



Press Conference

May 8, 2024
WWW.CJBIOATERIALS.COM

A large circular graphic with an orange border and a gradient background. At the top, it features the CJ BIOMATERIALS logo and the text 'PHACT PHA VERSATILE SUSTAINABLE PERFORMANCE'. Below this, a cluster of circular images shows various applications of PHACT PHA: a can of SPAM, a bowl of colorful fruits, a white cup of coffee with the PHACT logo, a small plant growing in soil, a white pill, a glass of orange juice, a mortar and pestle with yellow powder, a green leaf, and a white 3D-printed object.

CJ BIOMATERIALS

PHACT PHA
VERSATILE SUSTAINABLE
PERFORMANCE

SPAM

PHACT



Speakers



Max Senechal
CCO



Leah Ford
Director, GMC



Fred Pinczuk
CTO



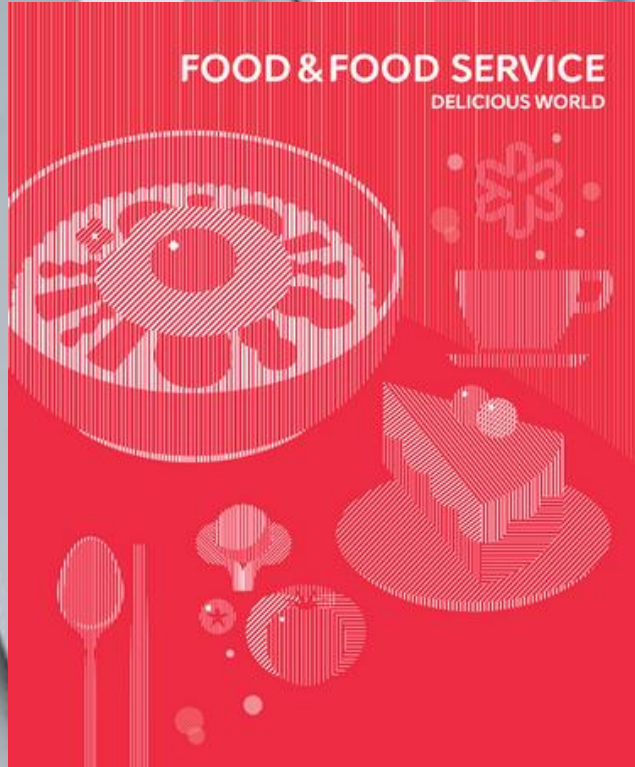
Hot Topics



- **CJ Biomaterials**
- **Critical Challenges**
- **New Product Launch**
- **New Applications!**
- **Agile Collaboration**
 - **NatureWorks - Leah Ford**
 - **Beyond Plastic - Fred Pinczuk**
- **Closing Comments / Q&A**



2023 Results
US\$ 31.41BN



**DELICIOUS
WORLD**

FOOD & FOOD SERVICE

Making it easy for everyone to enjoy delicious food while globalizing Korean cuisine.

- CJ CHEILJEDANG (FOOD Div.)
- CJ FOODVILLE
- CJ FRESHWAY

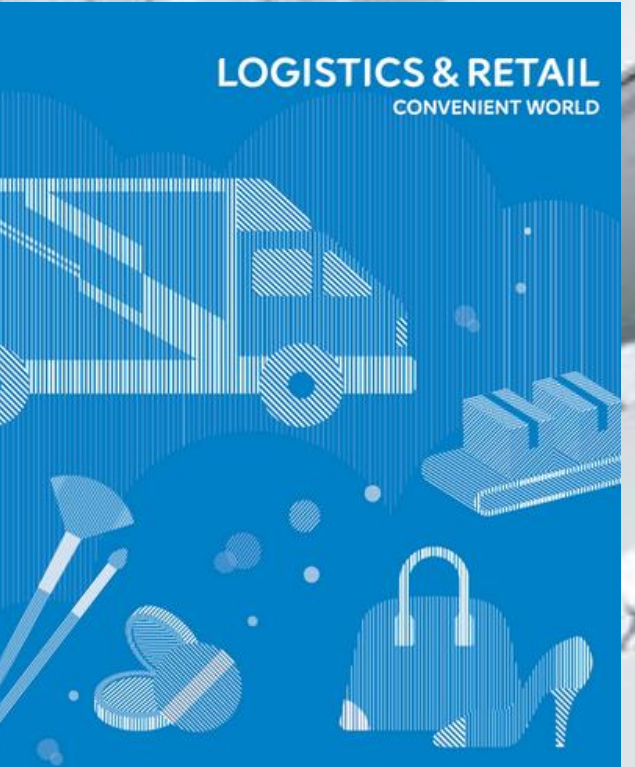


**HEALTHY
WORLD**

BIO

Improving health and wellness through biotech and pharmaceutical innovations.

- CJ CHEILJEDANG (BIO/FNT Div.)
- CJ FEED&CARE
- CJ BIOSCIENCE
- [CJ BIOMATERIALS](#)

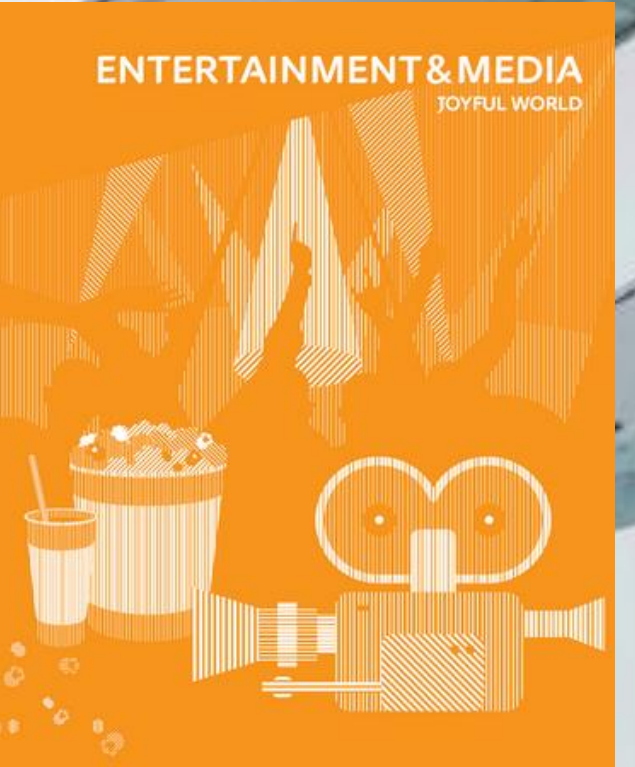


**CONVENIENT
WORLD**

LOGISTICS & RETAIL

Shaping the logistics and distribution industries in Korea. Innovating lifestyles and creating conveniences around the world with revolutionary logistics services.

- CJ LOGISTICS
- CJ OLIVEYOUNG
- CJ OLIVENETWORKS
- CJ ENM – COMMERCE DIV.



**JOYFUL
WORLD**

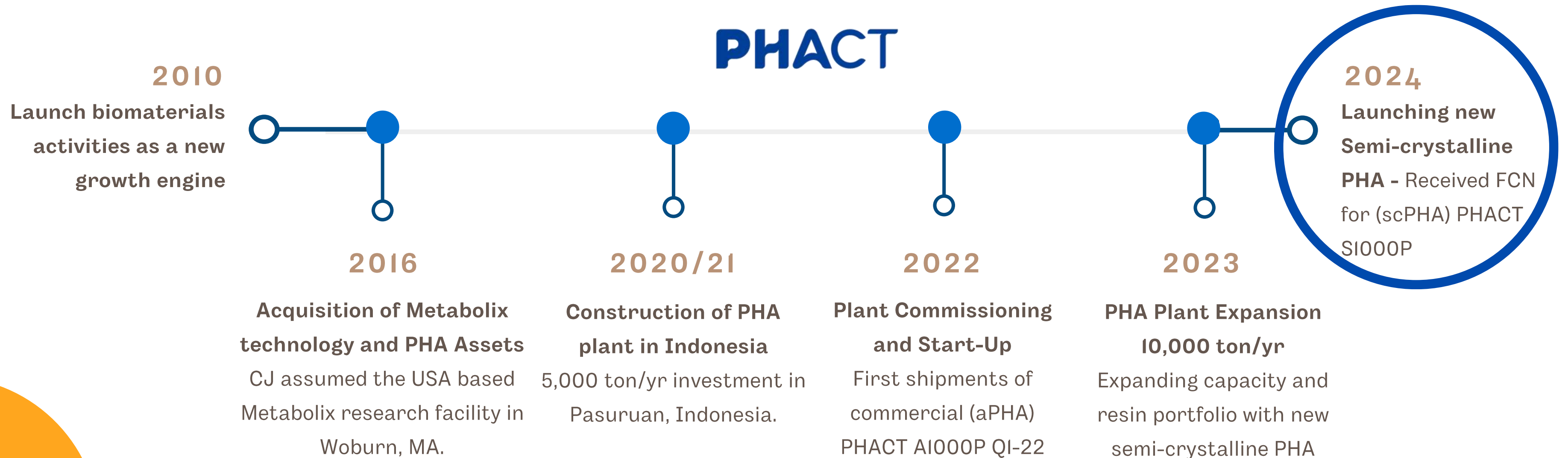
ENTERTAINMENT & MEDIA

Creating and distributing Korean cultural content via media (TV and online), theaters, live events, and more.

- CJ ENM - E&M DIV.
- CJ CGV



Building our platform by combining world-scale biotech assets with a world-class technology portfolio to enable circular and sustainable solutions



2010

Launch biomaterials activities as a new growth engine

PHACT

2016

Acquisition of Metabolix technology and PHA Assets
CJ assumed the USA based Metabolix research facility in Woburn, MA.

2020/21

Construction of PHA plant in Indonesia
5,000 ton/yr investment in Pasuruan, Indonesia.

2022

Plant Commissioning and Start-Up
First shipments of commercial (aPHA) PHACT AI000P QI-22

2023

PHA Plant Expansion 10,000 ton/yr
Expanding capacity and resin portfolio with new semi-crystalline PHA

2024

Launching new Semi-crystalline PHA - Received FCN for (scPHA) PHACT SI000P

What's NEW

@ CJ Biomaterials in our
COE in Woburn, MA

EXPANDED CAPABILITIES!

- **Blown Film:** Collin 30mm; 60mm die diameter
- **Injection Molding:** Krauss Maffei 50 Ton Press
- **Twin Screw Compounding:** Leistritz 18mm 35:1 L/D Extruder
- **Compression Molding:** Carver 15-Ton Press
- **Mechanical Testing:** Tensile, Tear, Impact, Hardness
- **Analytical Testing:** Torsional Rheology, Thermal Analysis (DSC), Melt Flow, Refractive Index, Orientation, Density





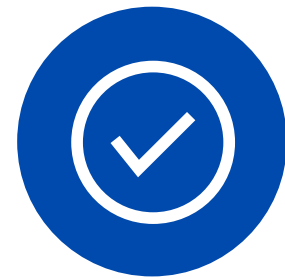
Our Focus

Systemic change is needed to stop the flow of plastic waste ending up in the environment. Of the seven billion tonnes of plastic waste generated globally so far, less than [10 per cent](#) has been recycled. (UNEP)



Plastic Waste

Minimize waste with circular solutions through organic recycling. Approximately 85 per cent of F&B packaging ends up in landfills or as unregulated waste (UNEP).



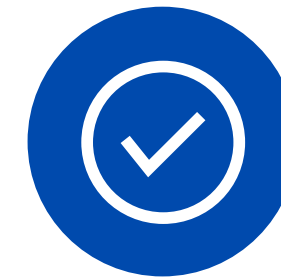
Food Waste Diversion

The use of compostable bioplastics (like PHA) in certain food packaging applications allows for the recovery of food residues more effectively. Collectively, diverting more organic matter (food) to compost and away from landfill.



Climate Action

PHA starts with nature and returns to nature. We must reduce our reliance on fossil fuels. The Global Warming Potential (GWP) for PHA is more than 50% lower than current fossil based plastics.



Human Health

PHA biopolymers do not create persistent microplastics and will fully biodegrade in all environments. Fossil based plastics degrade into microplastics and can carry toxins that can have detrimental impacts on many aspects of our health.



Ecosystems Land & Marine

Given the persistent nature of fossil fuel-based plastic and its toxicity, plastic pollution is a significant threat to biodiversity. It threatens ecosystems and animal and plant species, impeding their ability to deliver essential services to humanity. PHAs will eventually biodegrade in all environments.

Our New Launch

Today, we announce the **LAUNCH** of PHACT S1000P
 Our PHACT technology platform is versatile and differentiated.

NEW PHACT S1000P

PHACT A1000P

| PHA | P3HB (Crystalline, cPHA) | P3HB-P4HB (Semi-crystalline, scPHA) | P3HB-P4HB (Amorphous, aPHA) |
|-------------|---|--|--|
| Structure | | | |
| 4HB content | | 5~15% | ~35% |
| | * Increase in 4HB content promotes "rubber-like" properties (Low Tg) | | |
| Features | <ul style="list-style-type: none"> 1st generation PHA Crystalline polymer Brittle Crystalline | <ul style="list-style-type: none"> General PHA Semi-crystalline polymer Versatile properties Semi-crystalline | <ul style="list-style-type: none"> 2nd generation PHA Amorphous polymer Flexible, modifier Amorphous |

* P3HB: Poly(3-hydroxybutyrate)

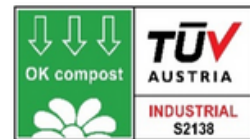
** P4HB: Poly(4-hydroxybutyrate)

Certifications

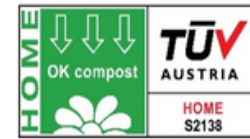
PHACT S1000P SEMI-CRYSTALLINE PHA

Biodegradability Certifications

✓ Complete



OK Compost Industrial



OK Compost Home



Commercially Compostable BPI
(#10529681-1)



Biodegradable Plastic
JBPA (A46002)



Industrial compostable
by DinCertco (9K0896)



OK Biodegradable Soil



OK Biodegradable Marine



Seedling by EUBP
(7W2170)

Food Contact Compliance

✓ Listed US, Korea and China



Food Contact Notification (FCN2330)



식품 및 식품첨가물공전

Registered as HBP (hydroxybutyl polyester)



National Food Safety Standard
Food Contact Plastic Resin (GB 4806.6-2016)

Bio-based Certifications

✓ Complete



OK Biobased by TUV
EN 16640 – 100%
biobased carbon content



Biobased Product by
DinCertco (8C266)



BioPreferred by USDA
(ID# 11346)

Certification of Green Technology

✓ Complete



Green Certification from South Korea /
PHA Manufacturing Technology using
microbial fermentation

In Progress



European Food Safety Authority

Food Contact Materials



PHACT CA1270P (transparent) and **CAI240PF** (opaque, contains CaCO₃) are two new compounds for blown, cast, and MDO film applications.

- 100% bio-based
- Optimal balance between stiffness, strength, tear and puncture resistance
- Excellent bubble and drawdown stability
- Industrial compostable with I240PF having good potential to be home compostable - tests are ongoing

New Film Compounds

Compostable Applications



Snacking Sustainably.
Our bags complete the circle, from snack to soil!

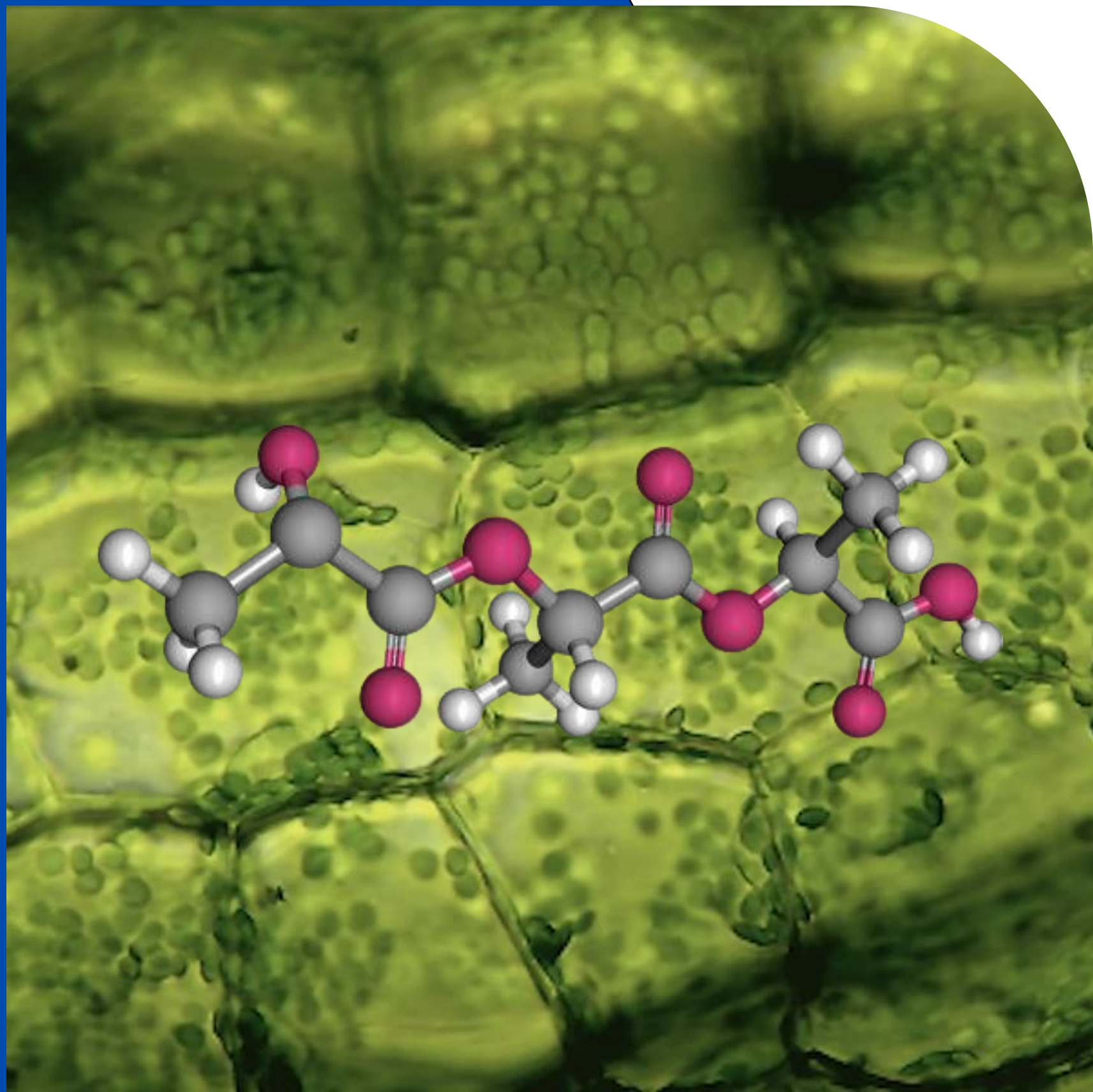
70% Smaller Carbon Footprint

ingo | PHACT

USDA CERTIFIED BIOBASED PRODUCT

| Calories 35 | | Calories from Fat 0 | |
|---|-------------------|---------------------|-------|
| | | % Daily Value | |
| Total Fat | 0g | Saturated Fat | 0g |
| Trans Fat | 0g | Cholesterol | 0mg |
| Sodium | 65mg | Total Carbohydrate | 1g |
| Dietary Fiber | 2g | Sugars | 5g |
| Protein | 1g | Vitamin A | 100% |
| | | Vitamin C | 10% |
| | | Calcium | 2% |
| | | Iron | 2% |
| Percent Daily Values are based on a diet of 2,000 calories per day. Your daily values may be higher or lower depending on your calorie needs. | | | |
| | | Calories | 2,000 |
| Total Fat | Less than 5% | 50g | 10% |
| Sat. Fat | Less than 25% | 25g | 5% |
| Cholesterol | Less than 300mg | 300mg | 60% |
| Sodium | Less than 2,400mg | 2,400mg | 100% |
| Total Carbohydrate | 30% | 30g | 10% |
| Dietary Fiber | 25% | 30g | 10% |





NatureWorks

**Leah
Ford**



Fred Pinczuk

Closing Comments



- New Products
- New Applications
- Expanded Capabilities
- Unwavering focus on making a positive impact on our planet and humankind
- Collaboration across the value chain is key

”The greatest threat to our planet is the belief that someone else will save it.

– Robert Swan, Author

Thank You

**Do You Have Any
Questions?**





NPE2024 PRESS EVENT

CREATING A MORE SUSTAINABLE FUTURE WITH PHA

PRESS KIT

