Solutions for a Better Tomorrow

LyondellBasell Advancing Sustainable Solutions: Unlocking possibilities

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Agenda

- **LyondellBasell approach to sustainability**
  - Our sustainability ambitions & actions
  - 2022 Sustainability Highlights
- ***Circulen* Polymers – Unlocking the Circular Potential of Plastics**
- **LCA study introduction for *Circulen*Recover PPC**
  - Life Cycle Assessment system boundary, hypothesis & data source
  - CO_2eq emission results of *Circulen*Recover PPC products
  - Life Cycle Assessment summary and outlook
- ***Circulen*Renew & *Circulen*Revive by mass balance**
  - Mass balance concept
  - LyondellBasell ISCC Plus Certification Footprint
  - CO_2eq emissions of *Circulen*Renew Polypropylene
- **Conclusion & outlooks**
  - LyondellBasell : your partner of choice for low-carbon solutions & circular economy

Solutions for a Better Tomorrow

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 will invest in venture funds that address the plastic waste challenge; we help catalyze $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

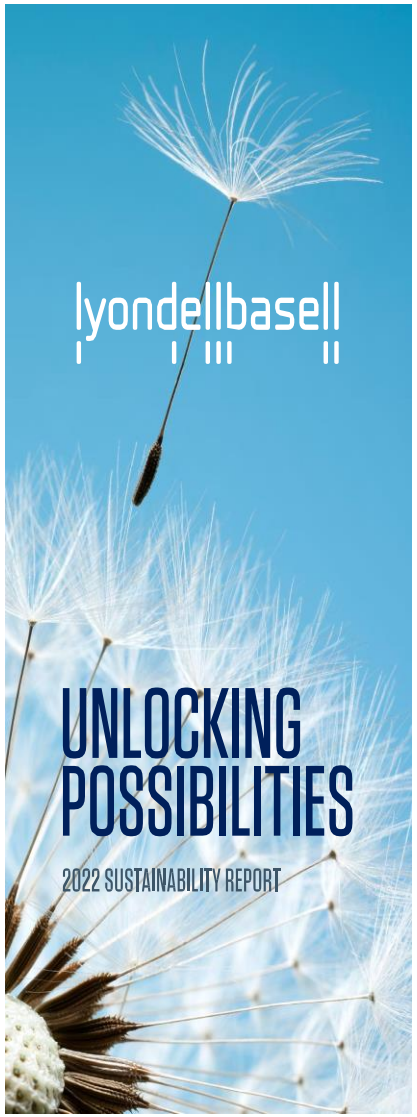
ACHIEVE
gender parity in global senior leadership by 2032

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.

2022 Sustainability Highlights



0.12
Total Recordable Injury Rate (TRIR), a record low performance and top decile for our industry

4 MILLION+
safe work hours achieved at 5 manufacturing sites

1 MILLION+
safe work hours achieved at 21 manufacturing sites

55
sites achieved GoalZERO performance with zero injuries and zero process safety and environmental incidents[1]

4
new plastic waste recycling projects and ventures announced to grow our mechanical recycling footprint and increase access to feedstock through advanced sorting

175,000
metric tons of recycled and renewable-based polymers produced and marketed since 2019

FIRST
commercial scale, single-train advanced recycling plant using LyondellBasell's proprietary *MoReTec* technology progressed to engineering

INCREASED
our greenhouse gas emissions reduction target for scope 1 and 2 from 30% to 42%, and established a 2030 scope 3 emissions reduction target of 30%[2]

LIMITED INSURANCE
engagement over our 2022 total energy consumption and scope 1 and scope 2 emissions performed by PwC

50%+
of our goal to procure at least half of our electricity from renewable sources by 2030 achieved, which will reduce our scope 2 emissions by nearly 1 MMT[3] annually when the projects are operational[4]

40%
of the Chief Executive Officer's direct reports are women, as of February 2023

17,000+
diversity, equity and inclusion training hours completed by 6,200 employees

6
total Employee Networks, with the addition of our Global Latin and Global Asian/Pacific Islander networks in 2022

$11 MILLION
in charitable investments globally through 1,800 grants

[1] Data is based on Level 2+ incidents. We classify incidents on scale of 0 to 5, with Level 5 having the highest impact.
[2] Relative to a 2020 baseline.
[3] Million metric tons.
[4] Based on 2020 procured levels.

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Circulen Polymers – Unlocking the Circular Potential of Plastics

Advancing Circular Solutions

Mechanical Recycling

Compounds derived from mechanically recycled plastic waste

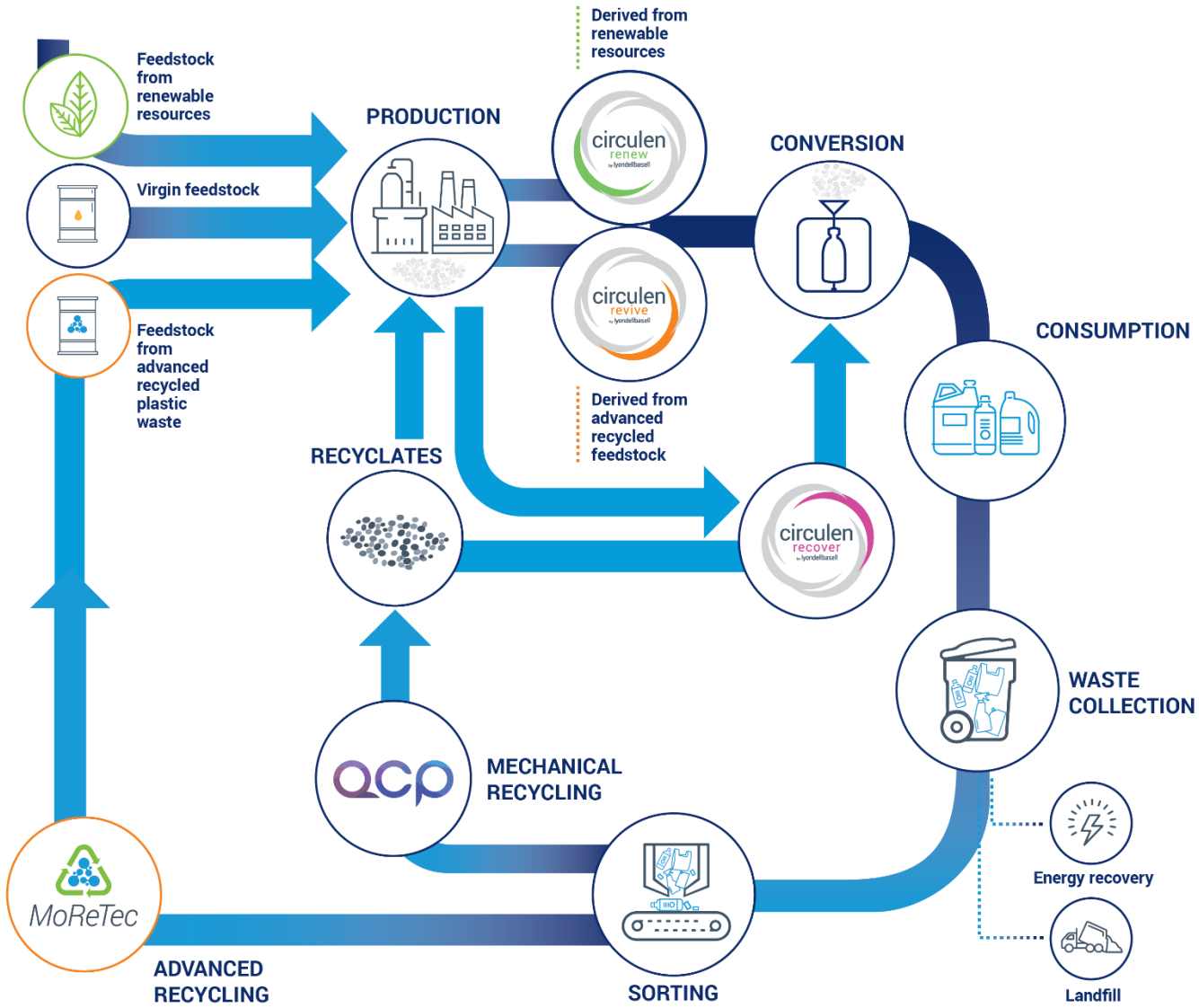
Renewable Feedstocks

Compounds derived from renewable resources*

Advanced Recycling

Compounds derived from Molecular Recycling Technology*

*on a mass balance approach



Advancing Circular Solutions

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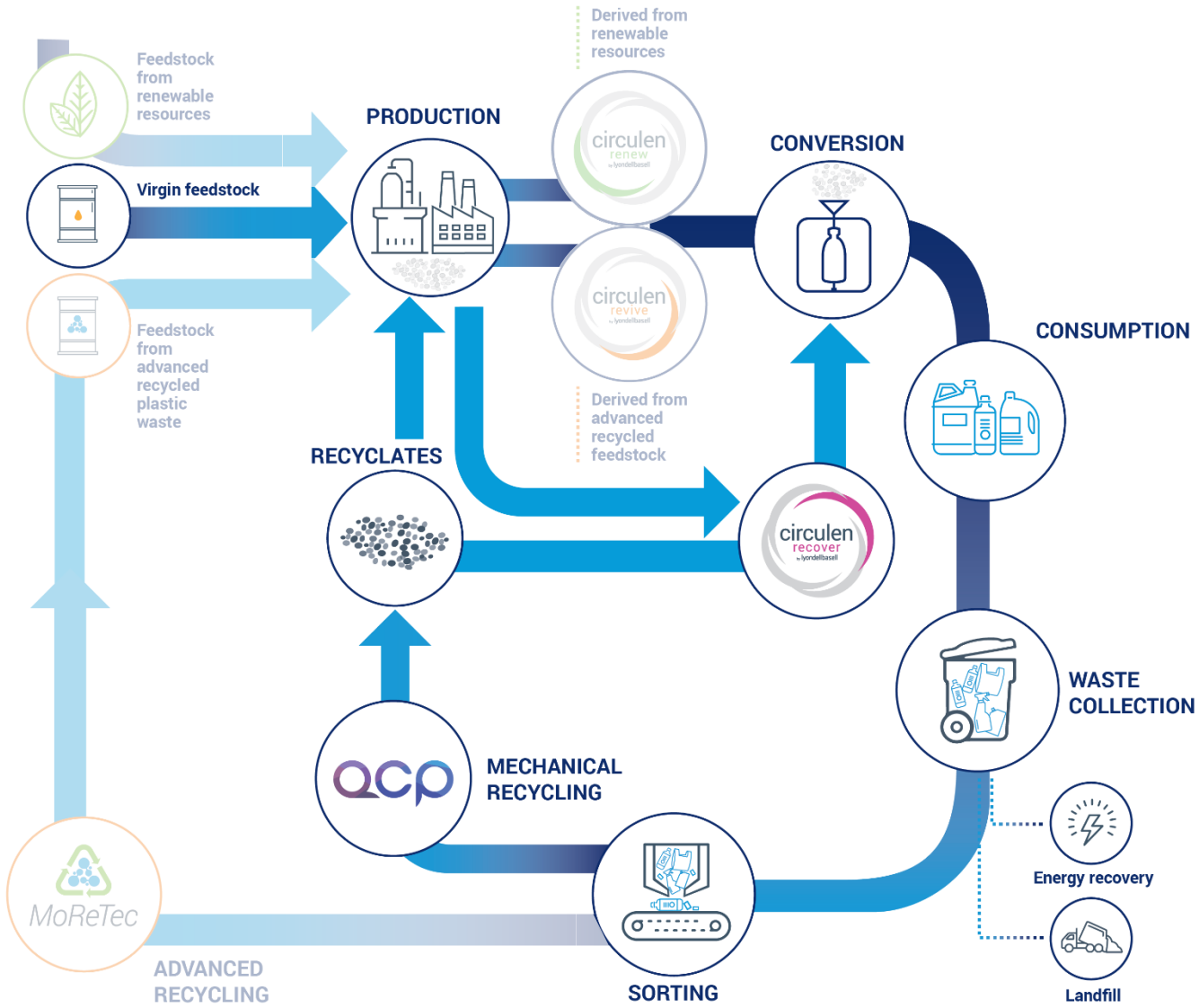

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LCA study introduction for *Circulen*Recover PPC

LCA study

ADVANCING CIRCULARITY

LyondellBasell

***Circulen*Recover PPC**

Quantis

Angela Schindler
Umweltberatung

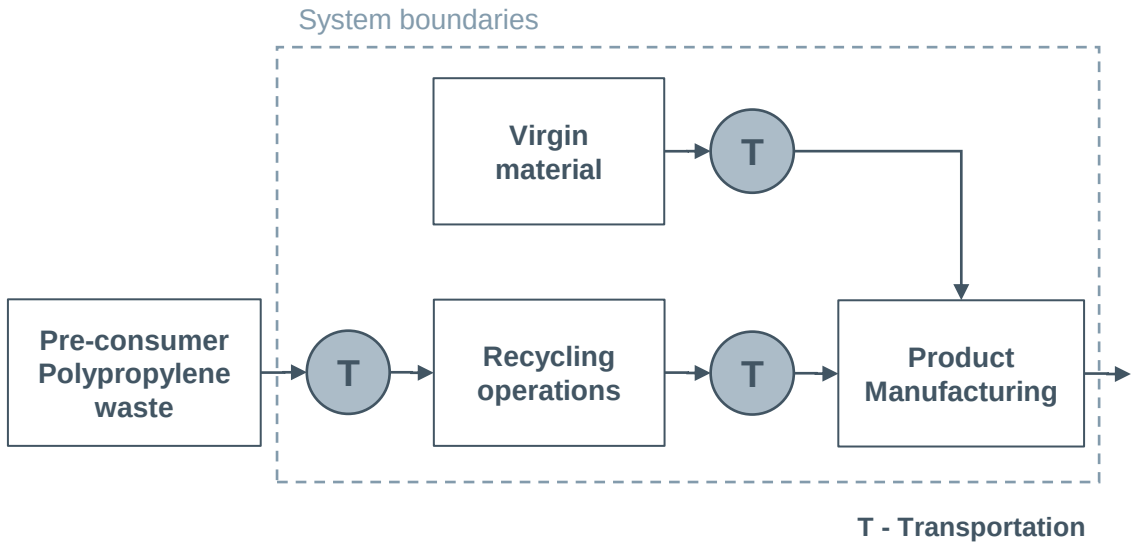
- Source: “Comparative Life Cycle Assessment Of Different Recycled Post-industrial & Primary Polypropylene Compounds”, *version 1.3*
- Publication date: November 2021
- External 3rd Party peer reviewed LCA of *Circulen*Recover PPC polymer products according to ISO 14040, 14044
- Cradle-to-gate LCA approach
- The analysis covers PP based compounds produced at our European own assets, partially composed of Pre-consumer waste, reference period 2020
- Impact categories were chosen according to CML-IA baseline 2016 indicators
- The LCA is conducted by QUANTIS
- The study was regularly reviewed by Angela Schindler, Umweltberatung
- Software used: GaBi
- Database: Ecoinvent 3.7.1 and GaBi professional
- Virgin polymer data: Plastics Europe Eco Profiles

Cradle-to-gate system boundaries

ADVANCING CIRCULARITY

LyondellBasell

***Circulen*Recover PPC**



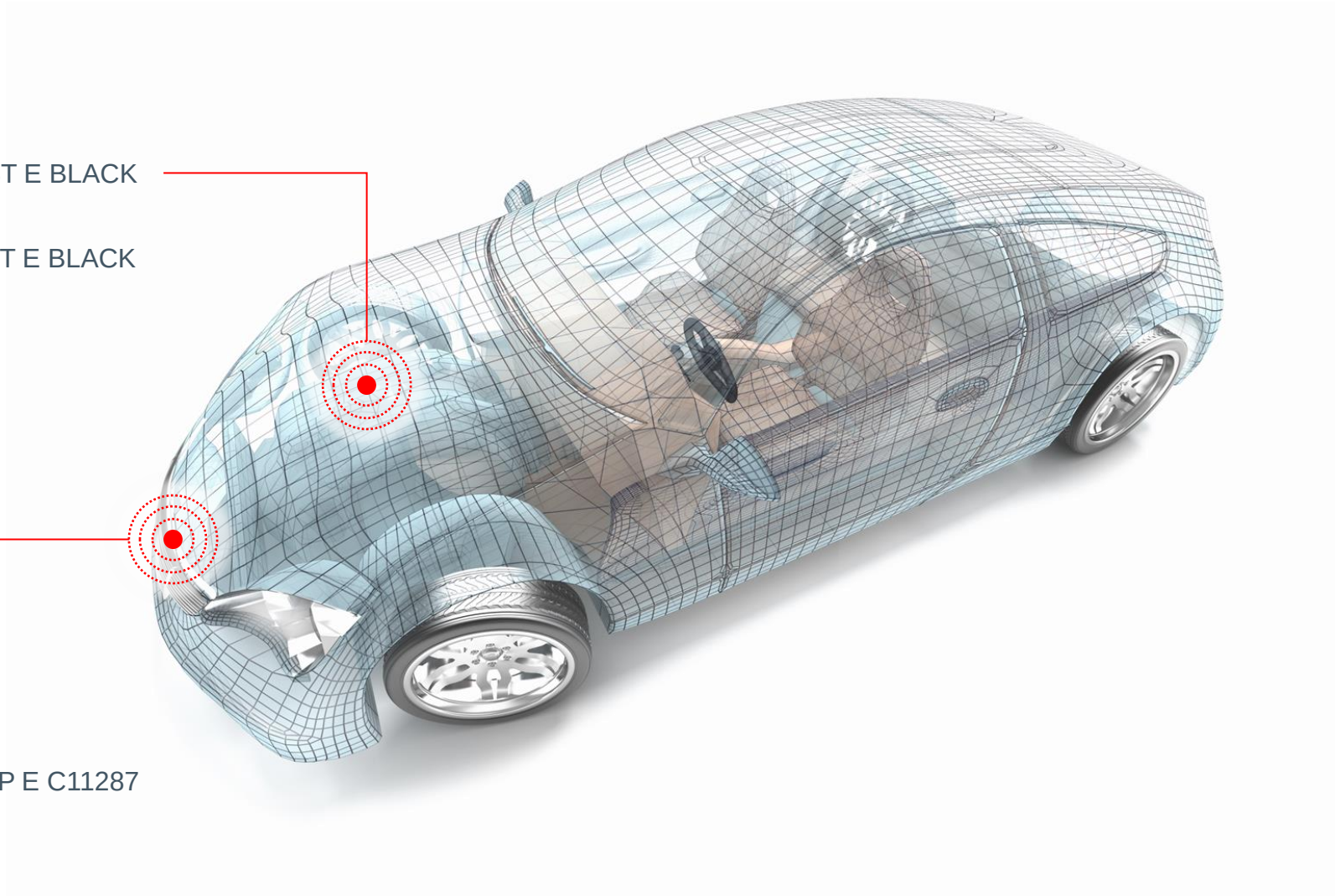
The following steps are included in the system boundaries of this study:

- Raw material production
- Collection, pre-treatment & mechanical recycling of pre-consumer polypropylene
- Upstream transportation of raw materials
- Upstream and downstream packaging
- Compounding

*Circulen*Recover PPC materials selected for the LCA Study

UNDER THE HOOD APPLICATION

- GLASS FIBERS REINFORCED
  - *Circulen*Recover PPC EKG 2268T E BLACK
- MINERAL FILLED
  - *Circulen*Recover PPC EKC 2269T E BLACK



EXTERIOR APPLICATION

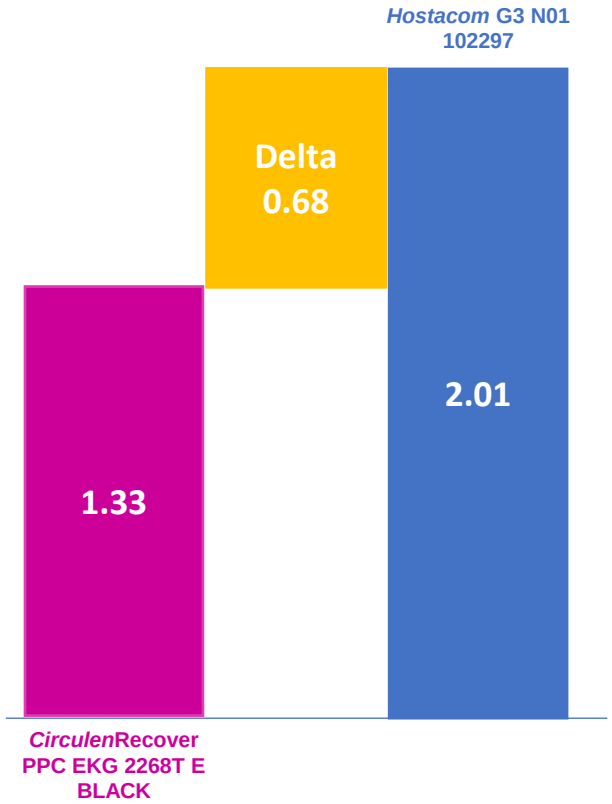
- VISIBLE BUMPER TRIMS
  - *Circulen*Recover PPC TKC 2308P E C11287

CO_2eq emissions: *Circulen*Recover PPC 30% glass fibers reinforced

CO_2eq emissions comparison between:
*Circulen*Recover PPC EKG 2268T E BLACK and LyondellBasell Benchmark: *Hostacom* G3 N01 102297

(metric tons CO_2eq per ton of product)

Note: the sizes of the bars are not precisely scaled but are indicative



The use of *Circulen*Recover PP reduces the CO_2eq emission by **0.68 tons CO_2eq per ton of product** vs. equivalent fossil-based polypropylene compound

Having a reduced CO_2eq emission value the use of *Circulen*Recover PPC will lead to a **CO_2eq reduction of 34% on a Cradle-to-gate (*) basis vs. the equivalent fossil-based PP Compound**[1]

This evaluation is based on a full pre-consumer waste raw material PP content

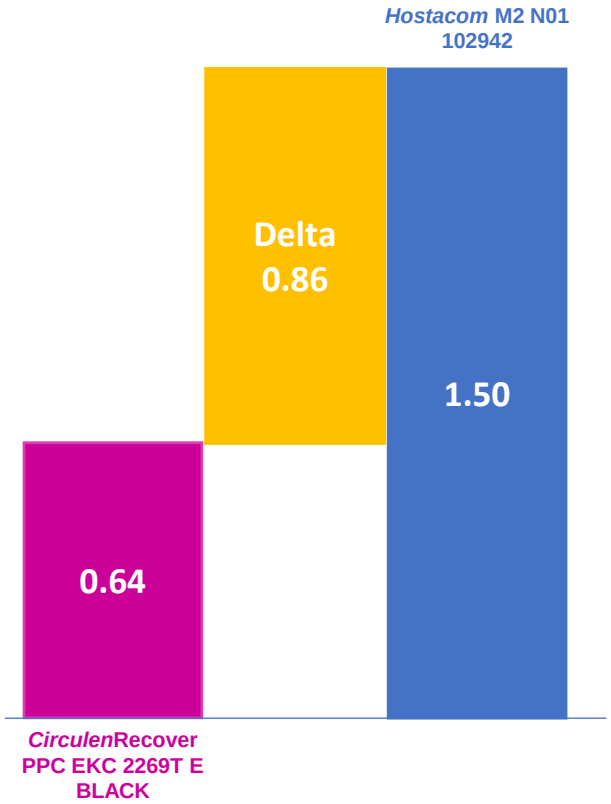
(*) Cradle-to-gate LCA is a partial product life cycle assessment covering from resource extraction (cradle) to the manufacture of the product (gate).

CO_2eq emissions: *Circulen*Recover PPC 20% talc filled

CO_2eq emissions comparison between: *Circulen*Recover PPC EKC 2269T E BLACK and LyondellBasell Benchmark: *Hostacom* M2 N01 102942 (homopolymer)

(metric tons CO_2eq per ton of product)

Note: the sizes of the bars are not precisely scaled but are indicative



The use of *Circulen*Recover PP reduces the CO_2eq emission by **0.86 tons CO_2eq per ton of product** vs. equivalent fossil-based polypropylene compound

Having a reduced CO_2eq emission value the use of *Circulen*Recover PPC will lead to a **CO_2eq reduction of 57% on a Cradle-to-gate (*) basis vs. the equivalent fossil-based PP Compound**[1]

This evaluation is based on a full pre-consumer waste raw material PP content

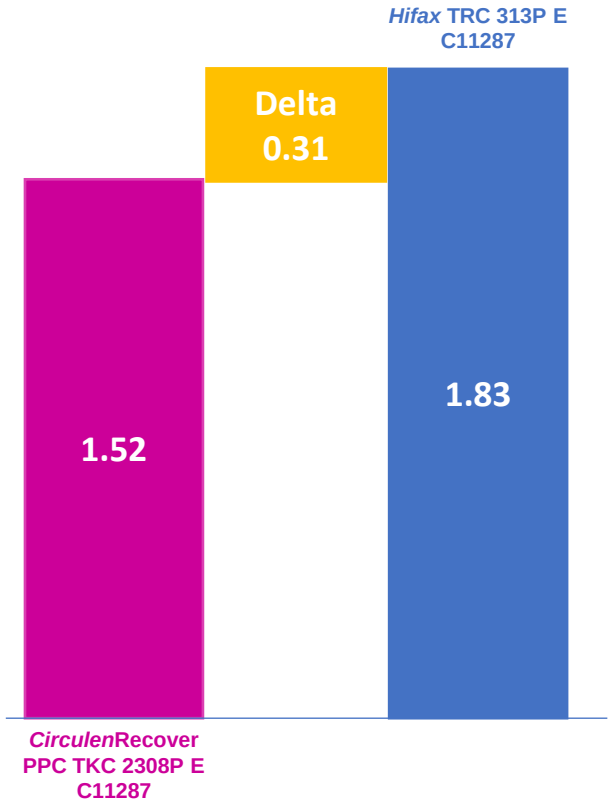
(*) Cradle-to-gate LCA is a partial product life cycle assessment covering from resource extraction (cradle) to the manufacture of the product (gate).

CO_2eq emissions: *Circulen*Recover PPC 10% talc filled & impact modified

CO_2eq emissions comparison between:
*Circulen*Recover PPC TKC 2308P E C11287 and LyondellBasell Benchmark: *Hifax* TRC 313P E C11287

(metric tons CO_2eq per ton of product)

Note: the sizes of the bars are not precisely scaled but are indicative



The use of *Circulen*Recover PP reduces the CO_2eq emission by **0.31 tons CO_2eq per ton of product** vs. equivalent fossil-based polypropylene compound

Having a reduced CO_2eq emission value the use of *Circulen*Recover PPC will lead to a **CO_2eq reduction of 17% on a Cradle-to-gate (*) basis vs. the equivalent fossil-based PP Compound**[1]

This evaluation is based on a partially pre-consumer waste raw material PP content (25% according to ISO 14021)

(*) Cradle-to-gate LCA is a partial product life cycle assessment covering from resource extraction (cradle) to the manufacture of the product (gate).

LCA* summary

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***Circulen*Recover PPC**

CO_2eq savings vs. equivalent fossil-based polymers (**)

***Circulen*Recover PPC EKG 2268T E BLACK**	***Circulen*Recover PPC EKC 2269T E BLACK**	***Circulen*Recover PPC TKC 2308P E C11287**
0,68 tons	**0,86 tons**	**0,31 tons**
34%	**57%**	**17%**

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

Mechanical recycled feedstock up to

100 %

Pre-consumer waste vs. virgin based

*** Life Cycle Assessment (LCA)** according to ISO 14040 & ISO 14044 is the compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle

*** A carbon dioxide equivalent or CO_2 equivalent, abbreviated as **CO_2eq** is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential. SOURCE: Eurostat*

**** **Cradle-to-gate** LCA calculated up to the polymer production and based on a feedstock composed of mechanical recycling Pre-consumer waste*

Cut-off approach have been applied

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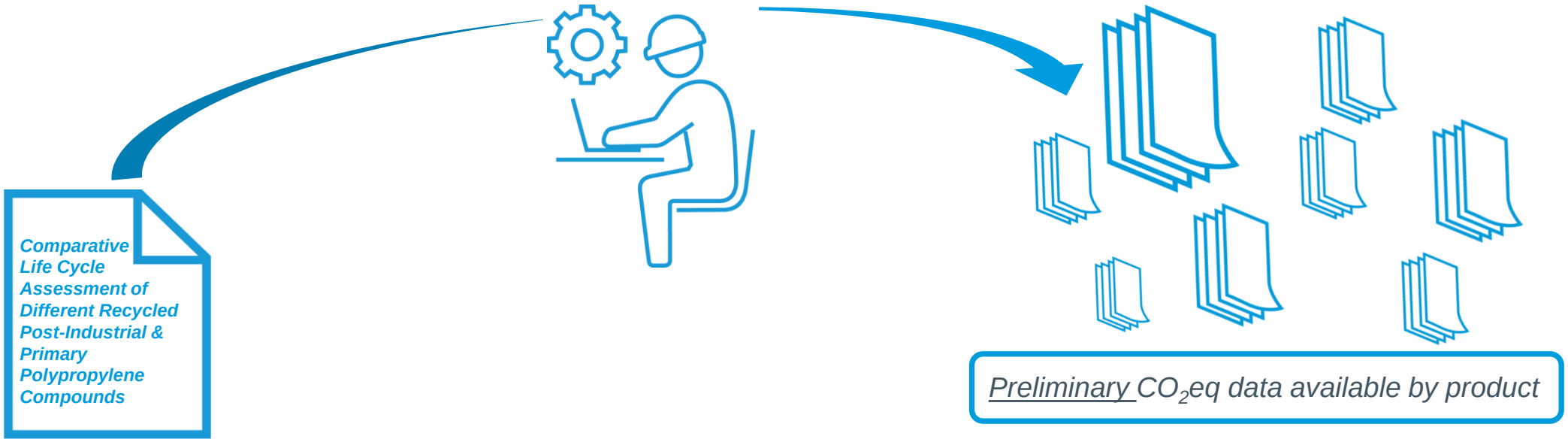
LCA achievements 2023



Achievements 2023:

Calculation of CO_2eq data extended on LyondellBasell PPC portfolio

Preliminary CO_2eq data available on more than 700 PPC products

The preliminary CO2-equivalent emission values are shared for information purposes only. The values have been calculated using a cradle-to-gate system boundary and the methodology for this set of results is based on a peer reviewed LCA study: 'Comparative Life Cycle Assessment of Different Recycled Post-Industrial & Primary Polypropylene Compounds', and uses primary foreground data from some LyondellBasell family of companies ("LyondellBasell") combined also with secondary background datasets from PlasticsEurope (Dec. 2016) and Ecoinvent (3.7.1).

Users are advised that the preliminary CO2-equivalent emissions values have to date not been assessed within an ISO standardized framework (study). The information provided does therefore not constitute a self-declared environmental claim or the like.

Even though LyondellBasell believes the data provided to be reliable, we make no warranty, express or implied, as to the accuracy or completeness of, nor assume any liability for, such information and users therefore can only accept and use it at their sole risk.

Before using a product sold by LyondellBasell, users should make their own independent determination that the product is suitable for the intended use and can be used safely and legally.

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*Circulen*Renew & *Circulen*Revive by mass balance approach

Advancing Circular Solutions

Mechanical Recycling

Compounds derived from mechanically recycled plastic waste

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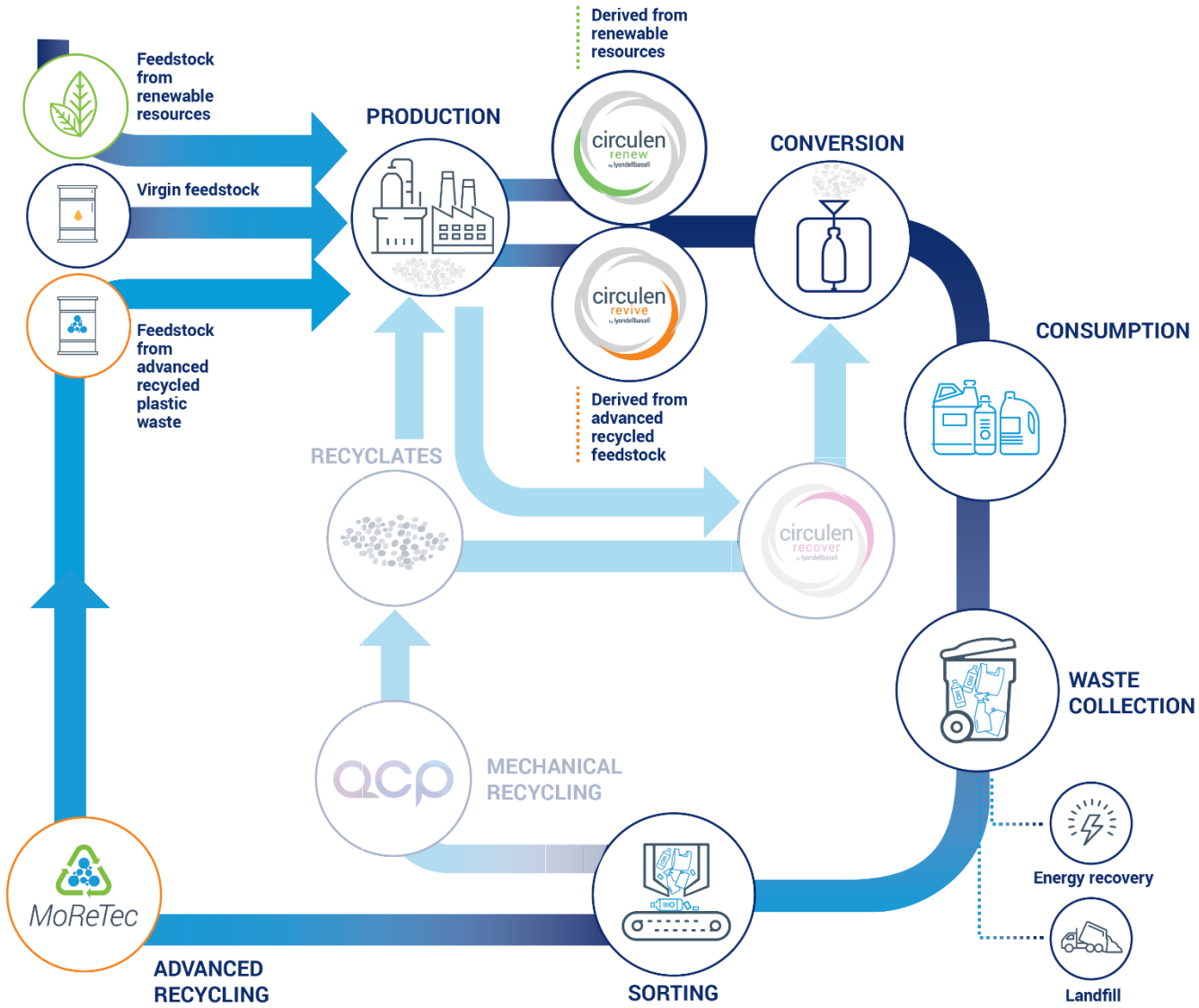


Mass balance concept - Easy example

Think about this

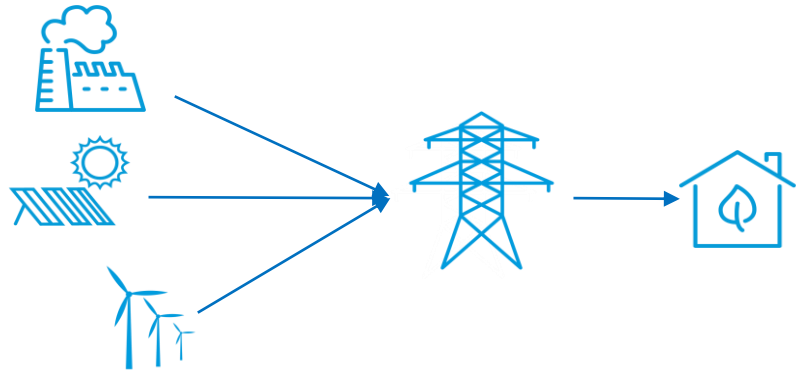
Traditionally, we use coal and gas to produce electricity. However, with the climate challenges, we're progressively replacing fossil feedstock with solar and wind.

It would be wasteful to build separate power grids transporting fossil-based or green electricity. So, all electricity sourced from coal, gas, sun and wind is fed into the same power grid.

Even if you selected a '100% wind' energy contract from your provider, when it arrives in your home, you can't tell how much of the electricity was sourced sustainably using wind turbines.

Your provider calculates precisely how much fossil-based and green energy they mix. This calculation is called a mass balance. With this mass balance they can guarantee that you have a share of the green energy produced.

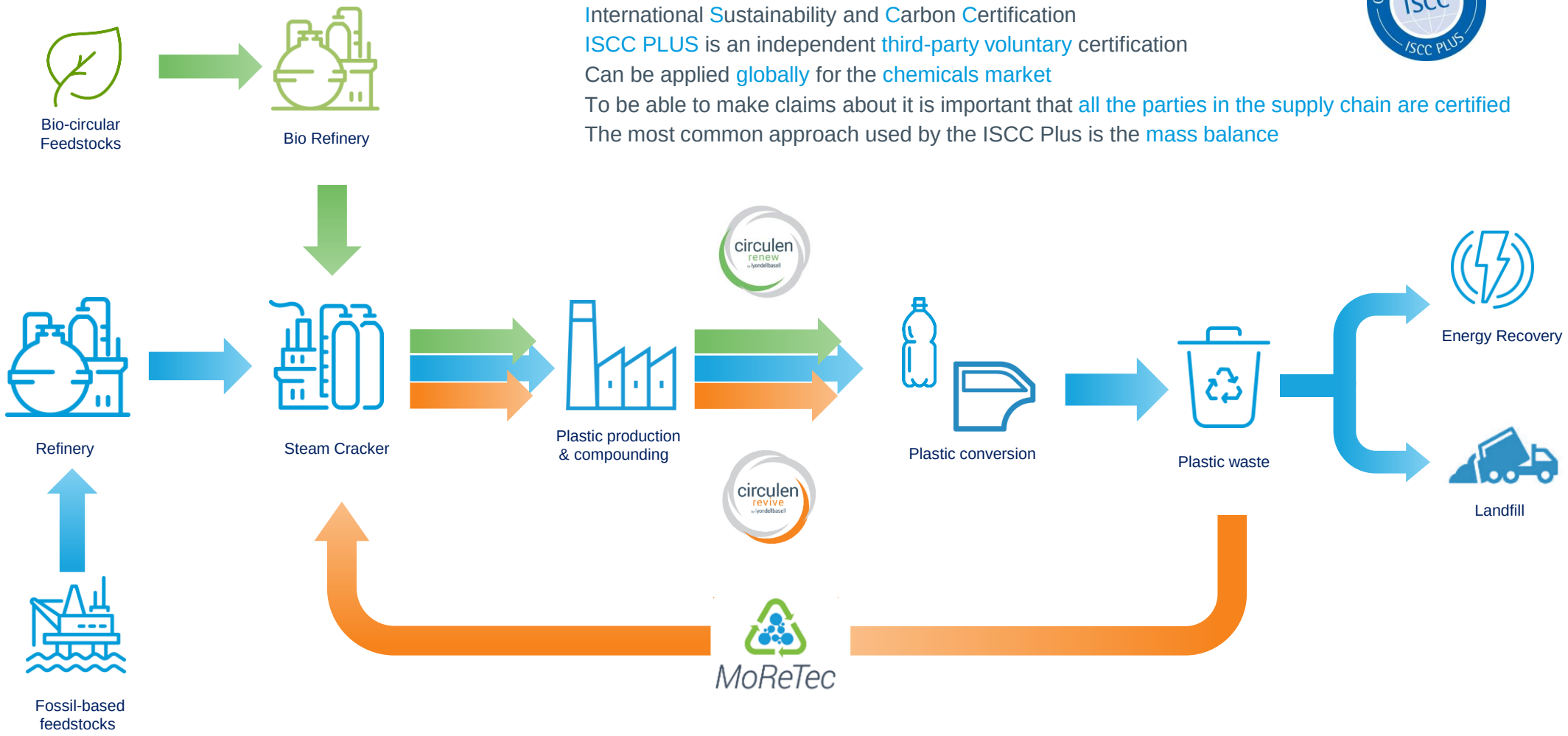
The same idea applies to LyondellBasell.



Unlocking the chain of custody

Certified Traceability

International Sustainability and Carbon Certification
ISCC PLUS is an independent third-party voluntary certification
Can be applied globally for the chemicals market
To be able to make claims about it is important that all the parties in the supply chain are certified
The most common approach used by the ISCC Plus is the mass balance



LyondellBasell ISCC Plus Certification Footprint

OUR ISCC PLUS CERTIFIED SITES

Belgium
Bornem

France
Berre
Fos-sur-Mer
Oyonnax

Germany
Bayreuth
Frankfurt
Kerpen
Münchmünster
Knapsack
Wesseling (Cracker)

Italy
Brindisi
Ferrara
Gorla

Spain
Tarragona

United Kingdom
Carrington

United States
Clinton, Iowa
Lake Charles, Louisiana
Channelview, Texas (cracker)
LaPorte, Texas

Drop-in solutions

To enable a complementary sustainable alternative to virgin plastics, offer an effective and sustainable alternative to virgin plastics

Full certified solutions

Based on PP, PE, *Catalloy*, PB-1, PPC, Engineered plastics, Masterbatch, Customer Performance Color and Specialty Powders

Customer proximity

with our strategically placed locations, we bring our services right to your site.

Traceability and Transparency

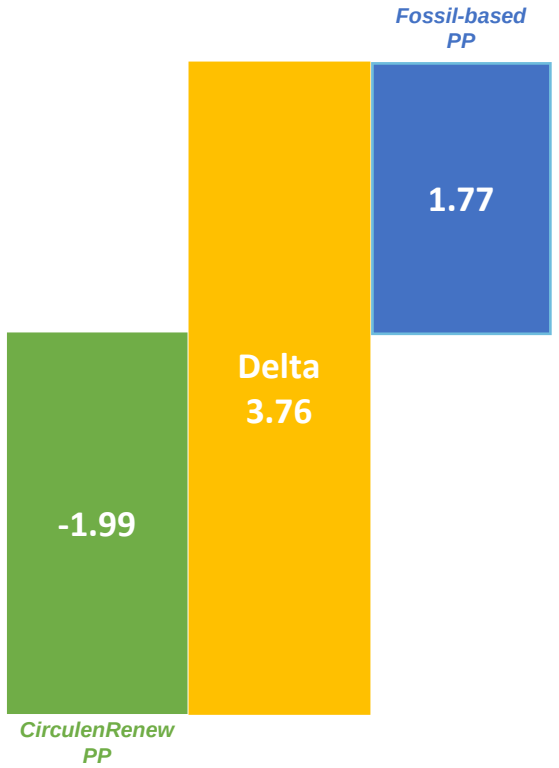
Enabling the tracking of raw materials throughout the supply chain.

CO_2eq emissions: *Circulen*Renew Polypropylene

CO_2eq emissions comparison between: *Circulen*Renew PP and fossil-based PP*

(metric tons CO_2eq per ton of product)

Note: the sizes are not precisely scaled and therefore indicative



The use of *Circulen*Renew PP reduces the CO_2eq emissions by **3.76 tons CO_2eq per ton of PP** vs equivalent fossil-based polypropylene

*Circulen*Renew PP has a negative CO_2eq value and will lead to a **CO_2eq reduction of 212% on a Cradle-to-gate (1) basis vs the equivalent fossil-based PP**

This evaluation is based on a renewable raw material composed of waste and residues; fossil fuels are used in process operations and transport

circulen renew by lyondellbasell

SUSTAINABILITY DECLARATION *Circulen* Renew[1]

SAP Order Number	5012345678	Date of Dispatch:	01-Jul-2022
Date of Issuance	10-Jul-2022	Place of Dispatch:	Brindisi
Seller	Basell Sales and Marketing, Rotterdam ISCC-PLUS-Cert-DE102-22040026		

PRODUCTION LOCATION		RECIPIENT	
Name:	Basell Poliolefine Italia s.r.l.	Name:	Plastic Company
Address:	Sito di Brindisi Via E. Fermi, 50 72100 Brindisi	Address:	Vas. Olgas 2 54640, Thessaloniki Greece

Certificate Number: ISCC-PLUS-Cert-DE102-22030019

1. GENERAL INFORMATION

Type of Product:	HDPE		
Raw material category: Bio-circular			
LyondellBasell Product Name:	Hostalen ACP 6031D		
Quantity:	25,600	metric tons	pounds (lbs)

2. CHAIN OF CUSTODY

Chain of Custody Option: Mass Balance

Mass Balance Option: Mass Determination

Multi-site Credit Transfer	No	✔ Yes

The type of recycling operation is not applicable. The finished material comes from post-consumer feedstock.

3. SUSTAINABILITY CRITERIA

The Raw Material meets the definition of waste and residue

The raw material meets the definition of waste or residue, i.e. it was not intentionally produced and not intentionally modified, or contaminated, or discarded, to meet the definition of waste or residue (applicable to waste and residues and products produced from waste and residues)

ISCC Compliant ✓ Yes

1. Derived from bio-mass excluding palm oil and animal fats on a mass balance basis.

Explanations

Raw Material relates to the initial material at the beginning of the supply chain (eg. Circular, Bio-circular or Bio). Circular (including technical-circular): mixed plastic waste. Bio-Circular, Used Cooking Oil. Bio: corn and/or vegetable oils. For further explanation, please see "List of material eligible for ISCC Plus certification").

*ISCC System Document 202 „Sustainability Requirements":
- Protection of Land with High Biodiversity Value or High Carbon Stock
- Environmentally Responsible Production to Protect Soil, Water and Air
- Safe Working Conditions,
- Compliance with Human, Labour and Land Rights
- Compliance with Laws and International Treaties
- Good Management Practices and Continuous Improvement

Contact us at: circularproducts@lyb.com

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Advancing Possible

(*) CirculenRenew Data PP are peer reviewed
(1) Cradle-to-gate LCA is a partial product life cycle assessment covering from resource extraction (cradle) to the manufacture of the product (gate)

We offer solutions supporting the transition to a low-carbon, circular economy

LyondellBasell offers an extensive product range of sustainable solutions for the market.

With our varied material technologies know-how and sustainability focus, we are your partner of choice for innovative solutions.

We are looking forward to work closely with you, to advance innovation together!

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Compounds derived from mechanically recycled plastic waste

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Thank you!
Q&A

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