



FULL CYCLE BIOPLASTICS

Organic Waste to Bioplastics



Winner
SXSW Eco
Reuse/Recycling
Startup Showcase

Winner
PM/GMA Food
Waste Startup
Competition

Winner
Sustainable
Entrepreneurship
Award-Plastics &
Recycling

Winner
Open IDEO: Food
Waste Challenge

Winner
Closed Loop
Foundation Grant

Winner
Think Beyond
Plastics, Most
Innovative Business

Winner
Ellen MacArthur
Foundation

Two Global Environmental Problems

Each Lacking System-Level Solutions



Plastic Pollution

9 million incremental tons of plastic polluting our oceans each year



Food Waste

1.4 billion tons of food wasted each year

One Circular Economy Solution

Full Cycle uses one problem to solve the other, **NATURALLY**

Full Cycle uses **food waste as feedstock** to create the bioplastics of the future.

Collected and treated properly, **no food is ever truly wasted** again.

Replacing petroleum plastics means **NO MORE plastic pollution**.

Full Cycle and the Circular Economy

Using Full Cycle's patented technology, food waste is transformed into bioplastic products that degrade **in natural environments** much like food waste

Cost-competitive, functional bioplastics catalyze system-level economic transformation

A regenerative materials loop is formed

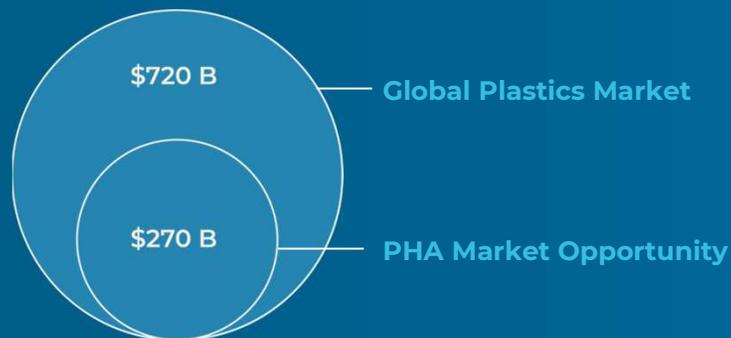
Full Cycle's technology is scalable for global deployment



As Full Cycle grows, the demand for bioplastics does too

Consumers and Companies alike are leading the charge for sustainable plastic alternatives

Entering a \$270 billion market based on the design space of PHA and the oil-based plastics it can replace



PepsiCo Joins Forces with Danimer Scientific to Develop Sustainable Flexible Packaging

– *Danimer Scientific*



8 Companies Are Ditching Plastic Straws

– *Fortune*

- Local businesses and companies like Starbucks, American Airlines, Walt Disney Company, Hyatt and others moving to eliminate plastic straw usage
- States of California and Hawaii, Seattle, New York City, San Francisco and others following suit



PHA bioplastics a 'tunable' solution for convenience food packaging

– *Plastics Today*

Global Plastic Commitment: 150 signatories agree to move toward for re-useable, re-cycled, or COMPOSTABLE alternatives.

Our Patented Technology Converts Waste into Biopolymers

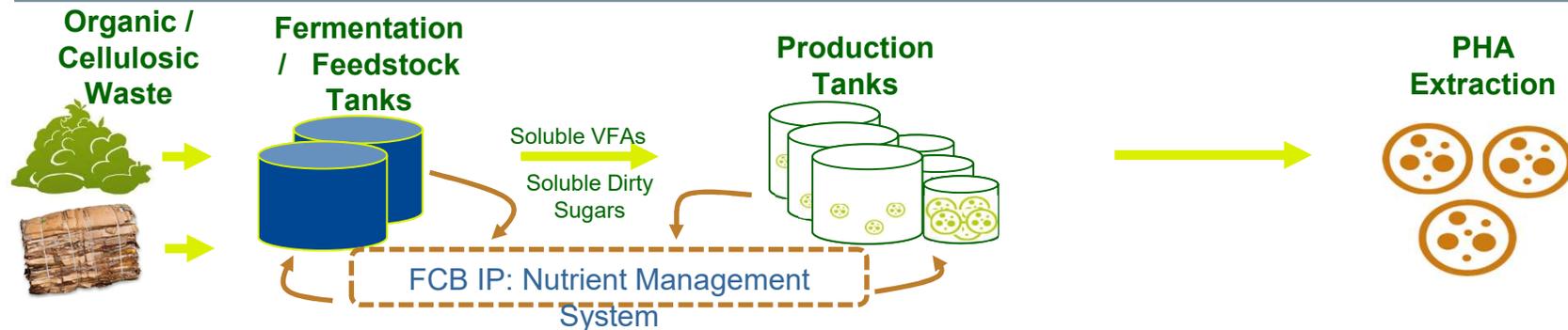
Feedstock Agnostic: can utilize wide array of organic biomass (e.g. inedible food waste, Ag byproducts, dirty paper/cellulosic materials, etc.)

Patent Granted: [US PTO US20160145659A1](#)

Differentiated: no GMO-bacteria, ability to tailor co-monomer ratio inside cell unlocking multiple product formats



Full Cycle's Technology Differentiation Drives Low Cost



Controlled Breakdown of Organic Waste

- + Low Cost Feedstock
- + Can bolt on to existing AD or In-Vessel composting units.
- + C5/C6 "Dirty" sugars are useable
- + Significantly higher value product than AD

PHA Production Via Intracellular Growth

- + Wild type, non-GMO bacteria
- + Non-sterile operating environment
- + Low pressure
- + Proprietary Nutrient Management System
- + Optimized break down of organics
- + Optimized PHA accumulation

Harvest and Process PHA From Cells

- + Non-homogenous feedstocks to homogeneous output
- + Ability to tailor PHA monomer composition for different product applications

Technology Demonstration: Mountain View, Ca



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Partnering with Full Cycle

Feedstock Partners

- Compost Facilities
- Anaerobic Digesters
- Landfills
- Food Processors
- Large Agricultural Operations

Site Partners

- Compost Facilities
- Anaerobic Digesters
- Transfer Stations
- Landfills
- Wastewater Treatment Plants
- Any site permitted to handle/treat Solid Waste

Operational Impact from Co-Location with Composter



Base Case

Inbound Material



400 Tons Per Day

Processing



200 tpd
Landfill



200 tpd
Compost

Outputs

GHG: 211MT CO₂E
Compost: 100 tpd
PHA Bioplastic: 0 tpd
Waste Water: High strength

Full Cycle

Alternative



400 Tons Per Day



0 tpd
Landfill



400 tpd Full
Cycle + Compost



GHG: **142 MT CO₂E**
Compost: **200 tpd**
PHA Bioplastic: **28 tpd**
Waste Water: **Treated Greywater**

Environmental Benefit of Co-Location with Composter



Base Case

Landfill + Compost

Inputs 400 tpd* food waste
 200 tpd landfill
 200 tpd compost

Outputs 100 tpd compost
 0 tpd PHA
 211 MT CO₂E
 High strength
 wastewater

* tons per day

Full Cycle Alternative

Compost + Full Cycle

400 tpd food waste
 0 tpd landfill
 400 tpd compost

200 tpd compost
 28 tpd PHA
 142 MT CO₂E
 Treated
 greywater

Impact/Benefits

Benefit from Full Cycle Technology

0 tpd No change in inbound tonnage
 -200 tpd All material diverted from landfill
 200 tpd FCB tech allows for 2X throughput
 for windrow composter
 100 tpd Compost output and revenue
 28 tpd PHA bioplastic adds new revenue
**-69 MTCO₂E Reduction of 33% of CO₂E from
 waste operations**
**-67 MTCO₂E Reduction of 32% of CO₂E from
 replacement of petro-plastics**

=Illustrative=

==The combined effect serves to reduce CO₂E by over 60%==

Business Model

Licensing Model Drives Rapid Global Deployment

Waste Partner

Food Processor, Paper Mill,
Waste Hauler/Operator

Provides waste and PHA facility location

Full Cycle

Licenses Core Technology
Enabling Profitable Waste to PHA Facility

Develops Operations, Construction, Finance, Marketing Partnerships

Project Financier

Project Finance Equity Partner
and/or Debt Partner

Assists in capital investment

Profitable Commercial PHA Facility

Owned by independent Project Finance-based SPV

**By licensing bioplastic
production facilities globally,
Full Cycle Bioplastics will foster
a more sustainable world**

Thanks!