

# Three Global Environmental Problems

#### Each lacking system-level solutions



**Plastic Pollution** 9 million tons of plastic polluting our oceans each year



**Food Waste** 1.4 billion tons of food wasted each year



**Climate Change** Carbon in the atmosphere is causing catastrophic climate change



# One Circular Economy Solution

Full Cycle uses one problem to solve the other *naturally* 



- Collected and treated properly, no food is ever truly wasted
- Replacing petroleum plastics means no more plastic pollution
- Sequestering carbon that would otherwise be released as greenhouse gas

Full Cycle uses **food waste** as **feedstock** to create the bioplastics of the future, unlocking hundreds of billions in demand



# 'Clean Plastics' are the Solution to Plastic Pollution, PHA is the Cleanest of Those Plastics





## Massive Tailwinds for Clean Plastics

### Heavy investment in PHA production

- Danimer Scientific IPO \$1B
- RWDC \$135M plant constructed in Georgia
- Newlight Tech raised \$45M in series F

### **Regulatory tailwinds**

- October 2020, Canada announces single-use plastics ban
- July 2020, Vermont bans single-use plastic bags and polystyrene food service products
- October 2020, England bans single-use plastic straws, stirrers and cotton buds

## PHA has Traditionally Been Too Expensive Due to Feedstock and Production Cost





Full Cycle's Technology Enables Production of PHA Using Low to Negative Cost Feedstocks in the Form of Organic Waste



Aerobic PHA growth



**PHA extraction** 

## Full Cycle Technology Results in a More Than <u>66% Reduction</u> in <u>Cost to Produce PHA</u>, Putting Us Near or At Cost Parity with Petroleum-Based Plastics



# 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





# How it Works: Full Cycle & the Circular Economy

Full Cycle enables circular economy PHA

- 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





Food/Organic waste



PHA degrades or is organically recycled





**Patented Process** Leveraging Natural **Bacteria creates PHA** 





Biodegradable **PHA products** 



# Full Cycle's Funded Research Pipeline

Fortune 500 Companies are embracing Full Cycle's model. We have partnered with large food companies to turn their waste into their packaging, drastically expanding the market for PHA

- Millions in non-dilutive pre-funded research capital invested
- Large up front purchase orders for our PHA
- Commitment to highly publicize branding partnerships
- **Current partnerships**

Fortune 50 Food Company Fortune 150 Food Company





**Major Global Food Producer** 









# Capital Efficient Business Model Allows us to Scale like a Software Company

- Project financing partnerships allows for high margin domestic production
- Licensing model powers high scale, high margin international production partnerships



# **CA:** Production facility

#### JPN: Large PHA joint venture in negotiation

AUS: License in final negotiation

NZL: Signed License Agreement



## Driving to Commercial Scale

### Full Cycle & Google



#### Current

#### Google Production Kitchen Facility

- Google has invested \$5M in the project
- Now operational at demonstration scale
- Verification of unit economics for PHA production

### Next

Commercial Facility #1

- Organic & Cellulosic Waste
- Multiple tons/day PHA
- Commercial Product Development (\$1M)

#### Market Development Scale

- Google-wide Facility
- Verification of unit economics at scale PHA for product commercialization
- Economically viable facility



# First Commercial Facility Full Cycle Bioplastics x Plentyful

- Targeting 5-10% PHA Yields
- Facility location: New Zealand
- 7 acre site
- 200 TPD nameplate capacity



Combining mixed organic and cellulosic waste feedstocks
 Projected \$1M+ in annual revenue to Full Cycle as licensor

# Projections

<b>Key Numbers</b>	2020	2021
Facilities under contract	0	3
Total Waste Capacity (kT/y)	0	146
Total PHA Capacity (kT/y)	0	7
Revenue (\$k)	\$2,285	\$5,619
Expenses (\$k)	\$2,816	\$5,711
EBITDA(\$k)	-\$531	-\$92
Capital Raise	\$12,000	
End of Year Cash Balance	\$11,470	\$11,378



2022	2023	2024	2025	2026
3	15	18	20	24
365	365	3,212	3,650	4,088
18	18	161	183	204
\$7,274	\$27,843	\$31,020	\$73,027	\$135,97
\$8,087	\$10,074	\$11,705	\$12,458	\$13,874
-\$814	\$17,769	\$19,315	\$60,568	\$122,09
	<u>Opportunisti</u>	<u>c Series B</u>		
\$10,564	\$28,333	\$47,648	\$108,217	\$230,314

**\$3.4M Revenue to date from product development** 









# As Full Cycle Grows, The Demand For Bioplastics Grows Too

- Consumers and companies alike are leading the charge for sustainable plastic alternatives
- PHA will replace 270B of the 720B global plastics market by 2030s



We should not be allowing plastic. And what we should do is phase it out. - Joe Biden, President Elect

One night, I was sitting watching a documentary about climate change, and it made me so ill. I immediately sent out a deck to everyone saying 'We're eliminating plastics from the company'.... We just went through and pushed the elimination. - Tim Cook, CEO @ Apple

We will shift from single-use to reusable packaging. [By 2030] target 50% reduction in waste sent to landfill from stores and manufacturing, driven by a broader shift toward a circular economy. To underscore this commitment, we are pleased to join Ellen MacArthur
Foundation's New Plastics Economy Global Commitment, setting ambitious circular targets for our packaging.

- Kevin Johnson, CEO @ Starbucks







## The Competitive Landscape

Full Cycle is the only company in the world that can consistently produce a wide array of PHA resin types from mixed waste feedstocks and the only company that will produce PHA that is cost competitive with petroleum plastics

Wide range of acceptable feedstocks

- Can tailor resin production per target product type
- Resin portfolio can be sold into several markets



# Executive team



#### Jeff Anderson, MS **Co-Founder & Co-CEO**

Jeff is a serial entrepreneur who brings a wealth of experience in the clean tech industry and has served in multiple executive roles in clean energy and waste repurposing. Jeff is a co-inventor of the technology, who did his master's thesis on economics in PHA production.



#### **Leslie Wolin** Head of People





Leslie's career spans HR and recruiting roles at a variety of startups at various stages of development and size, and major entertainment and big tech companies. Leslie brings a wealth of experience in building organizations that attract and retain world-class employees required for success.



#### **Ross Polk** Head of Growth



Ross is an expert in sustainability strategies and circular economy solutions as well as direct experience developing environmental solutions for the waste management industry.





#### **Dane Anderson, BS Co-Founder & Co-CEO**

Dane is an inventor, engineer, and entrepreneur focused on mitigating the effects of climate change and plastic pollution. Dane specializes in automation, biological wastewater treatment, green chemistry, and scaling technologies from lab to commercial scale.



#### **Casey Zweig, MS Director of Operations**





Casey has developed and implemented several programs which tackle major environmental issues through scalable, solutions-oriented design. Casey managed environmental programs for a California municipality, where she wrote and implemented progressive plastic policies, piloted a successful food waste compost program, and created award winning campaigns to promote ocean stewardship.

### + 20 Full Time Employees 🌾 NYU





UCDAVIS



# Advisors



#### **Julia Murphy** Managing Director - Ultra Capital

Ultra Capital is a large project finance firm for capital intensive projects. Given Julia's project finance expertise, she has been very helpful in planning the Full Cycle facility rollouts.



#### **Mike Jackson** Developer-in-Residence - Generate Capital

Project finance expert specializing in sustainable infrastructure. Mike's deep experience in venture capital and project finance helps to guide Full Cycle through its rapid growth.





#### Adam Schlesinger Senior VP - First Republic Bank

Canadian Subsidiary Lead Financial Services- Microsoft Canada Adam's knowledge of product and deep financial background open doors for Full Cycle across the value chain.

# Raising a \$10-\$20M Series A

### Funds used to achieve the following milestones by 2022 : If we raise \$10M

- Increase Project Development capacity lines to include 5 compounds of PHA

### If we raise \$20M

- Enhance IP protection globally for all licensees -File two additional patents
- Drastically expand sales & licensing team to achieve 2x license sales above 2023 projections -Establish continental offices to access key markets
- Purchase exclusive technology licenses for key upstream & downstream support processing
- In house R& D expansion to unlock product development, feedstock assessment and acquisition, and PHA off take partnerships









FIFTH SEASON VENTURES







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Winner

Member

Winner











Winner

#### Winner

Portfolio company





# Full Cycle's Technology Differentiation Drives Low Cost



**Organic/Cellulosic** waste



Anaerobic breakdown

### **Controlled breakdown** of organic waste

- Low cost feedstock
- Can bolt on 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
- Optimized break down of organics
- Optimized PHA accumulation









Aerobic PHA growth

**PHA** extraction

Proprietary nutrient management System

### Harvest and process PHA from cells

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

# Waste to Value Exists on a Global Scale

Regional waste solutions tap into huge global market potential: working with waste management companies to create system-level, sustainable change

#### \$300 million serviceable market for Full Cycle

Assumes 1-2% TAM penetration, between 25-50 facilities, average of 5 license sales per year, mature sales process by 2025

## High potential for both developed and emerging markets

- Strong value where organic recycling systems currently exist
- Great potential in emerging markets where waste infrastructure is disproportionately lacking and plastic pollution is high

# Licensing & project finance model enables rapid scale and impact



