

# ADVANCING A SUSTAINABLE WORLD

SUSTAINABILITY  
REPORT 2018



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## ABOUT THIS REPORT

In this report we describe our approach to sustainability. We share how we are developing products and solutions for a more sustainable future, protecting and investing in our people, managing our environmental footprint, and demonstrating our commitment to being a responsible, good neighbor in the communities where we operate.

Data relates to global operations at our majority owned or operated manufacturing sites, pipelines and large offices for 2018, unless stated otherwise. We report on our sustainability performance on an annual basis. Our 2017 Sustainability Report can be found on our website at [www.lyondellbasell.com/sustainability](http://www.lyondellbasell.com/sustainability).

On August 21, 2018, LyondellBasell completed the acquisition of A. Schulman, Inc., a leading global supplier of high-performance plastic compounds, composites and powders. The A. Schulman assets are part of our newly formed Advanced Polymer Solutions segment which produces and markets compounding and solutions, such as polypropylene compounds, engineered plastics, masterbatches, engineered composites, colors and powders; and advanced polymers, which includes *Catalloy* and polybutene-1 polyolefin resins. The acquisition doubled the size of our existing compounding business.

The newly acquired A. Schulman sites are included in financial and safety data, but are excluded from data related to product safety, environmental performance, and certain data related to philanthropy and our people. Commentary includes Quality Circular Polymers (QCP), our 50/50 joint venture recycling facility.

More information can be found at [www.lyondellbasell.com/sustainability](http://www.lyondellbasell.com/sustainability) or you may contact us by email at [sustainability@lyb.com](mailto:sustainability@lyb.com).

### **Forward-looking information**

*Certain disclosures in this report may be considered forward-looking statements. These are made pursuant to safe harbor provisions of the Private Securities Litigation Reform Act of 1995. You should read the Cautionary Statement contained in our [2018 Annual Report on Form 10-K](#) in conjunction with such statements.*

# A MESSAGE FROM OUR CEO



To our stakeholders:

I am very proud of the progress we have made since launching our first Sustainability Report in 2017. This is our second annual Sustainability Report, and in this report we introduce sustainability goals and highlight achievements within our manufacturing operations and product and technology groups.

The chemicals and plastics we produce are used to manufacture end products that make sustainable development possible, such as wind turbines and solar panels that produce electricity; insulation and roofing materials that reduce energy use in buildings; pipes that prevent water leakage and protect the purity of water supplies; medical supplies that improve the quality of healthcare; packaging that keeps food fresh and safe, reducing waste; and vehicle components that make cars lighter and more fuel efficient.

Additionally, plastic products typically have a lower energy footprint than alternative materials, especially in applications such as packaging. Lighter packaging reduces the energy needed for transportation and decreases associated carbon emissions.

We believe customer demand for both

recycled and conventional plastics will continue to grow, and we are well-positioned to meet this demand in a responsible manner by:

- Contributing to the circular economy through investments in plastic recycling technologies.
- Reducing our greenhouse gas emissions intensity, committing to a 15% reduction in carbon dioxide equivalent emissions per ton of product produced by 2030 compared with 2015 levels. In addition, we are committed to revisit this target as enabling technology evolves in this area.
- Responsibly managing the environmental impact of our operations, committing to zero plastic pellet loss to the environment.
- Collaborating across the plastics value chain through the Alliance to End Plastic Waste to develop, accelerate and deploy solutions to help end plastic waste in the environment.

In 2018, LyondellBasell achieved important sustainability milestones including:

## Improved safety

- Achieved a total recordable injury rate of 0.18 for employees and contractors, the

lowest number of total recordable injuries per hours worked in our company's history and one of the top safety records in our industry.

## Advancing circular and sustainable products

- Built capacity at Quality Circular Polymers (QCP), our mechanical recycling joint venture with SUEZ, a global leader in smart, sustainable resource management.
- Invested in research and development to advance the efficiency and scalability of molecular recycling, a technology that converts plastic waste into molecules that can be used as feedstock in the manufacturing process, producing new plastic from waste instead of fossil fuel.
- Worked to develop bio-based plastics using renewable biomass feedstock.

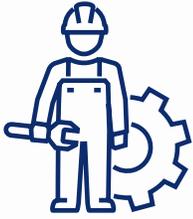
## Energy and carbon reduction

- Implemented energy savings projects at many of our manufacturing sites, reducing energy use by 3.5 million gigajoules.
- Through our joint venture with Covestro, we invested in a circular steam project at the Maasvlakte site in the Netherlands that will result in an overall annual reduction of approximately 140,000 metric tons CO<sub>2</sub> emissions and 0.9 petajoule of energy.

We are at the beginning stage of our sustainability journey and we are eager to learn. We will continue to take effective, measurable action and report on our progress as we work to make a positive contribution toward a more sustainable world.

Bhavesh V. (Bob) Patel  
Chief Executive Officer

# SUSTAINABILITY HIGHLIGHTS



Achieved our **best safety performance** with a total recordable injury rate of **0.18**



Achieved a **40%** process safety **incident rate improvement** compared with 2017



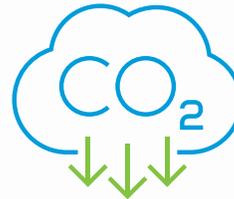
Built capacity at our **Quality Circular Polymers** recycling plant and added **33 new circular grades** to LyondellBasell's product portfolio



Invested in ground-breaking **molecular recycling** research and technology



Led the formation of the **Alliance to End Plastic Waste**



Announced a **Circular Steam Project** to reduce carbon dioxide (**CO<sub>2</sub>**) and waste at our Maasvlakte site in the Netherlands



**Reduced emissions to air** of nitrogen oxides (NOx), sulfur oxides (SOx), volatile organic compounds (VOCs), carbon monoxide (CO) and particulate matter (PM) compared with 2017



Donated more than **17,680** volunteer hours to the community as a part of Global Care Day 2018



Maintained **EcoVadis Silver** rating, placing us in the **top 30%** of companies assessed



Named to Fortune magazine's list of the **"World's Most Admired Companies"**



Morris, Illinois

# ABOUT OUR BUSINESS

LyondellBasell (NYSE: LYB) is one of the largest plastics, chemicals and refining companies in the world.

Driven by its employees around the globe, LyondellBasell produces materials and products that are key to advancing solutions to modern challenges like enhancing food preservation and safety through lightweight and flexible packaging, protecting the purity of water supplies through stronger and more versatile pipes, improving the safety, comfort and fuel efficiency of many of the cars and trucks on the road, and ensuring safe and effective functionality in electronics and appliances. LyondellBasell sells products into more than 100 countries and is the world's largest producer of polypropylene compounds and the largest licensor of polyolefin technologies.

## OUR KEY PRODUCT AREAS



### CHEMICALS

We produce the chemical building blocks for:

- automotive fluids
- furniture / household goods
- coatings / adhesive / cleaners
- cosmetics / personal care products

### POLYMERS

Our versatile plastic resins are used to create a variety of products including:

- automotive parts
- packaging
- piping
- textiles
- renewable energy technologies
- agricultural films / irrigation
- healthcare
- food supply products

### ADVANCED POLYMERS

Our diverse portfolio is used to create customizable products including:

- automotive parts
- differentiated packaging
- electronics / appliances
- construction materials
- roofing
- flooring
- geomembranes
- specialty pipe

### FUELS

Our refinery in the U.S. produces:

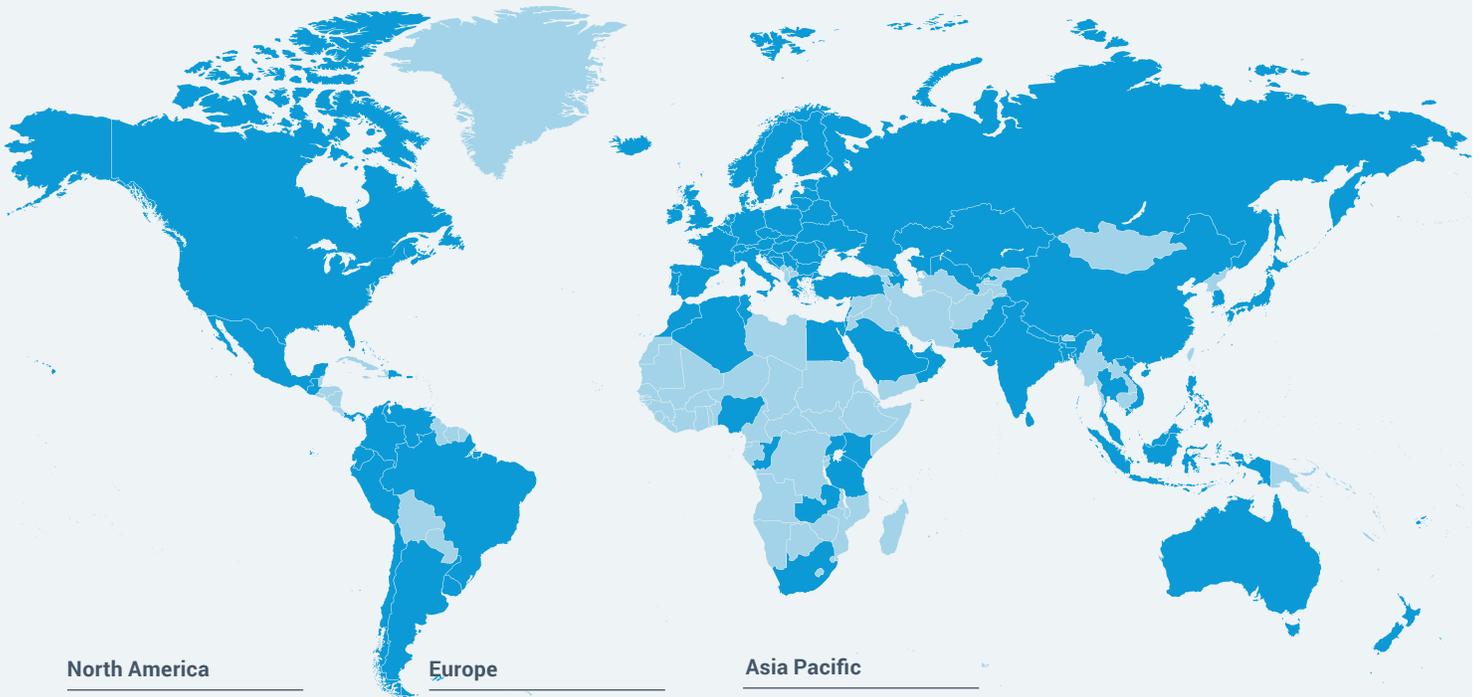
- gasoline / fuel components
- low-sulfur diesel
- jet fuel
- lubricants
- oxyfuels that help improve air quality

### TECHNOLOGIES

We license our state-of-the-art manufacturing and process technologies:

- technologies that are used by chemical and plastics companies around the globe

# GLOBAL PRESENCE



## North America

- USA
  - Illinois ■
  - Iowa ■
  - Louisiana ■
  - Michigan ●
  - New Jersey ■
  - Ohio ●
  - Tennessee ■
  - Texas ■ ● ▲
  - Houston* ★
- Mexico ■ ▲

## South America

- Brazil ■

## Europe

- France ■
- Germany ■ ●
- Italy ■ ●
- The Netherlands ■ ▲
- Rotterdam* ★
- Poland ▲
- Spain ■
- UK ■
- London* ★

## Asia Pacific

- Australia ■ ▲
- China ■ ▲
- Hong Kong* ★
- India ■ ●
- Malaysia ▲
- South Korea ▲
- Thailand ■ ▲

## Middle East

- Saudi Arabia ▲

### Legend

- ★ Administrative Offices/Headquarters
- Manufacturing
- Technology Centers
- ▲ Joint Ventures
- Countries where our products are sold (shaded dark blue)



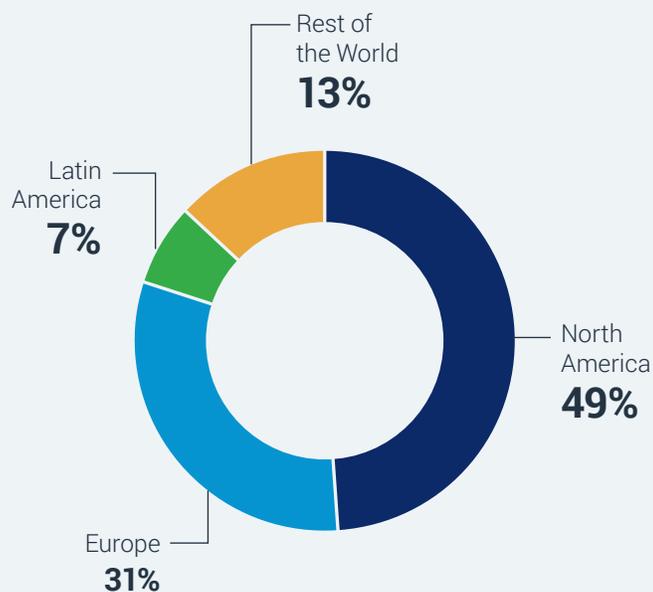
Cincinnati Technology Center, Ohio

## 2018 FINANCIAL HIGHLIGHTS

### HIGHLIGHTS OF CONSOLIDATED FINANCIAL STATEMENTS (\$ IN MILLIONS)<sup>1</sup>

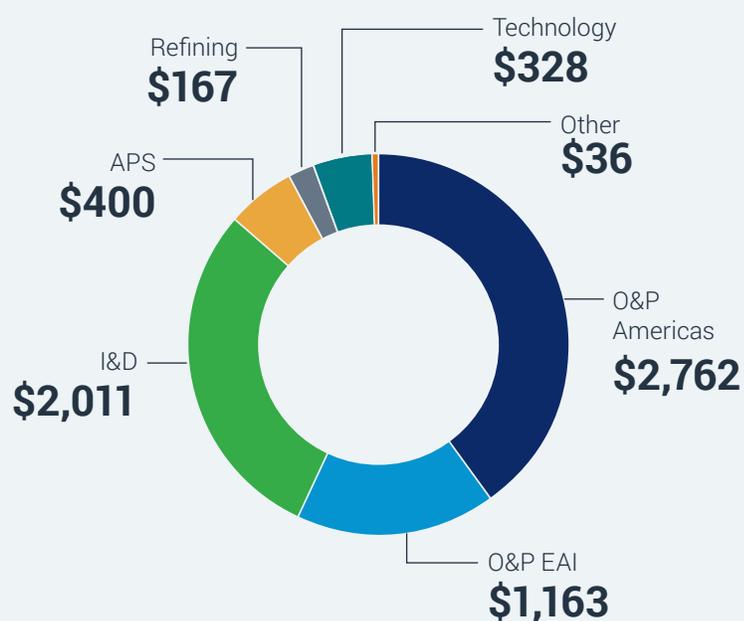
	2016	2017	2018
Sales and other operating revenues	\$29,183	\$34,484	\$39,004
Operating income	\$5,060	\$5,460	\$5,231
Income from equity investments	\$367	\$321	\$289
Net income	\$3,837	\$4,877	\$4,690
Diluted weighted average share count (millions)	420	399	389
Diluted EPS (\$/share)	\$9.13	\$12.23	\$12.01
EBITDA	\$6,602	\$7,134	\$6,867
Cash flow from operations	\$5,606	\$5,206	\$5,471
Capital expenditures	\$2,243	\$1,547	\$2,105

#### SALES BY REGION



#### EBITDA BY SEGMENT

(\$ in millions)



<sup>1</sup> Reconciliations for our non-GAAP measures can be found beginning on page 161 of the [2018 Annual Report](#). Financial data includes A. Schulman from the date of acquisition. Remuneration policies and annual compensation of senior executives can be found in our [2018 Proxy Statement](#).



## OUR APPROACH TO SUSTAINABILITY

For LyondellBasell, sustainability means advancing solutions to address global challenges while meeting our stakeholders' needs and the highest operational standards. Our commitment to society and the environment is embedded in our [company vision](#) to be the best operated and most valued company in our industry, today and tomorrow.

We have a relentless focus on the safety of our people, products, operations and the environment. We strive for zero incidents and seek ways to improve energy efficiency and reduce resource use. We maintain comprehensive programs designed to protect the health and safety of our people, prevent process

safety incidents and carefully steward our products. We believe plastic waste should not enter our rivers and oceans, and we are investing in technologies and collaborating with industry partners to find solutions.

Our business is dependent on the trust of the communities in which we operate. We are committed to being a responsible, good neighbor and contribute to philanthropic causes across the globe.

We believe that through collaboration with our employees, customers, suppliers, community stakeholders, investors and shareholders we can make a positive contribution toward a more sustainable world.

# OUR SUSTAINABILITY OBJECTIVES

In 2018, we advanced our sustainability efforts in three key focus areas: sustainable and circular products, plastic waste in the environment and climate change. Our company sustainability objectives are outlined below and specific goals are discussed in the relevant chapters of the report.



## SUSTAINABLE AND CIRCULAR PRODUCTS

**Advance both our mechanical and molecular recycling technologies, integrating recycled and circular products into our mainstream business portfolios.**

Achieving sustainable consumption and production patterns requires a focus on circularity. Plastic plays a significant role in the transition to a sustainable and resource-efficient future. We are contributing to a more circular economy through investments in recycling technologies, innovation and collaboration in product design, and the integrated use of waste streams.



## PLASTIC WASTE IN THE ENVIRONMENT

**Zero plastic pellet loss to the environment from our facilities.**

Plastic waste has no place in the environment and this includes the loss of pellets from manufacturing, storage and transportation facilities. We continuously improve our handling of plastic pellets and work with our transportation partners to achieve our goal.

**Develop and deploy meaningful solutions through our leadership role in the Alliance to End Plastic Waste (AEPW).**

Through our work with AEPW, we are creating effective waste infrastructure in developing countries, investing in innovation to advance and scale new technologies that minimize waste and increase recycling and recovery, educating stakeholders to mobilize action, and cleaning concentrated areas of plastic waste already in the environment.



## CLIMATE CHANGE

**Achieve a 15% reduction in carbon dioxide equivalent (CO<sub>2</sub>e) emissions per ton of product produced by 2030 compared with 2015 levels. In addition, we are committed to revisit this target as enabling technology evolves in this area.**

We recognize the global impact of climate change as a critical challenge both now and for future generations. Our global carbon management strategy targets emission reductions in our production processes and supply chain. At our manufacturing sites, we are investing in projects to improve reliability and reduce energy consumption, installing clean-burning boilers and furnaces, recovering and reusing waste heat to produce electricity, and introducing lower carbon feedstocks made from renewable biomass and post-consumer waste. In our supply chain, we are exploring low-carbon transportation solutions.

*"Through its safe, ethical and transparent business operations, LyondellBasell applies sustainable principles across its business to achieve industry-leading performance. The Board of Directors support the company's continued investments in circular solutions and its positive role in addressing the issues of climate change and plastic waste in our environment. We believe the company is well-positioned to deliver value to stakeholders while protecting the interests of future generations."*

### Jagjeet S. Bindra

LyondellBasell Board of Directors and Chairman of the Board Health, Safety, Environmental & Operations Committee



**RESPONSIBLE CARE®**  
OUR COMMITMENT TO SUSTAINABILITY

## RESPONSIBLE CARE®

We are a member of the voluntary chemical sector initiative, Responsible Care®, which aims to improve the environmental, health, safety and security performance of our industry.

We implement the principles of Responsible Care® across our operations every day through our commitment to GoalZERO.

## SAFETY

GoalZERO is our commitment to operating safely and with zero incidents, zero injuries and zero accidents. This core company value is the guiding principle for our Health, Safety, and Environment (HSE) function.

We cultivate a GoalZERO mindset with clear standards, regular communication, training, and targeted campaigns and events, including our annual Global Safety Day.

Health, safety and environment indicators are monitored continuously using a performance dashboard. Every manufacturing site sets goals to improve process safety and the safety of our people, and reduce environmental incidents.

## OPERATIONAL EXCELLENCE

Operational Excellence is the framework we use to deliver our GoalZERO objectives. It is our management system designed to deliver safety, environmental responsibility and reliability in everything we do. It sets out clear requirements for how we work and applies to our employees and contractors.

The [Operational Excellence management system](#) contains nine key elements that help identify and manage risks, and ensure our employees and contractors understand their roles and responsibilities. It is further supported by detailed standards and preferred practices that support our GoalZERO objectives.

We conduct internal audits at our manufacturing sites to verify compliance with Operational Excellence standards and perform periodic reviews to drive continuous improvement.



Altamira, Mexico



## THROUGH GOALZERO WE AIM FOR:

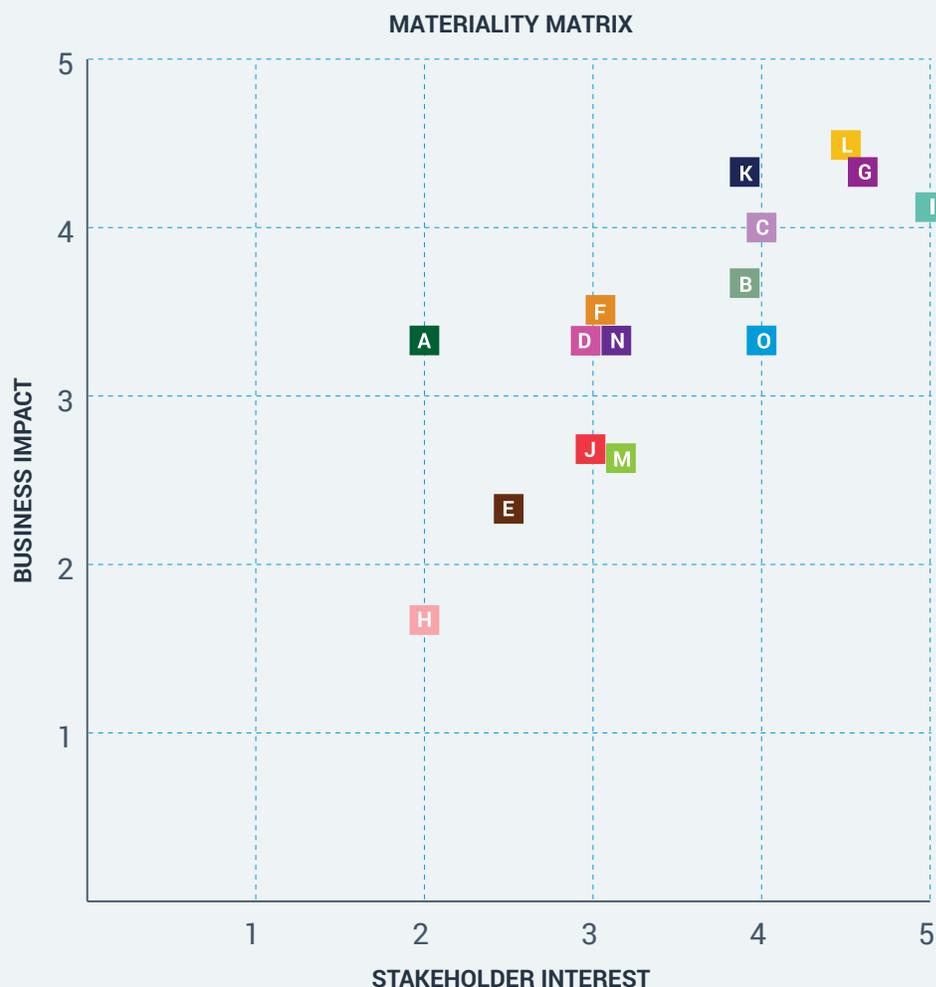
- Zero injuries
- Zero process safety incidents
- Zero product safety incidents
- Zero environmental incidents
- Zero plastic pellet loss to the environment

## OUR SUSTAINABILITY PRIORITIES

Our materiality assessment identifies the sustainability issues most relevant to our stakeholders and business. We conduct a materiality assessment every two years and the result of our 2018 assessment is shown in the matrix.

In this assessment, we evaluated input from leaders across the company and considered our impacts on the economy, society and the environment. We identified 15 issues that are the most important to our stakeholders and business. As a result, we stepped up activities around sustainable and circular products, plastic waste in the environment and climate change, while keeping our focus on health and safety and continuing to create value for stakeholders.

We will engage additional internal and external stakeholders to test the results of our materiality assessment and further support development of our sustainability strategy and approach.



*These are the top 15 issues most relevant to our stakeholders and business.*

## MATERIALITY ISSUE DEFINITIONS

**A Biodiversity and Land:** Working to protect plant and animal species, genetic diversity and natural ecosystems that provide clean water and air and contribute to food security, human health and local livelihoods. Working to protect land from contamination and remediating historical contamination.

**B Clean Air:** Working to reduce emissions of air pollutants from our operations.

**C Climate Change:** Working to reduce greenhouse gas emissions and contributing to the mitigation of and adaptation to the negative effects of climate change. Working to use energy more efficiently and investing in renewable energy sources that lower the overall environmental footprint.

**D Community Development:** Taking action to minimize and mitigate adverse community impacts and identifying opportunities to enhance positive impacts on the community, including local job creation, societal participation and philanthropic activities.

**E Effluents and Waste:** Working to reduce the generation of industrial effluents and wastes for disposal, and reducing spills of chemicals, oils, fuels and other substances.

**F Employee Engagement:** Building an engaged, talented workforce by developing skill sets, supporting diversity and ensuring fair employment and work practices.

**G Health and Safety:** Ensuring the health and safety of our workers and safety of our operations.

**H Human Rights:** Respecting and promoting human rights throughout our operations and supply chain. Acting in the spirit of internationally recognized social and ethical standards.

**I Plastic Waste in the Environment:** Working to prevent the release or escape of plastic waste to the environment.

**J Product Responsibility:** Working to ensure the safety and quality of LyondellBasell products (from manufacture and use, to end of life) through risk management and promoting responsible product use.

**K Socioeconomic Value Creation:** Creating economic value for LyondellBasell stakeholders including shareholders, employees, customers, suppliers, communities and society.

**L Sustainable and Circular Products:** Delivering products that support sustainability and the circular economy by keeping resources at their highest utility level for as long as possible, extracting the maximum value from them while in use, then recovering and regenerating products and materials at the end of life.

**M Sustainable Procurement:** Working to ensure our purchased goods are manufactured by suppliers that uphold our social, environmental and ethical standards.

**N Transparent and Responsible Business Practices:** Demonstrating integrity and adherence to responsible business practices expected by the marketplace, stakeholders and international standards.

**O Water Use:** Working to reduce withdrawal and consumption of water.

## SUSTAINABILITY AND HSE GOVERNANCE

Responsibility for sustainability ultimately lies with our CEO and the senior leadership team with oversight by the LyondellBasell Board of Directors. The Health, Safety, Environmental and Operations (HSE&O) Committee of the Board reviews health, safety and environmental policies and performance, our sustainable development initiatives and Operational Excellence results. The Committee receives updates on the progress of our sustainability activities at least biannually and reviews the Sustainability Report.

Our sustainability program is led by the senior vice president of Research & Development, Technology and Sustainability, who reports directly to the CEO. The program is executed by the global sustainability director who is responsible for the global sustainability team. This team works with the business to advance sustainability initiatives and is responsible for monitoring and reporting our performance. The senior leadership team's sustainability committee, comprised of senior executives, oversees our sustainability program and provides strategic direction.

The vice president of Health, Safety and Environment (HSE) leads the global HSE function and reports directly to the CEO. The HSE function provides expertise and

leadership for our GoalZERO program and site level HSE managers are responsible for putting GoalZERO into practice every day.

The GoalZERO steering team, made up of senior manufacturing leaders, is responsible for setting operational GoalZERO objectives each year.

## ETHICS AND COMPLIANCE

LyondellBasell upholds high ethical standards and is committed to complying with applicable laws and regulations. Our global compliance team monitors compliance and works with the business to drive our strong performance in this area. This team is overseen by the chief compliance officer. The Audit Committee of the Board has ultimate oversight of compliance issues.

Our [Code of Conduct](#) sets out our expectations on topics such as respecting fellow employees, anti-corruption, conflicts of interest, trade compliance, anti-trust and competition law, insider trading, sanctions, misconduct and political donations. It is available in 18 languages on our company website. New employees are trained on the Code and all employees complete annual refresher training.

We also have compliance policies to guide employees in specific areas such as due diligence for mergers and acquisitions, and conflict minerals.



Shanghai, China

More detailed requirements for the CEO, CFO and controller are set out in our [Financial Code of Ethics](#).

We encourage employees to speak up if they have any concerns. Anyone can raise a concern without fear of retaliation through their manager, supervisor, or the human resources, legal or compliance teams. We also offer an independent whistleblower telephone helpline and website available 24-hours a day and in multiple languages. It is operated by [EthicsPoint](#), a company providing third party reporting for many global companies.

## MANAGING RISK

Our enterprise risk management approach enables us to identify and manage business threats and opportunities, and supports the creation and protection of long-term value. The Board has oversight of the risk management process supported by the Audit Committee. The senior leadership team reviews enterprise-level risks each quarter to monitor progress and stay ahead of changes in our business environment.

Risks are also regularly reviewed by business segments and our manufacturing functions, with more complex risk analysis undertaken for major projects. Additionally, the enterprise risk management and financial risk management teams analyze risks when appraising capital investment projects. Sustainability-related risks are integrated into this enterprise risk management approach.

Identified risks are assigned to a senior leadership team member or business director who is responsible for putting risk management plans in place.

## TRANSPARENT POLITICAL CONTRIBUTIONS

We are committed to high standards of transparency in our advocacy, public policy work and political contributions. We report U.S. federal, state and local lobbying activities and political expenditures as

required by law. Every year we disclose direct and indirect corporate political contributions in our [U.S. Political Activity Report](#).

## PROTECTING HUMAN RIGHTS

We recognize we have a responsibility to respect and protect human rights. Our Code of Conduct describes our commitment to upholding human rights in all operations and at all facilities.

Through GoalZERO, we have a comprehensive program to protect the health and safety of our employees and contractors. We uphold all fair wage and hours laws wherever we work. We never use child, forced, bonded or involuntary labor and we do not knowingly work with subcontractors or suppliers that do. We do not typically have direct relationships with suppliers in countries where human trafficking originates, nor where child slavery is prevalent, such as those identified in the United Nations' 2014 Global Report on Trafficking in Persons and the International Labor Organization's 2015 World Report on Child Labor.

We published our first [Modern Slavery and Human Trafficking Statement](#) in 2017, following the introduction of the U.K. Modern Slavery Act 2015. We also comply with the [California Transparency in Supply Chains Act](#) of 2010 in the U.S.

Minerals including tin, tantalum, tungsten and gold, known as conflict minerals, can be associated with human rights risk if they are sourced from war-torn countries such as the Democratic Republic of Congo. We comply with conflict minerals laws and regulations and our [Conflict Minerals Policy](#) outlines our approach to sourcing responsibly. We outline the risks and report due diligence actions taken to manage risks with our suppliers in our annual [Conflict Minerals Report](#). The 2018 Conflict Minerals Report report includes information pertaining to the newly acquired A. Schulman sites.

## STAKEHOLDER ENGAGEMENT

We recognize our success depends on building relationships with our stakeholders. We engage with internal and external stakeholders through formal and informal channels and we have long-standing memberships in industry associations. The table below provides an overview of how we engage with key stakeholders.

STAKEHOLDER GROUP	HOW WE ENGAGE
<b>Customers</b>	We regularly speak with customers to improve our products and respond to their needs. Customer surveys help us identify ways to improve our products and customer service. Our sales representatives and technical experts work closely with customers to address concerns and provide product stewardship guidance. Customers regularly visit our manufacturing sites to review our operations and observe our compliance with international standards such as ISO and International Automotive Task Force (IATF), and applicable laws and regulations.
<b>Employees</b>	Employees are in regular dialogue with managers, and we gather employee feedback through a company-wide employee survey every two years. Employee-wide communications include a monthly e-newsletter and video news updates, quarterly newsletters at the major manufacturing sites and social media updates. Senior leaders communicate with employees through various online and face-to-face channels, including town hall events and regular site visits. Employees can anonymously report concerns at any time through EthicsPoint, our third-party ethics helpline.
<b>Investors and shareholders</b>	We communicate relevant information to shareholders and prospective investors on our website and we hold a formal investor engagement day every two years. We regularly participate in key investor conferences and make these presentations available to all stakeholders on the company website.
<b>Local communities</b>	We meet with community members where we operate to share information about the company and listen to concerns. We do this at many of our manufacturing sites through community advisory groups. We also hold site tours for community leaders, educational institutions and the public. Through our philanthropic program and annual Global Care Day, the company and our employee volunteers have a positive impact on hundreds of communities across the world.
<b>Industry associations</b>	We collaborate with industry and value chain partners to advance sustainable solutions. We belong to approximately 150 industry associations worldwide, most of which are in the U.S. and Europe. Senior executives and more than 230 employees participate in industry association boards, committees and working groups.
<b>Government and regulators</b>	We communicate with government, legislative and regulatory officials through issue-specific meetings, industry events and visits to our sites. We respond to public consultations to provide input and share expertise on future legislation.
<b>Suppliers</b>	We regularly engage with our suppliers to achieve our GoalZERO ambitions, with a particular focus on people, product and process safety. For example, we support contractors with comprehensive safety training at sites and hold annual contractor HSE forums where our CEO participates.

## SENIOR EXECUTIVE ENGAGEMENT IN SUSTAINABILITY THROUGH INDUSTRY ASSOCIATIONS

- Bob Patel** – Chairman of American Chemistry Council Board and member of the Board Global Strategy Committee and Board Sustainability Committee; Vice Chairman of the Alliance to End Plastic Waste.
- Jim Seward** – Chairman of the World Plastics Council.
- Richard Roudeix** – Board and Executive Committee of Cefic, and Chairman of its Climate Change and Energy Programme Council; Steering Board of PlasticsEurope; Board of European Petrochemical Association.
- Paul Augustowski** – Board of Directors for the Plastics Industry Association; Chairman of the American Chemistry Council’s Plastics Division Operating Committee.



## ADVANCING SUSTAINABLE AND CIRCULAR PRODUCTS

LyondellBasell products, materials and technologies are found in nearly every sector of the economy and help address modern challenges, including access to clean water, food safety and distribution, and quality healthcare. We believe chemicals and plastics provide innovative solutions that improve quality of life and contribute to a more sustainable world.

### CIRCULAR ECONOMY INITIATIVES

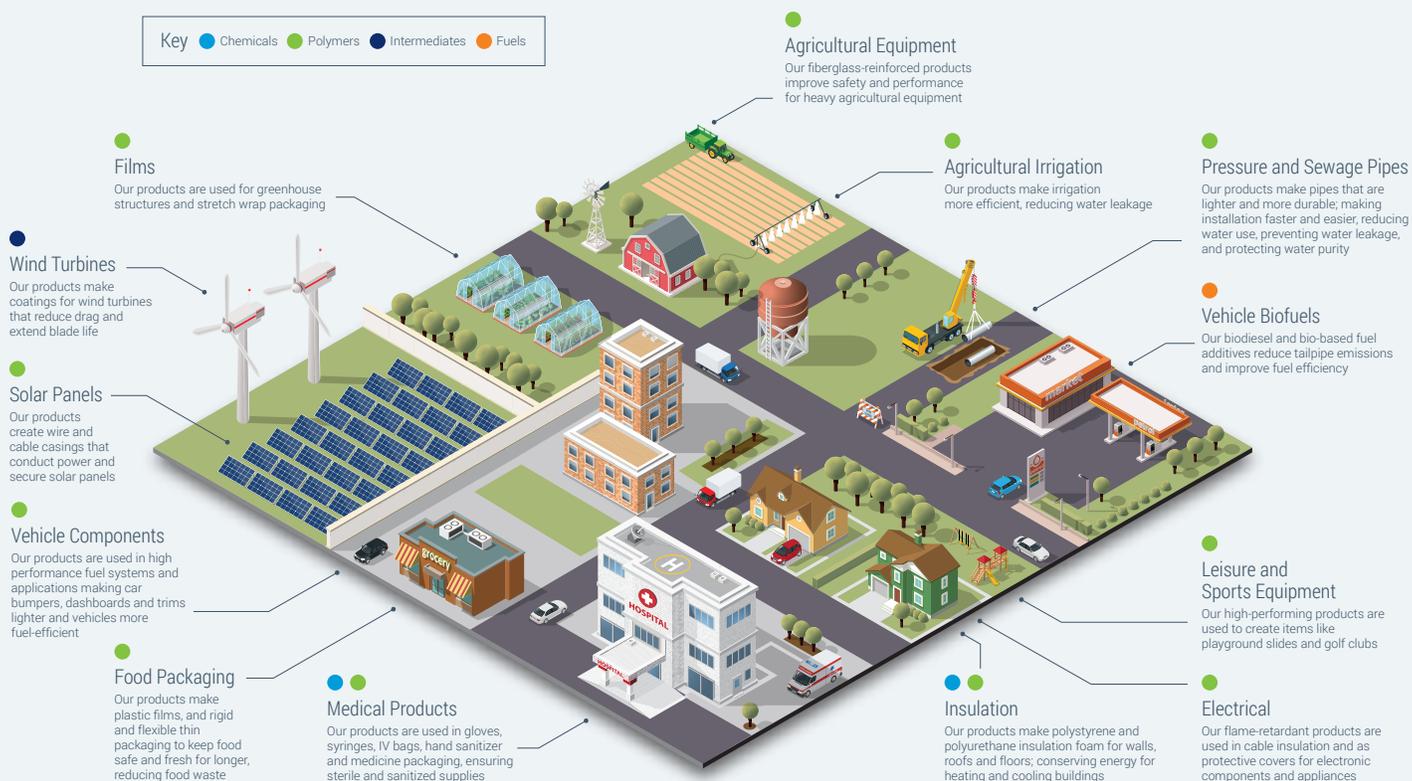
In a circular economy, resources remain in use for as long as possible to maximize their value. Repeatedly reusing and recycling materials through the value chain can reduce energy and resource consumption, contributing to a low-carbon economy.

Our circular economy initiatives include:

- Collaborating with customers and the value chain to enhance the recyclability of products and materials through improved design, material composition and product properties.
- Investing in the mechanical recycling of plastics to convert post-consumer waste into high quality recycled plastic resins for high-end applications.
- Researching molecular recycling technology to turn hard-to-recycle plastics into new feedstocks.
- Developing new products and applications that enable reduced resource use, such as polypropylene compounds used to light-weight automotive parts and our new *Hyperzone* PE technology for use in applications such as industrial drums and intermediate bulk containers.
- Exploring the potential to manufacture certain polymer and chemical products from renewable biomass, substituting fossil-based resources with bio-based feedstocks.
- Improving the efficiency of our manufacturing processes by improving yields, eliminating wastes and reducing energy and water consumption.

# OUR PRODUCTS ADVANCE SUSTAINABLE SOLUTIONS

Many of the chemicals and plastics we supply help create innovative products that meet the needs of modern society and contribute to sustainable development. Our products are found in nearly every sector of the economy.



## PROCESS INNOVATION TO REDUCE MATERIAL USE WITH *HYPERZONE*

In 2018, construction continued on our new *Hyperzone* polyethylene (PE) plant in La Porte, Texas. The plant is a first-of-its-kind facility employing our new, proprietary technology. Our pilot plant demonstrated that in certain applications, the *Hyperzone* PE technology will enable customers to manufacture lighter weight products without compromising strength, ultimately reducing the amount of raw material required. The technology was developed by LyondellBasell's global research and development teams in Ferrara, Italy; Frankfurt, Germany; Cincinnati, Ohio; and Houston, Texas. We expect startup of this unit in 2019.



## OUR APPROACH TO PUBLIC POLICY

We support public policy that seeks to eliminate plastic waste in the environment, reduce marine litter and create markets for recycled plastic while balancing the environmental and social benefits plastics bring. We collaborate with our industry partners, trade associations and other stakeholders to support the development of appropriate public policy.

There are significant challenges to improve reuse and recycling rates and effective policy should support solutions to these challenges. These include:

- Improving sorting technology and infrastructure for waste collection.
- Better data and understanding of post-consumer plastic waste flows.
- Enhancing circular design principles and developing new end-of-life options, such as molecular recycling, for certain types of plastic waste that are hard to recycle.
- Supporting consumer behavior-change to promote recycling.
- Preventing plastic littering and achieving zero plastic waste to landfill.

## THE ROLE OF PLASTICS IN A LOW-CARBON, CIRCULAR ECONOMY

Plastics are used in a wide range of consumer and industrial applications across almost every sector of the economy. Plastic products typically have a lower energy footprint than alternative materials, especially in applications such as packaging. Lighter packaging reduces the energy needed for transportation and decreases associated carbon emissions.

A study by Trucost demonstrates the environmental cost of using plastic in the consumer goods sector is 3.8 times less than alternative materials needed to replace plastic (such as glass, tin, aluminum and paper).<sup>1</sup> Substituting plastic in consumer products and packaging with alternatives that perform the same function would increase environmental costs associated with production, transport, material and energy recovery, and end of life management.

A circular economy for plastics could significantly reduce environmental costs by increasing recycling of post-consumer plastics, minimizing landfilling and capturing the value of recovered materials. Recycling plastics lowers the carbon footprint across the life cycle further still. Trucost estimates that the environmental cost of plastics could be reduced by over \$7.9 billion in net terms if circular economy models were adopted across Europe and North America.

Plastics play a critical role not only in meeting the needs of modern society, but also in the transition to a circular economy. We believe demand for both recycled and conventional plastics will continue to grow and LyondellBasell is positioned to deliver quality products and advance sustainable solutions to our customers in a responsible way.

### PLASTIC PACKAGING COMMITMENTS

Increasing the collection of plastic waste and overall reuse and recycling rates is an important step in developing a circular plastics economy. We support the voluntary commitments of PlasticsEurope and the American Chemistry Council to achieve high rates of plastic re-use and recycling.

#### PlasticsEurope

60% reuse and recycling of plastic packaging by 2030



100% reuse, recycling or recovery of plastic packaging by 2040



#### American Chemistry Council

100% reuse, recycling or recovery of plastic packaging by 2040



<sup>1</sup> Trucost and the American Chemistry Council, *Plastics and Sustainability: A valuation of environmental benefits, costs and opportunities for continuous improvement*, 2016.



## MECHANICAL RECYCLING

In 2017, we partnered with SUEZ, a global leader in smart, sustainable resource management, to acquire Quality Circular Polymers (QCP), a premium plastics recycling company located in Sittard-Geleen, the Netherlands.

QCP uses mechanical recycling technology to transform post-consumer plastic waste into high-quality polymers that can be used to make new products. The joint business leverages the two partners' strengths. SUEZ provides leading-edge technology solutions to improve the identification, separation and preparation of waste materials used as feedstock. LyondellBasell applies its long-

standing leadership in innovative plastic production technology, vast experience in product and application development and knowledge of important end markets, such as consumer goods.

Throughout 2018, we continued to build capacity at the QCP plant and by Q2 2019, we added 33 new circular grades to LyondellBasell's product portfolio. We also responded to customer demand to develop new colors of recycled high-density polyethylene (HDPE) and we helped bring to market consumer products with recycled content in a number of sectors.

*"Technology has always been at the heart of our organization, and we see innovation as the key in creating opportunity and providing solutions to the most important sustainability challenges of today. We are deeply engaged with our customers, brand owners and the wider stakeholder community as we collectively seek ways to increase circularity and reduce plastic waste."*

### Jim Seward

Senior Vice President, Research & Development, Technology & Sustainability

## OUR GOALS

Increase the recycling capacity of the existing QCP plant to 50,000 tons by 2021

Expand the number of end-use applications

Seek opportunities to grow mechanical recycling in other parts of the world

Develop a new polyolefin product range containing recycled content



*QCP – Sittard-Geleen, the Netherlands.*

UNILEVER

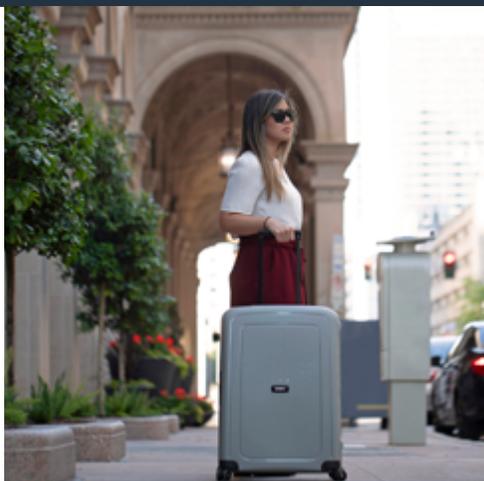


Unilever used QCP materials in its new packaging for Dove and Axe products in the European market.

**“We are transforming our approach to plastic packaging with a simple strategy called ‘no, less, better plastic.’ By using QCP’s recycled plastic in our packaging, we adhere to our ‘better plastic’ ambition of achieving 100% fully reusable, recyclable or compostable plastic packaging by 2025. When we do use plastic, we make sure it stands the best possible chance of being recycled and use as much of that recycled material again and again to create a fully circular model.”**

**Hanneke Faber,**  
President, Foods & Refreshment and member of the Executive Board, Unilever

SAMSONITE



Samsonite’s S’Cure ECO suitcase is made from post-consumer recycled plastic. The QCP polypropylene grade used for the suitcase shell delivers high impact resistance, even at low temperatures, meeting the demands of high quality luggage.

**“New sustainable materials play a key role in reducing our environmental footprint across our operations, allowing us to combine our thirst for innovation with our commitment to sustainability. We want to maximize the use of recycled and recyclable materials in our products in order to pass on a better world for generations to come.”**

**Christine Riley Miller,**  
Global Director of Sustainability, Samsonite

MAUSER PACKAGING SOLUTIONS



Mauser’s medical waste container made from 100% recycled plastic meets strict regulatory standards to handle healthcare waste in hospitals.

**“We collaborated with Quality Circular Polymers to develop this innovative high-quality post-industrial resin that we can use to manufacture a range of industrial packaging with a significantly lower carbon footprint.”**

**Axel Schaefer,**  
Head of Product Management, Mauser Packaging Solutions

## RECYCLED PLASTIC BOTTLES USED TO MAKE ADVANCED POLYMER COMPOUNDS

We are exploring the use of recycled plastics in every area of our business. This includes our compounding division, Advanced Polymer Solutions.

**Schuladur® PCR** is a thermoplastic polyester compound we offer customers in the automotive industry. It is extremely strong because the polymer matrix is reinforced with glass fiber. The product also has up to 50% recycled polyethylene terephthalate (PET) content from post-consumer plastic bottles. The recycle-based compound is of equivalent quality to conventional material and is used in automobile ignition systems and exterior parts.





## OUR GOALS

Carry out a successful PP/PE commercial campaign using waste oils derived from biomass in 2019

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## BIO-BASED FEEDSTOCKS AND BIOFUELS

In 2018, we began developing bio-based feedstocks as an alternative to feedstocks from non-renewable, fossil-derived resources. In June 2019, LyondellBasell introduced *Circulen* grades of bio-based polypropylene and low-density polyethylene made from renewable biomass.

*Circulen* products are sold using mass balance-based certificates, while *Circulen* Plus offers measurable bio-content which can be determined by carbon-14 analysis and stated as a parameter on the Certificate of Analysis.

We also produce biofuels for gasoline. Our ethyl-tert-butyl-ether (ETBE) is a

clean burning gasoline component that improves fuel efficiency and reduces tailpipe emissions. ETBE is partly made from renewable feedstocks, which means it has a lower greenhouse gas impact across its life cycle, from raw material production to use, compared with fossil-based gasoline. In 2018, use of LyondellBasell's ETBE gasoline in Japan and Europe reduced global CO<sub>2</sub> emissions by more than 1.6 million metric tons based on its renewable content. Additional reductions were likely achieved from higher fuel efficiency and energy savings at refineries and in the supply chain. LyondellBasell is certified by the International Sustainability and Carbon Certification (ISCC) as a producer of sustainable biofuel ETBE.



## OUR GOALS

By 2021, develop optimum process conditions to make the *MoReTec* technology scalable to a semi-industrial proof-of-concept plant

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## MOLECULAR RECYCLING TECHNOLOGY

Not all plastic waste is readily suited to mechanical recycling. Waste products with complex layers of multiple plastics or those blended or contaminated with other materials can be difficult and costly to recycle. Furthermore, mechanically recycled plastics may not be suitable for some applications in the food and medical sectors.

We are applying our vast knowledge of catalysts to explore molecular recycling technology (also called chemical recycling) as a complementary technique to traditional mechanical recycling. Molecular recycling is an emerging technology that converts plastic waste into molecules that can be used as feedstock in the manufacturing process, producing new plastic from plastic waste instead of fossil fuel.

In the molecular recycling process, plastic waste is treated and broken down into its basic chemical building blocks. The resulting chemicals can be used to make new polymer

resins for use in all applications, including food packaging and medical supplies.

In 2018, we announced a partnership with the Karlsruhe Institute of Technology (KIT) in Germany to develop a highly improved molecular recycling process. The project builds on KIT's world-leading research infrastructure and LyondellBasell's expertise in developing, manufacturing and selling advanced catalyst systems. Together we are researching the use of pyrolysis as a potential technology to process and chemically recycle plastic waste.

Over the past two years, LyondellBasell screened hundreds of potential catalyst systems using model polymers at our R&D sites. Our catalyst-based technology solution, *MoReTec*, improves the depolymerization process making the molecular recycling of plastic waste at a commercial scale possible.



## WORKING TO END PLASTIC WASTE IN THE ENVIRONMENT

We recognize plastic waste is a significant global challenge and it is unacceptable for it to enter our rivers and oceans.

We are proud to participate in initiatives across our industry and wider value chain that address this concern through the reduction, recycling, reuse and repurposing of plastic waste. We were one of the driving forces behind the formation of the Alliance to End Plastic Waste, the

first global, cross-value chain initiative dedicated to eliminating plastic waste in the environment.

In our own operations, we continue to target zero pellet loss to the environment and are working to increase recycling of our post-industrial waste. We are also engaging our employees in waste clean up projects at local beaches, waterways and parks.

*"History has shown us that collective action and partnerships between industry, governments and NGOs can deliver innovative solutions to a global challenge like this. The issue of plastic waste is seen and felt all over the world. It must be addressed and we believe the time for action is now."*

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### **Bob Patel**

CEO, LyondellBasell and Vice Chairman, Alliance to End Plastic Waste



# ALLIANCE TO END PLASTIC WASTE



LyondellBasell CEO Bob Patel (far right) joined World Business Council for Sustainable Development CEO Peter Bakker, Procter & Gamble CEO David Taylor and Veolia CEO Antoine Frérot in announcing the formation of the Alliance to End Plastic Waste.

LyondellBasell is a founding member of the [Alliance to End Plastic Waste](#) (AEPW), a major new initiative spanning the entire plastics value chain. This CEO-led, cross-sector, not-for-profit coalition has a clear mission to develop, accelerate and deploy solutions; catalyze public and private investment; and engage communities to help end plastic waste in the environment.

The AEPW is the first international coalition of chemical and plastics manufacturers,

converters, consumer goods companies, retailers and waste management companies dedicated to partnering with the finance community, government, and environmental and economic development NGOs to find market-based solutions.

Initial projects are focused in countries where waste collection and management have not kept pace with growing populations and burgeoning economies.

## THE ALLIANCE IS TAKING ACTION IN FOUR AREAS:



Creating infrastructure to collect and manage waste and increase recycling, especially in developing countries



Innovation to advance and scale new technologies that minimize waste, make recycling and recovering plastics easier, and create value from all post-use plastics



Education and engagement of governments at all levels, businesses, and communities to mobilize action



Clean up of concentrated areas of plastic waste already in the environment, particularly the major conduits of waste, like rivers, that carry land-based plastic waste to the sea



## OUR GOALS

Meet Operation Clean Sweep Blue requirements in the U.S. by 2020, and implement a similar approach at our European sites through PlasticsEurope

Begin reporting pellet loss to the environment in our 2020 Sustainability Report

## PREVENTING PELLET LOSS IN OUR OPERATIONS

We are a member of Operation Clean Sweep® (OCS), the plastics industry initiative aimed at preventing pellet loss. In 2018, we committed to the more rigorous American Chemistry Council's OCS Blue program, which requires members to demonstrate an enhanced commitment to managing and reporting pellet loss. We developed OCS best practice guidance and incorporated it into our Operational Excellence management system, requiring all sites to evaluate operations and reduce accidental discharge, spillage or escape of pellets from production or transportation equipment.

Actions taken at our sites include:

- Implementing programs to identify and eliminate pellets across our sites and capture them before they escape into the environment or waterways.

- Identifying short and long-term opportunities for continual improvement in reducing polymer loss.
- Conducting training programs with our employees.
- Using posters to remind our employees and contractors how to prevent pellet loss, along with stickers on pipes and at vulnerable spill points.
- Providing the right tools for cleanup activities at our plastic pellet cleaning stations.
- Sharing best practices across our sites and our industry.
- Educating and supporting our logistics providers and customers to prevent loss during handling and transportation.



Morris, Illinois



## OPERATING SAFELY

### PROTECTING PEOPLE

The safety of people and operations is our top priority. Our safety standards apply to everyone involved in our business, including employees, contractors and suppliers.

We are proud of our industry-leading safety performance. In 2018, we improved our excellent safety record with a total recordable injury rate of 0.18 for employees and contractors, the lowest number of total recordable injuries per hours worked in our company's history. This improvement is especially significant given the large number of additional workers on our sites for major turnarounds.

Additionally in 2018, 14 sites achieved more than one million safe working hours and 31 locations reached at least one year without a recordable injury.

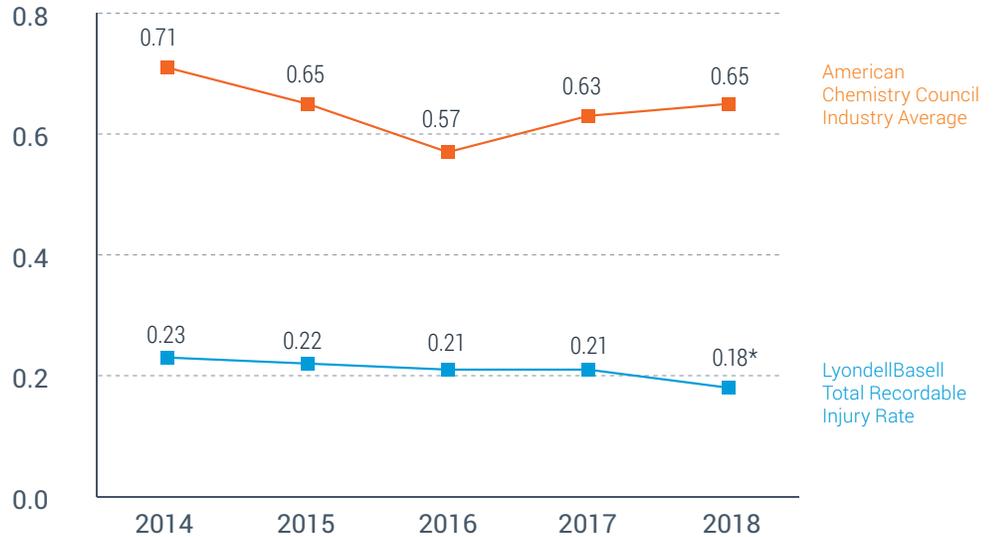
Eight sites were recognized for exemplary safety performance in 2018 by the American Fuel and Petrochemical Manufacturers (AFPM). Three sites received the top Distinguished Safety award, two were awarded the Elite Gold award and three achieved Silver Elite awards. Since 2017, 17 of our plants have received AFPM safety awards, recognizing industry-leading performance.

## OUR 5 STEPS TO MITIGATE RISK

1. Identify the hazards
2. Decide who might be harmed and how
3. Evaluate the risks and decide on precautions
4. Record findings and implement them
5. Review risk assessment and update if necessary

## TOTAL RECORDABLE INJURY RATE (PER 200,000 HOURS WORKED)

(Employees and contractors)



\* Includes A. Schulman sites as of August 21, 2018.

## MANAGING SAFETY RISKS

Our Operational Excellence program sets out the standards and management approach we use to achieve GoalZERO. This includes clear requirements for people, process and product safety.

We closely monitor safety risks, work quickly to investigate incidents and near misses, and swiftly take corrective action.

In 2018, we strengthened our risk management approach by piloting electronic permits to work. The e-permits replace traditional paper permits, improving communication between work crews and plant operators, giving them instant access to safety instructions and enabling them to spot potential conflicts in activities. Following a successful pilot during construction of our *Hyperzone* plant, we are implementing e-permitting across our sites.

Recognizing and mitigating potential hazards in the workplace is a critical part of our approach to preventing incidents and injuries. Risk assessments are conducted

for any potentially hazardous work. These range from completing safety checklists to a formal documented job hazard analysis process. Our approach includes five steps to mitigate risk outlined in our Risk Assessment Preferred Practice policy.

Our people undergo specific training to develop the skills to recognize potential hazards and reduce safety risks. This includes analyzing risks before any tasks are completed using a pre-task analysis. In 2018, we strengthened our approach by developing trainers at each site to integrate hazard recognition techniques and scenario-based training.

Sites undergo internal audits to verify compliance with Operational Excellence systems and procedures. Lessons learned and best practices are shared across the business. Onsite contractors, including logistics companies that handle and transport our products, are expected to comply with our HSE policies and support GoalZERO.



Maasvlakte, the Netherlands

## COLLABORATING WITH CONTRACTORS TO IMPROVE SAFETY

Personal safety risks can increase during periods of non-routine operation, for instance during maintenance or a scheduled turnaround. Our new contractor onboarding process is designed to improve safety when additional workers are on site. The electronic system, together with practical testing, screens and tests the competencies and safety awareness of contractor teams before they enter a plant. Once on site, interactive face-to-face training and further tests complete the process. The system was successfully implemented in 2017 in the Netherlands with 2,400 contractors during a turnaround at our Botlek site, and in 2018 with more than 300 contractors during preparation for the circular steam project at the Maasvlakte site.

*"Plan-based participation in a complex project such as the Botlek turnaround requires that safety is considered in the same way at all levels. LyondellBasell's contractor safety program and on-boarding process ensured everyone was provided with the same and the right knowledge to work clearly and safely during deployment."*

### **Gijsbert Veldhuizen**

**Operational Manager RBC Netherland B.V.**

*RBC Group is a leader in fire protection, and industrial and maritime safety and security in Europe.*

## SAFETY TRAINING FOR FRONT LINE SUPERVISORS

Front line supervisors play a critical role in identifying and managing safety risks at our plants. In 2018, we refreshed the front line supervisor safety training program and introduced an advanced leadership development program, which was completed by more than 370 of our front line supervisors in the U.S.

The program includes intensive face-to-face training over a 10-month period where "live" situations simulating safety scenarios test participants' reactions and decision-making. The course teaches communication, leadership, process safety, conflict resolution and team development skills. It will be rolled out to front line supervisors in Europe in 2019.

## EMBEDDING A GOALZERO SAFETY CULTURE

Our commitment to GoalZERO is championed at every level of the company. Excellent safety culture starts at the top with senior leaders, which includes the CEO.

Managers at each manufacturing site meet regularly to review safety performance and discuss issues relevant to their plant. HSE awareness teams evaluate injuries and find ways to prevent them in the future. Safety is also a priority at our office locations where group meetings typically start with a safety message.

Embedding our safety culture at our newly-acquired A. Schulman sites was a particular focus in 2018. Activities included training in HSE standards and GoalZERO, and comprehensive HSE site assessments. Additionally, each site was assigned a safety mentor from a legacy LyondellBasell site.

Beyond our own workforce, we rely on thousands of contractors and logistics companies. In 2018, we continued to strengthen our GoalZERO partnership with contractors and provided enhanced training to manage turnarounds safely. A revised contractor HSE management system standard was developed for roll out in 2019. Quarterly Contractor Safety Forums are also used to review incidents and near misses, and share lessons learned.



Berre l'Etang, France



## IMPROVING HAND SAFETY

Hand injuries represented 45% of total injuries in 2017, so we launched a comprehensive campaign to improve hand safety. We distributed new gloves that offer a higher level of protection and cut resistance across our sites, and asked employees and teams to identify opportunities for improving hand safety behaviors. Hand safety was also the focus of our 2018 Global Safety Day. As a result of this campaign, we reduced hand-related injuries in 2018 by 35% compared with 2017.



La Porte, Texas

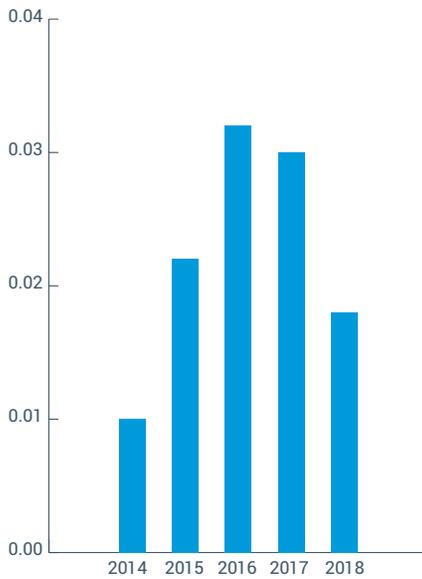
## WORKER HEALTH

Our LifeBeats program promotes healthy lifestyle habits and well-being among employees. LifeBeats gives our people tools to improve both their physical and mental health, and support the well-being of their families. Site champions across our operations promote health events and campaigns each year, including the annual LifeBeats 'Step Up for Health' walking challenge.

We provide a comprehensive medical monitoring service to assess employees exposed, or potentially exposed, to occupational hazards. We focus on prevention by proactively detecting hazards before they affect our people. We use regular health screenings to assess individuals and confirm the effectiveness of exposure prevention strategies. All employees have access to knowledgeable health professionals so they can raise questions or concerns and gain information on healthy lifestyle habits.



## PROCESS SAFETY INCIDENT RATE



*Includes A. Schulman sites as of August 21, 2018*

*Represents number of Level 3 and above process safety incidents per 200,000 hours worked. We classify process safety incidents on scale of 0 to 5, with Level 5 having the highest impact.*

## ADVANCING PROCESS SAFETY

Operating our plants safely and reliably is a top priority. Our process safety program establishes how we safely design, operate and maintain our manufacturing processes to prevent or mitigate the unplanned or uncontrolled release of process material. This program aims to prevent serious incidents and protect local communities and the environment.

We have clear standards for identifying and managing process safety risks within our Operational Excellence framework. Regular turnarounds — during which we shut down plants and carry out essential maintenance, upgrades and safety checks — are a key part of our safety program.

In 2018, we strengthened our process safety procedures for 'line break' activities where process piping, process tubing, or other equipment containing hazardous material or stored energy is opened, such as during maintenance work. A team of specialists from our global manufacturing sites defined a new risk assessment process for planning and executing line break activities. The team analyzed potential human failures and identified practices to manage those risks.

We also focused on reducing risks associated with combustible dust at the newly acquired A. Schulman sites. The presence of combustible dust can increase the risk of fire or explosion if not managed properly. LyondellBasell applied our established Operational Excellence standards to evaluate and manage these risks.

In 2018, we achieved a 40% reduction in process safety incidents compared with 2017, and we continually strive for zero incidents.

## PROTECTING THE SECURITY OF OUR PEOPLE AND ASSETS

The security of our employees and facilities is critical and we maintain comprehensive security policies and practices. We work closely with industry and government agencies to address potential security threats. We are equally vigilant about protecting communities close to our sites in the event of a security incident or emergency.

## PREVENTING AND RESPONDING TO EMERGENCIES

We take seriously our responsibility to prevent incidents that could harm workers, the community or the environment. We continually evaluate risks and have detailed emergency plans in place. LyondellBasell manufacturing sites maintain their own emergency response teams, including teams trained to respond to medical incidents, fires or releases of hazardous materials.

Site workers are trained on the proper procedures to follow in the event of an emergency and regular drills are conducted to test these procedures. We also coordinate preparation and planning with local government agencies and emergency responders.

## PROMOTING PRODUCT SAFETY

As the products we manufacture are used in thousands of everyday applications, it is critical they be handled and used safely by our employees and customers. Our product stewardship program defines our approach.

We assess and manage risks at every stage of the product lifecycle, from sourcing raw materials to the end use by customers and disposal. We also assess products and uses for risk to human health and the environment. We track product safety performance, review customer feedback and communicate product safety information both internally and externally.

We also continuously monitor product end-use applications to anticipate any potential health and safety risks. Each year, we review the risks associated with emerging applications in our polymer and chemicals business. Based on this assessment, we may prohibit or place conditions on the sale of products into certain end-use applications. We communicate all end-uses that are prohibited or require further review on our external website to ensure complete transparency for customers who purchase our products.

A particular focus for product safety in 2018 was the application of product stewardship and chemical safety controls to sustainable and circular products. For example, our product stewardship team worked closely with our marketing, sustainability and R&D teams to review existing and emerging recycling technologies, identify challenges, and find solutions to facilitate the potential use of recycled plastics in broader end-use applications such as food and cosmetics.

We have clear chemical control procedures in place to comply with applicable

regulations and we continually monitor these requirements for changes. Relevant regulations include the Toxic Substances Control Act in the U.S. (TSCA) and the European Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals (REACH). We monitor the movement of materials and we block transactions for materials, uses or customers that do not meet our safety requirements.

Our global product safety team communicates information about our products to customers. Public information we provide includes:

**I Safety Data Sheets:** We publish more than 79,000 safety data sheets that include information on product hazards and precautions to ensure safe use.

**I Product Stewardship Bulletins:** We issue declarations for customers on regulatory clearances for our products and their end uses.

**I Global Product Strategy Safety Summaries (GPSSS):** As a member of the International Council of Chemical Associations (ICCA) we take part in the Global Product Strategy (GPS) voluntary program to improve the safety of chemical products during their use and handling. The GPSSS documents summarize information about safe uses and applications of products.

In 2018, we answered more than 40,000 requests from customers, distributors and other stakeholders for regulatory information about our products. We continuously review customer feedback to better identify and mitigate potential risks.

# PRODUCT STEWARDSHIP THROUGH THE LIFE CYCLE

## Product portfolio safety assessment

Our product stewardship team is involved at the initial stage of researching and developing new products. We assess HSE and product safety risks before new products, raw materials or processes are approved for production. Product safety aspects are reviewed for each stage of the development process.



## Raw materials sourcing

Every business function utilizes a global raw material evaluation and approval standard. Policies prohibit the use of some substances and restrict the use of others. If a safety issue is flagged, our procurement teams will not buy the raw materials in question. Changes to raw materials or their sources are also reviewed for product safety.



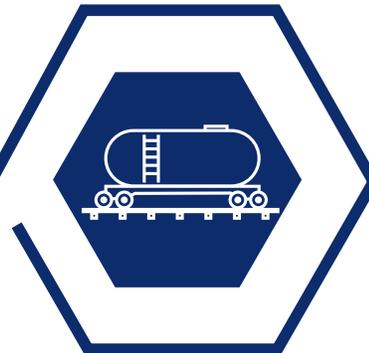
## Manufacturing

Our product stewardship standards help ensure substances are handled properly during manufacturing to prevent harm to our people and contractors. We conduct internal audits to confirm regulatory compliance and that risks are managed according to our standards when manufacturing, storing and loading our products.



## Distribution and customer use

We promote safe transport and storage of our products by customers, and we work closely with our suppliers, carriers and distributors. We have standards for equipment used to transport and store products and our logistics compliance team visits customers' sites to help ensure our products are handled safely. We communicate safety information to customers through safety data sheets, safety bulletins and global product safety strategy summaries.



## Consumer end-use and disposal

Certain end-uses for our products may require review and approval or may be prohibited. Compliance information about our products is available on our website and product end-of-life considerations are addressed on safety data sheets.



## REDUCING OUR ENERGY USE AND CO<sub>2</sub>e IMPACT

We use energy in the form of electricity, steam and fuel to manufacture our products. Feedstocks and energy represent the largest operating costs our business incurs.

Our business faces climate-related risks, including potential increased costs to comply with climate change legislation and related regulatory initiatives in Europe and the U.S. In addition, climate changes, such as drought conditions or increased frequency and severity of hurricanes and floods, could have an adverse effect on our assets and operations.

To address these risks, we are investing in energy reduction projects and working to reduce our carbon emissions.

We are also working to meet customer demand for products with a lower carbon

footprint. These include polymers made from bio-based feedstock and recycled polymer products .

### **FOCUSING ON ENERGY EFFICIENCY**

We use resources as efficiently as possible, recovering and reusing waste heat in the chemical manufacturing process, and employing best practices in energy management. Where feasible, our manufacturing sites use combined heat and power cogeneration systems, which recover waste heat to produce electricity.

A company-wide energy savings management standard sets out requirements and guidance for every site to measure and reduce energy use, including a five-year energy improvement plan.

Energy leaders at each site identify ways to conserve energy, supported with best practice guidance on reducing energy costs. Our energy excellence program provides training and site visits to continuously improve energy performance. In 2018, energy leaders were trained on a new management standard and we introduced energy training for all new hires serving in operational roles.

Energy dashboards are in place at many of our sites. The dashboards provide operators with real-time data on energy use and targets, enabling them to identify energy and cost saving opportunities. Energy dashboards typically save 2% of site energy cost. We developed new energy dashboards at Wesseling and Botlek sites in 2018.

## OUR ENERGY PERFORMANCE

### 2018 ENERGY USE AND INTENSITY



The amount of energy we use is closely linked to production levels. In 2018, our production increased by 2.2% compared with 2017, and our global energy use increased by 2% over the same period, resulting in a 0.2% decrease in the energy intensity of our operations compared with 2017.

In 2018, we made energy efficiency improvements at many of our sites, reducing energy use by a total of 3.5 million gigajoules. Energy saving projects implemented in 2018 include:

- New steam boilers at our Tuscola, Illinois site - 252,000 gigajoules.
- New air pollution control system at our Berre L'Étang, France site - 252,000 gigajoules.

- New advanced control system at our Münchsmünster, Germany site - 108,000 gigajoules.
- New turbine in the ethylene cracker at our Wesseling, Germany site - 126,000 gigajoules.
- Reducing energy loss from steam leaks by working with contractors to improve repairs and maintenance saved over 720,000 gigajoules during pilots at our sites in Channelview, Texas, and Wesseling, Germany. New guidance on steam leaks and traps will be added to our global energy excellence model for all sites.



Wesseling, Germany

## INVESTING TO SAVE ENERGY IN WESSELING, GERMANY

In 2018, we reduced energy use at our Wesseling site in Germany by upgrading and modernizing turbines in an ethylene production unit during a six week turnaround. The project demonstrated a significant environmental impact, saving approximately 126,000 gigajoules of energy in the first full quarter of operation, with an associated saving of approximately 10,000 metric tons of CO<sub>2</sub> per year, equivalent to the annual emissions of 5,000 German households. It also reduced the site's water use because less steam is needed to run the production unit.

## OUR GOALS

Achieve a 15% reduction in CO<sub>2</sub>e emissions per ton of product produced by 2030 compared with 2015 levels. In addition, we are committed to revisit this target as enabling technology evolves in this area.

## REDUCING CO<sub>2</sub>e

Reducing carbon dioxide equivalent (CO<sub>2</sub>e) emissions per metric ton of product is a priority for LyondellBasell. We organized a global CO<sub>2</sub> team comprised of experts from manufacturing, R&D, technology, and sustainability. This team is responsible for identifying capital investments, research and development needs, and technology requirements to reduce carbon emissions.

Our global carbon management strategy targets emission reductions in our production processes and supply chain.

At our manufacturing sites, we are investing in projects to improve reliability and reduce energy consumption; installing clean-burning boilers and furnaces; recovering and reusing waste heat to produce electricity; and introducing lower carbon feedstocks made from renewable biomass and post-consumer waste. We are also exploring how we can reduce emissions in our supply chain, such as switching to lower carbon intermodal solutions to transport our products.

In Europe, our operations participate in the European Emissions Trading System (ETS) and we purchase annual emission allowances to meet our obligations.

## OUR CARBON PERFORMANCE

As with energy use, our carbon emissions are closely tied to production. In 2018, our global CO<sub>2</sub>e emissions increased by approximately 2% compared with 2017 due to increased production across our sites. However, our global carbon emission intensity slightly decreased by 0.3% in 2018 compared with 2017.

## DATA SCOPE, SOURCES AND METHODOLOGIES: ENERGY AND EMISSIONS

Scope 1 and Scope 2 greenhouse gas (GHG) emissions data is provided for LyondellBasell majority owned or operated manufacturing sites, pipelines and large offices. Gases in our emission calculations are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF<sub>6</sub>) and we apply the GHG Protocol Corporate Accounting and Reporting Standard methodology.

Manufacturing sites collect energy data using an energy tracking system. Non-manufacturing sites collect energy data based on invoicing and energy metering. The data is converted to standard units of measure and we apply site-specific GHG emission factors, based on the production process at each site.

GHG emission factors for fuel and steam are calculated for each site based on combustion enthalpies and a mass balance. If multiple sites use the same fuel, we apply an average emission factor. Factors are also reviewed against the American Petroleum Institute Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry (2009) and with the emission factors of other sites to ensure accuracy and consistency. Generic conversion factors are used where site-specific factors are unavailable.

GHG emission factors for electricity are largely location-based and provided by local suppliers.

## 2018 CO<sub>2</sub> EMISSIONS



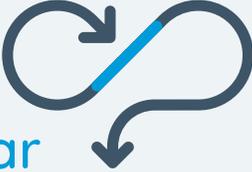
■ Global CO<sub>2</sub>e emissions – Scope 1 and 2

— Emissions intensity

Scope 1: Direct emissions from sites operated by LyondellBasell

Scope 2: Indirect emissions from external electricity and steam suppliers

Data excludes the newly acquired A. Schulman sites.



## Circular Steam Project

## CIRCULAR STEAM PROJECT TARGETS MAJOR CO<sub>2</sub> REDUCTIONS

Working with joint venture partner Covestro, at our shared site in Maasvlakte, the Netherlands, we are investing to achieve significant CO<sub>2</sub> emission reductions and support the Dutch government's carbon reduction targets.

The Maasvlakte plant produces propylene oxide and styrene monomer with the plant's wastewater currently being incinerated. The circular steam project uses innovative technology to convert the water-based waste into energy.

The new process will generate steam from the plant's waste and convert it into energy for use in the on-site production processes. The waste is divided into two streams. The

first stream is biologically treated, creating water and biogas. The second waste stream, containing waste fuels and caustic waters, enters a dry incineration process, fueled by the newly-created biogas that separates the salts and creates steam for the production process. The project is scheduled for completion in 2020.

Expected environmental benefits:

- Annual reduction of 140,000 metric tons CO<sub>2</sub> emissions.
- 0.9 petajoule of energy saved (equivalent to 9,000 households' energy use per year in the city of Breda).
- 11 million kilograms of salt residue prevented from entering surface water.

*"This project is an important step towards realizing the Dutch ambition of a 49% reduction in CO<sub>2</sub> emissions in 2030. The initiative by LyondellBasell and Covestro is an inspiring example of how this can be done, even in a very competitive market."*

**Allard Castelein**  
CEO Port of Rotterdam Authority

*"The Dutch government's support is pivotal to the viability of innovative projects like this Circular Steam Project, which will allow us to realize an annual CO<sub>2</sub> reduction equal to taking 31,000 cars off the road."*

**Willemien Terpstra**  
Director, Global Co-Products at LyondellBasell



Maasvlakte, the Netherlands

## MANAGING ENVIRONMENTAL IMPACTS

We carefully manage a range of environmental impacts beyond energy and greenhouse gas emissions, including other emissions to air, water use and waste. We are granted our license to operate from multiple regulatory authorities that oversee our facilities and we seek to earn the trust of our communities by operating safely and responsibly.

Our environmental management system standard, part of our Operational Excellence system, provides a mechanism for compliance assurance and continuous improvement. This extends not only to our employees but also our contractors and suppliers.

We constantly monitor and manage environmental risk and are committed to complying with all regulations and permits. We aim to operate efficiently which means using valuable resources responsibly, producing less waste and generating fewer emissions. Because our business is dynamic and subject to change based on production volumes, feedstocks and other business factors, our environmental metrics are reported in absolute (total) and intensity (rate per ton of product) terms to more clearly reflect our performance.



*Suzhou, China*

## MANAGEMENT SYSTEM CERTIFICATIONS

Excluding the sites acquired from A. Schulman, all of our majority owned and operated sites in the U.S., Europe and Australia are either certified to the International Standard for Environmental Management Systems ISO14001:2015 or, through their compliance with our Operational Excellence requirements, have management system elements in place that are ISO14001 certifiable. Our sites in Guangzhou and Suzhou, China, are also ISO14001:2015 certified and in 2018, we assessed four of our sites in India as we aim to achieve ISO14001 certification for these sites in 2019. Additionally, the LyondellBasell sites in Germany, France and Spain are certified to the Energy Management Standard ISO50001:2011. We began to review the management systems in place at A. Schulman sites following acquisition in 2018, with the aim of achieving ISO14001 certification or compliance with our Operational Excellence requirements.

## OTHER EMISSIONS TO AIR

We are dedicated to preventing pollution, complying with all laws and the terms of our permits, evaluating and adopting appropriate pollution controls, and closely monitoring and controlling our emissions. Since 2010 we have significantly reduced our absolute emissions to air and improved the intensity of emissions compared with production for NO<sub>x</sub>, SO<sub>x</sub>, VOCs and PM.

### ■ Nitrogen Oxides (NO<sub>x</sub>)

NO<sub>x</sub> is a by-product of combustion and is generated while burning fuels to produce heat, steam and electricity. Boilers and furnaces in our chemical and refining operations are the source of most of our NO<sub>x</sub> emissions. In 2018, our NO<sub>x</sub> emissions decreased by 3% to 7,841 metric tons due to use of improved clean-burning technologies at our sites.

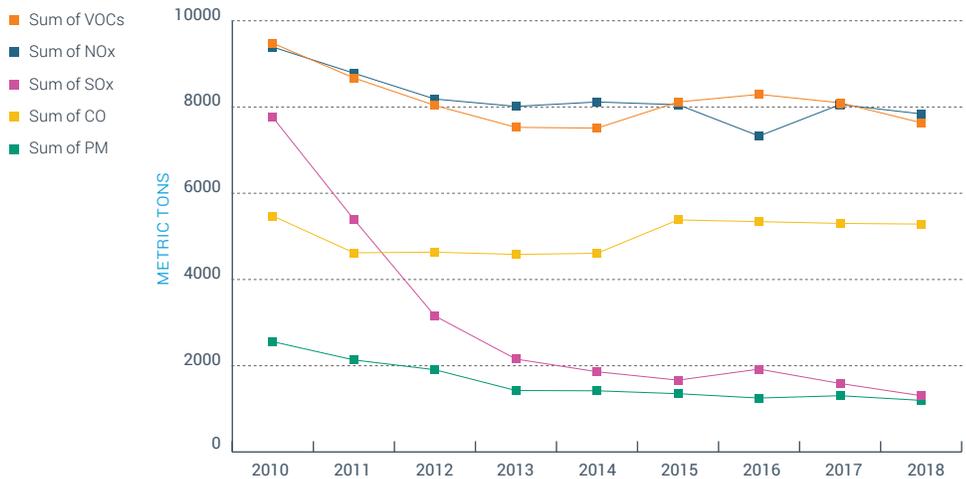
### ■ Sulfur Oxides (SO<sub>x</sub>)

In our operations, SO<sub>x</sub> emissions come from burning fuel which contains small amounts of sulfur, and from the process of removing sulfur from fuel products at our Houston, Texas, refinery. In 2018, our SO<sub>x</sub> emissions totaled 1,354 metric tons, representing a 15% decrease from 2017. This was due to increased use of natural gas, instead of liquid fuel at our Berre L'Etang facility in France and lower emissions from the sulfur recovery unit at the Houston refinery.

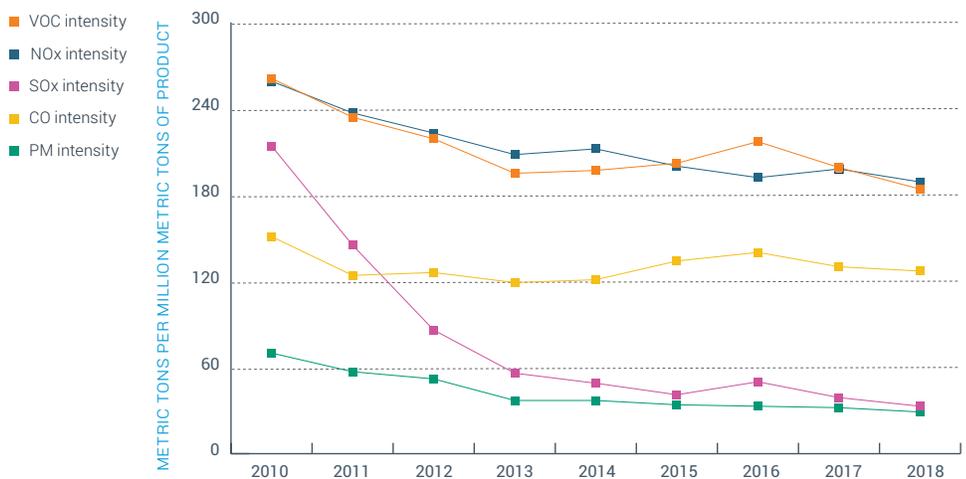
### ■ Volatile Organic Compounds (VOCs)

VOCs are associated with the chemicals and fuels we handle and produce, and are released into the atmosphere during chemical and fuel production. VOCs can be released through tiny leaks from pump seals, valves and other equipment. We have extensive programs in place to identify and repair small leaks, including using infrared camera technology. Our VOC emissions decreased by approximately 6% to 7,636 metric tons in 2018 due to technology improvements at our Berre L'Etang facility in France and Chocolate

## EMISSIONS TO AIR



## EMISSIONS TO AIR INTENSITY



Bayou plant in Texas where controls were installed on a fluidized bed dryer vent.

### ■ Carbon Monoxide (CO)

CO is produced when fuels are burned to produce heat, steam and electricity. The majority of our CO emissions come from burning natural gas at our chemical and refining operations. From 2017 to 2018, our CO emissions decreased slightly to 5,285 metric tons.

### ■ Particulate Matter (PM)

PM refers to small airborne particulates emitted during production, primarily from cooling towers and burning fuel. Since 2012, we have worked to reduce these

emissions by improving heaters and furnace operations. Our total PM emissions decreased by approximately 8% to 1,197 metric tons compared with 2017 due to equipment upgrades such as the cooling towers at our Morris facility in Illinois.

### ■ Ozone Depleting Substances (ODS)

In 2018, we emitted 74 kg of ODS, a small increase from 59 kg in 2017. We measure and report ODS as kg of CFC-11 equivalent and use emission factors based on the Montreal Protocol.

## WATER USE

Water is an important resource we depend on in our operations. We use water primarily for cooling and steam production. Our refining and manufacturing sites reuse water to reduce the amount of ground and freshwater withdrawn. The majority of our large sites use recirculating water systems for cooling in order to limit our freshwater intake.

More than half of the water we use is surface water and the remainder is mostly groundwater. The source of water depends on the location of the facility. We use a small amount of potable water and source recycled water from some industrial providers located close to our manufacturing sites. Some of our sites use sea water for cooling, while others draw water from freshwater sources, such as rivers, aquifers or local water supplies.

We manage water in accordance with permitted limits for discharge destination and water quality, and our Operational Excellence

systems support ongoing compliance. Many of our larger sites operate their own waste water treatment facilities, which allows for increased control over our water efficiency and quality of our discharges.

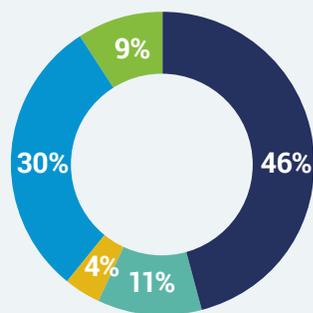
This year, we are reporting additional indicators, water intake and water discharge, to build a better understanding of our company water profile. We also clarified our reporting criteria and definitions for water consumption.

In 2018, water consumption decreased by 2% compared with 2017, and water consumption intensity decreased by 4% in the same period.

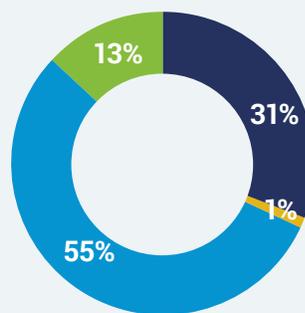
Some of our sites are located in areas of lower rainfall or dense population. In order to evaluate how we impact the local water availability and the local community, we will conduct a water stress survey in 2019. This will improve our understanding of current and future water needs, and enable us to prioritize areas to improve our water impact.

### WATER USE 2018

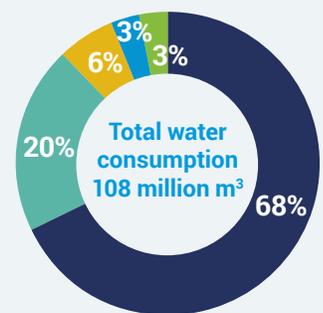
- Fresh Surface
- Groundwater
- Potable
- Seawater/Brackisch
- Other Use



WATER INTAKE BY SOURCE



WATER DISCHARGE BY DESTINATION



WATER CONSUMPTION BY SOURCE

**Water intake** is the total water pumped, piped, or otherwise brought on site for use in manufacturing and related activities.

**Water discharge** is the total water put back into water bodies through permitted or otherwise allowable methods. This includes remediation activities and water supplied for offsite use.

**Water consumption** refers to water that is not returned to the source location, either due to discharge to another water location, or due to evaporation or other types of water loss.

For more information, see data tables in the back of this report.

## WASTE

We take every opportunity to avoid generating waste, reusing it in our operations wherever possible. We look for recovery and recycling opportunities and evaluate co-products for reuse to avoid creating waste.

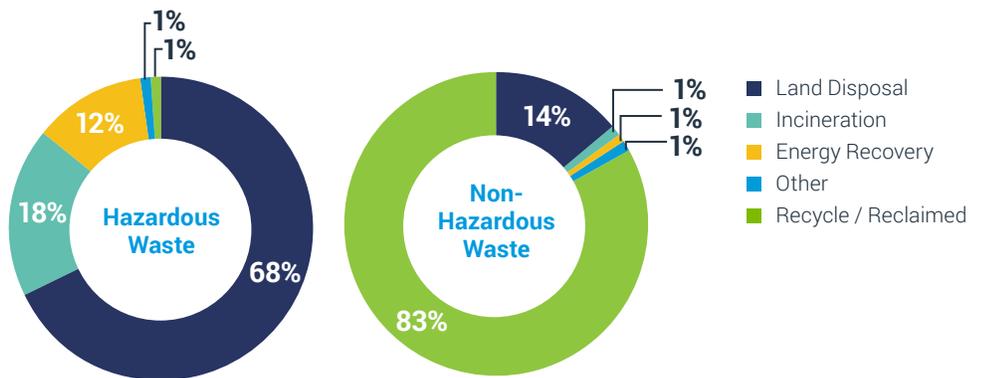
Most of the waste we produce is dilute hazardous liquid waste from chemical plant operations. Our operations also produce non-hazardous solid waste including general plant trash and construction and demolition debris. Waste disposal is managed in accordance with all applicable regulations. In 2018, 67% of waste was disposed to land, including landfill and permitted injection wells.

Project and construction work can increase waste volumes. In 2018, the total volume

of waste we produced increased by 9%. Hazardous waste increased by 2% partly due to an increase in waste fuels disposed of by third parties at our Maasvlakte site in the Netherlands. Non-hazardous landfill waste increased significantly by 76% to 237,000 metric tons, due to maintenance or construction work at some sites, including LaPorte and Corpus Christi in Texas.

At our Maasvlakte site, we advanced a project to significantly reduce waste and generate steam on-site by 2020 in partnership with Covestro. By reusing waste to generate high-pressure steam, the site is projected to reduce waste streams and prevent the release of 11 million kilograms of salt residue into surface water.

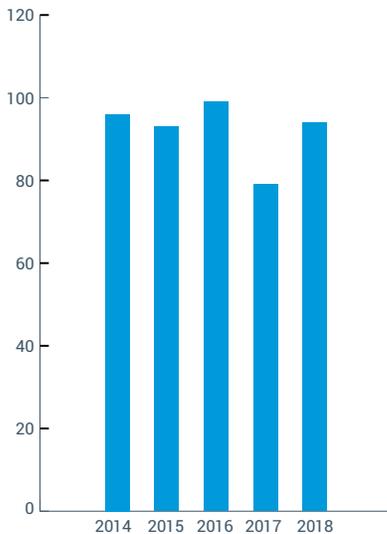
### WASTE BY TYPE 2018



For more information, see data tables in the back of this report.

## ENVIRONMENTAL INCIDENTS

(Categorized as level 2 incidents and above)



We classify environmental incidents on a scale of 0 to 5, with Level 5 having the highest impact.

## ENVIRONMENTAL INCIDENTS

Although we work hard to reduce our environmental impact, sometimes incidents can occur. We manage our environmental obligations and work diligently to investigate each incident and understand the cause. We then develop action items and share learnings throughout the organization to prevent future incidents.

In 2018, the total number of environmental incidents increased by approximately 19% compared with 2017. This was partly due

to the high number of site turnarounds in 2018 and unusually cold weather leading to freezing conditions in the U.S. Gulf Coast. Despite an increase in the number of incidents, the total quantity of associated emissions declined by 51% in 2018 compared with 2017, and there were zero environmental incidents at 65% of our sites. In 2018, we paid \$984,000 in penalties to environmental, health and safety regulatory authorities.



## DEVELOPING OUR PERFORMANCE-DRIVEN TEAM

Our success as a company is tied to the passion, knowledge and talent of our global team. To achieve our vision of being the best operated and most valued company in the industry, we must attract top performers and equip them with the tools needed to continuously grow and leverage their potential. We believe in honesty, diversity and fairness, and we focus on creating a work environment that is safe, respectful and inspires employees to strive for excellence.

Our mission, vision and values guide our daily work activities and drive our business success. We recognize individuals cannot succeed alone; we believe in the power of many and place a strong emphasis on teamwork. We pay a fair wage based on country-specific conditions, and we reward performance based on personal, team and company results.

*"We are proud of the LyondellBasell women who have excelled in science and engineering and are heading our manufacturing plants, advancing our engineering teams, achieving breakthrough discoveries in our R&D labs, and serving on our Board of Directors. But we have more work to do to create the inclusive environment we envision. We are committed to transforming our industry and our corporate culture in order to attract and retain bold, creative minds from a diverse population."*

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### **Darleen Caron**

Executive Vice President and Chief Human Resources Officer, LyondellBasell

As of December 31, 2018, we employed approximately 19,450 full-time and part-time employees around the world, including employees acquired from A. Schulman in August 2018. Of this total, 8,900 were located in North America and another 8,100 were located in Europe. The remainder of our employees are in other global locations. Less than 2% of our employees are part-time.

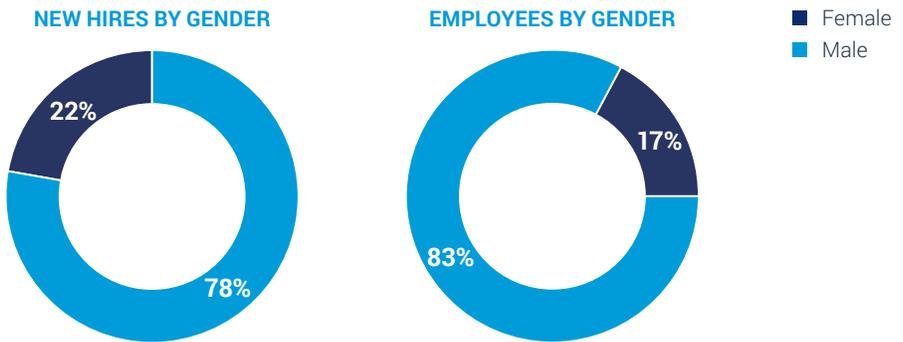
In 2018, approximately 900 of our employees in North America were represented by labor unions. The vast majority of our employees in Europe and South America were subject to staff councils or works council coverage or collective bargaining agreements.

We engage in open and on-going dialogue with employees and their representatives to ensure a proper balance between the best interests of the company and its employees. In a number of our locations, we partner with employee representatives on initiatives such as health and safety.

We use the services of contractors in the routine operation of our business, and we require that all contractors adhere to our Operational Excellence standards and GoalZERO commitment.

## PROMOTING DIVERSITY AND INCLUSION<sup>1</sup>

A talented and diverse workforce is a key competitive advantage. We believe employees of different genders and from many different cultural, linguistic and national backgrounds provide us with valuable perspectives and different ideas resulting in better decision-making and more creative solutions.



### RACE/ETHNICITY OF EMPLOYEES

As defined by the U.S. Equal Employment Opportunity Commission

	NUMBER	PERCENTAGE
Minority	1,920	29%
Non-Minority	4,632	69%
Other	56	0.8%
Not disclosed	83	1.2%

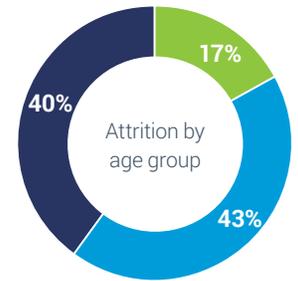
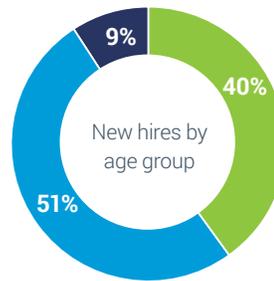
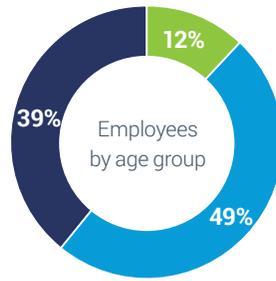
<sup>1</sup> Data as of December 31, 2018, based on a total of 14,230 legacy LyondellBasell employees, and excluding employees we acquired from A. Schulman in August 2018.



Rotterdam, The Netherlands

## EMPLOYEE DATA BY AGE GROUP<sup>1</sup>

**AGE**  
**18-29**  
**30-49**  
**50+**



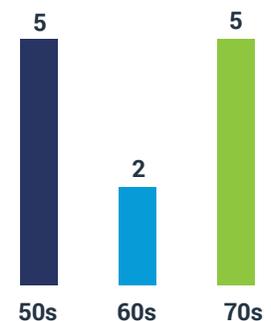
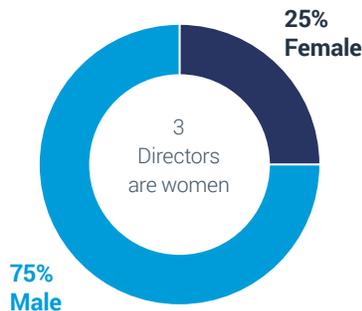
We are proud many employees have been part of the LyondellBasell family for all or most of their careers. We also recognize in certain areas, such as our manufacturing plants, an aging employee population presents a challenge. To ensure we are properly staffed for the future, we employ a variety of approaches to identify and develop talent within the organization while simultaneously using targeted recruiting strategies to bring new employees into the company.

We are also focused on appropriately capturing the valuable knowledge of our long-tenured employees. Our Technology & Knowledge Management system ensures employees benefit from each other's experience, no matter where they are located in the world. This suite of tools brings together best practices compiled by internal subject matter experts on operations, processes, systems and other areas critical to our business.

## DIVERSITY OF GOVERNANCE BODIES

For more information on our Board of Directors including nationality, qualifications and compensation, refer to the [2018 Annual Proxy Statement](#).

### GENDER AND AGE COMPOSITION OF BOARD OF DIRECTORS



<sup>1</sup> Data as of December 31, 2018, based on a total of 14,230 legacy LyondellBasell employees, and excluding employees we acquired from A. Schulman in August 2018.



## THE LYONDELLBASELL ACADEMY

Launched in 2018, **LyondellBasell Academies** are the umbrella under which we bring together enterprise-wide learning and development opportunities for our employees.

Our first academies focused on leadership development with the launch of the People Leaders Development Academy (PLDA). The PLDA equips those entrusted with leading our people with the skill sets and mindset necessary to be agile, accountable, collaborative and successful leaders. This intensive development program focuses on what it means to be a leader, improves self-awareness and personal effectiveness, and helps participants discover new ways to improve outcomes for themselves and their teams while driving cultural change and building accountability. Approximately 270 leaders are expected to complete the program in 2019. We also launched the Global Leaders Academy which brings the most-senior leaders in the company together to focus on building a winning leadership culture throughout the organization. Additionally, we created two academies focused on developing high-potential employees.

## LISTENING TO OUR PEOPLE

The voice of our employees informs many of the decisions made at LyondellBasell. We seek and receive input from our employees in many ways, including through the biennial employee engagement survey. Approximately 70% of employees responded to the 2018 survey, which was conducted prior to the A. Schulman acquisition.

Our employees reported that they were satisfied with LyondellBasell as a place to work (82% of respondents), feel proud to work for LyondellBasell (80% of respondents), are excited about the company's future (79% of respondents) and would recommend LyondellBasell as a good place to work (79% of respondents).

Although our employees scored the company very positively in most areas of the survey, our ambition and determination to ensure LyondellBasell remains a great place to work go hand in hand with demonstrating the ability to listen and act on our employees' feedback. Employees pointed to the need for more individual learning and development opportunities, and also felt the company's performance management system as a whole could be more meaningful.

As a result, we developed a more holistic approach to performance management, one that asks leaders and the employees they manage to engage in continuous performance conversations. In addition to equipping leaders with tools through the People Leaders Development Academy (see feature story), we launched a series of webinars focusing on the shift to continuous performance conversations. This training, attended by 950 leaders worldwide, provided tips, tools and practice to make these conversations more meaningful.

Getting to know our employees and teams is the foundation of a collaborative and strong culture. Shifting to continuous performance conversations allows employees and their managers to maintain open channels of communication and provides opportunities for real-time feedback. To ensure our employees have the right systems and tools in place to support this cultural shift, we designed a new online performance management system in 2018.

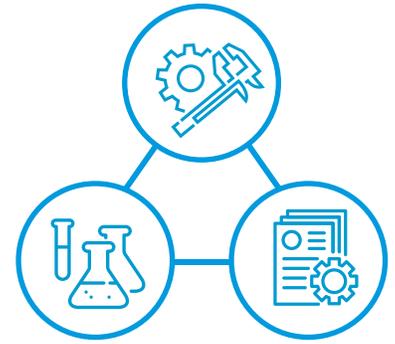


*Channelview Complex, Texas*

## TRAINING AND DEVELOPMENT

Employee growth and development are key elements supporting our vision of superior performance. We provide development opportunities for our employees through on-the-job experiences, learning from others, and in-class and online learning.

In 2018, we offered more than 376,000 hours of training to our employees through both in-person classes and our online learning management system. Operators and frontline supervisors received a total of 342,700 hours of training, while supervisors, managers and executives participated in more than 32,500 hours of training.



### Average Training Hrs/person

Professional	17.3
Technical	24.5
Administrative	8.4

Wesseling, Germany



## ADVANCING YOUNG TALENT IN EUROPE

Our [Young Engineers Program](#) welcomes the best young talent to our business to develop their engineering and leadership skills, and prepare them to join our European workforce.

Aimed at recent university graduates with technical talent, the program develops young people's management and technical skills, along with training on project management and personal effectiveness. Graduates are hired in the Netherlands and are assigned to at least three manufacturing sites across our European operations over the duration of the program. As part of the LyondellBasell Engineer University (Engineer U), the young engineers receive on-the-job and formal training. Mentors provide coaching, professional insight and advice to help participants develop their skills and set career goals.



M.D. Anderson Cancer Center

LyondellBasell  
Advancing Possible

LyondellBasell  
Advancing Possible

## ADVANCING OUR COMMUNITIES

Being a responsible, good neighbor in the communities in which we operate is embedded in our mission. We provide jobs that create economic value and we hire locally where possible. We also support economic growth and job creation throughout our supply chain by purchasing goods and services locally.

Additionally, we contribute to charities in cash or in-kind, and our employees volunteer thousands of hours to good causes each year.

In the last three years, we donated more than \$9 million and 46,000 volunteer hours to charities around the world to improve education, promote good health, protect the environment, and support first responders.

In 2018, we donated to more than 460 charities, including matching contributions, and put special focus on education.

Each year we support two flagship community campaigns:

**Global Care Day:** For the past 19 years, LyondellBasell employees worldwide, along with their families and friends, have devoted one day to making a difference in their communities by volunteering.

**United Way:** Each year our U.S. employees participate in local campaigns to support the United Way's goal of building strong communities. In 2018, LyondellBasell held fundraising campaigns at 28 sites across the country and donated a total of \$2.3 million to the organization. LyondellBasell has been a top corporate donor to the United Way of Greater Houston for 30 consecutive years.

# GLOBAL CARE DAY 2018: HIGHLIGHTS FROM AROUND THE WORLD

In 2018, approximately 3,620 employees from 67 LyondellBasell sites volunteered more than 17,680 hours for Global Care Day.



## BAYPORT, TEXAS

Forced to cancel this project in 2017 due to Hurricane Harvey, employees followed through with their commitment to the community and built an outdoor hockey rink and tennis wall at a local community park.

## HO CHI MINH CITY, VIETNAM

Volunteers removed plastic waste and other trash from a local beach, using the opportunity to teach children and families about the importance of protecting the ocean.

## DALIAN, CHINA

Employees donated hundreds of kilos of basic food and personal care products, such as rice, flour, noodles, soap and toothbrushes, to residents in a nursing home.

## TUSCOLA, ILLINOIS

Colleagues maintained flower beds and painted flowerpots to beautify the grounds at Tuscola Healthcare for the enjoyment of those in the elder care facility.

## MELBOURNE, AUSTRALIA

Fareshare Australia Inc.'s mission is to rescue and distribute food to those in need. With the help of our volunteers, 1,200 vegetable rolls and 1,000 quiches were prepared for distribution to charities and those in need at the Fareshare Foodbank.

## FERRARA, ITALY

Volunteers joined children with autism and their families in planting trees at the Dalla Terra alla Luna facility. The organization cares for children with autism, providing a safe and respectful environment where they can play and learn.

## HOUSTON, TEXAS

Employees and their families planted 65 trees and 100 seedlings at Burnett Elementary School. The trees provide shade for the playground and reduce energy use. Volunteers also built 150 bikes that will be used as awards for students who achieve their reading goals.

## RAYONG, THAILAND

Volunteers rehabilitated a damaged forest and animal habitat at The Royally-Initiated Siri Charoenwat Forest Plantation Project Park, helping to advance the rapid growth of trees, mushrooms, rattan and bamboo used by wildlife and the surrounding community.

## AURANGABAD, INDIA

The mission of the Prayag Youth Foundation is to protect the environment and increase tree planting. Volunteers partnered with the organization to plant 100 native species including Pipal, Banyan, Neem, Karanja, and Bakul, at the Goga Baba Hill base.



# GLOBAL CARE DAY

*Advancing Our Communities*

# OUR PERFORMANCE DATA

SAFETY PERFORMANCE		2014	2015	2016	2017	2018			
<b>TOTAL RECORDABLE INJURY RATE</b> (PER 200,000 HOURS WORKED/EMPLOYEES AND CONTRACTORS)									
LyondellBasell Total Recordable Injury Rate (TRIR)		0.23	0.22	0.21	0.21	0.18*			
American Chemistry Council Industry Average		0.71	0.65	0.57	0.63	0.65			
<i>*Includes A. Schulman sites as of August 21st, 2018.</i>									
<b>PROCESS SAFETY INCIDENT RATE</b>		0.011	0.022	0.032	0.030	0.018*			
<i>*Includes A. Schulman sites as of August 21, 2018 (Represents number of Level 3 and above process safety incidents per 200,000 hours worked. We classify process safety incidents on scale of 0 to 5, with Level 5 having the highest impact.)</i>									
ENVIRONMENTAL PERFORMANCE		2014	2015	2016	2017	2018			
<b>ENERGY USE</b> (MILLION GIGAJOULES)		392	411	382	408	416			
<b>ENERGY INTENSITY</b> (GIGAJOULES PER METRIC TON OF PRODUCT)		10.26	10.22	9.99	10.03	10.02			
<b>GREENHOUSE GAS EMISSIONS</b> (MILLION METRIC TONS OF CO <sub>2</sub> e)									
Scope 1 emissions		13.3	14.1	13.5	13.9	14.3			
Scope 2 emissions		8.5	8.7	8.3	9.0	9.1			
Total emissions		21.8	22.8	21.8	22.9	23.4			
<b>GREENHOUSE GAS INTENSITY</b> (METRIC TONS OF CO <sub>2</sub> e PER METRIC TON OF PRODUCT)		0.572	0.566	0.571	0.564	0.562			
<b>ENVIRONMENTAL INCIDENTS</b> (CATEGORIZED AS LEVEL 2 INCIDENTS OR ABOVE)									
Number of incidents		96	93	99	79	94			
	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>AIR EMISSIONS</b> ABSOLUTE (METRIC TONS)									
VOCs	9,479	8,675	8,036	7,529	7,510	8,117	8,293	8,098	7,636
NOx	9,391	8,785	8,185	8,015	8,117	8,054	7,327	8,057	7,841
CO	5,472	4,619	4,634	4,582	4,608	5,382	5,342	5,301	5,285
SOx	7,758	5,394	3,154	2,154	1,861	1,666	1,921	1,589	1,354
PM	2,558	2,134	1,907	1,425	1,419	1,352	1,251	1,305	1,197
<b>AIR EMISSIONS</b> INTENSITY (METRIC TONS PER MILLION METRIC TONS OF PRODUCT)									
VOC intensity	261	234	219	195	197	202	217	199	184
NOx intensity	259	237	223	208	212	200	192	198	189
CO intensity	151	124	126	119	121	134	140	130	127
SOx intensity	214	145	86	56	49	41	50	39	33
PM intensity	70	57	52	37	37	34	33	32	29
<b>OZONE DEPLETING SUBSTANCES</b> (KILOGRAMS OF CFC-11 EQUIVALENT)								59	74

ENVIRONMENTAL PERFORMANCE	2017*	2018
<b>WATER INTAKE BY SOURCE</b> (MILLION M <sup>3</sup> )		
Fresh Surface Water	98.8	109.0
Groundwater	26.4	26.4
Potable Water	9.0	8.8
Seawater/brackish water	70.0	70.0
Other Water Use	20.8	21.5
Sum of Water Intake (Total)	225.0	235.7
<b>WATER DISCHARGE BY DESTINATION</b> (MILLION M <sup>3</sup> )		
Fresh Surface Water	29.8	42.0
Groundwater	-	-
Potable Water	0.4	0.6
Seawater/brackish water	76.4	74.0
Other Water Use	18.0	18.5
Sum of Water Discharge (Total)	124.6	135.1

ENVIRONMENTAL PERFORMANCE	2017*	2018
<b>WATER CONSUMPTION BY SOURCE*</b> (MILLION M <sup>3</sup> )		
Fresh Surface Water	80.4	73.2
Groundwater	17.1	21.5
Potable Water	6.3	6.4
Seawater/brackish water	3.3	3.3
Other Water Use	3.8	4.0
Sum of Water Consumption (Total)	110.9	108.4
<b>WATER QUALITY</b> (METRIC TONS)		
Total Suspended Solids (TSS)	1,849	1,771
Biological Oxygen Demand (BOD)	576	596
<b>WATER INTENSITY</b> (M <sup>3</sup> WATER PER TONS OF PRODUCT)		
Water consumption intensity	2.73	2.61

\* Previously reported 2017 water consumption data has been revised to reflect changes in our water reporting definitions with the addition of new intake and discharge indicators.

ENVIRONMENTAL PERFORMANCE	2014	2015	2016	2017	2018
<b>WASTE BY TYPE</b> (THOUSAND METRIC TONS)					
Non-Hazardous Waste Production (t)	134	139	155	135	237
Hazardous Waste Production (t)	1,197	1,238	1,237	1,266	1,284
Total	1,331	1,377	1,392	1,401	1,521
<b>WASTE INTENSITY</b> (METRIC TONS PER TON OF PRODUCT)					
Non-Haz Waste Intensity (t)	0.0035	0.0034	0.0041	0.0033	0.0057
Hazardous Waste Intensity (t)	0.0313	0.0308	0.0323	0.0311	0.0309
Total	0.0348	0.0342	0.0364	0.0344	0.0366

## SOCIAL PERFORMANCE\*

EMPLOYEES BY REGION	Number of legacy LyondellBasell employees as of December 31, 2018	Number of employees as of December 31, 2018, including employees acquired from A. Schulman
North America	6,725	8,900
Europe	6,347	8,100
Rest of the world	1,158	2,450
Total	14,230	19,450

EMPLOYEES BY GENDER	NEW HIRES BY GENDER
Female	Female
2,488	262
Male	Male
11,742	947
Total	Total
14,230	1,209

EMPLOYEES BY AGE GROUP			NEW HIRES BY AGE GROUP		
18-29	30-49	50+	18-29	30-49	50+
1,705	7,039	5,486	485	611	112

ATTRITION BY AGE GROUP		
18-29	30-49	50+
129	327	306

\* Data as of December 31, 2018, based on a total of 14,230 legacy LyondellBasell employees, and excluding employees we acquired from A. Schulman in August 2018.

RACE/ETHNICITY OF EMPLOYEES (U.S. ONLY) AS DEFINED BY THE U.S. EQUAL EMPLOYMENT OPPORTUNITY COMMISSION	
American Indian or Alaskan Native	22
Asian	339
Black or African American	575
Hispanic/Latino	976
Native Hawaiian or Other Pacific Islander	8
Two or More Races	56
White	4,632
Not disclosed	83
Total	6,691

AVERAGE TRAINING HOURS PER EMPLOYEE PER JOB TYPE	
JOB TYPE	Average hours per person
Professional	17.3
Technical	24.5
Administrative	8.4



## LONDON

4th Floor, One Vine Street  
London W1J 0AH  
United Kingdom  
Tel: +44 207 220 2600

## ROTTERDAM

Delftseplein 27E  
3013 AA Rotterdam  
Netherlands  
Tel: +31 10 275 5500

## HOUSTON

LyondellBasell Tower, Ste 300  
1221 McKinney Street  
Houston, TX 77010  
Tel: +1 713 309 7200  
sustainability@lyb.com

## HONG KONG

32/F, Dorset House  
Taikoo Place  
979 King's Road  
Quarry Bay, Hong Kong  
China  
Tel: +852 2577 3855



[www.lyondellbasell.com](http://www.lyondellbasell.com)

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