Energy management	(1) Total energy consumed, (2) percentage grid electricity, (3) percentage renewable, and (4) total self-generated energy	RT-CH-130a.1	54
Water management	(1) Total water withdrawn and (2) total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress	RT-CH-140a.1	55
	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	RT-CH-140a.2	zero
	Description of water management risks and discussion of strategies and practices to mitigate those risks	RT-CH-140a.3	15
Hazardous waste management	Amount of hazardous waste generated; percentage recycled	RT-CH-150a.1	55
Community relations	Discussion of engagement processes to manage risks and opportunities associated with community interests	RT-CH-210a.1	83
Workforce health and safety	(1) Total recordable incident rate (TRIR) and (2) fatality rate for (a) direct employees and (b) contract employees	RT-CH-320a.1	89
	Description of efforts to assess, monitor, and reduce exposure of employees and contract workers to long-term (chronic) health risks	RT-CH-320a.2	35
Product design for use-phase efficiency	Revenue from products designed for use-phase resource efficiency	RT-CH-410a.1	56
Safety and environmental stewardship of chemicals	(1) Percentage of products that contain Globally Harmonized System of Classification and Labeling of Chemicals (GHS) Category 1 and 2 Health and Environmental Hazardous Substances, (2) percentage of such products that have undergone a hazard assessment	RT-CH-410b.1	45
	Discussion of strategy to (1) manage chemicals of concern and (2) develop alternatives with reduced human and/or environmental impact	RT-CH-410b.2	46
Genetically modified organisms	Percentage of products by revenue that contain genetically modified organisms (GMOs)	RT-CH-410c.1	79
Management of the legal and regulatory environment	Discussion of corporate positions related to government regulations and/or policy proposals that address environmental and social factors affecting the industry	RT-CH-530a.1	81
Operational safety, emergency preparedness, and response	Process Safety Incidents Count (PSIC), Process Safety Total Incident Rate (PSTIR), and Process Safety Incident Severity Rate (PSISR)	RT-CH-540a.1	43
	Number of transport incidents	RT-CH-540a.2	43
Production by reportable segment		RT-CH-000.A	55

GRI Standards Disclosure Summary

With reference to the Global Reporting Initiative (GRI) Standards. Management of Nouryon has reviewed and approved the GRI reported information. [GRI Requirement 8: Provide a statement of use] Except where stated otherwise, this report includes data from January 1 through December 31, 2023, which is aligned with our financial reporting period. For additional information contact sustainability@nouryon.com [GRI 2-3 Reporting period, frequency and contact point a. b.] For additional information on our metrics, see the Basis of our Reporting document.

GRI Universal Disclosure Summary

GRI Disclosure	GRI Disclosure Description	Page(s) in this index
2-3	Reporting period, frequency and contact point	92
2-5	External assurance	94
2-6	Activities, value chain and other business relationships	6, 60
2-7	Employees	73, 75
2-8	Workers who are not employees	73, 75
2-9	Governance structure and composition	10
2-10	Nomination and selection of the highest governance body	10
2-11	Chair of the highest governance body	10, 11
2-12	Role of the highest governance body in overseeing the management of impacts	12
2-13	Delegation of responsibility for managing impacts	11
2-14	Role of the highest governance body in sustainability reporting	10
2-15	Conflicts of interest	17
2-17	Collective knowledge of the highest governance body	10
2-18	Evaluation of the performance of the highest governance body	10
2-22	Statement on sustainable development strategy	6
2-23	Policy commitments	17, 18
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Material Topic Specific Disclosures

GRI Disclosure	GRI Disclosure Description	Page(s) in this index
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GRI 305: Emissions 2016		
3-3	Management of material topic	24, 47
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305-2	Energy indirect (Scope 2) GHG Emissions	24, 54
305-3	Other indirect (Scope 3) GHG Emissions	24, 54
305-4	GHG Emission Intensity	54
305-5	Reduction of GHG Emissions	24, 48
305-7	Nitrogen oxides (NOx), Sulfur oxides (Sox) and other significant air emissions	48
GRI 403: Occupational Health and Safety 2018		
3-3	Management of material topic	35
403-1	Occupational health and safety management system	35
403-2	Hazard identification, risk assessment, and incident investigation	35
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GRI 405: Diversity and Equal Opportunity 2016		
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416-1	Assessment of the health and safety impacts of product and service categories	44, 46
Nouryon specific material topic: Innovation and Product Development		
	Existing metrics - %R&D projects with a sustainable benefit	56
	% bio-based RMs	55

Independent Assurance Report

GRI 2-5

ERM Certification and Verification Services Limited ("ERM CVS") was engaged by Nouryon Speciality Chemicals BV ("Nouryon") to provide limited assurance in relation to the selected information set out below and presented in Nouryon's 2023 Sustainability Report (the "Report").

Engagement summary

Scope of our assurance engagement	Whether the corporate 2023 data for the following selected indicators (the "Selected Information") in Appendix A are fairly presented in the Report, in all material respects, in accordance with the reporting criteria. Our assurance engagement does not extend to information in respect of earlier periods or to any other information included in the Report.
Reporting period	1 st January 2023 – 31 st December 2023
Reporting criteria	<ul style="list-style-type: none">• WBCSD/WRI GHG Protocol, Scope 2 guidance and Corporate Value Chain (Scope 3) Accounting and Reporting Standard• Nouryon's Reporting Principles for all other metrics
Assurance standard and level of assurance	<p>We performed a limited assurance engagement, in accordance with the International Standard on Assurance Engagements ISAE 3000 (Revised) 'Assurance Engagements other than Audits or Reviews of Historical Financial Information' issued by the International Auditing and Assurance Standards Board.</p> <p>The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for a reasonable assurance engagement and consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.</p>
Respective responsibilities	<p>Nouryon is responsible for preparing the Report and for the collection and presentation of the information within it, and for the designing, implementing and maintaining of internal controls relevant to the preparation and presentation of the Selected Information.</p> <p>ERM CVS' responsibility is to provide conclusions to Nouryon on the agreed scope based on our engagement terms with Nouryon, the assurance activities performed and exercising our professional judgement.</p>

Our conclusion

Based on our activities, as described overleaf, nothing has come to our attention to indicate that the 2023 data and information for the disclosures listed under 'Scope' above are not fairly presented in the Report, in all material respects, in accordance with the reporting criteria.

Emphasis of Matter

Without affecting our conclusion, which is not modified, we draw attention to Footnote 19 on page 43 of the Report and the explanation provided by Nouryon relating to the exclusion of reporting sites.

Our assurance activities

Considering the level of assurance and our assessment of the risk of material misstatement of the Report a multi-disciplinary team of sustainability and assurance specialists performed a range of procedures that included, but was not restricted to, the following:

- Evaluating the appropriateness of the reporting criteria for the Selected Information;
- Interviews with management representatives responsible for managing the Selected Information;
- Interviews with relevant staff to understand and evaluate the management systems and processes (including internal review and control processes) used for collecting and reporting the Selected Information;
- A review at corporate level of a sample of qualitative and quantitative evidence supporting the Selected Information;
- An analytical review of the year-end data submitted by the locations included in the consolidated 2023 group data for the Selected Information which included testing the completeness and mathematical accuracy of conversions and calculations, and consolidation in line with the stated reporting boundary;
- In-person site visits to Nouryon facilities/production sites in Bohus (Sweden) and Magog (Canada), as well as a virtual visit to Morris, IL (USA), to review source data and local reporting systems and controls;
- Assessing the conversion and emission factors and assumptions used; and
- Reviewing the presentation of information relevant to the scope of our work in the Report to ensure consistency with our findings.

The limitations of our engagement

The reliability of the assured information is subject to inherent uncertainties, given the available methods for determining, calculating or estimating the underlying information. It is important to understand our assurance conclusions in this context.

Our independence, integrity and quality control

ERM CVS is an independent certification and verification body accredited by UKAS to ISO 17021:2015. Accordingly, we maintain a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements. Our quality management system is at least as demanding as the relevant sections of ISQM-1 and ISQM-2 (2022).

ERM CVS applies a Code of Conduct and related policies to ensure that its employees maintain integrity, objectivity, professional competence and high ethical standards in their work. Our processes are designed and implemented to ensure that the work we undertake is objective, impartial and free from bias and conflict of interest. Our certified management system covers independence and ethical requirements that are at least as demanding as the relevant sections of the IESBA Code relating to assurance engagements.

ERM CVS has extensive experience in conducting assurance on environmental, social, ethical and health and safety information, systems and processes, and provides no consultancy related services to Nouryon in any respect.



Gareth Manning
Partner, Corporate Assurance

London, United Kingdom
7 May 2024



ERM CVS
Informed Assured

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Appendix A

Indicator	Unit of Measurement
Direct absolute GHG emissions (Scope 1)	Thousand tonnes CO ₂ e
Indirect GHG emissions market-based (Scope 2)	Thousand tonnes CO ₂ e
Indirect GHG emissions location-based (Scope 2)	Thousand tonnes CO ₂ e
Total energy consumption	Million GJ
Energy consumption from unbundled RECs	MWh
Total energy consumption intensity	GJ/tonne of production
Percentage renewable energy consumed	%
NOx absolute emissions	Tonnes
NOx emissions intensity	Kg/Tonne of production
SOx absolute emissions	Tonnes
SOx emissions intensity	Kg/Tonne of production
Absolute freshwater consumption	Thousand m ³
Freshwater consumption intensity	m ³ /Tonne production
COD absolute emissions to surface water	Tonnes
Total absolute waste	Tonnes
Absolute hazardous waste	Tonnes
Absolute non-hazardous waste	Tonnes
Total waste intensity	Kg/Tonne of production
Calculated Scope 3 total absolute GHG emissions	Thousand tonnes CO ₂ e
Total OSHA Incident Rate (OIR) for employees and temporary workers	Per 200,000 hours worked
Total OSHA Incident Rate (OIR) for contractors	Per 200,000 hours worked
Lost Time Injury Rate (LTIR) for employees and temporary workers	Per 200,000 hours worked
Lost time Injury Rate (LTIR) for contractors	Per 200,000 hours worked
Process Safety Incident Count (PSIC)	# of incidents combined PSE1 + PSE2
Percentage of manufacturing sites with ISO 14001/RC-14001 certifications	%
Percentage suppliers acknowledging our Business Partner Code of Conduct	% by spend
Percentage female in workforce	%

About Nouryon

Nouryon is a global, specialty chemicals leader. Markets and consumers worldwide rely on our essential solutions to manufacture everyday products, such as personal care, cleaning goods, paints and coatings, agriculture and food, pharmaceuticals, and building products. Furthermore, the dedication of approximately 8,200 employees with a shared commitment to our customers, business growth, safety, sustainability and innovation has resulted in a consistently strong financial performance. We operate in over 80 countries around the world with a portfolio of industry-leading brands. Visit our website and follow us @Nouryon and on LinkedIn.

Nouryon