
I'm green
TM
BodyPak
Biopolymers
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What are Bioplastics?

Bioplastics are Biobased, Biodegradable or both!

Biobased

Renewable raw material feed stock

Biodegradable

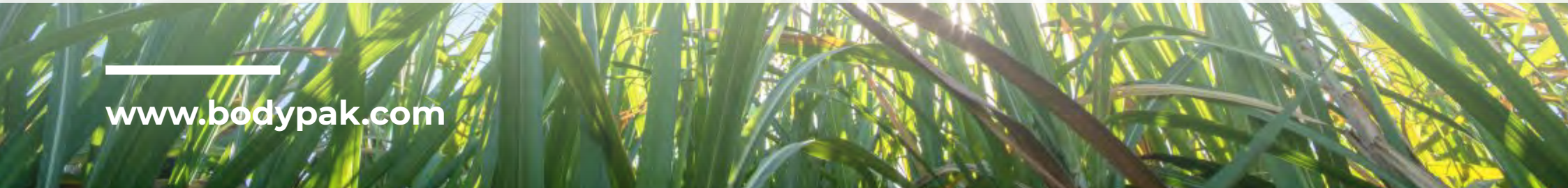
Chemical process in which micro-organisms convert materials into natural substances (depending on the conditions)

Bioplastics ▸ **Biopolymers** ▸ **Biobased**

Means that the material or product is (partly) derived from biomass (plants)

A dynamic industry growing at a rate of roughly 20% per year!

Saving fossil resources by using biomass provides a unique potential of carbon footprint reduction, can possess properties that are identical to their conventional versions and can be recycled in existing waste streams.



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Bioplastics

Bioplastics are Biobased, Biodegradable or both!

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Biobased

Recyclable — **Biodegradable**

Fossil-Based

Bioplastics

e.g. PP/PVC,
Biobased PET, PTT

Bio-PE

Bioplastics

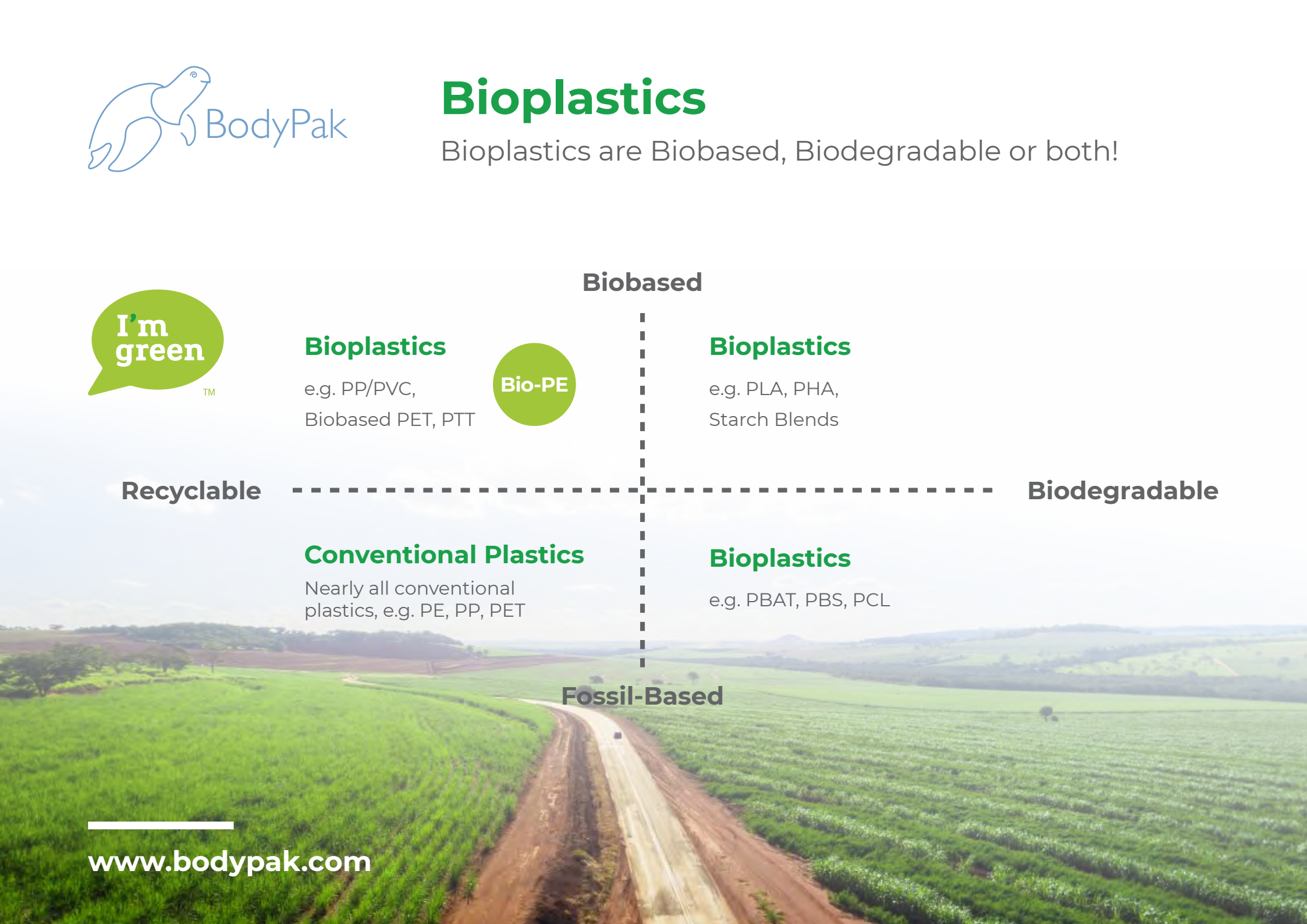
e.g. PLA, PHA,
Starch Blends

Conventional Plastics

Nearly all conventional plastics, e.g. PE, PP, PET

Bioplastics

e.g. PBAT, PBS, PCL



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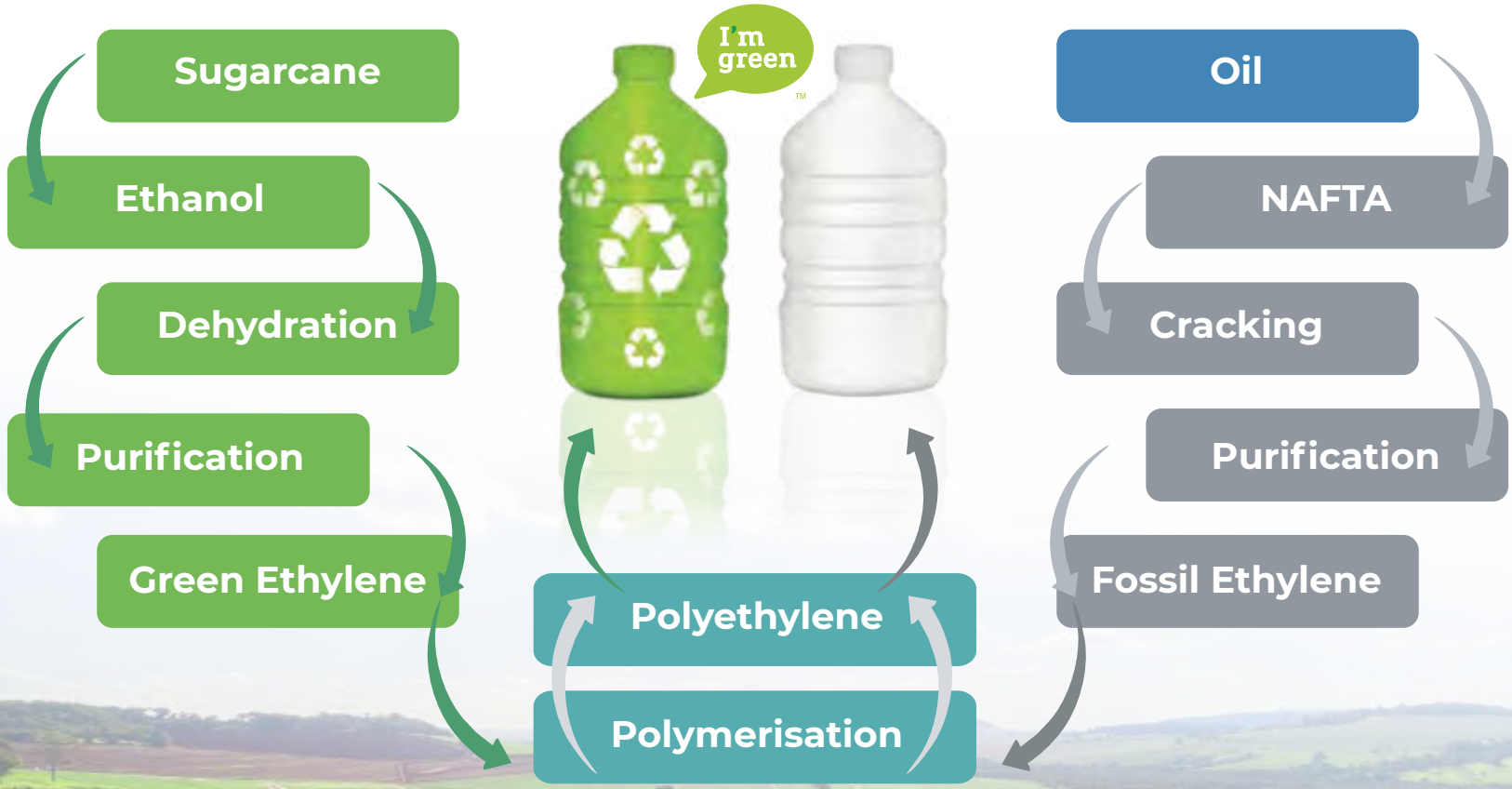
Green Polyethylene X Fossil Polyethylene



Technology: The production route for green polyethylene and the fossil polyethylene are the same, therefore the green polymer has got the same characteristics, quality and properties as the fossil equivalent.

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Green PE Cycle

Green Polyethylene helps reduce greenhouse gases and is 100% recyclable

Sugarcane captures CO_2

Recycling

Segregation

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PLANT

ETHANOL

Green PE Carbon Footprint from cradle to Braskem's gate:

1mt Green PE Captures 2.15m CO_2

w 100% recyclable

Packaging made from Green Polyethylene

Production of Green Ethylene and Green Polyethylene

1 Hectare of Land → 77 Tons of Sugarcane → 6700L of Ethanol → 3 Tons of Green Ethylene → 3 Tons of 'I'm Green' Polyethylene

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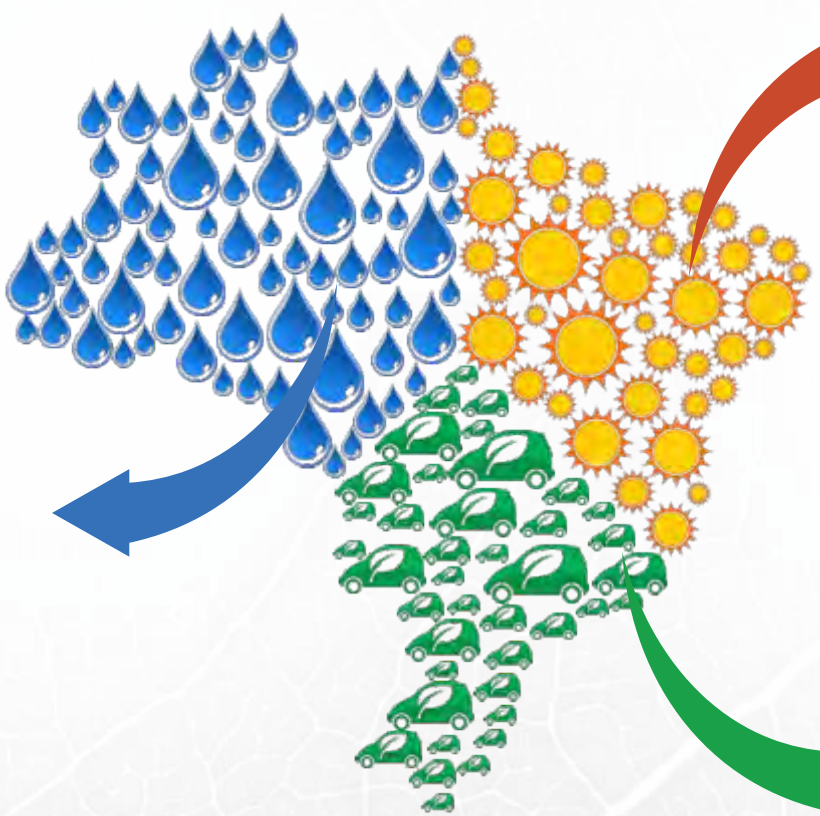
Brazilian Scenario

Favourable aspects for the development of biopolymers



The largest watershed in the world

Intense solar radiation and climate diversification

Pioneer in research and development of biofuels

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Land Usage

Significant potential for sustainable growth

Total Area
851.48
Millions of Hectares

Arable Land 329.94 (39%)

0.02%

Sugarcane
8.14
(2.4%)
50% Sugar
50% Ethanol

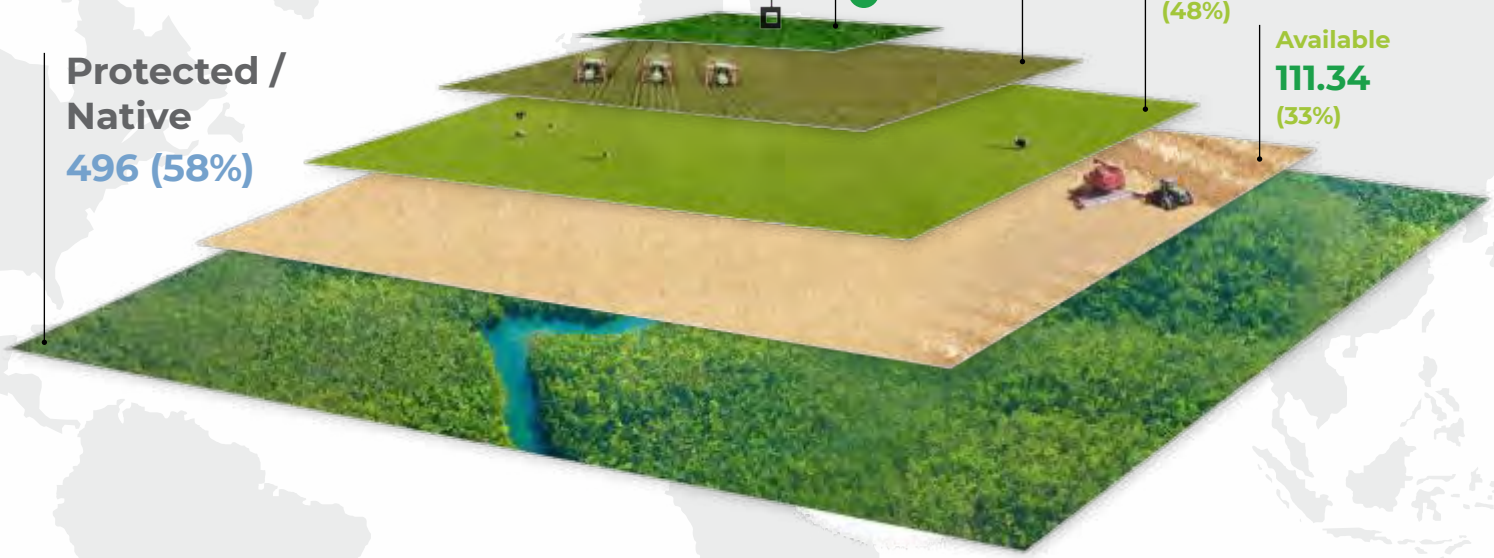
Agriculture
51.7
(16%)

Pasture
158.75
(48%)

Available
111.34
(33%)

Other
25.92 (3%)

Protected / Native
496 (58%)



Braskem's capacity of I'm Green™ Polyethylene Production: 200 KTON/Year

460m Litres of Ethanol = Approx. 68,000 Hectares

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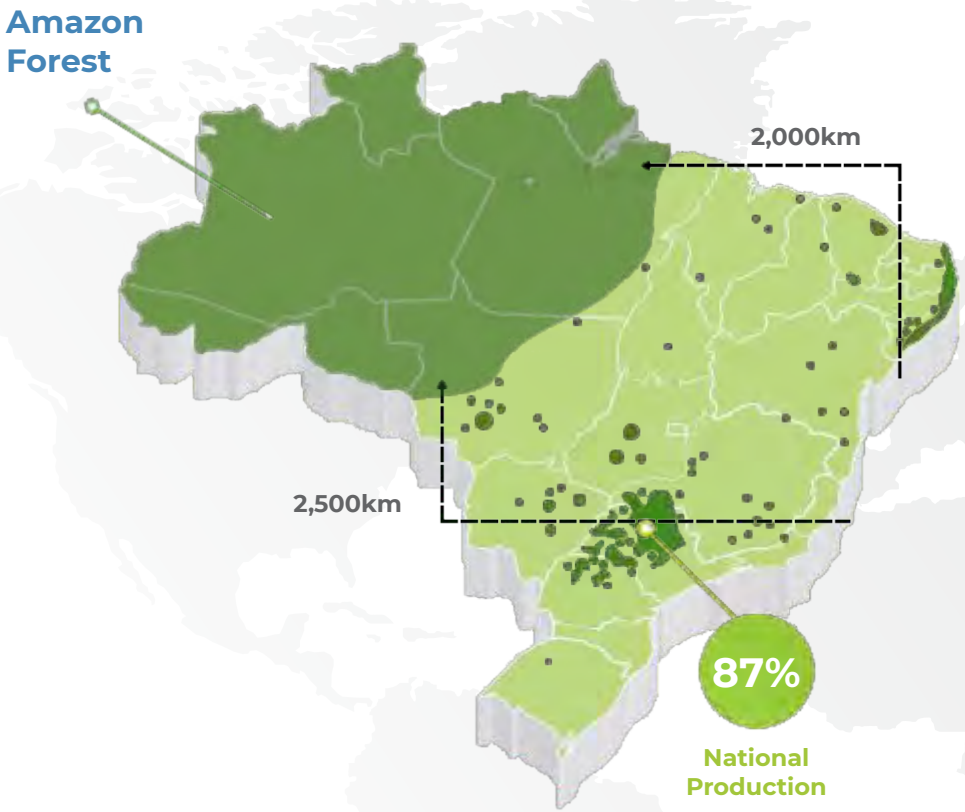
Brazilian Agroecological

Zoning Programme



Soil & Weather

Condition = Productivity

(No expansion to Amazon and Pantanal)

Areas for Sugarcane expansion

Areas with proper conditions for mechanical harvesting

Degraded pasture land

Regions with lower need for water usage in production

Respect for food security

CO_2 Footprint Reduction

CO_2 Emission per Person

4t CO2 eq/Year

Each 100T Green PE =

100 People's Emissions

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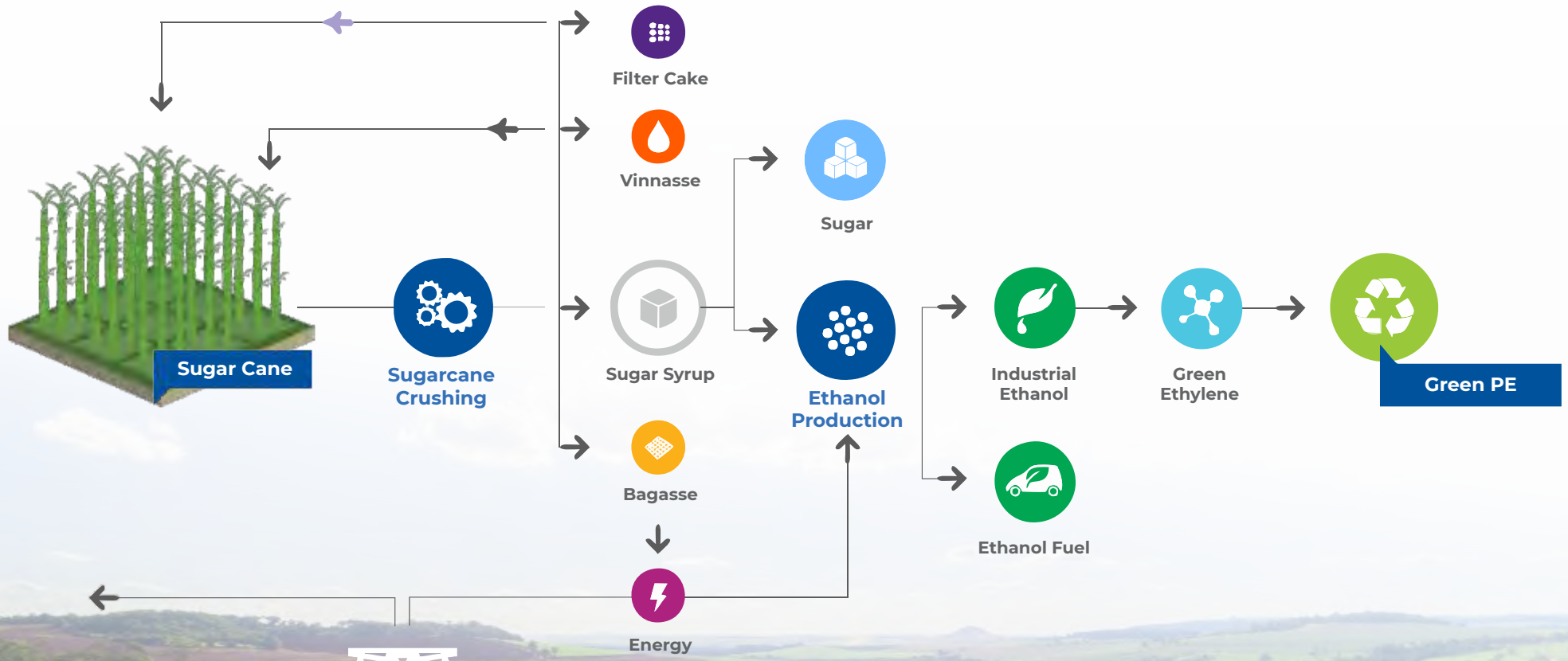
Sugarcane Ethanol

Efficient use of resources



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Carbon Footprint Comparison

Carbon Footprint (t CO_2 q./t polymer)

(1) LCA study conducted by E4TECH & LCA Works (from cradle to Braskem factory gate)
(2) Plastics Europe

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