



Go Circular with PLA

From material innovation to system transformation

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Go Circular Summit 2026

March 26, 2026

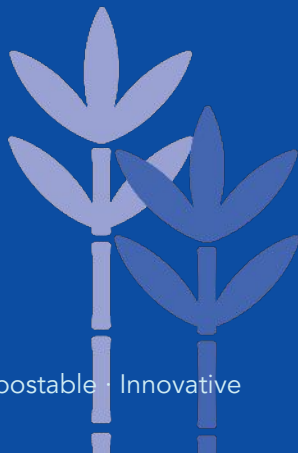
Luminy[®]
PLA bioplastics

The Challenges We Face

- Dependence on Fossil-based materials
- High Greenhouse Gas Emissions
- Low Recycling Rates
- Plastics Waste Accumulation
- Persistent Microplastics
- Regulatory and Social Pressure

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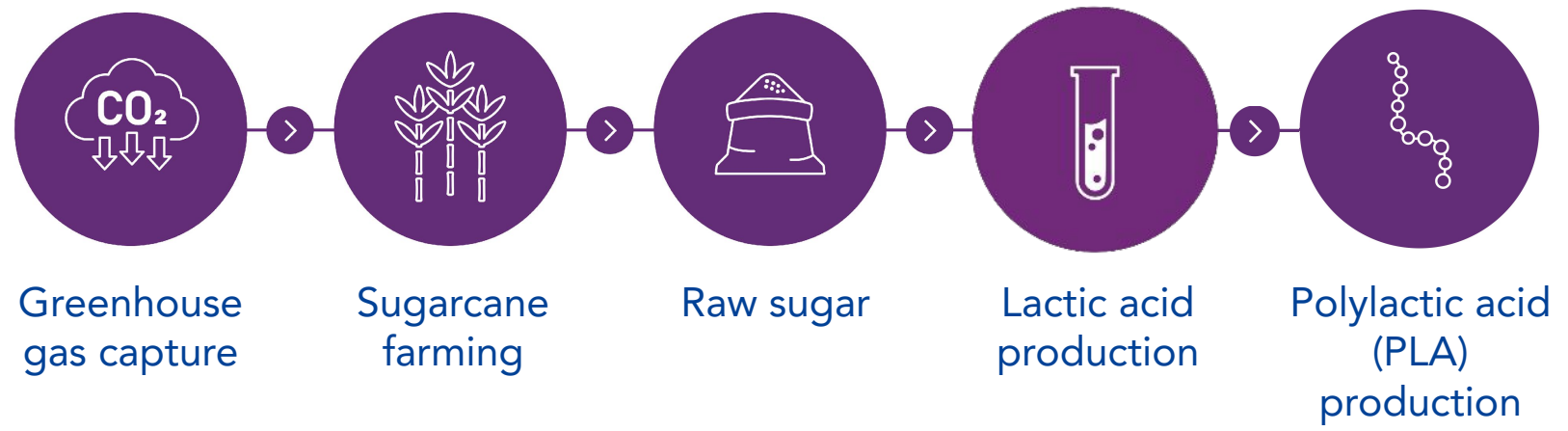
It's time to rethink plastics for a circular future —PLA is one of the solutions helping us get there.



What is PLA?

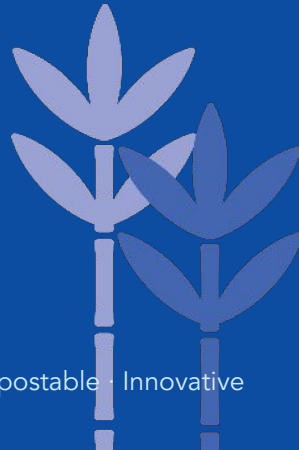
From plants to performance materials

Sugarcane is the starting point for Luminy® PLA. The sugar extracted from the sugarcane is fermented using microorganisms to produce lactic acid, an organic acid also produced by the human body.

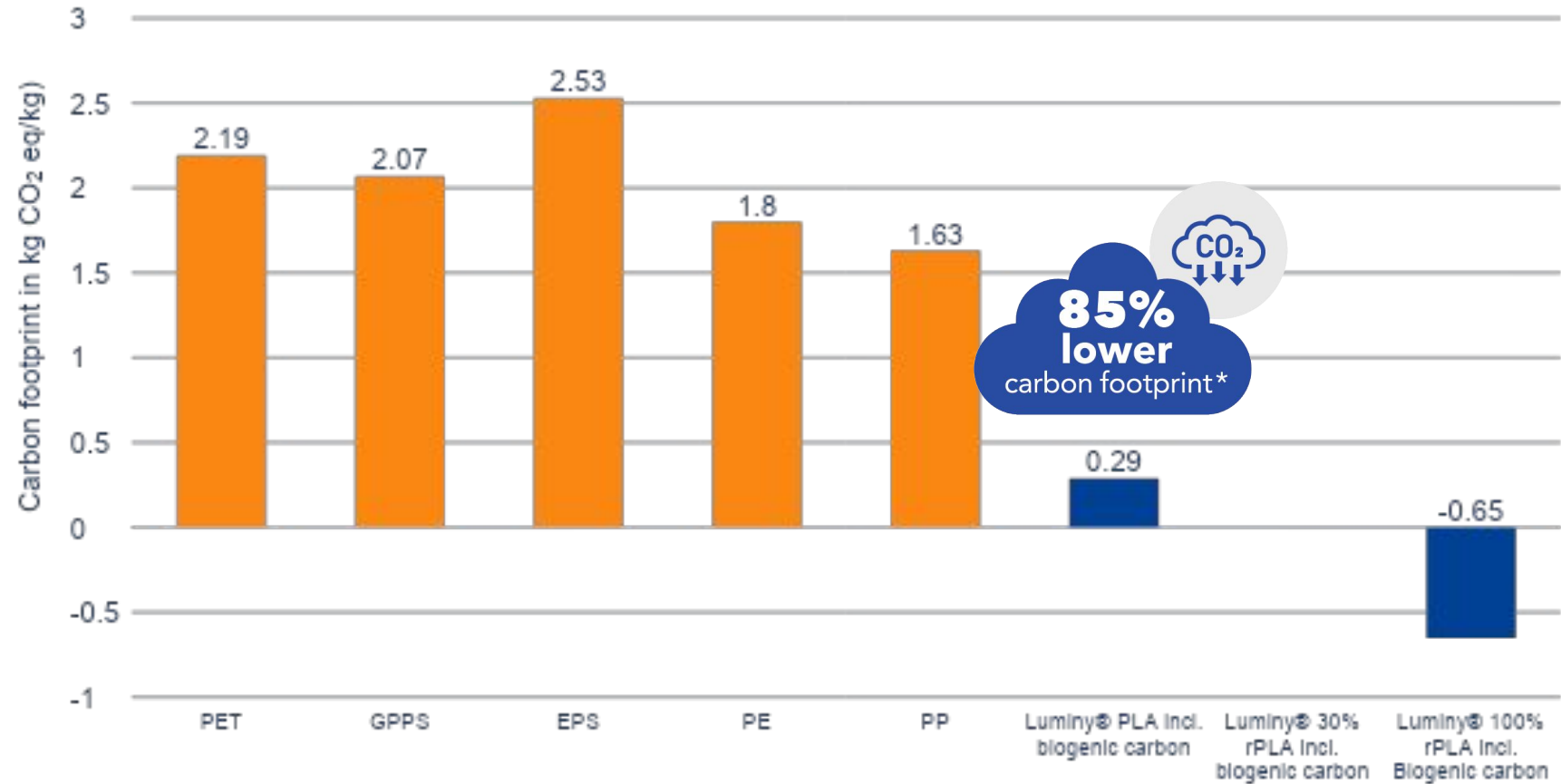


How Luminy® compares

Up to 85% lower carbon footprint vs. conventional plastics



Cradle to Gate Carbon Footprint for various polymers kg CO₂ eq/kg polymer



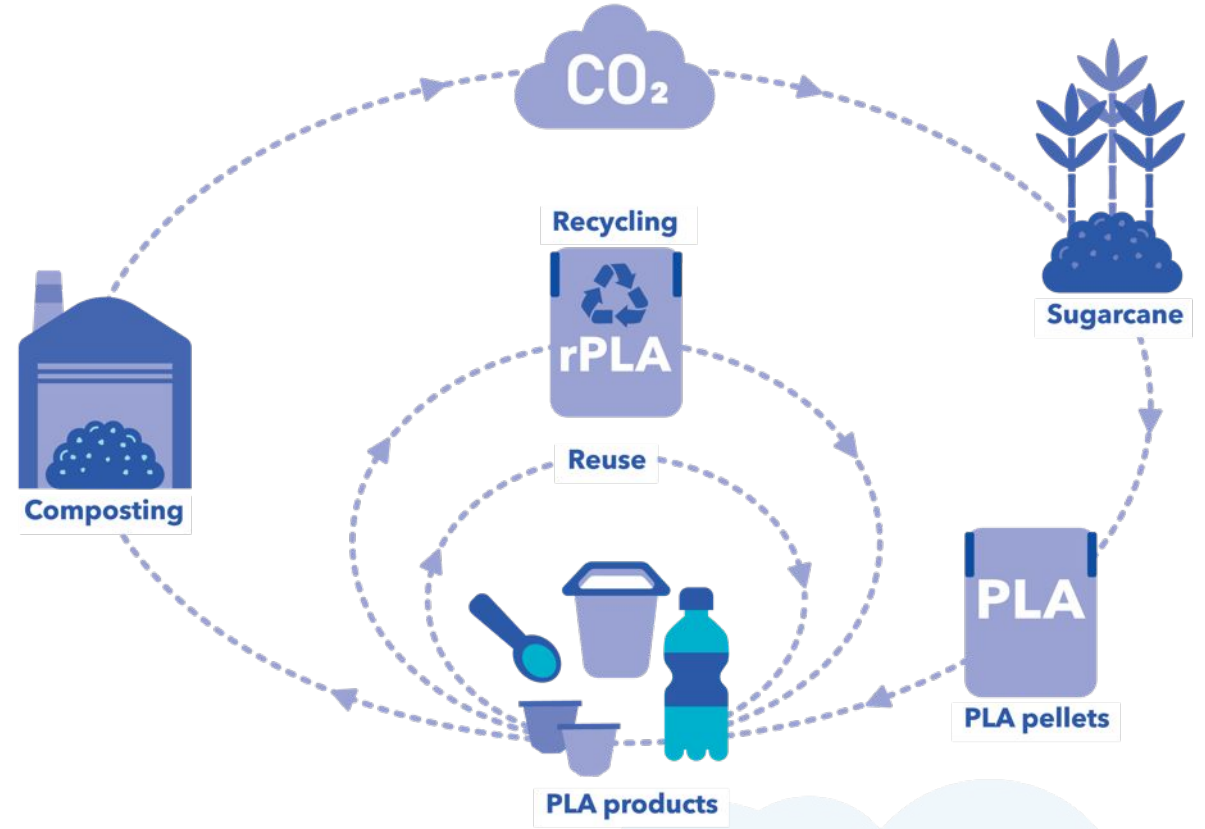
Source: Plastics Europe data and TotalEnergies Corbion LCA 2025
 *compared to conventional plastics when considering biogenic carbon

Closing the loop

Luminy® PLA offers multiple pathways — not a single end-of-life solution

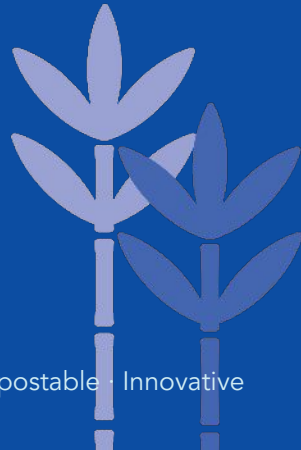
PLA comes from plants, but there are more ways to keep it in the loop:

- Reusing durable products
- Recycling PLA into new items
- Composting it back to the earth

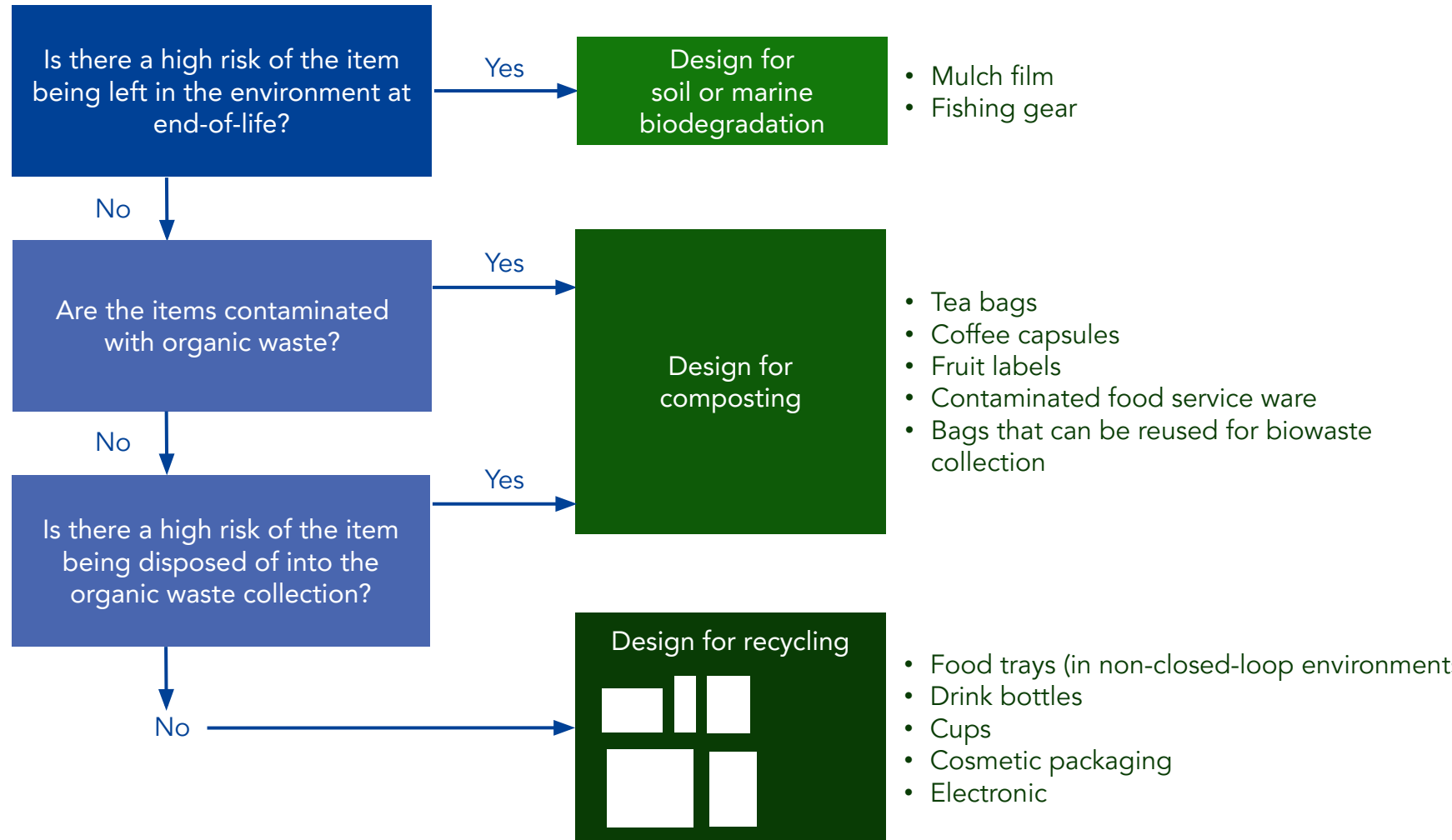


Choosing the best option

Which end-of-life works best for your application?



For items made with rPLA or virgin PLA that get contaminated with organic waste during use, composting is the best option



Composting Luminy® PLA

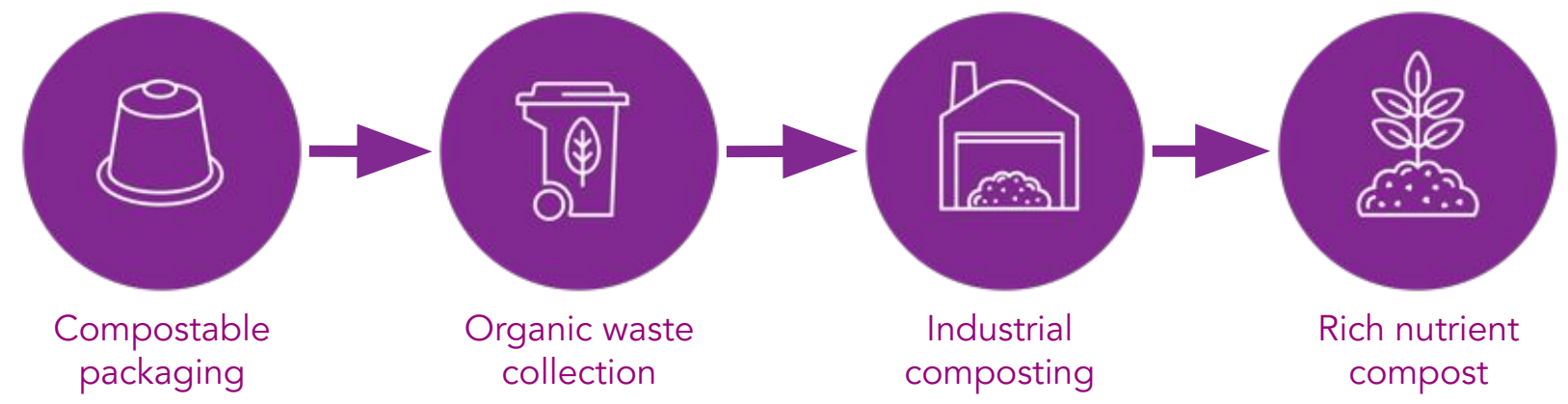
Back to earth

PLA plant pot fully disintegrated after 11 days

PLA teabags fully disintegrated after 22 days

But orange peel and banana skins were still present after 22 days

 Luminy® PLA is certified EN 13432 / ASTM D6400 in an industrial composter



Source: WUR study for Dutch Environmental Ministry, published February 2020.



Recycling Luminy® PLA

Stay in the cycle

Advanced recycling combines start-of and end-of-life benefits

1 COLLECTION

PLA bottles are gathered via a specialized network



2 CONDITION CHECK

Bottles are checked and sorted



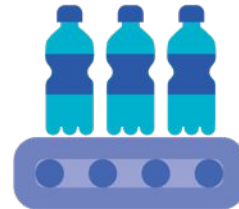
3 SHREDDING

Bottles are cleaned, flaked, and pelletized for advanced recycling



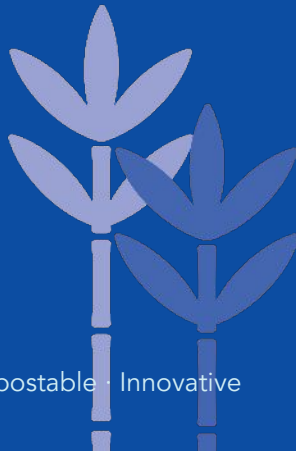
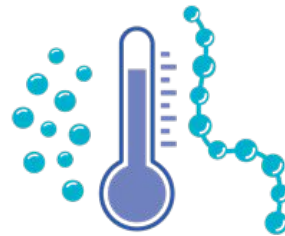
5 READY FOR PRODUCTION

rPLA resin is ready to produce new bottles



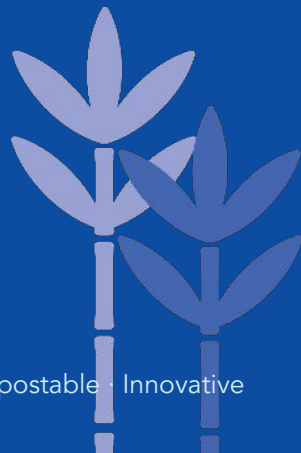
4 ADVANCED RECYCLING

PLA pellets undergo hydrolysis at the TotalEnergies Corbion Thailand plant, breaking the polymer into its monomers. These can then be repolymerized to create rPLA resin



Recycling Luminy® PLA

How advanced recycling compares



Hydrolysis: Luminy® PLA Advanced Recycling



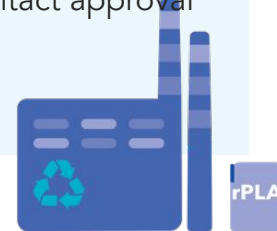
PLA hydrolysis requires water and a temperature of ~100°C resulting in lactic acid



A PLA hydrolysis reactor is an integrated part of the plant we operate in Thailand



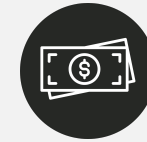
rPLA retains food contact approval like virgin PLA



Pyrolysis: Conventional polymers recycling



A pyrolysis unit produces oil at 450°C–700°C, which is blended with naphtha or gas oil and fed into a steam pyrolysis unit at ~850°C

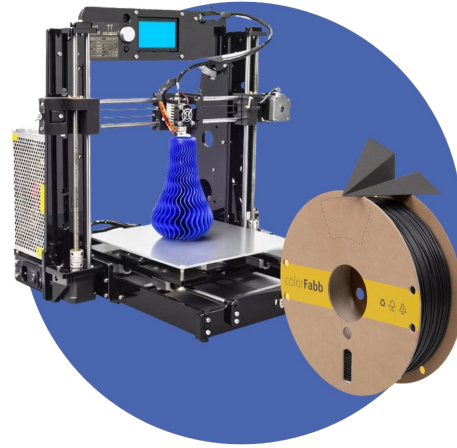


A pyrolysis unit is typically a “stand alone” unit requiring 100-200mm\$ of investment

TotalEnergies Corbion offers
20%, 30%, and 100% Luminy® rPLA grades

Key Applications

From short-life to durable applications



3D printing



Durable goods



Flexible packaging



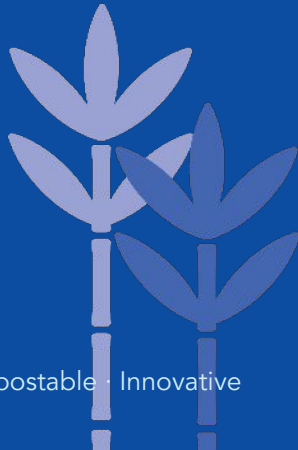
Food service ware



Fibers and nonwovens



Rigid food packaging



PLA can help us to achieve circularity



100% Biobased

Made from annually harvested renewable sugarcane plants



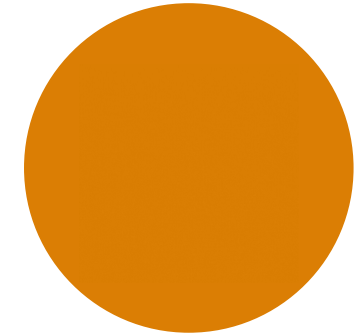
Compostable

Industrially composts faster than banana peels



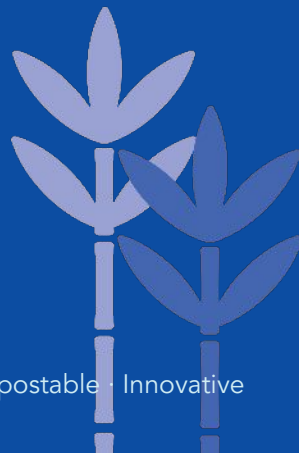
Recyclable

Mechanically and chemically



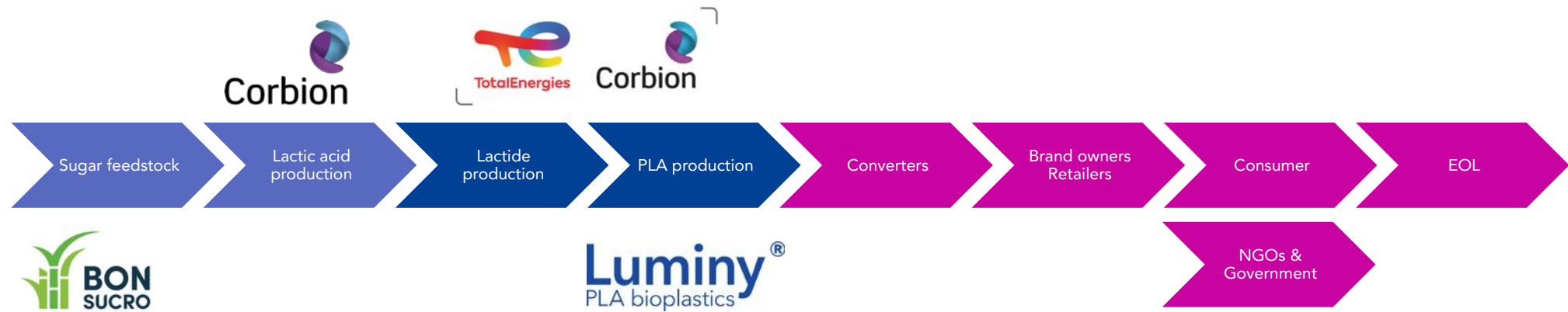
Versatile

Used anywhere conventional plastics are used



Circularity is a system challenge, not just a material innovation

At TotalEnergies Corbion, we collaborate across the entire value chain to turn circularity from ambition into reality.



Sansu Embossed Label-Free Bottle

On the market

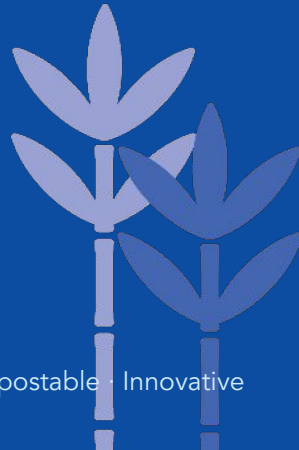
Embossed, label-free PLA bottle designed to simplify recycling process



PLA Protective foam-packaging

On the market

Bead foamed and molded Luminy® PLA packaging with much lower carbon footprint



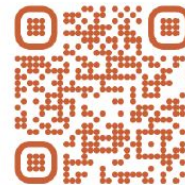
Tomra

Trial collaboration

Tomra's Near Infra-Red (NIR) sorting tech successfully separates PLA from mixed plastic waste, making the process fast and easy







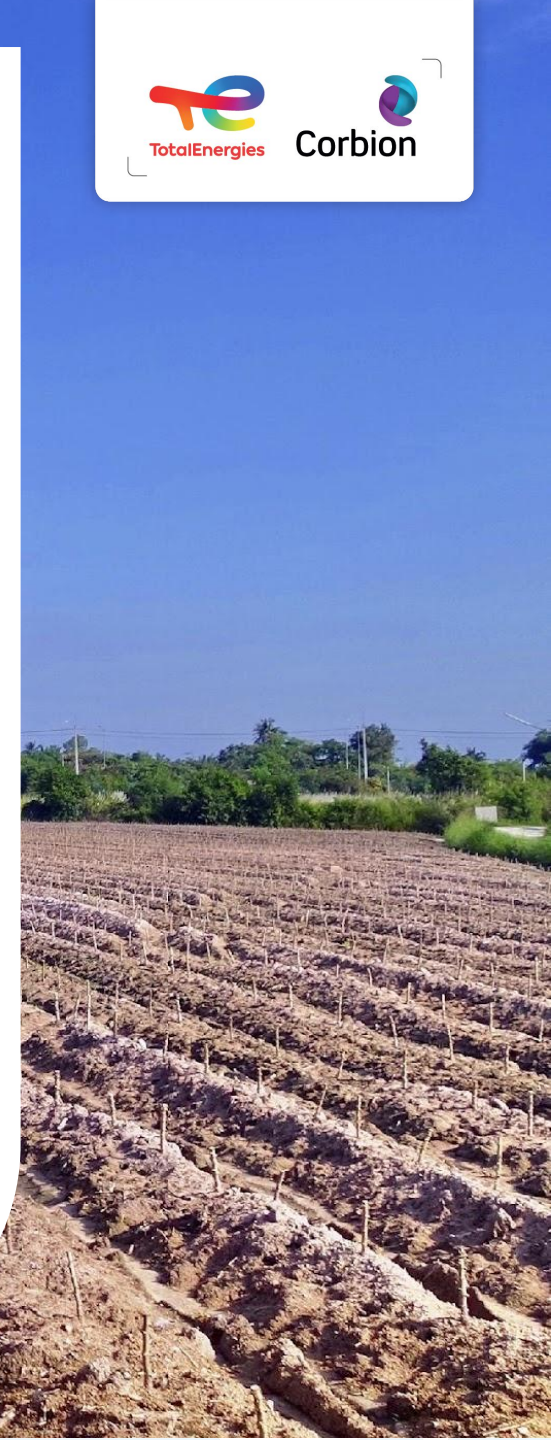
Please see our video on YouTube with the results of these sorting trials.



Unlocking the Full Potential of PLA for a Sustainable Future

True enabler of the circular economy

-  Versatile Across Applications: Luminy PLA enables solutions across packaging, hygiene, medical, 3D printing, and durable goods
-  Proven Lower Carbon Footprint: Significantly lower CO₂ emissions vs. fossil-based plastics, supporting measurable climate impact
-  Designed for Circularity: Applications engineered for recyclability and compostability, with rPLA further reducing carbon footprint
-  Collaboration to Scale Impact: Unlocking circularity requires alignment across the value chain — from producers to recyclers — and clear communication to drive adoption





Thank You

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