The LyondellBasell Approach to Product Sustainability

2023

Introduction

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Product Sustainability

LyondellBasell

Agenda

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Solutions for a Better Tomorrow

Our Sustainability Approach

Chemicals and polymers enabling sustainability and playing a key role in our society

Our industry-leading sustainability ambitions and actions

Leading the way to profitably advance and innovate sustainable solutions

ENDING PLASTIC WASTE

2 MM+ TONS
of recycled and renewable-based polymers produced and marketed annually by 2030

FOR EVERY $
we invest in venture funds that address the plastic waste challenge, we help catalyze another $5 from co-investors

ZERO
Plastic pellet loss to the environment from our facilities

TAKING CLIMATE ACTION

NET ZERO
greenhouse gas emissions from operations by 2050[1]

42%
absolute scope 1 and 2 greenhouse gas emissions reduction from operations by 2030[2]

30%
absolute scope 3 greenhouse gas emissions reduction by 2030[2]

50%
minimum of electricity produced from renewable sources by 2030[2]

SUPPORTING A THRIVING SOCIETY

ZERO
incidents, injuries and accidents

ACHIEVE
gender parity in global senior leadership by 2032

INCREASE
the number of people from underrepresented groups in U.S. senior leadership roles to reflect the general population ratio by 2032

ASSESS
a minimum of 70% of our key global suppliers using sustainability criteria by 2025

1. Our 2050 net zero greenhouse gas emissions goal includes scope 1 and 2 emissions.
2. Relative to 2020 baseline.


Creating solutions for everyday sustainable living

Our approach is aligned with the United Nations Sustainable Development Goals

UN Global Compact
The UN Global Compact (UNGC) aims to mobilize a global movement of sustainable companies and stakeholders. The UNGC encourages companies to do business responsibly by aligning strategies and operations with Ten Principles on human rights, labor, environment and anti-corruption. LyondellBasell joined the UNGC in 2020.

UN Sustainable Development Goals
The UNGC also encourages companies to advance broader societal goals such as the 17 UN Sustainable Development Goals (UN SDGs) that serve as a call for action to tackle global challenges by 2030.
We mapped the relevant UN SDGs to our sustainability strategy.

Collaboration for impact at scale

Alliance to End Plastic Waste	World Economic Forum	World Business Council for Sustainable Development	The Recycling Partnership
EU Circular Plastics Alliance	New End Market Opportunities	Together for Sustainability	Cyclyx International

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Reporting and Recognition

Our bold actions are delivering results and gaining recognition

Strong governance and social scores bolstered by improving sustainability ratings

Ecovadis Sustainability Gold Rating

MSCI ESG AA Rating

LyondellBasell's "B" rating from CDP Climate does not account for our accelerated climate targets announced in December 2022

Consistently delivering top performing governance and social ratings as reported by ISS and Sustainalytics

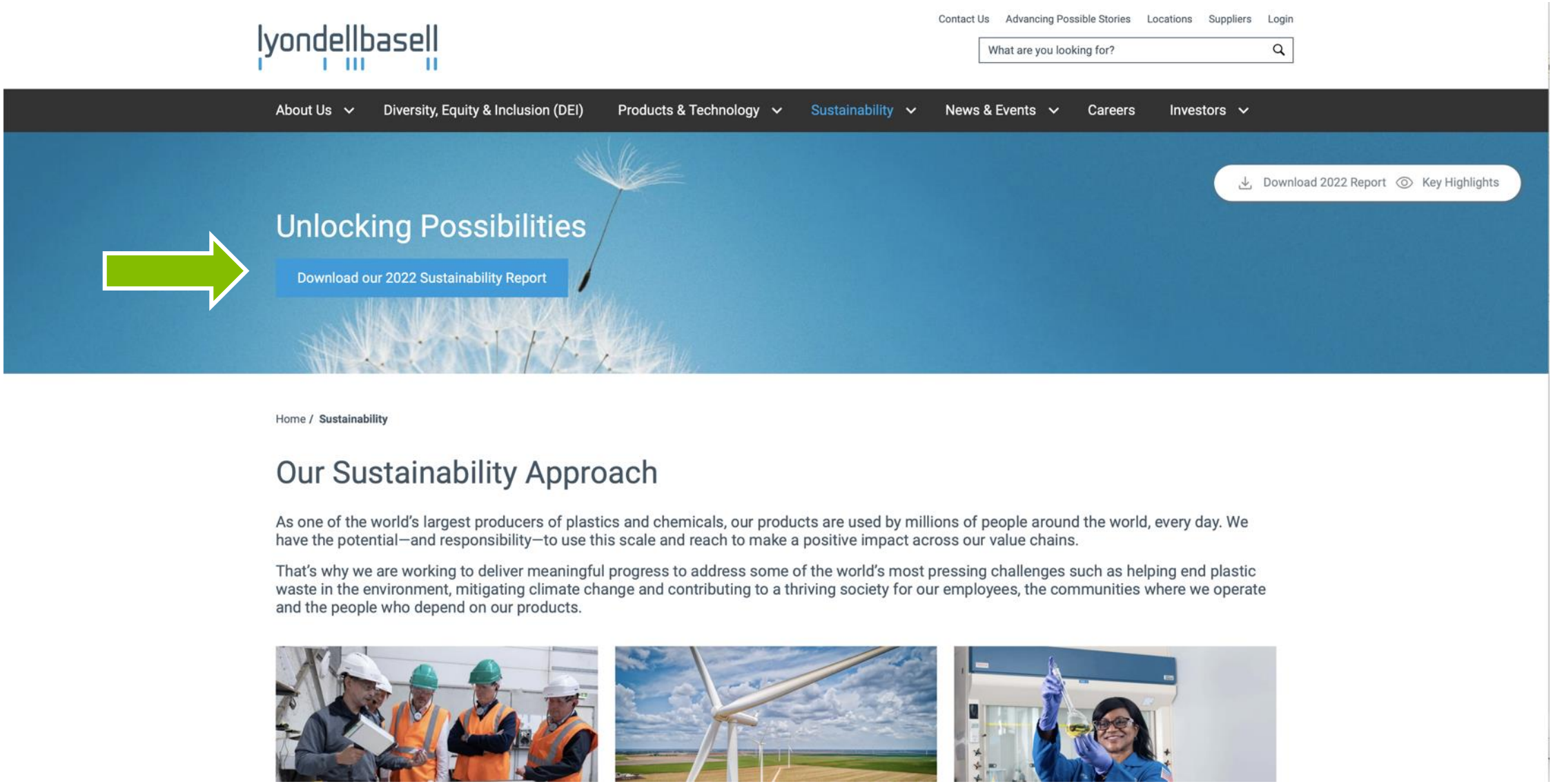
Added to FTSE4Good Indices

Above industry average according to S&P's 2022 Corporate Sustainability Assessment

We use widely adopted frameworks to communicate our sustainability performance

Global Reporting Initiative

Download our 2022 Sustainability report



Forward-Looking Statements

The statements in this presentation relating to matters that are not historical facts are forward-looking statements. These forward-looking statements are based upon assumptions of management of LyondellBasell which are believed to be reasonable at the time made and are subject to significant risks and uncertainties. When used in this presentation, the words “estimate,” “believe,” “continue,” “could,” “intend,” “may,” “plan,” “potential,” “predict,” “should,” “will,” “expect,” and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain such identifying words. Actual results could differ materially based on factors including, but not limited to, market conditions, the business cyclicality of the chemical, polymers and refining industries; the availability, cost and price volatility of raw materials and utilities, particularly the cost of oil, natural gas, and associated natural gas liquids; uncertainties and impacts related to the extent and duration of the pandemic; competitive product and pricing pressures; labor conditions; our ability to attract and retain key personnel; operating interruptions (including leaks, explosions, fires, weather-related incidents, mechanic

l failure, unscheduled downtime, supplier disruptions, labor shortages, strikes, work stoppages or other labor difficulties, transportation interruptions, spills and releases and other environmental risks); the supply/demand balances for our and our joint ventures’ products, and the related effects of industry production capacities and operating rates; our ability to manage costs; future financial and operating results; benefits and synergies of any proposed transactions; legal and environmental proceedings; tax rulings, consequences or proceedings; technological developments, and our ability to develop new products and process technologies; our ability to meet our sustainability goals, including the ability to operate safely, increase production of recycled and renewable-based polymers to meet our targets and forecasts, and reduce our emissions and achieve net zero emissions by the time set in our goals; our ability to procure energy from renewable sources; the successful shut down and closure of the Houston Refinery, including within the expected timeframe; our ability to successfully implement initiatives identified pursuant to our value enhancement program and generate anticipated earnings; potential governmental regulatory actions; political unrest and terrorist acts; risks and uncertainties posed by international operations, including foreign currency fluctuations; and our ability to comply with debt covenants and to repay our debt. Additional factors that could cause results to differ materially from those described in the forward-looking statements can be found in the “Risk Factors” section of our Form 10-K for the year ended December 31, 2022, which can be found at www.LyondellBasell. com on the Investor Relations page and on the Securities and Exchange Commission’s website at www.sec.gov. There is no assurance that any of the actions, events or results of the forward-looking statements will occur, or if any of them do, what impact they will have on our results of operations or financial condition. Forward-looking statements speak only as of the date they were made and are based on the estimates and opinions of management of LyondellBasell at the time the statements are made. LyondellBasell does not assume any obligation to update forward-looking statements should circumstances or management’s estimates or opinions change, except as required by law.

This presentation contains time-sensitive information that is accurate only as of the date hereof. Information contained in this release is unaudited and is subject to change. We undertake no obligation to update the information presented herein, except as required by law.

LyondellBasell’s reported emissions and expected reductions are based on a combination of measured and estimated data and are based on industry standards and best practices, including the Greenhouse Gas Protocol and guidance from the American Petroleum Institute. Emissions reported are estimates only, and data is subject to change as methods, data quality, and technology improvements occur. LyondellBasell’s goals to reduce emissions are good faith efforts based on current relevant data and methodology, which could be changed or refined as we evolve our approach to identifying, measuring and addressing emissions.

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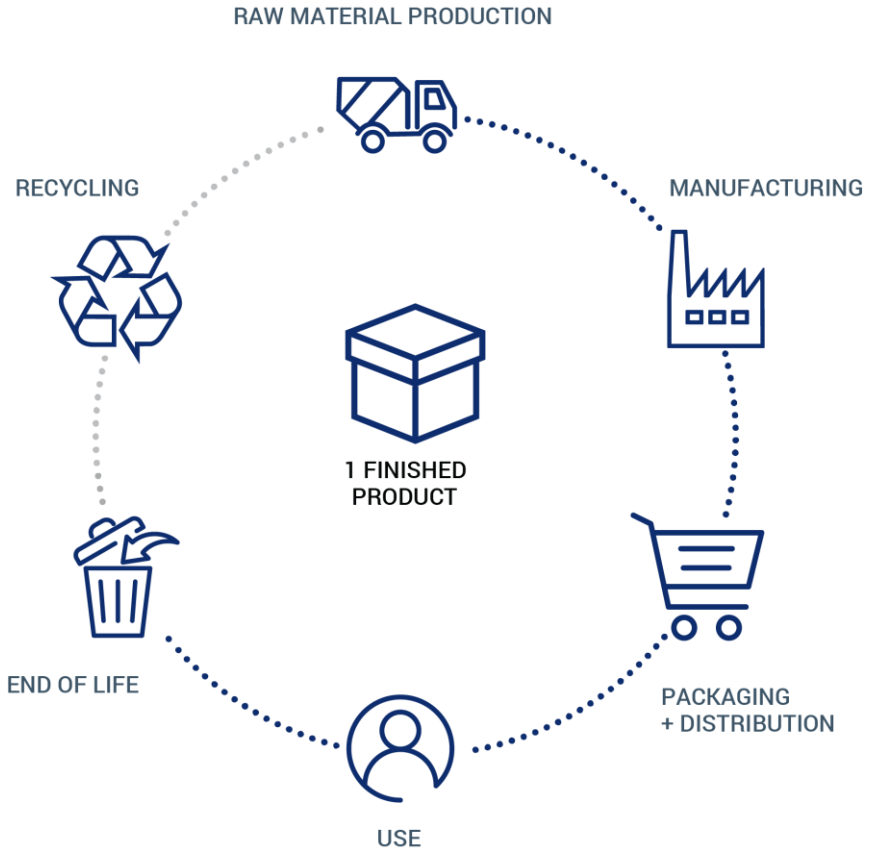
Measuring Product Sustainability and Available Standards

What is Life Cycle Assessment? – A fundamental concept to measure environmental sustainability

- Life Cycle Assessment (LCA) is a **robust, standardized methodology to assess environmental impacts associated with the complete or part of the life cycle (creation, use, end-of-life) of products, processes and activities**.
- It provides an **objective, science-based technique** for calculating environmental performance **according to ISO 14040 and ISO 14044**.
- Life cycle impact assessment (LCIA) is used in LCA to **establish a linkage between the inventory of elementary flows** for the system of the product or process **and** its **potential environmental impacts.**
- A **product carbon footprint (PCF) is part of the LCA** and reflects the impact on climate change. This results category covers all GHG emissions and removals (e.g., CO_2 uptake by plants via photosynthesis) presented in CO_2 equivalents (CO_2eq.).



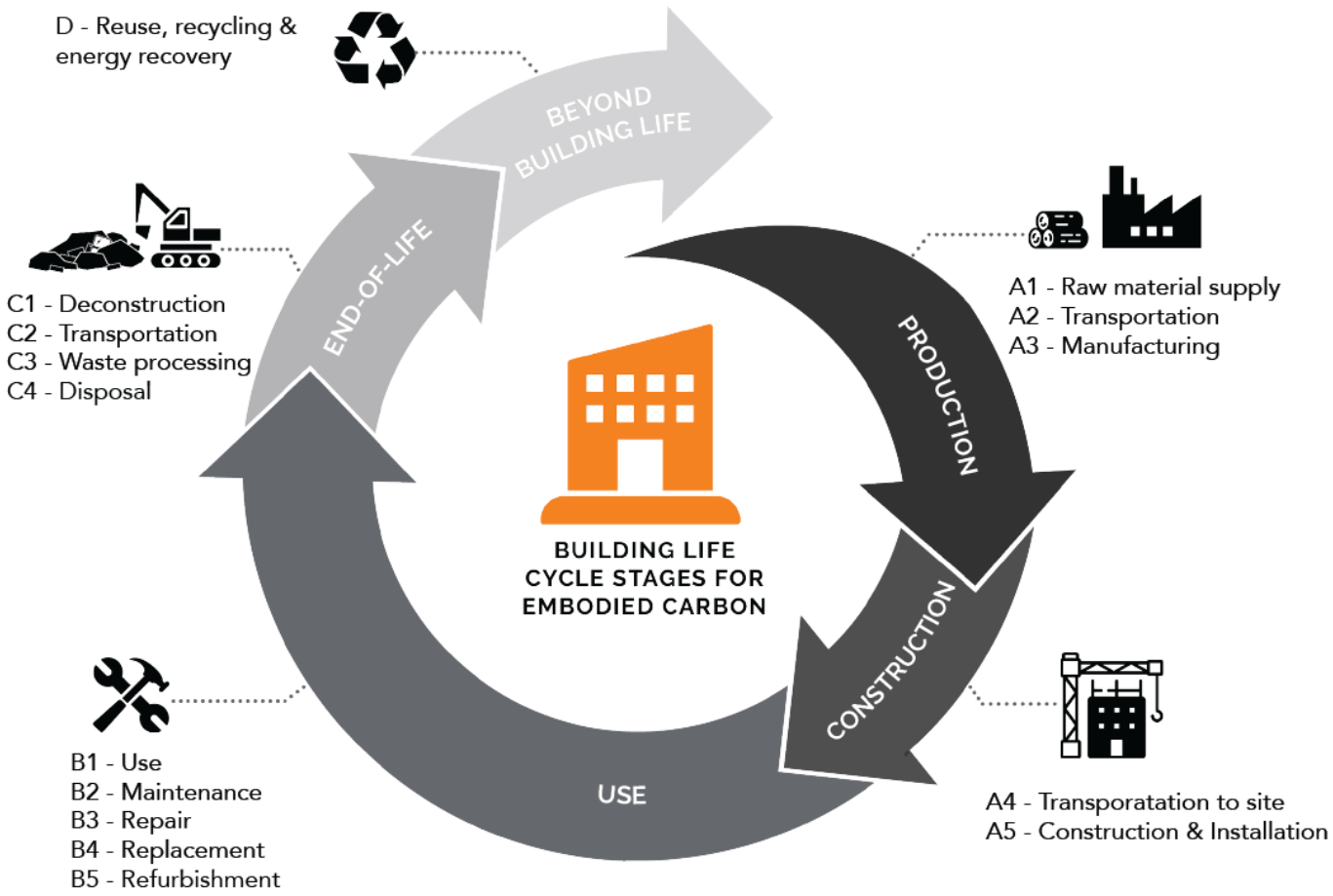
Schematic product life cycle – cradle to grave
Source: ICCA 2021

LCA is a robust and standardized method (ISO 14040 and 14044)

Standards concerning LCAs and EPDs and the assessment cycle

The following standards set out how LCAs and **Environmental Product Declarations** (EPDs) should be undertaken and presented

- **ISO 14040**: Environmental Management - Life Cycle Assessment - Principles and Framework
- **ISO 14044**: Environmental Management – Life Cycle Assessment - Requirements and Guidelines
- **EN 15643:2021**: Sustainability of Construction Works - Sustainability of Buildings – Parts 1, 2 and 3
- **EN 15978**:**2021** Sustainability of Construction Works - Assessment of Environmental Performance in Buildings - Calculation Method
- **EN 15804 (**EN 15804+A2): Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products



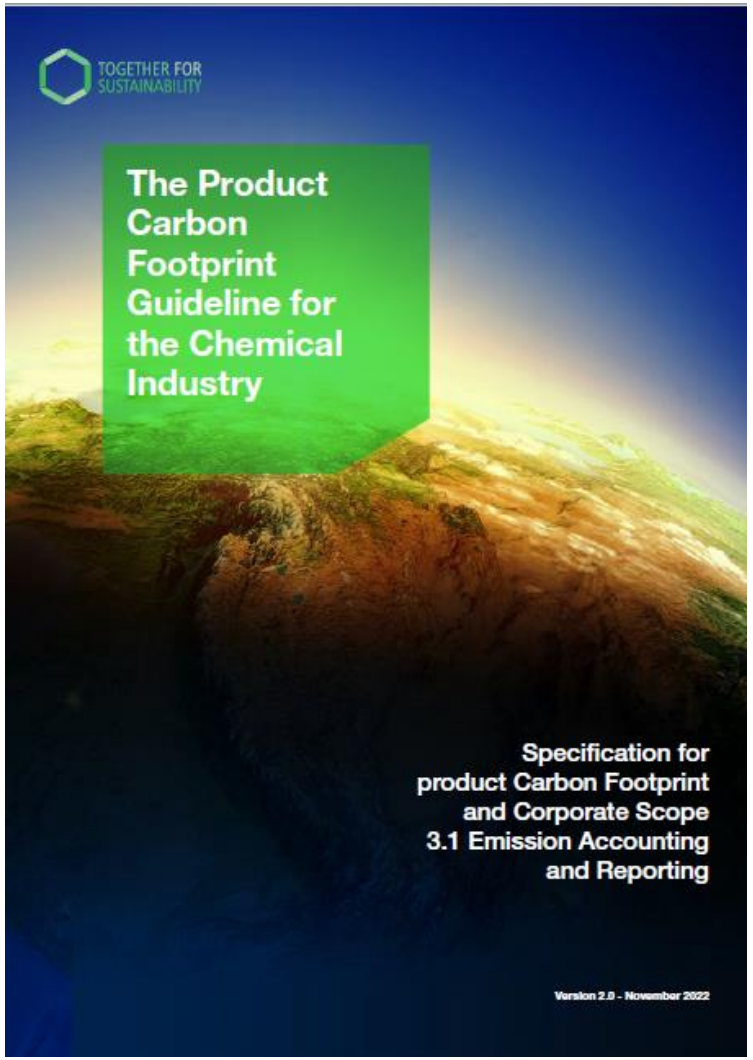
Adapted from the figure 6 of EN 15978 by ZEBx.org

Standards LYB will support

- Product Environmental Footprint (PEF) proposed by the EC (PEF guidance 6.3)
- Environmental Product Declarations according to EN 15804+A2
- LCA framework ISO 14040/44 (ISO/TS 14071: Environmental management — Life cycle assessment — Critical review processes and reviewer competencies: Additional requirements and guidelines to ISO 14044:2006
- ISO 14067: Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification
- TfS: The Product Carbon Footprint Guideline for the Chemical Industry

Together for Sustainability (TfS) - PCF Guideline for the Chemical Industry

- TfS is a global, procurement-driven initiative designed to improve the sustainability performance of chemical companies and their suppliers through the development of common approaches to audits, scope 3 GHG emissions measurement tools and supplier assessments issued by EcoVadis.
- The program is based on the UN Global Compact and Responsible Care® principles.
- Through our participation, LyondellBasell aims to assess and improve our procurement operations and supply chain, against a set of well-defined environmental, social and governance criteria.
- The TfS members developed a dedicated Product Carbon Footprint Guideline (**Scope 3 GHG Emissions Programme - TFS Initiative (tfs-initiative.com)**



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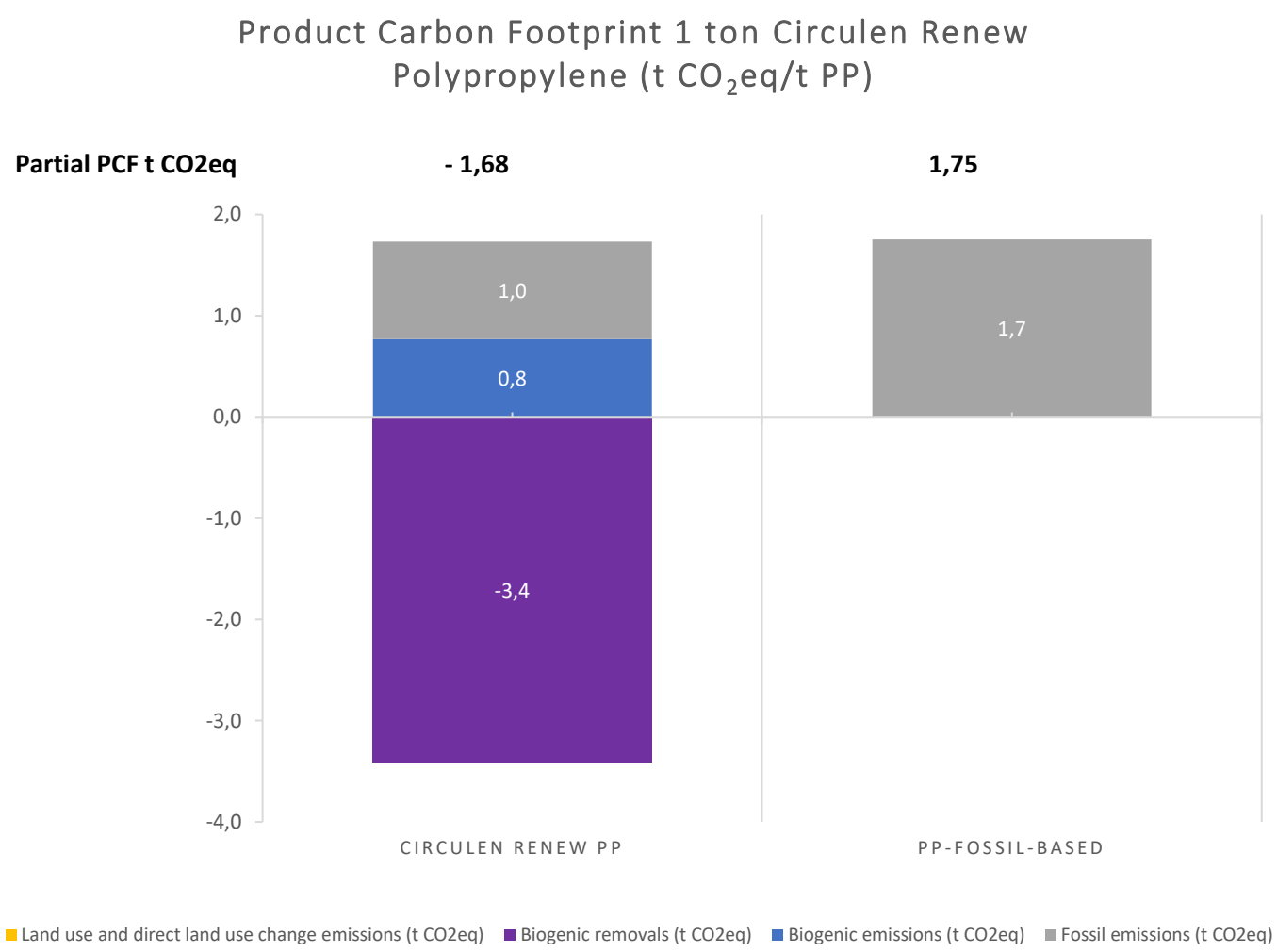
Reducing your scope 3 emissions with *Circulen*Renew

Product Carbon Footprint (PCF) of *Circulen*Renew Polypropylene (cradle-to-gate, ISO 14067)



The sum of four GHG emission types forms the product's carbon footprint.

- **Fossil GHG emissions** are related to e.g., processing of fossil feedstock, and combustion emissions from fossil energy carriers like coal, crude oil, and natural gas. They also occur in the processing of fossil-based naphtha to polymer products.
- **Biogenic GHG emissions** are related to treating and processing plant-based feedstock. By processing biomass-based feedstock biogenic carbon emission might occur from each processing step.
- **Biogenic removal** (negative) represents the carbon uptake of plant material during growth via photosynthesis. The biogenic removal is allocated over all products, by-products and wastes made from biomass-based materials.
- **Land use and land use change emissions** represents the emissions occurring from land clearing (deforestation) and land use (change in carbon soil stock during plant cultivation).

Please note: The land use and land use change emissions for both polymers are below 0,0005 tCO2eq./t product and therefore are not visible in the graph.

Circulen Renew carbon footprint results at a glance

Cradle-to-gate PCF of our *Circulen*Renew Portfolio (based on a critically reviewed LCA study)

PP **-1.68**

LDPE **-1.37**

HDPE **-1.39**

t CO_2eq emissions per ton of polymer production eq. (*)

LyondellBasell buys bio-circular feedstock sourced from

100% biomass-based waste & residues

(ISCC PLUS Certified)

Cradle-to-grave PCF reduction potential of our *Circulen*Renew Portfolio (using the worst-case End-of-Life scenario: Energy Recovery)

PP **70%**

LDPE **65%**

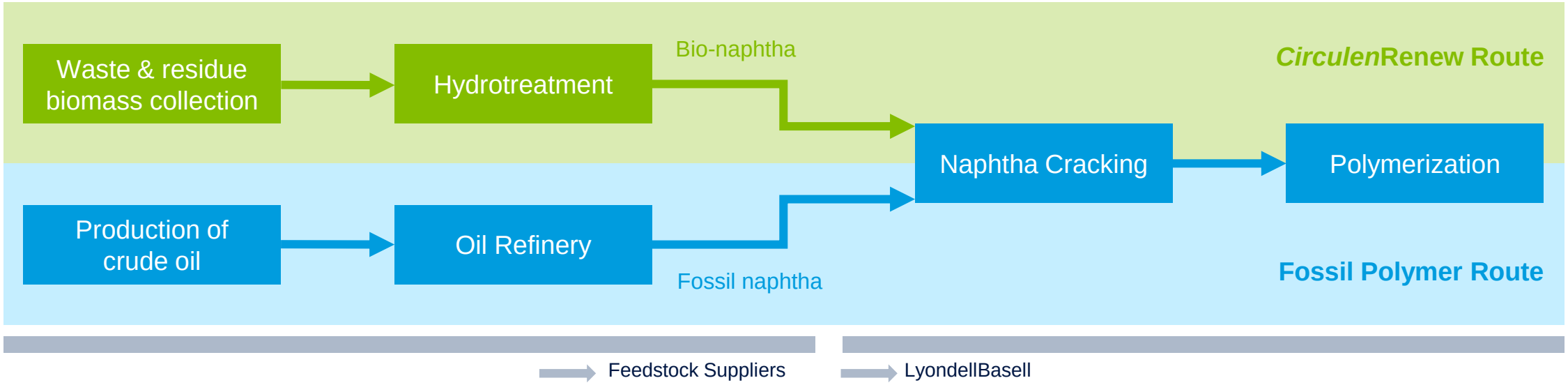
HDPE **65%**

lower than fossil-based over the entire life cycle

*** Cradle-to-gate** LCA approach **based on a feedstock composed of waste and residue oils,** when taking a waste like approach to all raw materials in the feedstock and is compared to fossil feedstock -based polymer.

CO_2eq is the reference unit for measuring the product impact on climate change = product carbon footprint. The used scientific method of global warming potential sums up all greenhouse gases. The GHG emissions are getting characterized with their impact towards global warming using the reference of CO_2. The result of a carbon footprint is then expressed as CO_2eq of a product.

The production pathway of our polyolefins



A Cradle-to-gate LCA is a partial product life cycle assessment covering the processing steps from resource extraction (cradle) to the manufacturing of the product (gate). The following steps are included in the system boundaries of our study:

- in the upstream of **renewable feedstock**, the collection of waste and residue biomass materials, their processing to bio-naphtha, and all transportation operations
- in the upstream of **fossil feedstock**, the extraction of fossil fuels, their refining to fossil naphtha, and all transportation operations
- the cracking of naphtha, bio or fossil-based, for monomer production through a steam cracker, and the polymerization

The functionalities of a *Circulen*Renew polymer and the equivalent from fossil origin are the same; the differences are in their CO_2eq emissions during production.

Summary

With *Circulen*Renew, we support our customers in reaching your climate targets and in reducing the carbon footprint of your products

- The data reported in this presentation are in part extracted from the LCA study (here named LCA): “Life Cycle Assessment of Polypropylene, Low-Density Polyethylene and High-Density Polyethylene produced at European plants, by using feedstocks from fossil or biomass origin”, commissioned by LyondellBasell to Sphera.
- The study has been executed according to ISO 14040/14044, it was critically reviewed by a panel of experts with backgrounds in biomass feedstocks, Plastics Europe methodology and chemical recycling. The carbon footprint results have also been shared according to ISO 14067.
- The cradle-to-gate LCA aims to compare the environmental impacts of the production of polyolefins (PP, LDPE, HDPE) based on fossil versus biomass-based feedstock.
- On a certified ISCC PLUS mass-balance basis, LyondellBasell purchases bio-circular feedstock (HVO hydrogenated vegetable oil) consistent with the feedstock assumptions in the LCA.
- The analysis takes a waste-like approach to the feedstock material on an ISCC+ certified mass balance basis.
- In addition, we provide a perspective on the stored biogenic carbon in the EoL.

Disclaimers

In general, reference to the *CirculenRenew* label indicates products sourced from bio-based feedstocks using a mass balance approach with a lower Product Carbon Footprint (PCF) compared to equivalent products from LyondellBasell that are sourced from fossil feedstocks. This conclusion is based on a critically reviewed cradle-to-gate life cycle assessment study commissioned by LyondellBasell. It's important to note that the cradle-to-gate methodology excludes emissions that occur after manufacturing. The PCFs provided are estimates and rely on current, relevant data and methodologies. These may be updated or refined as we continue to evolve our approach to identifying, measuring, and addressing emissions. For further information regarding the life cycle assessment methodology, including all underlying assumptions and results, please contact your LyondellBasell sales representative.

The Product Carbon Footprints (PCFs) displayed in this presentation are calculated in accordance with general standards for life cycle assessment (ISO 14040 and ISO 14044) and the carbon footprint of products (ISO 14067). However, these standards do not provide specific guidelines on how the PCF should be determined for individual products. In the absence of industry-specific guidelines for calculating PCFs in the plastics sector, it is not yet possible to make accurate comparisons of the same products from different companies. The calculations for PCF are based on greenhouse gas (GHG) emissions from LyondellBasell plants and utilize high-quality average data for purchased feedstocks and energy.

ISCC+ certified bio-based raw materials, which include bio-based wastes and residues such as used cooking oil (UCO) and palm fatty acid distillates (PFAD), are allocated to *CirculenRenew* products using a mass balance approach. The use of a mass balance approach means that we mix fossil feedstocks with bio-based feedstocks in our traditional production processes and allocate bio-based feedstock to the final product via mass balance certificates; individual products may or may not physically contain bio-based material. In the life cycle assessment, all bio-based raw materials in the feedstock, including PFAD, are treated using a waste-like approach. For more information on alternative feedstock scenarios, please consult your LyondellBasell sales representative.

While PCFs provide transparency about the greenhouse gas emissions associated with products, they should not be viewed as a comprehensive assessment of a product's sustainability.

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