



# Algae Black™

A Carbon Negative Replacement for Carbon Black



# Carbon Black Market Opportunity





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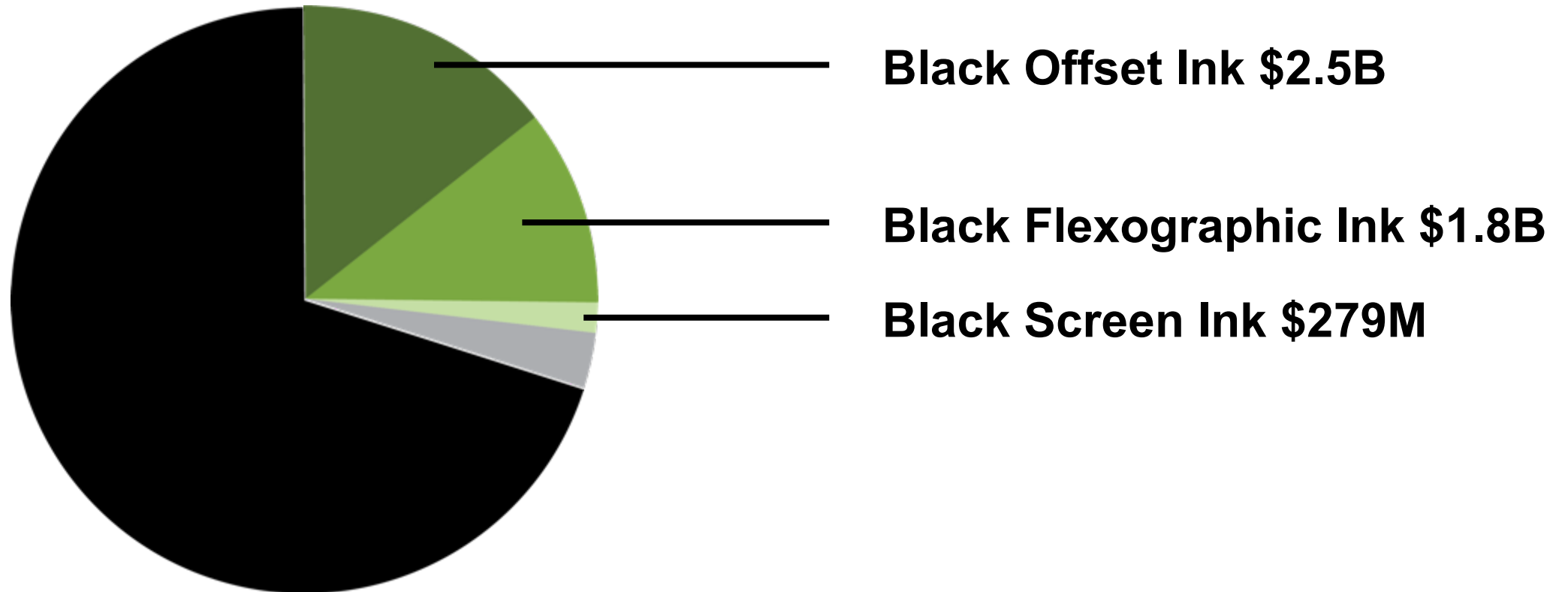




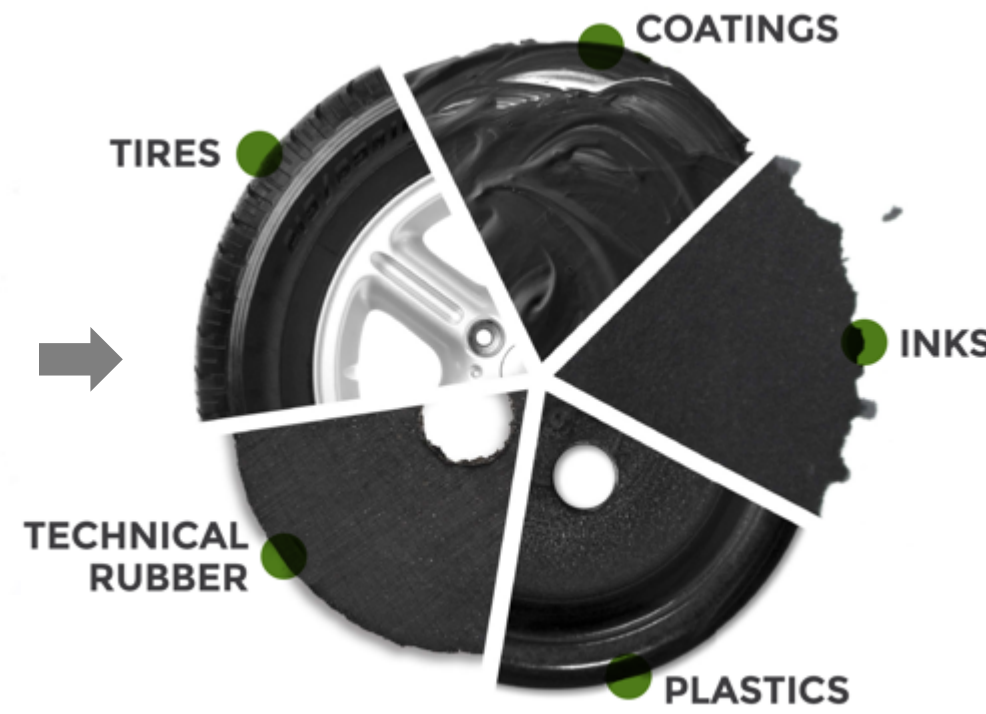
## Carbon Black Market Opportunity

**Total Carbon Black Market- \$17 Billion**

**Addressable Carbon Black Ink Market- \$5.1 Billion**



# Traditional Carbon Black





# Petroleum Production



# **The Problem with Carbon Black**

**Made from Petroleum**

**Carcinogen**

**Government Regulations**

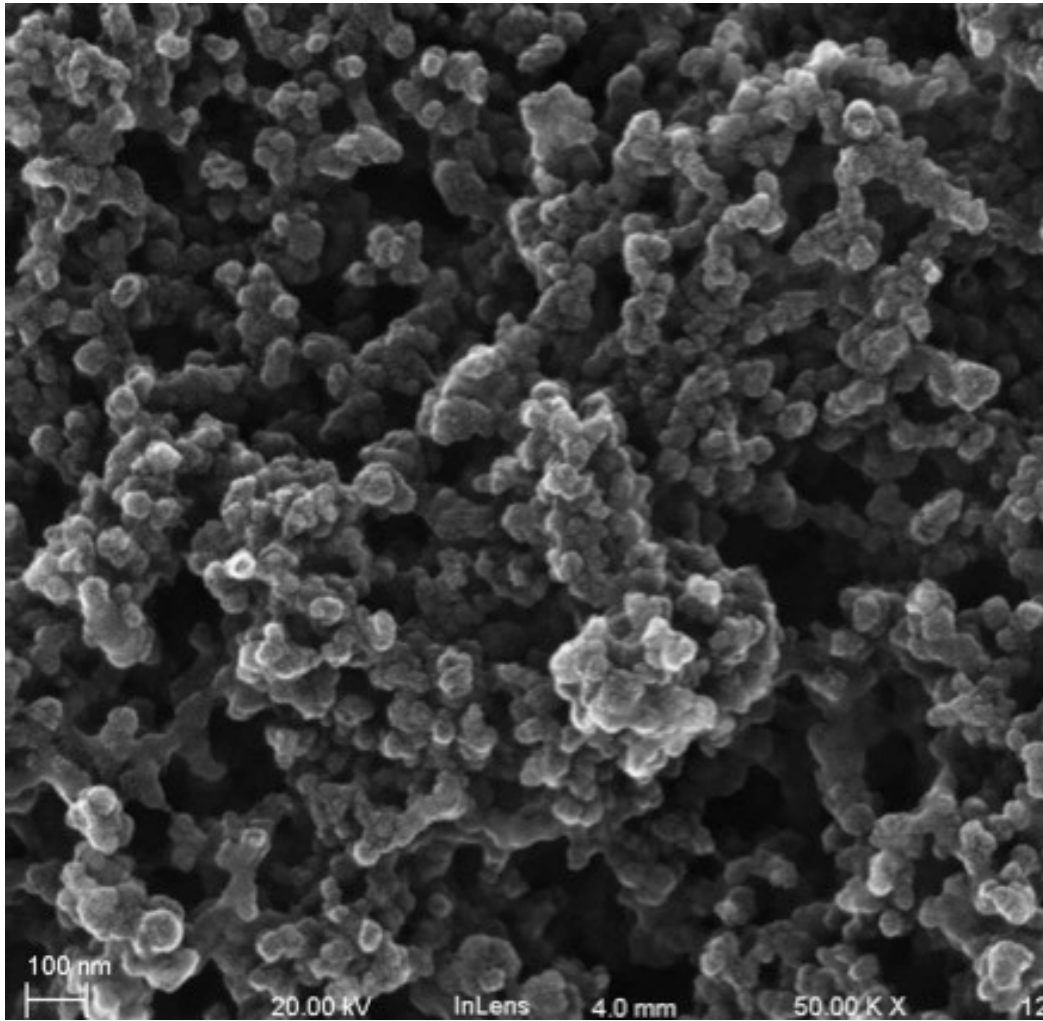
**Large Carbon Footprint**

**Hasn't changed in 100+ years**

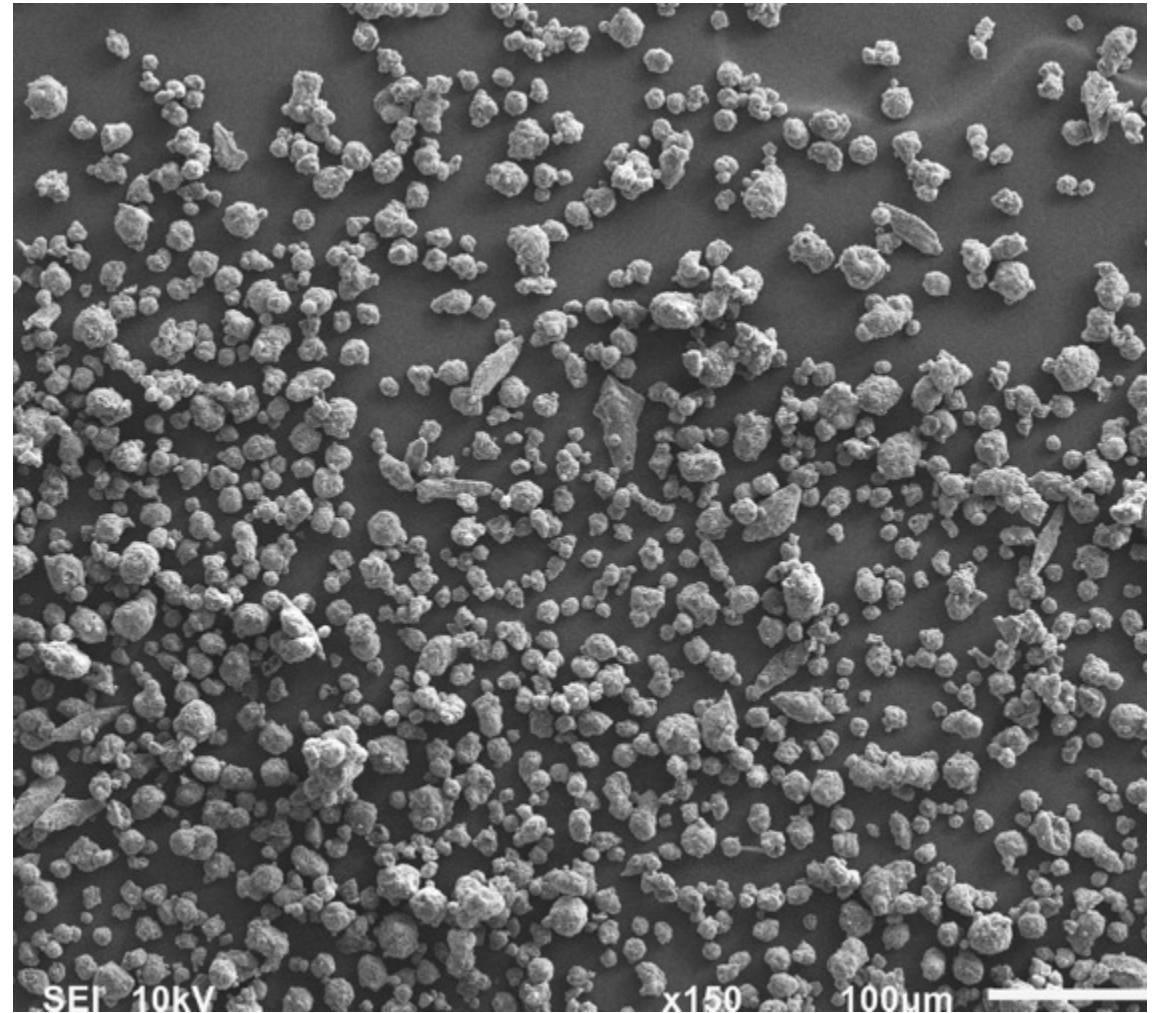


# Algae Black™ Solution





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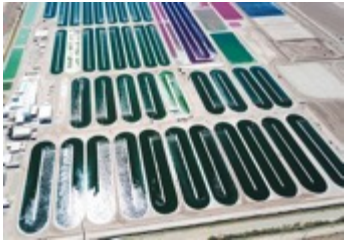


**Petroleum-based Pigments**

**Algae Cells**



# Our Solution



100% Renewable  
Feedstock from Waste  
Material



100% Safe  
Materials



Meets Industry  
Specifications



Innovative Marketing  
Opportunity



Drop in  
Replacement



Negative Carbon  
Footprint

# Introduction to Algae

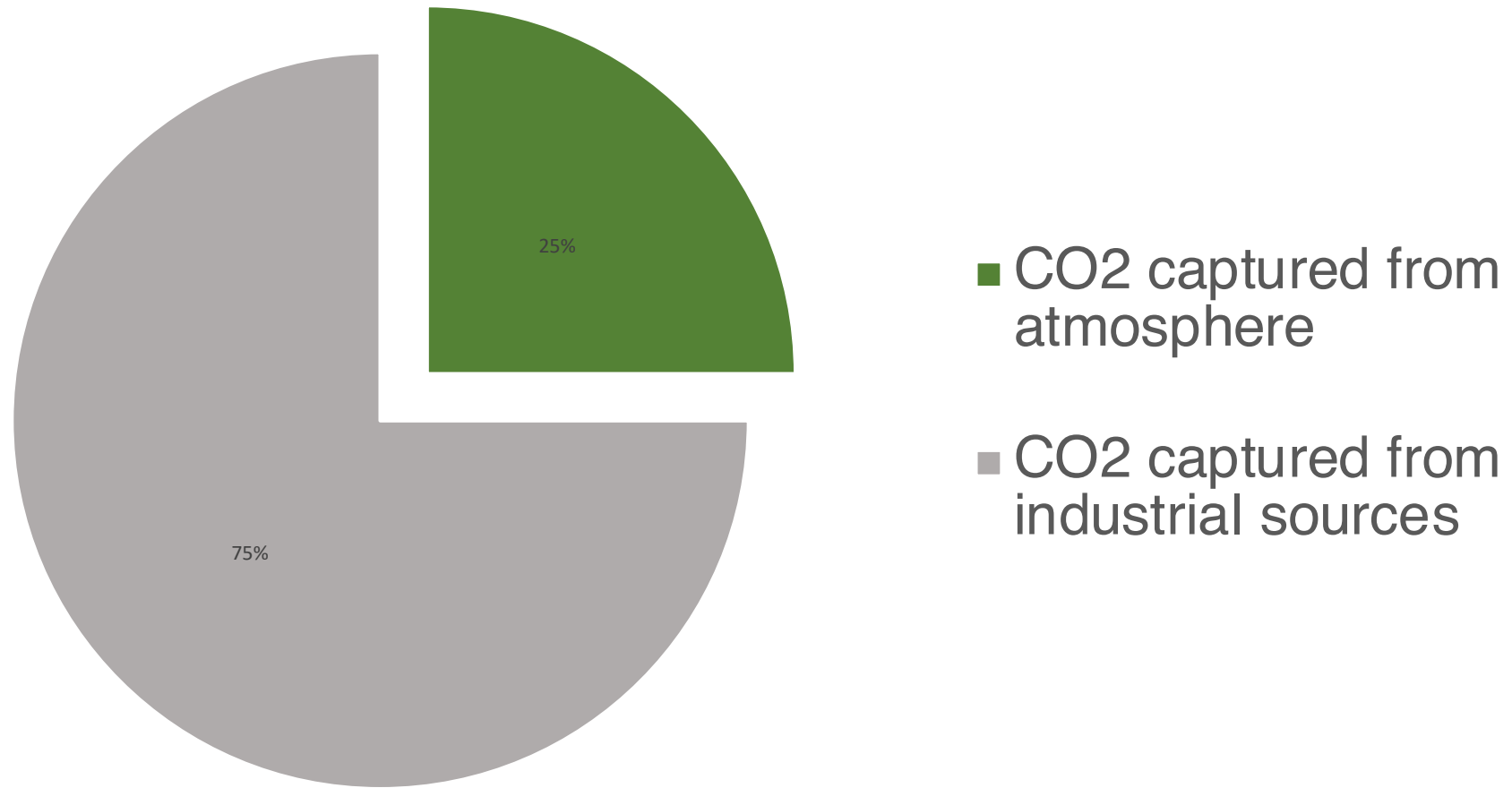


A 100-acre algae farm located in Southern, California. The farm is owned and operated by Earthrise Nutritionals, a subsidiary of DIC Corp. They produce whole cell spirulina powder and a blue colorant called phycocyanin for the natural foods market.

- **Grown by companies around the world for nutraceuticals such as astaxanthin and omega-3 oils**
- **Particle size, ash content, chemical composition, silica, processing steps, shape**
- Algae cells exponentially grow using sunlight, water and CO<sub>2</sub> from industrial sources
- Waste-algae material is generated after product of interest is extracted from biomass
- Grown by companies treating waste-water



# Algae Black Pigment Sequesters CO<sub>2</sub>



As algal cells grow, they use carbon molecules derived from carbon dioxide as their building blocks. Algae farms bubble carbon dioxide from industrial sources so the algae can efficiently sequester carbon dioxide from these sources before entering the atmosphere.

# Polyaromatic Hydrocarbons

**Client:** Living Ink  
**Contact:** Scott Fulbright  
**Project:** PAHs in Black Ink Powder  
**Analytes:** Polyaromatic Hydrocarbons  
**Method:** GC-MS  
**Date Analysis Performed:** 11/21/18  
**Analysis performed by:** Brian Cranmer

Approved by: Greg Dooley



Analytes	Black Ink Sample	Limit of Detection	Analytes	Black Ink Sample	Limit of Detection
Acenaphthene	<i>Negative</i>	> 10 ppb	3-Methylcholanthrene	<i>Negative</i>	> 10 ppb
Acenaphthylene	<i>Negative</i>	> 10 ppb	Naphthalene	<i>Negative</i>	> 10 ppb
Anthracene	<i>Negative</i>	> 10 ppb	Phenanthrene	<i>Negative</i>	> 10 ppb
Benz(a)anthracene	<i>Negative</i>	> 10 ppb	Pyrene	<i>Negative</i>	> 10 ppb
Benzo(b)fluoranthene	<i>Negative</i>	> 10 ppb			
Benzo(j)fluoranthene	<i>Negative</i>	> 10 ppb			
Benzo(k)fluoranthene	<i>Negative</i>	> 10 ppb			
Benzo(g,h,i)perylene	<i>Negative</i>	> 10 ppb			
Benzo(c)phenanthrene	<i>Negative</i>	> 10 ppb			
Benz[a]pyrene	<i>Negative</i>	> 10 ppb			
Benz[e]pyrene	<i>Negative</i>	> 10 ppb			
Chrysene	<i>Negative</i>	> 10 ppb			
Dibenz(a,h)anthracene	<i>Negative</i>	> 10 ppb			
Dibenz[a,h]pyrene	<i>Negative</i>	> 10 ppb			
Dibenz[a,i]pyrene	<i>Negative</i>	> 10 ppb			
Dibenz[a,l]pyrene	<i>Negative</i>	> 10 ppb			
7,12-Dimethylbenz(a)anthracene	<i>Negative</i>	> 10 ppb			
Fluoranthene	<i>Negative</i>	> 10 ppb			
Fluorene	<i>Negative</i>	> 10 ppb			
Indeno(1,2,3-cd)pyrene	<i>Negative</i>	> 10 ppb			

# Living Ink Process



Living Ink collaborates with brands to tell eco-innovation stories for marketing and sustainability purposes, thus allowing Algae Ink to be pulled through the brand's supply chain. Living Ink manufactures the black pigment and finished ink products, which are **sold direct to printers.**



# Algae Ink™ Products in the Market



**Flexographic Ink**  
(cartons)



**Flexo Ink**  
(poly materials)



**Offset Ink**  
(paper)



**Screen Print Ink**  
(garments)

Living Ink integrates sustainable Algae Black™ pigments into a variety of ink formulations that can print on different substrates for a diverse number of applications.

# Algae Ink™ Products in the Market



- Passed RSL tests of several brands
- Passed print/color trials of brands / vendors
- Passed severe wash test trials
- Easy for printers to use- no difference in shelf-life  
Soft-base and high solids base
- Ink has high UV lightfastness

# Algae Ink™ Products in the Market



**Flexographic Ink**  
(Hang-tags)



# Algae Black™ Plastic Products



**Masterbatch**  
(rPET, PP, PLA)



**Plastic Packaging**  
(Rigid)



**Composites**  
(Bioresins)

# Algae Black™ Products in Development



**Cosmetics Formulation**  
(beauty products)



**Foam Formulation**  
(footwears products)



**Textiles Dyeing**  
(garments)

# Current Commercial Trials

## Pre-Commercial Trials



## R&D Trials



Our customers and partners are innovative retail and material brands committed to achieving sustainability focused marketing and technical goals



# Global Interest from Chemical Companies

## Specialty Chemicals



## Ink Manufacturers



Many of the largest chemical and ink companies in the world have demonstrated significant interest in working with Living Ink. The company is exploring potential partnerships with strategic groups.

# Global Interest



These 10 online exclusives drew the highest readership totals during 2019:

1. [Living Ink is Successfully Commercializing Its Algae-Based Ink](#)
2. [Ink Industry Leaders Offer Their Thoughts on Upcoming Year](#)
3. [HP's Award-Winning True Water-Based Inks Created With Corrugated, Display Markets In Mind](#)
4. [Proposition 65 and the Ink Industry](#)

Ink World Magazine's #1 read article was about Algae Ink. This demonstrates the interest in innovative and eco-friendly ink products

# IP Position

## Patent Applications

- Non-Provisional Application – Compositions, Systems, Methods and Devices for Utilizing Microorganisms in Print (Filed 2015; US application)
- Non-Provisional Application - Biological inks and coatings (Filed November 2019; PCT application)

## Trademarks

- Registered- Living Ink®
- Used in commerce- Algae Ink™ ; Algae Black™



Algae Black™

## Trade Secret

- Process formulations; Process steps; Optimal material types

Initial non-provisional patents are pending with further filings expected to grow the patent family; trademarks have been filed.



# Company Today



# Living Ink Roadmap

Technical Validation



- Patents filed
- Process defined
- Sales / samples to partner
- Successful pilot trials
- Validate market need
- Pilot plant construction

Grant-\$1.6M - 2017-20

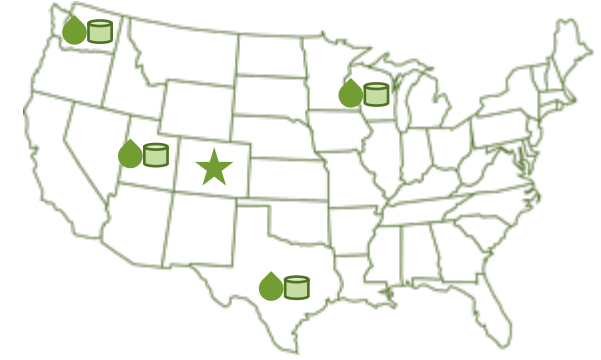
**WE ARE  
HERE** Scale Up



- Commercial production
- Continue R&D
- Validate business model
- Build out pigment production

Seed - \$1.5M - 2020

Commercialization



- Series A
- Long-term supply contracts
- Partner contracts
- Focus on pigment production

Series A - \$5M - 2022





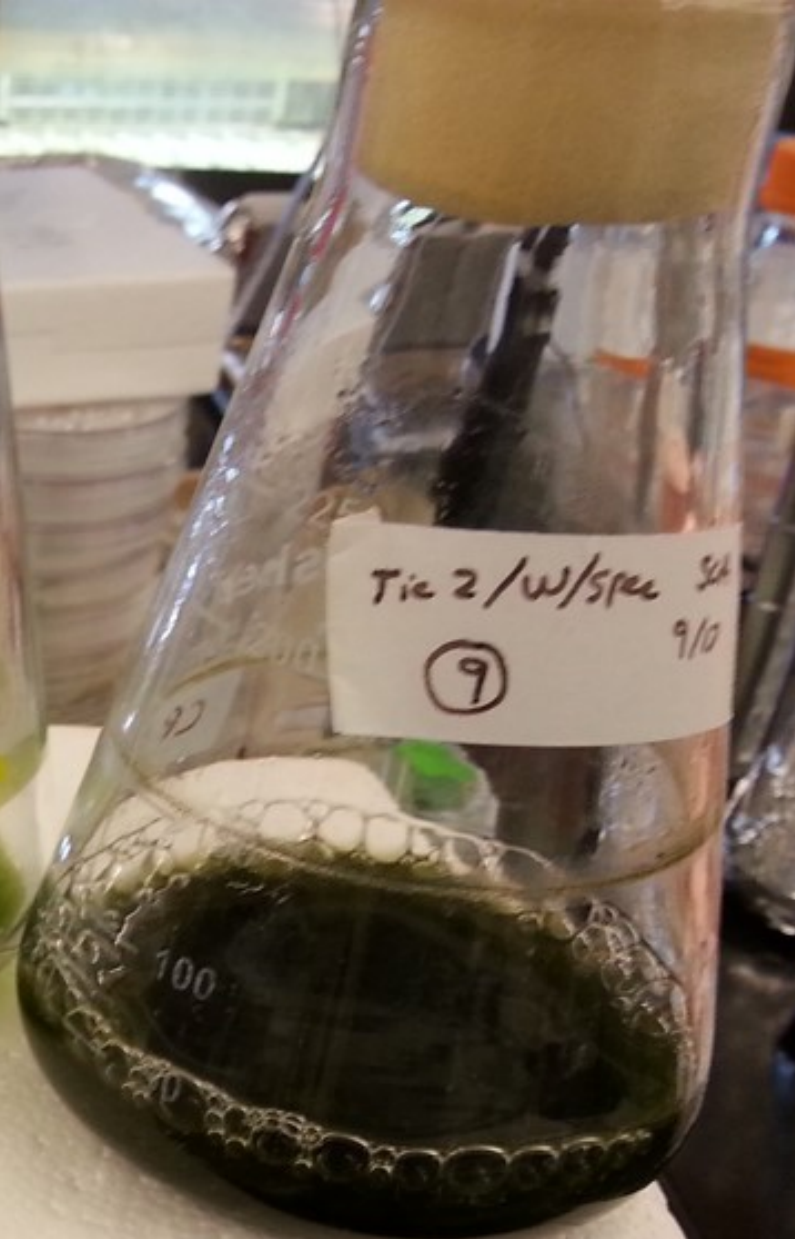
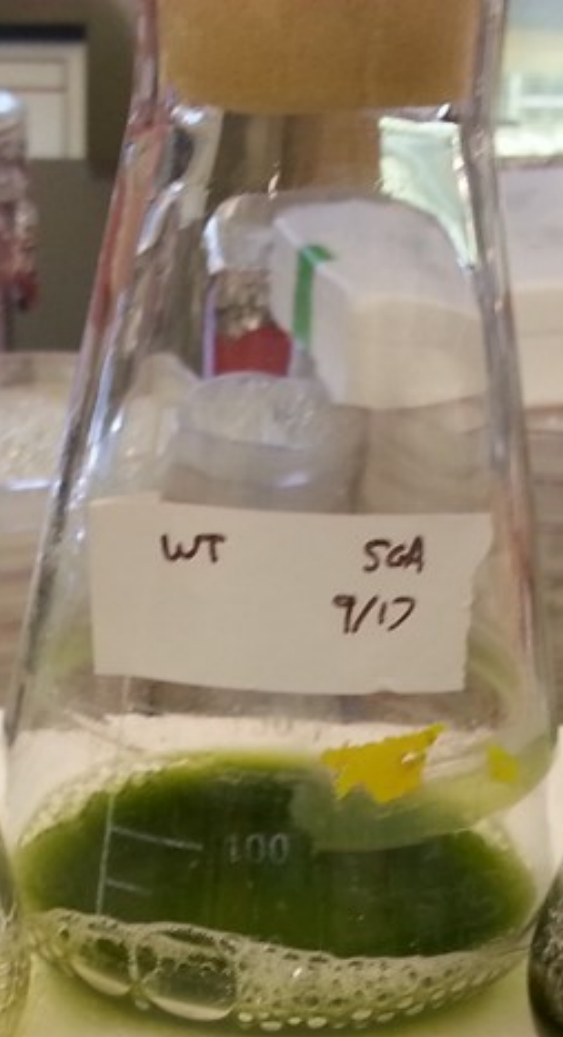
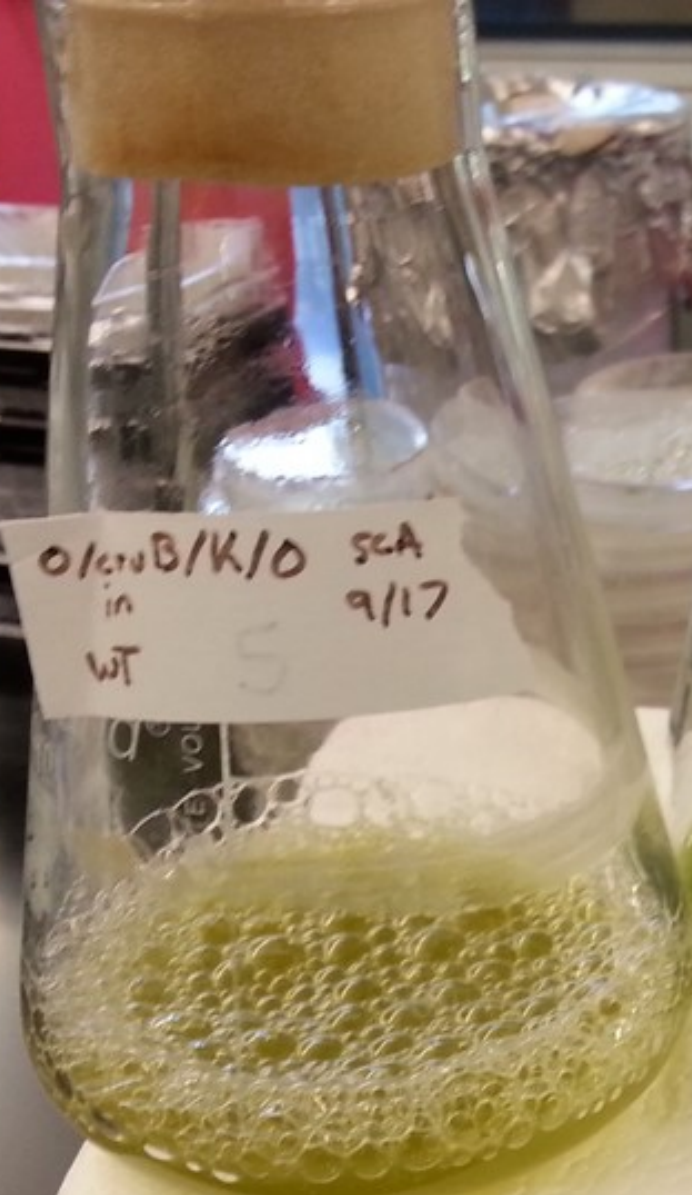
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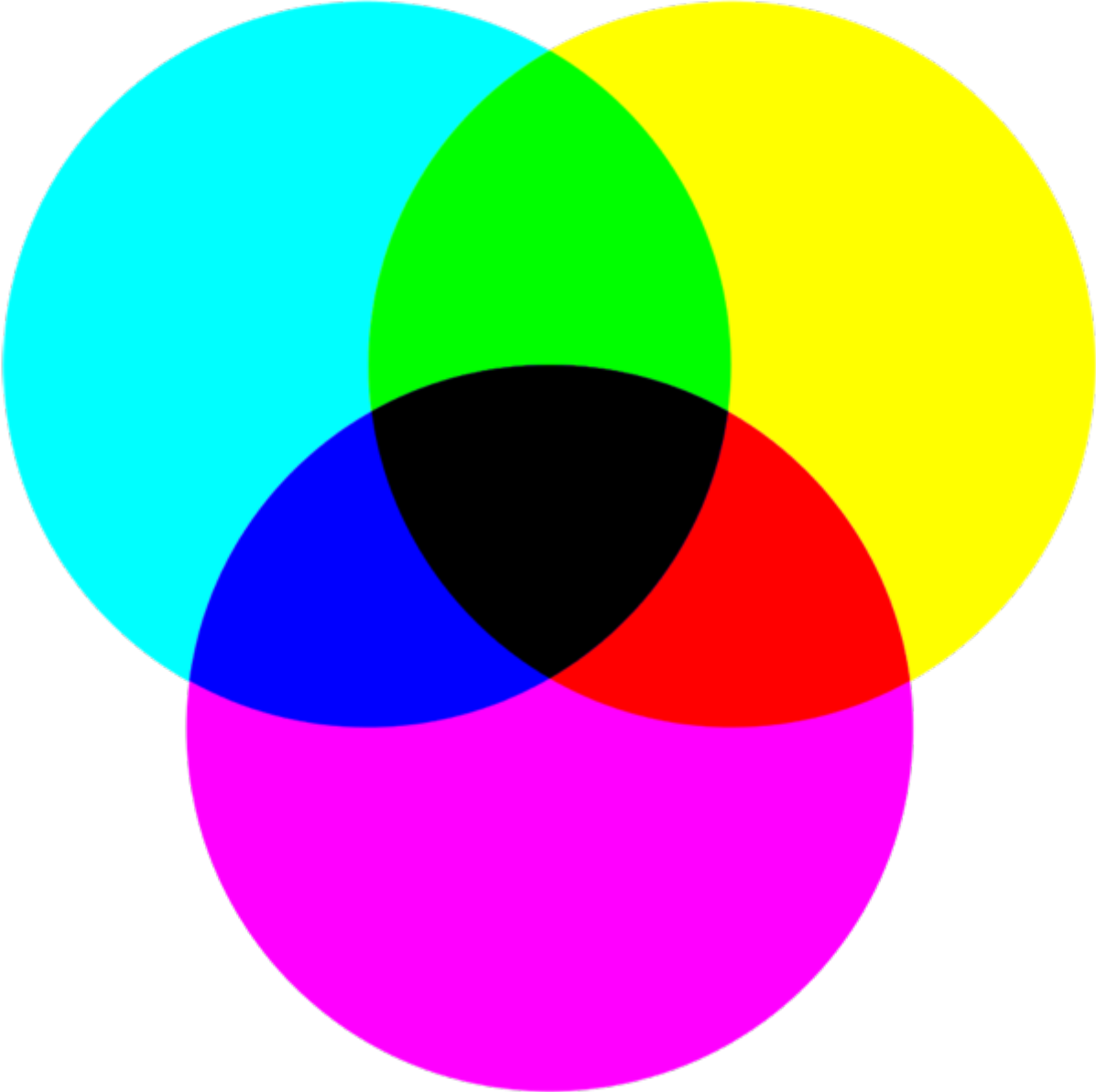










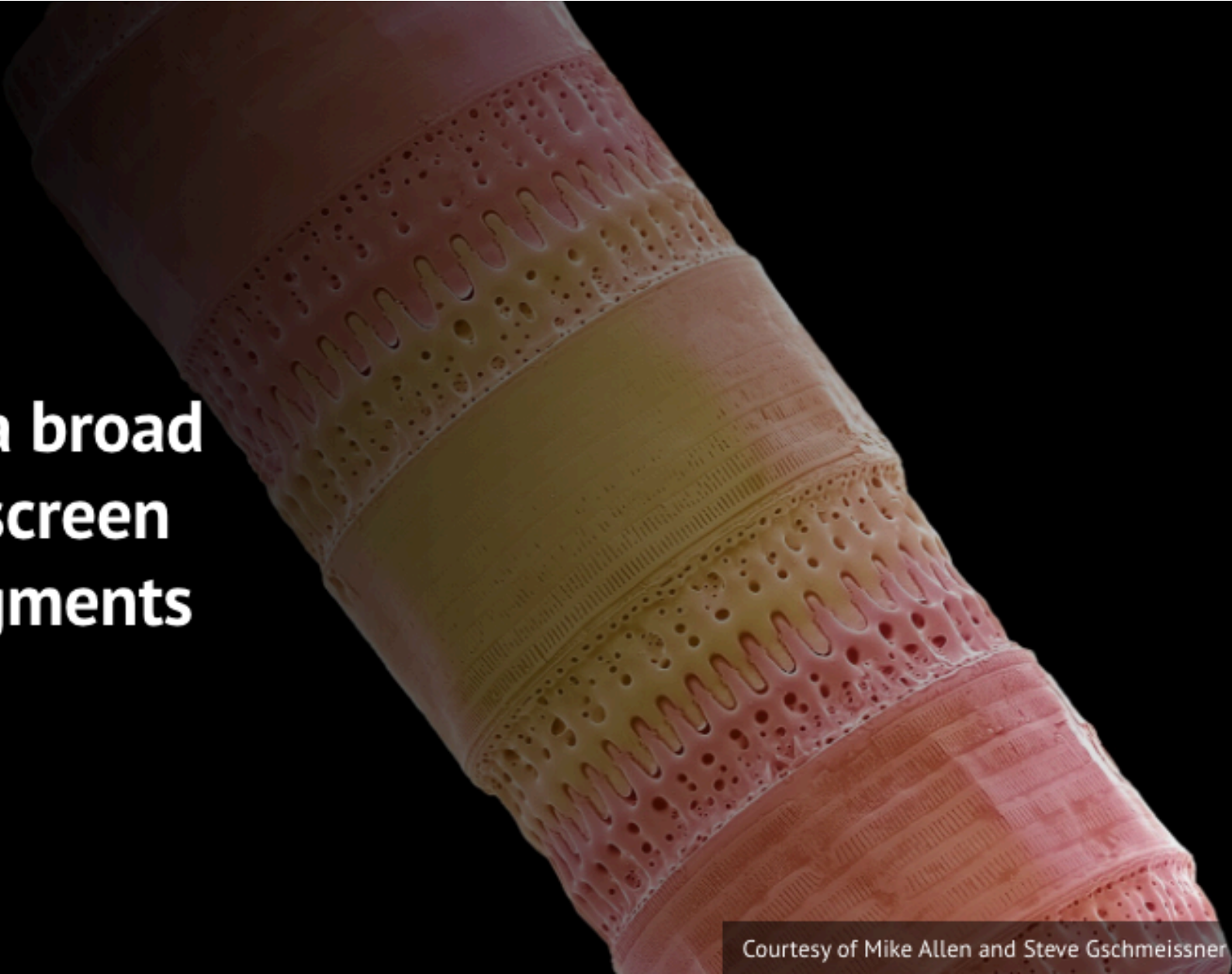


[Algae UK](#) /

# Sustainable inks – a broad brush approach to screen for vibrant algal pigments

Principle investigator: Matthew Davey  
Scottish Association for Marine Science

Courtesy of Mike Allen and Steve Gschmeissner



## Team



**Scott Fulbright**  
CEO



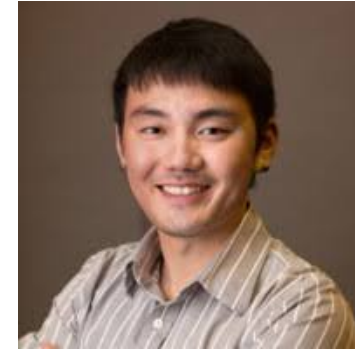
**Steve Albers**  
CTO



**Fiona Davies**  
Scientist



**Aparna Nagarajan**  
Scientist



**Kangmin Kim**  
Coatings Chemist



**Vicky Putsche**  
Scale-up Engineer

## Advisors



**Ben Walker**  
Over 30 years business planning and operations experience with Hewlett Packard.



**Kyle Wentz**  
Owner and President of Ecoenclose, an environmentally packaging Company



**Peter Bradley**  
Chairman of 2 companies, 1 PE-owned and the other NASDAQ listed.



**Brian Zimbelman**  
Investment Principal and Crawley Ventures, a Denver based VC firm



**Terry Clayton**  
Dr. Clayton is a Director at EFI.

Solid technical team that laid the foundation for developing and validating technology. The team will need to strengthen business development expertise.





**Call to Action:**

- **Printers in the UK**
- **Algae Suppliers**

**[scott.fulbright@livinginktechnologies.com](mailto:scott.fulbright@livinginktechnologies.com)**

**575-932-9938**

**[Livingink.co](http://Livingink.co)**

# Product Development

Product	Technical Validation	Market Validation	Market Size
Black Offset Ink	✓	✓	\$2.5B
Black Flexographic Ink	✓	✓	\$1.8B
Black Screen Ink	✓	✓	\$279M
Black Masterbatch Plastic	✓		\$X.XB
Black Plastic Composites	✓		\$X.XB
Cosmetics Formulation	✓		\$X.XB
Textile Dyeing	✓		\$X.XB
Foam Formulation	✓		\$X.XB
Ink Colors			
Product			