



RESHAPING PLASTICS

2022 ESG REPORT

Table of Contents

3. OVERVIEW

- 3. CEO Message
- 4. Introducing our New Corporate Strategy
- 6. 2022 ESG Highlights
- 7. About NOVA Chemicals
- 9. About This Report
- 11. Our ESG Priorities
- 12. Contributions to Society
- 13. How We Create Value

14. ENVIRONMENT

- 15. Plastic Circular Economy
- 22. Climate Care
- 28. Air Emissions
- 30. Waste
- 32. Water

34. SOCIAL

- 35. Inclusion and Diversity
- 39. Talent Management
- 41. Employee Health and Wellness
- 43. Employee and Contractor Safety
- 47. Process Safety
- 50. Product Safety

53. Transportation Safety

56. Community and Indigenous Relations

59. GOVERNANCE

- 60. Corporate Governance
- 61. Risk Management
- 62. ESG Governance
- 63. ESG Integration and Principles
- 67. Ethics
- 70. Responsible Supply Chain
- 73. Cybersecurity
- 75. Public Policy

76. PERFORMANCE TABLE

80. APPENDIX

- 80. Material Topic Boundaries
- 81. Engagement with Interested Parties
- 82. GRI® Index
- 86. SASB® Index
- 87. SDG Index
- 88. TCFD Index
- 92. Forward Looking Information
- 93. Advisory
- 93. Trademarks
- 94. Contact





CEO Message

DANNY DWEIK

Interim President and CEO

**Dear Stakeholders,**

The theme of our 2022 Environmental, Social and Governance (ESG) Report is "Reshaping Plastics." Plastics remain an integral part of our daily lives with multitudes of benefits to humanity across various applications that enable availability of safe, fresh food, healthcare supplies and product packaging. We have a collective responsibility however to ensure that plastics production, use and waste management is done following the best practices that safeguard our communities and planet. "Reshaping Plastics" is our North Star and is the foundation to our [NOVA 2030 strategy](#) and our driving purpose to "reshape plastics for a better, more sustainable world by delivering innovative solutions that help make everyday life healthier and safer and acting as a catalyst for a low carbon, zero-plastic-waste future."

In this report, we will introduce our sector-leading ambitions to drive the circular economy for plastics, to be in the forefront of decarbonization and to become a Top 30 company in Canada. We will also highlight our focus on important environmental, social and governance topics which are

most relevant to our company and its stakeholders, including the Plastic Circular Economy, Climate Solutions, Inclusion & Diversity and Ethics. We will also share our ambitions, progress, and challenges.

During this period, our sector has seen tough economic challenges. Yet, we have continued to keep our attention on how best to create additional value for the company and its stakeholders starting first with our employees who are continually building new skills and new ways of working to help us achieve and sustain a leadership position in the industry.

We demonstrated our commitment to strong safety performance with a best-ever overall combined recordable injury rate of 0.23 and an injury-free run rate of over 1.3 million work hours at our flagship project in Sarnia, Ontario to build our second world-class Advanced SCLAIRTECH™ technology facility. Through the launch of our innovative SYNDIGO™ rPE resins and ASTUTE™ plastomer resins, we are promoting the increased use of rPE and developing essential building blocks that are

used to promote recyclability and circularity. We also received recognition including a second EcoVadis Silver Rating, a CN Safe Handling Award for transportation safety practices, a Chemical Transportation Safety Pinnacle Award for our zero non-accident release (NARs) performance and the Closed Loop Circular Plastics Fund, which we support, received the American Chemistry Council's Sustainability Leadership Award for external collaborator for its role in advancing plastic circularity. Finally, we joined the [United Nations Global Compact® initiative](#) (UNGC) confirming our support to its Ten Principles in the areas of Human Rights, Labor, Environment and Anti-Corruption.

In closing, I am thankful for the opportunity to collaborate with the company's 2,500 employees and to welcome Roger Kearns as the company's new President and CEO. Most importantly, I look forward to advancing our journey of "Reshaping Plastics" for a better, more sustainable world.

[Roger Kearns](#) became NOVA Chemicals' President and Chief Executive Officer, effective June 12, 2023, succeeding Mr. Danny Dweik.

"NOVA Chemicals has repeatedly proven its ability to deliver innovative solutions to complex challenges, and I am thrilled to lead the company towards a more sustainable future. Our talented team, focused on the vision to be the leading sustainable polyethylene producer in North America, will unlock new possibilities, fuel growth, and create value for our customers, employees, and communities. Together we will impact the future of our industry and make a positive impact in the world."

**ROGER KEARNS**
NOVA Chemicals President and CEO

INTRODUCING NOVA 2030

OUR ROADMAP TO SUSTAINABILITY LEADERSHIP

With our renewed purpose of reshaping plastics for a better, more sustainable world, and our vision to be the leading sustainable polyethylene producer in North America, we have launched NOVA 2030: our roadmap to sustainability leadership. NOVA 2030 is our strategy to become a catalyst for a low-carbon, zero-plastic-waste future, and to achieve three aspirations by 2030:

1

Lead the development of and transition to a circular economy of plastics, with

30%

of our polyethylene sales by volume to come from recycled content

2

Be at the forefront in our industry for decarbonization by **reducing Scope 1 and 2 CO₂e emissions under operational control** by

30%

from 2020 levels

3

Be recognized as a

TOP 30

company in Canada by value, in accordance with our vision of being the **leading sustainable polyethylene producer** in North America

Our long history of taking meaningful action to adapt to changing conditions has set a **STRONG FOUNDATION** for our ambitions.

NOVA Chemicals is a **market leader** in Canada and is recognized as a **distinguished polyethylene producer and innovator**.

Our market leadership is demonstrated by NOVA Chemicals' #1 or #2 market position in the majority of our target markets. Our competitive positioning is driven by our reputation as a sought-after partner in innovation and product development, our best-in-class technical development, and commitment to providing a unique and exceptional customer experience.

To lead the development of a transition to circular plastics and achieve our recycled content aspiration, we plan to focus on mechanical and advanced recycling improvements. We aspire to build a state-of-the-art mechanical recycling business by 2030 and are exploring new advanced recycling technologies to create high-quality, high-performance, recycled and recyclable, low carbon plastics for premium applications.

Our 2030 aspirations are a part of our larger ambitions to achieve **net-zero Scope 1 and 2 emissions by 2050**.

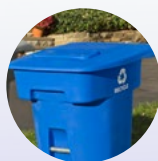
NOVA Chemicals' roadmap for decarbonizing our asset base includes improving energy efficiencies, electrifying and acquiring renewable power. We are exploring clean hydrogen as a low carbon fuel source, Carbon Capture, Utilization, and Storage (CCUS) and innovative, new technologies. Refer to the [Climate Care](#) section of this report for more details on our path to decarbonization.

We anticipate investing between **USD \$2-4 billion** by 2030 to achieve our aspirations and expand our sustainable product offerings, decarbonize assets, and advance recycling infrastructure and technologies.

Our new strategy builds upon NOVA Chemicals' long-standing commitment to developing sustainable solutions for our customers that enable the circular economy and contribute to a better, more sustainable world. With increasing regulations around plastic packaging and stronger sustainability ambitions from converters and brand owners, there is a growing demand for sustainable, high performance plastic materials. At NOVA Chemicals, we have the engineering expertise and innovation skills to bring high quality and innovative mechanical recycling solutions to market.

The world is changing... We are excited to lead that change. With our renewed purpose of reshaping plastics for a better, more sustainable world, we have envisioned a pathway to become a catalyst for a low carbon, zero-plastic-waste future and to reach net-zero by 2050.

KEY ACTIONS TAKEN



To contribute to reduced waste and emissions and promote a circular economy, NOVA Chemicals recently launched SYNDIGO recycled polyethylene (rPE), a new portfolio of resins made from 100% post-consumer recycled content.



Among our innovative new product offerings are ASTUTE plastomer resins that expand our portfolio and enable customers to design high performance and fully recyclable packaging.



NOVA Chemicals has also [announced a virtual power purchase agreement](#) to purchase 20 megawatts (MW) of renewable wind power that will be produced in central Alberta marking the first of many opportunities to increase low carbon, renewable energy in our power portfolio.



Through our continued efforts to pursue new technologies to abate and eliminate emissions from our production processes, we developed our Low Emissions Ethylene Process (LEEP™) technology. Innovations, such as LEEP technology, demonstrate our commitment and ability to create solutions to reduce our emissions and reach our aspirations.

2022 ESG Highlights



CONTINUING OUR STRONG SAFETY PERFORMANCE

With a **0.23 combined recordable injury rate**, we achieved our best-ever performance, demonstrating our commitment to safety and continual improvement.

We achieved a combined lost time injury rate of zero, a **100% reduction over five years**. We are proud of this step toward our goal of ZERO workplace injuries, illnesses and incidents.

This year the project to build our second world-class Advanced SCLAIRTECH technology facility also achieved its best ever safety performance including a **recordable injury free run of over 1.3 million exposure hours**.



DEVELOPING OUR PORTFOLIO OF INNOVATIVE SOLUTIONS

We continued to progress the market adoption of NOVA's rPE products. Through the launch of our innovative **SYNDIGO rPE resins** and **ASTUTE plastomer resins**, we are promoting the increased use of rPE and developing essential building blocks that can be used in a variety of all-polyethylene packaging to promote recyclability and circularity.



LAUNCHING OUR OWN EMPLOYEE DIVERSITY CENSUS

Our diversity census, launched in 2022, allows us to gain deeper insights on our **diverse workforce** and better address their needs.



INCREASING ADOPTION OF RECYCLED POLYETHYLENE

Our collaboration with Merlin Plastics generated initial production of **high performing, high density rPE** planned for commercial use in food packaging applications in 2023.



REINFORCING OUR COMMITMENT TO ESG

We joined the United Nations Global Compact (UNGC) confirming our support to its Ten Principles in the areas of Human Rights, Labor, Environment and Anti-Corruption supported by our annual disclosure using its Communication on Progress.



AWARDS & RECOGNITION

- We received **EcoVadis Silver rating** in 2022 for the second year in a row.
- NOVA Chemicals was awarded with a **CN Safe Handling Award 2022** for our transportation safety practices.
- We received a **Chemical Transportation Safety Pinnacle Award 2022** for our zero non-accident releases (NARs) performance.
- **American Chemistry Council (ACC) Sustainability Leadership Award** for External Collaborator awarded to Closed Loop Partners for its collaboration with NOVA Chemicals, LyondellBasell and Dow to establish the Closed Loop Circular Plastics Fund.



— OUR PURPOSE —

Reshaping plastics
for a better, more
sustainable world.

— OUR VALUES —

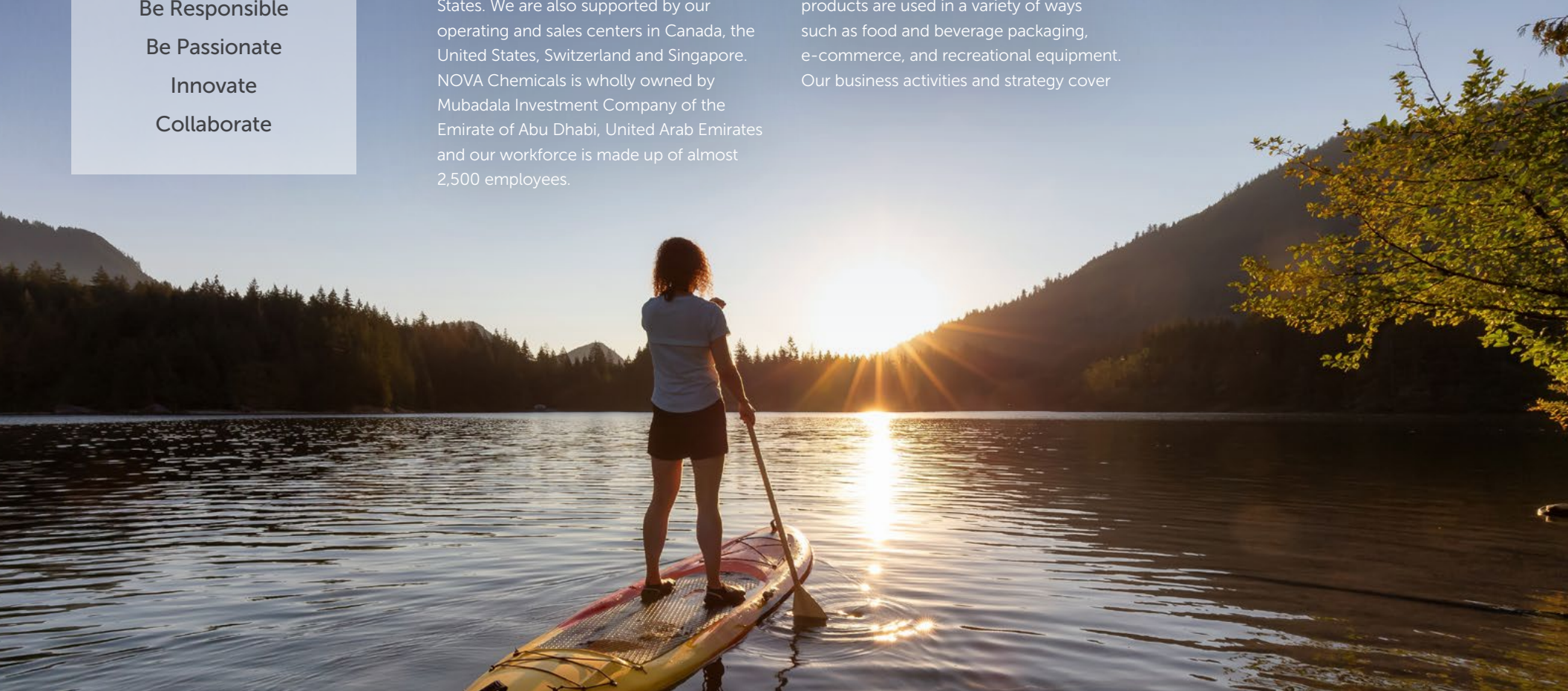
Be Responsible
Be Passionate
Innovate
Collaborate

About NOVA Chemicals

NOVA Chemicals develops and manufactures ethylene and polyethylene for plastic products and packaging that are essential to making everyday life healthier and safer. Our company is headquartered in Calgary, Alberta, Canada, and has manufacturing operations in Alberta and Ontario, Canada and Louisiana, United States. We are also supported by our operating and sales centers in Canada, the United States, Switzerland and Singapore. NOVA Chemicals is wholly owned by Mubadala Investment Company of the Emirate of Abu Dhabi, United Arab Emirates and our workforce is made up of almost 2,500 employees.

Our customers use our polyethylene resins to make plastic products that contribute to keeping people healthy and safe. Plastic is and will continue to be a valuable material that improves modern life. We share in the collective responsibility to ensure that plastic production, use, re-use and waste management follow best practices. Our products are used in a variety of ways such as food and beverage packaging, e-commerce, and recreational equipment. Our business activities and strategy cover

the entire life cycle of plastics including how we manufacture, use, and recycle plastic. Through our commitment to sustainability and Responsible Care[®] principles, our employees consistently work to ensure health, safety, security, and environmental stewardship throughout every facet of our operations.



2022 Company Changes and Major Project Updates

- In 2022, we established **NOVA 2030: Our Roadmap to Sustainability Leadership** which we announced early in 2023. As part of NOVA 2030, we announced sector-leading aspirations to drive the circular economy for plastics and stay at the forefront of decarbonization. We are focused on accelerating action towards achieving our vision of being the leading sustainable polyethylene producer in North America.
- We announced several updates to our Leadership and Board of Directors in 2022. To see the most current members of the Leadership Team and the Board of Directors, [visit our website](#). For additional information on our Board, see the Corporate Governance Section [here](#).
- We reached mechanical completion of our Corunna Cracker Expansion Project and new Advanced SCLAIRTECH technology facility in Sarnia-Lambton, Ontario and achieved our best ever Total Recordable Case Rate (TRCR) performance while completing these projects.

NOVA CHEMICALS' CURRENT LOCATIONS

ALBERTA, CANADA

- Joffre Manufacturing Site
- Red Deer Executive Place Office
- Pipeline Office, Sherwood Park
- NOVA Chemicals Head Office, Calgary
- Centre for Performance Applications, Calgary
- Centre for Applied Research, Calgary

LOUISIANA, USA

Geismar Manufacturing Site

ONTARIO, CANADA

- Corunna Manufacturing Site
- St. Clair River Manufacturing Site
- Moore Manufacturing Site
- Manufacturing East Corporate Centre, Sarnia

PENNSYLVANIA, USA

U.S. Commercial Center, Pittsburgh

INTERNATIONAL

Fribourg-European Operating Center

INTERNATIONAL

Singapore Sales Office



About This Report

We have reported our non-financial performance since the publication of our first sustainability report in 2014. This Environment, Social, and Governance (ESG) report is our ninth annual report. NOVA Chemicals publishes its ESG and financial reports on an annual basis covering January 1, 2022 to December 31, 2022.

This ESG report helps us demonstrate how the company creates value for its customers, suppliers and other stakeholders; how we work to help solve global challenges; and how we care for people and the environment.

We align our reporting to the Global Reporting Initiative (GRI) Standards, the Sustainability Accounting Standards Board® (SASB) Standards for the Chemicals industry, the Task Force on Climate-Related Financial Disclosures (TCFD) Recommendations, and the United Nations Sustainable Development Goals (UN SDGs). NOVA Chemicals is also a voluntary participant in the [United Nations Global Compact](#) (UNGC), which is the world's largest voluntary, business-led sustainability initiative covering human rights, labor, environment, and anti-corruption. By aligning with these frameworks and standards, we enhance our comparability with peers and are able to better articulate the impact and value of our ESG activities.



OUR FOUNDATION IS RESPONSIBLE CARE

NOVA Chemicals' Responsible Care program and codes of practice are based on the Chemistry Industry Association of Canada's (CIAC) Responsible Care Ethic and Principles for Sustainability, which guide how we manage issues relating to health and safety, environment, and social responsibility. The Responsible Care initiative is recognized by the United Nations and has been adopted by the global chemical industry.

The Responsible Care program is core to our sustainability and ESG efforts. These include broader sustainability topics that are crucial to meeting the expectations of our stakeholders, maintaining our leadership position in our industry, and delivering on our growth strategy.



Scope of This Report

- Unless otherwise noted, this report covers performance for the calendar year 2022, with historical data dating back to 2018.
- We report environmental data based on our operating control (i.e., we report 100% of the environmental impacts of our operated facilities regardless of ownership percentage, including operated ethylene and polyethylene assets and associated site-based infrastructure, and owned pipelines and office buildings). Using this principle, we do not report our portion of environmental impacts for non-operated joint ventures. In some instances, estimates are made based on best-available information and records at the time of writing.
- Data is based on permanent employees. When noted, safety data includes contractors.
- Techniques for data measurements and calculations, if not industry standard, are stated with the data.
- Unless noted, financial data is in U.S. dollars and environmental data is in metric units.
- Senior management and relevant staff have reviewed key information and believe it is an accurate representation of our performance.
- The Board of Directors has reviewed and approved this report.
- The NOVA Chemicals' Corunna, Moore, St. Clair River and Joffre Sites Scope 1 emissions data and information were third-party verified by [Dillon Consulting Limited](#) (Dillon). In its opinions dated June 2, 2023, and June 15, 2023, Dillon concluded with reasonable assurance that the Scope 1 emissions data and information were fairly stated. Third-party limited assurance of Scope 3 methodology, aligned to the [GHG Protocol Corporate Value Chain \(Scope 3\) Reporting Standard](#), and 2022 emissions data was conducted by [SCS Global Services](#).
- This report covers performance for NOVA Chemicals and its subsidiaries covered in our consolidated financial statements. The terms NOVA Chemicals, our, we, the company, and the corporation refer to NOVA Chemicals Corporation and its subsidiaries as a whole.
- To reflect the October 2020 divestiture of our expandable polystyrene (EPS) business unit, data from the EPS business is excluded starting from 2020 in this report.

Reporting Framework Alignment

We cross-reference our disclosures with the following frameworks and standards:

GRI	Page 82
SASB	Page 86
UN SDGs	Page 87
TCFD	Page 88



Defining Our ESG Priorities

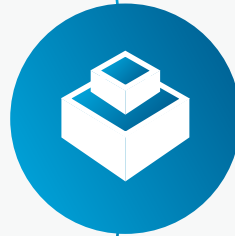
We conduct a biennial materiality assessment to identify and prioritize ESG topics that are most material to our business. Our most recent assessment took place in November 2022 and included interviews with our primary external stakeholder groups. Our approach to assessing materiality is based on industry standard practice and considers both stakeholder concerns and business impact. Our resulting ESG Reporting Framework guides our disclosure and is categorized into the three areas listed to the right.



PRIORITY TOPICS

These topics are of global concern and interest to our stakeholders. Priority topics are core to our business strategy and business performance, and are supported by our strategic ambitions. We provide the most extensive disclosure on these topics.

- Plastic circular economy
- Climate care
- Inclusion and diversity
- Ethics



FOUNDATIONAL TOPICS

These topics reflect the ESG expectations of our stakeholders and are important to our business. We provide supporting disclosure on these topics and strive for continuous improvement.

- Water
- Air emissions
- Process safety
- Employee and contractor safety
- Responsible supply chain
- Talent management



REPORTING TOPICS














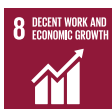

These topics are of interest to our stakeholders and our business. We report on our activities with supporting disclosures.

- | | |
|------------------------------------|-----------------------|
| Waste | Transportation safety |
| Human rights | Health and wellness |
| Community and Indigenous relations | Corporate governance |
| Product safety | Public policy |



Contributions to Society

We believe that sustainability and Responsible Care standards must be at the core of everything we do. Working on the ESG aspects of our business supports our purpose of reshaping plastics for a better, more sustainable world, and also contributes to solutions for specific global challenges, as embedded in the UN SDGs.

OUR ESG ACTIVITIES	RELEVANT ESG TOPICS	ESG TAG	OUR ESG ACTIVITIES CONTRIBUTE TO THE FOLLOWING SDGS:
<p>Our ambition to drive the transition of the plastic circular economy with 30% OF OUR POLYETHYLENE sales by volume coming from RECYCLED CONTENT BY 2030 will enhance the infrastructure and innovation needed for a circular economy to support more sustainable consumption and production patterns and help to PROTECT MARINE AND TERRESTRIAL ECOSYSTEMS.</p>	<p>Plastic Circular Economy</p>	<p>E</p>	   
<p>Our ambitions to reduce Scope 1 and 2 CO₂e emissions under operational control by 30% by 2030 from 2020 levels and to NET ZERO BY 2050 support global decarbonization efforts to COMBAT CLIMATE CHANGE AND PROMOTE A MORE SUSTAINABLE INDUSTRY.</p>	<p>Climate Care</p>	<p>E</p>	 
<p>FOSTERING INCLUSION AND DIVERSITY supports equality in the workplace and provides productive and value-added work for all.</p>	<p>Inclusion and Diversity</p>	<p>S</p>	 
<p>CONDUCTING OUR BUSINESS WITH HONESTY AND INTEGRITY, as well as maintaining improved communication on ethics-related policies and training, supports our company and supply chain.</p>	<p>Ethics</p>	<p>G</p>	
<p>WORKING TOWARDS IMPROVED ESG PERFORMANCE helps us:</p> <ul style="list-style-type: none"> Minimize our environmental impacts by reducing waste, using energy and water efficiently, and promoting sustainable economic growth Keep our people, communities, and customers safe Support healthy lives and promote well-being Support the maintenance of effective, accountable, and inclusive institutions through our ethics programs in our company and supply chain. 	<p>Air Emissions Water Waste Employee and Contractor Safety Process Safety Product Safety Transportation Safety Ethics Responsible Supply Chain</p>	<p>E S G</p>	     

How We Create Value

Input

ECONOMIC

- \$830 million in capital expenditures
- 2 innovation centers
- 5 manufacturing sites
- 5 commercial and sales centers
- 8,400 leased/owned railcars
- 580 kilometers (km) of pipelines

ENVIRONMENTAL

- 100 million GJ energy
- 33 million GJ natural gas, natural gas liquids, and other hydrocarbons
- 36 million cubic meters (m³) of water

SOCIAL

- ~2,500 employees
- >2,000 suppliers
- ~400 customers

Business Activities

BY DELIVERING
INNOVATIVE SOLUTIONS
TO MAKE EVERYDAY LIFE
HEALTHIER AND SAFER



BY BEING A CATALYST
FOR A LOW-CARBON,
ZERO-PLASTIC-WASTE
FUTURE



BY UNLOCKING THE
FULL POTENTIAL OF
OUR PEOPLE AND
PARTNERSHIPS



Output

ECONOMIC

- \$4.5 billion in revenue
- 3.8 million tonnes ethylene annual nameplate capacity
- 2.2 million tonnes polyethylene annual nameplate capacity
- rPE and ready-to-recycle resins
- Completed capital project with supplier to increase high-quality Post-Consumer Resin (PCR) supply

ENVIRONMENTAL

- Reached three partnerships to develop rPE supply
- Partnering at a global level to close gaps that lead to plastic waste
- 4.6 million tonnes of CO₂e Scope 1 & 2 emissions
- 13.2 million tonnes of CO₂e Scope 3 emissions
- 129 kilotonnes of waste generated in manufacturing with a 17% recycling rate

SOCIAL

- \$453 million paid in salaries and benefits
- Providing competitive and meaningful Total Rewards opportunities for employment
- Supporting employee well-being
- \$1.6 million invested in communities and 412 employees volunteered almost 2,600 hours in communities where we work and live
- Maintaining safe operations
- Enabling safer and better plastic resins



IN THIS SECTION

Plastic Circular Economy 15 >

Climate Care 22 >

Air Emissions 28 >

Waste 30 >

Water 32 >

ENVIRONMENT

We are dedicated to fostering innovation to advance the plastic circular economy, while also prioritizing decarbonization efforts throughout our organization. We strive to promote sustainable practices, and take proactive, responsible measures to manage our operational impacts to air, water, land, and biodiversity.

Plastic Circular Economy

At NOVA Chemicals, we are guided by our purpose to reshape plastics for a better, more sustainable world, and we believe that enabling a circular economy with products that can be recycled, reused and re-imagined will drive that change and support creating a world free from plastic waste.

We work collaboratively with partners across the value chain to develop products that will build a circular economy for plastics through design, use, and recycling. To accompany our new NOVA 2030 strategy and set new industry standards for driving the transition to a circular economy of plastics, we established a bold ambition during the year.

HOW NOVA CHEMICALS PROVIDES PLASTIC CIRCULAR ECONOMY SOLUTIONS

We intend to lead the development of a transition to circular plastics and shape and sustain a low carbon, zero-plastic waste future. We intend to achieve this, in large part, through the development of our plastic circular economy solutions in three key areas:

- **Mechanical Recycling:** As a key player in the recycled polyethylene (rPE)

market, we provide our customers with rPE through our agreements and partnerships with recyclers. This allows us to help customers achieve their recycled content goals. We are also committed to working with our recycler partners to enable higher quality rPE. Through our role in the plastics value chain, we contribute to the development of markets for high-quality rPE while supporting value chain sustainability goals. Our strategy around the circular economy is driven by our ambition to enable the acceleration of recycled content and to help our customers achieve their sustainability goals.

- **Advanced Recycling:** The NOVA 2030 strategy is also focused on developing advanced recycling technologies. For example, we have collaborated with Enkernem to introduce a chemical recycling pilot project to convert used,

non-recyclable and non-compostable plastics into feedstocks for virgin-grade plastics. We are also continuing to explore other proven advanced recycling technologies.

- **Designing for Better Recyclability:** By designing products for better recyclability, we are also able to drive the circular economy. We focus on high performance resins that enable replacement of non-recyclable packaging. Designing these high-performance resins enables packaging optimization and transition from multi-material to mono-material packaging, incorporating rPE to enhance recyclability. Our collaborative partnerships across the plastics value chain further foster the development of closed loop packaging solutions, contributing to the advancement of the plastic circular economy.

OUR AMBITION

To achieve 30% of our polyethylene sales by volume from recycled content by 2030.

WHY IS IT IMPORTANT FOR US TO CONTRIBUTE TO A PLASTIC CIRCULAR ECONOMY?

A plastic circular economy transforms the lifecycle of plastic, helping to eliminate plastic waste and minimize new resource use. By adapting to the changing regulatory landscape and meeting new market demands, we can also capitalize on opportunities in plastic circularity which will help enhance the enterprise value of our company.



Management Approach: How We Lead Development of a Plastic Circular Economy

Our role in the plastics value chain allows us to create innovative products and solutions in collaboration with our customers, brand owners, original equipment manufacturers (OEMs) and other partners to enable plastic packaging circularity and to increase the market for rPE and contribute to eliminating plastic waste.

OUR PLASTIC CIRCULAR ECONOMY SOLUTIONS

Our innovative products increase the use of high-performance recycled content in packaging solutions and support our vision to become the preferred supplier of low-emissions, circular plastics solutions in high-quality applications. We launched two innovative product brands, ASTUTE plastomer resins and SYNDIGO rPE, in 2022 and 2023 respectively that have advanced our efforts in providing industry-leading solutions for the plastic circular economy.

These new products represent significant milestones in NOVA Chemicals' new strategy and serve as critical proof points for how we will achieve our circular packaging and recycled content ambition.

In 2023, NOVA Chemicals formed NOVA Circular Solutions, a new line of business for our emerging mechanical and advanced recycling efforts with expertise in the areas of plastics development, recycling technology, additive science, packaging design, and regulatory compliance. NOVA Circular Solutions also serves as the home of our newest portfolio of SYNDIGO rPE resins.

SYNDIGO[™]
recycled polyethylene BY NOVA CHEMICALS

SYNDIGO rPE resins are designed to support our commitment to reduce plastic waste from packaging, to help our customers' decarbonization aspirations, and to set new industry standards for advancing the transition to a plastic circular economy. SYNDIGO resins offer highly versatile design flexibility that can be used in a variety of applications including NOVA Chemicals' first Federal Drug Administration (FDA) compliant rPE produced in Canada. The brand currently includes four commercially available products:



EX-PCR-WR3: a mechanically recycled resin sourced from agricultural film. It is ideal for e-commerce mailers, can liners, carry-out bags, protective packaging, and collation shrink applications.



EX-PCR-NC4: a mechanically recycled resin sourced from back-of-store distribution center stretch film and front-of-store consumer drop off. This product is ideal for heavy-duty sacks, e-commerce mailers, stretch wrap, collation shrink, protective packaging, and industrial films.



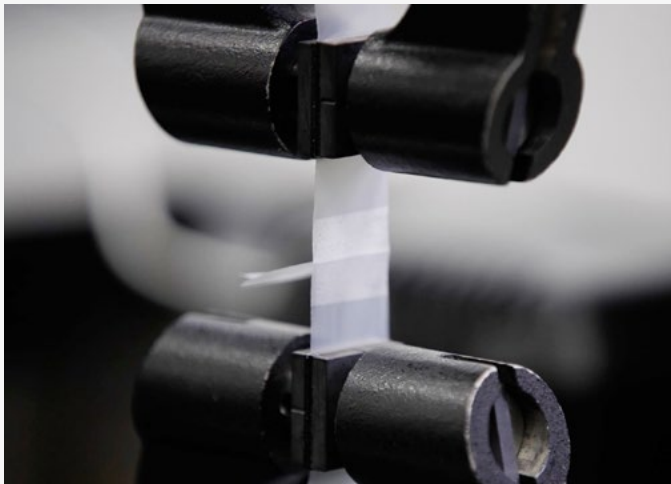
rPE-0860-FC: an FDA-compliant mechanically recycled resin sourced from High Density Polyethylene (HDPE) milk jugs. It is ideal for various types of flexible and rigid food packaging.



rPE-0860: an ideal option for converters and brand owners who are transitioning towards more sustainable products and packaging.

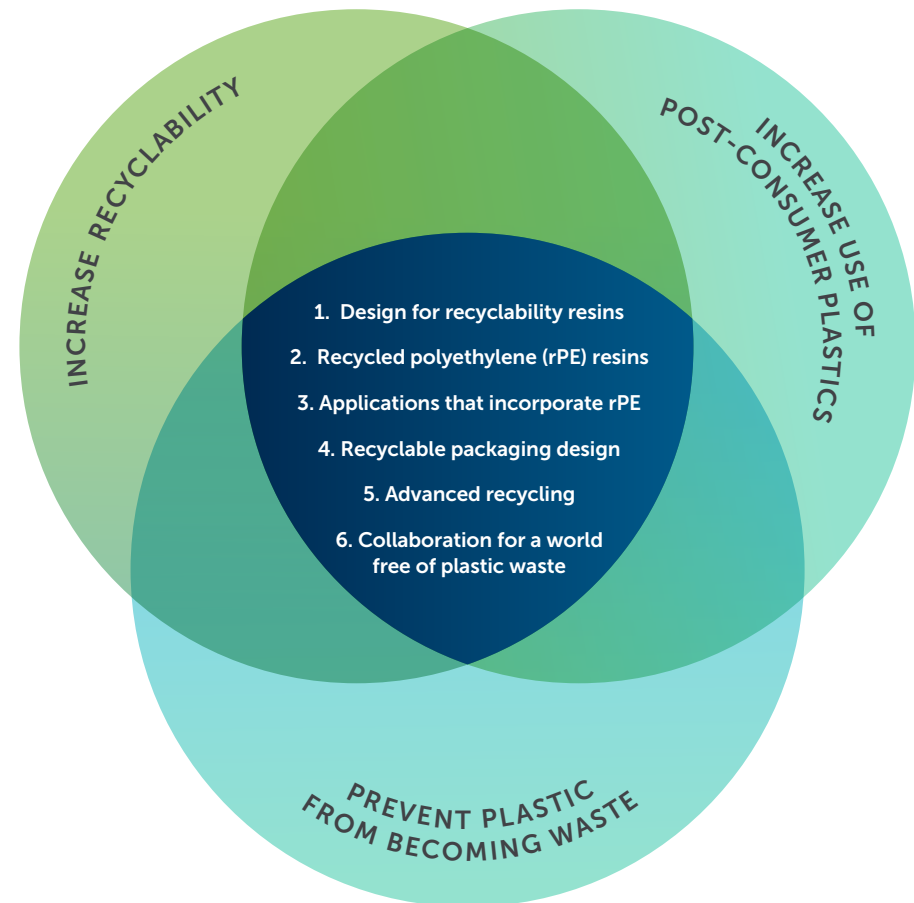
ASTUTE Plastomer Resins

We launched the ASTUTE brand of high-performance, all-PE plastomer resins in October 2022. The ASTUTE brand includes ASTUTE QPsK905 resin and ASTUTE QHsK908 resin. These plastomer resins are an essential step forward in designing packaging for recyclability. We leverage our proprietary Advanced SCLAIRTECH technology to produce these polyethylene-based plastomer resins. ASTUTE resins enable down-gauging and light-weighting of packaging while also providing strong processability and plastomer properties. End use applications for ASTUTE plastomer resins include food packaging, heavy duty sacks and e-commerce, and support users in achieving their packaging sustainability goals.



In addition to our new SYNDIGO and ASTUTE brands, we are continuing to develop our SURPASS® and SCLAIR® brands with innovative products such as our SURPASS HPs267-AB barrier resin that extends shelf life and SURPASS TX150 BOPE-HD (biaxially oriented high-density polyethylene) resin that enables mono-material packaging and replaces BOPET and BOPP materials.

In a plastic circular economy, materials are recycled so they can be used again and again. To enable a circular economy we focus on increasing plastic recyclability, increasing use of rPE and preventing plastic from becoming waste. We implement various solutions to impact these aims.



1



Design for Recyclability Resins

OUR PRODUCT PORTFOLIO includes SURPASS TX150-A resin for BOPE, HPs267-AB for material replacement and downgauging, the ASTUTE resins to make mono-material flexible packaging, and our Ready-to-Recycle resins that withstand multiple recycling processes.

2



Recycled Polyethylene (rPE) Resins

WE HELP ADDRESS OUR CUSTOMERS' CHALLENGES by offering SYNDIGO rPE. These resins are designed to support recycled content and decarbonization goals of converters and brands in flexible and rigid structures and include an FDA-compliant grade. Through three strategic long-term supply agreements, we also help companies meet their goals to increase the amount of post-consumer material used in various types of plastic products and packaging.

3



Applications that Incorporate rPE

EXPERTS AT OUR CENTRE FOR PERFORMANCE APPLICATIONS PROMOTE CIRCULARITY by designing products that incorporate rPE. In one example, our team developed a series of customizable film structure designs formulated with rPE. The film structures, which incorporate recycled low-density and linear low-density polyethylene (rLDPE/LLDPE), can be tailored to meet the needs of customers who want to incorporate recycled content into products such as protective packaging for e-commerce.

4



Recyclable Packaging Design

WE CAN INCREASE OUR IMPACT ON THE PLASTIC CIRCULAR ECONOMY BY DESIGNING FOR CIRCULARITY up front. We collaborate with customers to develop recyclable packaging made using all polyethylene. For example, our BOPE-HD resin technology enables fully recyclable packaging for an expanded range of products without sacrificing performance. It is ideal for use in food packaging, heavy duty sacks, e-commerce, and other demanding applications. Developments like BOPE-HD are critical to achieving [plastic industry commitments](#). We are working with a leading biaxially oriented tenter frame line manufacturer, to accelerate the development and commercialization of this technology and are collaborating with various biaxially oriented film producers to expand the availability of BOPE-HD film and enable the transition to fully recyclable mono-material packaging.

5



Advanced Recycling

ADVANCED RECYCLING ADDRESSES THE HARD-TO-RECYCLE SEGMENTS OF PLASTIC WASTE through technologies such as gasification or pyrolysis, converting plastic waste to feedstocks for new plastic production. Through advanced recycling, used, non-recyclable and non-compostable plastics can be converted to feedstocks for virgin-grade plastics. We are developing advanced recycling through a joint development project at pilot stage with Enerkem and exploring other proven technologies.

6



Collaboration for a World Free of Plastic Waste

WE ARE COMMITTED TO WORKING WITH OTHERS IN THE GLOBAL COMMUNITY to proactively prevent plastic pollution and its impacts on people, economies, biodiversity, and natural resources while building a circular economy. We participate in global projects that contribute to innovation, infrastructure, education, and cleanup efforts. See the next page for details on our collaborative work and partnerships.

Collaborating to Prevent Plastic Waste



Alliance to End Plastic Waste

NOVA Chemicals is a founding member of the [Alliance to End Plastic Waste](#) (AEPW) and we continue to work with its members to help end plastic waste in the environment. The AEPW consists of over 90 member companies and partners, and funds major projects across the globe that support communities and build sustainable waste management systems that fit their needs. In 2022, the AEPW is on track to divert 30,000 tonnes and recycle 21,000 tonnes of plastic waste through a portfolio of 35 major projects. The AEPW also launched Bersih Indonesia, its first flagship project to develop waste management systems to serve 2.6 million people in Malang, East Java.



Closed Loop Circular Plastics Fund

We are a founding member of the [Closed Loop Circular Plastics Fund](#) (CPF) which was established in 2021 to deploy catalytic financing into sustainable technologies, organizations and projects that advance the recovery and recycling of plastics in the U.S. and Canada. The fund has a goal to deploy a \$100 million (USD) investment and aims to recycle over 500 million pounds of plastic over the fund's lifespan. In just its first year, the CPF made significant investments in a range of solutions, including cutting-edge sortation technology and recycling infrastructure for plastics. The CPF was awarded the "[External Collaborator](#)" award at the American Chemistry Council's (ACC's) Sustainability Leadership Awards in 2022. The award recognized the CPF's collaboration with NOVA Chemicals and other investors to fund the acceleration of investment in technologies, companies and infrastructure projects to source, process and return post-consumer and post-industrial polyethylene and polypropylene into manufacturing supply chains in the U.S. and Canada.



Great Lakes Plastic Cleanup

NOVA Chemicals advanced our engagement and continued our lead corporate sponsorship with the [Great Lakes Plastic Cleanup](#) (GLPC), an initiative of Pollution Probe and the Council of the Great Lakes Region. The largest initiative of its kind, GLPC uses more than 100 devices and five technologies across the binational Great Lakes to deploy innovative capture and cleanup technologies for removing plastics while collecting critical data to inform solutions to plastic pollution and to encourage stewardship in local communities. The initiative grew significantly this year and now boasts more than 90 collaborators, adding several new participating sites in Canada and expanding into the U.S. where new plastic capture technologies are being piloted.



Canada Plastics Pact™ Network

NOVA Chemicals is an inaugural Knowledge Partner of the Canada Plastics Pact (CPP). The CPP is a multi-stakeholder, industry-led collaborative group that consists of members across the plastics value chain. Partners of the CPP share a vision of creating a circular economy in Canada and keeping plastic waste out of the environment. Knowledge Partners are organizations that provide professional, technical, and commercial systems knowledge that is crucial to advancing action on the CPP's Roadmap and achieving the CPP's targets.



NOVA Chemicals' role to support the Plastic Circular Economy

We are developing our knowledge and expertise and producing innovative products and solutions that contribute to maximizing the reuse and recycling of plastics. We aspire to be the most sustainable polyethylene producer by differentiating our business and developing innovative solutions for the Circular Economy.



2022 Activities

RECYCLED POLYETHYLENE BUSINESS

To enable the NOVA 2030 strategy and our ambition to achieve 30% of our polyethylene sales from recycled content, we created NOVA Circular Solutions to focus on lower emission, recycled solutions to support the growing demand for recycled plastics. Advancements in Mechanical Recycling, Advanced Recycling and Designing for Better Recyclability will each play a key role. Driving growth of mechanically recycled plastic solutions, collaborations and investments across the value chain will ultimately enable us to achieve our ambitions. A new senior-level leader, the Director of Mechanical Recycling, was appointed to build our mechanical recycling business working along with our technical and commercial marketing experts. Together, they will

help drive growth of NOVA Chemicals' business and achieve our circular economy sales ambition.

ADVANCING OUR TECHNOLOGIES

In December 2022, we reached mechanical completion of our second Advanced SCLAIRTECH technology facility and Corunna Cracker Expansion Project. The facility will have a production capacity of approximately one billion pounds of polyethylene per year, and the Cracker Expansion will provide ethylene feedstock to the new facility, expanding the existing cracker's current capacity by more than 50%.

DRIVING QUALITY FOR USE IN HIGH PERFORMING AND DEMANDING APPLICATIONS

In 2022 we continued to work with our suppliers to enhance the performance of our rPE to be used in the products and applications that will assist brands and

retailers in meeting their sustainability goals. We also saw the beginning of supply of high performing high density rPE from our long-term collaboration with Merlin Plastics Supply Inc. Merlin completed a capital project, partially financed by NOVA, to supply rPE for use in food packaging applications. Sales of this product will begin in 2023.

EXPANSION OF HDPE RESINS

We introduced our new specialized High Density Polyethylene (HDPE) resin technology for machine direction oriented (MDO) and biaxially oriented (BO) processes. Our innovative technology, SURPASS HPs153-A resin produces 100% high-density MDO films. These films can replace mixed material, non-recyclable films to produce fully recyclable all polyethylene laminates with high performance characteristics such as high

stiffness to maintain alignment for printing and converting, excellent heat resistance to minimize shrinkage during packaging conversion, and exceptional clarity.

MADE-IN-ALBERTA CHEMICAL RECYCLING TECHNOLOGY

We collaborated with Enerkem in 2020 to explore turning non-recyclable and non-compostable municipal waste into ethylene. In 2022, the project received CDN\$4.5 million in funding from [Alberta Innovates](#), to advance this technology to a pilot stage in Edmonton, Alberta. This funding allowed us to expedite the construction of a pilot-scale reactor system that converts syngas produced from used, non-recyclable and non-compostable plastics to feedstocks for virgin-grade plastics. This project demonstrates that collaboration across the value chain is key to producing solutions for the plastic circular economy.



Climate Care

NOVA Chemicals is striving towards our 2030 and 2050 decarbonization ambitions through our actionable roadmap for emissions reductions. Today, we are at the investigation and development stages. We manage the key climate related physical and transition risks and opportunities of our business.

As a leader in the North American polyethylene industry, we will continue to drive decarbonization through our sector-leading ESG ambitions established along with our new NOVA 2030 Strategy.

Our Roadmap to Net-Zero

In line with our 2030 Strategy and our Roadmap to Sustainability Leadership, we are developing a technical solutions-focused roadmap for decarbonizing our asset base. NOVA Chemicals' roadmap for decarbonization includes improving energy efficiencies, electrifying and acquiring renewable power. We are exploring clean hydrogen as a low carbon fuel source, Carbon Capture, Utilization, and Storage (CCUS) and innovative, new technologies to minimize emissions from our production processes, such as our proprietary LEEP technology that is in development.

The decarbonization strategy contributes to global ambitions to reach net-zero by 2050. To begin our decarbonization journey, we set our initial aspiration at achieving a 30% reduction in CO₂e emissions under operational control by 2030 from a 2020 baseline. Our 2030 ambitions are shorter-term objectives that will help us achieve our ultimate aspiration of net-zero Scope 1 and 2 CO₂e emissions by 2050.

We also have an ambition for 30% of our polyethylene sales by volume to come from recycled content by 2030. Much of this will be achieved through our approach to mechanically recycled resin, a low-carbon solution that is typically 20% of the Scope 1 and 2 emissions of NOVA Chemicals' average virgin resin production.

Our focus to improve the circularity of polyethylene will achieve lower life cycle GHG emissions in the use of the polyethylene products we sell and we will reduce the emissions of our recycled content business in accordance with our 2030 and 2050 GHG reduction ambitions.

To achieve these aspirations, NOVA Chemicals anticipates investing between USD \$2-4 billion by 2030. With this investment, we expect to expand our product offerings, decarbonize assets, and build a state-of-the-art mechanical recycling business.

OUR AMBITION

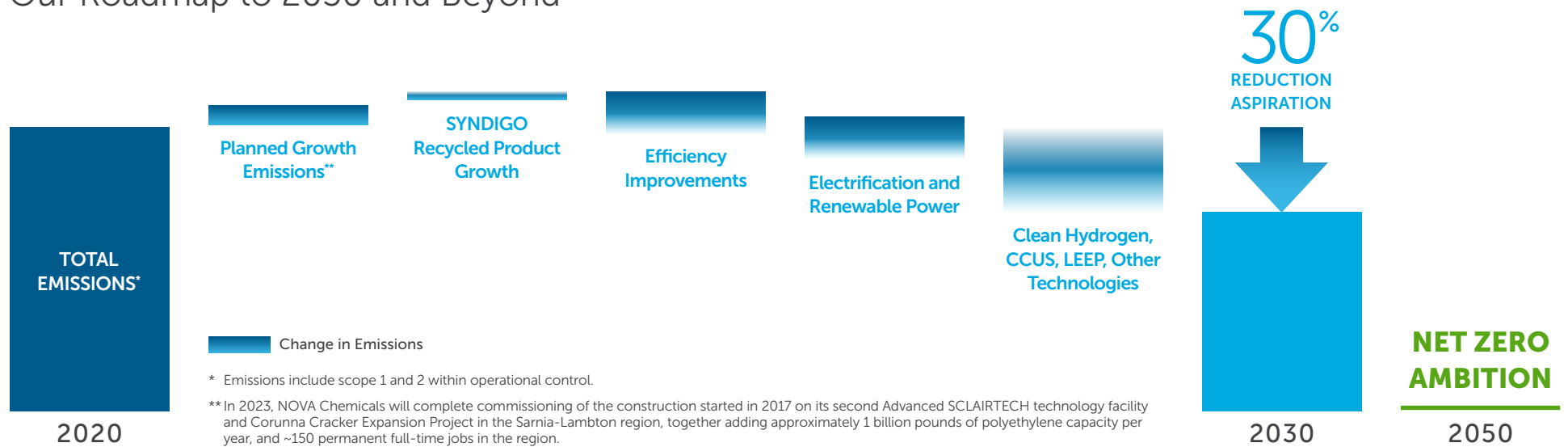
- To reduce Scope 1 and 2 CO₂e emissions under operational control by 30% by 2030 from 2020 levels
- Achieve net-zero Scope 1 and 2 emissions by 2050

WHY IS IT IMPORTANT FOR US TO REDUCE OUR GHG EMISSIONS?

By reducing GHG emissions from our operations, we can mitigate our contributions to climate change, realize energy efficiency savings, reduce our compliance costs, and offer lower carbon products to the market.

DECARBONIZATION

Our Roadmap to 2030 and Beyond



Refer to [Actioning our Decarbonization Roadmap](#) to learn more.

Note: This chart is illustrative of NOVA's decarbonization projects in investigation. NOVA has made no and does not make any commitment as to these projects by way of this chart.



Climate-related Risks and Opportunities

NOVA Chemicals strives to enhance our resilience to risks associated with climate change. In 2022, we initiated a climate-related risks and opportunities assessment in line with the recommendations of the TCFD. We identified and prioritized risks and opportunities through a series of interviews with our internal stakeholders as well as a review of our risk registers and recent and historic events, impacts, and exposures. This section provides insights into the material climate-related risks, categorized as either transition¹ or physical² climate risks, that may impact our business. (For detailed information please see Tables 1, 2, and 3 in the [TCFD Index](#)). In addition to risks, climate-related opportunities could come in the form of a change to market and consumer preferences that benefit the company, an expected increase in the availability of renewables, new markets or new operational locations, an expected increase in demand for certain products, or a competitive advantage.

Increasing stringency of emissions-related regulations in Canada and the U.S. emerged as a significant policy and legal risk for NOVA Chemicals. Regulations

like the Alberta Technology Innovation and Emissions Reduction Regulation and Ontario Emissions Performance Standards are expected to be introduced in several jurisdictions across North America. Other mechanisms such as carbon pricing, cap-and-trade system, or carbon border adjustments are also being considered by governments. Our decarbonization roadmap as well as associated technology improvements such as LEEP technology will play a significant role in mitigating these policy and legal risks.

We are also cognizant of increasing policy-driven limitations on plastic usage and/or single-use plastics. Alongside emerging policies, we are observing a shift in consumer preferences due to increasing awareness of climate change and plastic waste. Consumers are trending toward choosing brands that have environmentally sustainable practices, which may lead to a change towards low-emissions products and reduced demand for fossil fuel-based plastic products³. This may have implications on our brand image as well as sales and revenue. NOVA Chemicals considers this as an opportunity to enhance the sustainability of our products. Our NOVA 2030 strategy and planned expansion of

our rPE and sustainably-linked product line will help us in navigating this trend in consumer preferences and transition to a low-emissions and circular economy.

On the physical risk side, we see significant variation in the type of risks associated with our owned facilities due to regional variations in weather patterns, water demand, and impacts of climate change. Our assets have varying exposure to water stress and windstorms. We rely significantly on the availability of water for cooling and steam production. Water shortage and stress, especially in the Joffre region in Alberta, may cause operating outages and slowdowns, and associated financial losses. On the other hand, windstorms near our Geismar, Louisiana, facility could cause wind damage, storm surges, floods, power outages, and petrochemical plant damage with flaring, and pollution to the air. These physical risks not only have the potential to disrupt our operations, but also our supply chain. NOVA Chemicals manages these hazard exposures through the implementation of mitigation strategies such as Emergency Response Plans and water collection and treatment facilities at our manufacturing sites.

Climate Scenario Analysis

We conduct climate scenario analyses to identify and evaluate the impact of potential climate-related risks and opportunities across our business to inform our climate-related decision-making and better prepare the company for possible outcomes in the medium (2030) and long term (2050). Our scenario analysis incorporates a range of business considerations based on third-party scenarios. The transition risks are evaluated by quantifying the inherent and residual financial impact and qualitatively exploring the magnitude of impact using scenario narratives and data from S&P IHS Markit and from Chemical Market Analytics by OPIS, a Dow Jones Company. For the physical risk scenario analysis, we utilize global climate models from the Intergovernmental Panel on Climate Change (IPCC) to quantitatively project the inherent magnitude of the potential impact and supplemented the analysis with qualitative research insights. Please review the [TCFD Index](#) for additional information.

¹ Transition risks are climate-related risks arising out of governmental, market, or other actions associated with the transition to a low-carbon economy. These may include events such as change in consumer preferences, the implementation of climate-related regulations, the deployment of clean energy technologies, or an increase in legal liabilities for high-carbon emitting entities.

² Physical risks are those climate-related risks that arise from the physical impacts of climate change. As in the TCFD framework, NOVA Chemicals considers these risks to be either chronic, such as long-term variability in weather patterns, or acute, such as individual extreme weather events such as windstorms.

³ Sources include NOVA Chemicals' consumer trends research, and the McKinsey & Co. article, [Do consumers care about sustainability & ESG claims?](#)

Management Approach: Actioning Our Decarbonization Roadmap

The decarbonization strategy is supported by a roadmap of GHG opportunities identified at all of NOVA Chemicals' operating locations.

Efficiency improvements: We look for opportunities to make equipment upgrades and process improvements that increase efficiency and lead to lower GHG emissions.

Renewable power and electrification: We are actively seeking opportunities to enhance our already efficient approaches to power generation for our sites by adding renewable power sources, either through direct purchases or other agreements.

Each region has its own opportunities for Scope 2 emissions reduction based on the current grids, regulations, infrastructure,

and access to carbon sequestration, among other factors.

Clean hydrogen and CCUS: Our existing facilities were designed to use fossil fuels to provide most of the energy required to manufacture our products. Unlike fossil fuels, hydrogen combustion does not generate CO₂ emissions, and so it can be used as a low carbon emissions fuel to replace natural gas. Clean hydrogen refers to the production of hydrogen with lower carbon intensity than the steam methane reforming process. Production of hydrogen as a by-product of the ethane cracking process, reformer production abated with carbon capture and storage (commonly referred to as blue hydrogen), and the electrolysis of water using low carbon power (commonly referred to as green hydrogen) are some examples of clean hydrogen. We are evaluating the use of clean hydrogen as a way to decarbonize

our ethylene cracking process. Carbon capture and storage is another important technology that can be retrofit to existing facilities to abate GHG emissions.

Emerging technologies: A key area of focus for our forward-looking decarbonization strategy is the pursuit of emerging technologies, such as our proprietary LEEP technology under development. We continue to engage with industry and academia to evaluate new and innovative technologies that have the potential to further enhance and enable our decarbonization plans.

Alongside exploring new technologies, we focus on optimizing the efficiency of our current assets in the following ways:

- **Cogeneration:** In Alberta and Ontario, we currently obtain electricity produced from cogeneration facilities that use natural gas to generate electricity and

steam, resulting in lower GHG emissions intensity compared to stand-alone electricity and steam production. Cogeneration also provides a reliable electricity supply that is important for maintaining the stable operation of our production facilities. We are also looking for technologies that will meet our long-term electricity and steam needs.

- **Fugitive emissions program:** While our fugitive emissions of methane are a small portion (less than 1%) of our total GHG emissions, we focus on reducing the release of methane and other hydrocarbons. At all our facilities, we have leak detection and repair (LDAR) programs to control all hydrocarbon leaks, including methane.



How We Generate GHG Emissions

The vast majority of our GHG emissions (~99%) are CO₂ from combustion, with the remainder composed of methane and nitrous oxide. Our operations generate GHG emissions in the following ways:

SCOPE 1:

94% of our Scope 1 GHG emissions are a result of the ethylene manufacturing process. Ethylene is the foundation of our main product, polyethylene, and is one of the most important raw materials in the petrochemical industry.

SCOPE 2:

For our manufacturing processes, the majority of electricity we use comes from natural gas-fired cogeneration, which

produces both power and steam for our operations. We also require electricity to power our manufacturing and research facilities and offices.

SCOPE 3:

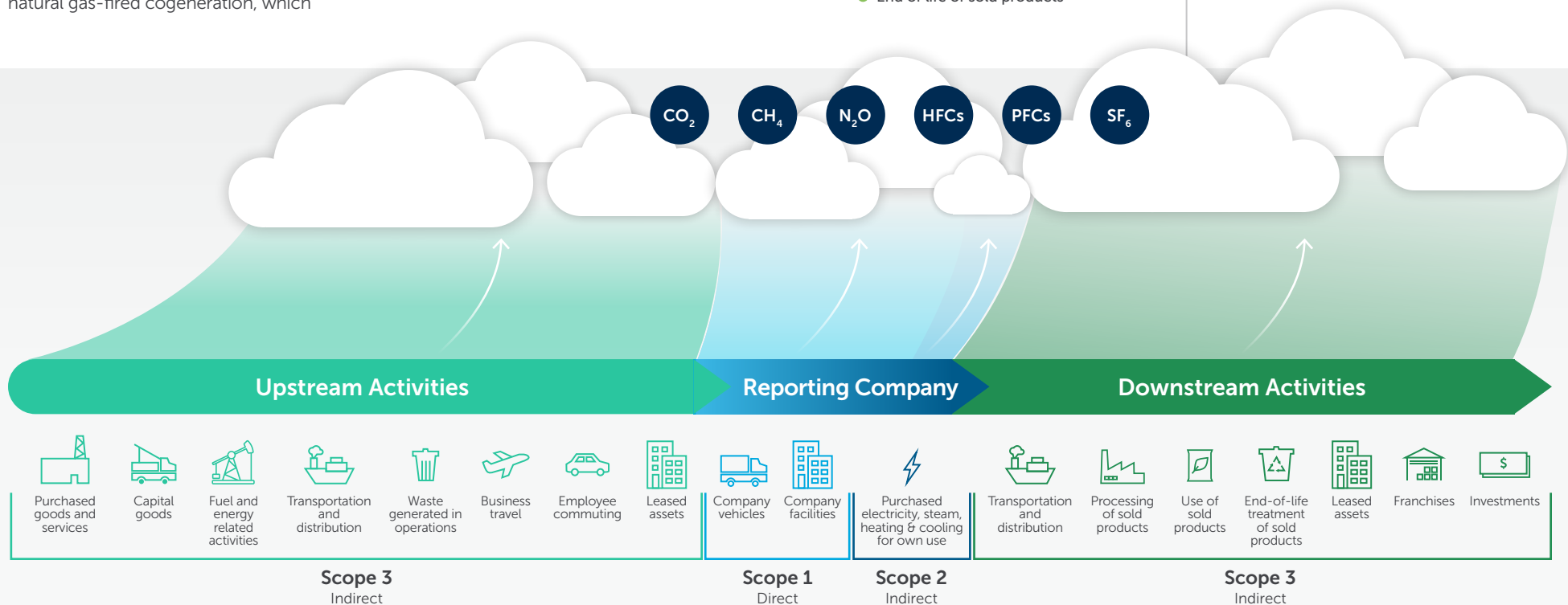
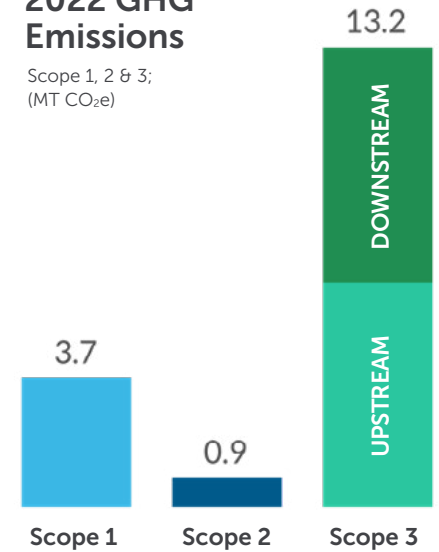
Our most material Scope 3 emissions result from our feedstock, downstream processing, and end-of-life treatment of goods produced with our products. While our Scope 3 emissions methodology follows the GHG Protocol Corporate Value Chain (Scope 3) Reporting Standard, estimating Scope 3 emissions can be challenging and we will continue to refine our methodology as the industry evolves its understanding of appropriate accounting methodologies and sources of data improve in accuracy and availability.



- Raw materials purchased
- Capital goods
- Fuel & energy related services
- Upstream transportation & distribution
- Downstream transportation
- Processing of sold products
- Use of sold products
- End of life of sold products

2022 GHG Emissions

Scope 1, 2 & 3;
(MT CO₂e)



2022 Activities

DEVELOPING OUR CLIMATE CARE STRATEGY AND DECARBONIZATION ROADMAP

In 2022, we continued development of our roadmap to drive decarbonization which [we announced](#) in early 2023. As a next step towards progress, NOVA Chemicals recently entered into a long-term Virtual Power Purchase Agreement (VPPA) with Shell Energy North America (Canada), Inc. to purchase 20 MW of renewable power and associated emissions offsets beginning in spring 2023. Through this agreement, we have started purchasing the power now being produced by BluEarth Renewables Inc. at its [Hand Hills Wind Project](#). BluEarth's Hand Hills Wind Project will feature 29 turbines across 12,000 acres, and will generate 145 MW of energy. This agreement with Shell Energy is a pivotal step in our decarbonization roadmap and signifies our commitment to achieve our emissions reduction ambitions. For more information on our VPPA, please see our [press release](#).

DEVELOPED OUR CARBON NEUTRAL POUCH

NOVA Chemicals created a carbon neutral pouch to demonstrate carbon neutrality in an all-polyethylene, recycle-containing package. The carbon footprint was first reduced through smart product design and incorporation of recycled high-density polyethylene. The remaining carbon footprint was then offset via investment in a verified emission reduction project.

COLLABORATION TO REDUCE EMISSIONS AND IMPROVE PERFORMANCE

Our frontline employees continue to engage in optimization and problem solving, collaboratively developing solutions that have significant sustainability and performance benefits.

OUR PERFORMANCE

GHG Emissions (Operation Control)



Our total absolute Scope 1 and 2 GHG emissions have decreased by 8% over the last five years as a result of reduced production. Due to lower production, our emissions intensity has increased by 5% during the same time period. In general, as NOVA Chemicals increases production, there is a corresponding increase in GHG emissions. Our assets are most efficient when running at full capacity, and high emitting years often demonstrate efficient performance in terms of GHG emission intensity. In 2022, we experienced challenging market conditions and planned activities which resulted in lower absolute emissions but higher intensity than in previous years. While our absolute emissions are expected to increase with the start up of our new SCLAIRTECH technology facility in 2023, our decarbonization roadmap will guide us to our 2030 ambition.

Air Emissions

Preserving regional air quality is essential to being a good neighbor and protecting the quality of the environment and the health of our employees and community members.

Management Approach: How We Manage Air Emissions

We measure air quality through the concentration of air pollutants such as oxides of nitrogen (NO_x), sulfur dioxide (SO₂), volatile organic compounds (VOCs), hazardous air pollutants (HAPs), and particulate matter (PM). Air emissions are regional issues, and we manage them at the facility level. All monitoring, repair, and reporting activities are conducted in accordance with the applicable regulatory requirements. Our strategies for optimizing our operational performance include:

REDUCING FLARING

We implement process optimization and advanced process control strategies to reduce flaring, lessen VOCs and, other air emissions. To upgrade our manufacturing

technology, conduct repairs, and perform maintenance, we occasionally shut down production which necessitates hydrocarbon flaring. We work to minimize flaring in the safe shutdown and subsequent startup of production processes.

ACTIVITIES FOR REDUCING AIR EMISSIONS

Our facilities use a combination of approaches to reduce air emissions including:

- Using cleaner alternatives for facility feedstock and fuel supplies
- Implementing low-NO_x burners to reduce NO_x at the combustion stage
- Incorporating selective catalytic reduction technology, which reduces the levels of NO_x from exhaust gas by having it react with a catalyst

- Using thermal oxidizers that use high temperature to reduce HAPs and VOCs
- Continued focus on LDAR programs at manufacturing facilities to identify and record fugitive emissions

ADAPTING TO REGULATIONS

We operate in accordance with air emissions regulations in the regions where we operate. The [Multi-Sector Air Pollutants Regulations](#) (MSAPR) apply to our Canadian facilities and require investments to reduce the rate of NO_x emissions from some of our boilers and heaters in Ontario.

WHY IS IT IMPORTANT FOR US TO MANAGE OUR AIR EMISSIONS?

Regional air quality is critical for maintaining a healthy environment for both our employees and community members in the places we operate. It is also a key concern for regulators, and air emissions are being increasingly regulated.

2022 Activities

ENVIRONMENTAL PROGRAM MANUAL

To support our efforts to align with RC14001® certification, a management system standard that combines elements of Responsible Care and ISO® 14001, we began developing the corporate Environment Program Manual. This manual describes the various methods, procedures, and programs we use to meet regulatory and Responsible Care requirements while minimizing environmental impact and exposure at NOVA Chemicals' facilities. The manual includes information around setting reduction goals and objectives, prioritizing work using a risk-based approach, implementing science-based solutions and best practices, and adopting continual improvement methods. We expect to complete the manual in early 2023.

CONTINUOUS IMPROVEMENT AT JOFFRE, ALBERTA

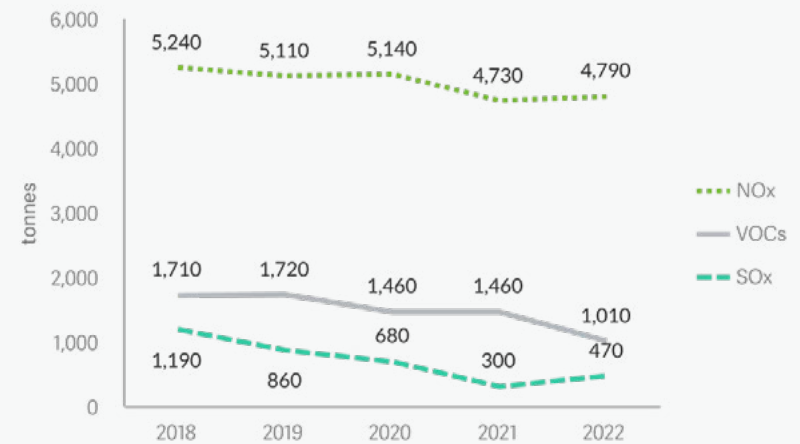
Our polyethylene facility in Joffre was upgraded in 2021 to reduce flaring and associated emissions using an innovative approach. In 2022, we performed an operating trial of the upgrades; however this trial did not perform as expected. We continue to pursue this project as a source of air and GHG emissions reduction opportunity.

NOx REDUCTION PROJECT AT SARNIA, ONTARIO

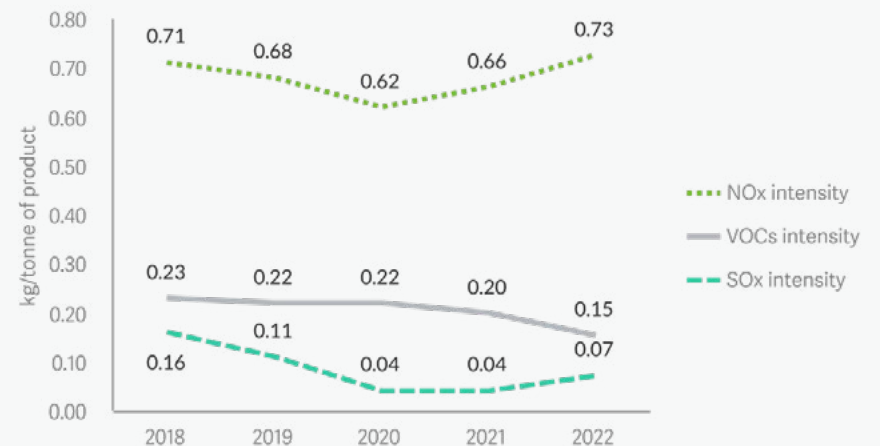
As part of our multi-year project for NOx emissions reduction, additional NOx emissions testing was performed to support the final equipment classification under the MSAPR (see [page 28](#)) for several boilers and heaters at our Ontario facilities. We have also refined the scope of work and timelines for various projects to reduce NOx emissions in accordance with the MSAPR requirements.

OUR PERFORMANCE

Air Emissions



Air Emissions Intensity



Our annual air emissions variations are primarily due to facility operating rates, annual source emission test results, refinements in the estimation methodology and changes in fuel composition to support plant start ups.

Waste

We work to achieve our vision of developing solutions that enable a circular economy through waste prioritization, management, prevention, and reuse efforts. Aligned with this vision, we continue to champion zero pellet loss at our sites and in our supply chain.



How We Manage Operational Waste

A variety of waste streams are produced from our manufacturing processes. The scrap polyethylene we produce is fully recyclable and is used by other companies as a raw material to create final plastic products. The majority of our waste consists of unusable by-products from manufacturing such as waste residues and sludges, filtration media, spent catalysts, used oils, and other types of waste. Some of our wastes also contain chemical compounds that must be separated or treated before they can be safely disposed.

WASTE HIERARCHY

Our waste management hierarchy tool (based on work by the U.S. Environmental Protection Agency) ranks our options for waste management. The goal of using this tool is to direct more waste streams

and increased volumes of waste toward the management options at the top of the waste hierarchy (prevent, reuse, recycle) and avoid disposal, wherever possible.

WASTE PRIORITIZATION

Our reduction strategies prioritize waste streams based on associated risks and opportunities. For example, we consider volume when prioritizing waste, but also include factors such as hazardous versus non-hazardous characteristics, transportation distance from our site to final disposal, the current disposal method, and the potential for reuse, recycling, or energy recovery.

WASTE PREVENTION

We explore different ways to recycle the scrap polyethylene we produce to avoid disposal. More than 99% of our scrap polyethylene is sent to recyclers for reprocessing.

WHY IS IT IMPORTANT FOR US TO MANAGE OUR WASTE?

Reducing our waste helps to make our facilities more efficient and reduces the impacts of our operations on the environment and the costs and risks associated with waste handling, transportation, and disposal.



OUR AMBITION

We aim to maintain our annual performance of zero plastic pellet loss to the environment from our facilities.

What does our ambition mean?

Zero plastic pellet loss means that no resin pellets are spilled to the environment during NOVA Chemicals' manufacturing processes. This ambition aligns with our view that plastic does not belong in the environment and our vision to advance the plastic circular economy. For the last three years, we have experienced zero plastic pellet loss from our site boundaries in accordance with Operation Clean Sweep® (OCS) and we continue to operate in a manner that maintains that performance.

WASTE REUSE

We are always seeking new opportunities to create value-added uses for our waste streams. For example, spent alumina from our St. Clair site is used as an additive for cement.

CHAMPIONING ZERO PELLETT LOSS

We continue to support Operation Clean Sweep, a campaign to prevent plastic pellets, powder, and flake loss at plastic-handling facilities. The OCS program aligns with our vision that plastics do not belong in the environment, and we believe that achieving that vision starts with our actions. Preventing pellet loss at our sites and in our supply chain is a top priority. As part of OCS, we conduct quarterly assessments at each of our sites to ensure that we have the appropriate tools available for clean up and 2022 marked the first full year of completed quarterly assessments.

2022 Activities

OCS ACCOMPLISHMENTS

As part of our commitment to OCS, we focused our efforts across four different

implementation areas including audits and assessments, facility upgrades, continuous improvement, and awareness and accountability. Notable efforts we made in 2022 included completing the Opportunity List Assessment and Ranking for one of our Joffre polyethylene plants, installing cleanup tools and equipment at our Joffre facility, incorporating OCS into specific operating procedures, and provided input to the CIAC on auditing mechanisms and best practices to support improvements across the industry. To continue our commitment, we have also developed our 2023 goals across the four implementation categories for our sites, Innovation Centers, and Corporate operations.

OCS CLEAN-UP CONTESTS

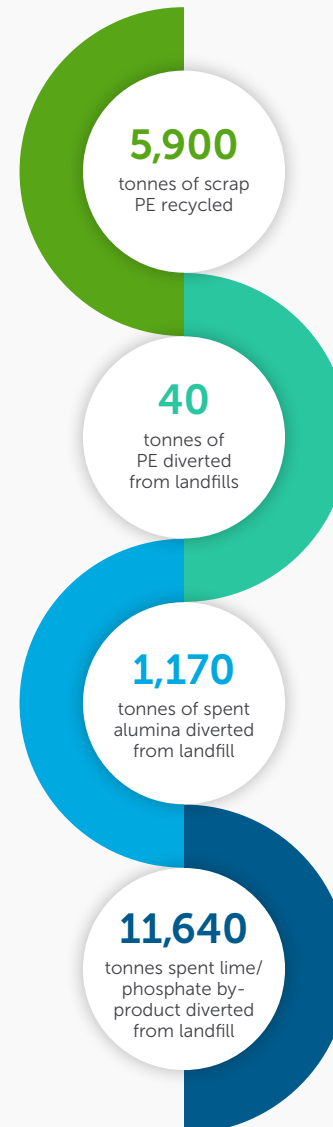
In June 2022, the Operations teams at the Moore and St. Clair River sites turned our commitment to OCS into action by participating in our OCS Clean-Up Contest. During our planned outages at the sites, teams took part in a historical resin clean-up. Removing historical resin waste helps us to meet our OCS goals, discover sources of waste, and identify problem areas.

and represents our largest non-hazardous waste stream. This waste is reused in local soil enhancement programs. The increase in 2022 is due to planned maintenance activities at the Joffre facility. Removing carbon dioxide from our primary feedstock results in a caustic waste by-product that is stored in local wells. This is our largest hazardous waste stream, which like all hazardous waste is managed according to regulatory and Responsible Care guidelines.

A CIRCULAR APPROACH TO OPERATIONAL WASTE

We continue to implement waste reduction programs at many of our sites and were able to divert more than 18,000 tonnes through the following programs:

2022 IMPACT



ACTIVITY

All scrap polyethylene is sent to a processor of post-industrial plastics for use in manufacturing, either directly or following processing, into recycled pellets.

At some of our sites, we generate waste (composed of lumps and strands) during production changeovers. A plastics company safely processes the lumps and strands from our St. Clair River and Moore sites and recycles them.

We use alumina (aluminum oxide) in our operations. Although we reuse the alumina, it loses its properties over time. Since 2018, we have sent spent alumina to an industrial company to be used in making cement. Alumina has rapid hardening properties and enhances cement for marine construction, sewer infrastructure, and structural concrete applications.

Some of our sites generate spent lime/phosphate by-product which is a recyclable waste stream. Our Joffre, Alberta, site makes this material available for use as a soil enhancement by landowners in the local area. This application of the spent lime/phosphate material enhances the soil properties of locally acidic soils and keeps this by-product out of area landfills.

WASTE (TONNES) 2022

Non-hazardous waste	32,760
Non-hazardous waste reused	21,510
Hazardous waste	95,840
Hazardous waste recycled	29

Spent lime/phosphate is a by-product of our water treatment process at the Joffre facility

Water

Water is a valuable resource and a critical part of our manufacturing processes. We test and treat all water returned to the environment, reuse water wherever possible, and are continually working to minimize the impact of our operations in water-scarce regions.

Management approach: How We Manage Water Use and Quality

Water is essential in our manufacturing processes, especially in cooling and generating steam. We withdraw the water we require for our industrial processes from the St. Clair, Red Deer, and Mississippi rivers.

A multi-disciplinary team of water-related experts guides our corporate approach to water management. The team is composed of environmental and technical specialists representing all manufacturing facilities as well as corporate innovation and environmental affairs personnel. The team is accountable for identifying and mitigating water-related risks; advocating for water conservation, recycling, or reuse; reducing water-related environmental impacts; and supporting water optimization projects across the company.

Our water management strategies include:

WATER REUSE

Our Joffre site has four stormwater retention ponds that allow us to store and use surface runoff from captured precipitation. We treat the water from these retention ponds through softening and clarification before it is reused in our operations. Water reuse accounts for around 5% of our annual site water use.

MINIMIZING WATER USE

Our internal project design and review processes evaluate how water is used at NOVA Chemicals facilities. Given that a significant amount of our water use is related to cooling, our efforts to improve energy efficiency (by reducing the heat load on our facilities) also contributes to improving water efficiency.

WATER TESTING AND TREATMENT

Almost all of the water we use is returned to the environment through evaporation from cooling towers and water retention ponds. Any water that is returned to surface water bodies goes through a rigorous testing and treatment process aligned with regulatory requirements and environmental standards.

UNDERSTANDING WATER AVAILABILITY

Availability of water fluctuates across the different regions in which our manufacturing facilities operate, which poses challenges in determining water use priorities and conservation. We are focused on evaluating all of our water-related risks and advancing our water use initiatives. See [TCFD Index](#) for water risk analysis.

OUR AMBITION

Develop a strategic water roadmap by 2025 that will identify actions that can help us reduce water use or improve our water efficiency in our operations.

What does our ambition mean?

We are focused on gathering and reviewing our water data to better understand our water risks (scarcity) and opportunities (equipment or process efficiencies). We plan to identify operational and facility actions that can help us reduce water use or improve water efficiency in our operations.



2022 Activities

We made progress on several major initiatives in 2022, including:

ENHANCED WATER RISK ASSESSMENT

In 2022, we completed a Water Body Risk Assessment to progress our understanding of water risks. The review used water risk indicators based on the World Resources Institute Aqueduct 3.0 database for each operating facility (Joffre AB, Sarnia ON, and Geismar LA) to assess baseline, 2030, and 2040 risks. Each of our manufacturing facilities face regional water risks which range from high water stress, seasonal variability, eutrophication, and floods. Following this assessment, we are progressing additional activities to update and review our portfolio of water reduction opportunities. We are also focused on enhancing water data visibility via internal scorecards and reporting systems.

REVIEW OF EMERGING REGULATIONS

NOVA Chemicals is in the process of reviewing emerging policies and regulations as well as disclosure standards and guidelines. The key objective of this exercise is to map water-related risks and opportunities, understand how and when they might emerge, and create appropriate strategies to mitigate the risks and capitalize on opportunities. In addition to issues such as water stress and quality, we are focusing on emerging regulations in North America and Europe to assess the implications on our operations.

MODERNIZED WASTEWATER TREATMENT PLANT

The Corunna Wastewater Treatment Plant (WWTP) Upgrade Project was completed in 2022 to replace the end-of-life primary oil and water separators in the chemical and oily water sewers. The project consisted

of several infrastructure changes including the addition of a Vapour Recovery Unit to treat air emissions such as hydrogen sulfide and hydrocarbons with residual emissions. Through the project we also converted a tank to serve as extra water storage in the event of storm surges, plant incidents and off-spec effluent water. We expect to see several operational benefits from these upgrades including a reduction in air emissions from the wastewater treatment plant, improved water treatment reliability, and additional water storage. With the new upgrades, the Corunna WWTP is also better equipped to receive wastewater effluent from the Rokeby site, where our new Advanced SCLAIRTECH technology polyethylene plant is located.

WATER (THOUSAND M³) 2022

Water withdrawn	36,300
Water discharged	21,240

Most of the water we withdraw is used for cooling and generating steam. A significant amount is returned to the watershed through evaporation from our cooling towers and water retention ponds.

WHY IS IT IMPORTANT FOR US TO MANAGE OUR WATER USE?

Water is an important shared resource for NOVA Chemicals and the communities we serve. By minimizing our water consumption and preserving water quality, we are contributing to the long-term sustainability of this shared resource.



IN THIS SECTION

Inclusion and Diversity	35 >
Talent Management	39 >
Employee Health and Wellness	41 >
Employee and Contractor Safety	43 >
Process Safety	47 >
Product Safety	50 >
Transportation Safety	53 >
Community and Indigenous Relations	56 >

SOCIAL

At NOVA Chemicals, we are working toward a more inclusive working environment, and we continue to advance the development and well-being of our people. We have a responsibility to ensure the safety of our employees, contractors and visitors, customers who handle and use our products, and communities near our operations and transportation routes. Through the execution of our growth plans and our community investment efforts, we seek to create a positive impact in the communities where we live and work.



Inclusion and Diversity



We aim to be an agile, high-performing team and create an environment where employees feel they belong, are engaged, and represent the communities where we live and work. This means that we strive to improve our recruiting and engagement practices to support an inclusive culture where everyone feels they can be their authentic self.

A workforce that fosters diversity and builds engagement and a sense of belonging helps to attract and retain top talent and improve overall business performance. We recognize that there are many aspects of diversity and we are beginning our initiatives with age, gender, race, sexual orientation, and disability status, as those populations represent the groups that are traditionally underrepresented in our company and industry.

OUR AMBITION

By the end of 2030 we aspire to achieve a:

10% increase in diversity across all levels of the organization from our 2020 baseline

30% representation of women across all levels of the organization

5% increase in representation of people of color in leadership from our 2020 baseline

10% increase in women in leadership from our 2020 baseline

In 2022:



25%
OF NOVA CHEMICALS'
WORKFORCE WERE WOMEN



24%
OF MANAGEMENT
WERE WOMEN



We initiated an **internal diversity survey** in order to track our diversity within our organization and enable future reporting. The diversity survey measures the following:

- LGBTQ2+
- Gender (Identify As)
- Disability
- Race/Ethnicity

Management Approach: How We Foster Inclusion and Diversity

At NOVA Chemicals we are dedicated to creating an inclusive and equitable culture and achieving diverse representation in our workforce. Our I&D Strategy establishes clear aspirations and expectations for creating an inclusive and diverse workplace. Five strategic pillars guide our activities:

1. BUILD AN INCLUSIVE CULTURE

We promote a caring and inclusive environment where leaders foster openness and belonging so that every employee can bring their full selves to work.

2. ATTRACT AND RETAIN DIVERSE TALENT

We work to develop a robust talent pipeline and inclusive hiring and promotion practices to ensure that NOVA Chemicals is a highly sought after place of employment. This would also aim to ensure employees feel valued at work, and are treated fairly in compensation and career progression. In 2020, we established a baseline for various aspects of diversity (e.g., gender, disability status) that we use to measure our progress. We are continuing to monitor the diversity of our workforce through our diversity census.

3. DIFFERENTIATE THE EMPLOYEE EXPERIENCE

We develop and implement policies, programs, and flexible benefits that serve the unique needs of diverse groups. For example, we continue to promote

employee involvement in informal development networks such as The NOVA Network (an internal volunteer network that provides development opportunities) and the Ellevate Network® (an external, global networking and development community program for professional women).

4. MAINTAIN ROBUST INCLUSION AND DIVERSITY COLLABORATION

We established formal I&D roles, responsibilities, and accountability structures and will regularly measure our progress. Key features of our structure include:

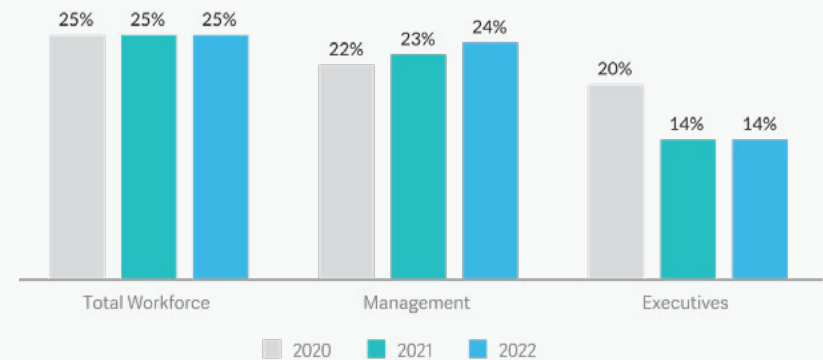
- a. Our Inclusion and Diversity Council which consists of 12 employee volunteers who provide insights to executive and human resource leadership to help build diversity and a sense of belonging for all employees. See [page 38](#) for details.
- b. The [Business Conduct Policy](#) (our Code of Conduct) outlines our responsibilities and expectations for workplace behavior around I&D.
- c. Questions or concerns can be raised through NOVA Chemicals' EthicsPoint®, our 24-hour confidential and anonymous (or otherwise) telephone and online reporting system.

5. ENGAGE WITH THE COMMUNITY AND EXTERNAL PARTNERS

We aim to work with our partners to establish ourselves as a recognized leader for change across our supply chain and in the broader community.

OUR PERFORMANCE

Women at Various Levels



In the last year, we saw an increase in women at the management level, although the percent women in our total workforce has remained the same.

We have laid the groundwork for change with our I&D Strategy and will work to improve these trends as we put greater focus on building a Diversity Recruitment Strategy while continuing to mature our culture of inclusion.



2022 Activities

EMPLOYEE RESOURCE GROUPS

To build our inclusive culture, the I&D Council is involved with our Employee Resource Groups (ERGs). ERGs play an important role in supporting our employees with any challenges they may encounter and making them feel safe, appreciated, and respected as we continue to grow. During the year, our main priority was to grow Women in NOVA (WIN) ERG and continue providing support, networking, and education opportunities to this group. In 2022, the WIN ERG took part in social events which included Breast Cancer awareness and a speed networking event. The ERG's upcoming tasks will include creating the group's charter, scheduling engagement events, and providing networking opportunities.

I&D TRAINING OPPORTUNITIES AND RESOURCES

In 2022, we established three I&D trainings and workshops: Belonging, Decide, and Include, to support our employees and leaders in developing new skills, overcome biases, and build stronger connections. We also developed a dedicated I&D microsite and I&D calendar to provide additional information to our employees. Employees can access digital resources from internal and external sources to support personal learning and embed I&D into everyday meetings and conversations. Throughout the year, inclusion moments were created as education around the eight heritage months that could be utilized for discussions at team meetings and individual learning.

EMPLOYEE DIVERSITY CENSUS

To better understand our employee population and the diversity at NOVA Chemicals, a Diversity Census was launched in 2022. We recognize that our organization includes people from different backgrounds and we strive to create a more inclusive environment by deepening our knowledge of our diverse workforce. The census consists of questions around gender, race, disabilities, and sexual orientation. The data we gather from responses will be used to design and implement programs that will better meet the needs of all employees at NOVA Chemicals. This Census is evergreen and can be updated at any time by employees to ensure we have the most up to date information.

INCLUSION AND DIVERSITY BENEFIT ENHANCEMENTS

Our benefits coverage is reviewed annually to promote inclusivity by ensuring that we are addressing the diverse needs of our employees and remain competitive. Through our 2022 review, we found various opportunities and improved our benefits for 2023 by adding paid parental leave, unpaid job protected leave, additional holidays, and including pregnancy loss in our Bereavement Leave policy.

PRESIDENT'S IMMIGRATION TASK FORCE

In early 2022, the Mayor of Sarnia and Warden of Lambton County created the President's Immigration Task Force to advance sustainable growth and diversity for the Sarnia-Lambton community and economy by attracting and integrating immigrants into the area and working population.

The committee consists of local leaders from various sectors including government, industry, business, trades, healthcare, and education. NOVA Chemicals is a founding member of the group and participates by providing input, making connections with local organizations, and representing the hiring needs of our business, which is the largest employer in the county.

SUMMARY OF OUR 2022 PROGRESS IN EACH OF THE PILLARS OF OUR I&D STRATEGY:

PILLAR	2022 ACCOMPLISHMENTS
1 Build an inclusive culture	<ul style="list-style-type: none"> Recognized eight heritage months and four days with Inclusion Moments, knowledge sharing, and employee perspectives Developed I&D training and workshops for leaders and all employees
2 Attract and retain diverse talent	<ul style="list-style-type: none"> Collaborated with Diversity focused search firms in 2022 to support our attraction efforts
3 Differentiate the employee experience	<ul style="list-style-type: none"> Assessed benefits coverage and enhanced offerings to be more inclusive of our workforce Introduced 2 floating holidays in Alberta in lieu of receiving Family Day and Remembrance Day to allow all non-shift employees in Canada flexibility to choose a day off of personal importance
4 Develop robust I&D Information Gathering Processes	<ul style="list-style-type: none"> Updated the structure of our I&D council to improve collaboration Launched our first Employee Diversity Census
5 Engage with the community and external partners	<ul style="list-style-type: none"> Participated in the President's Immigration Taskforce to promote diversity in the Sarnia-Lambton community

Our Inclusion and Diversity Council

In 2021, we launched our I&D program with a three-year plan to enhance our culture, become more inclusive, and increase our diversity. Our I&D Council, which supports management in implementation of this strategy, evolved in 2022 to align champions with key priorities in the strategy. The Council aligned its efforts to NOVA Chemicals' I&D strategy, creating a roadmap of priorities, outlining business processes, and developing I&D metrics and an initial KPI strategy.

These five sub-groups assist management in developing and implementing I&D programs and monitoring progress:

- **Employee Resource Groups (ERG) sub-committee** — focuses on developing current ERGs and creating new groups for the future;
- **Supply Chain/Community Investment sub-committee** — provide input for incorporating I&D elements into business process for NOVA Chemicals' supply chain and expand upon our current efforts, with an additional focus on I&D-related causes;
- **Engaging Leaders sub-committee** — this group helps in promoting the importance of leader support to the I&D initiative;
- **Connection Opportunities sub-committee** — focuses on enabling networking opportunities and platforms for employees to gather and connect; and
- **Dashboard/Data Development sub-committee** — looks to promote use of metrics, reports and dashboards to help the company track its I&D success to its targets.



▶ WHY IS IT IMPORTANT FOR US TO FOSTER INCLUSION AND DIVERSITY?

We believe that promoting an inclusive and diverse workplace can improve our company's overall performance. Building a workforce with a diverse range of backgrounds, thoughts, and experiences to guide decision-making will support NOVA Chemicals in being recognized as a top employer, help attract and retain top talent, and is ultimately the right thing to do.

Talent Management

We want to build a culture where our employees excel, bring their best selves, and feel valued. NOVA 2030 relies on the engagement of our employees and leaders, who play a critical role in achieving our objectives.

To realize our goals, we are prioritizing the health of our culture and the development of our workforce to enhance our performance. This includes measuring the health of our organization and continuing to provide opportunities for personal and professional growth and training, so that our employees have a high degree of trust, feel engaged in work that is meaningful to them and become better equipped to support our strategic priorities.

Management Approach: How We Create a Learning and Engaging Culture

ORGANIZATIONAL HEALTH

Our commitment to organizational health — how well we align ourselves around vision and strategy, execute our work and respond to changes internally and externally — is grounded in the principle that a high-performing company is a healthy company. We are focused on improving our organizational health by investing time, resources and funding to support our people and improve their work experience. These efforts enable the progress towards five organizational health aspirations that will help us improve performance and achieve our strategic ambitions.

Our Aspirations:

THEME	HEALTH ASPIRATIONS
1 Strategic Clarity & Engagement	We have a strategy with a compelling vision that is believed by all, and we are all clear on our contribution to making it happen.
2 Trust & Connection	We foster a positive employee experience where people feel proud, trusted, inspired, connected and energized.
3 Execution Excellence	Our processes, policies, and management systems enable agile, effective completion of work, and performance is made visible.
4 Ownership & Innovation	Innovating is core to NOVA Chemicals. We all own and encourage ideas to improve performance. We support and celebrate our learnings from our failures and successes.
5 Talent Development	We develop a winning team through challenging experiences and providing support to enable people to thrive.



EVERYDAY LEARNING

Our aim is to create an environment that prioritizes learning to encourage everyday innovation. Employees receive up to 70% of training and development on the job, 20% comes from coaching from leaders and/or networking, and 10% is gained through formal learning programs (virtual or classroom). All people leaders at NOVA Chemicals can participate in our Applied Leadership Network, a program that enables peer-to-peer learning through meetings that occur six times every year.

FORMAL LEADERSHIP DEVELOPMENT

NOVA Chemicals' Leadership Development programs and supporting framework place leaders into groups based on their leader level and development needs. These groups range from emerging leaders to senior people leaders. Our culture of development enables skill enhancement through a variety of means including experience, coaching, and formal training. One of our foundational programs, CONNECT The Neuroscience of Quality Conversations®, focuses on having effective conversations between leaders and employees, which is a key component to enhance individual performance and development. Virtual training sessions are led by the NeuroLeadership Institute. Our Emerging Leader program prepares individuals for future leadership roles, and our Accelerate Your Impact program prepares select candidates for senior leader roles. In 2022, we built on our leadership development framework and launched various new leadership development programs that are centered on developing the skills that we require at NOVA Chemicals to execute our strategy.

2022 Activities

IMPROVING ORGANIZATIONAL HEALTH

To understand our current state, we conducted our first annual employee survey to measure the health of our organization. We had an 81% participation rate and gathered over 4,500 comments from our employees. The survey results provided an understanding of our areas of strength and opportunities for improvement and led to the creation of organizational health aspirations. Each aspiration is sponsored by a member of the Executive Committee with senior leaders providing guidance. To achieve these aspirations, we introduced our first set of enterprise-level initiatives that will deliver improvements to all employees and local-level initiatives to directly impact work within the regions and functions. Execution of the initiatives is owned by employees.

COMMITMENT TO OUR LEARNING CULTURE

At NOVA Chemicals we are dedicated to creating a thriving learning culture that focuses on continuously improving employee development to be more efficient, aligned with best practices and supportive of employee needs, approaches and schedules. In 2022 we made a renewed commitment to this culture by launching the Discovery Lab, our new architecture for employee training at NOVA Chemicals, which will encompass our current initiatives, new program offerings, and developments for the future.

To support our employee development culture, we implemented our learning

and development standards to help employees better understand what successful learning encompasses. Employees are also able to access and track their learnings through our newly developed learning management system.

ENHANCED LEARNING AND DEVELOPMENT PROGRAMS

In 2022, we formalized our leadership development framework by identifying the capabilities we want to enhance and developing and launching various leadership programs. During the year, we launched the Igniting Your Influence program which is designed for first level leaders to develop their core leadership capabilities such as communication, delegation, driving change, executing strategy, and coaching. The program consists of on-demand learning components that are available 24/7 and live collaborative learning sessions.

We also developed our Forging the Future program for mid- and senior- level leaders which focuses on skills including translating strategy into results, determining strategic priorities, driving transformation through culture, strategic influence, and leading networks. This program will be launched with our leaders in 2023.

As part of our commitment to developing our employees at all levels, we designed our Execution Essentials program in 2022 to empower all employees, from senior leaders to frontline workers, and help build the critical and foundational skills that are required to effectively execute work day-to-day. Execution Excellence is now available to senior leadership and will be extended to all employees in 2023.



Note: Discovery Lab is an internal Human Resources program of NOVA Chemicals which supports employee training.

Employee Health and Wellness

At NOVA Chemicals, we recognize the strong connection between the health and well-being of people and their work environments, safety, and productivity.

Management Approach: How We Promote Health and Well-Being

OCCUPATIONAL HEALTH AND PROGRAMS

We implement standardized occupational health and programs across all NOVA Chemicals facilities that are compliant with applicable regulations and our standards. Occupational health is embedded throughout our business and supports safe, reliable, and competitive operations by maintaining a high-performance culture. This is enabled by our robust occupational health practices that minimize risks to workers and to the business. Our core programs support employee health and wellness and ensure workers are protected

across the areas of mental, biological/chemical, and physical health such as ergonomics, fitness to work, travel health, and hearing conservation programs.

INDUSTRIAL HYGIENE

Our Industrial Hygiene program is integrated with the Occupational Safety, Occupational Health, and Contractor Safety Leadership programs. The Industrial Hygiene program aims to recognize, manage, and control industrial hygiene and safety risks and reduce incidents, injury, illnesses, and occupational disease to help provide a safe and healthy work environment. The program's strategic goal is to protect workers from exposure to chemical, physical, and biological hazards and utilizes risk management systems and tools to prevent occupational illness/disease

and injury, to help us achieve our ambition of Goal ZERO.

EMPLOYEE WELL-BEING PROGRAM

NOVA Chemicals' Total Well-Being program supports employee physical, mental, financial, and social well-being and demonstrates our commitment to improving the well-being and working experience for all employees, both at work and at home. Through this program we provide employees with various resources including an Employee and Family assistance program and multi-media educational information from trusted partners. The well-being programs include a digital platform that promotes well-being by allowing employees to set personal goals and track progress, which we refreshed in 2022 to support more personalization

options. Employees who participate in the digital platform are eligible to receive health and wellness related incentives. In 2022, we renewed our commitment to total well-being and mental health in the workplace. This included assessing our strategy, communicating our re-commitment to employees, and updating our platform with Lifeworks to include additional tools and resources for mental health. As we look ahead to 2023, we plan to increase our efforts around our mental health pillar by increasing employee education in this critical health element. Through improved learning opportunities and support for employees and leaders, we aim to support an environment where everyone understands and supports the importance of mental well-being and health.



2022 Activities

SAFE RETURN TO WORK

Throughout the COVID-19 pandemic we have taken a risk based approach, enabling our Pandemic Advisory Team (PAT) to focus on the key areas of exposure to mitigate impacts to our operations. We continue to take action to protect our employees' health and safety, and PAT continued to support our ongoing initiatives to ensure a safe return to work and protect the health and safety of all employees and contractors working at our facilities and living in our communities. In 2022, PAT transitioned to focusing on infection prevention and control processes to support resilience and business continuity if we face another similar situation in the future. This work allowed us to successfully transition to a full on-site environment for employees. To support our employees we delivered education and awareness campaigns on the benefits of COVID-19 vaccinations and infection prevention tips.

FATIGUE RISK MANAGEMENT

In March 2022, we began developing and implementing a procedure for Fatigue Risk Management (FRM) to integrate workplace recognition of fatigue into NOVA Chemicals' processes. We desire to better understand the role of fatigue which may result in incidents and accidents. We formed a FRM Strategy Team to create a project charter and milestones to support successful implementation. This initiative was first rolled out to our Pipeline group in Ontario to ensure that designed tools, processes, and training are comprehensive.

REFRESHED WORKPLACE RESPECT AND VIOLENCE PROGRAM

Building a culture of respect in the workplace is crucial for ensuring the well-being of our employees and developing trust throughout the workforce. Our refreshed Workplace Respect and Violence Program supports this culture and places a greater emphasis on respect and encouraging employees to speak up about violations.



Employee and Contractor Safety

We are committed to Goal ZERO (zero injuries or incidents) and believe that all work-related illnesses and injuries can be prevented. Our vision is to achieve Goal ZERO by ensuring safety is embedded in all processes and programs at NOVA Chemicals.

Occupational Safety is a core value that guides everything we do, and we are dedicated to fostering an established safety culture with clear accountabilities and expectations for employees and contractors.

Our business success depends on protecting the safety of our employees, contractors, and the communities in which we operate.

The Responsible Care management system is geared to support safe, consistent application of Responsible Care standards and practices while clearly defining expectations and accountabilities for performance for all activities and work at our facilities.

NOVA's Approach: How We Manage Employee and Contractor Safety

NOVA Chemicals' safety culture works to ensure that all employees and contractors feel empowered and responsible for maintaining the safety of their colleagues. We are in the process of transitioning our safety management system to RC14001, an internationally recognized risk-based approach. The RC14001 Management System sets the expectations and identifies the processes and controls required to mitigate and manage risk.

We recognize that contractor safety is essential for sustained Responsible Care performance as our contractor workers are exposed to some of our highest risk work. We are implementing our new Contractor Safety Management Program which focuses on prequalification, selection, and onboarding criteria to establish clear expectations for safety performance management and assurance. NOVA Chemicals is implementing these improvements in 2022 and 2023 across all facilities. This includes employing tools to enable the program and performance metrics to measure and assess its effectiveness.

Visible and felt leadership presence at the work fronts and alignment on safety culture with our contracting partners is supported by regional Contractor Safety Management Committees who oversee our contractor safety program implementation and maintenance. The contractor safety program revisions include updates to prequalification scoring, bid evaluation scoring, strengthens contractor safety performance requirements and refocuses field supervision on task risk management. This program will undergo an assurance check by a qualified third party to verify effectiveness starting Q4 2023.



Each new year we recommit to a focused mindset around managing process and personnel when we engage all employees in our Am I Ready campaign. The theme for the Am I Ready campaign in 2022 was “Goal ZERO is Achievable When We Work Together.” The campaign is a call to action for all employees to commit to and focus on Responsible Care and safety behaviors. The campaign reviews the past years Responsible Care performance to highlight Goal ZERO trends across our corporation and learn from successful work and unplanned incidents. It also focuses on actions each employee should concentrate on to commit to their part in maintaining a safe work environment for all in the coming year. Key topics for 2022 were behavioral-based safety and safety interactions, working from heights, and stored energy awareness.

ENCOURAGING SAFE BEHAVIORS

- **Safety interactions:** We observe safe and at-risk behaviors and use our findings to address safety concerns by engaging our employees and contractors in constructive and respectful dialogues. These safety interactions support a Responsible Care mindset and play a key role in achieving Goal ZERO. In 2022, our employees recorded more than 55,600 safety interactions in the workplace or while working from home. Our dedicated safety team regularly analyzes the content of all recorded safety interactions to gain insights, share lessons learned, and better understand trends so we can adjust our programs as necessary.
- **Safety awareness:** We regularly hold Toolbox Talks, which are informal, job-specific safety meetings to promote

safety awareness within the company.

We also host an annual Safety Day event at all NOVA Chemicals locations to help employees and service providers learn about safety incident prevention and emerging safety best practices.

- **Hazard recognition:** Hazard identification and correction is an essential part of a safe workplace. We provide hazard recognition training and learning opportunities to help employees better identify and address workplace hazards, including safety tools and processes such as our Am I Ready philosophy, which challenges employees to consider whether they have the right training, competency, equipment, and mindset to undertake the required work.
- **Sharing of learnings:** We conduct a Significant Incident Review process after

each incident. This process includes an analysis and a leadership quality review. After the analysis and review, information about the incident is shared across the company via our Responsible Care Risk Alerts and Responsible Care Risk Bulletins. The Responsible Care Risk Alerts also contain a “call to action” that initiates immediate mitigation activities, which is useful to promote safety awareness and prevent similar incidents from happening in the future.

- **NOVA’s Nature Awards:** These annual awards recognize individuals and projects within the company that exemplify the values, practices, and habits (including safety) that will allow us to achieve our strategic ambitions.



▶ WHY IS IT IMPORTANT TO ENSURE EMPLOYEE AND CONTRACTOR SAFETY?

Our employees and contractors are vital contributors to the success of our company. It is imperative that we create and uphold an environment that is free of illness, injury, or harm so that everyone stays safe every day.

2022 Activities

IMPLEMENTED CONTRACTOR SAFETY MANAGEMENT PROGRAM

In 2022, we rolled out a new, risk-based contractor safety management program. The program is aligned with the RC14001 system and focuses on establishing risk management processes, clarifying roles and responsibilities, and standardizing performance management (learn more about RC14001 certification requirements on [page 43](#)).

REVISED SAFETY ALERT PROCESSES

We are seeing improvements in NOVA Chemicals' process safety events following the new alert process that was introduced in 2021. The new process, the Responsible Care Risk Alerts and Bulletins, are issued based on severity or potential severity and use a corporately developed template that improves the quality and consistency of the reports. In 2022, we issued alerts for significantly lower-severity events compared to the previous year.

ENHANCED VISIBILITY OF SAFETY PERFORMANCE AT FACILITY LEVEL

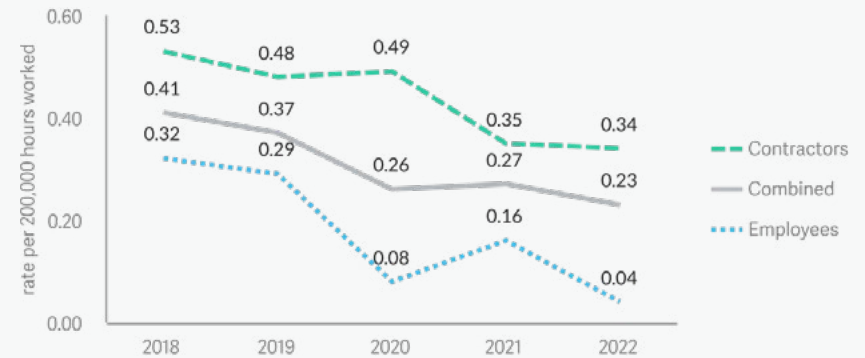
As part of our efforts to continue increasing visibility of our safety performance, we introduced a number of additional metrics for process and occupational safety in 2022. These metrics are reviewed monthly by NOVA Chemicals' leadership team and are housed in our data visualization dashboard. The dashboard allows employees to view corporate and facility-based safety performance data and variables in near-real time, which helps employees and leaders identify gaps, enable mutual learning, and connect individual decisions to facility and company performance outcomes.

EXPANDED ASSURANCE PROGRAM

As part of our ongoing alignment with the RC14001 certification system, we have modified our assurance program to a risk-based approach. The approach now includes defining Major Unwanted Events and identifying critical controls. These changes support the identification, prioritization, and mitigation of safety risk gaps, and make our internal assurance function a catalyst in achieving Goal ZERO. The changes also provide independent confirmation of program efficacy to senior leadership and the Board while demonstrating due diligence to external stakeholders.

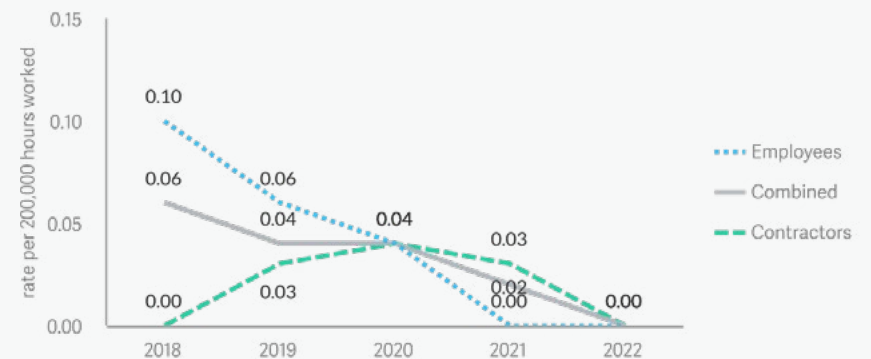
OUR PERFORMANCE

Recordable Injury Rates



In 2022, our combined recordable injury rate was 0.23. This represents our best-ever performance and a 44% reduction in overall TRIR compared to 2018. NOVA is on a journey to top quartile safety performance and is developing systems and a safety culture to achieve this goal. Our year on year safety performance improvements are trending positively to support these objectives as we work closely with all NOVA employees and our service providers to advance our strong NOVA safety culture. Our 2022 safety performance improvement indicates we are on course to achieve top quartile performance on our ambition for Goal ZERO.

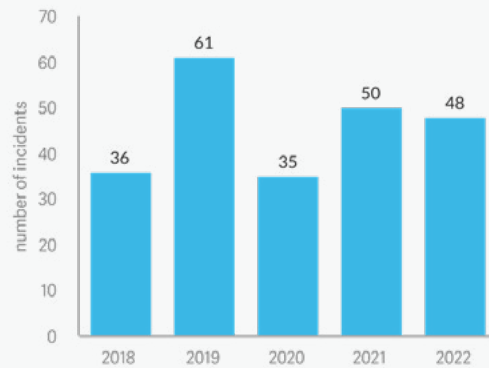
Lost Time Injury Rates



In the last five years, we have reduced our combined lost time injury rates and achieved ZERO lost time injuries in 2022. We are proud of this accomplishment and aspire to sustain our Goal ZERO commitment through continuous improvement.

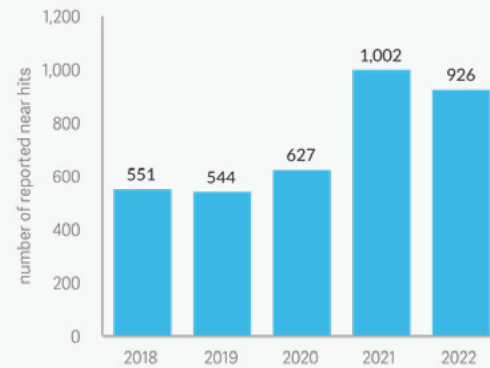
OUR PERFORMANCE

Vehicle Incidents



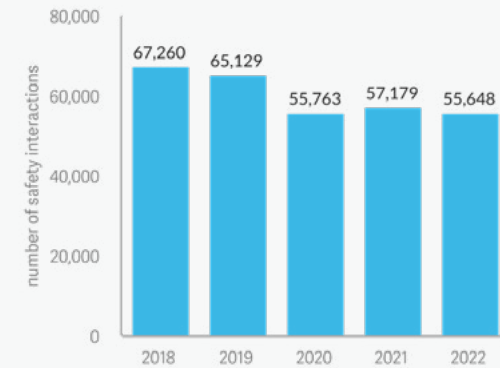
Our driving-related incidents (do not include rail or powered mobile equipment) have increased by 33% since 2018, but have decreased 4% since 2021. Employees must complete virtual safe driving training, with refresher training available. The majority of incidents were related to minor vehicle damage while the vehicles were stationary or making minor contact with stationary equipment. The data shows that the performance trend is incidental to the implementation of a park to pull away policy where initially we had more minor backing related vehicle incidents. This shift initially resulted in higher frequency, but lower severity incidents involved with in many cases reversing vehicles into parking spots. The data in 2022 is now showing progressive improvement as this new policy is embedded and although the vehicle incident trend is now improving again, vehicle safety and driver awareness and training are areas of focus to improve performance in this area.

Near Hits



A near hit is an unplanned event that did not result in injury, illness, damage, loss, or violation of a procedure, process, regulation, or law, but had the potential to do so. We encourage near hit reporting because it is a proactive leading indicator that enables us to identify and address a hazardous situation before an incident occurs. The increase in near hits follows awareness outreach to carriers, site coordinators, and team leaders that has led to renewed recognition for reporting transportation incidents and near hits.

Safety Interactions



Safety interactions are peer interactions about safe or at-risk behaviors. We encourage employees to speak up when they see positive or at-risk behaviors, as part of a Responsible Care mindset. Although the reduction in total number of employees as of 2020 resulted in a corresponding reduction in the total number of Safety Interactions, participation rates met or exceeded our internal targets. Our trends show approximately 75% of the interactions are based on safe behaviors and are predominantly related to work planning and preparedness, slip, trips and fall prevention and health and wellness.

Process Safety

NOVA Chemicals is committed to upholding process safety measures, including prevention and risk-reduction efforts, to help ensure the safety of people, the environment, and property.

Management Approach: How We Manage Process Safety

Our approach to preventing process safety incidents that could harm people, property, or the environment includes:

"LAYERS OF PROTECTION" MANAGEMENT

We follow a layered management model to prevent process safety incidents through multiple lines of defense. The "Layers of Protection" management model includes three key layers: engineering, operating, and maintenance. Our facilities are designed with inherent safety features and protective technologies, and we apply safety management systems and processes (e.g., hazard assessment and analysis, asset integrity management, change management) while operating all facilities.

The layers of protection are also extended to include employee safety awareness and our organizational safety culture.

PROCESS HAZARD ASSESSMENT

As part of our ongoing five-year Process Hazard and Risk Assessment Program, we actively monitor and manage risks associated with our facilities and related operations. We assess the risk, frequency, and severity of risk scenarios by using industry-leading methodologies consistent with those published by the [Center for Chemical Process Safety](#). NOVA Chemicals is also piloting a new hazard analysis tool that aimed at continuing to reduce and prevent incidents. See 2022 Activities [here](#) for more details.

THOUGHTFUL COMPLIANCE

Thoughtful Compliance at NOVA Chemicals describes a mindset in which employees and contractors remain open to vulnerability and are willing to question whether things are in line with expectations. Thoughtful Compliance ensures we are consistently and successfully managing the risks associated with our operations, including proper management of hazards and compliance with the programs and practices designed to keep us safe. By recognizing when things are not as they should be, we can take action to rectify them and prevent them from happening in the future. To promote a Thoughtful Compliance mindset, we engage in a number of activities focused on improving our safety culture. See Encouraging Safe Behaviors for details.

▶ WHY IS IT IMPORTANT FOR US TO MANAGE PROCESS SAFETY?

As a petrochemical company, we manage many materials, including some which are hazardous. Focusing on process safety is critical to preventing incidents such as explosions, fires, or toxic releases that can result from the accidental release of these materials.



2022 Activities

The following activities enabled us to advance our commitments to both Responsible Care and Process Safety:

STREAMLINED OUR APPROACH TO RISK ASSESSMENT

We consolidated our risk assessment models into a single risk matrix. This streamlined approach allows for better comparison and prioritization of risks across the company as it measures all risks against one set of criteria. Existing applications such as our process hazard review and Responsible Care risk registers, as well as any future applications such as incident classification, will also adopt this new approach.

IMPROVED INCIDENT MANAGEMENT

In 2022, we designed and configured a new cloud-based platform for risk assessment and incident management. The platform will include our newly-developed classification scheme for actual severity and potential risk of events, aligned with the consolidated risk matrix. The new system has an event management module which allows management, tracking, and response to incidents and events that may impact the safety of our operations and regulatory compliance. It also provides a centralized platform to track, investigate, and report incidents in real-time. Utilizing this module will help support the overall safety and health of the organization by reducing the risk of future events.

PILOTED A HAZARD ANALYSIS TOOL

NOVA Chemicals recognizes that proactive identification and control of hazards through formal Job Hazard Analysis and in-field assessments is critical to the reduction and prevention of incidents. In 2022, we initiated a pilot program for a new Job Hazard Analysis procedure for high risk jobs. The goal of this program is to assert greater clarity and consistency with the management of risks related to facility operations. In 2023, we will kick off a new initiative to revamp our Field Level Hazard Assessment tool with a group of facility stakeholders, and aim to achieve full implementation in 2024.

COLLABORATED WITH INDUSTRY LEADERS

In 2022, NOVA Chemicals chaired an industry initiative through the [Center for Chemical Process Safety \(CCPS\)](#) to develop a [white paper](#) on effectively using process safety metrics to improve process safety performance. This initiative represents the next step in best practices for applying and gathering Process Safety metrics to promote change. The paper addressed the linkage between leading and lagging indicators, as well as examining the role of culture and leadership engagement in using metrics to drive change. By chairing this initiative, we continue to support process safety within the processing industries and collaborate with like-minded peer organizations to advance process safety both inside the company and in the broader community.

OUR PERFORMANCE

Process Safety Incidents



Process Safety Total Incident Rate (PSTIR) is calculated using the American Petroleum Institute (API) RP 754 from 2021. This rate is based only on Tier 1 incidents, which aligns with SASB recommendations.

Process Safety Incident Severity Rate (PSISR) is calculated using the American Petroleum Institute (API) RP 754 from 2021. This aligns with SASB recommendations.

To manage process safety performance, we use layers of protection management, risk assessments, and a culture of thoughtful compliance. 2022 represents the first year since API RP 754 was introduced in 2010 that NOVA Chemicals has not experienced a Tier 1 Process Safety event or a Tier 2 Process Fire. Note: API 754 (industry guidance) provides classification thresholds based on the nature of the material, release size/rate, and resulting consequences. Typically, Tier 1 events resulted in adverse consequences (most often equipment damage) while Tier 2 events had the potential to result in adverse consequences.

CASE STUDY

NOVA Process Safety Performance Records

It has been over three years since the Geismar site experienced a Tier 1 or Tier 2 Loss of Containment (LOC) event. April 13, 2020, was the last Tier 2 LOC event at Geismar involving hydrocarbons. Further, since 2021 the Geismar site has not experienced a NOVA Tier 3 Flammable LOC event. Driving this performance has been a continued and sustained focus at the Geismar site looking at bolted joint integrity in combination with enhanced leak detection practices.

Some examples are:

1. Bolted Joint Integrity is a quality metric (Bolted Closure Failure Rate) with their nested maintenance workforce and is reviewed in quarterly Supplier Relationship Meetings. Additionally, higher risk hydrocarbon systems (e.g., large high pressure ethylene systems or hydrogen systems) are leak tested using helium prior to reinstatement/commissioning following major maintenance activities.
2. Recent maintenance work on the Ethylene Binary Refrigeration compressor systems was leak tested with helium prior to turning over to Operations for reinstatement. This process identified no potential issues, which further reinforced the quality control work being done relative to the site's Bolted Joint Integrity program.

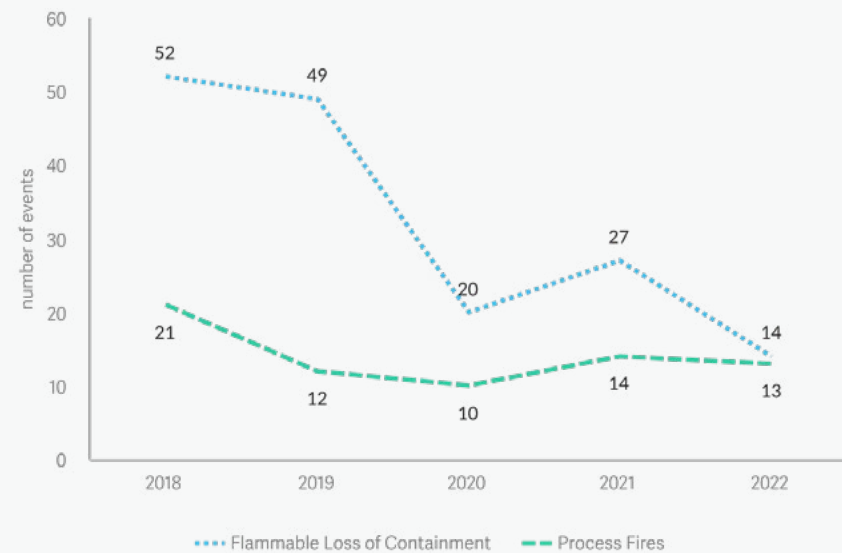


3. We use an optical gas imaging camera (FLIR — Forward Looking InfraRed) designed to detect hydrocarbons, methane, and other VOC emissions during recommissioning hydrocarbons systems following leak checks to ensure any loss of containment is identified and managed.
4. The site also has a regulatory LDAR program, which requires all components (valves) in VOC service to be monitored each quarter. Geismar has over 12,000 components in its LDAR program, which are monitored for leaks.

Through these programs and ongoing commitment to minimizing potential leaks, the site has demonstrated and sustained outstanding Process Safety performance.

OUR PERFORMANCE

Process Safety Events



Improvements in compliance, assurance, and performance are typically seen incrementally and over a number of years as we refine our engineering, operations, and maintenance standards and expectations based on learnings from our operational experiences and evolving industry best practices.

Flammable loss of containment events (FLOCs) are incidents that typically involve an unplanned release of flammable materials exceeding 10% of the Tier 2 threshold in the American Petroleum Institute (API) RP 754 from 2021.

Process fires are any unplanned fire involving process materials.

Product Safety

Proper management of the health, safety, and regulatory impacts of our products is critical at every stage of the product life cycle — from design and manufacturing, through sales and use, to reuse, recycling, and disposal.

We are always working to improve our understanding of product risk while further engaging our suppliers and customers and ensuring regulatory compliance.

Management Approach: How We Manage Product Safety

Our product safety program is designed to outline and communicate the safety impacts of our products, address product regulations, and manage risks. This program includes:

UNDERSTANDING PRODUCT RISK

We regularly test our products to ensure safety and suitability for various customer applications. Identification of any potential hazards of our products during their lifecycle are handled through our Product Risk Characterization and Management program. This program prioritizes our products by risk and takes immediate action to mitigate unreasonable risk. It also includes our updated prioritization methodology which determines high priority products for further risk assessments. Read more about the updated approaches to risk on [page 52](#).

OUR AMBITION

By 2025, we aim to implement a Sustainable Chemistry program that works toward more sustainable products and product solutions with improved safety and environmental profiles.

What does our ambition mean?

A Sustainable Chemistry program includes developing and implementing tools to evaluate the sustainability of our products and product solutions, as well as KPIs to track our progress to improve products' safety and environmental profiles. The Sustainable Chemistry program supports and guides our actions from early Research and Development through to procurement of the ingredients in our products.

Our new Sustainable Chemistry Program will leverage the [American Chemical Society's 12 Principles of Green Chemistry](#), the [American Chemistry Council's Sustainability Principles](#), and industry benchmarking as a basis for development. By using these well-established ideals, we are creating a Sustainable Chemistry Program that will propel us towards more sustainable products and product solutions in the future. Our work toward our ambition is ongoing as we develop additional milestones and deliverables to hold ourselves accountable.



WORKING WITH SUPPLIERS

Selecting best-in-class suppliers is a priority for NOVA Chemicals. We engage external partners through our Responsible Care Outreach program to promote Responsible Care values such as safety and environmental stewardship. To ensure our partners are meeting our rigorous technical property criteria, we audit all supplied products. Suppliers of ingredients that remain in our products as sold are required to provide us with detailed regulatory and hazard information on their components so we can understand and manage potential impacts.

PROVIDING SAFETY INFORMATION TO CUSTOMERS AND THE PUBLIC

We provide customers and the public with safety information in the following ways:

- We create, maintain, and distribute Safety Data Sheets ([SDS](#)) and labels to communicate the hazards of NOVA Chemicals' commercial and non-commercial products, including safe handling methods by employees and customers
- We create risk profiles and background information documents (product backgrounders) for our customers to help promote safe handling and Responsible Care values
- We provide product information on our website and work actively with trade

associations (e.g., as a member of CIAC and ACC) to conduct public education and outreach

- We have a robust process to review and manage any allegations that our products or processes may adversely affect people or the environment

MAINTAINING REGULATORY COMPLIANCE

NOVA Chemicals is focused on continual compliance with regulations governing the manufacture, sale, and use of our products. To achieve this, we subscribe to comprehensive regulatory databases and actively engage with trade associations to stay informed about industry best practices and upcoming regulatory changes. When

required, we consult with industry experts for assistance in monitoring the expanding realm of global chemical and product regulations.

In addition, we use tracking systems to avoid the accidental distribution of products that do not meet regulatory requirements. As of 2022, NOVA Chemicals' Product Safety team has automated the Raw Materials regulatory compliance questionnaire and data collection process to improve efficiency, ensure consistency and up-to-date information, and reduce potential for transcription errors.



2022 Activities

ENHANCED RISK ASSESSMENT METHODOLOGY

In 2022, NOVA Chemicals instituted a new prioritization methodology to determine high priority products for further risk assessments. The methodology is based upon the [International Council of Chemical Associations \(ICCA\) Guidance on Chemical Risk Assessments](#). All commercial products which met internal criteria were evaluated using the new methodology and no products were identified as high priority.

IMPROVED MONITORING OF THIRD-PARTY RISK EXPOSURE

NOVA Chemicals' Product Safety team has implemented a process, supported by a software solution, for continuous monitoring of third-party companies with whom we do business. This monitoring enables the company to continuously evaluate the risk of the relationship to NOVA Chemicals by identifying any questionable actions or events in which the third-party has been involved and has been publicly reported. The software also allows for a streamlined approach to distributing questionnaires to external companies and provides a method for storage and evaluation of questionnaire responses.

CONTINUED EXPANDING SDS AUTOMATIC DISTRIBUTION

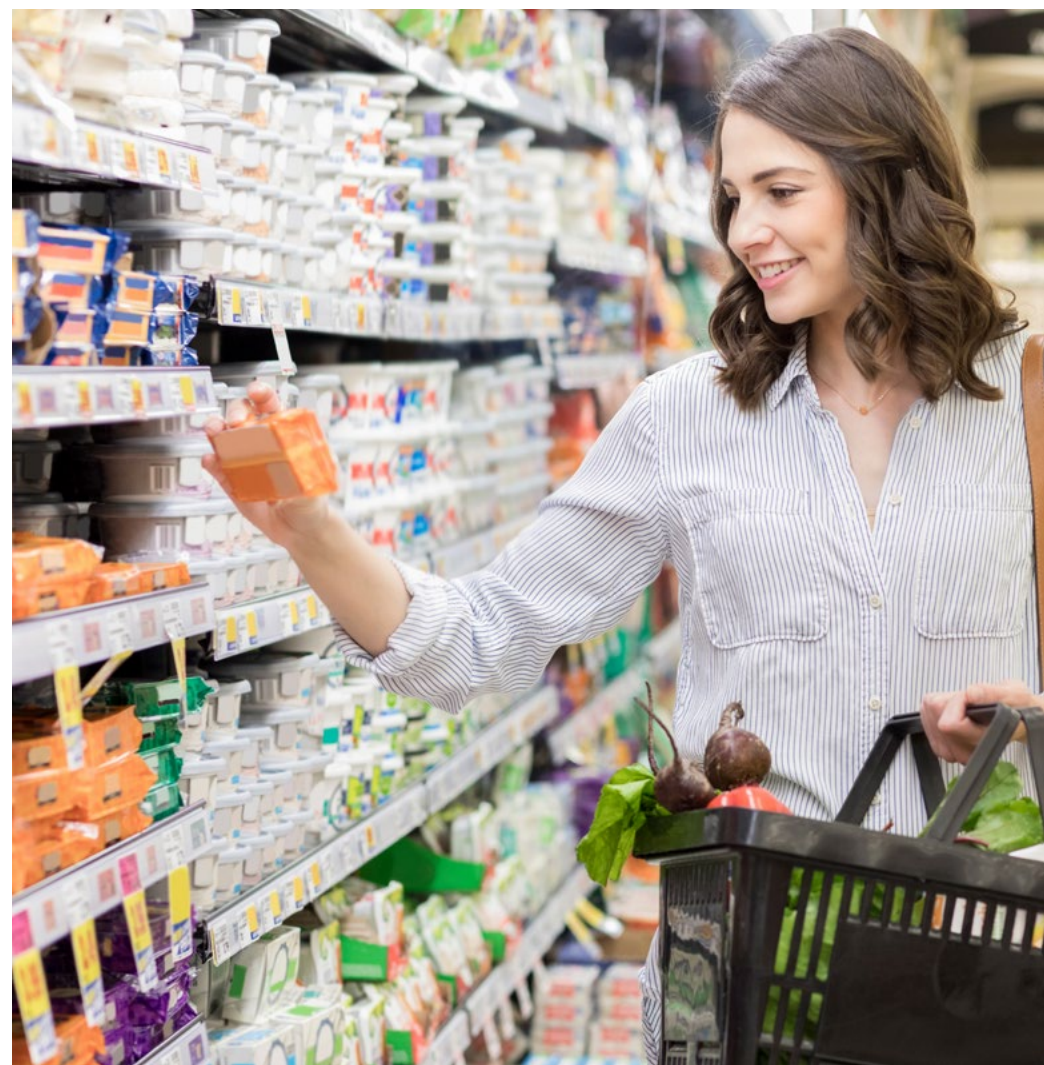
To ensure timely access to the most accurate product safety information, we continually work to expand automatic distribution of SDSs to all countries in which we sell our products. In 2022, we expanded the SAP® software automatic SDS distribution functionality to Indonesia, Malaysia, and Vietnam. These customers now automatically receive an SDS when they purchase a product for the first time, and upon subsequent purchases if it has been more than a year since they last received the SDS or if the SDS has since been updated. When required, an SDS is sent to customers at other times or frequency levels.

CHEMICALS OF CONCERN

As a company working in a constantly evolving field, our top priority is to ensure that all decisions regarding product safety and use are based on the latest scientific evidence. To achieve this, we diligently monitor a range of information sources, including regulatory agencies' product reviews and studies related to toxicology, environmental impact, chemical hazard classification, and substances of very high concern bulletins. Additionally, we regularly review relevant government chemical risk assessment reports that apply to our operations and products. We are committed to gaining a better understanding of the potential impacts of our products and work to phase out any chemicals of concern. As such, we continue to participate in the consortium that is working with the U.S. Environmental Protection Agency on its risk evaluation of 1,3-butadiene.

▶ WHY IS IT IMPORTANT FOR US TO MANAGE PRODUCT SAFETY?

It is our responsibility to help protect public health and the environment and to promote the safe handling and use of our products.



Transportation Safety

We prioritize the safe transportation of raw materials and feedstocks, intermediate chemicals, and finished products to their destinations and aim to avoid releases of these products to the environment. We implement comprehensive planning, screening, assessment, and audit plans that are aligned with industry regulations and best practices to ensure safe transportation.

Management Approach: How We Manage Transportation Safety

We use various methods of transportation such as pipelines, rail, trucks, and marine vessels to transport raw materials and feedstocks, intermediate chemicals, and finished products to customers. We rely heavily on external parties to transport our products, and focus many of our activities on ensuring we work with safe carriers. This work includes:

ACTIVITIES FOR ALL MODES OF TRANSPORT

Transportation security: Facility Security Management Programs are in place at all our operating facilities and are supported by our Corporate Transportation Security Plan for rail, road, and marine transport. These programs and plans include measures

to prevent dangerous goods and our polyethylene products from being stolen or otherwise unlawfully interfered with during handling, offering for transport, transporting, or importing. We are members of the U.S. Customs and Border Protection's CTPAT® program (Customs Trade Partnership Against Terrorism) and the Canadian Border Services Agency's Partners in Protection program and adhere to the minimum security criteria for importers for cross-border trade in both countries.

Incident reporting: We measure and monitor transportation incidents at or between all our facilities and transportation incidents involving our products at vendor and customer facilities. Our supplier outreach program engages our suppliers and carriers to ensure they accurately report incidents and implement corrective actions.

OUR AMBITION

Sustain our performance of zero non-accident releases (NARs) during rail transport through 2025.

What does our ambition mean?

A NAR is the unintentional release of a hazardous material, including loading and unloading while in railroad possession that is not caused by a rail-related accident. Avoiding these releases is important to us because it aligns with our aspiration of zero NARs.

In 2022, we achieved our 9th year in a row of zero NARs, which represents an award-winning performance that we are striving to maintain. NARs can be prevented with proper unloading and loading procedures as well as railcar maintenance and inspection.



Transportation emergency management:

Several of the materials we transport are subject to an Emergency Response Assistance Plan, a Canadian regulatory requirement for certain dangerous goods. Our Transport Canada approved Emergency Response Assistance Plan (ERAP) incorporates industry standards and best practices, and is actively updated to include any new chemicals we transport. Our NOVA Chemicals Logistics Emergency Response Team (NOVAlert) of technical advisors is supported by emergency response service providers stationed along major transportation corridors that we use for product and raw material transportation in Canada. We also participate in TRANSCAER® (Transportation Community Awareness and Emergency Response), a program to ensure communities are provided with important information about products being moved through their area and to communicate measures we take to ensure safe transportation.

Pellet loss prevention: We align with the principles of Operation Clean Sweep, a campaign to prevent plastic pellet loss at facilities and during transportation. We also encourage our customers and transportation partners to commit to OCS pellet stewardship practices to keep plastic pellets out of the environment.

ACTIVITIES FOR SPECIFIC MODES OF TRANSPORT

Screening and onboarding of trucking carriers: We prioritize working with carriers who are committed to Responsible Care

principles. We review carriers through self assessments (e.g., handling, routing, security, and other safety aspects) and use third-party screening by industry-leading vendors. When onboarding new carriers, we discuss and mutually agree on expectations.

Evaluation of carriers: We assess all our carriers, with the exclusion of one-time shipments. As part of our Responsible Care Outreach Program, we evaluate all carriers to assign a level of risk (Low/Medium/High) which determines how often they are reviewed. Using the RiskRate® Due Diligence Management System, carriers are monitored 24/7 and relationship owners are notified automatically of any matters of concern supported by other business processes used to monitor and manage risk.

Railcar securing and maintenance: To prevent NARs, we implement strict processes to secure our railcars (e.g., RideTight® fluidsealing management program) and employ a tank car maintenance program that goes beyond regulatory requirements. All rail tank car and rail hopper car loading and unloading personnel have access to a railcar inspection training program to ensure proper implementation of these processes.

Pipeline integrity: We operate approximately 580 kilometers of pipelines and are committed to maintaining a rigorous pipeline integrity program. Our program includes right of-way inspections, flyovers, in-line inspections, and integrity or verification digs.

ZERO NARS

We achieved zero NARs during rail transportation in 2022.

In 2022, we received a CN Safe Handling Award and a Chemical Transportation Safety Pinnacle Award for our zero NARs performance in 2021. See “What does our ambition mean?” on [page 53](#).



2022 Activities

PRGM 1300 TRANSPORTATION SAFETY AND LOGISTICS

To align with regulations and industry best practices for transportation safety, we have comprehensive planning, screening, assessment, and audit plans. In 2022, we developed PRGM 1300 Transportation Safety and Logistics to ensure that our products, raw materials, waste, etc., are handled and transported in a way that is safe, secure, environmentally responsible, and aligned with Sustainability and Responsible Care practices and transportation regulations and standards. The program outlines roles and responsibilities, key requirements for various transportation activities, and expectations for compliance, audits, and continual improvement.

CP 902 RESPONSIBLE CARE OUTREACH

Our commitment to implementing Responsible Care principles guides our operations, and in 2022, we introduced the CP 902 Responsible Care Outreach program. The program is designed for engagement with suppliers and customers to help them understand our commitment to Responsible Care and our expectations of them. The tool is also used by the NOVA Chemicals team to assess the value chain based on performance criteria and review the process to receive product safety information from customers and clients.

HOPPER CAR UNLOADING CHECKLIST

In 2022, we enhanced our focus on OCS procedures and are committed to working with our customers to be a trusted advisor. We refreshed our hopper car unloading checklist that outlines important actions and procedures to encourage behavior changes that will help keep pellets in hopper cars and out of the environment.

IMPLEMENTED WORKPLACE SECURITY AWARENESS TRAINING

A key part of our Security Management Program, Security Vulnerability Assessments (SVAs) help us identify opportunities to improve our overall security as well as our transportation safety. For example, following an SVA recommendation, we developed workplace security awareness training to enhance workers' familiarity with security issues and make them more aware of their roles and responsibilities regarding security matters. In January 2022, we completed the roll-out of this training at all NOVA Chemicals sites. All employees and contingent workers receive this training.

SECURITY PROGRAM AUDITS

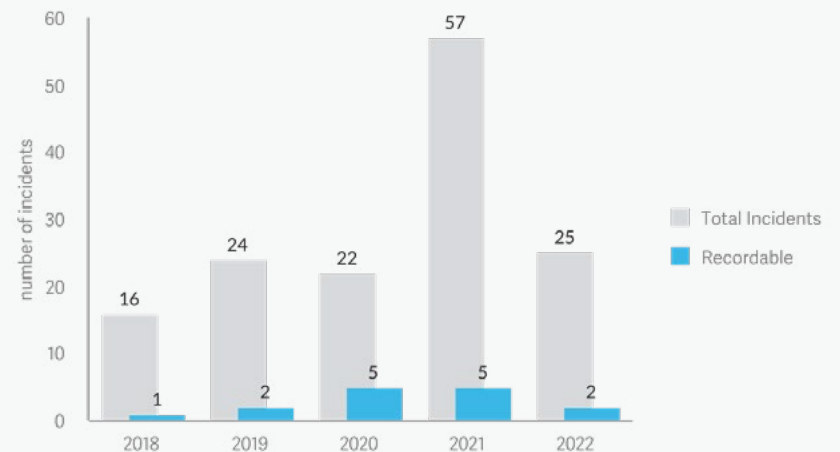
We participated in two major audits by external parties on our supply chain security at our Joffre site. The Canada Border Services Agency Partners In Protection verification audit resulted in no actions required. Transport Canada conducted the Rail Security Audit, and in reporting no areas of non-compliance, also noted with favor the operation and resourcing of the security program.

WHY IS IT IMPORTANT FOR US TO MANAGE TRANSPORTATION SAFETY?

By incorporating best practices to ensure safe transportation, we can help prevent product spills and incidents that could negatively impact the safety of people and the integrity of our environment.

OUR PERFORMANCE

Transportation Safety Incidents



Transportation incidents exclude vehicle incidents that do not involve products. The significant increase in total incidents in 2021 was due to increased recognition and reporting of minor transportation incidents and near hits by our carriers and our employees. Note that Total Incidents includes near hits.

Community and Indigenous Relations



We aim to be a good neighbor in our communities and a sought-after local employer. To achieve this, we collaborate with our communities and invest in projects that address their specific needs and concerns. Along with regularly engaging with the communities we operate in, we also seek to establish and sustain long-lasting, positive partnerships with Indigenous communities.

Management Approach: How We Manage Community Relations and Investment

BEING ACCOUNTABLE

We have a responsibility to be accountable to communities that we impact. The CIAC's Responsible Care [Accountability Code](#) guides our operations and provides expectations for proactive community awareness and communication including engagement with Indigenous communities.

BUILDING AND SUSTAINING STRONG COMMUNITIES

We are committed to investing in organizations that work toward improving the quality of life in the communities around us. The various organizations that we work with are dedicated to removing barriers for our communities' most vulnerable populations. The initiatives we support are focused on three core areas that relate to our business strategy: Science and Education, Health and Community Service, and the Arts.

BEING A GOOD NEIGHBOR

Our Good Neighbor Program details specific commitments and actions related to our construction activities.

Our Good Neighbor Commitments include:



Communications

- Create opportunities for stakeholder feedback
- Continue to consult with directly and potentially impacted stakeholders



Employment

- Create opportunities to connect the construction workforce with local businesses
- Promote local employment and business development opportunities



Environment

- Meet our permitting and regulatory requirements
- Participate in tree planting and biodiversity protection initiatives
- Work with our contractors to minimize material waste and oversupply



Traffic

- Implement a traffic management plan
- Proactively anticipate traffic impacts, particularly during peak times and movements of heavy equipment
- Promote safe driving behaviors



Noise

- Schedule work primarily during daytime hours

2022 Activities

VOLUNTEERING OUR TIME

Participating in and developing our communities through active service and volunteerism is one way that we contribute to our communities. Either through individual or group action or through paid volunteer time, we lend our support to community and conservation initiatives. Despite COVID-19 restrictions, our employees volunteered almost 2,600 hours in 2022.

GIVING THROUGH UNITED WAY® CAMPAIGN

We raised nearly \$1.3 million through our regional United Way campaigns. This included a combination of pledges from employees and retirees, virtual fundraising events, and NOVA Chemicals' matching dollars.

DISABILITY MENTORING DAY

For the eleventh year, NOVA Chemicals sponsored Disability Mentoring Day to bring together students with disabilities to promote career development and exploration. We hosted 25 students at an in-person event from our Pittsburgh office to give students an opportunity to learn about new employment possibilities and future educational opportunities. On Disability Mentoring Day and during our monthly mentoring program with Bender Leadership Academy, an organization committed to expanding opportunities for employment of people with disabilities, mentors at NOVA Chemicals help connect students with disabilities to new and empowering experiences.

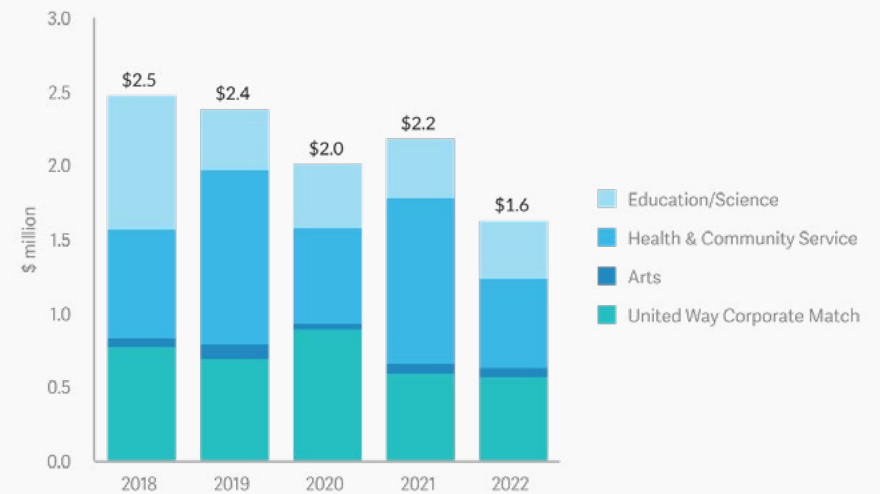
SUPPORTING EMERGING TALENT

Our business and industry rely on the expertise from scientists, engineers, and technicians and we are passionate about increasing science literacy in the next generations to drive interest, excitement, and confidence in pursuing Science, Technology, Engineering, and Math (STEM) careers. For more than 20 years, we have delivered our genScience initiatives which aim to spark passion, innovation, and discovery around STEM in future generations. These initiatives include:

- Providing up to 60 individual scholarships annually totaling just over CAD\$140,000. Approximately 20% of scholarships are awarded to Indigenous students, and 60% of them directly target STEM-related fields.
- Renewing our commitment to Let's Talk Science® program for three years with an investment of CAD\$600,000. This multi-year commitment will support STEM education for children and youth across Canada, regardless of gender, geography, culture, language, abilities, and financial status.
- Working with Carnegie Science Center to empower youth across Western Pennsylvania to explore a future in STEM through educational programming and connections with industry professionals and careers such as ChemFest, Engineer the Future, and Carnegie STEM Girls+ and Tour Your Future.

OUR PERFORMANCE

Community Investment



We continue to invest in organizations that improve quality of life, including United Way, Carnegie Science Center, and Let's Talk Science. After a brief pause on new signature investments while we refresh our strategy, we anticipate a return to pre-COVID spend levels beginning in 2023.



ALLIANCE TO END PLASTIC WASTE CLEAN4CHANGE

Many of our employees engage in different workstreams that help to advance the Alliance to End Plastic Waste's mission. In 2022, NOVA Chemicals employees participated

in a global clean-up, Clean4Change, sponsored by the Alliance. Together over 2,000 global volunteers picked up over 1.4 million pieces of litter in 32 cities.

ENGAGING WITH INDIGENOUS COMMUNITIES

Across the regions where we operate, we work with our local Indigenous communities to strengthen our partnerships and relationships. Respect for the unique history, culture, and rights of Indigenous communities guides our engagement with them. We proactively seek opportunities for engagement and learning including effective dialogue and consultation, and providing equitable opportunities in employment, procurement and through the supply chain. Periodic reviews of our outreach, communication, and engagement processes with Indigenous communities reflect our dedication to enhancing our efforts. As part of our commitment to Responsible Care initiatives, we are dedicated to upholding the United Nations-recognized Indigenous Community Codes.

Our leaders play an active role in building relationships with Indigenous communities. For example, NOVA Chemicals' environment and public affairs leaders meet with Aamjiwnaang First Nation's (AFN) environmental lead and attend Clean Air Sarnia and Area meetings alongside representatives from AFN. NOVA Chemicals' Vice President of Manufacturing East also engages with the AFN Chief and Chairs the Sarnia-Lambton Environmental Association

which hosts engagements with the AFN Chief and counsel. We are a member of Visions of Harmony group which focuses on career development opportunities for local Indigenous youth. In addition, our Indigenous Student Achievement Award provides financial support for Aamjiwnaang students. As we continue to expand our operations, we are committed to seeking out new opportunities for the future to support Indigenous communities across Canada through skills training, employment, business development, and community investment.

RECOGNIZING NATIONAL DAY OF TRUTH AND RECONCILIATION

To honor the residential school survivors and lost children, their families, and communities, NOVA Chemicals recognized National Day of Truth and Reconciliation. Employees were encouraged to wear their orange shirts and pins and welcomed a presentation from two members of the Indigenous community. The speakers, two residential school survivors, joined us for an impactful conversation that included discussion on their own histories of the residential school system and why reconciliation is such an important process.

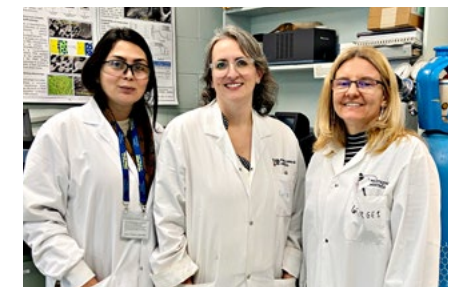


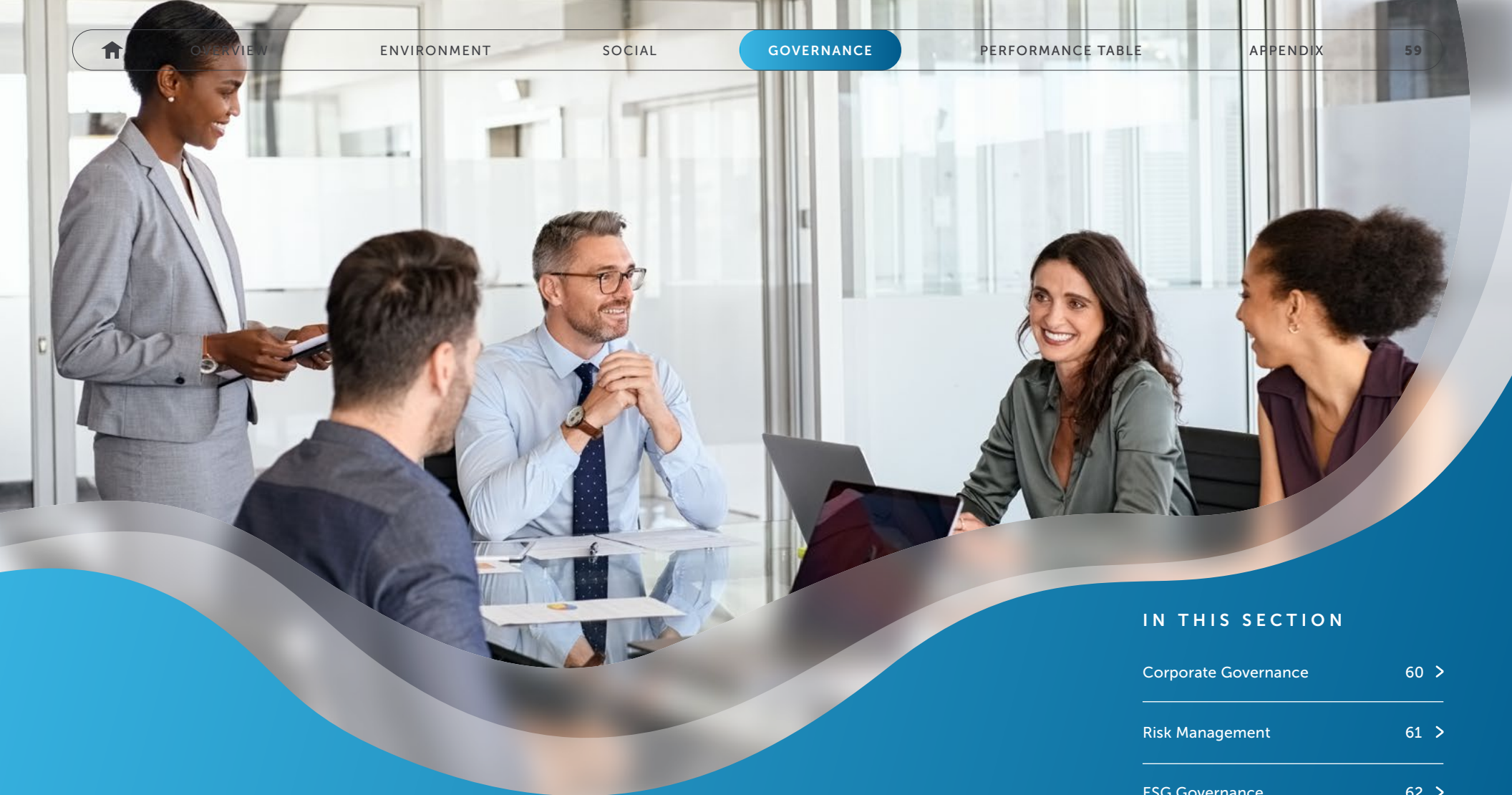
CASE STUDY: SUPPORTING STEM EDUCATION

Polytechnique Montreal BONFIRE® Platform Pilot Program

In 2022, we completed a three-month pilot program with Polytechnique Montréal to bring our proprietary BONFIRE film development platform to students. Graduate students in the Chemical Engineering program used the BONFIRE platform to simulate novel package designs for the final project of their Polymer Packaging Engineering course. Through the program we aim to inspire future packaging designers and provide students with practical experience for their careers.

Students also give NOVA Chemicals valuable feedback on the platform which will help us build new capabilities for our customers and the plastics industry.





GOVERNANCE

Our unwavering commitment to sustainability and our Responsible Care program is complemented by our long-standing commitment to transparency and accountability. We continually improve our governance and business practices and work to promote a culture of ethical behavior in our company and with our customers and partners.

IN THIS SECTION

Corporate Governance	60 >
Risk Management	61 >
ESG Governance	62 >
ESG Integration	63 >
Ethics	67 >
Responsible Supply Chain	70 >
Cybersecurity	73 >
Public Policy	75 >

Corporate Governance

Our continued success is inherently linked to effective corporate governance. Our robust corporate governance practices enable us to responsibly manage and protect the value of our company, as well as maintain alignment between the Board of Directors, management, and all of our stakeholders.

▶ WHY IS CORPORATE GOVERNANCE IMPORTANT?

Sound corporate governance is critical to mitigating risks, achieving strong performance, and maintaining accountability to stakeholders.

Role of the Board

The role of our Board is to safeguard the interests of NOVA Chemicals' shareholder, provide high-level oversight of our activities and performance, including our strategy, and to evaluate the effectiveness of management's policies and decisions. With the launch of the new NOVA 2030 corporate strategy, the Board's role regarding the oversight of ESG within the company has become more prominent. Refer to the [ESG Governance](#) section of this report for more information.

Board Structure

At the end of 2022, our Board of Directors was comprised of nine members, three of which are independent. The Board

has two standing committees: the Audit, Risk, & Compliance Committee and the Remuneration Committee. In addition, we have a Pension and Savings Plan Committee, which is a subcommittee of the Audit Committee and the Remuneration Committee, comprised of members of management.

Board Renewal and Diversity

Recognizing that diverse backgrounds bring invaluable perspectives to our team, we seek Directors with diverse competencies, skills, and experience. We do not have term limits or a formal retirement policy for Directors. At the end of 2022, the average tenure of a Director on our Board was 2.1 years.

Executive Compensation

Our underlying principle is to provide competitive compensation that attracts, retains, and motivates highly capable executives to achieve the company's business plan. NOVA Chemicals' executive compensation is heavily weighted towards incentive plans with 76% of our CEO and an average of 62% for other executive officer compensation considered "at-risk" and dependent on performance against targets.

✪ BOARD AND GOVERNANCE INFORMATION

Board composition and independence

Size of Board	9
Percent Women	11
Independent Directors	3
Separate Chair and CEO	Yes
Independent Chair*	No
Board Meetings Held in 2022	8
Average Meeting Attendance	90%

Board renewal

Mandatory Retirement Age	No
Average Director Tenure	2.1 years

Ethics

Code of Conduct for Directors, Officers, and Employees	Yes
--	-----

All data as of Dec. 31, 2022.

* An independent Chair does not apply in a private ownership setting.

Risk Management

At NOVA Chemicals, we have a formal Enterprise Risk Management (ERM) program. Our approach to risk management is guided by the Committee of Sponsoring Organizations of the Tradeway Commission (COSO) Enterprise Risk Management Framework.

Our Risk Management Policy defines the framework of NOVA Chemicals' enterprise-wide risk management by providing principles, roles and responsibilities, and guidelines for risk assessment, mitigation, and reporting. The Policy aims to ensure the implementation of sound risk management practices across the organization.

Our ERM program includes a process to identify all significant risks to our company. When we evaluate and assess risks and opportunities, we consider multiple criteria, including the likelihood of occurrence and the severity and nature of a potential impact. The assessment of our risks is mapped in our risk matrix (formatted as a heat map) and tracked in our risk register.

Our approach includes risk and opportunity identification and evaluation for physical and transition risks. Climate-related risks that could have a material impact on business operations, financial condition, and company reputation are considered in our strategic and financial planning.



ESG Governance

Many of our stakeholders play a crucial role in overseeing our ESG progress, helping to ensure that we remain on course, and advance effectively towards our vision. To meet our commitments and be successful in the long term, ESG must be embedded in activities, roles, and responsibilities across the company.

Governance structure and details on Board members and their ESG roles

The **Board** is responsible for approving and supervising the execution of NOVA Chemicals' corporate strategy, including the NOVA 2030: Roadmap to Sustainability Leadership. Additional responsibilities include overseeing the identification and management of climate-related risks, compliance with relevant ESG-related regulations and reporting, and evaluating the effectiveness of risk mitigation policies, decisions, and climate action plans. The Board receives information on climate-related performance, including progress towards climate ambitions, and climate-related risks, opportunities and/or mitigation actions from the Executive Committee.

The **Audit, Risk, and Compliance Committee (ARCC)** of the Board oversees annual disclosures and recommends ESG disclosures for Board approval.

The **Executive Committee** includes the President and CEO, who is the highest individual responsible for the corporate strategy, including ESG strategy. The SVP, General Counsel & Corporate Secretary has the highest level of management accountability for NOVA Chemicals' ESG regulatory reporting. The remaining members of our Executive Leadership are responsible for various aspects of NOVA Chemicals' ESG performance.

Additional management-level functional teams such as the Sustainability Function, Site-Based Environmental Specialists, the Operations Leadership Team, Enterprise Risk Management, the Finance team, the Corporate Environmental Affairs team, and the Supply Chain and Procurement team support management of climate-related issues and the implementation of the decarbonization plan. These enabling groups support the Executive Committee in managing climate related risks and opportunities and new material ESG risks at NOVA Chemicals.

LINKING ESG TO COMPENSATION

Our Executive compensation is linked to NOVA Chemicals' performance against annual ESG objectives. In addition to financial and safety objectives, our Long-Term Incentive Plan includes objectives to address NOVA Chemicals' risks and opportunities associated with the Circular Economy, Climate Care, and Inclusion and Diversity (I&D) goals. The Short-Term Incentive and Technical Variable Pay plans continue to emphasize social aspects related to occupational and process safety performance.

ESG Integration and Principles

Our [Sustainability and Responsible Care Policy](#) directs our sustainability activities at the highest level.

We aim to meet or exceed compliance obligations and commitments, improve our performance, and create long-term value by:

- Providing resources to meet Responsible Care principles and ethics
- Prioritizing work using a risk-based approach (e.g., including climate risk and plastic risk in our Enterprise Risk Management System)
- Setting and achieving goals and objectives
- Implementing science-based solutions and best practices
- Adopting continual improvement methods
- Aligning our interests with those of interested parties

ESG Factors Informing Capital Investment

NOVA Chemicals' project-screening tool includes ESG factors. The scoring system used in our capital process includes environmental and sustainability criteria such as the degree of alignment to the corporate strategy. By using this tool, we can identify projects that have ESG and sustainability value and prioritize them for further review. This approach also brings greater attention to the non-quantifiable or longer-term benefits of some sustainability initiatives.

ECOVADIS SILVER RATING

In 2022, NOVA Chemicals was awarded a Silver medal by EcoVadis for the second year in a row. Our actions to further strengthen our sustainability management systems with the implementation of new measures and policies such as our Sustainable Procurement Policy, our Supplier Code of Conduct, and our Business Partner Due Diligence Policy, was reflected in our improved score, which places us in the top 11% of companies assessed by EcoVadis in our industry category. EcoVadis assesses companies using a scorecard that covers 21 sustainability



indicators in four themes: Ethics, Environment, Labor and Human Rights, and Sustainable Procurement. NOVA's Labor and Human Rights score was in the top 1% of companies rated by EcoVadis in our industry category.

Policies and Responsibilities for the Management of Our Material ESG Topics

ESG TOPIC	WHO IS RESPONSIBLE	MANAGEMENT SYSTEM AND/OR POLICIES
Plastic Circular Economy	<ul style="list-style-type: none"> • Our Market-Focused Teams are composed of marketing, product development, sales, and technical services specialists. These teams collaborate with Operations to bring new products to market • Our Sales and Marketing Leadership Team has accountability for plastic circular economy growth, including our Circular Solutions and rPE resin sales 	<ul style="list-style-type: none"> • We follow a stage-gate approach to product development, with several built-in checkpoints to ensure we develop products that meet market needs • Responsible Care PRGM 900 Product Safety
Climate Care	<ul style="list-style-type: none"> • Our Climate Solutions Team is responsible for the decarbonization roadmap, including the identification of short-term and long-term initiatives and technologies for GHG emissions reduction • The accountability for implementation of our GHG reduction plan is with our Executive Committee, with implementation responsibility across many functions including the Operations Leadership Team, Finance Team, Sustainability Team, and Supply Chain and Procurement Team • Our Sustainability function is responsible for the environment and GHG strategies and internal reporting on corporate ESG performance 	<ul style="list-style-type: none"> • Our Sustainability and Responsible Care Policy guides our practices and aspirations, including our management and advocacy approach to key risks and opportunities • All our facilities have management systems to govern all facets of Responsible Care. These systems align with the requirements of the American Chemistry Council (ACC) or the Chemistry Industry Association of Canada (CIAC) • We are transitioning to the RC14001 management system, a standard that combines elements of Responsible Care and ISO 14001. In 2020, all U.S. sites achieved RC14001 certification. Canadian sites have made significant progress to becoming RC14001 certification-ready.
Employee and Contractor Safety Process Safety Air Emissions, Waste, Water Health and Wellness Product Safety Transportation Safety	<ul style="list-style-type: none"> • Our Safety and Operational Risk Council is made up of senior leaders (CEO, SVPs, facility VPs, and Directors) and is responsible for demonstrating Responsible Care leadership, identifying risks and performance trends, allocating resources for safety and risk initiatives, and improving organizational performance towards Goal ZERO • Eight Responsible Care Strategy Teams are accountable for developing strategies to improve our Responsible Care performance • The Responsible Care Strategy Teams are integrated across locations and functions • The Product Safety Team is responsible for understanding and communicating the health, safety, environmental, regulatory, and security impacts of our products throughout their lifecycle, and reports to the Product Safety Strategy Team on a quarterly basis • The Logistics and Procurement Team is responsible for transportation safety, including tracking and managing transportation incidents, near hits, and non-accident releases. Metrics are reported monthly to the Logistics Leadership Team. The Supply Chain Risk Exposure Evaluation Network (SCREEN), a work group within Logistics, evaluates transportation risks and reports to the Director, Logistics and Customer Service 	<ul style="list-style-type: none"> • Eight Responsible Care Strategy Teams: <ul style="list-style-type: none"> • Environment • Occupational Health • Industrial Hygiene • Occupational Safety • Contractor Safety • Emergency Services & Security • Process Safety • Product Safety



ESG TOPIC	WHO IS RESPONSIBLE	MANAGEMENT SYSTEM AND/OR POLICIES
Inclusion and Diversity Talent Management	<ul style="list-style-type: none"> Our Human Resources Team is responsible for tracking performance and developing programs in pursuit of our I&D goals and to develop our leaders and employees 	<ul style="list-style-type: none"> Our I&D Strategy will guide our actions towards a more inclusive and diverse workplace Our formal leadership development is largely delivered through a program called CONNECT The Neuroscience of Quality Conversations Respectful workplace and Violence Prevention Policy
Community and Indigenous Relations	<ul style="list-style-type: none"> Our Regional Public Affairs Team is responsible for developing programs to engage with and support our communities including fostering long-term positive relationships with Indigenous stakeholders 	<ul style="list-style-type: none"> Sustainability and Responsible Care Policy CIAC Accountability Code. ACC for Geismar operations Community Investment Principles
Ethics and Compliance	<ul style="list-style-type: none"> The Ethics and Compliance Team is responsible for developing, implementing, directing, reviewing, and revising the Ethics and Compliance program to be consistent with our risk profile and business strategies and to meet best practices The team reports metrics quarterly to the Executive Committee and the Audit, Risk & Compliance Committee of the Board and annually to the Board of Directors 	<ul style="list-style-type: none"> Code of Conduct Anti-Trust Compliance Policy Anti-Bribery and Corruption Policy Conflict of Interest Policy Business Partner Due Diligence Risk Rate Due Diligence Management System Digital incident management system with built-in reporting metrics (e.g., calls to the ethics hotline, cases) and automatic notifications and reminders
Responsible Supply Chain	<ul style="list-style-type: none"> The Logistics and Procurement Team, working within the Responsible Care Outreach Program, is responsible for the business relationships with its supply chain partners, including evaluating the operational risks of the transportation functions 	<ul style="list-style-type: none"> Responsible Care Outreach Program Supplier Code of Conduct Business Partner Due Diligence Program Sustainable Procurement Policy
Public Policy	<ul style="list-style-type: none"> Our Government and Industry Relations Team is responsible for engaging with government officials and regulators 	<ul style="list-style-type: none"> We follow Canadian, Alberta, and Ontario lobbying acts in Canada and rely on industry and trade associations and lobbying firms to advocate on our behalf in the U.S.
Cybersecurity	<ul style="list-style-type: none"> Our IT organization is responsible for procuring systems and developing processes that protect our assets, data, and information 	<ul style="list-style-type: none"> NIST® cybersecurity framework IT User Policy Code of Conduct

How We Improve

STANDARDIZATION

Standardizing processes is a vital component of our ongoing efforts to improve. We prioritize standardization of company-wide policies and procedures, with a focus on high-risk activities that pose a frequent threat of injury or have the potential to cause severe consequences.

We successfully implemented significantly revised programs, including contractor safety, industrial hygiene, occupational health, process safety, product safety, risk and security. We also developed and/or revised procedures for a number of critical areas including hazardous products management, protection from oxygen deficient atmospheres, Responsible Care outreach, occupational injury/illness management, working from heights, personal protective equipment and risk alerts process.

ENHANCING VISIBILITY

Our interactive Business Intelligence (BI) Dashboards provide employees and leaders with access to facility- and corporate-level performance data, including safety and production metrics. Through the dashboards, users can visualize, explore dozens of variables and analyze performance trends. This tool is a key component of NOVA Chemicals' wider digitalization effort, aimed at leveraging data to enable insights leading to identifying areas for improvement, fostering mutual learning, and driving continuous progress.

OTHER IMPROVEMENT ACTIVITIES

- Our Continuous Improvement Program is a comprehensive strategic management system for improving our business on an ongoing basis;
- We periodically review our policies and programs to ensure we comply with changing regulations, address societal expectations, and respond to sustainability risks and opportunities;
- We assess our risks and ensure they are eliminated or controlled to appropriate levels;

- Our operations undergo internal and external audits according to a schedule or based on the results of our risk assessments;
- We measure our performance, benchmark against our peers, and assess our improvement over time; and
- We investigate ethical, environmental, health, safety, and security incidents and apply appropriate mitigating actions and analyze trends.

SPOTLIGHT ON RESPONSIBLE CARE

All our facilities have management systems to govern all facets of Responsible Care standards. These systems align with the requirements of the ACC or the CIAC. We are transitioning all of our facilities to a new RC14001 management system, a standard that combines elements of Responsible Care and ISO 14001. Benefits of the RC14001 unified management system include enhanced transparency and

accountability, improved clarity on value chain influence and responsibility, reduced variation across the organization, and alignment with international standards.

To keep our management systems certified, our facilities must undergo third-party audits every three years. In 2020, all U.S. sites achieved RC14001 certification. Our Canadian sites are in the process of updating their current management system and have made significant progress towards being

RC14001 certification-ready. The Canadian facilities continue to meet our commitments to CIAC and undergo an extensive external verification every three years. We successfully completed our ninth verification in 2022.



Ethics

At NOVA Chemicals, we are committed to conducting our business with honesty and integrity, and we are fully committed to doing so in a responsible manner. To ensure that we live up to these values, we have robust systems and policies that guide employee conduct.

Management Approach: How We Manage Ethics

SETTING EXPECTATIONS

Our Business Conduct Policy, and the suite of policies it contains, provides employees with clarity and guidance on expected work behaviors. Some of our key policies are:

- **Code of Conduct:** Our [Code](#) is designed to assist everyone who works for or represents NOVA Chemicals, including employees and Directors, in making decisions with integrity and honesty. It includes references to our policies and guidelines that promote compliance with laws and regulations. We monitor changes and developments and maintain up-to-date controls.
- **Anti-Trust Compliance Policy:** This policy gives our employees guidance on how to conduct their day-to-day activities without engaging in prohibited conduct or entering into unlawful agreements that protect free and open competition.
- **Anti-Bribery and Corruption Policy:** This policy provides a structure to manage bribery and corruption risk by establishing rules to ensure that all of NOVA Chemicals' activities are conducted with the highest level of integrity and ethical standards and fully comply with all applicable laws.
- **Conflict of Interest Policy:** This policy provides guidance on recognizing possible conflict of interest situations and describes the process employees must follow to disclose potential conflicts.
- **Supplier Code of Conduct:** Our [Supplier Code of Conduct](#) outlines our ethical and compliance expectations of suppliers in the areas of human rights; integrity; transparency; health, safety and the environment; and confidentiality.

OUR AMBITION

Continued assessment of our management of the Ethics and Compliance program emphasizing compliance with Anti-Bribery and Anti-Corruption regulatory requirements (where applicable) and our Anti-Bribery and Anti-Corruption risk as it relates to international agents and distributors.

What does our ambition mean?

Our anti-bribery management program includes all our policies and procedures that support our employees in preventing incidents of bribery or corruption in our dealings with suppliers, customers, and governments. In 2022, we instituted robust procedures to this end. In 2023 we developed a plan to identify any gaps and, by the end of 2023, will begin the implementation of our plan to close identified gaps.

- **Business Partner Due Diligence Policy:**

This policy outlines the expectation for Business Partners Due Diligence such that NOVA Chemicals works only with business partners who meet our standards in relation to ethics and compliance, and have a shared commitment to acting in a legally compliant manner.

- **Respectful workplace and Violence Prevention Policy:**

This policy promotes a safe and respectful workplace, where all individuals are free from workplace harassment and violence.

We recognize that conducting business ethically, maintaining compliance, and upholding human rights is critical to the success of our business. We routinely review our policies and practices and update any aspects as necessary.

ASKING QUESTIONS AND REPORTING CONCERNS

Our EthicsPoint reporting system is a 24-hour confidential and anonymous (or otherwise) telephone and online reporting system. The EthicsPoint system is for employees, contractors, business partners, and members of the public to ask questions about ethics matters, request help in decision-making, or report possible violations of the Business Conduct Policy and associated policies. In addition to using the EthicsPoint reporting system, concerns or questions can be raised to leaders, the legal department, or human resources staff. All matters reported through the EthicsPoint system or other means are investigated, documented, and resolved

or further followed up on. We also identify improvements and organizational learning opportunities to prevent reoccurrence. Retaliation against anyone who, in good faith, reports a suspected, potential, or actual violation is strictly prohibited.

PROVIDING COMMUNICATIONS AND TRAINING

All employees are required to complete a business ethics and compliance curriculum within their first two months of hire at NOVA Chemicals and annually thereafter. Most of the training consists of online learning modules, with some additional training sessions provided in person. In addition to annual training and refreshers on the Code of Conduct, we provide in-person presentations related to the following topics: anti-bribery and corruption, anti-trust and competition law, conflicts of interest, gifts and entertainment, interactions with suppliers and customers, and trade compliance. In 2022, 97% of permanent active employees completed business conduct training.

AUDITING, MONITORING, AND REMEDIATION

Our Ethics and Compliance Team continues to oversee and implement monitoring and remediation plans for ethics and compliance risks and violations.

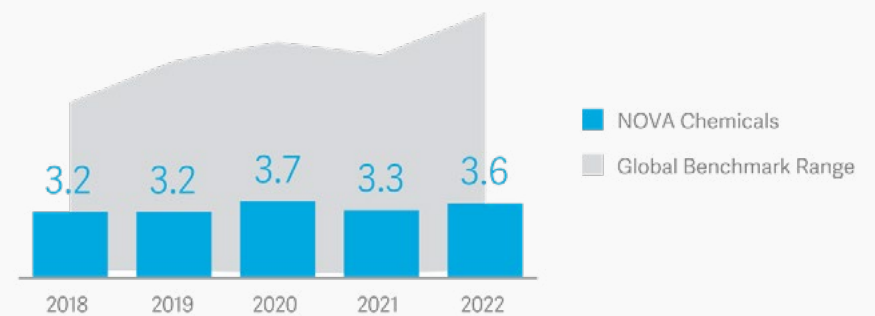
OUR PERFORMANCE



- **53%** QUESTIONS
- **7%** ALLEGATIONS REMAINING OPEN AT YEAR-END
- **25%** UNSUBSTANTIATED ALLEGATIONS
- **16%** SUBSTANTIATED ALLEGATIONS

We investigate all matters received. A substantiated allegation might result in employee education, coaching, discipline, or termination, where permitted by local law.

Ethics-Related Reports per 100 Employees



We compare the number of reports received through our ethics line to the [NAVEX Global® benchmark](#). NAVEX Global has a database of 3,430 organizations that collectively received more than 1.5 million individual reports in 2022. Although there is wide range of call volumes between organizations, NAVEX Global notes that organizations with higher reporting rates (calls per 100 employees) may be experiencing the positive business outcomes discussed in the George Washington University study [Evidence on the Use and Efficacy of Internal Whistleblowing Systems](#), which shows that higher report volumes are associated with fewer and lower amounts of government fines and material lawsuits.

2022 Activities

REINFORCED COMMITMENT TO ETHICS AND HUMAN RIGHTS



NOVA Chemicals is a participant in the [United Nations Global Compact](#) (UNGC) and supports the Ten Principles of the UNGC on human rights, labor, environment and anti-corruption.

Our operational sites are in countries that are governed by strong legal and human rights regulations. We comply with all human rights-related laws in the countries in which we operate. We protect and support the communities where we work by maintaining safe working conditions in which all employees are given an appropriate number of working hours and fair compensation for their work. The use of child and forced labor of any kind is illegal and nonnegotiable at NOVA Chemicals.

In 2022, we rolled out two new policies to demonstrate our ongoing commitment to upholding the highest ethical standards within the company and across our value chain.

- Our [Supplier Code of Conduct](#) outlines our expectations for all suppliers to meet our standards in the areas of human rights; integrity; transparency; health, safety and the environment; and confidentiality.
- Our Business Partner Due Diligence Policy outlines the minimum requirements for NOVA Chemicals' business units' due diligence procedures to ensure that we exclusively engage with entities that uphold our ethical and compliance standards, and are equally committed to legal compliance. It further details the approach to assess the risk of a business relationship with a potential partner and monitor that risk throughout the course of a relationship.

Human trafficking, or modern slavery, is a criminal industry that denies people their freedom and human rights. We stand firmly against human trafficking and slavery and all human rights violations. We are hired fairly and with consent, and we hire others fairly and with consent.

WE SUPPORT



ENHANCED AWARENESS OF ETHICS

We are advancing our work on a business ethics and human rights training program for our leadership team. The goal of this training is to demonstrate to our employees that our leaders are well-equipped to manage concerns, complaints, or violations in an ethical manner, and encourage them to speak up about anything they may consider potentially unethical.

▶ WHY IS IT IMPORTANT FOR US TO MANAGE ETHICS?

Maintaining a robust ethics and compliance management system is critical to reducing reputational and operational risks associated with potential violations or wrongdoing. It is also key to upholding human rights in our company and within our supply chains.



Responsible Supply Chain

We seek to work with suppliers, customers, agents, and distributors who are aligned with our efforts to conduct ethical business practices. Our business impacts include the indirect impacts from our supply chain, and we are committed to ensuring that our partners meet our standards and commitments for environmental responsibility, human rights, and health and safety of employees and communities.

Management Approach: How We Manage our Responsible Supply Chain

Our suppliers are a critical component of enabling our operations and provide us with feedstocks, raw materials, labor and materials for maintenance and capital improvements, corporate services, and transportation services. To carry out our manufacturing, construction, and services, we work with over 2,000 suppliers. Key policies that guide our actions to ensure suppliers are aligned with our Sustainability & Responsible Care values include:

- **Supplier Code of Conduct:** Our [Supplier Code of Conduct](#) outlines our ethical and compliance expectations of suppliers in the areas of human rights; integrity; transparency; health, safety and the environment; and confidentiality.

- **Business Partner Due Diligence Policy:**

This policy outlines the expectation for Business Partners Due Diligence such that NOVA Chemicals works only with business partners who meet our standards in relation to ethics and compliance, and have a shared commitment to acting in a legally compliant manner.

- **Sustainable Procurement Policy**

Framework: Sets out our practices on responsible sourcing including how we identify and/or evaluate qualified suppliers of products and services.

We are also a participant in the United Nations Global Compact, which is a voluntary initiative focused on implementing sustainability principles, including human rights.

OUR AMBITION

- By 2026, engage 100% of our targeted suppliers to align with NOVA's Responsible Supply Chain principles
- Increase awareness of the Operation Clean Sweep program through engagement with 100% of our key customers and transportation partners by 2025.

What does our ambition mean?

Our standards and commitments for Responsible Supply Chain, including environmental responsibility, human rights, and health and safety of employees and communities, are embedded in our policies and programs which guide our actions. We deploy a range of approaches and tools to engage with targeted suppliers as determined by our risk identification, assessment and prioritization, to understand, mitigate and address adverse impacts and to foster continuous improvement.

The OCS program is an initiative to prevent the loss of plastic pellets to the environment during manufacturing or transportation. By engaging with key customers and transportation partners we increase awareness of the OCS program through our supply chain.



INTERNAL AND THIRD-PARTY SCREENING

Using a combination of an internal screening process and third-party service providers, we assess the risks associated with our suppliers, customers, and distributors. Criteria we evaluate include trade-prohibited countries, denied parties (according to relevant government agencies), and value of the business arrangement. The level of risk determines the level of further due diligence which may include further investigation and risk mitigation and greater scrutiny. External assessments are also critical in our sourcing and supply chain partner relationships. We use [EcoVadis](#) assessments, NAVEX RiskRate Due Diligence Management System and [ISNetworld](#)® software to review and score the sustainability performance and management systems of targeted supply partners on topics such as Environment, Labor and Human Rights, and Ethics.

SUPPLY CHAIN RISK EXPOSURE EVALUATION

Our Supply Chain Risk Exposure Evaluation Network (SCREEN) is a cross-functional team that supports our commercial and logistics functions to identify and manage risks associated with the transportation and storage of products in the supply chain.

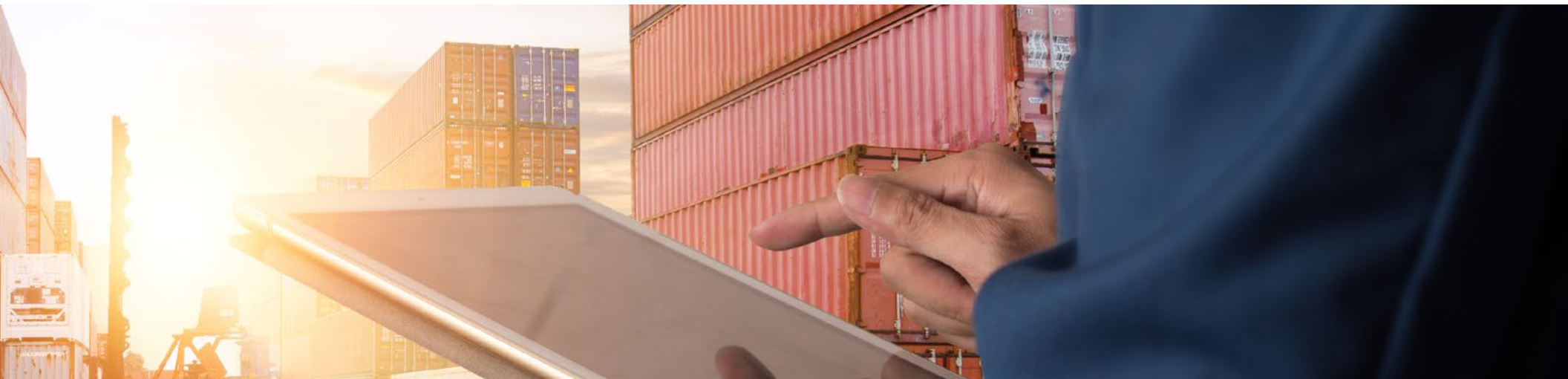
- **Security Programs:** To protect the security of our international supply chain, we are a registered partner in the U.S. Customs Trade Partnership Against Terrorism and the Canada Border Services Agency's Partners in Protection program.
- **Responsible Care Outreach:** We implement a Responsible Care Outreach Program to encourage the adoption of Responsible Care principles throughout our value chain. Following a risk assessment of supplier and customer categories, we engage with targeted customers, suppliers, carriers, and other stakeholders to help them understand our commitment to Responsible Care and our expectations for doing business with us.

OUR COMMITMENT TO HUMAN RIGHTS



We stand by the principle that everyone has the right to be treated with dignity and respect. NOVA Chemicals is dedicated to supporting and upholding the preservation of human rights in all our operations and throughout our supply chain. As a proud participant in the United Nations Global Compact, we recognize and respect human rights. Our commitment to human rights is included in our Code of Conduct.

We expect our partners to do the same. We have policies and processes in place to help us identify, prevent, mitigate and address adverse human rights impacts in our supply chain, such as our [Supplier Code of Conduct](#), our Business Partner Due Diligence Policy, and our engagement with EcoVadis, ISN and RiskRate to assess supplier sustainability management systems.



▶ WHY IS IT IMPORTANT FOR US TO HAVE A RESPONSIBLE SUPPLY CHAIN?

By managing our value chain according to our Values and Code of Conduct, we can have a greater impact to positively influence our entire value chain and promote sustainable practices beyond NOVA Chemicals' direct operations.

2022 Activities

SUSTAINABLE PROCUREMENT POLICY FRAMEWORK AND SUPPLIER CODE OF CONDUCT

In 2022 we developed our Sustainable Procurement Policy Framework, which sets out our practices on responsible sourcing including how we identify and/or evaluate qualified suppliers of products and services.

In 2022 we increased our efforts to engage with our suppliers to understand their sustainability journey and to gather more information relevant to our Ecovadis assessments.

We also launched our [Supplier Code of Conduct](#) which outlines our expectations for our suppliers' actions related to important topics such as human rights, anti-bribery and corruption, competition, and health, safety and the environment. At the end of 2022, the Supplier Code of Conduct had been incorporated into the standard language for all new supplier contracts.

Utilizing RiskRate Due Diligence Management system through our NAVEX® system, we conduct reputation screenings of all contractors or suppliers competing in a strategic sourcing event, e.g. RFI — Request for Information or RFP — Request for Proposal. The tool allows us to review reports and understand the possible risks to NOVA Chemicals from adverse media related to our contractors.

Technical and Corporate Procurement currently qualifies contractors and suppliers by utilizing a third-party to gather, evaluate and grade against industry aligned health, safety and environmental criteria. Utilizing this same platform, steps were taken in 2022 to map out a Sustainability Scorecard to allow us to score and grade our supply base on their ESG practices and objectives, with the plan to implement an ESG scorecard by Q4 2023.

❄ OPERATION CLEAN SWEEP

We support OCS in its campaign to eliminate plastics from the environment. To contribute to this mission, we aim to prevent pellet loss at our sites and in our supply chain. To achieve this, we assess each of our polyethylene sites quarterly, ensuring we have the necessary tools for clean up.

In 2022, we developed a hopper car unloading checklist and guideline that outlines important actions and procedures to encourage behavior changes that will help keep pellets in hopper cars after they've been unloaded at customer locations. This will be rolled out to customers in 2023.

OUR RESPONSIBLE SUPPLY CHAIN JOURNEY



Cybersecurity

Digital advances offer significant business advantages; however, they can also potentially introduce risks related to digital piracy, cyber ransom, and business interruption or physical damages. We have robust training, auditing, and information protection measures in place and continuously improve our processes and technology to counter these threats.

How We Manage Cybersecurity Risks

Our holistic approach to digital risk management follows the National Institute of Standards and Technology ([NIST](#)) framework, a voluntary framework created by industry and the U.S. government to protect major infrastructure from cybersecurity risks. Our cybersecurity measures adopt a zero-trust principle and incorporate multiple factors to best protect our data, systems, and information. A multi-year strategy was designed for our risk-driven security program that considers the advancements in both threats and the protection landscape. Five focus areas

were identified and various initiatives were planned to mitigate current and future challenges. Our efforts include: Security Strategy and Governance, Security Risk Management, Data Governance and Security, Asset Posture Management, and Security Operational Excellence.

ASSESSING RISK

We comprehensively assess and review new systems and initiatives to ensure cybersecurity standards are maintained. We also complete cyber risk assessments of third-party vendors to ensure secure cyber controls are implemented to minimize our risk exposure. As a part of continuous improvement mindset, the introduction

of NOVA's standardized Security Risk Management Framework in 2022 enables key stakeholders to understand security requirements, posture, and controls. The framework adoption is part of our security strategy to drive visibility to business risks, improvements to security program, and enable risk-informed decisions.

SECURING THE OPERATIONAL ENVIRONMENT

Our network is segregated into various zones, based on how critical they are to NOVA Chemicals. Each zone has security controls in place to manage access and ensure maximum protection from malware and malicious activities. Given their

significance, we isolate our operational centers from the internet and corporate network activity to limit the risk exposure of a corporate network breach.

Contract templates have been updated to include cybersecurity language to ensure contractors and suppliers understand and acknowledge NOVA Chemical's cyber controls.



PROTECTING INFORMATION

We regularly update user policies and our processes for data loss prevention and data classification. We implement a best-in-class Identity Governance Solution to protect identities and ensure access to sensitive information is provided to only necessary parties.

TRAINING

To manage digital risks, we include a cybersecurity module in our mandatory Business Conduct Policy annual training. We focus on user-centric security by conducting security simulations and training to ensure we train and equip our first line of defense. Business and IT employees also engage in tabletop exercises to test incident response effectiveness and practice responding to cybersecurity events. Focused training is provided to groups with higher risk business processes.

FOSTERING ACCOUNTABILITY

We continue to run regular IT security campaigns including phishing to test employees' awareness of cybersecurity monthly and ask employees to refresh their core security training annually. In 2021, we developed an IT User Policy that includes acceptable use of NOVA Chemicals' systems and guidelines for handling repeat violations during phishing campaigns. All employees and contractors must certify that they read and understood the policy.

AUDITING

Our cybersecurity systems are audited yearly by a third party and subject to external penetration testing. We also completed an independent security assessment to help drive improvements to security practice.

2022 Activities

In 2022, we used a service-based design to identify key areas of the practice and developed our security systems to deliver operational security that accounts for people, process, and technology.

We have embraced agile ways of working, and adopted a SecDevOps approach which prioritizes security to deliver a secure-by-design enterprise security system.



Public Policy

We believe it is essential to have a strong and fair regulatory system to maintain a level playing field, regulatory stability, and the license to operate. Strict ethical standards have been established to guide our engagement with officials and regulators.

Management Approach: How We Get Involved in Public Policy

We participate in public policy advocacy through trade associations in jurisdictions where we have manufacturing operations. We are members of the following business and industry associations:

IN CANADA:

- CIAC
- Canadian Manufacturers & Exporters
- Business Council of Canada
- Resource Diversification Council
- Alberta Plastics Recycling Association
- Business Council of Alberta

IN THE U.S.:

- ACC
- Plastics Industry Association
- Flexible Packaging Association
- AMERIPEN® Association
- Association of Plastics Recyclers

We also directly engage with regulators on key issues to support them in their efforts to protect human health and the environment. Our lobbying activities are guided by the relevant regulatory standards such as the Canadian federal Lobbying Act, the Alberta Lobbyists Act, and the Ontario Lobbyists Registration Act. We review our lobbyist registration annually to ensure compliance.

We have an internal lobbying policy and provide training for any executives or employees who interact with government officials. We track and, as required, publicize any lobbying activities that are directly focused on policies, programs, and regulations. In the U.S., we work with industry and trade associations to advocate on our behalf.



Performance Table

ENVIRONMENT	UNITS	2018	2019	2020	2021	2022
GHG EMISSIONS (OPERATIONAL CONTROL)⁴						
Scope 1 GHG emissions ⁵	kilotonnes	4,094	4,135	3,963	3,820	3,729
Scope 2 GHG emissions	kilotonnes	900	912	844	837	852
Scope 3 GHG emissions ⁶	kilotonnes	15,500	15,800	14,800	14,900	13,200
GHG emissions intensity (Scope 1 and 2)	tonnes CO ₂ e/ tonne of product	0.66	0.65	0.63	0.65	0.69
Scope 1 emissions under carbon-limiting regulations ⁷	percent	NR	NR	83	85	80
OTHER AIR EMISSIONS						
NOx	tonnes	5,240	5,110	5,140	4,730	4,790
SOx	tonnes	1,190	860	680	300	470
VOCs	tonnes	1,710	1,720	1,460	1,460	1,010
Hazardous air pollutants (HAPs) ⁸	tonnes	NR	NR	95	83	65
REGULATORY COMPLIANCE						
Regulatory/permit exceedances ⁹	count	6	5	7	4	2
ENERGY USE						
Total energy consumed from natural gas (excluding electricity)	million GJ	NR	NR	43.99	37.94	33.02
Total energy used	million GJ	NR	NR	113.44	113.81	100.41
Total purchased electricity	million GJ	NR	NR	5.91	5.93	5.55
Purchased electricity – non-renewable	million GJ	NR	NR	5.91	5.93	5.55
Purchased electricity – renewable	million GJ	NR	NR	0	0	0
WATER						
Water withdrawal	thousand m ³	NR	NR	40,850	40,150	36,300
Water withdrawn from regions with High or Extremely High Baseline Water Stress ¹⁰	thousand m ³	NR	NR	14,920	14,830	13,510
Total water discharge	thousand m ³	NR	NR	21,270	21,260	21,240
WASTE						
Total non-hazardous waste	tonnes	NR	NR	20,410	27,090	32,760
Non-hazardous waste reused	tonnes	NR	NR	12,370	15,010	21,510
Total hazardous waste ¹¹	tonnes	NR	NR	98,710	91,850	95,840
Hazardous waste sent for recycling	tonnes	NR	NR	120	12	29

A note on restatements: We will restate annual data if there is a material change of five per cent or more.

NR: Not reported

⁴ We report all environmental information, including GHG emissions, using our operational control approach. This means we report 100 percent of GHG emissions from facilities that we operate regardless of financial ownership, including operated ethylene and polyethylene assets and associated site-based infrastructure, and owned pipelines and office buildings. No emissions offsets were applied in the 2018 to 2022 reporting years.

⁵ NOVA Chemicals' GHG Scope 1 emissions calculations in Alberta have been reported and assured by a third-party since 2007 and Scope 1 emissions for Ontario assets have been reported and assured by a third-party since 2011.

⁶ NOVA Chemicals' value chain emissions are inclusive of the most relevant 12 of 15 categories defined in the GHG Protocol. Third-party limited assurance of Scope 3 methodology, aligned to the GHG Protocol Corporate Value Chain (Scope 3) Reporting Standard, and 2022 emissions data was conducted by SCS Global Services. We have refined our quantification methodology and approach resulting in a change in the previously reported 2020 value.

⁷ Emission-limiting regulations include jurisdictions with industrial carbon regulation.

⁸ Hazardous air pollutants (HAPs) are defined by the EPA as those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. The EPA provides a list of HAPs in "The Clean Air Act Amendments of 1990 List of Hazardous Air Pollutants." 2021 data has been restated to correct a calculation error.

⁹ Regulatory/Permit Exceedance (RPE) includes reportable spills and other non-compliances with federal, provincial/state, or municipal approval, permit, or regulatory requirements with potential for adverse impact. This metric excludes administrative non-compliances and reports to the regulator related to minor issues.

¹⁰ Water stress as classified by the World Resources Institute's (WRI) Aqueduct Water Risk Atlas tool, High (40–80 percent) or Extremely High (>80 percent) Baseline Water Stress.

¹¹ 2020 and 2021 data have been restated to correct for a prior omission of a caustic waste stream.



SOCIAL		UNITS	2018	2019	2020	2021	2022
EMPLOYEE AND CONTRACTOR SAFETY							
Recordable injury rates – employees			0.32	0.29	0.08	0.16	0.04
Recordable injury rates – contractors			0.53	0.48	0.49	0.35	0.34
Recordable injury rates – combined	count per 200,000 exposure hours		0.41	0.37	0.26	0.27	0.23
Lost time injury rate – employees			0.10	0.06	0.04	0	0
Lost time injury rate – contractors			0	0.03	0.04	0.03	0
Lost time injury rate – combined			0.06	0.04	0.04	0.02	0
Fatalities – employees and contractors	count		0	0	0	0	0
Vehicle incidents ¹²	count		36	61	35	50	48
Near misses (near hits) ¹³	count		551	544	627	1,002	926
Safety interactions ¹⁴	count		67,260	65,129	55,763	57,179	55,648
PROCESS SAFETY							
Total process fires ¹⁵	events		21	12	10	14	13
Flammable Loss of Containment (FLOC) ¹⁶	events		52	49	20	27	14
Process Safety Incidents Count (PSIC) – Tier 1	incidents		6	8	1	2	0
Process Safety Incidents Count (PSIC) – Tier 2	incidents		8	10	8	11	7
Process Safety Total Incident Rate (PSTIR) ¹⁷	incidents per 200,000 worked hours		0.13	0.18	0.03	0.06	0.00
Process Safety Incident Severity Rate (PSISR) ¹⁸	severity-weighted rate of incidents per 200,000 hours worked		0.39	0.49	0.09	0.28	0.00
TRANSPORTATION SAFETY							
Total number of transportation incidents	count		16	24	22	57	25
Reportable transportation incidents ¹⁹	count		1	2	5	5	2
Non-Accident Releases (NARs) ²⁰	count		0	0	0	0	0

¹² Vehicle incidents include only driving-related vehicle incidents, and excludes any incidents involving powered mobile equipment or rail.

¹³ Near hits: A near hit is an unplanned event that did not result in undesirable consequences but had the potential to do so. We encourage near hit reporting because it is a proactive leading indicator that enables us to identify and address a hazardous situation before an incident occurs.

¹⁴ Safety interactions are peer interactions about safe or at-risk behaviors. We encourage employees to speak up when they see positive or at-risk behaviors, as part of our commitment to Responsible Care.

¹⁵ Process fires are any unplanned fire involving process materials.

¹⁶ Flammable loss of containment events (FLOCs) are incidents that typically involve an unplanned release of flammable materials exceeding 10% of the Tier 2 threshold in the American Petroleum Institute (API) RP 754 from 2021.

¹⁷ Process Safety Total Incident Rate (PSTIR) is calculated using the American Petroleum Institute (API) RP 754 from 2021. This rate is based only on Tier 1 incidents, which aligns with SASB recommendations.

¹⁸ Process Safety Incident Severity Rate (PSISR) is calculated using the American Petroleum Institute (API) RP 754 from 2021. This aligns with SASB recommendations.

¹⁹ Consistent with the International Council of Chemical Associations (ICCA) Guidance for Reporting Performance, an incident causing one of the following: direct involvement of authorities and/or emergency services, evacuation of people, or closure of public traffic routes for at least three hours; any release of more than 50 kg/L of dangerous goods or more than 1,000 kg/L of non-dangerous goods; any damage of more than 50,000 Euro (including environmental cleanup) resulting from a transport incident; or a death or injury leading to intensive medical treatment, a stay in hospital of at least one day, or an absence from work of more than three days.

²⁰ Non-accident releases are the unintentional releases of a hazardous material during rail transportation, including loading and unloading while in railroad possession, that is not caused by a derailment, collision, or other rail-related accident.



SOCIAL CONTINUED	UNITS	2018	2019	2020	2021	2022
PRODUCT SAFETY						
Percent of Significant Products Assessed for Risk and Prioritized based on ICCA Guidance ²¹	percent	NR	NR	NR	NR	100
Incidents of non-compliance (e.g., product recalls and allegations) concerning the health and safety of products ²²	count	0	0	0	0	0
Products subject to information requirements ²³	percent	100	100	100	100	100
Percentage of revenue from products that contain Canadian Globally Harmonized System of Classification and Labeling of Chemicals (GHS) Category 1 and 2 Health and Environmental Hazardous Substances	percent	NR	NR	8	11	6
Percentage of such products that have undergone a hazard assessment	percent	NR	NR	100	100	100
EMPLOYEES						
Total number of employees	count	2,885	2,906	2,351	2,456	2,476
Full time	count	2,820	2,836	2,303	2,422	2,447
Part time	count	65	70	48	34	29
Women	count	710	711	592	616	617
Men	count	2,157	2,171	1,742	1,833	1,851
Employees in the U.S.	count	578	581	291	273	275
Employees in Canada	count	2,291	2,309	2,051	2,174	2,192
Employees covered by collective bargaining agreements	percent	11	11	8	8	8
Total new hires	count	220	210	84	252	238
Rate of new hires	percent	8	7	4	10	10
Voluntary (retire/resign) turnover	percent	5	5	10	4	7
Total turnover (voluntary and involuntary)	percent	7	6	18	6	8
Women at various levels						
Total workforce	percent	NR	NR	25	25	25
Board of Directors	percent	NR	NR	0	0	11
Management	percent	NR	NR	22	23	24
Executives	percent	NR	NR	20	14	14
Demographics						
30 years and under	percent	NR	NR	13	13	12
30 to 50	percent	NR	NR	55	56	59
50-plus	percent	NR	NR	32	31	29

²¹ In 2022, NOVA implemented a new prioritization methodology for product risk assessments using the International Council of Chemical Associations (ICCA) Guidance on Chemical Risk Assessments.

²² Interpreted for application to NOVA Chemicals as incidents of non-compliance specifically limited to U.S. EPA Toxic Substances Control Act (TSCA) allegations, U.S. Food and Drug Administration (FDA) product recalls, and Canadian equivalents. Non-compliance with voluntary codes is not included.

²³ Products subject to information requirements for content, safe use, and/or disposal.



SOCIAL CONTINUED		UNITS	2018	2019	2020	2021	2022
COMMUNITIES							
Community investment	\$	2,479,642	2,390,635	2,017,962	2,181,637	1,627,191	
Volunteerism (hours) ²⁴	hours	6,136	5,934	2,248	1,396	2,568	
ECONOMIC VALUE GENERATED AND DISTRIBUTED							
Revenues	million USD	4,195	3,343	3,207	5,061	4,472	
Payments to governments (taxes paid net of refunds) ²⁵	million USD	(17)	(3)	(61)	(43)	239	
Payments to employees (salaries and benefits)	million USD	465	473	414	472	453	
Capital expenditures	million USD	449	793	688	670	830	
ADDITIONAL INFORMATION ON TAXES							
Income and property taxes paid ²⁶	million USD	14	119	14	15	243	
Income tax refunds received ²⁷	million USD	31	122	75	58	4	
Taxes paid, net of refunds ²⁸	million USD	(17)	(3)	(61)	(43)	239	

²⁴ 2020, 2021 and 2022 hours reflect COVID-19–related restrictions.

²⁵ Includes only income and property tax. Excludes sales taxes (goods and services tax (GST), harmonized sales tax (HST), Québec sales tax (QST)).

²⁶ NOVA Chemicals is committed to transparency and responsible tax payments. We are guided by tax principles that follow the intent of the law in our tax calculations and payments. Since 2018, revenues have increased, most notably in 2021 when NOVA realized record profits. In 2018, 2019, 2020 and 2021 we received refunds in excess of taxes paid. In 2017 and 2018, tax losses were created as a result of unfavorable litigation. The losses were carried back and applied against taxable income in prior years to recover cash tax previously paid. The refunds were received in 2018 through 2021. In 2019, our income tax rate decreased because the Alberta Job Creation Tax Cut bill came into effect reducing the income tax rate for Alberta-based business to incentivize job creation. In 2022 income taxes were paid with respect to the record earnings achieved in 2021.

²⁷ We received tax refunds from tax authorities/governments after their assessment of our tax obligations.

²⁸ This figure is our taxes paid minus tax refunds. In 2018, 2019, 2020, and 2021 the refunds exceeded the taxes we paid. However, in February 2022, we paid \$230 million to Canadian taxation authorities for income taxes payable on 2021 earnings. NOVA Chemicals was not required to pay cash tax installments in 2021 and, as a result, the full balance of tax associated with earnings in 2021 was due in February 2022.

GOVERNANCE		UNITS	2018	2019	2020	2021	2022
BUSINESS ETHICS AND ANTI-CORRUPTION							
Matters received	count	92	93	87	80	89	
Questions	count	54	63	63	53	47	
Allegations of Code violations	count	38	30	24	27	42	
Unsubstantiated	count	17	14	17	14	22	
Substantiated	count	16	16	6	9	14	
Remained open at year end	count	5	0	1	4	6	
Percent of employees who signed Code of Conduct	percent	97%	98%	93%	93%	96%	
Percent of employees who received mandatory training	percent	8%	100%	100%	100%	100%	
Number of employees who received optional training courses	count	250	300	425	684	700	
CATEGORIES FOR ALLEGATIONS AND QUESTIONS							
Accounting, auditing, and financial reporting	percent	3	0	0	0	1	
Business integrity	percent	67	85	78	93	63	
HR, diversity, and workplace respect	percent	70	65	63	63	36	
Environment, health, and safety	percent	9	1	14	3	0	
Misuse, misappropriation of corporate asset	percent	5	4	4	4	0	

Appendix

This report has been prepared with reference to the GRI Standards. This section contains additional disclosures to fulfill GRI and other requirements, which are not addressed elsewhere in this report. For more information on the GRI standards please visit the [GRI website](#).



Material Topic Boundaries

We report on the topics that are most relevant to our stakeholders and can impact the success of our business. We determined our material topics, and their boundaries, during our biannual materiality assessment in 2022. For the purposes of GRI reporting, the topics covered under our Priority and Foundational Topics are considered material topics.

	SUPPLIERS/ CONTRACTORS	NOVA CHEMICALS FACILITIES AND LOCATIONS	CUSTOMERS	COMMUNITIES	SOCIETAL INTEREST
Plastic circular economy		●	●		●
Climate care	●	●	●	●	●
Inclusion and diversity		●			
Ethics	●	●	●		
Water	●	●		●	
Air emissions	●	●		●	
Process safety		●	●	●	
Employee and contractor safety	●	●			
Responsible supply chain	●	●			
Talent management		●	●	●	

Engagement with Interested Parties

Our continued success depends on understanding and respecting the needs and concerns of interested parties at every stage of our operations. We consider interested parties to be people or groups who are directly or indirectly affected by our operations, those who perceive themselves to be affected by a decision or activity, and those who have the ability to influence outcomes. The table below illustrates the range of interested parties with whom we interact, the concerns they have raised, and how we engage with them.

INTERESTED PARTIES	TOPICS AND CONCERNS		HOW WE ENGAGE	
Communities and Indigenous Communities	<ul style="list-style-type: none"> Public safety Environmental and social impacts Employment Noise, light, and traffic 	<ul style="list-style-type: none"> Support for community programs Cumulative effects of production Plastics sustainability 	<ul style="list-style-type: none"> Callout system Conversations Community advisory panels Neighbor events/open houses 	<ul style="list-style-type: none"> Volunteer activities Newsletters Website community information Responsible Care verification
Employees	<ul style="list-style-type: none"> Fair total compensation Safe work environment Career development Work/life balance 	<ul style="list-style-type: none"> Impact of employee work on society Environmental and social impacts 	<ul style="list-style-type: none"> Newsletters Employee sessions Quality conversations 	<ul style="list-style-type: none"> Engagement surveys Intranet and direct emails Volunteer opportunities
Customers	<ul style="list-style-type: none"> Cost Quality On-time delivery Mutual development benefits 	<ul style="list-style-type: none"> Safety Lifecycle of products Plastic sustainability Greenhouse gas (GHG) emissions 	<ul style="list-style-type: none"> Direct engagement (meetings and events) Joint development programs Collaboration 	<ul style="list-style-type: none"> Product information Training/technical support Innovation Conferences
Suppliers	<ul style="list-style-type: none"> Stability Growth plans 	<ul style="list-style-type: none"> Fair treatment Mutual development benefits 	<ul style="list-style-type: none"> Meetings Joint development programs 	<ul style="list-style-type: none"> Training Technical support
Owner	<ul style="list-style-type: none"> Return on investment ESG performance 	<ul style="list-style-type: none"> Strong governance and succession Strategic planning 	<ul style="list-style-type: none"> Board meetings Board visits 	<ul style="list-style-type: none"> Regular correspondence Reports
Governments/Regulators	<ul style="list-style-type: none"> Impact to communities Corporate responsibility Investment 	<ul style="list-style-type: none"> Compliance requirements Taxes Climate change and plastic pollution 	<ul style="list-style-type: none"> Reporting Periodic conversations 	<ul style="list-style-type: none"> Policy advocacy
Providers of Capital	<ul style="list-style-type: none"> Long-term success Return on investment 	<ul style="list-style-type: none"> Cash generation/interest payments GHG emissions 	<ul style="list-style-type: none"> Conference calls Reporting 	<ul style="list-style-type: none"> Conversations
Industry Associations	<ul style="list-style-type: none"> Advocacy for industry 		<ul style="list-style-type: none"> Industry association meetings Conferences 	<ul style="list-style-type: none"> Industry surveys



GRI Index

GRI 1: FOUNDATION 2021

Statement of use	NOVA Chemicals has reported the information cited in this GRI content index for the period January 1, 2022 to December 31, 2022 with reference to the GRI Standards.
GRI 1 used	GRI 1: Foundation 2021

GRI 2: GENERAL DISCLOSURES 2021

DISCLOSURE	LOCATION	PAGE NUMBER
2-1 Organizational details	About NOVA Chemicals	7
2-2 Entities included in the organization's sustainability reporting	About this Report	9
2-3 Reporting period, frequency and contact point	About this Report, Advisory	10, 93
2-4 Restatements of information	Performance Table	76
2-5 External assurance	Assurance Statement	10
2-6 Activities, value chain and other business relationships	Responsible Supply Chain	69-72
2-7 Employees	How We Create Value, Performance Table	13, 76
2-8 Workers who are not employees	Performance Table	76
2-9 Governance structure and composition	ESG Governance, Corporate Governance	60, 62
2-10 Nomination and selection of the highest governance body	Corporate Governance	60
2-11 Chair of the highest governance body	Corporate Governance	60
2-12 Role of the highest governance body in overseeing the management of impacts	ESG Governance	62
2-13 Delegation of responsibility for managing impacts	ESG Governance	62
2-14 Role of the highest governance body in sustainability reporting	ESG Governance	62
2-15 Conflicts of interest	Ethics	67-68
2-16 Communication of critical concerns	Ethics, Performance Table	67-68, 76
2-17 Collective knowledge of the highest governance body	ESG Governance, Corporate Governance	60-63
2-19 Remuneration policies	ESG Governance, Corporate Governance	60, 62
2-22 Statement on sustainable development strategy	CEO Message, Introducing Our New Corporate Strategy	3-5
2-23 Policy commitments	Corporate Governance, Ethics	60, 64-65, 67-68
2-24 Embedding policy commitments	Corporate Governance, Ethics, Responsible Supply Chain, Performance Table	60, 64-65, 67-68, 70, 76
2-25 Processes to remediate negative impacts	Responsible Supply Chain	70-72
2-26 Mechanisms for seeking advice and raising concerns	Ethics	67-68
2-27 Compliance with laws and regulations	Performance Table	76
2-28 Membership associations	Plastic Circular Economy, Public Policy	15-16, 19, 75
2-29 Approach to stakeholder engagement	Community and Indigenous Relations, Responsible Supply Chain, Appendix	56, 71, 75
2-30 Collective bargaining agreements	Performance Table	76

**GRI 3: MATERIAL TOPICS 2021**

DISCLOSURE	LOCATION	PAGE NUMBER
3-1 Process to determine material topics	ESG Governance, Appendix	62-63 , 80
3-2 List of material topics	ESG Governance, Appendix	64-65 , 80

GRI TOPIC STANDARDS

DISCLOSURE	LOCATION	PAGE NUMBER
PLASTIC CIRCULAR ECONOMY		
3-3 Management of material topic	Plastic Circular Economy	16
CLIMATE CARE		
3-3 Management of material topic	Climate Care	25
305-1 Direct (Scope 1) GHG emissions	Climate Care, Performance Table	26-27 , 76
305-2 Energy indirect (Scope 2) GHG emissions	Climate Care, Performance Table	26-27 , 76
305-3 Other indirect (Scope 3) GHG emissions	Climate Care, Performance Table	26-27 , 76
305-4 GHG emissions intensity	Climate Care, Performance Table	26-27 , 76
305-5 Reduction of GHG emissions	Climate Care	22 , 23 , 25
AIR EMISSIONS		
3-3 Management of material topic	Air Emissions	28-29
305-7 Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	Air, Performance Table	28-29 , 76
WASTE		
3-3 Management of material topic	Waste	30-31
306-1 Waste generation and significant waste-related impacts	Waste	30-31
306-2 Management of significant waste-related impacts	Waste	30-31
306-3 Waste generated	Waste, Performance Table	30-31 , 76
306-4 Waste diverted from disposal	Waste, Performance Table	30-31 , 76
306-5 Waste directed to disposal	Waste, Performance Table	30-31 , 76
WATER		
3-3 Management of material topic	Water	32-33
303-1 Interactions with water as a shared resource	Water	32-33
303-2 Management of water discharge-related impacts	Water	32-33
303-3 Water withdrawal	Performance Table	32-33 , 76
303-4 Water discharge	Performance Table	32-33 , 76

**GRI TOPIC STANDARDS CONTINUED**

DISCLOSURE	LOCATION	PAGE NUMBER
INCLUSION AND DIVERSITY		
3-3 Management of material topic	Inclusion and Diversity	36
405-1 Diversity of governance bodies and employees	Performance Table	76
401-3 Parental leave	Inclusion and Diversity	37
TALENT MANAGEMENT		
3-3 Management of material topic	Talent Management	39
401-1 New employee hires and employee turnover	Performance Table	76
P404-2 programs for upgrading employee skills and transition assistance programs	Talent Management	39-40
EMPLOYEE HEALTH AND WELLNESS		
3-3 Management of material topic	Employee Health and Wellness	41
403-6 Promotion of worker health	Employee Health and Wellness	41-42
EMPLOYEE AND CONTRACTOR SAFETY		
3-3 Management of material topic	Employee and Contractor Safety	43-44
403-1 Occupational health and safety management system	Employee and Contractor Safety, Employee Health and Wellness, Process Safety, ESG Integration	41-44 , 47-48 , 64
403-3 Occupational health services	Corporate Governance	41-42 , 64 , 66
403-9 Work-related injuries	Employee and Contractor Safety, Performance Table	43-45 , 76
PROCESS SAFETY		
3-3 Management of material topic	Process Safety	47
403-2 Hazard identification, risk assessment, and incident investigation	Process Safety	47-48
PRODUCT SAFETY		
3-3 Management of material topic	Product Safety	50-51
403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	Product Safety	50-52
416-1 Assessment of the health and safety impacts of product and service categories	Performance Table	76
416-2 Incidents of non-compliance concerning the health and safety impacts of products and services	Performance Table	76
417-1 Requirements for product and service information and labeling	Performance Table	76

**GRI TOPIC STANDARDS CONTINUED**

DISCLOSURE	LOCATION	PAGE NUMBER
TRANSPORTATION SAFETY		
3-3 Management of material topic	Transportation Safety	53-54
COMMUNITY AND INDIGENOUS RELATIONS		
3-3 Management of material topic	Community and Indigenous Relations	56-58
CORPORATE GOVERNANCE		
3-3 Management of material topic	Corporate Governance	60
ETHICS		
3-3 Management of material topic	Ethics	67-68
205-2 Communication and training about anti-corruption policies and procedures	Ethics	67-69
205-3 Confirmed incidents of corruption and actions taken	Ethics	67-69
RESPONSIBLE SUPPLY CHAIN		
3-3 Management of material topic	Responsible Supply Chain	70-72
CYBERSECURITY		
3-3 Management of material topic	Cybersecurity	73-74
PUBLIC POLICY		
3-3 Management of material topic	Public Policy	75



SASB Index

Below are the quantitative metrics and references to qualitative descriptions in this report that align with the Sustainability Accounting Standards Board (SASB) standard for the Chemicals industry. The Sustainability Accounting Standards Board is a non-profit organization with the goal of enabling businesses around the world to identify, manage, and communicate financially material sustainability information to their investors.

SASB REF	SASB SUGGESTED DISCLOSURES	2022 DATA
GHG EMISSIONS		
RT-CH-110a.1	Gross global Scope 1 emissions	3,729 kilotonnes
RT-CH-110a.1	Percentage of Scope 1 emissions covered under emissions-limiting regulations	80
RT-CH-110a.2	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	pages 22-27
AIR QUALITY		
RT-CH-110a.3	NOx (excluding N ₂ O)	4,790 tonnes
RT-CH-110a.3	SOx	470 tonnes
RT-CH-110a.3	Volatile organic compounds (VOCs)	1,010 tonnes
RT-CH-110a.3	Hazardous air pollutants (HAPs)	65 tonnes
ENERGY MANAGEMENT		
RT-CH-130a.1	Total energy consumed	100.41 million GJ
RT-CH-130a.1	Total purchased electricity	5.55 million GJ
RT-CH-130a.1	Percentage renewable electricity purchased	0
RT-CH-130a.1	Self-generated electricity	0 million GJ
WATER MANAGEMENT		
RT-CH-140a.1	Total water withdrawn	36,300 thousand m ³
RT-CH-140a.1	Total water consumed	NR
RT-CH-140a.1	Percentage water withdrawn in regions with High or Extremely High Baseline Water Stress	37
RT-CH-140a.1	Percentage water consumed in regions with High or Extremely High Baseline Water Stress	NR
RT-CH-140a.2	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	0
RT-CH-140a.3	Description of water management risks and discussion of strategies and practices to mitigate those risks	pages 32-33
HAZARDOUS WASTE MANAGEMENT		
RT-CH-150a.1	Amount of hazardous waste generated	95,840 tonnes
RT-CH-150a.1	Percentage hazardous waste recycled	0
COMMUNITY RELATIONS		
RT-CH-210a.1	Discussion of engagement processes to manage risks and opportunities associated with community interests	pages 56-58, 81
WORKFORCE HEALTH & SAFETY		
RT-CH-320a.1	Total recordable incident rate (TRIR) (incidents per 200,000 hours worked)	0.23
RT-CH-320a.1	Fatalities	0
RT-CH-320a.1	Near misses (total not rate)	926
RT-CH-320a.2	Description of efforts to assess, monitor, and reduce exposure of employees and contract workers to long-term (chronic) health risks	pages 41-49



SASB REF	SASB SUGGESTED DISCLOSURES	2022 DATA
PRODUCT DESIGN FOR USE-PHASE EFFICIENCY		
RT-CH-410a.1	Revenue from products designed for use-phase resource efficiency	Not reported
SAFETY & ENVIRONMENTAL STEWARDSHIP OF CHEMICALS		
RT-CH-410b.1	Percentage of revenue from products that contain Globally Harmonized System of Classification and Labeling of Chemicals (GHS) Category 1 and 2 Health and Environmental Hazardous Substances	6
RT-CH-410b.1	Percentage of GHS 1 and 2 products that have undergone a hazard assessment	100
RT-CH-410b.2	Discussion of strategy to (1) manage chemicals of concern and (2) develop alternatives with reduced human and/or environmental impact	pages 50-55
GENETICALLY MODIFIED ORGANISMS		
RT-CH-410c.1	Percentage of products by revenue that contain genetically modified organisms (GMOs)	Not applicable
MANAGEMENT OF THE LEGAL & REGULATORY ENVIRONMENT		
RT-CH-530a.1	Discussion of corporate positions related to government regulations and/or policy proposals that address environmental and social factors affecting the industry	page 75
OPERATIONAL SAFETY, EMERGENCY PREPAREDNESS & RESPONSE		
RT-CH-540a.1	Process Safety Incidents Count (PSIC), Tier 1	0 incidents
RT-CH-540a.1	Process Safety Incidents Count (PSIC), Tier 2	7 incidents
RT-CH-540a.1	Process Safety Total Incident Rate (PSTIR) (incidents per 200,000 hours worked)	0
RT-CH-540a.1	Process Safety Incident Severity Rate (PSISR) (severity-weighted rate of incidents per 200,000 hours worked)	0
RT-CH-540a.2	Number of transport incidents	25 incidents

SDG Index

GOALS	RELEVANT REPORT SECTION
SDG 3 Good Health and Well Being	<ul style="list-style-type: none"> Employee and Contractor Safety Employee Health and Wellness Air Emissions Waste
SDG 5 Gender Equality	<ul style="list-style-type: none"> Inclusion and Diversity
SDG 6 Clean Water and Sanitation	<ul style="list-style-type: none"> Waste Water
SDG 8 Decent Work and Economic Growth	<ul style="list-style-type: none"> Talent Management Inclusion and Diversity
SDG 9 Industry, Innovation, and Infrastructure	<ul style="list-style-type: none"> Plastic Circular Economy

GOALS	RELEVANT REPORT SECTION
SDG 12 Responsible Consumption and Production	<ul style="list-style-type: none"> Plastic Circular Economy Climate Care Waste Water
SDG 13 Climate Action	<ul style="list-style-type: none"> Climate Care Air Emissions
SDG 14 Life Below Water	<ul style="list-style-type: none"> Plastic Circular Economy
SDG 15 Life on Land	<ul style="list-style-type: none"> Climate Care Waste
SDG 16 Peace, Justice, and Strong Institutions	<ul style="list-style-type: none"> Ethics

TCFD Index

GOVERNANCE

a) Describe the board's oversight of climate-related risks and opportunities.

- [ESG Governance](#)

b) Describe management's role in assessing and managing climate-related risks and opportunities.

- [ESG Governance](#)

STRATEGY

a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.

- [Introducing our New Corporate Strategy](#)
- [Climate-related risks and opportunities](#)

The following tables provide more details on our priority transition and physical risks and opportunities.

Table 1: Transition Risks

RISK CATEGORY ²⁹	DESCRIPTION	TIME FRAME
Policy/Legal	Increased stringency of climate-related regulations in Canada and the U.S.	M, L
Policy/Legal	Increased policy-driven limitations on plastic usage and/or single-use plastics.	S, M, L
Policy/Legal/Market/Reputation	Increased climate-related demands, disputes, and litigation in various jurisdictions across the U.S. and Canada.	M, L
Market	Decreased demand for energy-intensive and/or fossil fuel-related products due to a shift in consumer preferences towards low-emissions products.	M, L
Market	Reduced market availability/supply of fossil fuel-based feedstock at the current price.	M, L
Technology	Increased need to develop and/or implement low-emissions technologies.	S, M
Reputation	Increased use of climate performance metrics by lenders and insurance providers.	S, M, L

S = Short-term (5 years), M = Medium-term (2030), L = Long-term (2050)

Policy/legal, market, technology or reputational risks that result from regulatory, legal and societal change related to the transition to a low carbon economy (Source: [TCFD Disclosures 2022 Status Report](#))

Table 2: Transition Opportunities

OPPORTUNITY CATEGORY ²⁹	DESCRIPTION	TIME FRAME
Products & Services	Increased demand for low-carbon, circular, or sustainability-linked products.	S, M, L
Products & Services	Increased availability and access to climate finance (e.g., green bonds/loans)	S, M, L
Resource Efficiency/Energy Source	Increased economic and operational feasibility of resource-efficient technologies.	M, L
Energy Source	Increased adoption and use of renewable energies.	S, M, L

S = Short-term (5 years), M = Medium-term (2030), L = Long-term (2050)

Resource efficiency, product- and service-related and energy source-related opportunities that result from regulatory, legal, and societal change related to the transition to a low carbon economy (Source: [TCFD Disclosures 2022 Status Report](#))

Table 3: Physical Risks

RISK CATEGORY ²⁹	DESCRIPTION	TIME FRAME
Acute	Increased intensity and frequency of heat waves.	M, L
Acute	Increased frequency and size of uncontrolled and destructive wildfires.	M, L
Acute	Increased frequency and severity of floods caused by extreme rainfall.	M, L
Acute	Increased intensity and frequency of windstorms.	M, L
Chronic	Increased water stress due to long-term changes in rainfall patterns.	S, M, L
Chronic	Increasing mean temperature	M, L

S = Short-term (5 years), M = Medium-term (2030), L = Long-term (2050)

The risk of financial losses caused by extreme weather events (acute) or longer-term shifts in climate patterns (chronic) (Source: [TCFD Disclosures 2022 Status Report](#))

²⁹ Climate-related risk categorization as per the Recommendations of the [Task Force on Climate-related Financial Disclosures, 2017](#)

Climate Scenario Description

Our [climate scenario analysis](#) incorporates a range of business considerations based on third-party scenarios and their corresponding implications for NOVA Chemicals' operational and non-operational assets as well as our supply chain for the time periods of 2030 and 2050.

Table 4: Climate Scenario Description

CLIMATE SCENARIOS	PHYSICAL RISK SCENARIO ANALYSIS	TRANSITION RISK SCENARIO ANALYSIS
Aggressive Mitigation	An Aggressive Mitigation scenario assumes little to no change in physical climate risk.	2050 Temperature Outcome: 1.8°C Scenario Data: S&P Global, IHS Markit Green Rules; Green Scenario - Circular Plastics Service, Chemical Market Analytics by OPIS, A Dow Jones Company
		Description: The revolutionary transformation toward a sustainable, low-carbon economy is driven by a strong public and political ambition to reach Paris Agreement-aligned climate targets. This leads to aggressive regulations limiting the extraction and use of fossil fuels.
Middle-of-the-road	Description: Global and national institutions work slowly towards achieving sustainable development goals. There remain challenges to mitigation and adaptation due to ongoing environmental and societal vulnerabilities.	2050 Temperature Outcome: 1.7-3.2°C Scenario Data: IPCC SSP2-4.5/RCP4.5
		2050 Temperature Outcome: 2.4°C Scenario Data: S&P Global, IHS Markit Inflections; Base Scenario - Circular Plastics Service, Chemical Market Analytics by OPIS, A Dow Jones Company
Limited Climate Action	Description: GHG emissions are curbed based on existing policies and commitments. There is continued use of fossil fuels and energy-intensive activities, high challenges to mitigation, and low challenges to adaptation.	2050 Temperature Outcome: ~4°C Scenario Data: IPCC SSP5-8.5/RCP8.5
		Description: Decarbonization efforts vary across the world, but a long-term energy transition is set in motion. There is periodic wavering on climate commitments from government, markets, and society.
		<i>A limited climate action scenario assumes little to no transition risk.</i>

Scenario Analysis Results: Transition Risks

The results of the scenario analysis indicate that NOVA Chemicals is well positioned to manage the evaluated climate-related transition risks. Our 2030 Strategy positions us to address the changing consumer demands and continue to serve traditional customer demand, while our roadmap to reduce CO₂ emissions enables us to lessen our compliance obligations (Table 5).

b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.

c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.

Table 5: Transition Risk Scenario Analysis Results

INCREASED STRINGENCY OF EMISSIONS-RELATED REGULATIONS IN CANADA AND THE U.S.	DECREASED DEMAND FOR ENERGY-INTENSIVE AND/OR FOSSIL FUEL-RELATED PRODUCTS DUE TO A SHIFT IN CONSUMER PREFERENCES TOWARDS LOW-EMISSIONS PRODUCTS
Risk Type: Policy and Legal Context: NOVA Chemicals operates in jurisdictions that regulate or have proposed to regulate GHG emissions. Jurisdictions may increase the stringency of regulations (e.g., Alberta Technology Innovation and Emissions Reduction regulation, Ontario Emissions Performance Standards regulation) for GHG emissions in Canada and the U.S. through mechanisms such as increasing carbon pricing, implementing a cap-and-trade system or carbon border adjustments.	Risk Type: Markets Context: Climate change is a consumer concern and is leading to brand owner commitments to reduce fossil-based plastics. Consumers are consciously choosing brands that have environmentally sustainable practices or values. In addition, the attention to plastics is increasing with rapid development in plastics policies related to plastic waste. This may lead to a shift in consumer preferences towards low-emissions products and reduced demand for fossil-based plastic products.
Impact: Increased capital investment in emission reduction technologies and operating expenditures.	Impact: Decreased revenues and negative brand image.
Time Horizon: Medium- and long-term	Time Horizon: Medium- and long-term
Potential Magnitude of Impact: High	Potential Magnitude of Impact: Low to medium
Risk Mitigation: NOVA Chemicals has envisioned a strategic roadmap to help us achieve our 2030 strategic ambitions including the reduction of Scope 1 and 2 CO ₂ e emissions under operational control by 30% by 2030 from our 2020 baseline. We have established and begun initiatives to decarbonize our assets in order to achieve our ambitions.	Risk Mitigation: Our corporate strategy and planned expansion of our rPE and sustainably-linked product line position us well to support the shift in consumer preferences by driving the transition to a low emission, circular economy of plastics, with 30% of polyethylene sales volume from recycled content by 2030. We have established and begun initiatives to expand our sustainable product line and will continue to monitor and mitigate this risk over time.

Scenario Analysis Results: Physical Risks

Select NOVA Chemicals-owned assets are currently exposed to water stress and windstorms. These hazard exposures are managed through the implementation of mitigation strategies such as Emergency Response Plans and water collection and treatment facilities. The physical risk exposure analysis identified that the current exposure of NOVA Chemicals-owned assets is not projected to increase for water stress or windstorms (Table 6). However, the analysis identified that water stress is projected to increase for select supply chain assets. Further analysis is required to better understand and take appropriate action on the associated potential risks.

Table 6: Physical Risk Scenario Analysis Results

INCREASED INTENSITY AND FREQUENCY OF WINDSTORMS	INCREASED WATER STRESS
Risk Type: Acute	Risk Type: Chronic
Context: The Atlantic hurricane season averages 14 named storms, seven hurricanes, and three major hurricanes. Windstorms could cause wind damage, storm surges, floods, power outages, and petrochemical plant damage with flaring and pollution to the air.	Context: Petrochemical processes rely on the availability of water for cooling and steam production, and water shortages may have financial implications for the company due to operating outages and delays.
Impact: Increased operational disruptions, insurance premiums and capital costs, and frequency or severity of supply chain disruptions.	Impact: Decreased production and productivity; increased frequency of supply chain disruptions.
Time Horizon: Medium- and long-term	Time Horizon: Medium- and long-term
Potential Magnitude of Impact: Low	Potential Magnitude of Impact: Low
Risk Mitigation: NOVA Chemicals continuously monitors government weather alerts and has established Emergency Response Plans to reduce the potential impact of severe weather events including windstorms.	Risk Mitigation: NOVA Chemicals mitigates the risk of water license exceedances by collecting and treating rain or stormwater at its manufacturing sites.

RISK MANAGEMENT

a) Describe the organization’s processes for identifying and assessing climate-related risks.

- [Risk Management](#)
- [Climate-related risks and opportunities](#)

Our ERM program includes a process to identify all significant risks to our organization, including climate-related risks. Our approach includes:

- 1. Risk and opportunity identification:** Our Risk Coach Network includes representatives from all business units. The network meets regularly and is responsible for continually reassessing identified significant risks and opportunities and identifying emerging risks and opportunities. The Executive Committee determines whether risks are included in our enterprise risk register. The ARCC is informed of any new or material changes to risks being managed or any changes in risk assessment.

Risk and opportunity identification of climate-related transition risks: Transition risks and opportunities are identified as a part of the annual ERM risk assessment. As governments adjust regulations and their positions to align with more ambitious global decarbonization goals, we continue to monitor regulatory changes periodically. Identified risks are periodically communicated to the Risk Coach Network, Executive Committee, and the Board, to enable the consideration of identified risks in strategic and financial planning.

Risk identification of climate-related physical risks: Physical risks are identified as a part of the annual ERM risk assessment. We have included physical risks, such as Canadian storm events, U.S. hurricane events, and other operational hazards in our enterprise risk register and continue to monitor changes. We also communicate potential key physical risks to our senior leaders to increase awareness. We furthermore subscribe to a weather service that provides site-specific advance notifications and forecasts for tropical storms and hurricanes for our Geismar, Louisiana, facility.

2. Risk and opportunity evaluation: When evaluating and assessing risks and opportunities, we consider multiple criteria, including the likelihood of occurrence and the severity and nature of a potential impact. For instance, the impact of risks can be social (impacting people), environmental (impacting air, land, water, or biodiversity), financial, or reputational. All risks are assigned an inherent level of risk (risk without mitigation) and a residual level of risk (risk remaining after accounting for current mitigation activities and insurance recoveries). The assessment of our risks is mapped in our risk matrix (formatted as a heat map) and tracked in our risk register.

Climate-related risks that could have a material impact on business operations, financial condition, and company reputation are considered in our strategic and financial planning.

b) Describe the organization's processes for managing climate-related risks.

Our risk management process follows a "three lines of defense" model. Our first line of defense is the "owner" of the risk, or the business unit most likely to be impacted by a risk, who is responsible for mitigating it. Our second line of defense is our Risk Coach Network, which is responsible for continually reassessing identified significant risks and identifying emerging risks. The risk coach network is guided by risk tolerance levels that are defined by the Executive Committee and reviewed by the Board. The third line of defense is our internal audit process, which verifies that risks are being managed.

c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.

Our process for identifying, assessing, and managing climate-related risks is completely integrated with, and not separate from, our ERM program. The Executive Committee is responsible for the integration of risks into our strategy and policies.

METRICS AND TARGETS

a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.

The following metrics allow us to understand and manage our exposure to climate-related physical risks and transition risks:

- Absolute GHG and other pollutant emissions
- GHG intensity
- Scope 1 emissions under carbon-limiting regulations
- Regulatory/permit exceedances
- Energy use
- Waste
- Water withdrawal and discharge

b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 GHG emissions, and the related risks.

- [Performance Tables](#)

The vast majority of our GHG emissions (~99 percent) are CO₂ from combustion, with the remainder composed of methane and nitrous oxide.

c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

- [Introducing our New Corporate Strategy](#)
- [Climate Care](#)
- [Circular Economy](#)

Cautionary Statement Regarding Forward Looking Information

Materials in this report may contain forward-looking statements with respect to NOVA Chemicals Corporation, alone or together with its subsidiaries and affiliates (“NOVA Chemicals”). By its nature, forward-looking information requires NOVA Chemicals to make assumptions and is subject to inherent risks and uncertainties. There is significant risk that predictions, forecasts, conclusions and projections that constitute forward-looking information will not prove to be accurate, that NOVA Chemicals’ assumptions may not be correct and that actual results may vary from the forward looking information. NOVA Chemicals cautions readers of this report not to place undue reliance on its forward looking information as a number of factors could cause actual results, conditions, actions or events to differ materially from the ambitions, targets, expectations, estimates or intentions expressed in the forward-looking information.

Forward-looking information gives NOVA Chemicals’ expectations or forecasts of future events. You can identify these statements by the fact that they do not relate strictly to historical or current facts. You can often identify forward looking statements by words such as “believe,” “expect,” “plan,” “intend,” “estimate,” or “anticipate” and similar expressions, as well as future or conditional verbs such as “will,” “should,” “would,” and “could” in connection with a discussion of future operating or financial performance. In particular, forward-looking information includes statements relating to future actions, ambitions, prospective products or product development, future performance or results of current and anticipated products, sales efforts, expenses, targeted cost savings, business strategies (including the NOVA 2030 strategy), and financial results.

With respect to forward-looking information, NOVA Chemicals makes assumptions regarding, among other things: future oil, natural gas, natural gas liquids and benzene prices; its ability to obtain raw materials; its ability to market products successfully to its anticipated customers; the impact of increasing competition; corporate tax rates; capacity additions; global GDP growth; carbon pricing; ESG regulation and its ability to obtain financing on acceptable terms. Some of NOVA Chemicals’ assumptions are based upon internal estimates and analyses of current market conditions and trends, management plans and strategies, economic conditions and other factors and are necessarily subject to risks and uncertainties inherent in projecting future conditions and results.

Some of the risks that could affect NOVA Chemicals’ future results and could cause results to differ materially from those expressed in NOVA Chemicals’ forward-looking information include: commodity chemicals price levels (which depend, among other things, on supply and demand for these products, capacity utilization and substitution rates between these products and competing products); feedstock availability and prices; operating costs; terms and availability of financing; technology developments; currency exchange rate fluctuations; starting up and operating facilities using new technology; realizing synergy and cost savings targets; NOVA Chemicals’ ability to implement its business strategies; meeting time and budget targets for significant capital investments; avoiding unplanned facility shutdowns; safety, health, and environmental risks associated with the operation of chemical plants and marketing of chemical products, including transportation of these products; public perception of chemicals and chemical end-use products; the impact of competition; changes in customer demand; changes in, or the introduction of new laws and regulations relating to NOVA Chemicals’ business, including environmental, competition and employment laws; loss of the services of any of NOVA Chemicals’ executive officers; uncertainties associated with the North American, South American, European, and Asian economies; terrorists attacks; severe weather events; and other risks detailed from time to time in the publicly filed disclosure documents and securities commission reports of NOVA Chemicals.

NOVA Chemicals’ forward-looking information contained within this report is expressly qualified in its entirety by this cautionary statement and except as required by applicable law, NOVA Chemicals undertakes no obligation to update publicly its forward-looking information to reflect new information, subsequent events or otherwise.

Advisory

The information contained herein is provided for general reference purposes only. By providing the information contained herein, NOVA Chemicals makes no guaranty or warranty and does not assume any liability, with respect to the accuracy or completeness of such information, or product results in any specific instance, and hereby expressly disclaims any implied warranties of merchantability or fitness for a particular purpose or any other warranties or representations whatsoever, expressed or implied. Nothing contained herein shall be construed as a license to use the products of NOVA Chemicals in any manner that would infringe any patent. Nothing herein shall be copied, reproduced, distributed or otherwise used without the express written permission of NOVA Chemicals.

Trademarks

- Advanced SCLAIRTECH™ is a trademark of NOVA Chemicals.
- ALLIANCE TO END PLASTIC WASTE® logo is a registered service mark of Alliance to End Plastic Waste, Inc.
- AMERIPEN® is a registered service mark of American Institute for Packaging and the Environment Corporation.
- ASTUTE™ is a trademark of NOVA Chemicals Corporation in Canada and of NOVA Chemicals (International) S.A. elsewhere; authorized use/utilisation autorisée.
- BONFIRE® is a registered service mark of NOVA Chemicals Corporation.
- CANADA PLASTICS PACT™ and CCP CANADA PLASTICS PACT™ logo are service marks of The Natural Step (Canada) Inc.
- CARNEGIE SCIENCE CENTER® logo is a registered service mark of Carnegie Institute.
- CLOSED LOOP PARTNERS® logo is a registered service mark of Closed Loop Partners, LLC.
- CONNECT The Neuroscience of Quality Conversations® is a registered service mark of NeuroLeadership Institute Inc.
- CTPAT® is a registered service mark of United States Department of Homeland Security.
- ECOVADIS® logo is a registered service mark of ECOVADIS SAS.
- Ellevate Network® is a registered service mark of Ellevate Network LLC.
- EthicsPoint®, NAVEX® and NAVEX GLOBAL® are registered trademarks of NAVEX Global, Inc.
- Global Compact® and UN Global Compact® logo are registered trademarks of United Nations.
- GRI® is a registered trademark of Stichting Global Reporting Initiative.
- ISNETWORLD® is a registered service mark of ISN Software Corporation.
- ISO® is a registered service mark of International Organization for Standardization.
- Let's Talk Science® and Let's Talk Science® logo are registered service marks of Let's Talk Science Inc.
- NIST® is a registered trademark of National Institute of Standards and Technology.
- NOVA Chemicals' logo is a registered trademark of NOVA Brands Ltd.; authorized use/utilisation autorisée.
- Operation Clean Sweep® is a registered service mark of Plastics Industry Association, Inc.
- RC14001® is a registered certification trademark of American Chemistry Council, Inc.
- Responsible Care® and Responsible Care® logo are registered trademarks of the Chemistry Industry Association of Canada.
- RideTight® is a registered service mark of Virginia Sealing Products, Inc.
- RiskRate®, NAVEX® and NAVEX GLOBAL® are registered trademarks of NAVEX Global, Inc.
- SAP® is a registered trademark of SAP SE.
- SCLAIR® and SURPASS® are registered trademarks of NOVA Chemicals Corporation in Canada and of NOVA Chemicals (International) S.A. elsewhere; authorized use/utilisation autorisée.
- SUSTAINABILITY ACCOUNTING STANDARDS BOARD® and SASB® are registered trademarks of the SASB Foundation.
- SYNDIGO™ and SYNDIGO™ logo are trademarks of NOVA Brands Ltd.; authorized use/utilisation autorisée.
- TRANSCAER® is a registered service mark of the American Chemistry Council, Inc.
- UNITED WAY® and UNITED WAY® logo are registered service marks of United Way Worldwide.

RESHAPING PLASTICS

FOR A BETTER, MORE SUSTAINABLE WORLD.



novachem.com
care@novachem.com

