PLUG AND PLAY

SILICON VALLEY SUMMIT

JUNE 10-12 2025



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SV SUMMIT

BATCH 18

NEW MATERIALS & PACKAGING EXPO

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OPENING REMARKS

Robert Grey

Director, Sustainable Future
Plug and Play

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Trends Driving Materials Innovation

Regulation

- Active domestic & abroad
- EPR for Packaging
- EU – CSRD, PPWD, CSDDD, CBAM, etc.
- Fluctuating US Federal

Supply Chain

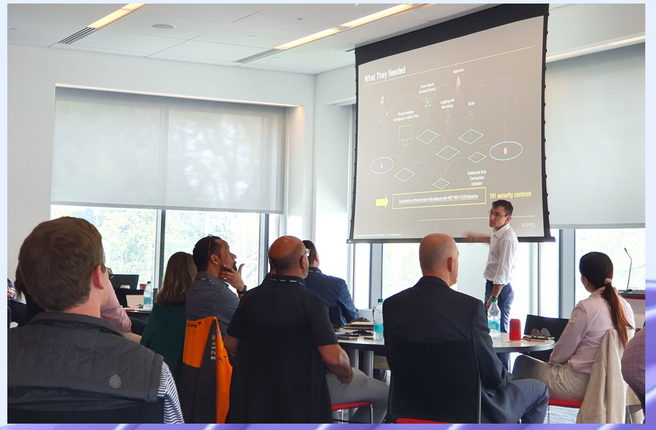
- Tariff response
- Domestic supply means circular supply
- Digitization of supply chain
- Scope 3 motivates whole value Chain

AI

- AI everywhere
- Specialized models for materials
- Trend presentation later today

Navigating the AI Enterprise-Startup Landscape

In Collaboration with The Coca-Cola Company
April 2nd, 2025





PROGRAM HIGHLIGHTS

AI for AI's Sake? Understanding the Right Use Case for AI
Vinay Narayan *ex-Meta Reality Labs*

Build, Buy, or Partner
Brett Barton *Unisys Global AI Practice Leader*

The Case for Startups
Lauren Luellwitz *IBM Strategic AI Partnerships Director*

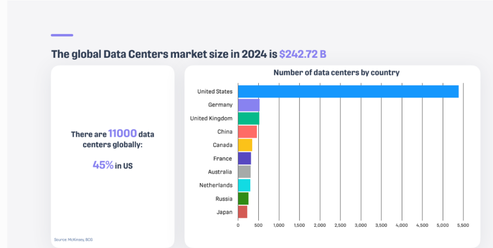
Privacy Cyber and AI
Ian Schmertzler *Dispel Founder and CEO*

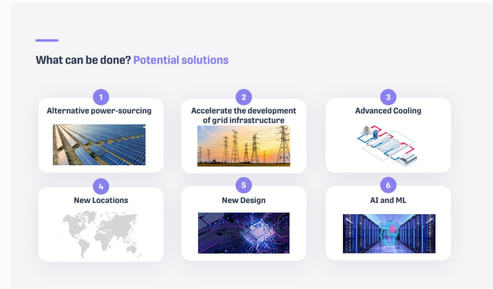
Learning to Dance with Generative AI
Jayala Bradley *Accenture Generative AI Leader*

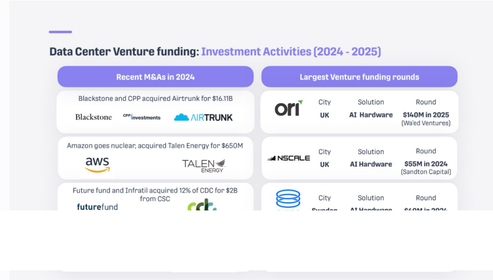
Farming New Frontiers with AI
Sachi Desai *The Climate Corporation, Sr. Director of Strategy - Global Strategic Partnerships*

TREND PRESENTATION

Camilla Rizzi *Plug and Play Ventures Associate*







2025 Event Highlights

SF CLIMATE WEEK

April 2025

Happy Hour: How to Prepare for Scale!

PLUG AND PLAY SUSTAINABILITY

Forum: 2025 Hydrogen & Catalysts for a Carbon-Neutral Future

TANAKA PRECIOUS METALS

Panel: PFAS Remediation: Navigating the Emerging Value Chain

Lux Research

EXTENDED PRODUCER RESPONSIBILITY (EPR) FOR PACKAGING WEBINAR

May 2025

Themes: Data Systems, Enabling Materials & Logistics for Material Recover

CIRCULARITY CONFERENCE ROUNDTABLE

April 2025

Theme: Effective models of collaboration to build a circular economy

Ongoing Programming Series

Extended Producer Responsibility (EPR) for Packaging

WEBINAR

May 2025

Trends Presentation
Themes: Data Systems, Enabling Materials & Logistics for Material Recover

Panel 1: Driving EPR Success Through Data Innovation and Collaboration

Panel 2: Built for Recovery: Creating Packaging That Works in Today's Systems

UPCOMING EPR FOR PACKAGING EVENTS

Startup Showcase
September 2025

Corporate Roundtable
Winter Summit 2025

Technology Focus Areas - Fall 2025 Program

Advanced Packaging Materials and Technology

- Sustainable, food-safe materials
- Lightweighting technologies
- Alternative coatings, adhesives, and inks

AI x Materials

- Materials discovery & formulations
- Simulations & property predictions
- Improved data management and utilization

Biofunctional Materials

- Anti-microbial technologies
- Regenerative health materials
- Diagnostics and detection

Next-Gen Performance Materials

- Lightweight structural materials
- Flexible electronics and optical materials
- Sustainable energy utilization

Agenda



- Opening Remarks
- Corporate Panel
- Startup Pitches: Part 1
- AI Tools for Materials
- Startup Pitches: Part 2
- Closing Remarks

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CORPORATE PANEL

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MATERIALS CORPORATE PANEL



MODERATOR

Gabe Mickel

Corporate Partnerships Manager
Plug and Play



Kathleen Gisser

Research Fellow - Innovation Partnerships
Sherwin-Williams



Eri Oh

R&D Marketing/Business Development Manager
TANAKA



Cate Sujin Kim

Head of Innovation Center
SeAH

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EMCEE

Gloria Chyr

Ventures Associate
Plug and Play

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STARTUP PRESENTATION



Blue Lake Packaging

Plastic-free fiber-based materials and packaging solution provider

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Innovate for A Sustainable Future®

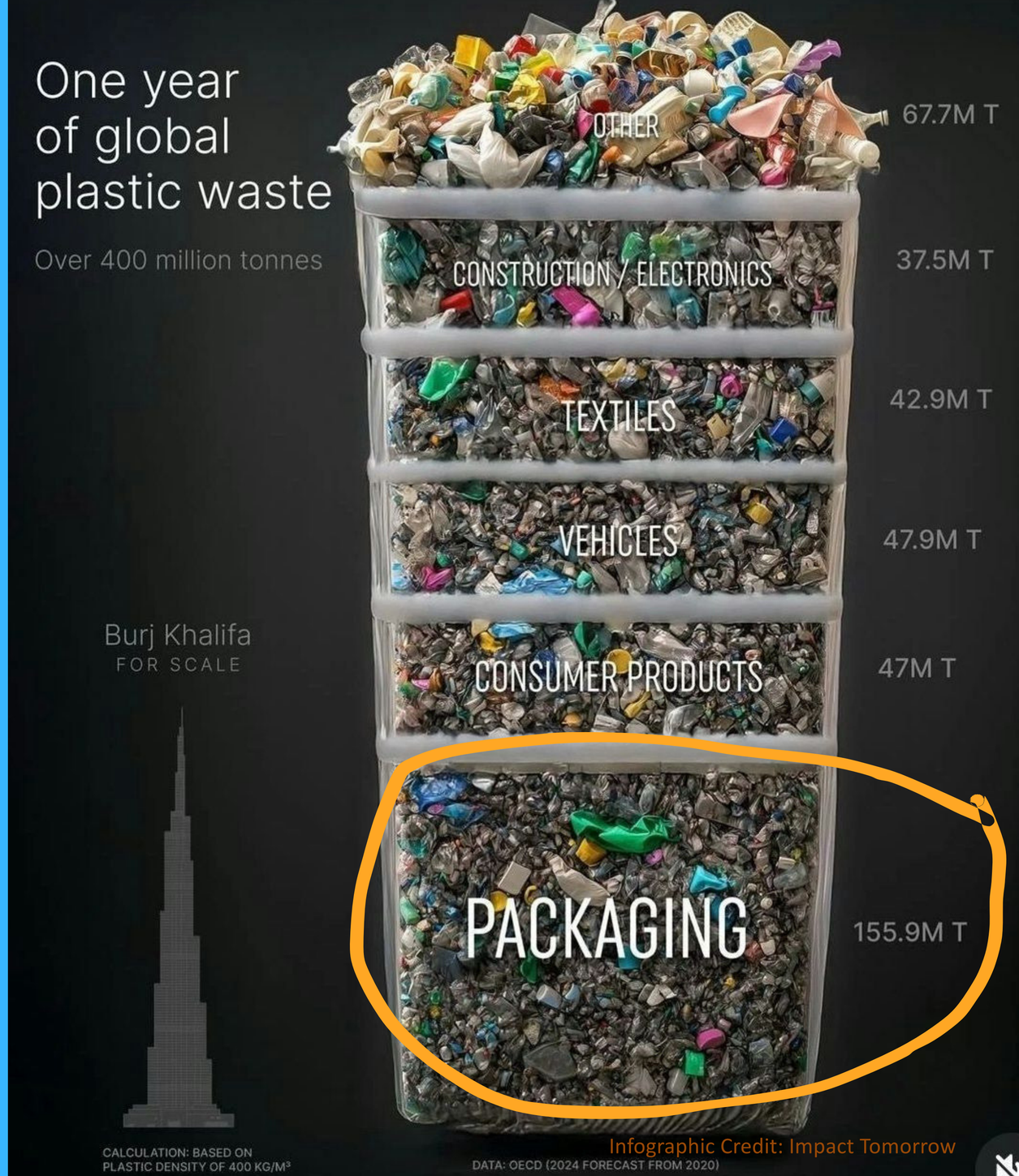
Blue Lake Packaging, Inc.

Presented by:

Ying Liu, Founder & CEO

info@bluelakepackaging.com • www.bluelakepackaging.com

The world is drowning in plastic waste!



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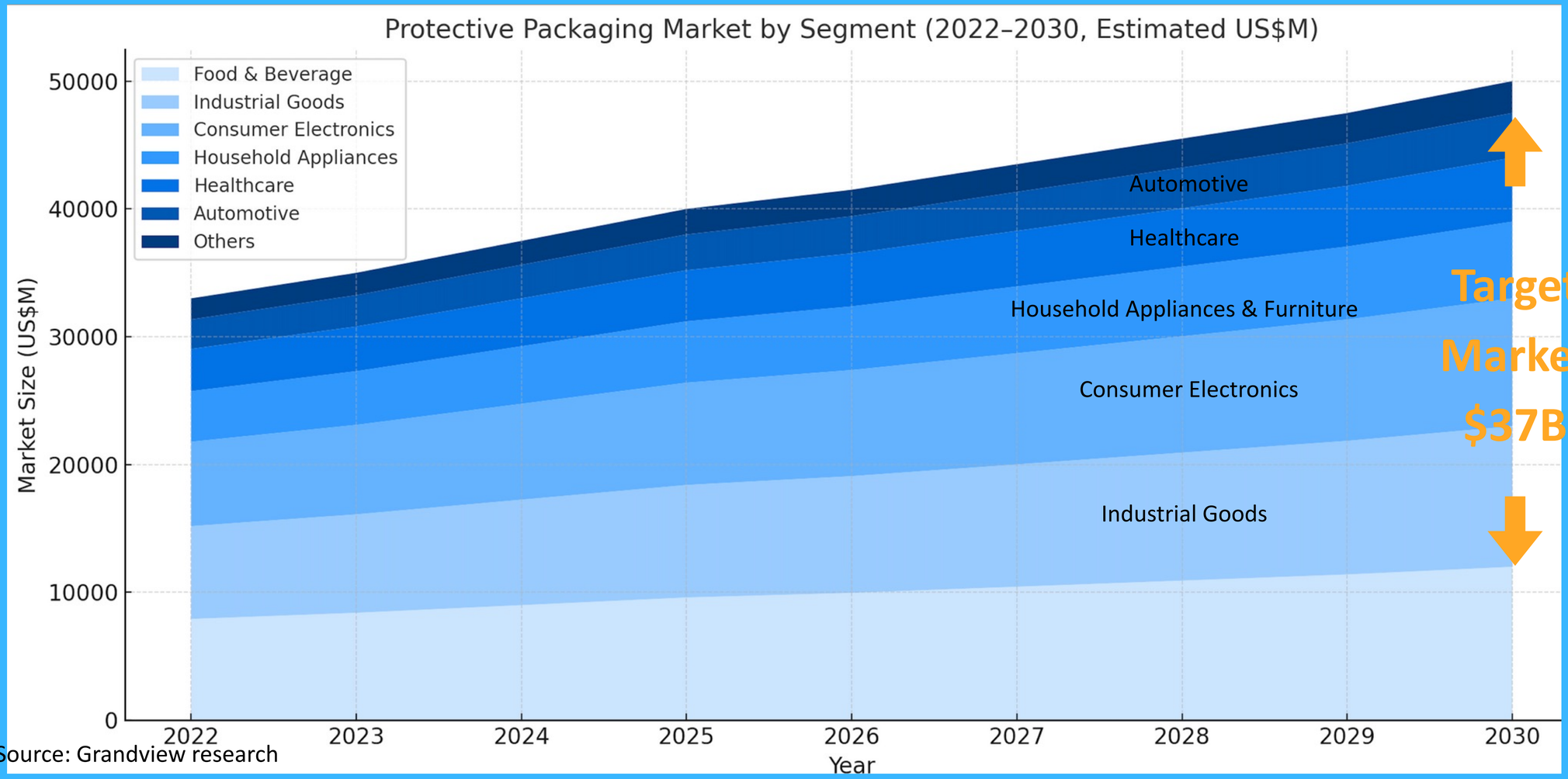
Blue Lake Target Market: Protective Packaging - $37B by 2030



Source: Grandview research

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Problem

Despite their widespread use in protective packaging, EPS and EPE foams present growing environmental, health, regulatory, and recycling challenges.





Styrene is a liquid petrochemical that is derived from benzene and ethylene.



Pentane is highly inflammable, causing dizziness when inhale, and toxic to aquatic organisms.



It's not snow, it's pollution: Lake Tahoe littered with thousands of plastic beads

Beads, believed to be remnants of a floating dock and made of expanded polystyrene, can harm environment, say experts

Slow degradation, potentially leaching chemicals into the land or air

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Solution

High-performance, recyclable-with-paper foams made from renewable plant fibers and bio-materials—scalable via automated manufacturing to replace petroleum-based cushioning foams

DTC & E-Commerce

- Strong need for sustainable packaging + brand differentiation
- Want eco-friendly appearance and plastic-free claims

Appliances, Furniture & Industrial Equipment

- Prioritize protective performance
- want scalable molded alternative for large/heavy items

Consumer Electronics & Medical Devices

- Require protective inserts for fragile devices
- Fiber foam can replace molded plastics, align with ESG

Packaging Converters & Distributors

- Can integrate fiber foam into their sustainable material portfolio
- Help scale distribution across multiple industries

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Alternate Solution Comparison

	Temperpack	CruzFoam	Evocative	PulPac	Stora Enso Papira®	Blue Lake
Materials	Starch or PLA	Chitin from shrimp, crab shells	Mushroom/Mycelium	Wood pulp	Wood pulp	Wood pulp, bamboo, bagasse, Agricultural waste fibers, OCC
Method	Extrusion, wrap with/wo LLDPE	Extrusion	Grow around removable components, not in commercial production	Dry Molded Fiber	Not in commercial production	Proprietary equipment and tooling method
Applications	Thermal, Cushioning	Thermal, Cushioning	Cushioning	Plates, utensils etc. thin, customizable molded fiber	Cushioning	Cushioning, thermal Customizable
Environment	Compostable	Biodegradable	Biodegrable	Recyclable with paper & biodegradable & compostable	Recyclable with paper & biodegradable & compostable	Recyclable with paper & biodegradable & compostable
Cushioning Performance	**	***	**	**	***	****
Cost	$$~$$$	$$$	$$$$	$$	N/A	$$
Fund Raised	$206M	$25.3M	$121M	$41M	Part of a Public Company	$2.45M

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Competitive Advantages

Fiber foam combines the protective performance of plastic foams with the recyclability and sustainability of paper—offering a drop-in solution that meets both regulatory, brands and consumer demands.



Recyclable with paper



No toxics throughout product lifecycle



Versatile performance and cost effective



Automated manufacturing

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Leadership



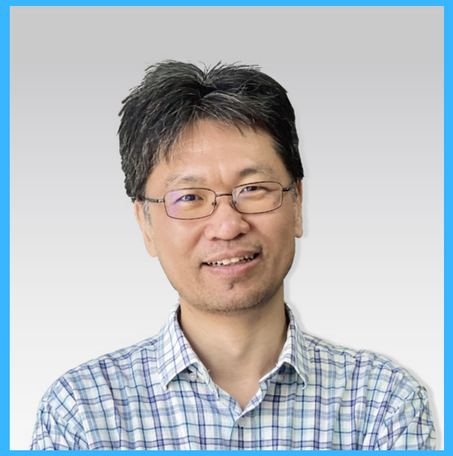
YING LIU
CEO

- 25+ years leadership including 12+ with Apple in supply chain & product management
- Founding Director of Apple China Operations
- Board member of Packaging School and Business School at Michigan State University



OWEN HUANG
TECHNOLOGY

- 27+ years of experience in paper making, polymer product management with Guangzhou Paper, APP, GE, BASF
- Serial Entrepreneur in nano materials ESD and Thermal Solutions
- Engineering Degree in Pulping and Paper Making



WEIHUA DAI
MANUFACTURING

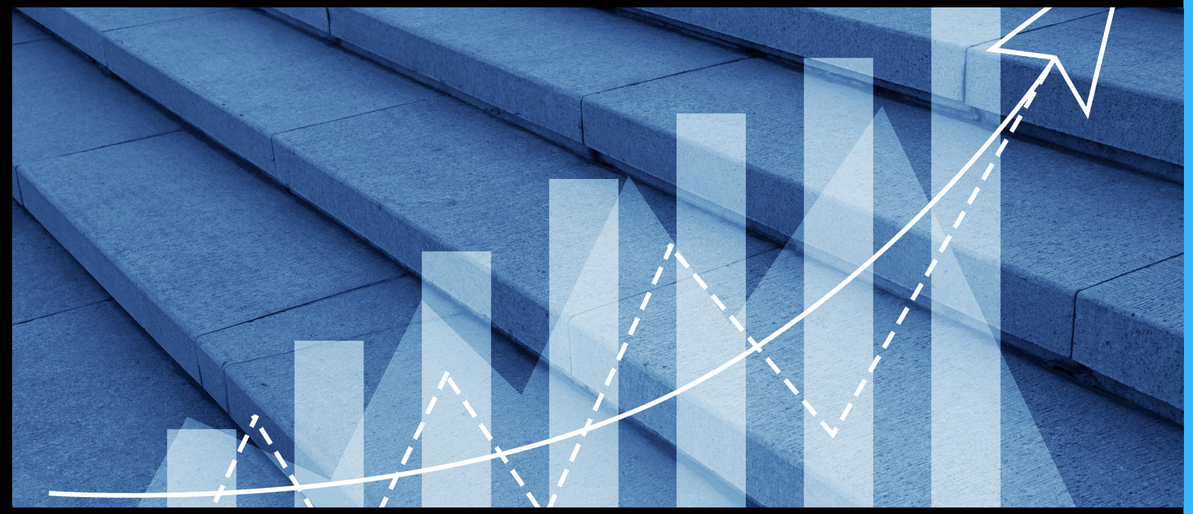
- 20+ years of experience in design-for-manufacturing, process and equipment development, and quality management with Apple, Nokia, Dell, Celestica
- Six sigma black belt



XIANG LI
PROJECT MANAGEMENT

- 15 years as structural engineer and project manager with world well-known firms
- B.S. in Structural Engineer from Ohio State University, MS from University of Southern California

Traction



Currently in pilot and commercial testing across multiple industries, fiber foam is on track to scale as a next-generation protective material.

Leading brands PoCs

Orders on hand

>$3M in Revenue for various projects

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Barriers to Entry



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Funding Timeline

January 2020

Pre-Seed

Valuation: $8M
Investors: Bolt & Incite

May 2025

Seed

Valuation: $20M
Investor: EWP (secured)

2026

Expand Market

Aiming for market diversification and revenue growth through expansion

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Strategic Fit



Fast Growing Demand for Sustainable Packaging Solutions

Sustainable packaging has moved from trend to mandate—driven by legislation, corporate social responsibility, and the race to win consumer trust.

Strenghten Circular Economy

Fiber foam closes the loop in protective packaging by combining renewable inputs with local existing paper waste streams, aligning with circular economy principles.

Agile Manufacturing

Fiber foam's agile, automated manufacturing enables rapid scaling and customization—helping the packaging industry adapt quickly to shifting regulations, supply chains, and customer needs.

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Ask

- We look for US manufacturing partners
- We seek $3M in addition to secured $1M in seed-funding to scale our operations. Funds will be allocated to



$2M

Automated Manufacturing
Capacity Expansion
Initial Order Fulfillment

$700k

US Manufacturing Fit
via Partnership

$300k

Business
Development

copyright@Blue Lake Packaging, Inc.

Fight Plastic Pollution Together!

To get more information:

www.bluelakepackaging.com

info@bluelakepackaging.com



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OXbyEL Technologies

Solving the global PFAS water contamination problem

#PNPTCSiliconValley

Join us at **pnptc.com**

OXbyEL Technologies, Inc.

"Oxidation by Electrochemistry"

The Next Generation of Water Treatment

C-Corp (2018)



Ed Ricci, CEO
edricci@oxbyel.com
602-819-0622
www.oxbyel.com

Your Take Away

OXbyEL Is Changing How Drinking Water Is Treated Today

The Customer Problem

Traditional water treatment solutions are not effective in addressing various contaminants like PFAS

Drinking Water



Industry



DoD



Customer Pain Points:

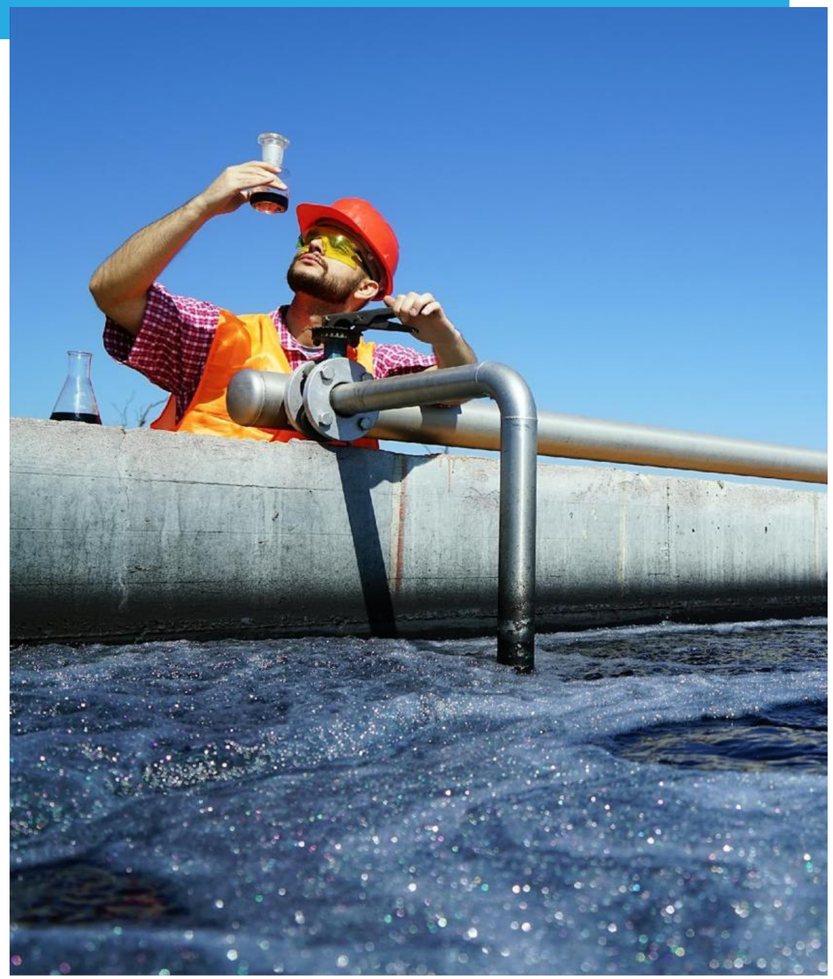
COST; Liability; Contaminants not destroyed; wastewater not reused

The Cost of Clean Water

E.P.A. Says 'Forever Chemicals' PFAS Must Be Removed From Tap Water ***(April 10,2024***

143M people affected by PFAS in drinking water

American Water Works Association says the PFAS issue is a $30B problem



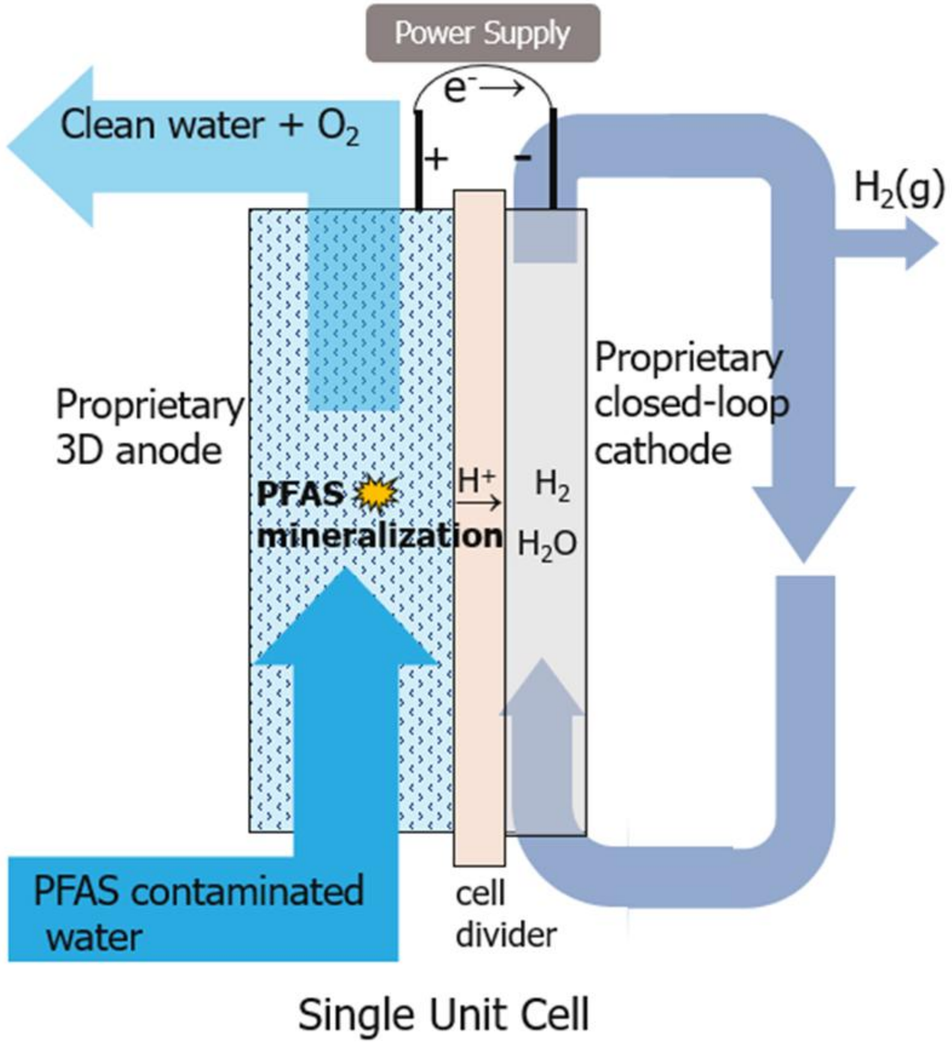
The Incumbent- Filtration Through Carbon or Resin

- **OXbyEL is 5X lower cost** (example- groundwater remediation)

- **OXbyEL is DESTRUCTIVE- no harmful waste**

OXbyEL's Process **Single-step destruction**	**Granular Activated Carbon Filtration**
$4.96 / kgal	$26.63 / kgal

OUR SOLUTION: Divided Radial-Field TOF Electrolyzer*



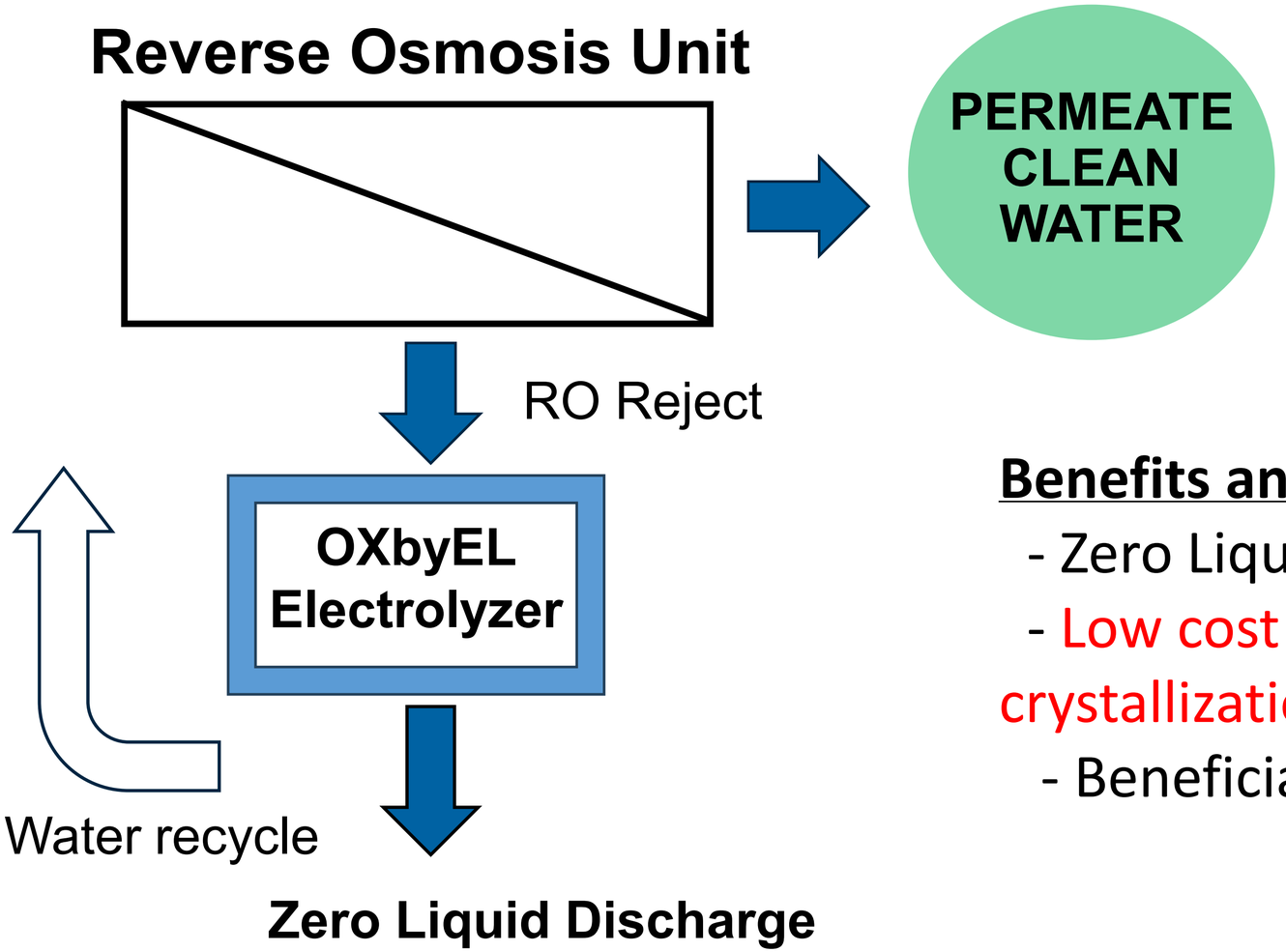
Single Unit Cell

- Proven Scalable design – **divided cell**
- Proprietary 3D anode
- Proprietary Closed-loop cathode
- Continuous flow process
- Mineralization of pollutants in minutes at low cost

OXbyEL Technologies, Inc.

* Patent protected US11,679,998, PCT appl. US17/990,887, PCT appl. US18/929,806 , PCT appl. US19/060,333

TREAT LARGE- SCALE MUNICIPAL/ INDUSTRIAL WATER



<u>Benefits and Differentiators</u>

- Zero Liquid Discharge and Valuable Water Recovery
- Low cost (eliminates incumbent evaporation/ crystallization reject processes)
- Beneficial recovery of minerals

TRACTION

$3.5M in undiluted funding

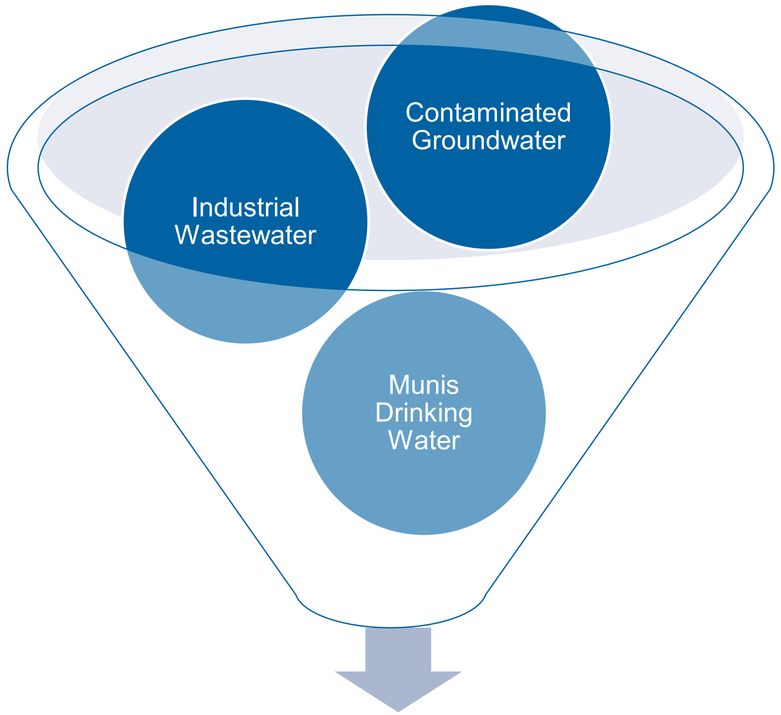
- **PATENTS**: 1 pioneering patent granted, 3 in review
- **PROJECTS**:

- 3 USAF Projects; Pilot at City of Tucson drinking water well planned in June 2025

- Treatability work completed for multi $B private sector companies

- Drinking water treatment Pilot planned with major Utility supported by NSF Phase 2

GO TO MARKET ACTIONS



Thousands of Munis across the US are making buying decisions today

- **2025**- Build <u>1 mgd commercial drinking water treatment system</u>
- **2026**- Sell commercial drinking water and industrial treatment systems (Sales business model w unit prices @ $5M and COGS @ $2.7M
- **2027- 2029-** 50% margins; over $100M revenue in 4 years; exit with sale to large water management cos or Strategic

Funding Sought

$3M SEED Round

Previously funded by: Chemical Angel Network

Use of funds:

- Deliver beachhead 1 mgd commercial unit to treat drinking water
- Develop sales channels and customer base
- Relocate to larger facility
- Add expert personnel
- Prudently fund IP expansion





Ed Ricci

President and CEO, Founder

- 35 years environmental business leader, SVP at Brown and Caldwell (22 years)
- Built, grew & managed a $100M national environmental consulting business focused on remediation
- M.S. in Water Quality, Iowa State
- Deep industrial and consultant customer relationships



Dr. Colleen Legzdins

Vice President Technology, Founder

- Former Founder/CTO - Axine Water Technologies
- Former Senior Engineer, Program Leader- Ballard Power Systems
- Ph.D. in Materials Engineering, University of British Columbia
- Technical expertise in electrochemical materials engineering, water treatment, and new products commercialization



Preston Montalvo

Chief Process Engineer

- Experienced in process engineering design and process operations, including leading teams of technical staff and contract employees
- Diverse experience in multiple fields for piloting processes, startup of brownfield and greenfield operations and process optimization
- M.S. in Chemical Engineering, University of Utah
- Technical expertise in process design, water treatment, and manufacturing operations

OXbyEL's Commercialization Plan includes 30 additional hires

Advisors

Dr. Damoder Reddy
Entrepreneur; founded/ exited 3 technology cos; active in Tech Coast Angels, Chemical Angels Network

Tom Schumann
Exec Dir., Center for Entrepreneurial Innovation AZ tech incubator in Az.; past Leader Inventors Ctr. of Michigan

Dr. Sergio Garcia-Segura
Associate Professor, Arizona State U., 65 publications in water electrochemistry

Anthony Parkinson
International CEO, Founder, Executive Board Member in multiple business sectors including hard tech; multiple non- profit accomplishments

OXbyEL Technologies, Inc.

A New Generation Water Treatment Company Changing How Water is Treated Today



Ed Ricci, CEO
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602-819-0622
www.oxbyel.com

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sustanix
build not to last

Sustanix

Coatings that are truly circular

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Truly circular bio-alternative to PFAS/Microplastic

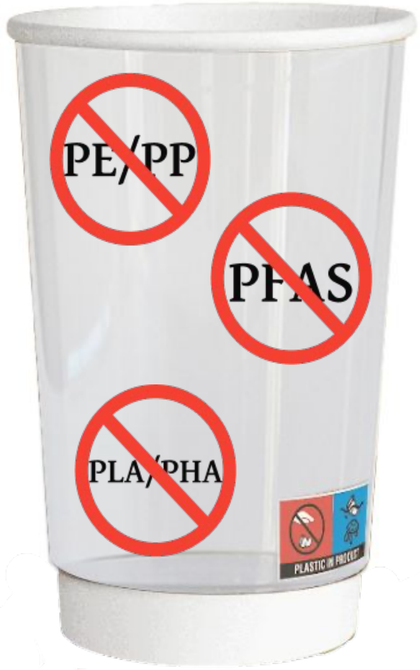
sustanix

build not to last

Consumer brands face legislation against packaging waste

Upto 25% of paper is Plastic & PFAS





The Recycling Reform Act passes the Senate

Packaging and Packaging Waste Regulation (PPWR)

Washington State Packaging EPR – and now there are seven

Solution - Single layer coating with multiple advantages

- 100% biobased and recyclable barrier coating
- Cost competitive to current alternatives
- Works on existing machinery
- PE, PP & PFAS comparable performance
- Proven food contact safe and toxic free

The technology



Cellulose



Plant proteins



Seaweed



Starch

Hydrophobic & hydrophilic modification

Formulated in water

Novel invention

Novel invention

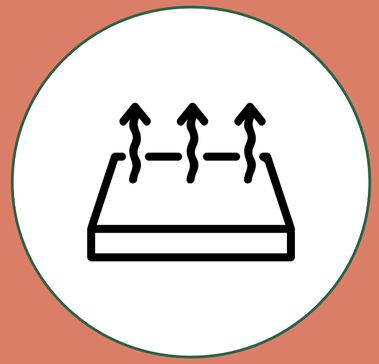
Personal care

Textiles

Agro care

Paper coating

One chemistry for all bio-solution in paper packaging

	Water-dispersant formulation	Extruded polymer	Sizing additive	WVTR & OTR
				
Patent filing by	June 2025	December 2025	Q2 2026	Q2 2026

Completely recyclable and heat sealable

intertek
Total Quality. Assured.

Food contact safety test approved

Smurfit Kappa
Paper Division

TCS Project Number: TCSA-0553 Sustanix coating trials		Substance 135	Key words Research	Customer EIT	Remarks
Number of Samples					
Quality/grade		**T2U**	**T2U**		
Producer		SK Rethel	SK Rethel		
Location producer		Rethel	Rethel		
Grade name producer		Testliner II Unzised	Testliner II Unzised		
Production date					
Reel number					
Reel width					
Date entrance		16/11/23	16/11/23		
delivered by					
User / origin sample / Customer					
Remarks:			5,0 g/m² coating		
LIMS number		Blanco	Sustanix coat		
Basis weight nominal	gr/m²	**170**	**170**		
Base weight real	gr/m²	169.8	176.1		
Thickness	um	238	246.3		
Density	kg/m3	713	715		
S Test	N	1.82	1.95		
Corrected on substance	*kPa*	*1.82*	*1.88*		
SCT md	kN/m	4.31	4.63		
Corrected on substance	*kPa*	*4.32*	*4.47*		
SCT cd	kN/m	2.78	2.99		
Corrected on substance	*kPa*	*2.78*	*2.89*		
Cobb 1 min. TS	gr/m²	183	2.6		
Cobb 1800	gr/m²	183	22.2		
Roughness Bendtsen TS	ml/min	2220	2116		
Porosity Bendtsen	ml/min	223	1.8		
cracking depth md	mm	3.42			
cracking strength md	kN/m	10.12			
Reject recyclability test	%	0.7	2.1		
Moisture absolute content	%	6.8	6.5		
	Measured by:	K. Rabeling			
	Date:	11/04/24			
	Remarks:	The Cobb value has significantly imoved.			
		The strength properties have not improved significantly by the coating.			
		The recyclability test shows a reject of around 1,5% higher then compared to the blanc. This will result that it can be applied as raw material in the standard papermaking production process			

Completely recyclable



Water dispersant formulation



Heat sealable pouches

Compared against other bio-alternatives

	Scaleup to multi-tons/day	Free from radical polymers	Water dispersion technology	Recyclable, biodegradable, carbon neutral	Applied using existing machinery
PLA/PHA	✓	✗	✗	✗	✓
Seaweed	✗	✓	✗	✓	✓
Plant protein	✗	✗	✗	✓	✗
Sustanix	✓	✓	✓	✓	✓

Traction

Trial customers

Coating companies	Brands	Convertors	Paper companies
5	2	8	4

Strategic partners

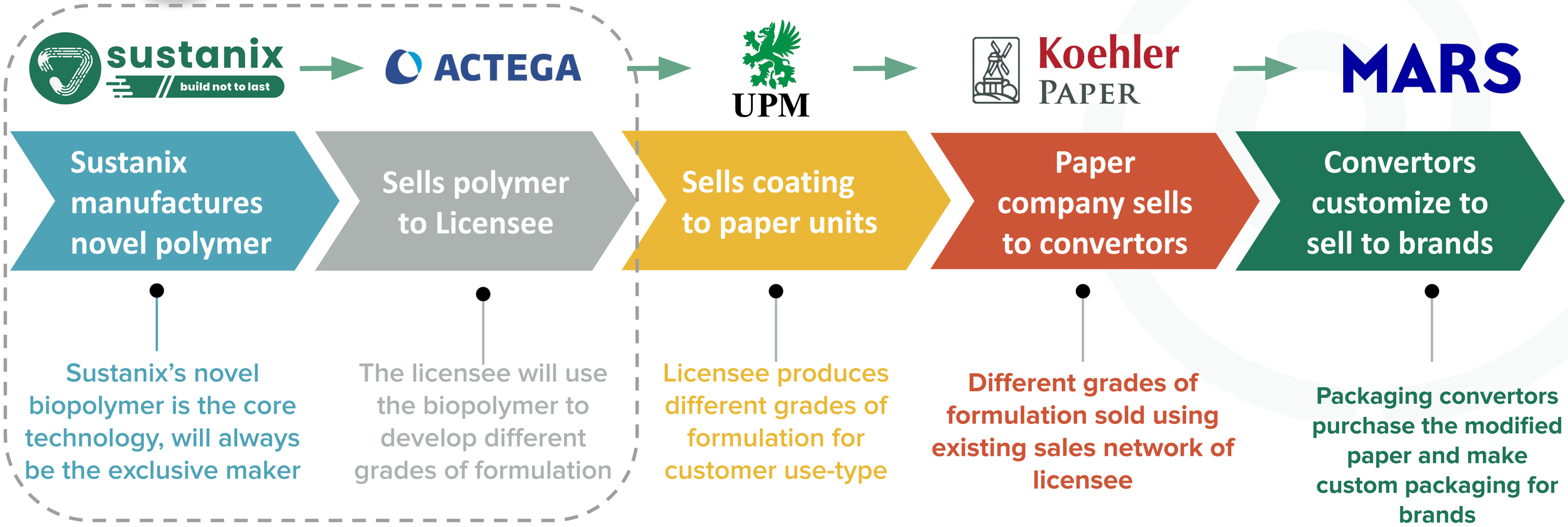
Brightlands Knowledge crossing borders
Chemelot Innovation and Learning Labs
AMI Biobased Materials Institute of RWTH Aachen and Maastricht University
UM
WorldStartup
PLUGANDPLAY
Chemie Cluster Bayern
Circular Valley

Funds & Investments

Interreg EUROPEAN UNION
LIOF
Rijksdienst voor Ondernemend Nederland
MABS WUBS
VREDE EN RECHT The Hague

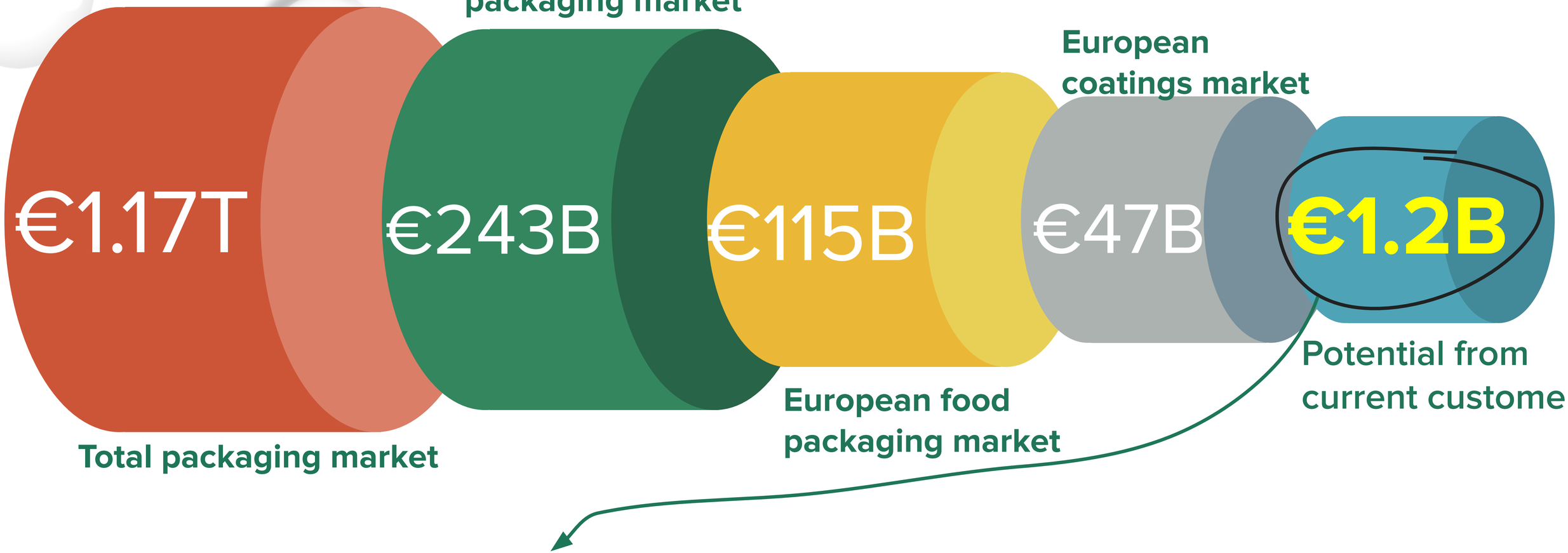
** Names of all trial partners can be shared during due diligence*

Business model - Sales through licensing



**Brand logos for representative purpose only*

Business opportunity



Paper Company | Coating | Convertors | Brands | End users

Team



Sarvesh Poddar
Cofounder
Operations & Business



Dr. Ketan Makwana
Cofounder
Material Research & Innovation



Derk Smid

Global Partnerships



Hugo Delissen

Business Scaleup Advisor



Kanu Barad

Polymer Scientist



Mitch Penders

Jr. Polymer Chemist



Hemang Darji

Formulation Scientist



Aernout Aki Ackerman

Legal & HR advisory

What we are looking for,

Joint development

Custom built formulations for different application in coatings and additives

Investment

Seed round of € 5.4 Million, used in Asset building - Application lab & demo facility

Licensee

Test and become a licensee for our technology

build not to last

Let’s partner to scale this circular technology!

Thank you

www.sustanix.com

sarvesh.poddar@sustanix.com

+31 6 43 54 78 65

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STARTUP PRESENTATION

SANDBOX carbon

Sandbox Carbon

The easiest, most cost effective, and most reliable way to directly decarbonize commercial properties

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SANDBOX carbon

Waste Management, for Air Pollution

Aaron Rose
co-founder & CEO
aaron@sandboxcarbon.com



Air pollution is infrastructure's invisible enemy.

Red tape slows progress.

Cutting air pollution cuts red tape, making it easier to **get building.**

The Carbon Dumpster

Next gen waste management



Simple Operations

Functions just like existing trash and recycling services.

Less Expensive

Up to 35% less expensive to operate and 1/20th the cost to install.

More Reliable

The reliability of gas, rather than electricity, in inclement weather.

Real Sustainability

Significantly reduces greenhouse gas and smog forming emissions.

How it Works

Significant technical and commercial differentiation



Human Friendly

No hazardous or combustible materials.
No compressed gases.

Simple Integration

Retrofittable to existing systems without requiring a full overhaul.

Modular

Assembled from modules that can easily scale to meet a customer's specific needs.

The core technology has been developed in house and we own all intellectual property.

One Technology. Many Markets.

Commercial Real Estate | $20B



Backup Power Systems | $2B





Construction & Live Events | $3B



Locomotives | $6B

Flexible business model that meets customers where they are

Emissions reduction as a service

Target Cost	Target Reduction	Maximum Reduction
		**90%**
Fixed monthly cost for the voluntary market.	Adjustable performance to meet regulatory requirements.	Net-zero emissions. Today.

Industry and technical expertise

SANDBOX carbon



Aaron Rose

Co-founder & CEO

MIT xylem



David Griggs

Co-founder & CTO

MIT Exxon REMORA



Brandon Poa

Mechanical Engineer

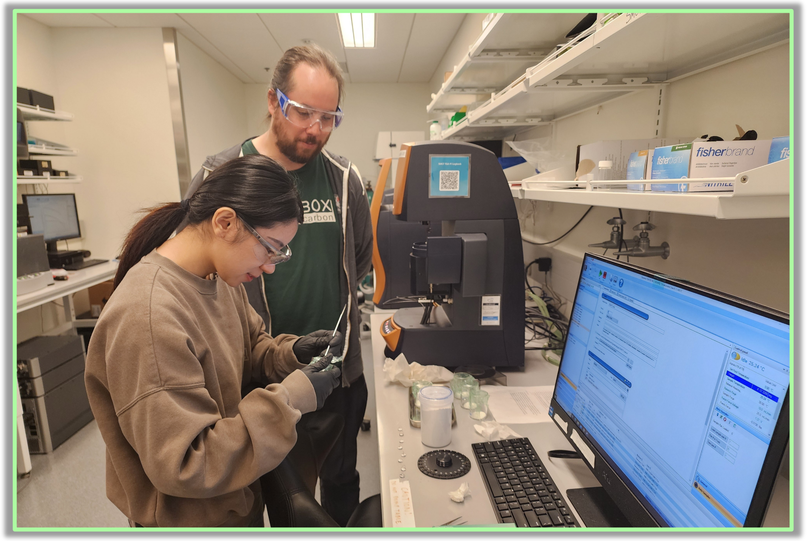
University of Dayton MPE HSI

From Pilot to Scale

Working to deliver first two commercial pilots this summer



Single cartridge prototype with **over 200 hours of operation** on real exhaust gases



Working with the REACT Lab at **Northwestern University to validate performance**



Fabricating the first Carbon Dumpster to deliver to our pilot customer for testing and regulatory approval

Opening a seed round after pilot delivery

SANDBOX carbon



Reduce. **Remove.** Recycle.

The Carbon Dumpster

Waste Management, for Air Pollution

hi@sandboxcarbon.com

PLUG AND PLAY

SV SUMMIT

STARTUP PRESENTATION



CIRAC

Advanced recycling technology for converting multilayer packaging waste to aluminum and fuel oil

#PNPTCSiliconValley

Join us at **pnptc.com**

SIRAC BANGKOK

CIRAC

WASTE LESS WASTE





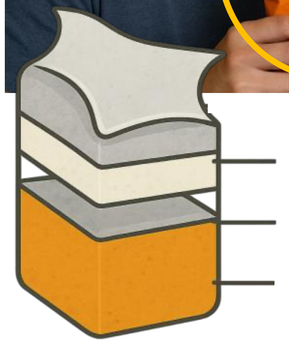


CORE PROBLEM

CIRAC is addressing 80% of the single use snack and instant food packaging market.

Multilayer plastic packaging is unrecyclable





Plastic

Aluminum 20%

Plastic

400 x

(4 MT/Year)

We swallow a credit card's weight in plastic. Weekly.

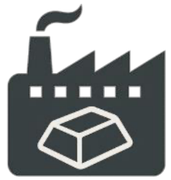


It contaminates our food supply chain



OUR SOLUTION

With CIRAC's machine design, you recover wasted aluminum.



Aluminum Industry



Aluminum Laminated Food Packaging



End Customer



Landfills

Now, you can reduce pollution while recovering value - all in one step



CIRAC **Patented**



Recovered Aluminum film

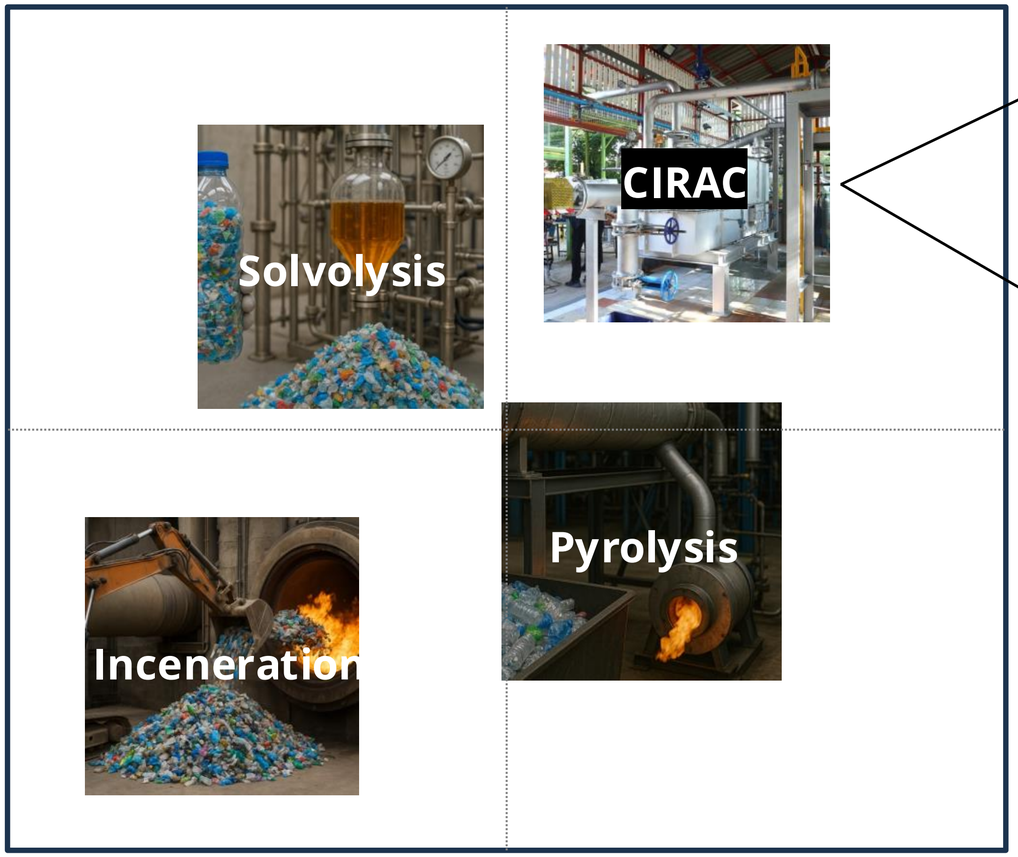
Saving 2 TCO_2e machine/day

CIRAC focuses on machine design for aluminum recovery

MARKET ADVANTAGE

Lower cost, higher ROI than current multilayer waste methods.

Ecofriendly



Affordable



Product 1

Produce Al with 95% less CO_2 than virgin aluminum

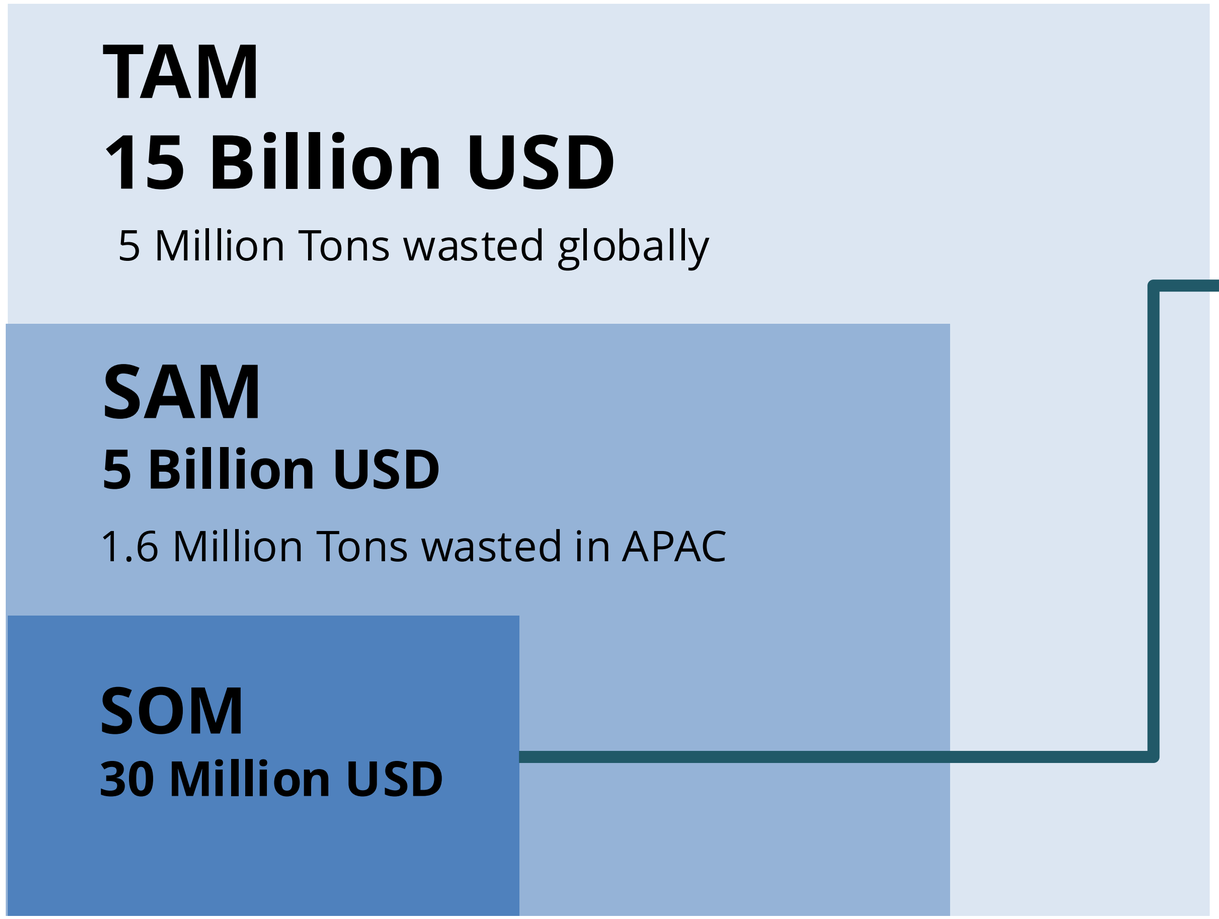


Product 2

Reduce electricity 60% by recycle fuel oil back

MARKET OPPORTUNITY

Provides profitable, patented and unique technology to recover aluminum in APAC that is wasted.

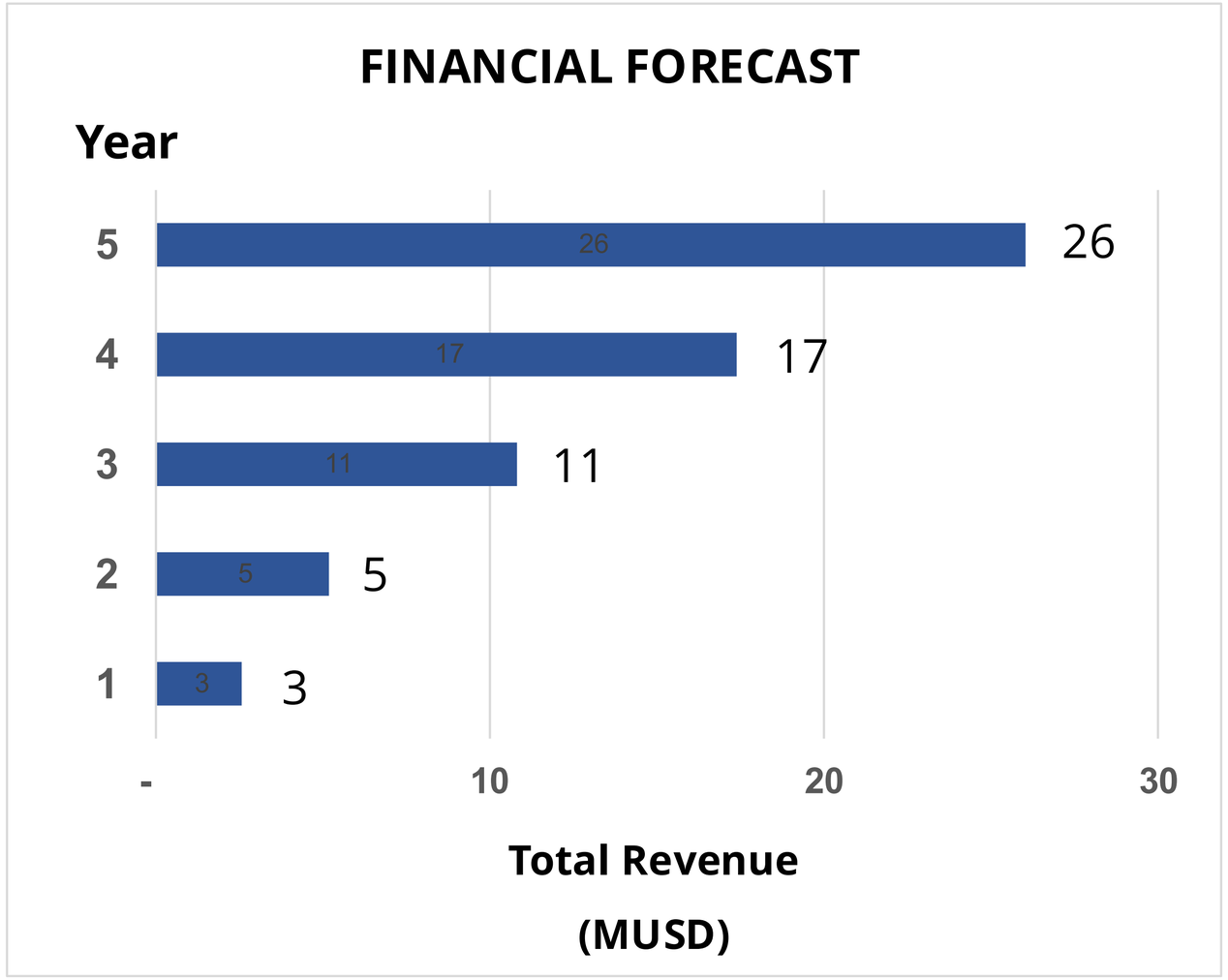


SOM: 30 Million USD

Potential Customer	Tons/Year
TH Waste disposal company	5,000
TH Pharma packaging	3,500
TH Tetrapak packaging	4,000

FINANCIAL MODEL

We transform waste into value to generate revenue while cleaning the environment.



REVENUE MODEL



20% quicker ROI than standard pyrolysis technology.

60%	Selling Machine
20%	Leasing Machine
15%	Licensing (After 4th year)
3%	Consumables and Add-ons
2%	Maintenance and Service

CHANNEL PARTNERS

We don’t just build machines – we build the future of sustainable waste recycling.

FUNDING/ FINANCE → **DEMO CENTER (CASE STUDY)** → **OEM** → **DISTRIBUTOR**

UNDP

ALLIANCE TO END PLASTIC WASTE

CSIRO
Australia's National Science Agency

ECCA FAMILY FOUNDATION

SECONDMUSE FOUNDATION

ECO FRIENDLY THAI CO., LTD.



Partner with milk carton waste disposal company

PM ENGINEERING

CIRAC

GLOBAL R&D

CASE STUDY

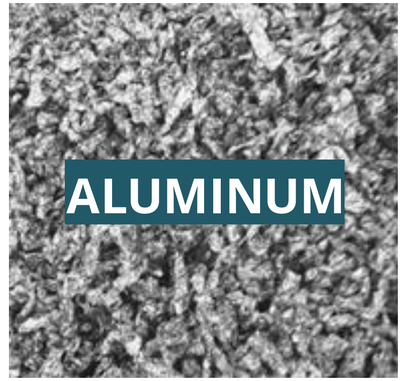
Our machine has already processed over 5 different wastes and proved AI products quality.

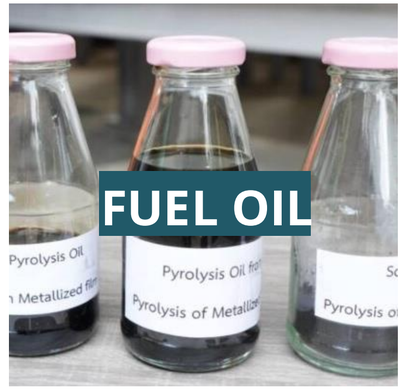
5 types of unrecyclable waste	
	Instant coffee
	Instant noodle
	Seaweed
	Lid of snack packaging
	Milk and Juice box

CIRAC machine



New recyclable product





VISION & TEAM

Founded by a group of researchers and engineers who have worked on 250 petrochemical industry projects.



FOUNDER



SIKARIN TAMIYAKUL
Ph.D., Petrochemical Technology, PPC, Chulalongkorn University., TH



CHATCHAI AMORNLERTPREECHA
M.Sc. Institut Francais du Petrole, France (French Government Scholarship)



WIROON TANTHAPANICHAKOON
Managing Director Global R&D Co.,Ltd

ADVISORS



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Professor school of Natural Science, MACQUARIE University



Prof. Dr. Tharapong Vitidsant
Chulalongkorn University

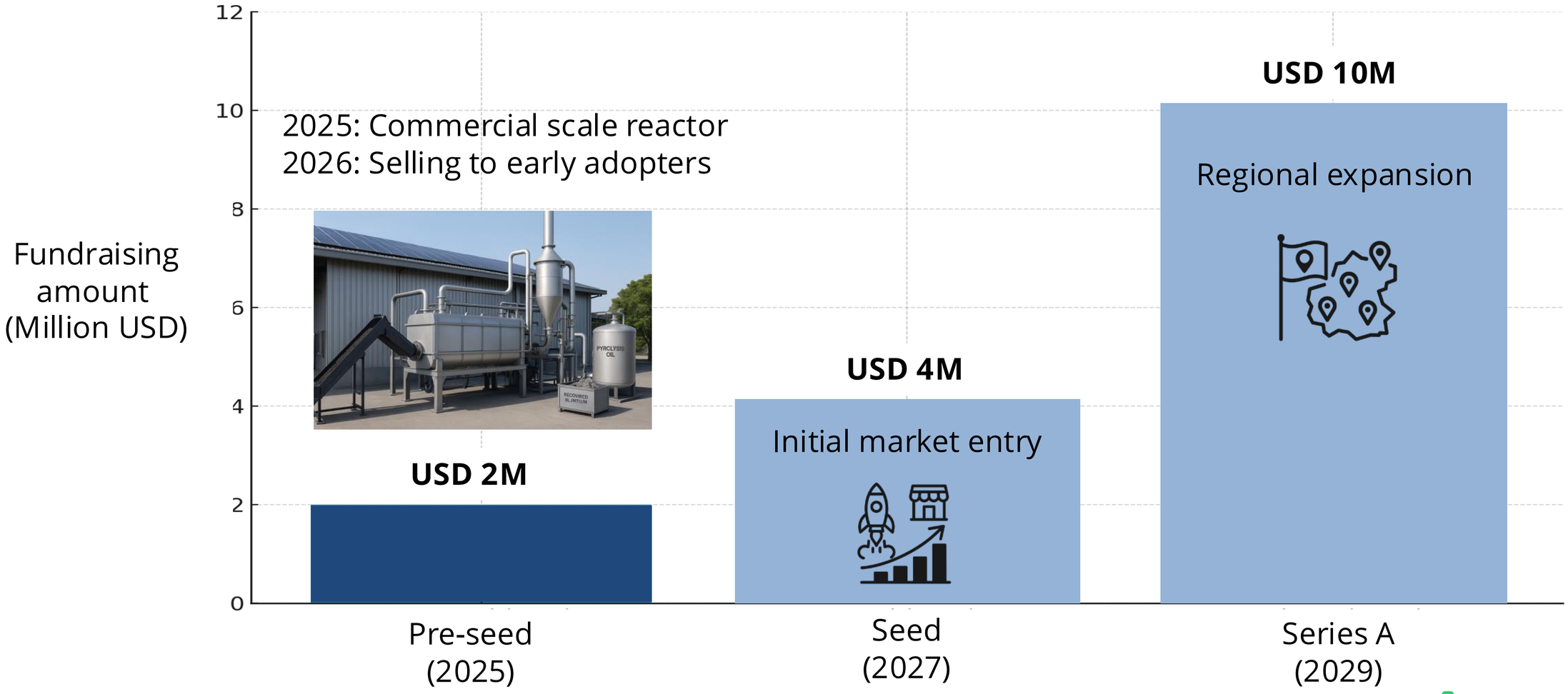


Assoc. Prof. Dr. Prapan Kushonthara
Chulalongkorn University

CIRAC SIRAC BANGKOK

INVEST TO REDUCE PLASTIC WASTE FOR ALL

Strategic funding to transform waste into value while driving profitability and environmental impact.



SIRAC BANGKOK

SIRAC BANGKOK

THANK YOU

Let’s meet

Telephone
+6683-6933-445

Address
Bangkok, Thailand

Website
https://www.linkedin.com/CIRAC

JUNE 2025

PLUG AND PLAY

SV SUMMIT

STARTUP PRESENTATIONS

#PNPTCSiliconValley

Join us at **pnptc.com**

PLUG AND PLAY

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STARTUP PRESENTATION

cert systems

CERT Systems

CERT Systems produces essential chemicals without fossil fuels

#PNPTCSiliconValley

Join us at **pnptc.com**

cert

systems

Making clean ethylene
for a sustainable world.

PnP Summit, June 2025

We make cost-competitive clean **Ethylene**

Plastics
Jet Fuel
Packaging
Textiles
Pipes
Electronics
Furniture
Sporting goods
Inks and paints
Medical Devices
Coolants
Specialty Chemicals

cert
systems


Ethylene is currently made from fossil fuels.
The ethylene industry is hard to decarbonize.
Fossil dependence threatens supply chains.

EXISTING PATHWAYS TO SUSTAINABLE ETHYLENE ARE NOT SUFFICIENT

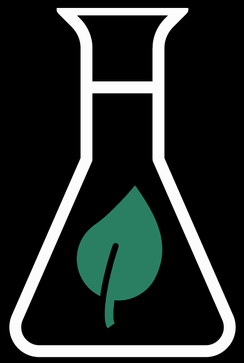
CCS/ ELECTRIFICATION
Still requires fossil fuels, limited GHG reductions.

Up to 1.5x cost premium



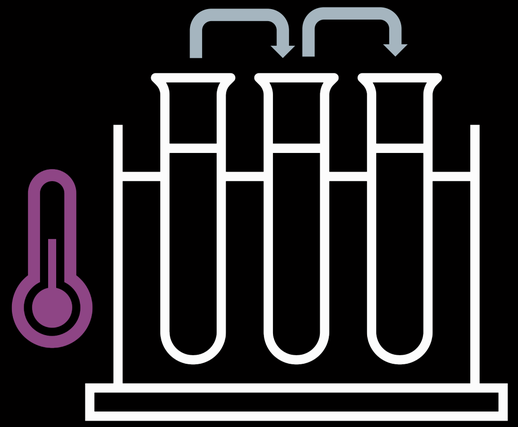
BIOETHYLENE
Land use constraints on feedstock, soil degradation.

1.5 - 2x cost premium, >60% supply gap by 2050

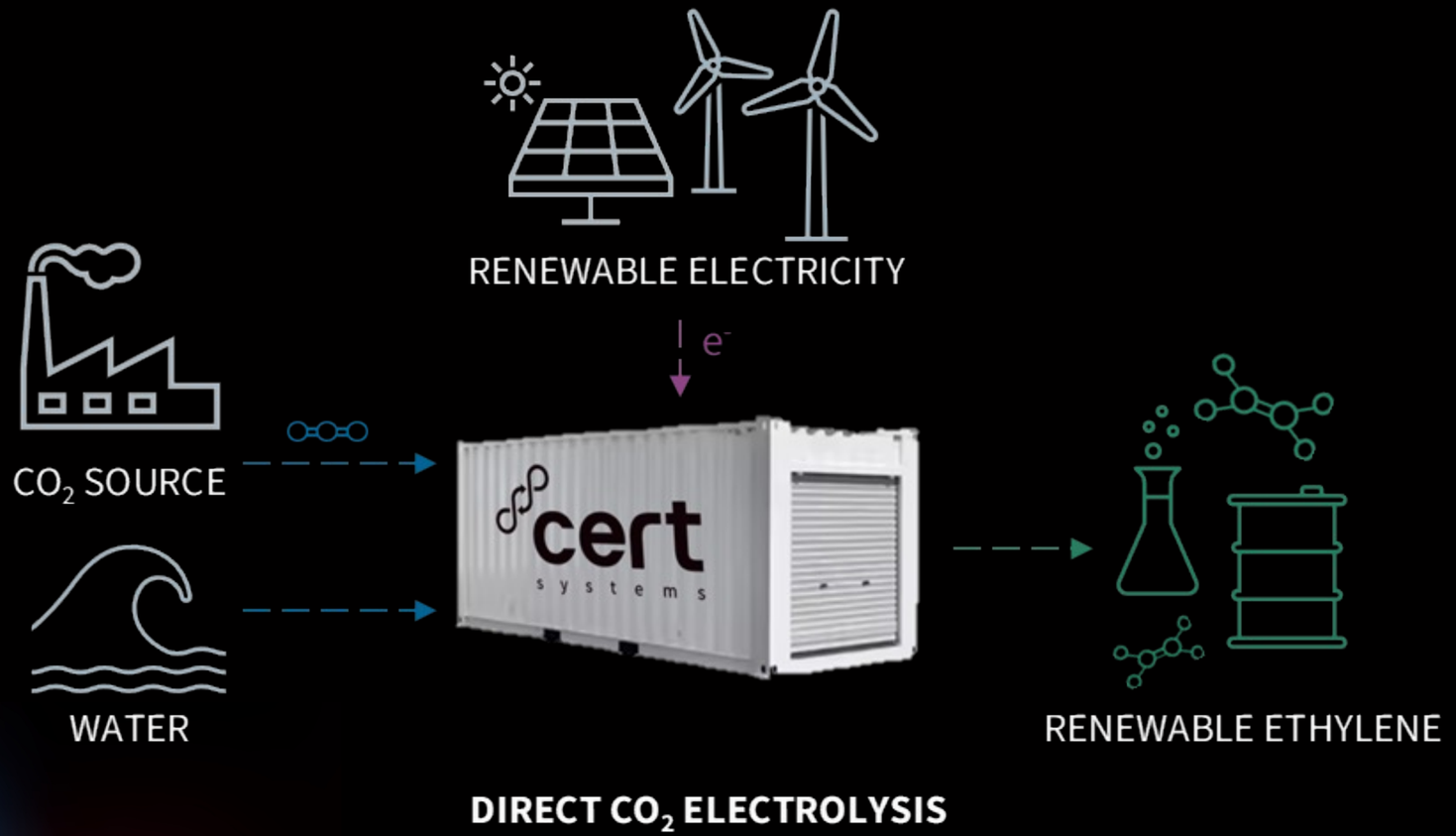


1st GEN CO_2 UTILIZATION
Complex, multistep processes, hydrogen requirement.

2-4x cost premium
High Capex



CERT'S DIRECT CO_2 ELECTROLYSIS

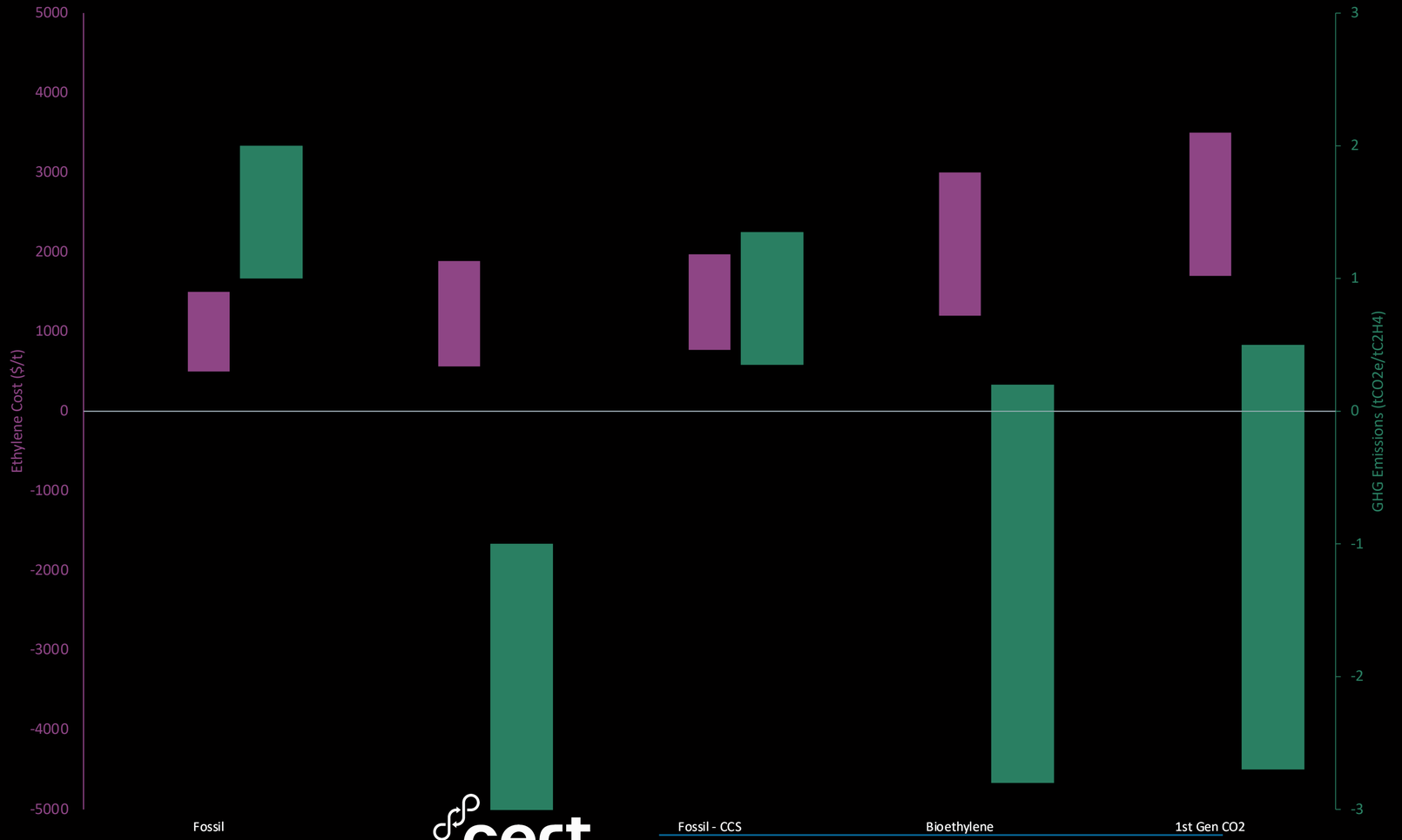


SINGLE-STEP CLEAN ETHYLENE PRODUCTION

- Reduced costs and complexity
- No requirement for expensive green hydrogen feedstock
- On-site production enables **supply chain resiliency**
- Enables **use of existing value chain infrastructure**

LOW COST, LOW EMISSION

CERT's Direct CO_2 Electrolysis process offers **lower cost** than other sustainable methods and the **lowest GHG emissions**.



Assumptions/sources:

- *Elec: 3-7 ¢/kWh*
- *McKinsey predicted costs*
- *WoodMac, SPGlobal*

CUSTOMERS AND REVENUE MODELS

Ethylene + SAF **(Technology Provider)**

UNITED · DELTA · Lufthansa · TECHNIP ENERGIES · LUMMUS TECHNOLOGY · Honeywell UOP

Ethylene **(Technology Provider)**

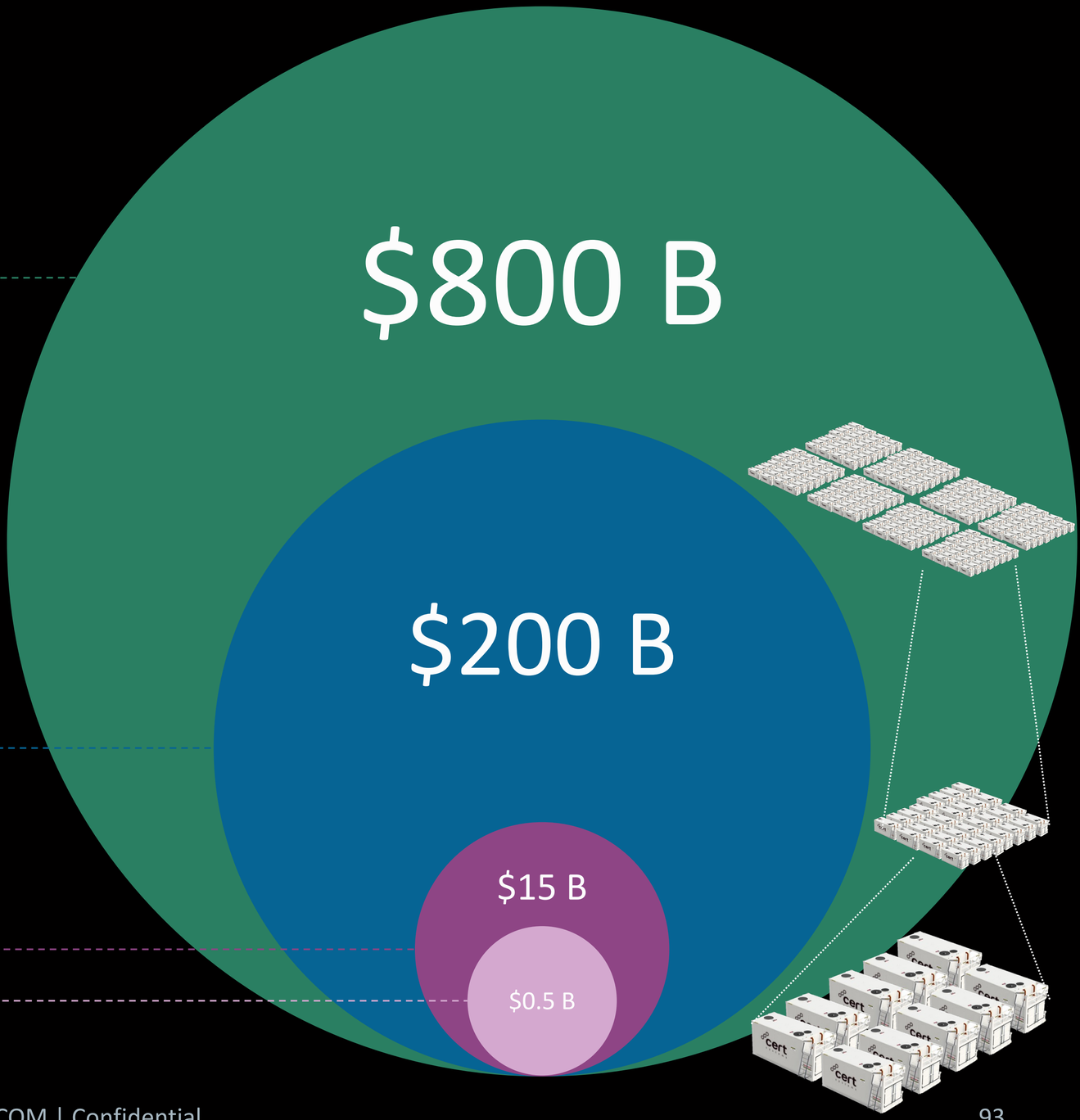
REPSOL · BASF We create chemistry · TotalEnergies · AGC

Sustainable Polyethylene **(Direct Sales, JV)**

Milliken · TOYOTA · amcor

Renewable HDPE packaging **(Direct Sales)**

NIVEA · DANONE · P&G



cert systems

TEAM



Alex Ip, PhD

Co-Founder & CEO

15 years in Cleantech
Grew teams for solar and carbon R&D
Established partnerships with global companies



Christine Gabardo, PhD

Co-Founder & CTO

Electrochemical expert
>50 peer-reviewed articles, >12k citations
Led XPRIZE team in finals

Breakthrough Energy Fellows

UNIVERSITY OF TORONTO

XPRIZE CARBON
nrg | cosia
FINALIST

ADVISORS



Prof. Dave Sinton
Chief Scientific Advisor
UNIVERSITY OF TORONTO



Jen Wagner
Business Advisor
CARBON CURE



Alice Havill
Scale-up Advisor
LanzaTech



Houston Brown
Fractional IP Director
IP



John Gartner
Operations Advisor
PLUG POWER



Susan Koch
Fractional CFO
Carbon Engineering



Joe Cargnelli
Electrolyzer Advisor
HYDROGENICS

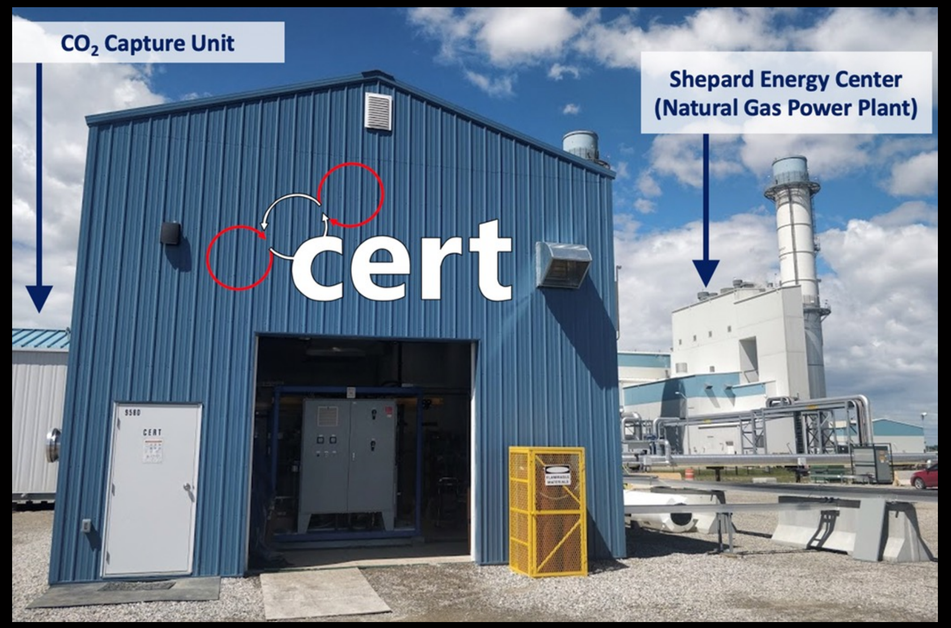
MULTIDISCIPLINARY TEAM



cert systems

CONVERSION OF INDUSTRIAL CO_2 EMISSIONS



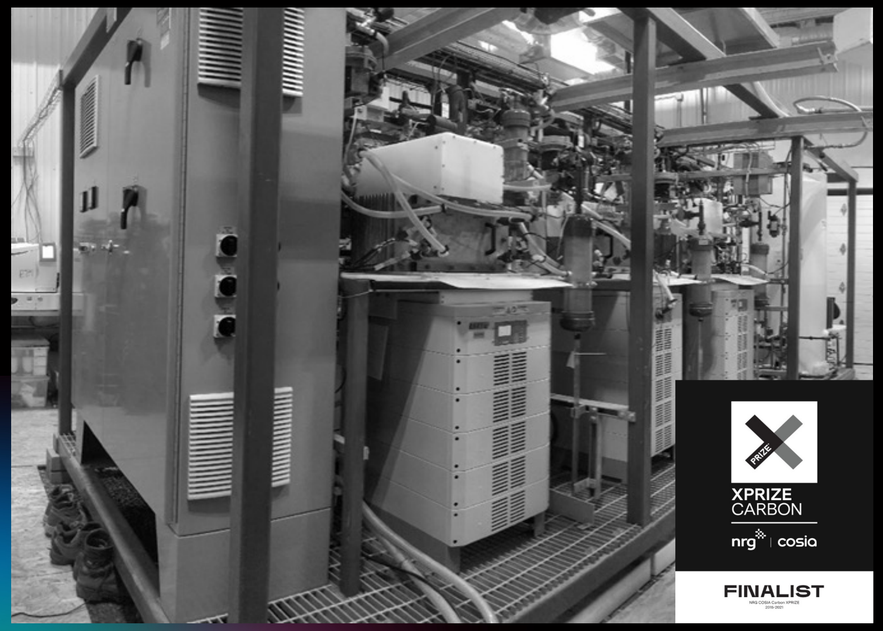


First demonstration of industrial CO_2 emissions conversion into ethylene

cert systems

INDUSTRY TRACTION & RECOGNITION

XPRIZE FINALIST:
1st DEMONSTRATION OF INDUSTRIAL CO_2 INTO ETHYLENE



ETHYLENE VALUE CHAIN PARTNERSHIPS
AND
>$600k IN PAID PROJECTS

AGC

SIEMENS energy

Confidential
Petrochem Co.

>$6M IN NON-DILUTIVE GRANTS AND AWARDS

Breakthrough Energy Fellows

NGen

Natural Resources Canada

NRC·CNRC

cert systems

SEED FUNDRAISE - $6M USD

Milestones

- **Build** commercial-scale prototype
- **Engineer** first commercial pilot plant
- **Secure** initial offtake customers
- **File** key patents

18 months → Ready for commercial deployment in Series A



JOIN OUR MISSION

To produce essential chemicals without fossil fuels

cert systems

ALEX@CO2CERT.COM

PLUG AND PLAY

SV SUMMIT

STARTUP PRESENTATION

PakIt Green

PakitGreen

Sustainable Packaging Redefined

#PNPTCSiliconValley

Join us at **pnptc.com**



Barrier & Functional Coatings for Packaging

By Jerold Zwas
Jzwas@pakitgreen.com
248-730-3097

PakItGreen

PakItGreen

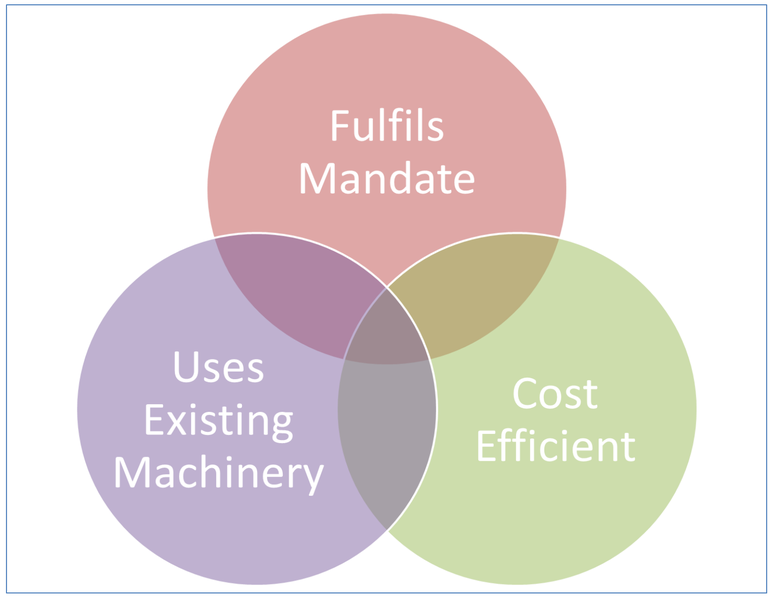
Packaging industry is in a massive state of upheaval!

- Legislation & Regulations
- Customers Demand
- Corporate Goals



7 States with EPR &
9 with proposals
EU Directive on Packaging
PFAS Ban

PakItGreen Family of Sustainable Solutions



- ✓Patents
- ✓Exclusive Licenses
- ✓Unique multi-functional coating
- ✓Wax free additives

Coatings



Coated Paper

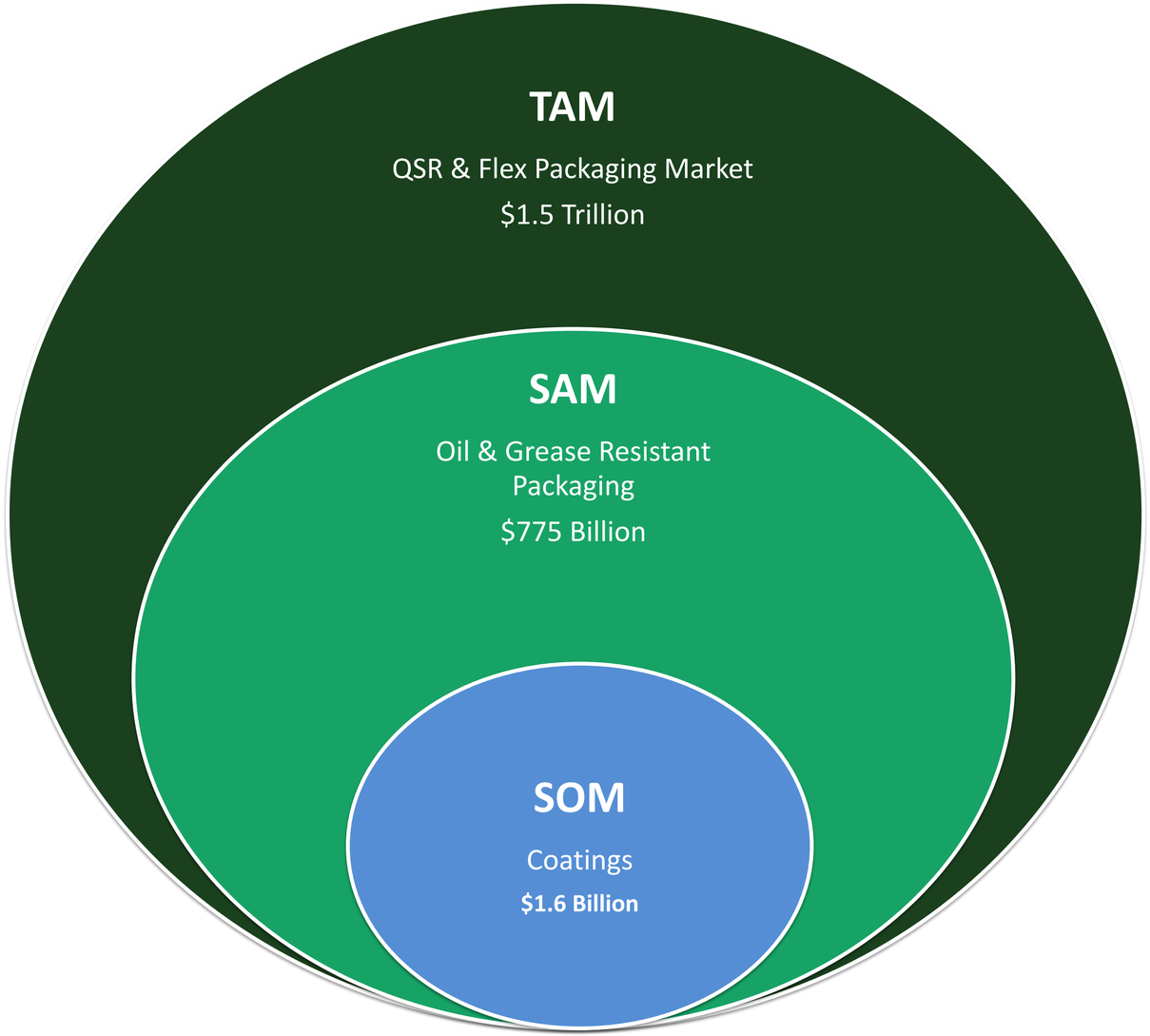


Molded fiber Additive



PakItGreen

Market Size



Current Focus

Potential Follow on Markets









Take out containers, Frozen Foods, Pizza Boxes etc

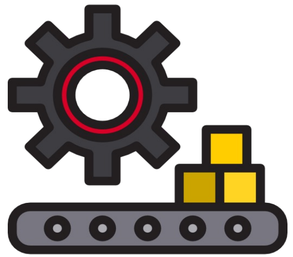
Heat sealed packages

Oxygen & Moisture

PakItGreen

Immediate Commercial Potential







- 6 Commercial Pilots
  - Over $25 million
- 23 Companies Testing

- 600 Ton Manufacturing Capacity Now
- In discussions with additional contract manuf.

- 6 Products Ready Now
- 5+ Products in Pipeline

Oil, grease, water, moisture oxygen, and heat sealing

PakItGreen

Experienced Leadership Team

-- in startups, finance, entrepreneurship and marketing as well as deep technical expertise



Jerold Zwas
CEO

Co-Founder

Over 20 years of expertise in tech-based startups with successful exits



Sanjeev Jain
COO/CTO

Co-Founder

Prolific inventor and commercially successful

Advisory Team

- **Muhammad Rabnawaz, PhD MSU School of Packaging**
- **Bruce Macrone , MacPac**
- **Scott McNutt , Nextep Partners, LLC**



Aditi Ullal

Marketing Manager

8 years of marketing & communications experience in the packaging



Ramadan Abouomar

Product Development

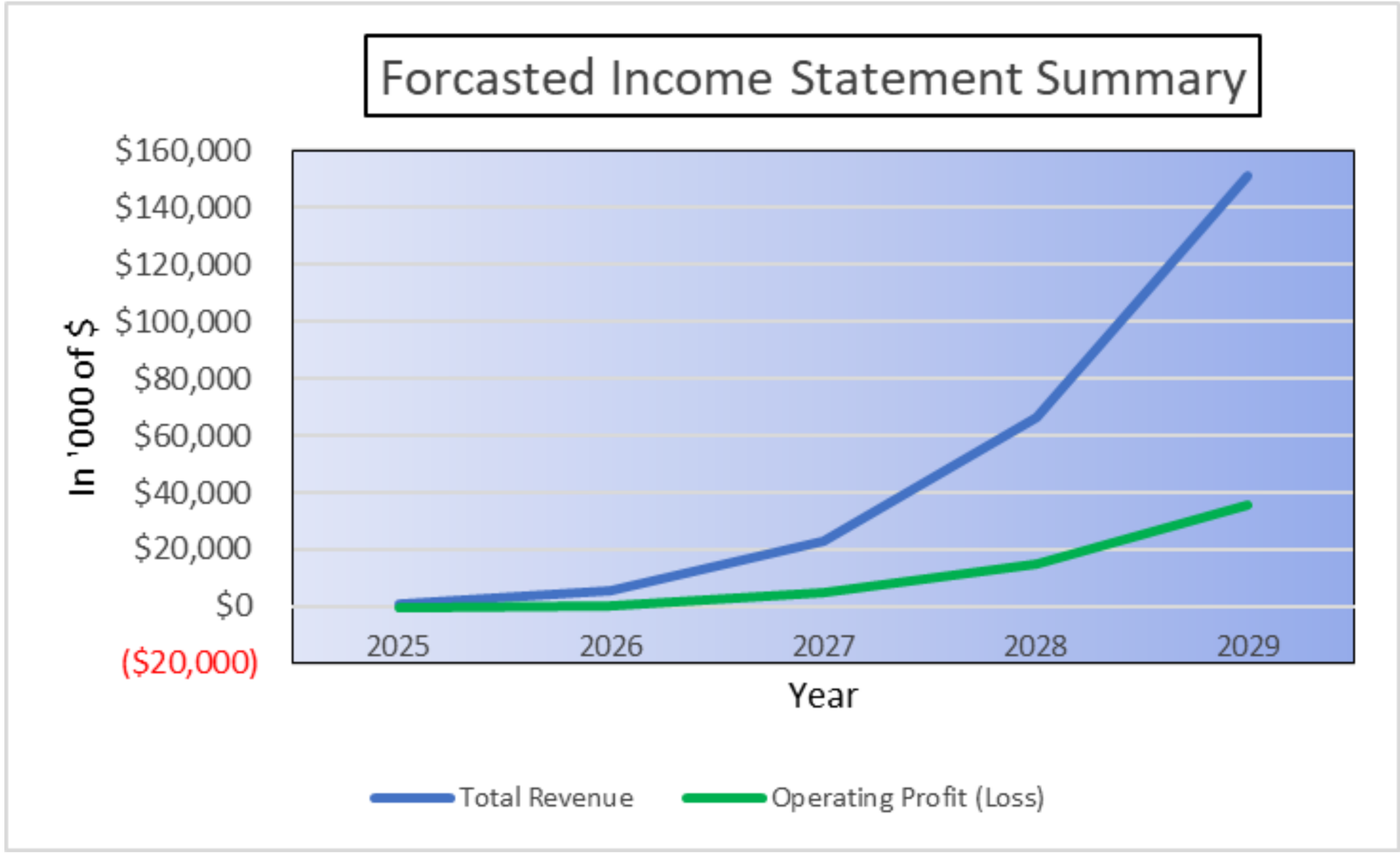
PhD in Polymer Science and Polymer Engineering.

R&D Team

- **Dr. John Walls PhD Lead Chemist**
- **Dr. MD Sarwar PhD Primary Investigator**

PakItGreen

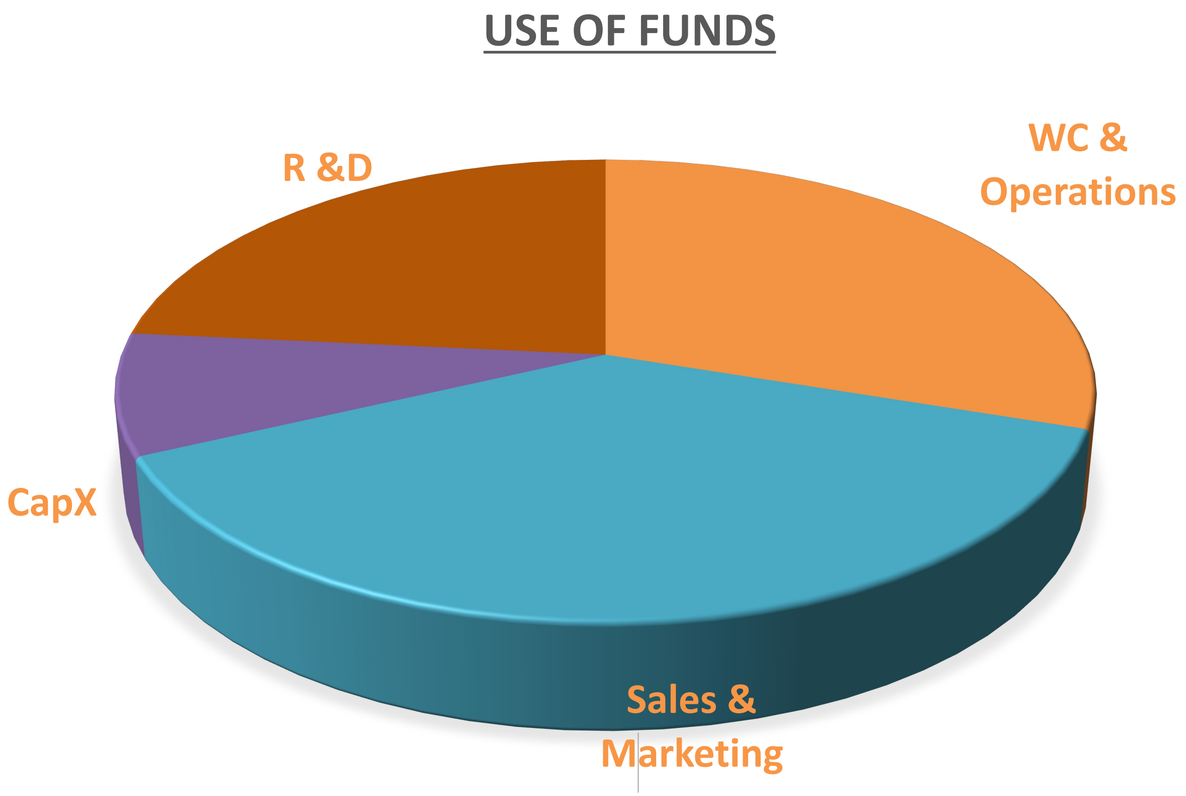
Financials



PakItGreen

Funding Needed: $1,000,000

- VCs
  - Lead Secured
- Family Offices
- Angles and Angle Groups



Exit Strategy: Sale of the Company



Highly Active Space

- **30 notable deals – 2022**
- **11x to 12x EBITDA**

ECOPACK GREEN BOX LTD.

Phoenix Strapping Systems

NODA

ATLANTIC PACKAGING

ImperialDade



Thank You!

Any Questions?

Jerold Zwas

jzwas@pakitgreen.com

248-730-3097

PakItGreen

Competitive landscape

	PakIt Green	Michelman	Solenis	H.B Fuller
Meets New Standards				
Easy to Convert				
Cost-efficient				
Multi-functional Barrier				
Application – Wet-end (For Molded Fibers)				N/A
Heat resistant coating for Molded fibers				N/A

PLUG AND PLAY

SV SUMMIT

STARTUP PRESENTATION



Bioeutectics

High-performance, natural and sustainable solvents

#PNPTCSiliconValley

Join us at **pnptc.com**

bioeutectics

From nature to life

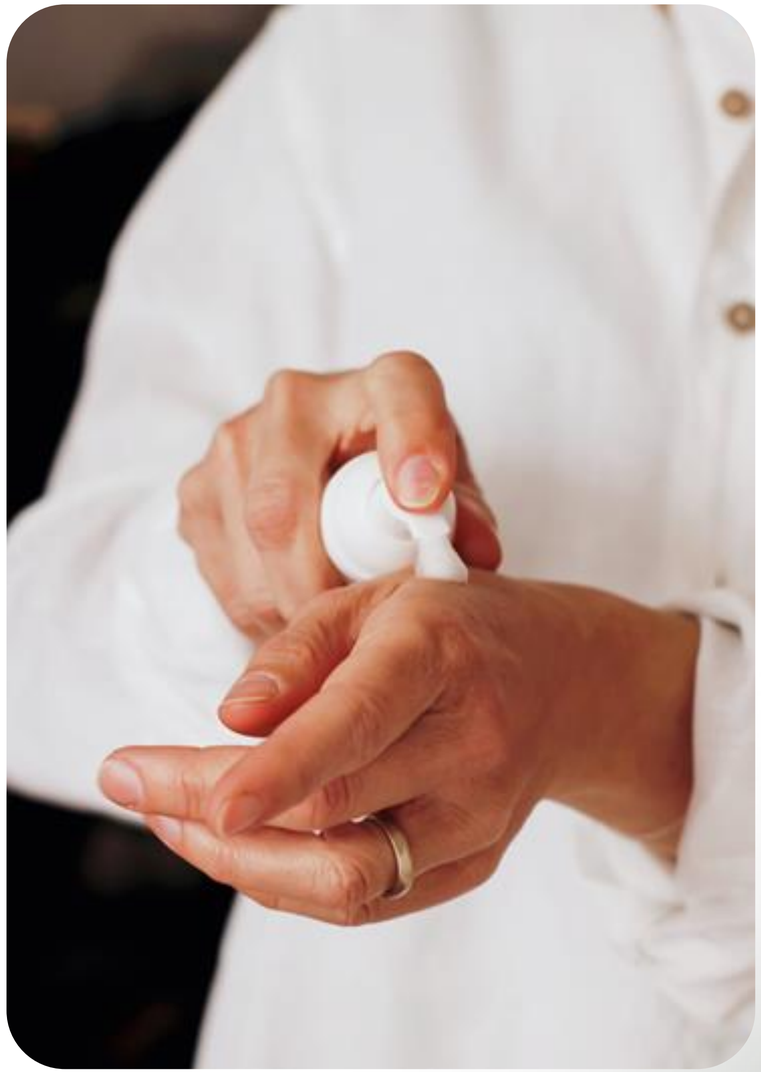








What do all these pictures have in common?

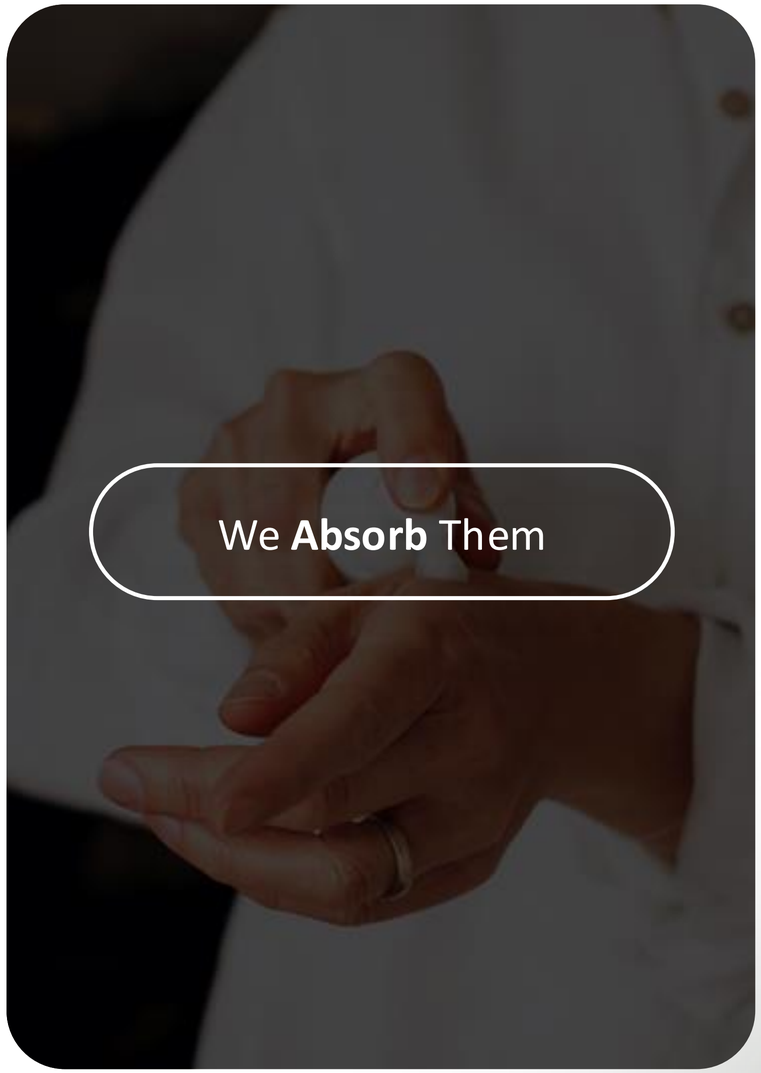




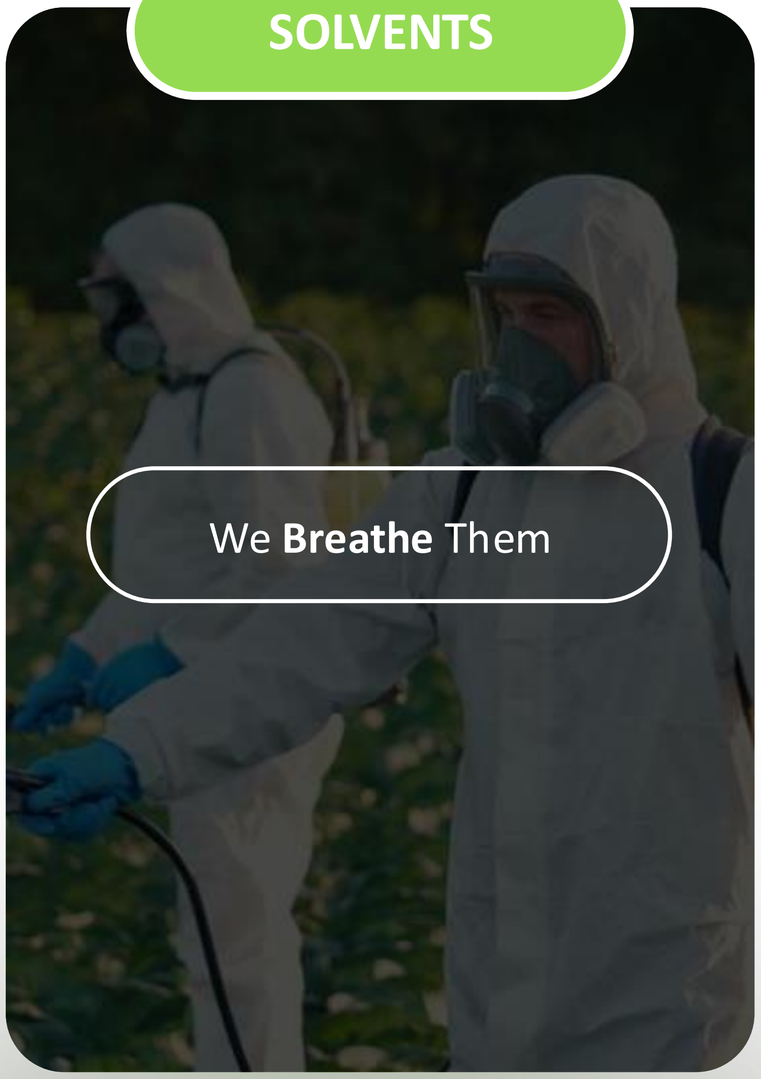


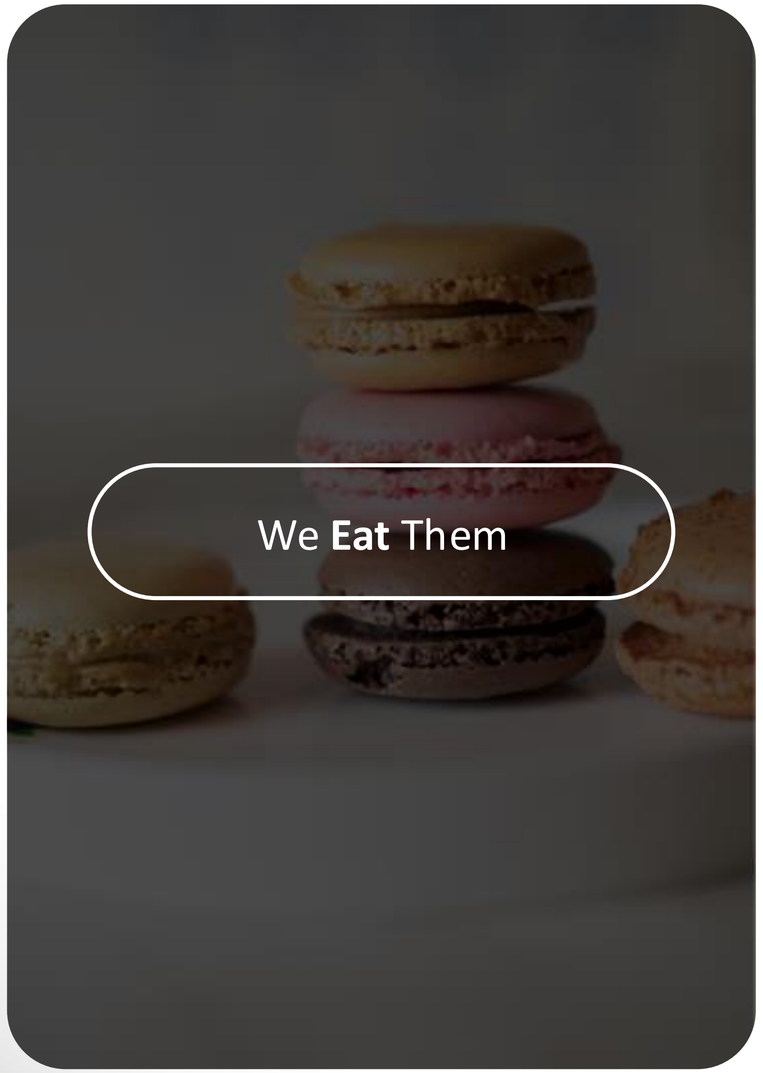
bioeutectics

What do all these pictures have in common?



SOLVENTS





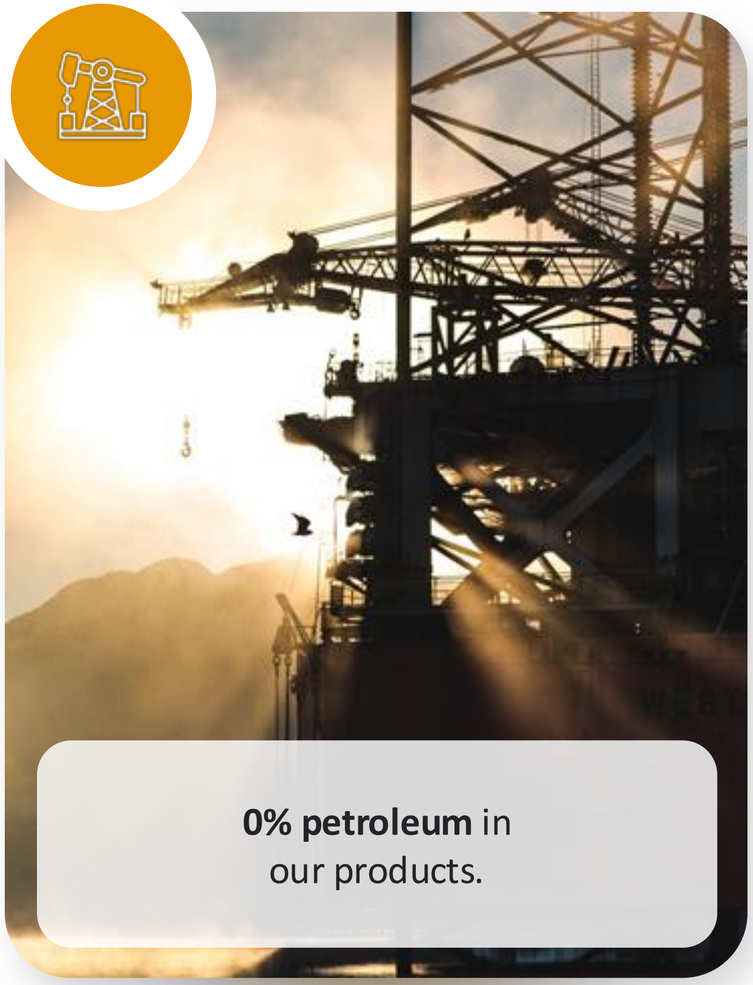
bioeutectics

How is the Solvents Offer Today?

SOLVENTS	NATURAL ORIGIN	RAW MATERIALS	RISK / TOXICITY	WASTE / BIODEGRADABLE
Traditionals	✗	✗	✗	✗
Biosolvents	✓	✓	✗	✗
Ionic Liquids $	✓/✗	✓/✗	✓/✗	✓/✗

bioeutectics

What if there was a greener solution?



0% petroleum in our products.



0 MT of Dangerous waste generated.



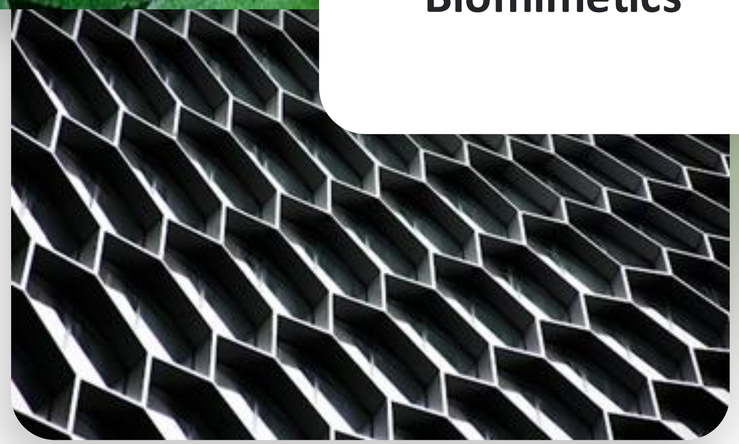
Avoid 32.5 Million workers being exposed to **dangerous chemicals**

bioeutectics

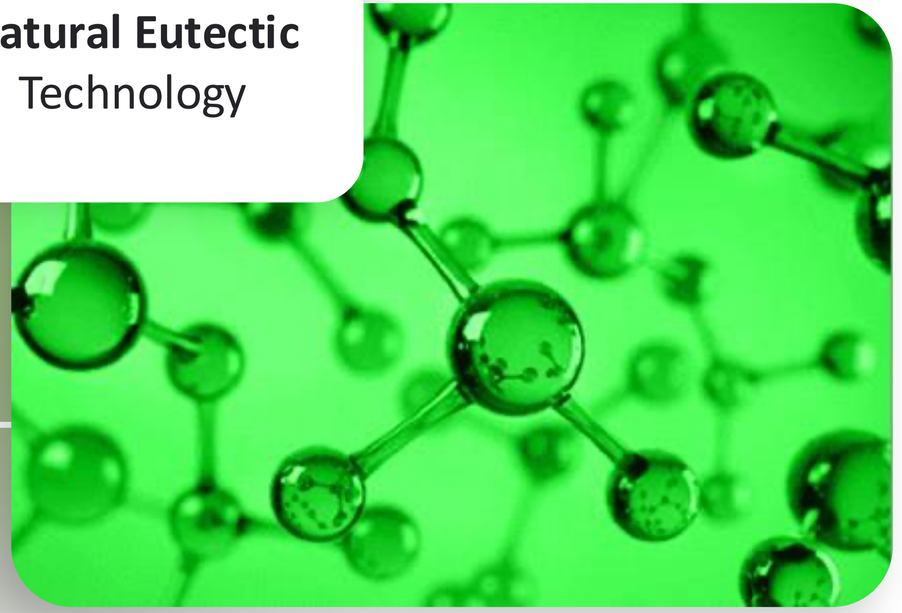
Revolutionizing the Solvents Industry



Biomimetics

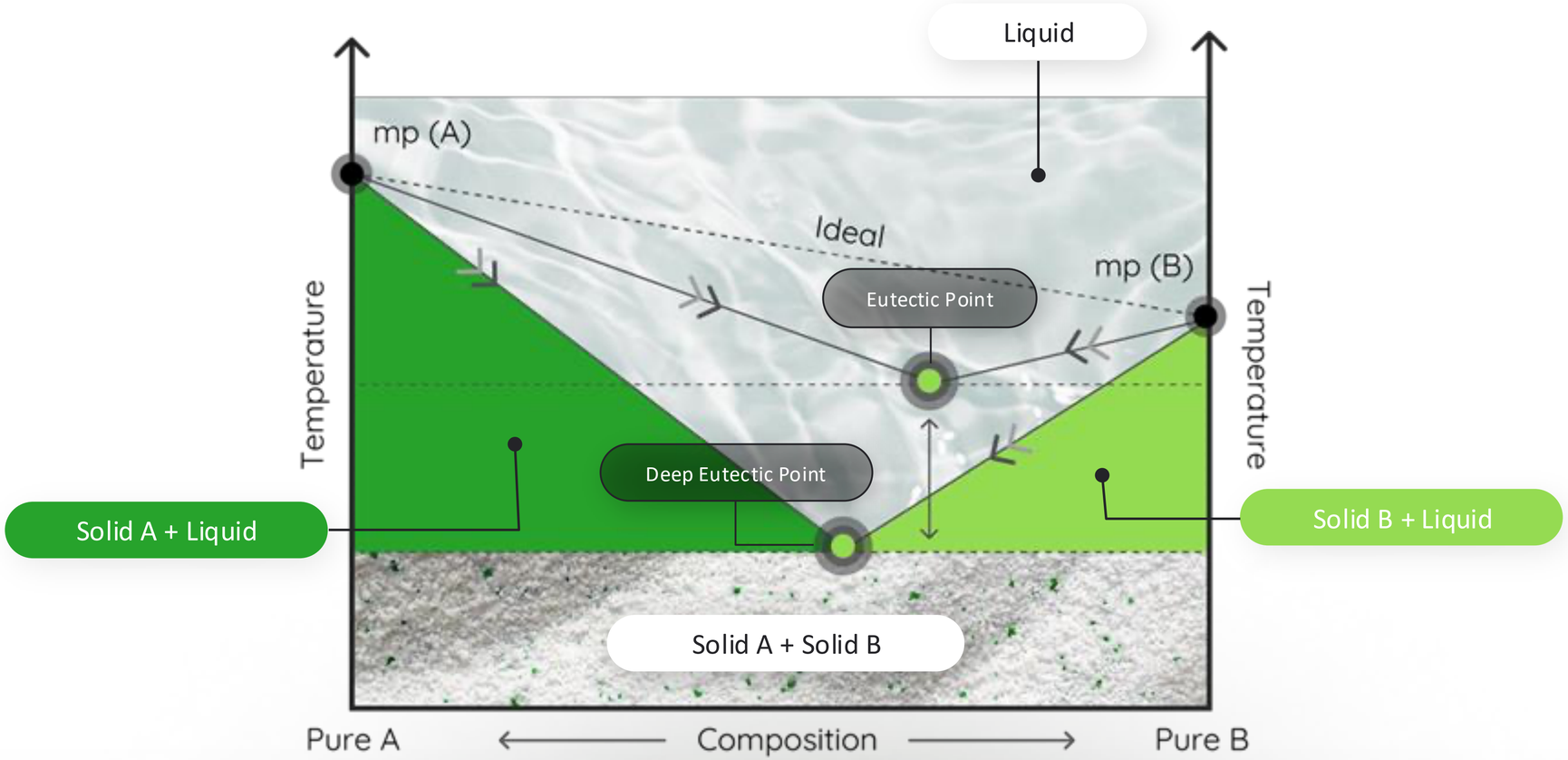


Natural Eutectic
Technology



bioeutectics

How does Eutectic Technology work?



Natural Solid Component A
Food Grade GRAS

Natural Solid Component B
Food Grade GRAS

bioeutectics

AI Platform:
Shaping the solutions of the future

Efficiency

Raw materials availability

New products to discover



Entry
of info



Machine
learning



Potential products to
be tested

98%
Accuracy

Massive Proprietary Database

bioeutectics

The New Generation of Solvents

Natural and Smart

20+

products
fully developed

PATENT-PENDING

Replacing

- Surfactants
- Mineral Acids
- Alkaline agents
- Aprotic Petrochemical Solvents
- Traditional Synthetic Preservatives

- Hydrophilic- **BioE-F**
- Hydrophobic-**BioE-B**
- Amphiphilic-**BioE-A**
- SUPRADES-**BioE-S**



bioeutectics

Market Opportunity



Agro Tech
Natural Adjuvants and other Green Solvents



Personal care, Cosmetics and OTC
Replace existing Solvents and enhance final products



Food Ingredients
Extractions of Colorants, Fragances, Oils, Proteins, Pectins, medicinal plants, etc.



Green Tech
Gas Capture, Polyamides, Nylon disolution, PET Recycling

TAM
$53BI
Solvents market

SAM
$22BI
This 4 applications

SOM
1%
220 Million

Biosolvents
9bi of the **TAM** and growing on a **40% rate** for 2025

FACILITIES

MENDOZA

TULSA

bioeutectics

Shaping the Future

3 Paid Pilots - 600K R

(USD 12 MM proj RR 2026)

- Personal Care (US)
- Food Ingredients (EU)
- Agro Tech (Japan)

20 + MTA's

- Biggest Personal Care brands
- Biggest Food Ingredients Producers
- Agro Tech chemical producers

10 PO's in negotiation

- Personal Care Brands
- Food Ingredients Producers
- Cosmetics and Nutraceutics Producers

Customers **testing our products**

Swedish Match · SYENSQO · COTY SINCE 1904 · YPF · CPKelco A HUBER COMPANY · SHERWIN WILLIAMS · michroma

Nissan Chemical CORPORATION · SKF · dsm-firmenich · LVMH · NotCo · BoreA CANADA Essential Oils · Givaudan · BY BUG

bioeutectics

Our Impact

5 million

liters of **petrochemical solvents** will be **replaced in 2025** by our products.

70% less

Carbon Footprint Impact

1.2 billion lts

Substituting **5%** of current solvents
The impact would be **(3.3 Mill MT reduction in CO2 emission)**

SDGs

- Industry, Innovation and Infrastructure
- Good health and Well-being
- Climate action
- Responsible consumption and production

bioeutectics

The Team

bioeutectics



Tomás Silicaro

CO FOUNDER & CEO



Fernanda Silva

CO FOUNDER & CSO



Federico Gomez

CO FOUNDER & CTO











INDIE BIO

eit Climate-KIC

MC MASSCHALLENGE

GRIDX

GERMAN ACCELERATOR®

Google for Startups

endeavor

AcelerarEspaña

PLUGANDPLAY

Roadmap: This is what we are doing

Incubator / Accelerator
0,75 M USD

2022

- **15 products** ready
- **R&D lab**
- **Application lab** + pilot plant
- **IP** strategy
- **AI platform** MVP

Seed
2,1 M USD

2023

- **Patents filed**
- **Customers testing**
- Scale pilot **production**
- **6 products launch**
- (3 BIOE HB and 3 BIOEHF)
- Production **agreement** or **facilities.**

USA Move

2024

- **Internationalisation**
- **Aggressive** go to market
- Expanding **portfolio**
- **Began Production** ***(Production Capacity 440 MT per month)***

Bridge Round (2 MM USD)

2025

- **Start Selling**
- More **applications**
- **New** products
- Customer Expansion

Investors

GRIDX SOSV Atento Capital SYENSQO Fen Ventures air capital bioeutectics

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STARTUP PRESENTATION

The Hurd Co.

The Hurd Co.

The Hurd Co makes agrilose™, a man-made cellulosic feedstock pulp made from 100% agricultural waste

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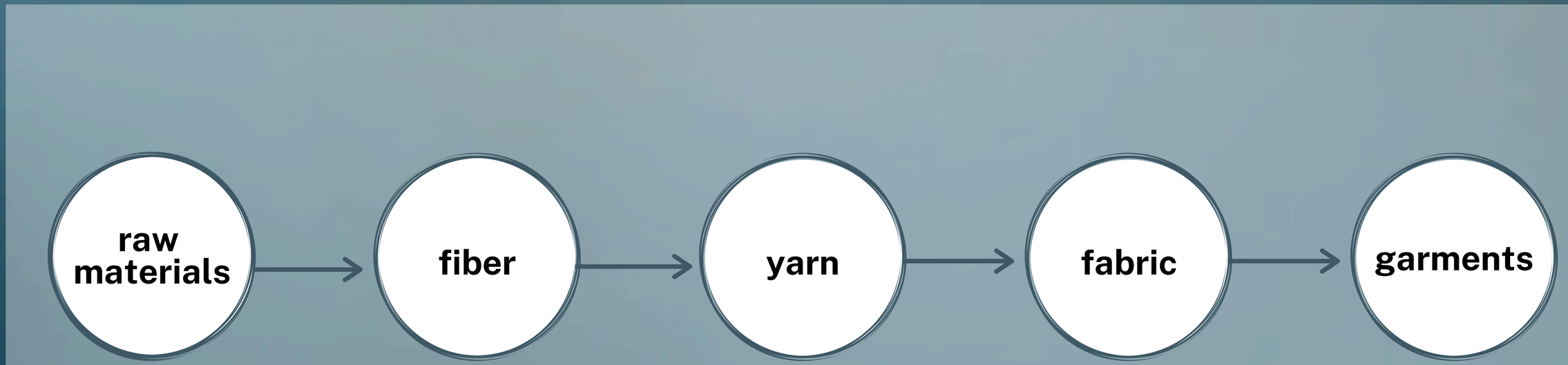
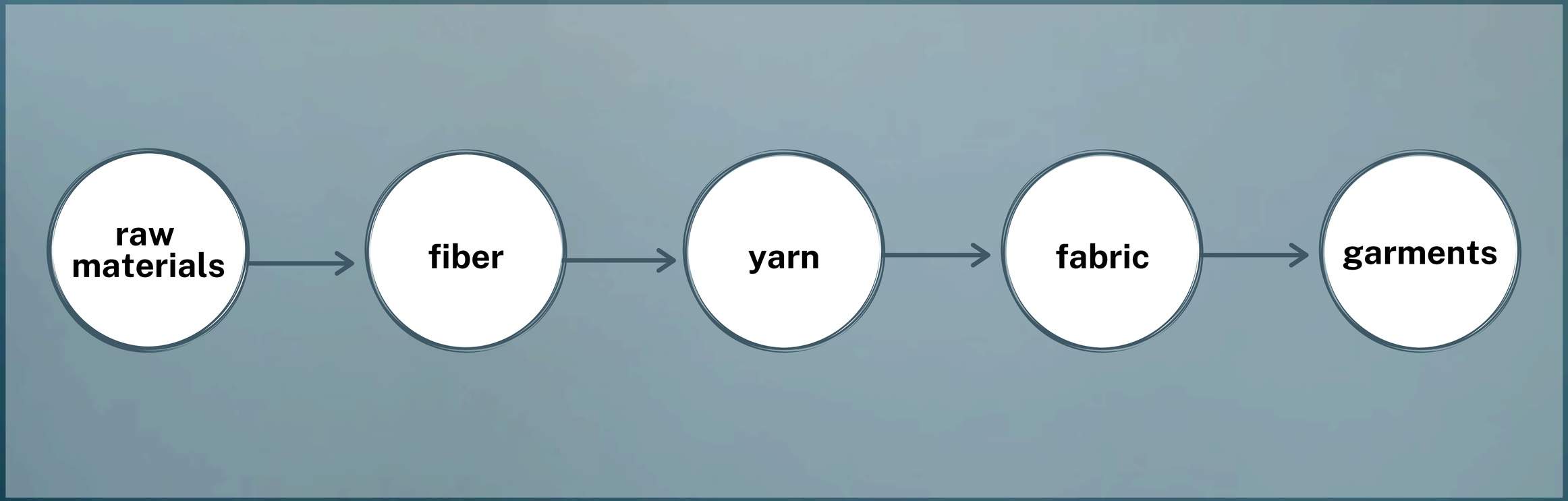
The Hurd Co.

from waste to wear


By **2030**,
demand will exceed supply.
NO CURRENT SOLUTION
The Hurd Co.

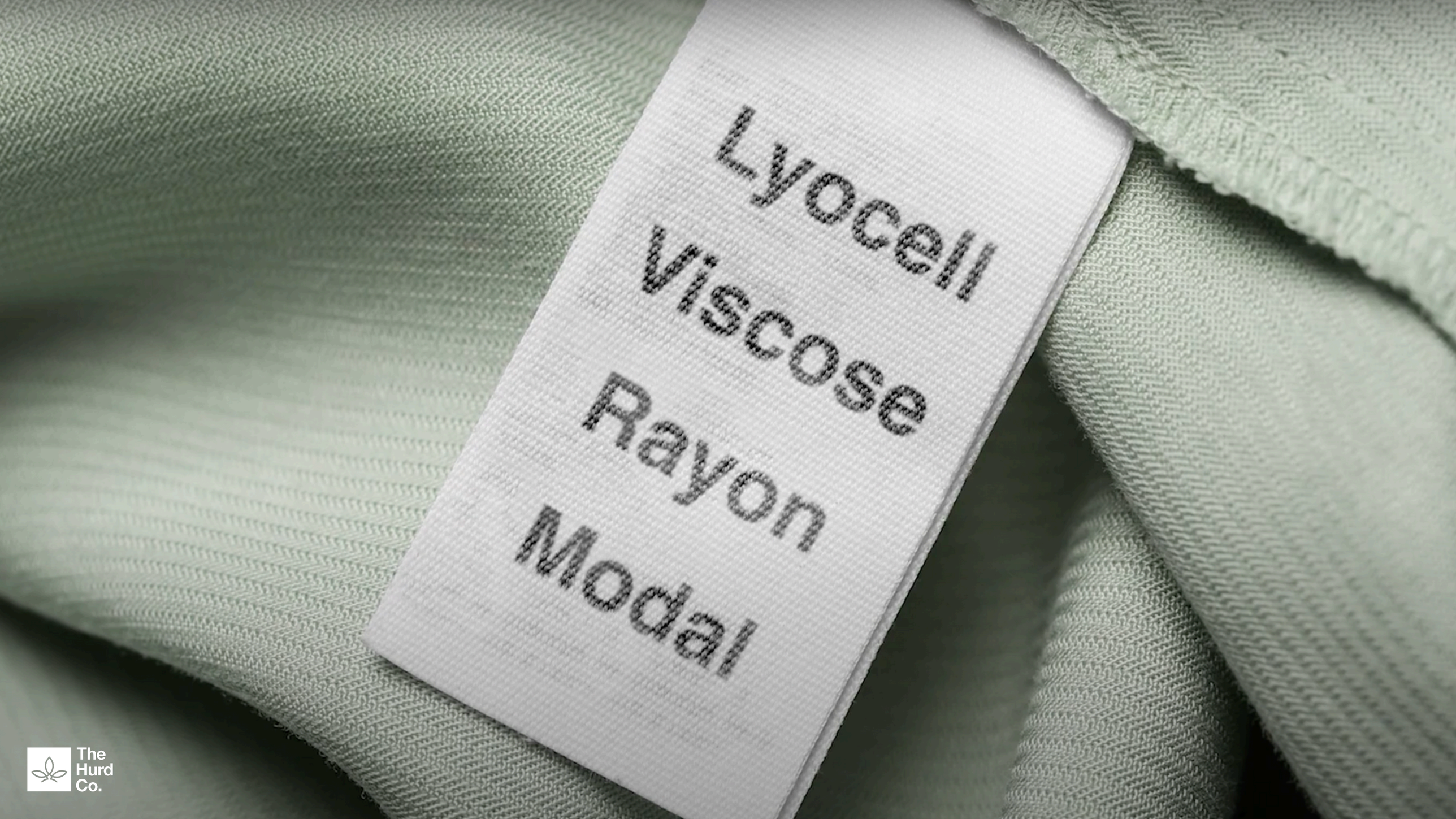


The Hurd Co.



MANUFACTURERS NEED A STABLE + SUSTAINABLE SOLUTION

The Hurd Co.


Lyocell
Viscose
Rayon
Modal

Manmade Cellulosic (MMC)



The Hurd Co.

Manmade Cellulosic (MMC)



300M+ trees
every year

The Hurd Co.

Manmade Cellulosic (MMC)



300M+ trees
every year

$10B
MMC Pulp Market

The Hurd Co.

UNSUSTAINABLE



limited



volatile

The Hurd Co.



The Hurd Co.

agrilose®

SAME QUALITY

SAME PRICE

as standard pulp



agricultural waste



agrilose®



MMC fiber

The Hurd Co.



0
toxic emission



50%
less water



85%
less carbon

The Hurd Co.

0
toxic emission

50%
less water

85%
less carbon

65% REDUCTION IN MANUFACTURING COST

The Hurd Co.



Lyocell fiber made from agrilose® by one of the largest fiber extrusion companies in the world

COMMERCIALIZATION PILOT

Pilot Facility
ready to go

Sample Garments
4 brands

agrilose®
brand launch

The Hurd Co.



Taylor Heisley-Cook

CEO
co-founder



David Mun

COO
co-founder



Charles Cai, PhD

CTO
inventor



Michael Gurin, MBA

CSO



Ciara Cates

VP Business Development

TOAD&CO
EVERY DAY IS AN ADVENTURE

ALANTE CAPITAL

amyris

MICHIGAN ROSS SCHOOL OF BUSINESS

Lenzing
Innovative by nature

Northwestern University

UCLA

UNIVERSITY OF CALIFORNIA RIVERSIDE

MGFuels
Building a Sustainable Future Today

patagonia

BREN SCHOOL · UCSB

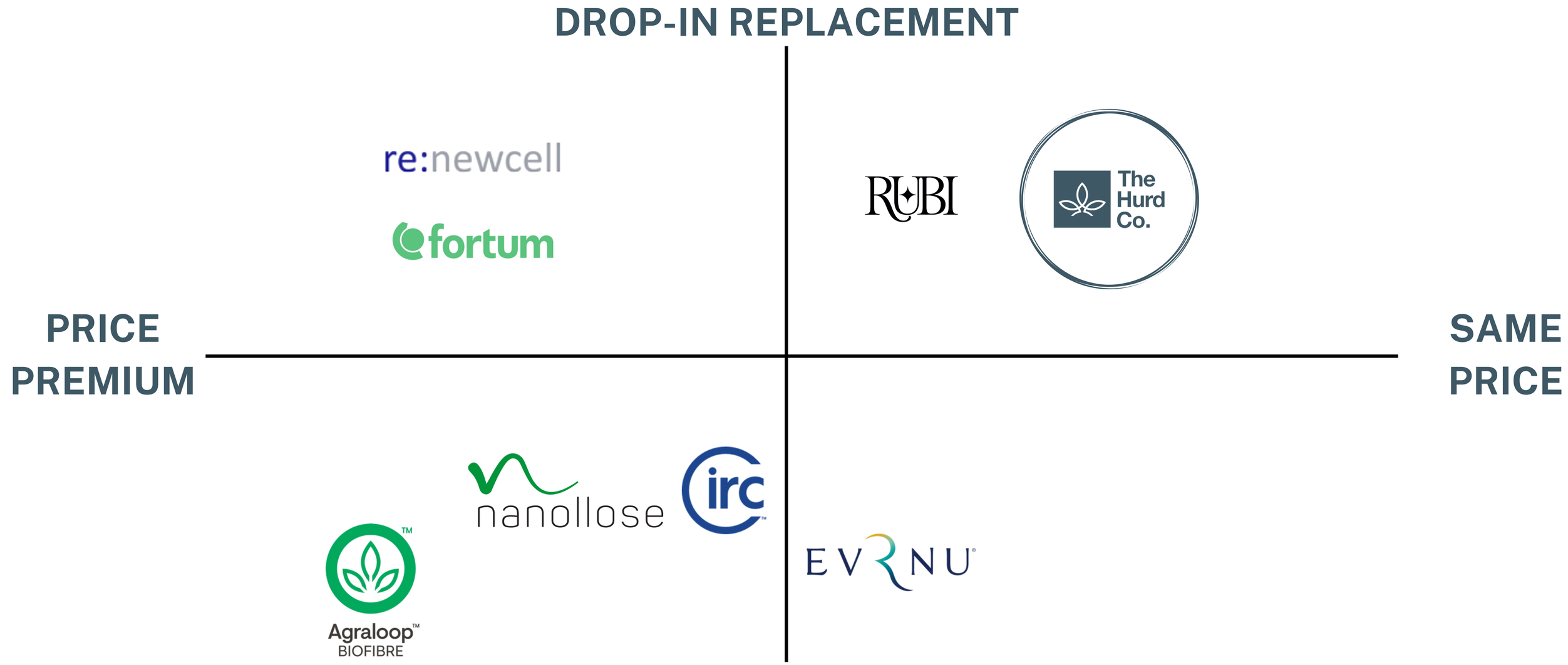
BREN SCHOOL · UCSB

30 UNDER 30

Quantis

The Hurd Co.

THE ONLY ABUNDANT, DROP-IN, SAME PRICE OPTION



Recent Recognition

texworld NEW YORK CITY

INNOVATION AWARDS SXSW 2024 FINALIST

GLOBAL FASHION SUMMIT TRAILBLAZER 2024 PROGRAMME

Proud Alumna of

Berkeley SKYDECK

PLUG AND PLAY

FASHION FOR GOOD

Grant Funding: $1.6M

U.S. DEPARTMENT OF ENERGY

california almonds® Almond Board of California

VENTURE ACCELERATOR AT UCLA ANDERSON

Bren School of Environmental Science & Management UNIVERSITY OF CALIFORNIA, SANTA BARBARA

The Hurd Co.

$6.5M Seed

COMMERCIALIZATION PILOT

SUPPLIER CONTRACTS

SALES CONTRACTS

The Hurd Co.

hello@thehurdco.com | @thehurdco | thehurdco.com

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CLOSING REMARKS

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Tabitha Mills

Senior Program Manager
Plug and Play

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BATCH 18 STARTUPS

OXbyEL Technologies, Inc.

sustanix build not to last

bioeutectics From nature to life

blue lake Innovate for a sustainable future

cert systems

PakIt Green

The Hurd Co.

CIRAC

Fibernx The Next Generation Fibers

FLITE

SANDBOX carbon

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STARTUP

AWARD



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HONORABLE

MENTION



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THANK YOU, MENTORS!

Angela Tseng *Change Climate Project*
Austin Hwang *Honda Xcelerator Ventures*
CJ Terral *TerraLoop*
David Torres *Vanguard Pacific Outsourcing*
Darryl Kirsh *Fiddlehead Ventures*
Diana Tsao Block *ex-Nike*
Florian Turk *Microwave Solutions*
Gary Robinson *Tetonia*
Hart Haugen *Sherwin-Williams*
Jay Amarasekera *ex-SABIC*
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Khaled Boqaileh *LabsCubed*
Laurie McGinley *Via Lucent*
Mark Pastore *Malava Partners*
Matt Johnson *Laiier*
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Michael Keer *Product Realization Group*
Michael Medoro *Rivian*
Ron Erd *Unlocking Growth*
Steven Grall *Guiding Grow & Transitions*
Tami Hutchinson *Intel Capital*
Yuki Sekiguchi *Startup Navigators*
Yzhar Perry *Enlipsium*

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THANK YOU, PARTNERS!

PEPSICO

INX A SAKATA INX COMPANY

SHERWIN-WILLIAMS

VALQUA

TANAKA PRECIOUS METALS

TOSOH

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THE NEW MATERIALS & PACKAGING TEAM



Robert Grey
Director, Sustainable Future



Gabe Mickel
Corporate Partnerships Manager



Gloria Chyr
Ventures Associate



Charlotte Boyer-Chammard
Senior Partner Success Manager



Alejandro Nieto
Senior Ventures Analyst



Tabitha Mills
Senior Program Manager

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THANK YOU FOR ATTENDING

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