

# PLA Bioplastics

for a brighter future

**BIO Montreal 2017**

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**TOTAL**



**Corbion**



## Content

- **About Total Corbion PLA**
- **Synergy**
- **Plant construction update**
- **Being sustainable is not just being a biopolymer producer**

# TOTAL CORBION PLA bv founded March 2017



World's 4<sup>th</sup> Largest Oil Company

**Headquarters:** Courbevoie, France

**Revenue:** \$150 B

**Employees:** 96,000

**Profit:** \$6 B

**Main Products:**

Oil & Gas, Solar & BioEnergy

Commodity & Specialty Chemicals



World's Largest Lactic Acid Producer

**Headquarters:** Amsterdam,  
Netherlands

**Revenue:** \$970 MM

**Employees:** 1,700

**Profit:** \$180 MM

**Main Products:**

Food Ingredients, Biochemicals

Bioplastics, Biomedical



a 50/50 JV committed to

**market development, production, sales and marketing of PLA**



# TOTAL CORBION PLA bv founded March 2017

## Two parent companies with complementary strengths



Commodity Polymer (PE, PP & PS)  
production expertise

Polymer processing expertise fully  
translatable to PLA

World beating polymer processing  
centers of excellence in Feluy,  
Belgium and La Porte TX

Premier polymer testing and  
characterization capabilities

Pilot lines for Injection molding, sheet  
for thermoforming, film (cast and  
blown, 5 layer and BO), melt blown,  
melt spinning and bico fibers and non-  
wovens, foam, compounding and  
ISBM



World's Largest Lactic Acid Producer  
supplying over 50% of the world's  
merchant lactic acid

World leading extremophilic  
fermentation technology

Leading purification technology for  
mono and di-acids

World's only producer of D-lactic acid  
40 years of experience in making  
resorbable polymers for in body use –  
PLA, Polyglycolic acid,  
Polycaprolactone etc

# Building a world scale PLA plant

- Capacity** 75 kTpa
- Situation** Under construction, next to the world's largest lactic acid and lactide plants
- Location** Rayong, Thailand
- Timeline** Start of operations 2<sup>nd</sup> half 2018
- Status** Groundbreaking ceremony took place 9 November 2016, construction is ongoing





# Simply making bioplastics is not enough – you need to do it sustainably




Declaration  
Rev. No. 1

**DECLARATION**

To whom it may concern,

Reference is made to EU REGULATION No 1829/2003 of the EUROPEAN PARLIAMENT AND THE COUNCIL of 22 September 2003 on genetically modified food and feed.

Given the definitions in above mentioned regulation Corbion only uses non-GMO raw materials in the production of LACTIC ACID and LACTIDES in Thailand and Spain.

The LACTIDE product (PURALACT L) that is manufactured by Purac (Thailand) Ltd is a non-GMO substance. PURALACT L is used as the raw material for the production of Luminy PLA.

The LACTIDE product (PURALACT D) that is manufactured by PURAC (Spain) and Purac (Thailand) Ltd is a non-GMO substance. PURALACT D is used as the raw material for the production of Luminy PDLA.

Corbion Luminy PLA (L105, L130, L175, LX175) and Corbion Luminy PDLA (D070, D105, D120, D130) are therefore non-GMO substances.

Gorinchem, October 13th, 2016  
Signed by:  
Purac Biochem bv




P. van 't Veld  
QA Manager

corbion.com
Page 1 of 1

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## Supplier Code



Corbion's purpose is to improve the quality of life, for people today and for generations to come. We aim to do this using our biobased solutions, but also in the way we conduct our business.

To give direction to our purpose, our vision at Corbion is to inspire a conscious choice for safe, healthy and convenient solutions made through nature's processes and renewable resources.

Our mission is to achieve this vision by creating value for our customers through our biobased solutions, designed by science, powered by nature and delivered through our dedication. We want to achieve our mission in a manner that is ethical and consistent with our values: Partnership, Passion and Performance.

Partnership represents our way of doing business, the way we engage with others who share the playing field with us. We collaborate with our stakeholders, including our suppliers, to achieve our vision. As a sustainable company, we expect our suppliers to uphold similar standards on environmental and social responsibility and to meet the standards of our Supplier Code.

### 1. Business ethics

- ▶ Supplier complies with all applicable local laws and regulations.
- ▶ Supplier refrains from any form of corruption. All business is conducted with integrity.
- ▶ All business transactions with Corbion are accurately and completely recorded, and guarantee legal and fiscal compliance.

### 2. Human rights & labor conditions

- ▶ Supplier does not use child, forced or compulsory labor.
- ▶ Supplier does not discriminate based on nationality, race, religion, gender, age, sexual orientation, disability, etc.
- ▶ Supplier respects the right of their employees to freedom of association and has an employee grievance process.
- ▶ Supplier complies with relevant International Labour Organization (ILO) standards.
- ▶ Supplier provides safe and healthy working conditions for all employees.
- ▶ Supplier provides appropriate wages and working hours, according to applicable laws, for all employees.
- ▶ Supplier provides contracts or equivalent documents to all employees.

### 3. Environment

- ▶ Supplier operates in an environmentally responsible manner.
- ▶ Supplier strives for continuous improvement of their environmental performance by minimizing the use of raw materials, energy and water, the emission of greenhouse gases and the production of waste.

### 4. Product quality and safety

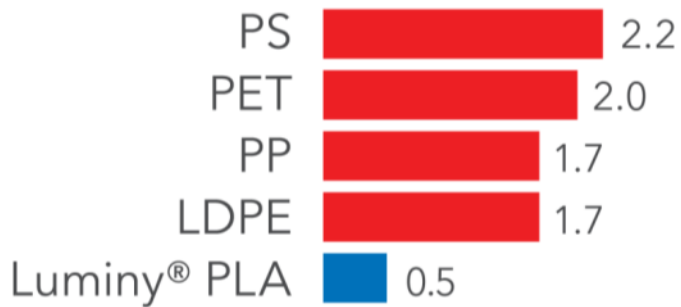
- ▶ All products and services meet the quality and safety criteria specified.

### 5. Intellectual property

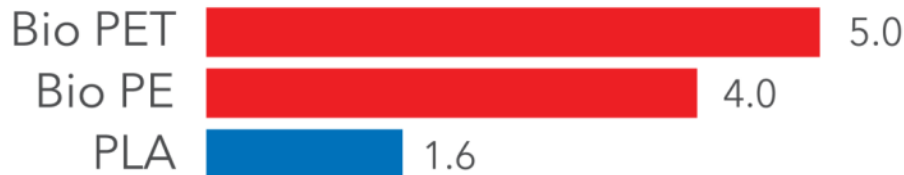
- ▶ Supplier protects all confidential information provided by Corbion and its respective business partners.

# PLA carbon footprint & feedstock efficiency

## Carbon Footprint Emissions from production of common polymers\*



## Carbohydrate Usage of Bioplastics (kg sugar per kg plastic)



Sources: [www.lca.plasticseurope.org](http://www.lca.plasticseurope.org) and Int. Journal Life Cycle Assessment, 'LCA of the manufacture of lactide and PLA...' 3 Aug 2010.

# BONSUCRO Sugar – certified sustainable sugar



## Thai plant set to produce PLA pellets using cane sugar-derived lactic acid



Bonsucro news

## Corbion achieves first Chain of Custody certification for bioplastics

Congratulations to Corbion for achieving the first Bonsucro Chain of Custody certification for bioplastics using lactic acid from cane sugar. SGS, the independent certification body who carried out the audit, presented Corbion with the certificate in a ceremony yesterday at Bonsucro Technical Week in Bangkok, Thailand.





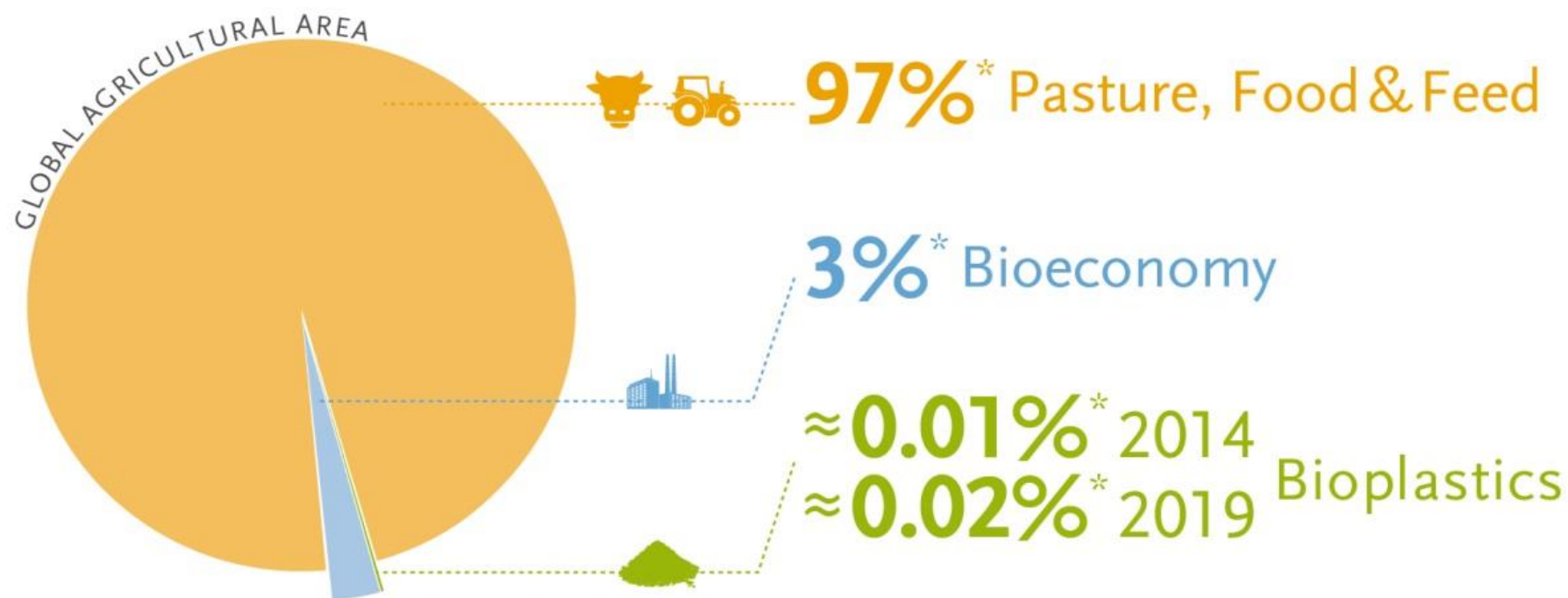


- All GMO crops are banned in Thailand
- Greater biodiversity
- Reduces mono-culture
- No chance of cross contamination of genetic code

*Bioplastics are no where near to competing with food and feed !*

*Land use for bioplastics 2014 and 2019*

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Source: European Bioplastics, Institute for Bioplastics and Biocomposites, nova-Institute (2015).

\* In relation to global agricultural area

More information: [www.bio-based.eu/markets](http://www.bio-based.eu/markets) and [www.downloads.ifbb-hannover.de](http://www.downloads.ifbb-hannover.de)

Reducing food waste in the supply chain by 1% will free up more land than would be needed to make bioplastics according to even the most optimistic estimates



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[www.total-corbion.com](http://www.total-corbion.com)