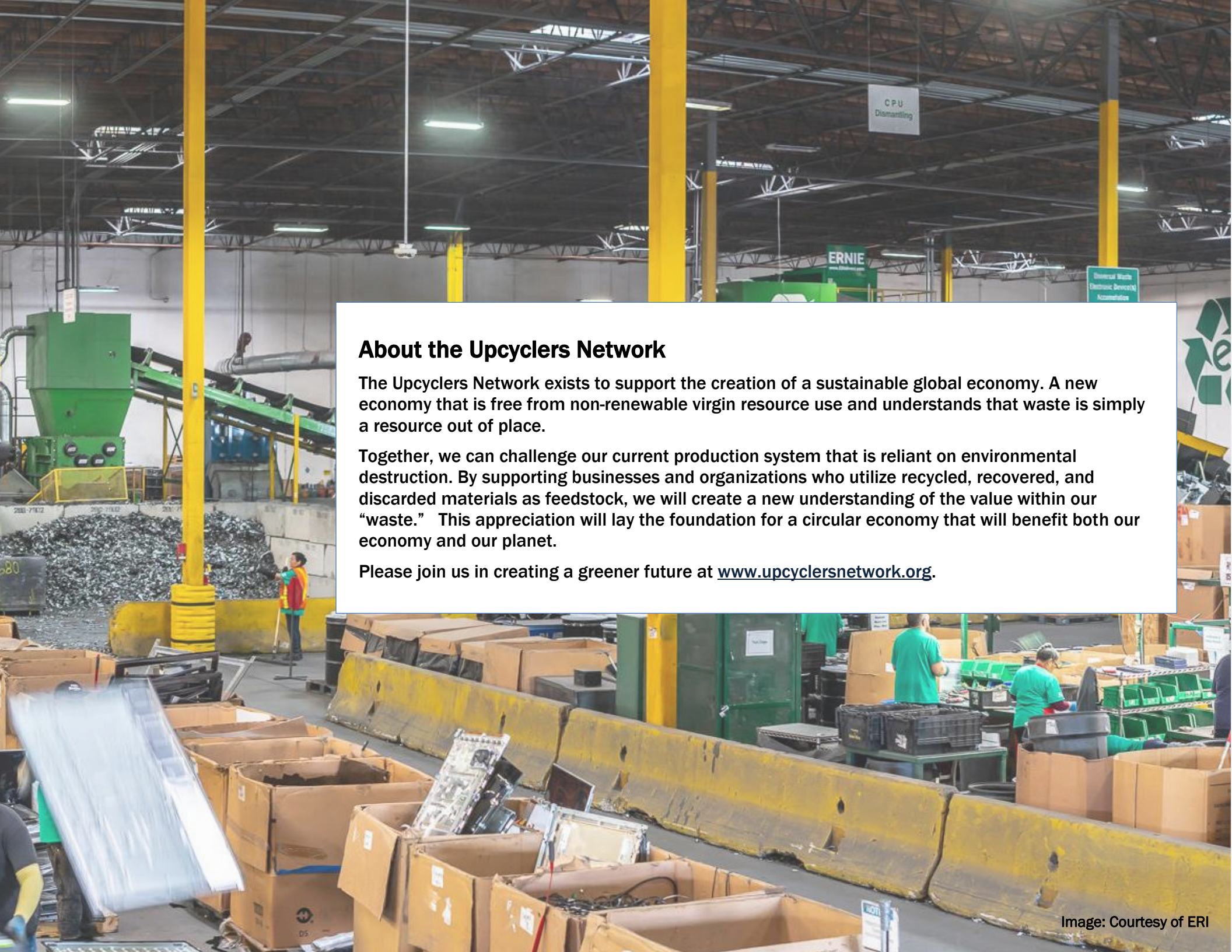


CLOSING THE MATERIAL LOOP

How Innovators from the Public and Private Sector are Creating Value from Waste



About the Upcyclers Network

The Upcyclers Network exists to support the creation of a sustainable global economy. A new economy that is free from non-renewable virgin resource use and understands that waste is simply a resource out of place.

Together, we can challenge our current production system that is reliant on environmental destruction. By supporting businesses and organizations who utilize recycled, recovered, and discarded materials as feedstock, we will create a new understanding of the value within our “waste.” This appreciation will lay the foundation for a circular economy that will benefit both our economy and our planet.

Please join us in creating a greener future at www.upcyclersnetwork.org.

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Introduction

Closing the Material Loop: How Innovators from the Public and Private Sector are Creating Value from Waste shines a spotlight on over 20 innovators within the waste-as-a-resource ecosystem. By highlighting and sharing interviews

and case studies from those who are on the front lines of building a circular materials economy, this report provides real world guidance on how to create closed loop materials solutions.

The US population discards enough aluminum to rebuild the **US commercial air fleet four times over every year.**

Over 11 million tons of recyclable clothing, shoes, and textiles make their way into landfills each year. It takes **713 Gallons of water** to make just **ONE** cotton T-Shirt.

A single recycled plastic bottle saves enough energy to run a 100-watt bulb for 4 hours.

Recycling also creates **20% less air pollution and 50% less water pollution** than making a new bottle.

The U.S. produces the most trash per person in the world generating **1,609 pounds per person per year.** **5% of the world's people generate 40% of the world's waste!**

Sources:

<https://www.usi.edu/recycle/solid-waste-landfill-facts/>

<https://www.rubiconglobal.com/blog-statistics-trash-recycling/>

The Case for Taking Action

If viewed from a societal perspective, the economic rationale to promote recovered resource use is clear. Material that is sent to landfills represents not only the lost financial value of the material itself, but also the lost revenue from potential economic opportunities that could have utilized this waste material as feedstock. For example, for just single use packaging alone, in 2010 the United States threw away \$11.4 billion worth of recyclable containers and packaging material.¹ This amount represents almost double the 2019 budget of the US Environmental Protection Agency which was \$6.1 billion². Furthermore, recycling and reuse are estimated to create between 9 to 30 times more jobs as compared with landfilling and incineration.³

Meanwhile, the potential environmental benefits of reducing both non-renewable virgin resource use and reliance on landfills are equally compelling. Landfills have long been known to cause soil and water contamination issues for the local communities in which they are located, lead to the loss of regional biodiversity, as well as emit methane, a gas that is 20-30 times more potent than carbon dioxide at causing climate change. Natural resource extraction is responsible for the

loss of pristine habitat and biodiversity, creates soil erosion, pollution, and deforestation, and in some cases, leads to the loss of livelihood for the local community.

Lastly, as global consumer spending is projected to almost double to \$64 trillion by 2030⁴, there is an urgency to create new methods of production that can fulfill projected consumer demand while staying within planetary resource constraints.

Supporting the growth of recovered materials markets and products made from waste presents a clear path forward to building a more sustainable economy that can also support regional economic development.

¹ <https://www.asyousow.org/reports/unfinished-business-the-case-for-extended-producer-responsibility-for-post-consumer-packaging>

² <https://www.epa.gov/sites/production/files/2018-02/documents/fy-2019-epa-bib.pdf>

³ <https://www.ecocycle.org/zerowaste/jobs>

⁴ <https://www.brookings.edu/research/the-unprecedented-expansion-of-the-global-middle-class-2/>

INTRODUCTION

The Framework for this report is organized around three sections:

1. **The Public Sector** This section emphasizes the important role that the public sector has in encouraging market demand for recovered material. A variety of cities and states are featured as well as different support mechanisms including financial incentives, administrative support, and start-up incubation.
2. **Partnerships and Collaborations** This section focuses on successful collaborations between different organizations.
3. **Entrepreneurs** This section features entrepreneurs that have created solutions that promote waste as a resource. Included businesses range from those that have developed B2B as well as B2C solutions.

The objectives of this report are as follows:

- **Act as a resource** for states, cities, manufacturers, and brands in the United States and globally that are seeking solutions for the development of recovered materials markets
- **Further impact** by highlighting innovative partnerships, business models, and products to material suppliers, manufacturers, and retailers
- **Bring awareness** of the current and potential environmental and economic impact of the resource recovery industry to the policy, investor, and entrepreneur community

Most Importantly, Inspire Action! Contrary to the media narrative that presents a fairly pessimistic outlook on the future of recycling, this report shows that there is a robust network of players and organizations that are successfully working to support recycled and recovered materials markets and solutions.

For opportunities to engage directly with the featured innovators, join the Upcyclers Network (www.upcyclersnetwork.org) to be notified of upcoming webinars and Q&A sessions with the authors and interviewees starting this Fall 2019.

PUBLIC SECTOR INNOVATORS

“When people realize the inherent value of the materials management sector, suddenly recycling and composting are no longer solely an altruistic concept, but one that has tangible economic benefits. This captures the attention of an entirely different audience.”

-Eric Heyboer, Colorado Recycling Grant Program Administrator



Image Courtesy of Kent County, Department of Public Works

PUBLIC SECTOR INNOVATORS

KEY FINDINGS

PUBLIC SECTOR

The Public Sector plays an integral role in the development of recovered materials markets. Whether through actions such as fostering awareness of the financial value found within “waste” to the local community, offering business support services including loans or permitting assistance, or developing eco-parks and manufacturing hubs built around local landfill; states and cities have the unique opportunity and responsibility to create a favorable ecosystem that can accelerate the creation of recovered material economies.

The programs and initiatives highlighted in this section represent seven regions across the United States which have developed programs to support demand for recovered materials. Some of the featured programs, such as CalRecycle’s Recycling Market Development Zone program, are well established and have been in place for over 20 years. Other programs, such as Austin’s Circular Economy Mapping program, were founded more recently, in the Spring of 2019. The programs are also supported by a wide range of budgets, ranging from approximately \$200,000 for Colorado’s NextCycle program, to a projected \$9-12 million for the creation of Kent County’s EcoPark. **The goal in showcasing this diversity of programs is to provide case studies that are pertinent to all cities and states regardless of what budget constraints or organizational structures may be in place.**

KEY FINDINGS

Making the Economic Argument

All of the interviewees spoke to the importance of framing “waste” in terms of economic value. This shift from materials management activities being traditionally seen as a cost center to positioning these activities in an economic development and revenue generation light has arguably helped these programs gain greater buy-in from both the community at large and within their respective municipalities or states.

Embracing Entrepreneurs and Local Experts

Several featured cities and states understood that existing solutions for the processing of “waste” and end-markets for recovered materials may not currently exist. Thus, they have and continue to pro-actively pitch their materials to the entrepreneurial, business, non-profit, and academic community. In some cases, cities are even developing start-up acceleration programs to foster scalable solutions. Encouraging inclusivity and diversity of program participants to include “non-traditional” business owners was also cited by some interviewees as a priority for their resource recovery program.

Breaking Down Silos

As programs are developed to support the utilization of recovered materials, proper communication and coordination between different city departments (namely Economic Development and Resource Recovery/Waste Management) is integral to ensuring there is no duplication of efforts as well as to lay a

PUBLIC SECTOR INNOVATORS

KEY FINDINGS

framework for strategic coordination. Some of the featured cities have even developed joint funding for a cross-departmental role or for the creation of an entirely new Circular Economy department. The Procurement, Building, and Workforce Development departments were also cited by interviewees as being important to include in the development of recovered materials strategies.

Setting Realistic Expectations

Having a full understanding of a region's infrastructure, labor pool, and transportation options is important in crafting a materials management strategy that a region can realistically support. The scale and type of resource recovery and manufacturing businesses that a city or region should be focused on attracting will be dependent on these attributes. Energy and water needs, accessibility to a skilled workforce, and proximity to large populations were important factors that large scale manufacturers considered when deciding on potential sites.

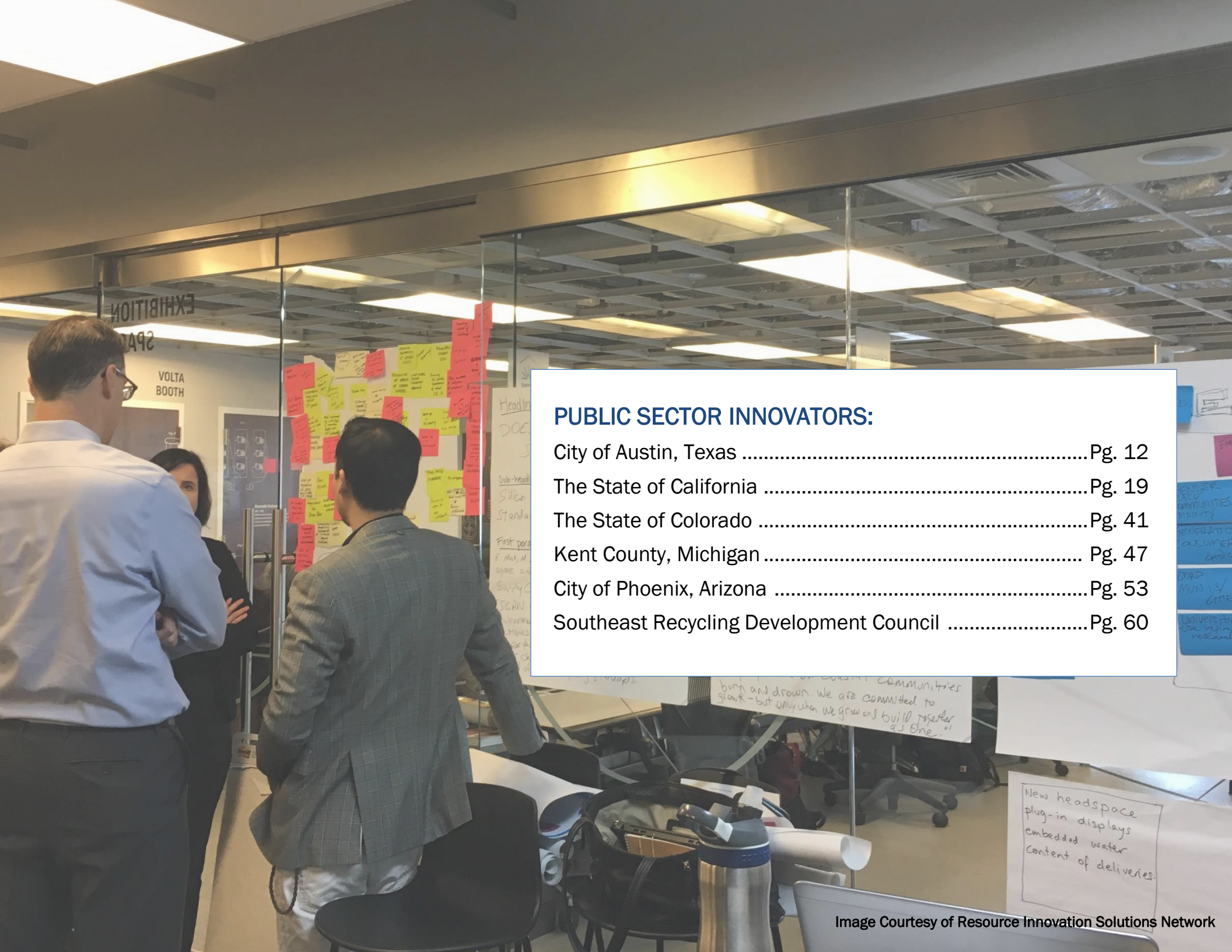
Driving Change Without High Tipping Fees

Even in a regulatory environment that is unfavorable to high tipping fees, regions can still support resource recovery activities and the

development of end-markets for those materials. Having regional leadership publicly commit to landfill diversion goals, seeking out local manufacturers who have zero waste mandates as part of their sustainability goals, and educating local residents about the lost financial potential of the material currently being currently landfilled were all strategies that interviewees mentioned as helpful in the creation of resource recovery and end-use programs. Recognition, through awards or certification, for manufacturers that have achieved zero waste manufacturing and/or who have developed partnerships with other manufacturers to utilize their byproduct can also drive momentum for behavior change.

More than Monetary Assistance

Financial assistance in the form of grants, low-interest loans, or tax rebates are helpful for supporting businesses that utilize waste-as-feedstock but not necessarily the only critical piece in supporting their development. Programs may also offer non-financial support including the generation of media coverage, access to experts and city data, permitting assistance, and coordination among different departments, as important benefits that can help businesses to develop and scale.



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CITY OF AUSTIN, TEXAS



- Circular Economy Program
 - *Lessons from Austin's [Re]Verse Pitch Competition:*
Q&A with Natalie Betts, Manager, City of Austin,
Circular Economy Department

Circular Economy Program

<http://austintexas.gov/circulareconomy>

In 2011, the City of Austin set a goal to divert 90 percent of all material from the landfill by 2040. The Zero Waste goal creates exciting expansion opportunities for the local recycling and reuse sector – a primary focus of Austin's Circular Economy Program, a unique partnership between two City of Austin departments, Austin Resource Recovery and the Economic Development Department.

The Circular Economy Program believes Central Texas can become the most vibrant circular economy in the U.S., where every material can be put to its highest and best use within the local economy at each stage of its life cycle. The CEP hopes to achieve this goal by attracting, retaining, and growing businesses, non-profits, and entrepreneurs in the zero waste industry in order to create well-paying local jobs, attract investment, and supporting the necessary infrastructure for a resilient circular economy in Central Texas.

The CEP's initiatives have two distinct audiences and roles. One focus is to support zero-waste related businesses and entrepreneurs. The other

focus is to promote behavior change among residents to drive demand for these business types. These two goals are promoted through the following programs and resources, funded by the City of Austin.

Programs focused on supporting zero-waste related businesses and entrepreneurs:

- **Enterprise Resource Guide:** Updated biannually, this guide provides resources for entrepreneurs in the recycling and reuse sector, and includes information such as free Small Business trainings and classes, local funding options, how to do business with the City of Austin, and Zero Waste Ordinances to be aware of. tinyurl.com/rrresourceguide
- **[Re]Verse Pitch:** An opportunity for social entrepreneurs to create or expand a business idea using raw materials that local businesses, non-profits, and institutions are generating as byproducts. Since its inception in 2016, the program has diverted 9.5 million lbs. of material. <http://reversepitch.org>

PUBLIC SECTOR INNOVATORS

CITY OF AUSTIN, TEXAS

- **Austin's Circular Economy Story Mapping:** A digital, interactive online tool that maps relationships of local businesses. [See our beta version here.](#)
- **Austin Materials Marketplace:** Online business-to-business byproduct exchange platform. To date, the program has kept over 933,000 lbs. out of the landfill. <https://austinmaterialsmarketplace.org/>
- **ATI Circular Economy Incubator:** Links entrepreneurs with academia, industry, and government to solve global challenges in design and reuse. Helping businesses test circular economy technology and business model innovations. <https://ati.utexas.edu/ati-announces-circular-economy-incubator/>
- **Material of the Year:** An annual project to identify and implement a solution for a hard-to-recycle material through information gathering and bringing together multiple industries. The 2019 material is textiles.
- **Business retention and expansion efforts:** Includes visits to local businesses working in the circular economy sector (e.g. reuse, thrift, recyclers, remanufacturers, upcyclers) to understand challenges and provide resources, and a monthly newsletter to our community with upcoming opportunities, news and events
- **Business recruitment efforts:** As part of the Economic Development Department, CEP is involved with the City's broader business recruitment efforts. Zero waste is a target industry for the City, and the incentives policy

includes specific provisions to reward remanufacturers and encourage zero waste business practices.

Programs focused on Supporting Behavior Change among Residents

- **Austin Reuse Directory:** An online searchable directory to inform residents of nearby outlets to reuse items, such as drop-off locations, pick-up services and resale options. Users can also search by item quality and cause supported. www.austinreusedirectory.com
- **Fix-It Clinics:** In partnership with the Austin Public Library, residents can bring in broken items free-of-charge and learn how to repair them alongside skilled volunteer coaches. Clinics are held quarterly, but the program is working to expand community access to repair through partnership clinics with local businesses and orgs. Since fall 2015, the program has kept nearly 2,000 lbs. out of the landfill. www.austintexas.gov/fixitclinic
- **MoveOutATX:** A community-led effort to keep reusable items out of the landfill at the end of summer during off-campus student move-out at The University of Texas. Reuse organizations set up convenient outlets in and near apartment complexes for students to donate items. During the pilot year in 2018, the program kept 62 tons of material out of the landfill, benefited 8 reuse organizations, and provided \$154,000 in economic value to the community. moveoutatx.org
- **National Reuse Day:** October 19 marks National Reuse Day and has been recognized

PUBLIC SECTOR INNOVATORS

CITY OF AUSTIN, TEXAS

by the Austin City Council since 2013. In 2018, the City partnered with reuse organizations to offer residents an opportunity to donate items at participating locations of the Austin Reuse Directory in exchange for an 'I Heart Reuse' sticker that was redeemable for discounted shopping at those same locations.

- **Economic Impact Report:** Published every five years to understand the current and potential economic impacts of Austin's recycling and reuse-related activity. The 2015 report is available [here](#).

Additionally, Austin's Circular Economy Program leads a topical council on reuse for the State of Texas Alliance for Recycling, engages with the local Circular Economy Club chapter, and hosts regular educational and outreach events to promote circular economy and zero waste. Over the past 18 months, the program has held or presented at 42 events, touching over 1,700 individuals. **The programs detailed above have helped keep 9.8 million lbs. of material from local landfills since October 2017.**

Author: Madelyn Morgan, Circular Economy Planner, City of Austin



Madelyn Morgan was awarded Waste360's 40 Under 40 in 2019. She has organized diversion projects for special events, researched micro plastics, consulted with businesses to implement cost effective zero waste programs, developed and launched a rebate program, taught zero waste classes, and led community-driven reuse planning and project implementation. Currently, she supports the City of Austin's circular economy program, developing programs and initiatives to support local businesses and non-profits who are "closing the loop" in Austin. She also chairs the State of Texas Alliance for Recycling's Reuse Council and the departmental Green Team. Maddie has a B.A. from The University of Texas at Austin and an M.A. in Sustainability from Texas State University.

Lessons from Austin's [Re]Verse Pitch Competition: Q&A with Natalie Betts, Manager, Circular Economy Department

Background

The [Re]Verse Pitch Competition, a social innovation program, helps turn valuable raw materials that are currently leaving local businesses, nonprofits and institutions as waste, into the foundation for new social enterprises. The competition begins at the opening event, where Material Suppliers—entities that consistently generate or collect by-product, surplus, or other underutilized materials in Austin—give presentations about their would-be waste to entrepreneurs. Potential competitors, after attending the materials demonstrations, then have five weeks to determine how previously wasted item(s) might now become the foundation for a sustainable Austin enterprise.

The event has evolved from having one winner to two beginning in 2018, when categories were created for Seed Stage (new start-ups) and Growth Stage (companies who had already generated revenue) companies.

Contestants receive guidance from mentors and technical advisors and have the opportunity to attend specialized workshop sessions as they formulate a business plan and test their concepts for viability. Finalists pitch for the chance to win one of the two Innovation Prizes—\$10,000 to the best new business idea and \$10,000 to an existing business that is able to make use of one of above byproducts—at the closing event.

With 4 years of experience under your belt, what is the best advice to someone interested in replicating the effort?

My advice would be to build a team from multiple organizations and sectors. [Re]Verse Pitch in Austin has benefited tremendously from the fact that our “founding” team had the expertise, perspective, and resources of a co-working space, a university, and a non-profit business coalition, in addition to local government as the lead organizer. Before you get started, have as many conversations as possible with key stakeholders, to see what questions people have and what concerns they raise about how it will work in your area. Keep iterating as you go. We created the program without a playbook, so we have been intentional about reviewing what has worked well and what hasn't, and really listening to feedback to improve the competition every year.

What are some tips for other organizations looking to create start-up programs focused on waste as feedstock?

- **Keep the big picture in mind.** Supporting idea stage businesses is inherently risky, and not every idea from ReVerse Pitch, even the winning ones, will go on to business success. **But ReVerse Pitch is about more than individual business successes; at its core, it's about raising awareness about the economic**

potential of waste, and inspiring social entrepreneurs to get excited about the problem-solving and profit-making potential of the circular economy.

- **Be open.** I think a key component of this competition's success is being welcoming to all. ReVerse Pitch, which asks entrepreneurs to solve a specific problem rather than pitch an idea they are already invested in, will attract non-traditional entrepreneurs, and that's a good thing. **Keeping the competition open helps to bring more people into the conversation about how to reach zero waste through business innovation and can make a city's overall entrepreneurial ecosystem more inclusive.**
- **Money matters,** but not for the reasons you might think. We have discovered over time that offering prize funds is necessary; not because \$10,000 is the key amount to make or break a business idea. The prize money is what indicates the seriousness of the competition, inspiring the competing entrepreneurs to dedicate significant time and stay committed to the project throughout the competition.

What are some of the materials that have been pitched?

We see everything! It's been fascinating to learn about the variety of byproducts from Austin businesses. But the most common materials tend to be organic materials, hard-to-recycle plastics, and fabric or textiles. You can see all our past materials on our website: <http://reversepitch.org>.

What resources do you provide competing entrepreneurs?

Competitors are matched with entrepreneurial mentors based on their business idea and the skills of interested mentors. Technical advisors are also available as a resource to competitors, as subject matter experts of a particular material or business arena, such as logistics or marketing. Additionally, the City offers classes and workshops to help competitors create a business plan and fine tune their idea. Finalists are offered a pitch practice opportunity with additional coaching. After the competition, we also meet with everyone who submitted a finalist application to ask for their feedback and offer ongoing support (e.g. introductions, resources, education) to those continuing to pursue their idea.

Where does the award money come from?

Award money is pooled from several City departments, including Austin Resource Recovery, Economic Development, the Innovation Office, the Office of Sustainability, and Austin Energy Green Building. Currently, the competition funds up to a \$10,000 prize for each the Seed Stage and Growth Stage categories.

Additionally, many local businesses offer in-kind prizes, such as co-working space, legal services, start-up advertising services and more.

What stakeholders and partners were essential in getting this program started?

PUBLIC SECTOR INNOVATORS

CITY OF AUSTIN, TEXAS

- City's Innovation Office: Our own Innovation Office helped us think through the program structure and offered us an internal "match challenge": they would provide us with \$5,000 for a prize, if we could come up with another \$5,000 from other departments.
- US Business Council for Sustainable Development: This local non-profit had important connections to local businesses with interesting waste streams that didn't have established local end users; these businesses became our first Material Suppliers.
- Impact Hub Austin: A founder of this social entrepreneurship co-working space was a critical member of the team because she looked at the program through an entrepreneur's lens and made sure our program was responsive to their needs.
- University of Texas at Austin: Several schools within the University of Texas have been partners over the years, and have helped us secure event emcees, pitch coaches, space, and mentors.
- SCORE Austin: This local chapter of volunteer mentors was crucial in getting us our first crop of mentors.

Describe the time and costs allotted to creating this program:

We currently contract with the Austin Young Chamber of Commerce to run the competition, which costs the City \$18,500. The City also contributes (through various departments) \$20,000 for the prize funds and pays about \$3,000 per year for the online competition platform and the competition website.

What is your favorite part of the competition?

My favorite part of the competition is seeing how many first-time entrepreneurs participate. Our competition is unique in that there is no barrier to entry: anyone is welcome to compete, and you don't have to have a business idea already validated to get in the door. I love that [Re]Verse Pitch is a place where passionate people can come to learn about how to turn their passion into a successful business. I also love how much variety our competition produces. In one recent practice session, I heard business ideas ranging from biodegradable tire technology, to a social club, to the manufacturing of art supplies; all using ReVerse Pitch byproduct materials!

**PUBLIC SECTOR
INNOVATORS**
CITY OF AUSTIN, TEXAS

Author: Natalie Betts, Manager, Circular Economy Department



Natalie oversees the Circular Economy Program at the City of Austin, working to create a resilient, innovative, and inclusive economy that uses waste as a resource. Prior to her current role, Natalie served in multiple capacities with City of Austin's Economic Development Department, including analyzing economic development projects; assisting businesses with the economic development incentives process; developing new incentive programs; integrating economic and workforce development; and executing international business, trade, educational and cultural programming. Natalie is an alumna of the White House Internship Program, Indiana University, and Emory University.

THE STATE OF CALIFORNIA

The CalRecycle Recycling Market Development Zone & Loan Program

- San Joaquin County Recycling Market Development Zone
 - Featured Loan Recipient-Ecologic Brands
 - The RMDZ Grantee Perspective: Interview with Julie Corbett, President and Founder of Ecologic
- Ventura County Recycling Market Development Zone
 - Featured Ventura RMDZ Loan Recipient- Oxnard Pallet Company
 - Learning's from 15 years of Promoting Waste as Feedstock: Q&A with David Goldstein, Zone Administrator
- Yolo County Recycling Market Development Zone
 - Featured YOLO RMDZ Company Highlight-Aquafil
 - *Building a Relationship with Aquafil*: Q&A with Wendy Ross, Economic Development Manager, City of Woodland and Yolo RMDZ Coordinator
- The California Association of Recycling Market Development Zones
- The Recycling Build Infrastructure Now Coalition

The CalRecycle Recycling Market Development Zone & Loan Program

www.calrecycle.ca.gov/RMDZ



The Department of Resources Recycling and Recovery (CalRecycle) administers a Recycling Market Development Zone (RMDZ) Loan Program to support California-based recycling businesses by financing businesses that prevent waste or reuse or recycle recovered materials through value-added processing or

manufacturing. The Recycling Market Development Zone (RMDZ) program combines recycling with economic development to fuel new businesses, expand existing ones, and create jobs by diverting material away from landfills and back into local economies.

PUBLIC SECTOR INNOVATORS

THE STATE OF CALIFORNIA

This program provides attractive loans, technical assistance, and network marketing to support businesses that use materials from the waste stream to manufacture their products and are located in a zone.

There are currently 40 zones in California, covering more than half of the state's population and land area, and most of its prime industrial lands. The zones cover roughly 88,000 square miles of California from the Oregon border to San Diego. As of April 9, 2019, the RMDZ program has provided approximately \$236 million in loans for 295 discrete projects, many of which involve companies that have received more than one loan.

Assistance is provided by local zone administrators. Local government incentives include assistance interpreting building codes and zoning laws, streamlined local permit processes, reduced taxes and licensing, and assistance locating secondary material feedstock supply. Local incentives vary from jurisdiction to jurisdiction.

Funding Terms include:

- \$2,000,000 or 75 percent of total project cost, whichever is less.
- Current interest rate of 4%
- A borrower and its related entities may receive more than one RMDZ loan, but may not have more than \$3,000,000 principal outstanding on all RMDZ loans.

- Term is fixed at 10 years when secured by business assets, or 15 years when secured by real estate.
- Matching funds of at least 25 percent of the total project are required.
- Collateral is required. Collateral may include equipment, inventory, accounts receivable, and commercial real estate
- For further details, refer to www.calrecycle.ca.gov/RMDZ/Loans/

Eligible Applicants for the program can include:

- Private, for-profit entities
- Nonprofit organizations (except private schools)
- Local government entities
 - Cities, counties, and cities and counties
 - Regional or local sanitation agencies, waste agencies, and joint powers authority

All projects must be located in a CalRecycle designated RMDZ and use postconsumer or secondary recovered waste feedstock generated in California. To see a map of zones throughout California and/or to determine whether a physical address is located in a zone, refer to: www2.calrecycle.ca.gov/BizAssistance/Zones/

For further information including a full list of funded companies, loan allocations, and case studies, please refer to the RMDZ website: www.calrecycle.ca.gov/RMDZ .

PUBLIC SECTOR INNOVATORS

THE STATE OF CALIFORNIA

In the following pages, the RMDZ's of YOLO, Ventura, and San Joaquin, along with RMDZ funded companies within each zone and Q&A's with the respective Zone Administrator, are

highlighted to provide insight and examples of how each zone approaches the goal of supporting the use of post-consumer waste material.

Author: Steve Lautze, founding President of the CA Association of Recycling Market Development Zones



Steve Lautze has 40 years of experience in the recycling and economic development fields, including operations, consulting, and policy development. Steve recently concluded 16 years as President of the California Assn. of Recycling Market Development Zones, and has worked for 20 years in the City of Oakland, Ca. to develop sustainable economic development practices as the Green/Industrial Specialist in that city's Business Development Team. Steve is also a co-founder of the Recycling Build Infrastructure Now Coalition, and a past President of the Northern California Recycling Association.

San Joaquin County Recycling Market Development Zone

www2.calrecycle.ca.gov/BizAssistance/RMDZ/Zones/Details/32

www.greenteamsanjoaquin.com/home.aspx

The San Joaquin County Recycling Market Development Zone (RMDZ) is a three-way partnership between the Stockton Chamber of Commerce, local government and the California Department of Resources, Recycling and Recovery. The Zone forms a nexus of local landfill diversion and economic development efforts.

Essential to this partnership is the participation of recycling based businesses. Zone representatives search for competent, motivated processors and manufacturers willing to initiate or expand the use of recycled materials. The RMDZ program is designed to give local recycling based businesses a competitive edge and offers low interest loans to eligible companies.

San Joaquin County municipalities offer different incentives to attract business development, such as permit assistance, a one-stop permit process, no development fees, and flexible air quality and land use standards which allows some businesses to operate outdoors. The Stockton RMDZ is limited to the boundaries of San Joaquin County.

Recycled materials are available to provide continuous feedstock, including paper, plastic, glass and organic. The RMDZ can help locate tires, inerts, construction, and demolition materials as well.

Land and buildings in this RMDZ are available at reasonable cost, including planned and existing

industrial parks. The area also offers excellent transportation advantages. San Joaquin County has two major highways that run north to south with Interstate 5 and Highway 99. There is also an east-west connection via Interstate 205 and Highway 120. Additionally, two rails systems are provided by the Burlington Northern Santa Fe and Union Pacific Railroad.

San Joaquin County also hosts an inland port connecting to international waterways, warehouse storage and handling facilities for both dry and liquid bulk materials, facilities and equipment to handle break-bulk and containerized cargoes by land or sea. Stockton Metropolitan Airport provides air cargo services and is centrally located in the county.

The Stockton RMDZ is part of Green Team San Joaquin, an award-winning program of the Greater Stockton Chamber of Commerce founded in 2005. Green Team San Joaquin is a collaborative effort between private businesses, municipal and county solid waste divisions, economic development professionals and the community of San Joaquin County with the goal of showing businesses that "going green" will not only reduce their costs of doing business, but it will also help the environment and move the entire San Joaquin County economy forward through improved quality of life and economic development opportunities.

Green Team San Joaquin manages and facilitates other events and programs including, REXPO, the Business Academy for Regulatory Compliance (BARC), the Recycling BIN Summit, Pathways to

Green Schools and REACON. Currently, the program has been replicated in Stanislaus county, Merced county, and Fresno county.

Author: Frank Ferral, Public Policy Director, Stockton Chamber of Commerce; San Joaquin RMDZ Program Administrator

Featured San Joaquin RMDZ Loan Recipient - Interview with Julie Corbett, President and Founder of Ecologic Brands

Julie, can you talk about the relationship between Ecologic Brands and the San Joaquin RMDZ?

The RMDZ program was instrumental in scaling our business. We spent nearly the last three years on developing the automation necessary to scale our business. The original format was not easily scalable. With the RMDZ financing, we were able to develop and install the equipment necessary to scale from a maximum production of three million bottles per year with current assembly equipment up to 15 million bottles per year.

RMDZ administrators have been easy to work with and they allow us to run our business. Yes the process was long and cumbersome, but the people at CalRecycle have been very helpful in helping us through the process.

Describe the process for applying for the RMDZ loan?

We submitted over 100 pieces of documentation beginning in March 2015. A project narrative proposal, supporting documentation, financials, diversion studies, etc.

The First Loan was approved about 6 months later in August 2015. Then it took another year to close the loan. During that time they assessed whether the loan approval met the original criteria. We provided numerous studies, sales projections, and diversion and ghg reduction forecasts.

GHG Reduction Calculations are tough. We use recycled materials to make our bottles which clearly shows diversion from landfills, but there is also the diversion to landfills by replacing a plastic bottle with our bottle which is harder to quantify. We then needed to learn how to calculate the GHG reduction. We used Method

For Estimating Greenhouse Gas Emission Reductions From Recycling along with a third party Life Cycle Analysis that we had done to calculate GHG Reductions. This was a huge learning experience for us.

For those companies that are interested in applying for the RMDZ loan program, what are some milestones you recommend they reach before applying? Any other advice? Other resources they should reach out to?

Milestones – a clear obtainable vision. A solid business model that shows growth, positive margins, the GHG reduction for each CAPEX purchase and a sales pipeline that supports the CAPEX. Project timelines and costs for specific equipment.

Be involved in the community to help drive positive press about your business.

CalRecycle publishes a list of companies which have received RMDZ loans, so talk with someone that has been through the process. CalRecycle is also a great source of information.

Packaging is a low margin business and yet you are making it work in California. What would you say to those who say that setting up manufacturing in California is too cost-prohibitive? What were some of your greatest challenges, cost-wise in operating here?

California has a strong labor force, a wide range of opportunities. Employees in California tend to be very passionate about the work especially in socially conscious companies like Ecologic.

The two biggest costs are for us are the cost of labor and overhead. Automation is the key to managing these costs. By increasing automation we are able to lower the cost of our products, but also have a path to train lower paid positions up to a higher paid position. I think also when you talk about the low margin business of packaging, we must remember that a new product may start off with a negative margin, but process improvements as well as automation can dramatically increase margins. **I have seen companies that have tried to cover all their costs from day one, but you have to be careful to not price yourself out of business opportunities.**

What would you recommend to policymakers that are looking to incentivize the growth of manufacturing utilizing recovered feedstock in the US?

Good question. Even before I get to legislation, I would start with education or rather “re-education”. **Much of what we learned as consumers over the last 20 years about recycling is wrong. How many items do we think get recycled that actually can’t or just don’t? The US does not have many companies that use recycled materials, especially plastics.**

Most Californians and other Americans do care about the environment and about recycling. Better programs to collect feedstock in more

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usable forms would go a long way, not only from individuals, but also companies that go through tons of feedstock each and every day. We find out more and more that while plastic is a cheap and easy way to make many things, the vast amounts are both harmful to the environment and to individuals using products from plastic bottles.

We need infrastructure in place that promotes feedstock as a replacement to plastics. The issue is multifaceted, but can be accomplished.

Legislatively we could require packaging companies, over time, to phase out and find alternatives to plastics. **At Ecologic, we have created a closed loop economy. We take recycled cardboard from a company and turn them into a product that we sell back to that same company creating a true sustainable closed loop system. In the future we see a world where stores take their waste and send them to a company like Ecologic who in turn creates packaging that is then used in the stores.**

About Ecologic ecologicbrands.com

Ecologic Brands is a California-based designer and manufacturer of the world's first-ever paper bottle. We are committed to creating a greener future. Our molded fiber shell is made from 100% recycled cardboard and newspaper to form a unique, innovative, and disruptive container. When needed, our technology can also leverage the barrier properties of plastic in a composite container that provides a tangibly green packaging solution. Ecologic is an award winning packaging solutions provider and has produced over 4 million bottles worldwide.

Author: Julie Corbett, President and Founder of Ecologic Brands



Julie is the mastermind behind Ecologic's new bottle – a testament to her insatiable curiosity and ability to “think outside the bottle”. Julie's passion is bolstered by her 16 years of marketing and investment experience. Prior to founding Ecologic, she was a Vice President at Jurika, Mills & Keifer, where she helped launch the Counterpoint Mutual and Counterpoint Select funds. Julie was also a Partner at Jurika & Voyles, Inc., where she led the firm's institutional service and marketing efforts that contributed to asset growth of more than \$5 billion before it was sold in 1997.

Ventura County Recycling Market Development Zone

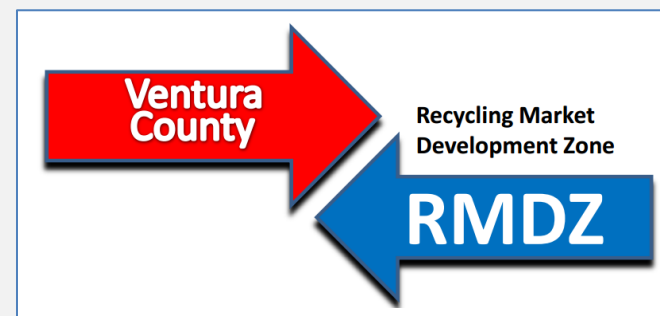
www.vcpublicworks.org/wsd/iwmd/developmentzone/

Formed in 1992 and expanded countywide in 1993, the Ventura County Recycling Market Development Zone (RMDZ) is administered by the Ventura County Integrated Waste Management Division of the Water and Sanitation Department of the Ventura County Public Works Agency.

The entire County of Ventura is a state-designated Recycling Market Development Zone (RMDZ). The zone includes the incorporated cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, Santa Paula, Simi Valley, Thousand Oaks and Ventura, as well as the unincorporated areas of the county.

The County's population exceeds 800,000, and the largest city, Oxnard, has a population of over 200,000. Ventura County features 42 miles of coastline, the Los Padres National Forest, and 1.2 million acres of land, including 15,000 acres of industrially zoned land. The RMDZ overlaps a foreign-trade zone, centered around the county's deepwater port.

Ventura County has a dependable labor supply, uncrowded freeways, a thriving agricultural industry, and an infrastructure geared to handle planned growth. The county is adjacent to Los



Angeles, providing access to large urban markets as well as sources of materials for manufacturing.

The RMDZ improves recycling programs by increasing the value of recyclables. With the California Department of Resources Recycling & Recovery (CalRecycle), the RMDZ assists businesses that make products from recycled material through the following incentives:

- **Low Interest Loans and Other Assistance with Financing** – The RMDZ can finance up to 75% of a project, up to \$2 million per loan. Loan terms are up to 15 years, and the low interest rates are offered through fixed-rate loans. Rates are kept at or below the prime rate.
- **Permit Assistance** – Public agencies assist businesses with local and state permitting and regulatory processes.
- **Location Assistance** – Businesses are guided to over 12,000 acres of industrially zoned property, and other sites, throughout Ventura County.
- **Materials for Manufacturing** – Ventura County recycles over 200,000 tons of solid waste per year. Recyclables are collected through

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curbside, buyback, and drop-off programs and are processed in four main locations.

- **Tax Exemption for Capital Expenditures** – Recycling-based businesses are eligible for a partial exemption from sales taxes on machinery and equipment they purchase. This reduction of the State portion of sales tax can also reduce the cost of special-purpose buildings used for a manufacturing process.
- **Other Benefits** – Benefits include business plan assistance, business incubator and industry cluster networks, promotion, and financing assistance.

Programs outside the scope of the Ventura RMDZ that work in partnership to support the development of end markets for recovered material include:

- **Local Business Assistance Organizations** – Local city economic development officers and the Economic Development Collaborative of Ventura County provide a variety of financial and permitting assistance as well as business consulting services.
- **Ventura County's Workforce Development Division** – Workforce Development offers employers free personnel services, including employee recruitment and screening, on-the-job training, and customized training. Up to

half the salary of eligible employees can be reimbursed to employers during an agreed-upon training period.

- **The California Renewable Energy Loan Guarantee Program** – This program guarantees loans made by financial institutions to eligible businesses for the purpose of purchasing renewable energy systems that will reduce usage of the State's electrical grid. Discounts averaging 17 percent per year are available for interruptible service. Southern California Edison's Economic Development Discount Rates for power in Ventura County's RMDZ averaged 15 percent per year for 5 years.
- **The Port Hueneme Foreign-Trade Zone** – The only deepwater port between San Francisco and Los Angeles provides duty reductions, deferrals, inversions, and other benefits to importers, exporters, and certain product assemblers.

Since 1993, the County of Ventura's RMDZ program has helped local businesses obtain more than \$10 million in low-interest, long-term loans and \$11 million in additional funding. These funds have helped businesses divert approximately 1.2 million tons of material and created or sustained over 1100 jobs in the region.

Featured Ventura RMDZ Loan Recipient - Oxnard Pallet Company

<http://oxnardpalletco.com>

Since 1993, Oxnard Pallet Company has been buying, selling, and trading new, used, and custom pallets in all sizes, as well as offering reliable trucking services throughout California.

Oxnard Pallet Company, a woman-and minority-owned business, has established a reputation for on-time and comprehensive collection and delivery of wooden pallets. Serving mainly agricultural customers, Oxnard Pallet Company provides, collects, and reuses these “platforms of commerce” to hundreds of businesses in Ventura County.

In 2011, Oxnard Pallet Company received a \$145,000 4% interest loan from CalRecycle, through Ventura RMDZ program. Prior to receiving the RMDZ loan, Oxnard Pallet Company was able to handle 6,000 tons of pallets per year. As a result of the loan, they have undertaken an expansion that has resulted in 4,000 additional tons of reuse per year. Most significantly, Oxnard Pallet Company ventured into an area of pallet reuse not served by other local companies, tearing apart and reusing the wood from off-

specification and broken pallets that are often unacceptable for standard reuse methods. Additionally, by purchasing a “baking unit,” Oxnard Pallet Company was able to certify pallets “insect free,” facilitating exports by local companies that needed the pallets to move their products. The company was also able to hire two additional employees as a result of the expansion.

The main challenge with this loan was winning the right to operate in the former headquarters of the Lima Bean Processing Association. Because the land was zoned for agriculture, and therefore much less expensive than industrially zoned land, the case had to be made that their pallet reuse would mainly benefit agricultural companies. Certain unique aspects of the site made it easier to argue the site could not instead be leveled and the land returned to row crops; the site has 16 enormous concrete silos, with concrete walls so thick that it would take many years for the value of farming to equal the cost of demolition.

Learning's from 15 years of Promoting Waste as Feedstock: Q&A with David Goldstein, Ventura RMDZ Administrator

David, given your long history of work within the RMDZ can you share a bit about the variety of companies and materials that have applied for the RMDZ loan program?

Although curbside collections are the most visible recyclables to most residents, commercial and industrial recycling is actually much bigger, and only a small portion of that is hauled by publicly contracted companies or goes to sorting centers. For example, the biggest recyclable by weight is inert material (dirt, concrete, and asphalt), and the biggest source of generation for that is road repair. Those recyclable materials go to many places, including Santa Paula Materials (funded by an RMDZ loan) and State Ready Mix (which received significant permit assistance from the RMDZ).

In some cases, we have been able to keep recyclables completely local. For example, large truckloads of baled cardboard can be delivered directly to a mill in Oxnard, where old boxes are turned into a soup of pulp then rolled into new sheets of “medium,” the layer in the middle of cardboard. That product is shipped to box plants, including a factory in Camarillo. Some of the boxes made locally are even used by the local strawberry industry.

In your experience, what has been the most challenging part of the loan application for companies you assisted?

Companies must qualify for the program based on financial viability and having a project that will develop markets. RMDZ administrators help companies determine financial viability of their plans and can even help some projects become more financially viable by matching manufacturers with suppliers of recycled material, assisting with permits, or even helping promote products (such as through Recyclestore.com).

Recycling industries face many of the same barriers faced by all manufacturers. These barriers to business expansion are also barriers to an RMDZ loan because they sometimes prevent the project from being considered viable. One of those barriers is the lack of a trained workforce. When it comes to manufacturing, lack of a trained workforce can delay solving the problem. National Manufacturing Day activities offer an opportunity to get kids or students interested in studies leading to lucrative careers with the potential to greatly affect the environment.

The RMDZ program seems geared towards companies that already have established business models and need

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funding to scale as opposed to supporting companies in the R&D or pilot phase. Do you think that is a missed opportunity?

- We do fund start-ups! The most successful was Silicon Recycling Service.

Using a \$1.6 million RMDZ loan, Silicon Recycling Services developed from a local scrap recycling center into an internationally renowned provider of recycled silicon. **This loan, in 2001, helped the company turn waste from the solar and computer manufacturing industries into material useful to solar panel manufacturers. Because SRS's process has been so widely imitated, discards resulting from computer and solar industry silicon manufacturing processes are now an international commodity rather than a waste.**

One of SRS's early customers was Shell Solar (formerly Solarworld and Siemens Solar), also in Camarillo. Bob Worthley, formerly Director of Procurement and Logistics for Shell Solar, said, "We used to have to throw away pot scrap and other silicon waste from the operation. **Then Rob Bushman (founder of the company that later became SRS) perfected a process to recycle the waste into material we could use again. Now silicon recycling has grown so much, everyone wants the scrap, from solar manufacturers and from the computer industry, so it isn't even a waste anymore."**

For other states thinking about strengthening or starting up a program to encourage the use of "waste" as feedstock, what advice can you offer?

Start with a focus on manufacturers and consider measures to increase market demand for recycled products.

When you try to picture the cause of most pollution, do you imagine a factory's smoke stack belching smog and a discharge pipe pumping effluent? Do you think of a factory consuming resources and energy for the creation of disposable products destined for eternity in a landfill? This archetype of pollution is the image presented to us in Dr. Seuss' *The Lorax*, and it makes a simplified point for children, but the real story is harder to see.

Just as the repentant manufacturer narrating Dr. Seuss' story had to convince the public "everyone needs a thneed" before he could pollute the air, foul the water, deforest the landscape and drive away all the animals, the origin of pollution is actually market demand. While advertisers may try to sell products based on appeals to exclusivity, youthfulness, convenience, or other attributes, if enough consumers apply environmental principles to their purchases, manufacturers could compete with each other to make their "thneeds" out of organically grown, locally sourced, long-lasting, recycled content materials. If enough people care, more products might be made with environmentally beneficial attributes, even if these products are marketed based on other selling points.

Recycling is the first step in a manufacturing process; it is a method of supplying raw material to industry. Recycling enables corporations to mine the urban waste stream instead of extracting resources from nature. The resources

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provided by recycling are also pre-refined, so manufacturers use less energy and create less pollution when they melt, mulch, pulp, or otherwise transform discards into new products. As an added benefit, using recycled content in manufacturing sustains 3 to 11 times more jobs

than the collection and disposal of recyclable material, according to Pat Lee, Marketing Director of the Fabricators and Manufacturers Association, citing data from the California Department of Resources Recovery and Recycling.

Author: David Goldstein, Zone Administrator, Ventura County Recycling Market Development Zone



David Goldstein manages the Ventura RMDZ and has worked on the program since the California's first market development designation cycle in 1992. David also serves on the California Mattress Recycling Advisory Committee, chairing the Diversion and Market Development subcommittee. Previously, David was the President of the Re-refined Oil Marketing Association and served six years on the board of directors of Habitat for Humanity of Ventura County, starting two ReStores.

Yolo County Recycling Market Development Zone

www2.calrecycle.ca.gov/BizAssistance/RMDZ/Zones/Details/43



The 1,021 square mile Yolo County Recycling Market Development Zone includes all of the incorporated and unincorporated areas of Yolo County, except for the City of West Sacramento and the unincorporated area of Clarksburg. The participating incorporated cities of Yolo County include Davis, Winters, and Woodland.

Yolo RMDZ is situated in the northern portion of the Sacramento Valley. With the presence of UC Davis and farming throughout the county, Yolo County is rich in agriculture and tourism.

The Yolo RMDZ is administered by Wendy Ross, the Economic Development Manager for the City of Woodland and the Yolo RMDZ Coordinator for the four jurisdictions of Davis, Winters, Woodland, and Yolo County.

Target Materials

Local officials and businesses are interested in using innovative technologies to manufacture products from secondary materials such as organics, construction and demolition material, plastics, paper and glass.

Program Provisions

Each jurisdiction in the Yolo RMDZ works closely with each other to support businesses within

their jurisdictions. The Yolo RMDZ coordinator works with all four jurisdictions to market each community for its unique attributes.

Depending on the needs of the business and which jurisdiction it is located in, the following are examples of activities that the Yolo RMDZ program offers assistance with.

- Locating manufacturing materials
- Permitting referral
- Development impact fee deferral
- Siting
- Finding markets for products
- Provision of current market conditions/trends
- Evaluation of technology and equipment.
- Provision of geographical data on demographics, waste streams, and economics.
- Product Marketing via the RecycleStore.

Other Incentives

Yolo County RMDZ is currently located in an area qualifying for PG&E's Economic Development

Enhanced Rate Reduction program for new businesses. Businesses in the incorporated cities or county can apply directly to the cities or county to understand the range of financial and economic incentives and opportunities available. There are also a variety of tax credits and other additional state incentives available for private companies that will be hiring qualified employees.

Transportation & Infrastructure

Yolo County is located approximately 20 miles north of Sacramento along the State’s major

north/south corridor, Interstate 5 and just 9 miles north of the I-80 which connects the Sacramento Valley to San Francisco, just 75 miles to the southwest. The Sacramento International Airport is eight miles to the southeast along I-5.

Commercial and passenger rail and air service are also available for business needs. In addition, there are many industrially zoned sites and business parks available and equipped to handle manufacturing operations.

Featured Yolo RMDZ Loan Recipient - Interview with Billy Cantrell, Project Manager, fil USA

Was there a particular reason Aquafil needed to be located in California?

The most important reason to locate in California or as close as possible to California, was because we were sourcing most of our material from the state and we also wanted to maximize the incentives we receive. Although most of the country will be comparable in pricing regardless of where you purchase N6 from, the deal breaker can be the freight to get it to you.

For our first location, we chose to locate in Phoenix, Arizona due to relationships with a collector in the area. It was still close enough to Los Angeles and the surrounding areas that the freight costs were reasonable. For our second



location focused on servicing Northern California, we chose Woodland.

Can you share any differences in setting up in California versus Arizona? Pros and Cons?

As to the Cost of Location, Phoenix was much more expensive. One key factor driving that was the level of skill sets in the contractors’ pool. In order to hire contractors of the skill set we needed, we had to hire from union groups in Phoenix. We aren’t opposed to union groups. Working with them just creates another pass-on expense of union costs. But there were not

enough private contractors in Phoenix to handle the type of work we needed.

In Woodland, there were more labor options to choose from. And in regards to the pre-conceived notions we had of high costs for setting up and operating in California that were informed by some of our peer relationships, we've actually experienced it quite differently.

In your relationship with the City of Woodland and the YOLO RMDZ, what really stood out?

With the City of Woodland, there was genuine interest in supporting us from the beginning. They really made us feel wanted and not just from one department or one person, but from the entire Woodland team.

Specifically, with companies like ours needing as much power as we need, you never can find a building with the correct amount of energy or the proper distribution. This is never a show stopper, but it can be difficult to find the right solution. The City of Woodland helped us overcome this challenge by bringing the power company (PG&E) in to be part of the initial project team. Even now, the City of Woodland continues to help us proactively manage the goals and timelines that the power company had agreed to.

As a project manager, I found less support from the City of Phoenix with regards to helping us with our energy needs. In Phoenix, we met with the City and then separately with the power company.

What would you say to cities that may want to attract businesses such as Aquafil to locate in their region? Are there particular steps they can take and information they can provide to facilitate the process?

When looking at locations, all the factors mentioned before are important- labor pool, power supply, local support, and location. Where the City of Woodland stood out is the amount of time they invested in us and their continued support even after we chose Woodland as our location.

Even today, eight months after the construction of the plant, the City of Woodland is still deeply involved in making sure timelines are moving and being achieved. **Too many cities work really hard to attract companies with promises, but once you commit as a company, they disappear after signing the contract.**

I believe Woodland prides themselves on fulfilling their commitments. They are a prime example of what all cities should aim for. They feel like part of our team and have genuine interest in our success. Every City should have a Wendy!!

Aquafil is also very focused on Net Zero Waste within your recycling process. Can you share a bit more about this?

Aquafil has to be focused on Net Zero waste. Within the raw material we purchase, which is post-consumer carpet, we are really only interested in one component, the face fiber.

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However, we cannot be so eager to obtain this material without considering the other byproducts. These byproducts can be expensive to dispose of and the added cost could easily be a deal breaker.

Plus, truly responsible companies look at all of their waste streams to prevent improper disposal to landfills. Aquafil believes that it is our responsibility to maximize material use from our raw material. Therefore, we look for partners that have a need for our “waste” materials to both maximize savings for us as well as prevent any items from going to landfill.

About Aquafil

www.aquafil.com

Since 1969, Aquafil has been one of the leading players, both in Italy and globally, in the production of polyamide 6: a landmark in terms of quality and product innovation. Our two product areas are yarn for carpet and yarn for textiles. Additionally, the Aquafil Group is a leader in the research of new production models for sustainable development. The Group has a presence in eight countries on three continents with 16 plants employing more than 2,700 people in Italy, Slovenia, Croatia, Germany, the United Kingdom, the United States, Thailand, and China.

Author: Billy Cantrell, Project Manager, Aquafil USA

Billy is the Project Manager for Aquafil USA. He has worked in the Carpet industry for 35 years, with the last 10 years in recycling. His focus the last 6 years has been on developing processes to take post-consumer carpet back into a product suitable for reproducing yarn and engineered plastics.

For other manufacturers that may have zero waste goals, how should they approach this?

Zero Waste Manufacturing needs to be engrained from plant inception, not as an afterthought! It starts with upper management philosophies and direction. If the senior management is bought into the Zero Waste, then it naturally becomes important to all employees. When the owner buys in we are all in.

Attracting Manufacturers to Your City: Q&A with Wendy Ross, Economic Development Manager, City of Woodland and Yolo RMDZ Coordinator

How did Aquafil choose to locate in Woodland?

There were several steps that lead to Aquafil selecting Woodland as the site for their Northern California facility.

First, in the Spring of 2018, I had been approached by CalRecycle regarding the Carpet Recycling Program (CARE). CalRecycle contacted me, as the Yolo RMDZ coordinator, in my capacity to market the zone to Aquafil and provide letters of support to Assembly members advocating for the bill that would re-fund the CARE program. The connection between the CARE program and Aquafil was that Aquafil was interested in applying for grant funding through the CARE program.

I connected with Aquafil to understand their needs and potential interest in locating their manufacturing facility in the Yolo RMDZ. At the time, I was unfamiliar with the company and didn't know anything about their Econyl thread. Upon doing some research, I realized that Aquafil's expansion was a great fit for the RMDZ program as well as presented an opportunity to further Woodland's economic development goals to diversify outside of agriculture.

Around the same time, CalBIS/Go-Biz and the Greater Sacramento Economic Council (GSEC) contacted me with a confidential lead termed Project "Clean". Reviewing the

information, it was obvious that they were also focusing on Aquafil. At this point, I again reached out to Aquafil and followed up with the GSEC process. As part of this process, the City wrote a letter suggesting some possible sites that might work. We understood that they had been focused on West Sacramento and Sacramento County as they needed to be close to the carpet feedstock supply from the Northern California and Nevada regions. We asked them to include Woodland as an option.

Following our invitation, Franco Rossi, President of Aquafil USA and his team came and met with our development review team. The development review team included PG&E, utility engineering, development services engineering, building and plan check, planning, and the City Manager. **We had gathered all these stakeholders together to present a unified approach in expressing our interest in having Aquafil locate in Woodland, Ca. I believe this was a key aspect in demonstrating our commitment to Aquafil and building trust in this early stage.**

Following the initial in-person meeting, the development review team (including myself) worked with Franco and eventually Billy Cantrell, the plant manager, to provide the permitting and logistical information needed to properly assess if Woodland was the right location for them.

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My team and I also worked with the state and PG&E (our local energy provider) to find incentives that Aquafil might be eligible for. This included the five year discount program whereby PG&E offers a 12% discount off the price of power to new businesses as part of their economic development incentive program. We also helped Aquafil secure the \$500,000 CARE carpet stewardship grant funds by writing letters of support outlining the potential economic development benefit to the City of Woodland.

What were the challenges that you had to overcome with the siting process?

Access to power was one of the largest challenges.

During the site visit, Franco had expressed concern that there would not be enough power to begin even Phase 1 of their operation. I facilitated a meeting that brought the PG&E and Aquafil USA management teams into one room to discuss power needs. As a result of these discussions, eventually PG&E provided a letter of commitment for Phase 1, with a timeframe of May 2018. PG&E also committed to work with Aquafil to increase their power supply for Phase 2 of the Aquafil operation by an agreed upon date in the future.

However, when Aquafil was set to begin operation of Phase 1 there were challenges with gaining access to power. This was during the time of the horrible fires that were devastating the towns of Paradise and Magali, just 45 miles north of us. PG&E had pulled all staff from local projects to report to these fires. Thus, part of my role was to

facilitate contact with senior management at PG&E to ensure that the power commitments were advancing. They were responsive and Aquafil did gain sufficient power for Phase 1 of their project.

How do you see the Aquafil and Woodland relationship going forward as you continue into Phase 2 of development?

Power is still our focus. Moving forward, we have requested a meeting with PG&E for later in April to begin the process to ensure sufficient power for Phase 2. Phase 2 is scheduled to be in operation by 4Q2019/1Q2020. The PG&E staff has begun to survey the transmission line in the area and on site. From the City perspective, we will put a timeline together with PG&E to ensure on time delivery for Aquafil's power needs.

In addition, we continue to have conversations about ways in which we can assist in reducing power expenses for Aquafil and other business users in the region. One possibility could be to share a substation with the property to the north (660 No. Pioneer Avenue.) The site is currently vacant and was a warehouse in the past. If a heavy power user does eventually occupy that space, constructing a substation could be a very viable option.

In closing, what do you think are important aspects for cities and municipalities to think about when supporting the development of a large scale manufacturing facility?

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When it came to Aquafil, we could have taken a more laissez faire approach and waited to see if the other sites in the region fell through. However, given that Aquafil is a progressive and clean (close to zero waste) manufacturing operation that helps contribute to our city's goal of landfill diversion as well as generates over 50 local jobs, it made sense for us to proactively attract this business.

Working with a business like Aquafil is easy. Once you know what they are looking for and asking from you as a local community, it was up to us from across city departments to work collectively to provide them with the support they needed.

From a broader perspective, developing the proper citywide infrastructure to support the needs of potential businesses is key in creating the right environment for them to locate.

For many years, Woodland was known as “warehouse central.” The city was only able to build large warehouses with little infrastructure. The buildings were standard tilt-ups with clear heights ranging from 24-32 feet. Proportionally, there was a small amount of manufacturers as

the city did not have the water, sewer capacity or storm drainage facilities to serve industry. This was due to the fact that a significant portion of our industrial area had been in the 100 year flood plain.

Thus, the city has been proactively working with the Army Corps of Engineers and State Department of Water Resources to come up with a flood solution. In 2015, we also developed a state of the art waste water pollution control facility that can sufficiently handle wet industry. This facility includes a treated surface water and intake facility on the Sacramento River.

We have also been working with the CA Department of Public Health on a reclaimed water system. This system can offer water to users at a significant reduction in price from treated potable surface water. The water is being used in the city's landscaping and by one major business who is a “super user” of water, significantly reducing their water expenses. With this system, the city has ample water to serve its current businesses and residents and is prepared to welcome many more!

Author: Wendy Ross, Economic Development Manager, City of Woodland and Yolo RMDZ Coordinator



Wendy Ross has been working in the City of Woodland in economic development since 2000. She has been the Yolo RMDZ Coordinator since the Zone was established in 2013. Wendy works closely with both business prospects and city development teams to ensure a seamless process for setting up a business from A-Z.

The California Association of Recycling Market Development Zones



The California Association of Recycling Market Development Zones (CA RMDZ) was created in 2001 to represent the 40 RMDZ local and regional government districts throughout California that have specialized expertise for creating and expanding strong markets for recycled and organic materials. The zones are located in every part of this state of nearly 40 million people, including rural and urban areas in northern, central, and southern California. Working in partnership with CalRecycle and innovative entrepreneurs, the CA RMDZ program addresses critical waste reduction and climate action policy goals, and also helps to grow a more truly sustainable economy in California.

The Association is particularly focused on transforming the traditional waste management infrastructure to a new materials management paradigm, where specialized facilities will transfer separated organics and other recycled materials into compost and other valuable products. While efforts to date have been quite successful at diverting these materials from landfills, the real challenge ahead is to convert these materials into closed loop products, including finished compost for agriculture, and specialized materials such as carpet and textiles, to name just a few examples.

Author: Steve Lautze, founding President of the CA Association of Recycling Market Development Zones



Steve Lautze has 40 years of experience in the recycling and economic development fields, including operations, consulting, and policy development. Steve recently concluded 16 years as President of the California Assn. of Recycling Market Development Zones, and has worked for 20 years in the City of Oakland, Ca. to develop sustainable economic development practices as the Green/Industrial Specialist in that city's Business Development Team. Steve is also a co-founder of the Recycling Build Infrastructure Now Coalition, and a past President of the Northern California Recycling Association.

The Recycling Build Infrastructure Now Coalition

www.greenteamsanjoaquin.com/bin-summit-2018.aspx

The objective of the Recycling Build Infrastructure Now Coalition (aka the Recycling BIN Coalition) is to promote and advocate for the maximum *conversion* of recycled materials collected throughout California into value-added products. Such conversion of recycled materials creates quality new jobs for Californians while helping the state to reduce generation of greenhouse gases (GHG). The guiding question for the Coalition's activities is "What is to be done in the legislative, regulatory, financial, and technical arenas to

make recycling market development the standard way of doing business in California?" The Recycling BIN Coalition was founded in 2011 by the Greater Stockton Chamber of Commerce, the California Association of Recycling Market Development Zones (CARMDZ), the California Product Stewardship Council (CPSC), and the California Association for Local Economic Development (CALED). Currently, the BIN Coalition has grown to over 25 diverse partners.

Author: Steve Lautze, founding President of the CA Association of Recycling Market Development Zones



Steve Lautze has 40 years of experience in the recycling and economic development fields, including operations, consulting, and policy development. Steve recently concluded 16 years as President of the California Assn. of Recycling Market Development Zones, and has worked for 20 years in the City of Oakland, Ca. to develop sustainable economic development practices as the Green/Industrial Specialist in that city's Business Development Team. Steve is also a co-founder of the Recycling Build Infrastructure Now Coalition, and a past President of the Northern California Recycling Association.

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- Nextcycle
- *Creating Nextcycle*: Q&A with Eric Heyboer, Colorado Recycling Grant Program Administrator

NextCycle

www.colorado.gov/pacific/cdphe/nextcycle

The Recycling Resources Economic Opportunity (RREO) Program, created in 2007, provides funding that promotes economic development through the management of materials that would otherwise be landfilled. This program is housed within the Colorado Department of Public Health and Environment (CDPHE). Funds are available to support recycling, composting, anaerobic digestion, source reduction, and beneficial use/reuse. Currently, the RREO program is the only source of funding available at the state level to support infrastructure and end-market development in the materials management sector.

For many years, the RREO Program has focused on awarding grants for infrastructure development since the demand for new infrastructure to support materials management has historically been strong in Colorado. As funding allowed, a special grant offering would be advertised focused specifically on end-market development, but not on a consistent basis. **In light of China's Green Fence initiative in 2013, followed by their much stricter National Sword policy implemented in 2017, it became apparent**



that the RREO Program needed to pivot and focus more resources on spurring the development of domestic end-markets.

Additionally, Colorado adopted new waste diversion goals in 2017. These goals aim to more than double the state's current recycling rate to 45 percent by 2036. Colorado's geography and changes in international end-markets pose significant challenges to meet that goal. Colorado will need strong regional infrastructure and robust end-markets to form a more sustainable domestic recycling economy within the region.

To better leverage the RREO Program's resources to help Colorado respond to changing market conditions, and better position Colorado to meet its ambitious waste diversion goals, the Colorado NextCycle program was developed. Launched in 2018, Colorado NextCycle assists cross-sector teams in preparing their business concepts. Colorado NextCycle is first and foremost a program offering technical assistance, helping project teams to either consider a business in Colorado or to ensure they are successful in expanding their business in Colorado. **Colorado NextCycle was purposefully designed not to**

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replicate the work and resources available through Colorado's Office of Economic Development and International Trade, but instead provide expertise on how to develop a business specifically within the materials management sector as it exists in Colorado. Business concepts included the development of end-markets for recovered commodities and/or organic materials, as well as secondary processing of recovered commodities and/or organic materials.

A variety of incentives are available through Colorado NextCycle:

- **Technical Advisory Committee:** This volunteer committee is composed of subject matter experts covering materials processing, infrastructure, manufacturing, finance, risk assessment, partnerships, market development and more. Each committee member is available to assist project teams in their area of expertise.
- **Access to Jump-Kit:** The jump-kit contains basic material recovery information in Colorado.
- **Financial Support:** Each team selected to participate in NextCycle receives a modest \$5,000 grant to assist with research and development of their idea and business plan. Funds are intended to help cover the cost of travel, hiring third party experts, product testing, and other expenses related to developing a business plan.
- **Access to Data Room:** Teams selected to participate will gain access to the data room,

an information resource containing local and regional population and waste data, supply chain modeling, commodity market pricing, regulatory and policy information, and more.

- **Hyper Accelerator:** All teams were invited to a two day hyper accelerator where they were invited to give their business pitch, receive feedback to refine it, make connections with other project teams, and allow for opportunities for one-on-one discussions pertaining to state regulations and Colorado's market conditions.
- **Recycle Colorado Summit for Recycling:** Each June, Recycle Colorado organizes their annual conference that typically hosts over 300 people from across the Rocky Mountain region. Each project team will be invited to give their business pitch during a session at the Summit, allowing them to make connections with potential investors and business partners.

Considering that this is the first year of this program, the eligibility guidelines were intentionally broad. An eligible project could improve on an existing end-market or create a new one. The term "end-markets" was defined loosely. For Colorado NextCycle, the term applies to projects, businesses, or other entities that turn recovered materials into marketable products, including manufacturing, secondary processing, and re-use.

"Recovered materials" were defined as materials that have reached the end of their current use and includes plastics, metals, fibers, organics including food scraps, construction and

demolition debris. No maximum or minimum project size was defined, and no preferred geographic distribution of projects within Colorado was recommended.

NextCycle teams can include for-profit, nonprofit, university, governmental, or other members. A project team could consist of an individual person, a single company, or may include any number of cross-sector entities. Teams were

encouraged to include regional partners. Notably, out-of-state teams were eligible, but to be eligible the project must directly address end-markets in the State of Colorado. The company must have a sincere interest in potentially expanding into Colorado.

Refer to Chart 1. for a list of participating NextCycle businesses.

Building a Start-up Incubator: Q&A with Eric Heyboer, Colorado Recycling Grant Program Administrator

How did you get the right stakeholder buy-in and funding to create NextCycle?

For a program like NextCycle, collecting data on the economic impact of Colorado's recycling industry, and the value of materials that are currently being landfilled, was the first step in gaining momentum. **When people realize the inherent value of the materials management sector, suddenly recycling and composting are no longer solely an altruistic concept, but one that has tangible economic benefits. This captures the attention of an entirely different audience.**

There was also a desire by the RREO Program's advisory board not to do a study on end-market development. There was very clear direction provided that an end-market development program was needed that would lead to tangible results, as opposed to spending time and resources on a study that would sit on a shelf.

Once we had the data we needed, we were able to use that data to inform the development of a new program that tackles end-market development head-on.

What were the challenges/objections you ran into? How did you counter them?

Many of the models we looked to from other states had much larger budgets than anything Colorado could afford, but we knew we wanted to follow a similar path that was different from a traditional grant offering. **While we couldn't promise million-dollar awards to the best projects, we knew from experience that there was significant value in offering technical assistance to help nurture an idea that has the potential to establish an end-market.** This is where we decided to focus our resources, to help vet these project ideas and position them to be successful

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in securing future funding, from grants or otherwise.

The total budget for the NextCycle program in year one was less than \$200K, yet we were still able to design the program from the ground up, do a fair amount of marketing, bring on nine project teams, and leverage the expertise of our hired consulting firm and volunteer technical advisory committee to provide the technical assistance that CDPHE is not equipped to provide alone.

How did you successfully communicate the program to businesses located in Colorado and outside the region?

Be innovative in your marketing. For example, we found that the traditional approach of buying ads in e-newsletters was both expensive and ineffective, based on open-rates. Taking advantage of professional networks and word-of-mouth seemed to have more bang-for-the-buck. Highlighting the program at conferences and participating in webinars also drums up interest.

Equally important, marketing needs to be consistent. It's easy to have a big blitz when there is something big to announce, like when the project teams are selected, but then lose a little steam as we focus on other tasks. It's important to keep interest in the program by highlighting how projects are advancing.

One of the benefits of having project teams participate in Colorado NextCycle is the recognition they get from a state-level agency. As a state agency, we have a robust network of

media contacts. When we announce a slate of cutting-edge new businesses that were competitively selected to participate in a business development program, it lends credibility to each of the project ideas. Based on our experience, this has helped attract considerable interest. It's great visibility for the project teams, so don't discount its value. Encouraging project teams to actively seek out interviews to talk about their project as they continue to progress has helped stretch our marketing dollars and keep NextCycle fresh and exciting.

What are the key priorities you focused on for your inaugural launch?

Loop in your state's office of economic development early and often. We were very deliberate in making sure we didn't replace the services and resources they offer, but instead complement them by offering technical expertise specific to the materials management sector. There was a learning curve on our end since we weren't entirely familiar with the full suite of resources available through their office – or even who the right contact was. It's important to ensure that the technical assistance being provided is effective, looping in the office of economic development at the right time to avoid any redundancies.

A critical piece to any marketing plan is engaging the right audience. To be effective, you have to make the connection that the recycling industry is a relevant source of feedstock for all types of manufacturing activities. It's all too easy to

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default to our established networks in the materials management world when developing a marketing strategy. **Reaching out to sectors that don't regularly overlap with the recycling industry and catching their interest, is key to attracting innovative and solutions-based end-market project ideas. This has been more challenging than we anticipated.**

Don't underestimate the value of a technical advisory committee or equivalent. Having a diverse group of experts outside our agency and separate from the consulting firm we hired helped ensure a healthy stakeholder

conversation, especially in the early days of the program as it continued to take shape. Having the committee help select the project teams for inclusion was also valuable, since it invited an impartial perspective. To be successful, it's important to get the right people involved and to be comfortable that committee members may come and go. Don't be afraid to bring on new experts if you anticipate a specific need from one or more of your project teams. Also, have a Plan B contact in your back pocket (or even Plan C contact) if a committee member must bow out due to other time commitments.

Author: Eric Heyboer, Recycling Grant Program Administrator, State of Colorado



Eric has worked for the Colorado Department of Public Health and Environment for eight years as administrator of the Recycling Resources Economic Opportunity Grant Program. Prior to that, he was involved in the development and implementation of Boulder County's zero waste program for County offices, as well as having directed operations of the County's household hazardous waste facility. He has also served two terms on the Recycle Colorado Board of Directors.

Chart 1: The 2019 NextCycle Teams

TEAM	LOCATION	FEEDSTOCK	NEED / AIM
9Fiber	Looking to build a facility in Pueblo	Hemp / cannabis waste, source from 240 miles	Build a facility to transform waste into fibers that can be reused in manufacturing process in 9 industries.
Direct Polymers	Existing facility in Commerce City	Scrap plastic	Add wash and pelletizing lines to existing facility to be able to accept contaminated scrap plastic.
Ekomats	Unknown. Based out of the Netherlands looking for second North American site	Plastic films, aggregate glass	Existing company looking to expand in N. America. Transform plastic wastes into mats used in trails & construction.
Natural Building Innovations	Gunnison	Standing dead trees	Small company looking to expand existing process. Recover dead standing trees and turn them into usable local lumber.
Renewology	Looking to site a facility in CO. Existing facilities in Nova Scotia and Utah	Mixed plastics, film plastics	Conduct a feasibility study for a new facility for converting plastic waste from material recovery facilities and municipal drop-off locations into fuel products and feedstocks.
Recycle PV Solar	Unknown. Looking to site facility in CO.	Solar panels	Industry group looking to collect, refurbish, and resell damaged solar panels in CO.
San Juan Organics	Looking to start a facility & collection in Durango	Food waste	Private-public partnership started to develop a facility to turn food waste into custom blended soils.
Spring Back Colorado	Facility located in Commerce City	Mattress springs/coils	Non-profit recycles mattresses and box springs, looking to invest in equipment and processes to expand recycled materials scrap.
Vartega	Existing facility in Golden	Carbon fiber, thermoplastic waste	Early stage carbon fiber recycler wants to expand to recycle thermoplastic into

composite materials for advanced manufacturing.

KENT COUNTY, MICHIGAN

- Sustainable Business Park, Department Of Public Works
- Positioning Materials Management As A Source Of Economic Opportunity: Q&A With Kristen Wieland, Communications & Marketing Manager, Kent County Department Of Public Works



The Sustainable Business Park, Kent County Department of Public Works

www.reimaginetrash.org

The Kent County Department of Public Works (DPW) has the opportunity to put West Michigan on the map as a national leader in recycling and waste reduction while helping protect our air, land, and Great Lakes. Each year, Kent County DPW processes over 1 billion pounds of trash, of which more than 75% could be reused, recycled, or repurposed. The Kent County DPW has set a bold goal to divert 90% of trash from local landfills, including the county-owned landfill, by 2030.

The Sustainable Business Park is a key part of achieving this goal. Building a Sustainable Business Park in Kent County will help the local community cut down on trash buried in landfills and attract investment and jobs from companies that convert waste into usable products. The Park will take waste materials that would otherwise be dumped into a landfill and reuse or recycle those materials into products including

compost for agriculture, fuel pellets, plastic pellets for new plastic products, biofuels and textiles. A variety of complementary businesses, entrepreneurs, and startups that need access to raw materials could tap into these reclaimed or converted materials, incorporating them into their production processes or transforming them into entirely new products.

The Park has tremendous potential for preserving open space, establishing a center for innovation, and both producing and using renewable energy to power operations, which will help save money on electricity costs and further protect our air and Great Lakes.

The current goal is to bring together national and local experts to engage in a plan for the 200-acre Sustainable Business Park to make West Michigan a national leader in circular economy thinking. The plan will look at the necessary improvements, costs, funding sources, and

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proposed implementation schedule. As part of the plan the DPW is actively working with the business community to attract potential tenants and complementary technologies.

Companies could begin locating at the Sustainable Business Park as early as 2023. The Sustainable Business Park will be located just south of Grand Rapids on 250 acres directly adjacent to Kent County's landfill in collaboration with Allegan County.

The Kent County Department of Public Works has partnered with The Right Place (rightplace.org), West Michigan's leading economic development organization, to identify and select businesses that have, or will create, technologies, intellectual properties and practices to upcycle materials currently heading for a landfill. Partnerships are currently being sought in the following areas:

- Agriculture
- Education and Research

- Energy and Waste Conversion
- Compost

Kent County is home to almost 700,000 people and the second largest city in Michigan, Grand Rapids. Located between Chicago and Detroit, it leads Michigan's economic growth as home for such corporate titans as Steelcase, Herman Miller, Meijer and Amway.

For further information, please contact:

Tim Mroz, Vice President, Strategic Initiatives, The Right Place

mrozt@rightplace.org

Dar Baas, Director, Department of Public Works, Kent County

Darwin.Baas@kentcountymi.gov

Positioning Materials Management as a Source of Economic Opportunity: Q&A with Kristen Wieland, Communications & Marketing Manager, Kent County Department of Public Works

What was the impetus for Kent County's 90% diversion by 2030 goals?

In 2015, Kent County disposed of 1.8 million cubic yards of trash, a staggering volume that would fill the University of Michigan's Big House football stadium twice over. This sobering one-year statistic, when combined with the findings of

the West Michigan Sustainable Business Forum's Economic Impact Potential and Characterization study (wmsbf.org) released in 2016 that affirmed 75% of what we call 'trash' can readily be diverted, was a sure call to action.

As we looked ahead to envision what Kent County and what the West Michigan region will look like

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in the year 2030, the DPW found itself asking questions about demographics, population growth, economic development, jobs, logistics, best practices, environmental protection, continuous improvement, reuse, recycling, trash, landfill capacity and land use. As the agency charged with overseeing proper management of the solid waste generated in Kent County, DPW leadership determined that NOW is the time for a paradigm shift. **We can no longer perpetuate landfilling discards as the solution in Kent County. Placing valuable material in a landfill and using hundreds of acres of land for this ‘one and done’ purpose is not acceptable. Rather, we need to implement a sustainable materials management strategy where our discards, or “by products”, are not seen as ‘waste’. We need to collectively recover the nutrient value of organics and the commodity value of metal, plastics, glass and fiber; take advantage of opportunities to reuse materials that have intrinsic value; and utilize the energy and fuel value of remaining discards so that landfilling becomes very secondary in this process.** Those of us in the waste industry must become more efficient and productive in the management of the materials on our side of the equation.

How did you and your team create a strategy for achieving these goals?

After significant discussion to ensure alignment with our internal stakeholders (primarily staff and the Board of Public Works), DPW Director Darwin Baas put a stake in the ground to give us all a concrete stretch goal: based on what we know anecdotally from the last 40 years of leading

progressive solid waste management planning and concretely from the 2015 waste characterization, our mission became to rally our community to reduce waste destined for landfill by 20% by 2020 and 90% by 2030.

How we were going to do that and who was going to come along side us to make it happen wasn’t clear at that time. Knowing that DPW had influence over the infrastructure for waste processing as well as that we had support within DPW and influential members of the community gave us the confidence to move forward with development of a Master Plan. The goal of the master planning process was to identify how existing infrastructure could be maximized to support the development of a Sustainable Business Park and what types of technologies were available to help us supplement existing infrastructure to replace landfilling as the primary disposal outlet for waste in the region.

Following a series of presentations to community groups in 2017 to test the concept of a Sustainable Business Park idea publicly, it became clear fairly quickly that there was not only widespread support and excitement for the Park but also a variety of opportunities for economic development that could bring new dimensions of the benefits this would bring to the community.

What’s your timeline?

The Kent County Board of Public Works approved the Master Plan in October 2018 and authorized the DPW director to form a business and economic development team to advance

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proposals for development of the Sustainable Business Park. The initial development timeframe is 36 months; in the event the Park development does not progress to meet diversion and municipal solid waste disposal capacity needs, the DPW will reevaluate the need to develop all or part of the property into landfill.

How did you get other departments such as the Economic Development Department on board? What were the main obstacles?

Human nature calls us to hide waste - to make it go away. Bringing awareness to the realities of the problem was critically important. Comparing the amount of trash being landfilled to something tangible, like the U of M football stadium, made people think differently about what they were putting in the trash. Individually we know how much we throw away, but showing it collectively becomes a more impactful story.

Illuminating the economic value of the material being discarded – putting a dollar value on all the cardboard, plastic, metal, textiles, organic material that was being discarded – brought a whole new level of urgency, and different stakeholders came to the table. Ultimately the partners who have been and continue to be at the table with us over the last few years see the value that reducing waste going to landfill brings. Some see it for its economic development value, some see it for its environmental value, others just know that it's the right thing to do and want to be part of the solution.

In working to obtain buy-in from different stakeholders for the creation of the Sustainable Business Park, can you explain your process thus far?

We've been engaging potential sources of waste inputs, waste processors and users of potential feedstocks of the Park continuously since beginning the master planning process. Any respondent to the Request for Information during the master planning process will be contacted by The Right Place, our economic development organization, for follow-up to diver deeper into their technology or proposed process.

In addition, we already have strong relationships with regional manufacturers and local and national waste experts and continue to loop back to them. We have had no problem finding folks in the private sector, higher education and nonprofit world who find synergy with what we're trying to accomplish – everyone is finding their niche in this massive project because it truly does affect the entire community.

How you are approaching the development of the park? What stages will this involve?

We anticipate the first phase of the park development will include organics processing (likely compost) and a construction & demolition processing facility. One aspect of this project that we focused on during the master plan was making sure we were clear that the Sustainable Business Park is just one critical piece of a three-

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part solution to achieve our goals of 90% reduction in landfilled waste by 2030.

The other two pieces already exist and our community has already invested in them: Kent County's Waste to Energy Facility (opened in 1990) has already saved nearly 15 years of landfill capacity by preventing 5.3 million tons of MSW from entering area landfills, recycling 133,000 tons of scrap steel, and providing baseload energy to power 11,000 homes; and Kent County's Recycling & Education Center has been the primary processor for single stream recyclables in the region, processing over 400,000 tons of recyclables since first opening in 1991.

We continue to make upgrades and equipment modifications at both these facilities to supplement the landfill diversion potential at the Sustainable Business Park.

Are there some things you wish you had done differently? Were there challenges you didn't expect?

We continue to walk cautiously down this path because we know that Sustainable Business Parks are a new concept and paradigm shift doesn't happen quickly. The impacts to the community from this type of development could be incredibly positive but we are cognizant that changes external to the Park will get pushback and we'll need to continue to engage stakeholders on methods of waste collection, the disposal cost at a Sustainable Business Park, the long-term benefits (some of which won't be seen for generations to come) and the trade-offs that

we'll need to consider. We wish that we had started this process five years earlier to give us a little more time to gather data, plan, research and otherwise prepare the community for this shift.

Can you share more about the budget and funding partners for the park?

We're working on funding now. DPW anticipates and is prepared to invest in the infrastructure to get the site ready for tenants. The property is currently undeveloped with no water, sewer, electric, gas or improved roads so we expect our investment role to be early in the development to pave the way for private investment in building and equipment needs. DPW expects to enter into long-term leases for the property. Costs and potential funding sources are under development now as well.

From our Master Plan we expect site infrastructure costs to be between \$9 and \$12.4 million. As far as community benefit, the Master Plan reported that the Sustainable Business Park could bring \$130 million in local economic impact if a processing and waste sorting component was implemented; 150 jobs created by processing and waste sorting alone; and \$500 million in anticipated direct private-sector capital investment as a result of the Park development.

What would you say to other cities that are looking to create similar programs?

Listen closely to what your community is asking for and gauge whether they're ripe for this type of shift. West Michigan is known for innovation and collaboration. It is home to corporate giants like

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Steelcase, Herman Miller, Meijer and Amway and those companies are seeking solutions to help them meet their corporate sustainability goals. We also have residents who expect progressive services to help them manage their waste.

Consider whether you have the resources accessible to you (internal and external) and the political will to be the conduit to help businesses

achieve their sustainability goals, residents reduce their environmental footprint and ensure legacy sustainable materials management practices are in place.

Take your time to vet the idea of changing status quo, be prepared for skepticism and be willing to have difficult conversations to build trust and transparency.

Author: Kristen Wieland, Communications & Marketing Manager, Kent County Department of Public Works



Kristen is responsible for outreach and community engagement for the Kent County Department of Public Works in Grand Rapids, Michigan. She is responsible for marketing activities as it relates to the departments' bold goal to reduce landfilled waste by 20% by 2020 and 90% by 2030. In her role, Kristen worked closely with internal and external stakeholders to oversee the county's Sustainable Business Park Master Plan development process.

CITY OF PHOENIX, ARIZONA

- Reimagine Phoenix Initiative
 - Case Study: Finding Local Solutions For Plastics 3-7
- Resource Innovation Solutions Network

Reimagine Phoenix Initiative

www.phoenix.gov/publicworks/reimagine

Introduction

In 2013, City Council announced a new citywide sustainability initiative, Reimagine Phoenix, to divert 40 percent of waste from the city landfill by 2020 and to better manage its solid waste resources. In April 2016, this goal was expanded to achieve Zero Waste by 2050.

To reach these diversion goals, the City of Phoenix Public Works Department is focused on improving solid waste programs, forming private and public-sector partnerships, and expanding community and educational outreach to both residents and businesses.

In addition, the City of Phoenix Public Works and Community and Economic Development departments have been collaborating to create public-private partnerships to build the City's Circular Economy. **These two departments have created a unique project manager position whereby an individual with an economic development background and skillset is housed in Public Works to learn about Public Works programs and operations.** This individual is expected to contribute to helping the City find



opportunities to redirect materials back into the economy instead of sending them to the landfill.

RFPs to Support End Market Development

In an effort to generate market demand for recovered materials, starting in 2015, the City issued a number of Reimagine Phoenix Request for Proposals (RFPs).

These RFPs included the Reimagine Phoenix Call for Innovators (CFI). The CFI requested information that would allow the City to identify best uses for materials deposited by Phoenix residents in their trash and recycle bins, and to understand the business opportunities that would create local economic activity from those materials.

The City also issued two separate Transforming Trash into Resources RFPs to identify new partners to help the City reach its diversion goals. These two RFPs resulted in five contracts to divert feedstock from landfill including: Carpeting and Carpet Foam, Mattresses, Food Waste (from key municipal facilities), Urban Wood, and Latex Paint.

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Most recently, in 2018, the City issued the Curbside Textile Diversion Program RFP aimed at diverting textiles from the City's solid waste stream.

The Resource Innovation Campus

The City is also using the RFP process to develop the Resource Innovation Campus (RIC), a Circular Economy test bed and hub for entrepreneurship and innovation around waste. **The RIC is home to one of the City's two transfer stations as well as a composting facility. Approximately 50 acres of the RIC will be leased to innovators with market-ready technologies and manufacturing processes that reuse or repurpose the City's resource streams.**

The RIC is designed as a home for valuable public-private partnerships. The RIC features land leases at attractive rates, infrastructure support and access to City feedstock. It will function as a gathering place where great minds collaborate to find solutions that can increase diversion and where waste-to-product projects and ideas can be nurtured and developed.

RIC RFP's include the Palm Fronds Diversion RFP issued in 2016. This RFP sought solutions for the diversion of palm fronds through a process that transforms the palm fronds into new products or reuses the palm fronds for a new purpose.

In the summer of 2018, the City also issued the Plastics #3-#7 Diversion RFP. This RFP sought one or more entities to redirect those materials for waste-to-product or waste-to-liquid fuel technologies.

Support for Circular Economy Businesses

The City of Phoenix Community and Economic Development Department also work to promote a business-friendly environment and offers a number of programs for companies looking to expand or locate to the City. Circular Economy oriented firms expanding or locating within Phoenix, AZ are supported by state level incentives, City workforce assistance and job training funds, and start-up resources and innovative programs to streamline and expedite the review and permitting process for new businesses.

Phoenix has much to offer circular innovators including access to leading sustainability and circular economy experts through the Resource Innovation Solutions Network (RISN) and the Ellen MacArthur Foundation (EMF), important research from nearby Arizona State University, as well as city programs to support solutions to specific waste and other resource management challenges.

As of early 2019, Phoenix's waste diversion rate is at 33 percent.

Case Study: Finding Local Solutions for Plastics 3-7 by Joseph Rossell, Reimagine Phoenix Project Manager, City of Phoenix Public Works Department

The Need

In 2017, China's "National Sword" policy had a disruptive impact on global recycling markets. Prior to September 2017, the City's Material Recovery Facility (MRF) operator sorted and sold plastics #3-#7 as one bale on the open market. However, since China's market closure, the City began landfilling these materials due to lack of market demand.

These low value plastics have been on the Public Works Department's radar for some time but these materials quickly became a major priority following China's shift in policy. Landfilling, burning, or stockpiling these materials were not considered viable options in the long run by my department or the City. Thus, the City began seeking partnerships with entities interested in transforming these resources into products or energy as well as be willing to be located on the RIC.

The RFP Process

Since City resources and land would be tied to any of the selected solutions, the City was required to follow a transparent procurement process. On June 7, 2018, the City issued the Plastics #3-#7 Diversion Request for Proposal (RFP), seeking one or more entities to divert these hard to recycle plastics. Proposals with waste-to-product or waste-to-fuel technologies were considered.

As it relates to what the City was looking for in a proposal, the emphasis was placed on four key criteria including:

- Qualifications and Experience
- Proposed Technology
- Business Plan and Financial Return
- Benefits to the City.

In addition to the above criteria, there was a strong preference for bids proposing to establish operations on the RIC.

Selection Process

The City of Phoenix Public Works Department assembled an evaluation panel capable of looking at each proposal in the most comprehensive and holistic way. The team sought representatives from the City of Phoenix Public Works and Community and Economic Development Departments to help the group understand each bid from the standpoint of diversion, impact on public works operations, impact on job creation and larger economic impact and benefits to the City.

Besides department stakeholders, Public Works also extended invitations to individuals with backgrounds in entrepreneurship, the plastics industry, and chemical engineering.

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Each panel member scored the three proposals according to four evaluation criteria. Through the comprehensive evaluation phase, the panel unanimously recommended Renew Phoenix be awarded the Plastics #3-#7 Diversion RFP. In early April, the City of Phoenix City Council approved the recommendation to award the contract to Renew Phoenix.

Renew Phoenix

Renew Phoenix is a joint venture between Generated Materials Recovery (GMR) and Renewlogy. GMR provides recycling services to manufacturing facilities in AZ, UT and CO. GMR Brings technical, operational, and local market expertise to the joint venture and will help Renewlogy source additional local plastic waste. Renewlogy is a plastics to fuel technology firm founded at MIT in 2011 with facilities in the U.S. and Canada. Renewlogy provides the proprietary chemical recycling process that converts low-value plastics into high-value fuels.

Renewlogy participated in the Resource Innovation and Solutions Network Incubator, a joint partnership between the City of Phoenix and Arizona State University established in 2014. More information on RISN can be found in the Side Box.

Challenges and Learning's

The RFP process might seem simple and straightforward. The truth is that finding a solution that satisfied the goals and priorities of each City Department and stakeholder was complex.

It was vital for the Public Works and Procurement teams to clearly articulate respective interests and desired outcomes in order to build a close working relationship and find mutual common ground.

From the vantage point of my department, Public Works, the goal was to find a company that would be interested in being located on the Resource Innovation Campus (RIC) that could divert and transform landfill bound materials into fuel or products. From the Procurement department's point of view, because the City could become a potential purchaser of the end product from the Plastic 3-7's, their main interest was to ensure there was a level playing field to foster competition among innovators to provide the highest value solution for diverting plastics #3-#7.

By holding regular meetings between both departments to discuss goals and priorities, our two respective teams were able to move through the procurement process and find a solution that promotes diversion and the growth of a local circular economy.

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Author: Joseph Rossell, Reimagine Phoenix Project Manager, City of Phoenix Public Works Department



Joseph Rossell is a project manager focusing on the Reimagine Phoenix Initiative. Reimagine Phoenix is a citywide waste diversion and sustainability initiative with the goal of diverting 40 percent of trash from the landfill by the year 2020. Joseph's efforts center on establishing partnerships to keep material from the landfill, increasing the diversion rate, and advancing the City's Circular Economy program.

The Resource Innovation and Solutions Network Incubator

<http://sustainability.asu.edu/resourceinnovation/risnincubator/>

The Resource Innovation and Solutions Network (RISN) is a program of the Rob and Melani Walton Sustainability Solutions Services at Arizona State University, in partnership with the city of Phoenix's Reimagine Phoenix initiative. The program launched in January 2014 under former Phoenix Mayor Greg Stanton with a focus on advancing integrated resource management through a global network of public and private partners using collaboration, research, innovation and application of technologies to create economic value, driving a sustainable circular economy.

In 2016, City of Phoenix and ASU's Rob and Melani Walton Sustainability Solutions Service and Entrepreneurship + Innovation division launched the RISN Incubator program. The first circular economy incubator in the United States, RISN Incubator is a niche-business accelerator for entrepreneurs in the early stages of waste-to-product innovation. The incubator offers ventures an opportunity to rapidly scale and transform their startup into a vehicle to solve some of the world's greatest challenges. We help our ventures test their concepts, build out their company and scale to market.



The program is customized based on the individual venture's needs but at its core, provides the following services:

- Dedicated expert mentors to guide advancement.
- Unmatched strategic advisement.
- Introductions to industry stakeholders.
- Access to technical experts in the field of material reuse, technology and the circular economy.
- Business trainings on topics related to building a cost and revenue model, operations, value proposition, understanding your customers and more.
- "Waste" material from the City of Phoenix for use in the development, testing and activation of a product or service.
- A process for entrepreneurs and their ventures to be continuously evaluated and pre-qualified for funding opportunities.

Program success is measured using standard economic development metrics such as capital raised, revenues generated, and jobs created. As of December 1, 2018, RISN Incubator had two cohorts and incubated 13 ventures. These

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ventures have raised \$2.95 million in capital, generated over \$4.1 million in revenues, created 86 new jobs and internships, filed 3 patents, and

launched 12 products. RISN Incubator's third cohort commenced on April 1, 2019.

Author: Amanda Jordan, Program Coordinator, RISN Incubator



Amanda supports RISN's existing programs and initiatives while also playing a key operational role in the success and future growth of the incubator by partnering with the innovators on a day-to-day basis, supporting the work within the regional innovation ecosystem, and helping to build critical components and structures for the success moving towards a circular economy in the Phoenix metro area.

PUBLIC SECTOR INNOVATORS

SOUTHEAST RECYCLING DEVELOPMENT COUNCIL

SOUTHEAST RECYCLING DEVELOPMENT COUNCIL

- Southeast Recycling Development Council
- *Recycling Is Far From Dead: Q&A with Will Sagar, Executive Director, Southeast Recycling Development Council*



Southeast Recycling Development Council

www.serdc.org

Mission

The mission of the Southeast Recycling Development Council (SERDC) is focused on unifying government, industry, and non-governmental organizations around recycling.

Goals of SERDC include:

- Increase collection and recovery of quality recyclable material
- Foster economic development via the recycling industry
- Create a greater awareness of the recycling industry's economic impact in the Southeast

These activities serve to further SERDC's primary purpose of increasing the collection and recovery of materials while also fostering economic development.

Structure

SERDC is a member driven organization with 110 active members. Members are comprised of

industry and manufacturing companies, state and local governments, retail and consumer goods brands, trade associations, non-profits, state recycling agencies, and Colleges and Universities.

History

The impetus for the formation of SERDC began in 2004. Regional manufacturers saw that much of the material that was being sent to landfill could be utilized in their feedstock and began discussions with state recycling staff on how to bring these materials back into the market.

In November 2004, representatives from industry, state and local government, environmental and recycling associations, and the Environmental Protection Agency Region IV, were invited to discuss the feasibility of forming a regional organization. Attendance and interest was phenomenal. Subsequent meetings lead to the formation of the interim Board of Directors, with an equal division of industry and state/municipality representation.

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The original intent was that SERDC would be comprised of eight states, however, as interest grew it quickly became an 11-state organization: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

SERDC became a 501-c-3 non-profit organization incorporated in Alabama in 2006.

Activities

In a 2016 study, SERDC determined that over 362 key Southeastern manufacturers look to recycled feedstock to develop new consumer goods. These manufacturers collectively support almost 98,000 jobs and see a sales volume towering more than \$40 billion.

However, the Southeast has unique challenges relative to every facet of collection, processing, marketing and manufacturing of recyclable materials; supply is not meeting demand.

The SERDC has created programming to address this imbalance. Programs include:

- **The Recycling Infrastructure Grant Program**
This grant program offers funding to deliver needed recycling infrastructure in the Southeast. Investment in physical infrastructure, such as recycling carts, material recovery facility (MRF) upgrades,
- Recycled Materials Demand Mapping
<https://www.serd.org/maps>
- Materials Exchange
<https://www.serd.org/wasteexchanges>

recycling trucks, and/or transfer stations to unlock investments in curbside recycling infrastructure, are key to dramatically increasing material recovery.

- **The Integrated Solid Waste Management Program**

Discussions between SERDC, US EPA Region 4, and eight SERDC-member states identified the need to develop integrated solid waste management (ISWM) systems that consider how to prevent, recycle, and manage solid waste in ways that most effectively protect human health and the environment, all while being economically sound.

The US EPA Region 4 worked with RRS, a consultancy, to develop two tools to assist local governments in the US Southeast by analyzing their recycling programs. These FREE tools are available on <https://www.serd.org/ISWM> and are meant to provide insight and direction for further community-specific research and planning.

Educational Initiatives

SERDC has an ongoing education initiative in partnership with State Agencies which includes workshops and webinars. In addition, SERDC maintains a robust website of end market utilization of recovered materials which includes:

- State Recycling Materials Directories
<https://www.serd.org/marketdirectories>

Events

- Events include annual Legislative Days, the Biennial SERDC Summit, workshops,

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webinars, and the newly developed Measurement Matters Summit created in 2017. The goal of the Measurement Matters Summit is to create a national conversation

around how to effectively manage our resources, efforts, and outcomes by creating consistent language within recycling.

Recycling is Far from Dead: Q&A with Will Sagar, Executive Director of the SERDC

What are important steps to creating a materials demand program?

Well the first thing you have to do is set a baseline. To understand if you are making progress on market demand for recovered material, you must know where you are starting! Building our Recycled Materials Demand Map was one of the first priorities of SERDC.

To develop the database that supports the map tool, SERDC worked with State Recycling Agencies and Associations, Trade and Industry Associations, and Chambers of Commerce to gather this information. There is no NAICS code for businesses using recycling, leading the research to these other sources. Many companies report sales and number of employees to Dunn & Bradstreet. For the others, SERDC researched news stories, local and state reporting and direct interviews.

You also need to connect these manufacturing businesses with their local legislators to bring more awareness about the economic and jobs impact that these businesses provide. We are not a lobbying organization, but we do help businesses build these relationships through our

annual Legislative Day. These businesses are not only looking to source material directly from the local region, but they can help offset the disposal costs of landfill for cities because they are creating a market for these materials where there previously was none! Would politicians rather have these businesses be sending their money to overseas or out-of-state suppliers?

Your region seems to have a robust demand for recovered material. What would you say to those that say that “recycling is dead?”

Recent media stories accurately point out that there are problems in some recycling programs, but any inference taken that discounts recycling’s value to our economy is in error. **What is NOT accurate is to label recycling as dead or not working. Indeed, recycling is feeding American manufacturing. The large majority of the material collected in our recycling programs remains in the United States feeding our manufacturing base.**

Yes, China’s appetite for our recovered materials grew substantially in recent years, up to approximately 15% of our market (ISRI.org).

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With an inelastic supply of “trash”, a small shift in demand will lead to large price swings. Hence, we have this volatile market. However, the recycling industry has previously seen huge swings in market prices. There were price drops in 2008 and in the 1990’s. Just like the real estate market in the US, the recycling markets always corrected and can be expected to recover again.

American and foreign companies are already responding. There are 17 new or capacity expansion paper mill projects currently under construction in the United States. These projects reflect an investment of over \$1 billion. Reduced prices for paper have created opportunities for expanded demand.

And current demand for recycled material is not as bad as some articles indicate. While demand for mixed grade paper has declined, total recovered paper exports increased four percent in 2018 (US Census). PET bottles are within 15% of their 15-year price average. (recyclingmarkets.net). Down, but certainly within a normal range of fluctuation. HDPE is also holding a steady price, within 30% of its average.

In the Southeast alone, there are 362 manufacturing facilities operating currently that rely on recycled material for feedstock in the production of consumer goods. These plants employ 98,000 people in manufacturing jobs and generate \$40 billion in sales (serdc.org). They are

still running every day and buying material constantly, regardless of the actions taken by the government of China!

So how we can help bring prices back to pre-National Sword levels?

First, we have to clean up the stream. The primary need is to reduce contamination. Current contamination levels of 25% are typical. This greatly increases the processing cost and reduces the value of the market bound material. Messaging about what to recycle must be clearer and we need to focus on targeted material types. We were co-founders of The Recycling Partnership, an organization created in 2013 to tackle these education and awareness issues. This work is more important now than ever.

Second is to increase participation. Increasing participation will also reduce the cost per ton. A focused outreach program to encourage recycling is needed

Lastly, we need a change in mind set in the public sector. For policymakers, there needs to be a shift to understanding that recycling is good for business! We are throwing away material that has value. The immediate cost of capturing recycling may not be as cheap as just sending it to a landfill, but the long term economic benefits that recovering the material adds to the economy far outweigh the costs to collect and process. The benefits are clear.

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SOUTHEAST RECYCLING DEVELOPMENT COUNCIL

Author: Will Sagar, Executive Director, Southeast Recycling Development Council



Will graduated from the University of North Carolina with a double major on Economics and Mathematics. After selling the excavation business he built and operated for a decade, he was the Solid Waste Director for Transylvania County, NC for 16 years. While there he started the recycling program, built the first lined landfill in Western North Carolina; implemented a Pay As You Throw program, established a permanent Household Hazardous Waste collection; and started an electronics recycling program. Later with Henderson County, he started electronics collection and created a county energy accounting system.

A fisherman wearing a blue cap and dark clothing stands on the deck of a boat. The background shows a harbor with other boats, including one with the name 'PAPI ALFREDO' visible. The foreground is filled with fishing equipment, including a large metal coil and black fishing nets.

PARTNERSHIPS AND COLLABORATIONS

“While we can utilize these marquee events to inspire and educate our fans, ideally, we are also setting up the local infrastructure and awareness that can have a lasting impact long after a particular event is over. Developing these types of partnerships can provide a pathway to replace business as usual with a better way of doing business.”

– Scott Jenkins, General Manager of Mercedes-Benz Stadium and Co-Founder of the Green Sports Alliance

PARTNERSHIPS AND COLLABORATIONS

KEY FINDINGS

Partnerships and Collaborations

The need for more partnerships and industry collaborations to help scale sustainability efforts is well understood. Nowhere is this need more apparent than within the development of recovered materials supply chains. Very rarely does one organization have the expertise to act as the collector, processor, product manufacturer, and end-market retailer for a recovered material while doing so profitably at scale. However, fostering successful relationships and results oriented programs among different organizations is not an easy task. Who are the right partners? What is the right incentive and cost structure?

This section features three case studies of successful alliances that are demonstrating tangible results. **The experiences gained from these collaborations are valid not just for those working in the private sector, but also for those in the public sector.** These case studies call out issues that regions and municipalities also face when building recovered materials markets. There are parallels between both the private and public sector in the need for greater education around the value of recycling, building trust among different stakeholders, overcoming technical or perceived issues with the utilization of recovered materials, and dealing with logistical and infrastructure challenges.

Sharing the experiences of these first-movers will ideally create the impetus for business and industries to move from discussion to collaboration and action.

KEY FINDINGS

Invest in Long Term Relationships

The featured partnerships were all initiated by companies that already had pre-existing relationships with one another. While some of the alliances grew to include new relationships, the founding teams of each program involved those that had already worked together on prior initiatives. These partners had already established a common understanding of how their respective organizations' missions were in alignment and had built a shared sense of trust from the results of past outcomes. Thus, they were ready to engage on much larger scale efforts. In addition, the nature of these partnerships was focused on long-term engagement as opposed to being one-off or transactional.

Costs are Important

Cost parity was an important issue mentioned by all interviewees. The goal for each partnership was to create a truly financially sustainable program that would result in cost-savings in the long term. Within those parameters, there was the understanding that reaching true efficiency and scale would take time, especially in the case of the development of new materials and supply chains. These concerns were built into project timelines to allow for a realistic understanding that cost-parity may not be achieved immediately.

Engage with Internal Stakeholders

While the sustainability department may be leading the program externally, for collaborations

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KEY FINDINGS

with external partners to succeed, engaging internal departments and employees was cited by interviewees as being a critical component of success. While the common focus for partnership success is on picking the right *external* partners, interviewees emphasized the need to have strong internal buy-in for the external collaboration to succeed. Assuaging internal departments' fears around material quality and costs were cited as ways to help build support for testing out new supply chains and material sources.

Culture of Sustainability

Tied into the need for internal engagement is the idea that there must already be a strong company-wide understanding that sustainability is an important priority. If this type of culture is not already widespread, interviewees

recommended focusing on smaller scale projects and building a track record of smaller wins. Tying in consumer expectations around sustainability as well as the need for resource securitization could also be useful motivations for employees to utilize in advancing a culture of sustainability,

Sharing Information Beyond the Partnership

Sharing information about their partnerships and programs beyond their immediate network or partnerships was a priority for many interviewees. Keeping data about the partnership proprietary was viewed as having an adverse impact on building truly scalable new supply chains or material innovations that were cost effective. Overall, innovators hoped that by creating these first-mover circular programs, they would make it easier for others to develop their own programs.



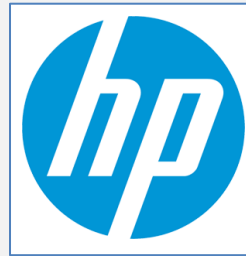
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BEST BUY, ERI AND HP: CLOSING THE LOOP FOR PRINTERS

BEST BUY, ERI AND HP: CLOSING THE LOOP FOR PRINTERS



- Program Overview
- Stakeholder Perspectives
 - Interview with Theresa DiMarco, Manager, Best Buy
 - Interview with Dean Miller, Program Manager - Recycling Innovation and Jean Gingras, Sustainable Impact Program Manager, HP

Summary: Best Buy, ERI, and HP have partnered to deliver an industry-leading printer that incorporates recycled plastic from printers

www.bestbuy.com/site/clp-computers-tablets/hp-inkjet-printer-trade-in-offer/pcmcat748301576921.c?id=pcmcat748301576921

Program Overview

CASE STUDY

Laying the Foundation for the Program

As the largest United States consumer electronics retailer, Best Buy has focused on providing end-of-life solutions for consumer electronics by offering consumer electronics collection at all of its retail locations. Best Buy's diverse and extensive recycling program is now America's largest and most convenient retail recycling option for consumer electronics as 70% of

Americans live within a 15 minute drive of Best Buy. Prior to the HP partnership, Best Buy was already collecting used printers from customers to ensure proper recycling. The creation of a formal program with HP offered the opportunity to increase the number of printers collected as well as drive awareness around the value of recycling.

HP's Sustainability Strategy:

Materials management is a central focus in HP's product sustainability efforts. To reduce impact

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across the value chain, HP continuously strives to lessen their material usage and increase recycled content in products. More than 75% of HP ink cartridges are manufactured utilizing recycled plastic. Dovetailing on the success of the program to manufacture ink cartridges with recycled plastic, HP set goals to manufacture the first printer which incorporated recycled plastic.

Best Buy's Sustainability Strategy:

Best Buy aims to be a good steward of the environment, through our operations, services and products. To address the global issue of electronic waste, we established our recycling program in 2009. We continue to operate the most comprehensive consumer electronics takeback program in the U.S. And, with 70 percent of the U.S. population living within 15 minutes of a Best Buy store, we are also the most convenient place for collection.

Partnership Development:

The Best Buy and HP recycling relationship started in 2012 with a program to recycle ink cartridges. Due to strong collaboration between Best Buy and HP, along with HP's plastics providers and Best Buy's ink cartridge and electronics recycling partners Regency Technologies and ERI, Best Buy and HP were confident the program could expand beyond ink cartridges to actual printers.

The development of the program has been a multi-year journey that started in 2015.

The Program

Developing Incentives to Recycle:

Best Buy and HP created a custom coupon offer, "Recycle and Save" to incentivize customers to bring in their used printers to recycle at Best Buy. This program provided all customers an additional 15% off the purchase of a new HP printer when recycling an old unit, *regardless* of the brand the customer brought in for recycling. The printer program mimics the incentive structure of the ink recycling program whereby consumers receive a discount on the replacement of their ink cartridges after bringing in their old ones in for recycling.

Marketing channels for the program included messaging in the printer aisle of all Best Buy stores, online advertisements on bestbuy.com and targeted email messages to My Best Buy customers.

Material Sourcing:

Securing a source of high-quality recycled content material that was economically feasible for both the processor and recycler was challenging even with Best Buy's support from the collection side. Best Buy and HP partnered with ERI to source the recycled plastic printer shred for use in the new printers. **The process involved months of testing and refinement to ensure the plastic shred contained little-to-no contamination, had the correct mix of HPDE plastic resin, and was processed to the correct shred specification for the production process.** After months of refining the specifications and diligence by all parties, the plastic shred was approved by HP's product team

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for manufacturing. Best Buy's recycling partners began shipping plastic shred to HP's processor in the Summer of 2016.

To ensure a steady supply of recycled feedstock to meet HP's manufacturing demands; the ERI team evaluated its plastic stream and began experimenting with other electronic items that contained similar plastic resin. This testing and validation process continued into 2017-2018 with additional materials now included within the feedstock.

Impact

Since the beginning of the Recycle and Save program in 2016, over 300,000 printers have been collected at Best Buy retail locations for

recycling, and more than 180,000 HP printer coupons have been redeemed.

Besides driving sales and increasing collection rates, this program also benefits the electronics recycling industry by securing a buyer for what can be an unstable market for recycled plastic and printers.

To date, HP has an aggressive goal of producing a printer with 10% recycled content from printer plastic.

The Future

With Best Buy's retail market share, and HP's printing industry share, the potential for further growth and impact is significant.

Stakeholder Perspectives

Interview with Theresa DiMarco, Manager, Consumer Electronics and Appliance Recycling, Best Buy

How did this program begin? Why HP?

Best Buy and HP already had a partnership for the ink recycling program. Since Best Buy is an industry leader in the recycling space, the teams discussed how we could do something much bigger. The volume of printers recycled at Best Buy and HP's need for recycled content were aligned, so we began exploring possibilities. This was not an easy effort, taking well over a year to get off the ground, but we both shared the same strategic vision to make this happen.

What was the role of Best Buy in facilitating this partnership?

Our Closed Loop partnership extends the value of our everyday free recycling program to customers. By offering a coupon towards a new purchase we are able to share the closed loop story and include our customers in the success story. **Consumers pay attention to the environmental impact of their purchases, so this partnership spoke to what our customers were asking for.** This short video actually walks the customer through how a printer is recycled and how that material is reincorporated into another printer:

<https://www.bestbuy.com/site/clp/bbyon/pcmcat249300050019.c?id=pcmcat249300050019&wid=1561270735>

How did Best Buy approach connecting ERI and HP?

ERI has been our electronics recycling partner since the launch of the Best Buy in-store electronics recycling program. ERI is innovative in the industry and has state of the art shredder technology. Both HP and ERI understand that collaboration is critical to long term, sustainable solutions in unstable commodity markets.

How is this partnership beneficial for Best Buy?

Best Buy has the largest retail recycling program in the U.S. The Closed Loop partnership allows us to extend the value of the recycling program to our customers through coupon offers, which in turn drives traffic to our stores.

The partnership between HP and ERI allows Best Buy to continue to offer free printer recycling as this was a product that had very low end-market value. Additionally, the HP and Best Buy "Recycle and Save" program triggered interest among other brands to begin to offer these types of programs in partnership with us. This benefits both the environment and sales.

What has the customer response been to the Recycle and Save offers?

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Initially the response was slow, but as Best Buy and HP continued to collaborate on marketing and in-store tools and training, we have seen

growing response. The promotion started off by issuing approximately 300 coupons a week and has grown tenfold to over 3,000 per week!

Interview with Dean Miller, Program Manager, Recycling Innovation and Jean Gingras, Sustainable Impact Program Manager, HP

How has HP leveraged the Sustainable Impact strategy to progress the closed-loop economy?

At HP we know what's good for the environment is good for business and society. As part of our Sustainable Impact strategy, we are working to grow our business, not our footprint – and support our customers to do the same.

Our closed-loop programs support our efforts to build a strong circular economy that stretches back years. For example, 27 years ago, HP established its Planet Partners program to enable customers to return used ink and toner cartridges for recycling.

As part of our circular economy strategy, we focus on developing solutions that use less resources; designing products that can be easily repaired, maintained, and upgraded so they can stay in use for the longest possible time; shifting to as-a-service models; and ensuring that our products and supplies can be properly recycled or repurposed at end of service.

Working closely with Best Buy on materials recovery, we have been able to establish a closed-loop recycling process that expands our circular economy efforts.

Integrating an alternative feedstock requires buy in and coordination from several teams. How did you get buy in from all teams – procurement, engineers, R&D, etc., to deliver the end product?

First and foremost, we knew we had to create strong partnerships with each impacted organization. Recognizing that all corporate functions are busy and being willing as the Sustainability organization to be a hands-on partner in solving inevitable issues was key.

Additionally, successful implementation of any new material requires addressing three key areas: cost, quality, and availability. Initial efforts with recycled plastics focused on developing recycled solutions with virgin plastic performance and quality, as well as ensuring that the recycled plastics were cost competitive – that is, cost neutral or better in comparison to virgin material.

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Product teams are typically working to meet multiple objectives and working through numerous development issues. **But if you can provide assurances about quality and cost savings, you create an environment where teams are willing to take on the additional risk.**

Why did you select Best Buy as a partner versus a direct to recycler partnership?

The initial motivation was an apparent **cultural alignment** between the two organizations. Even in initial conversations it was clear that there were parallels in the goals and aspirations that would enable a deeper HP/Best Buy partnership.

Secondly, we wanted to create a fully circular solution – and working with Best Buy provided an opportunity to interact with customer at point of sale and also at product end-of-life. So collaborating with Best Buy, a key channel partner with the largest electronics take-back program in the US, made perfect sense.

What were the greatest challenges in setting up the program/partnership(s)?

Creating a new paradigm is difficult enough in a single large organization, but creating something as complex as a closed-loop system that requires coordination between two large companies and multiple suppliers/partners is not easy. Very early on, we established a set of common goals to ensure that everyone was working to the same vision. The team also worked hard to find solutions that provided wins for all the companies involved, and this helped keep the momentum going.

How has HP overcome the logistics challenges of a reverse supply chain?

Our approach has been to first demonstrate that we can create high quality RC material, with a line of sight to efficiency improvements that will provide cost savings. **We did not constrain the initial effort with the requirement that all logistics inefficiencies be addressed before initiating the pilot or even before moving to the production phase.**

The strategic partnerships approach throughout the supply chain facilitated open book reviews of costs/expenses and discussions that have led to optimizations and efficiencies that would never have been possible in a purely transactional environment. **We also have a willingness to accept a short-term solution in which it is ok to merely cover costs, with the agreement that as efficiencies are realized all parties will benefit.**

What advice can you share with other manufacturers interested in integrating post-consumer recycled content in their products?

First, be sure to start small, and start with an effort with a high probability of success. Recycled plastic has lots of bad history, and failed efforts only reinforce misconceptions. But you can build momentum from small successes.

You have to roll up your sleeves and try things. Since you don't know what you don't know, more discussion will rarely improve insight. Expect setbacks, embrace them, learn from them, and move forward.

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Don't try to optimize the effort too early; be willing to accept early effort inefficiencies. And be an engaged and participatory OEM that is willing to subsidize the system startup.

And finally, find partners who are culturally aligned with your organization and are seeking strategic relationships. Recycling and recycled plastics are low-margin businesses and trying to knit an eco-system together using transactional negotiation tactics will be difficult.

About Best Buy

www.bestbuy.com

We at Best Buy work hard every day to enrich the lives of consumers through technology, whether they come to us online, visit our stores or invite us into their homes. We do this by solving technology problems and addressing key human needs across a range of areas, including entertainment, productivity, communication, food, security and health.

About HP

www8.hp.com

HP Inc. creates technology that makes life better for everyone, everywhere. Through our product and service portfolio of personal systems, printers and 3D printing solutions, we engineer experiences that amaze.

About ERI

eridirect.com

ERI is the largest fully integrated IT and electronics asset disposition provider and cyber security-focused hardware Destruction Company in the United States. Certified at the highest level by all leading environmental and data security oversight organizations to de-manufacture, recycle, and refurbish every type of electronic device in an environmentally responsible manner, ERI has the capacity to process more than a billion pounds of electronic waste annually at its eight certified locations, serving every zip code in the United States. ERI's mission is to protect organizations, people and the environment.

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Authors:



Theresa DiMarco, Manager, Best Buy

manages consumer electronics and appliance recycling for Best Buy.



Jean Gingras, Sustainable Impact Program Manager, HP

Jean Gingras is responsible for planning and implementing strategic sustainability programs to meet the evolving needs of customers and channel partners.



John Shegerian, Co-Founder and Executive Chairman, ERI

John Shegerian is a serial social entrepreneur who focuses on solving global problems through game changing innovation to build successful, socially responsible companies.

Dean Miller, Program Manager - Recycling Innovation, HP

Dean Miller is the technical lead for HP product recycling solutions. He also oversees the qualification and implementation of recycled content plastics into HP products.

PARTNERSHIPS AND COLLABORATIONS

NEXTWAVE PLASTICS: AN OCEAN BOUND SUPPLY CHAIN NETWORK

NEXTWAVE PLASTICS: AN OCEAN BOUND SUPPLY CHAIN NETWORK

- Program Overview
- Stakeholder Perspectives
 - Interview with Oliver Campbell, Director, Worldwide Procurement & Packaging Engineering, Dell

Summary: Lonely Whale, Dell Technologies, Bureo, General Motors, Herman Miller, HP Inc., Humanscale, IKEA, Interface, and Trek Bicycle are working to develop the first global network of ocean-bound plastics supply chains.

www.nextwaveplastics.org



Program Overview

NextWave Plastics is an industry-led, open-source collaboration among leading companies to create a global network of ocean-bound plastics supply chains. Originally convened by Dell Technologies and led by Lonely Whale, this initiative aims to keep plastic in our economy and out of the ocean and has committed to reduce a minimum of 25,000 tons of plastic waste entering the oceans by 2025 across countries most impacted by plastic pollution.

Key Actions

- NextWave member companies process ocean-bound plastics, such as abandoned fishing gear, for use in their products and packaging. Ocean-bound plastic is plastic that has not yet found its way into the ocean and

is classified as “mismanaged waste.” That is, plastic that is not being collected, is not likely to be collected and is found within 50km of a waterway or coastal area.

- To decrease the volume of plastic and nylon litter and waste before it enters the ocean, NextWave member companies have committed to demonstrating to other companies the commercial viability and advantages of ocean-bound plastics into their supply chains in the context of heightened consumer, stakeholder, and policymaker awareness of the environmental impacts of marine plastic. Member companies have also agreed to reduce non-essential plastic usage across their operations and supply chains.

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- NextWave ensures the integrity of supply chains and resulting product integration through chain-of-custody compliance and external, third-party verification of impact.
- NextWave supports the work of the UN Environment, including UN Sustainable Development Goal #14, to conserve and sustainably use the oceans, seas, and other marine resources for sustainable development.
- NextWave also supports the UN Environment's Clean Seas Campaign, a global initiative that encourages government, corporate, and individual commitments to reduce the extent and impact of marine litter.

Partners

- NextWave is supported by global scientists and environmentalists from the UN Environment, Zoological Society of London, the 5Gyres Institute and the New Materials Institute, who advise on a sustainable model that supports the needs of coastal communities and environments.
- Current suppliers include Bureo, Plastix Global, ZSL's Net-Works, Aquafil, and more, and they source from diverse geographies, including Indonesia, Denmark, Chile, Cameroon, the Philippines, and Haiti. The following types of plastics are supplied: Nylon 6, Nylon 66, PET, HDPE and PP.
- Companies interested in joining NextWave Plastics can visit the [Apply](https://nextwaveplastics.org) page on nextwaveplastics.org.

Author: Dune Ives, Executive Director, Lonely Whale



Dune Ives is the Executive Director of award-winning [Lonely Whale](#), where she designs and leads initiatives that address environmental degradation and species decline. Through her leadership, Lonely Whale has received global recognition as one of Fast Company's World Changing Ideas, Huffington Post's Top Ten Movers and Shakers in Environmental Sustainability, the P4G 2018 Circular Economy Award sponsored by the Danish Government; and more. Dune has spoken at the Milken Institute of Philanthropy Expert Convening, Washington Post LIVE, and as the Plenary Speaker at the 2018 Our Ocean Conference in Bali, Indonesia.

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NEXTWAVE PLASTICS: AN OCEAN BOUND SUPPLY CHAIN NETWORK

Stakeholder Perspectives

Interview with Oliver Campbell, Director, Worldwide Procurement & Packaging Engineering, Dell

Oliver, can you talk to us about the creation of NextWave? What was the impetus for forming this organization? How did Dell bring together the Founding Members?

We knew from our prior work in sustainable materials, such as bamboo, that it really helps in some cases if the supply chain is “open source” and not proprietary. Rapid growth and scale are needed to drive cost efficiency for these materials to become commercially viable sustainable alternatives. It can feel like a bit of a race to make these innovations stick. Coupled with the fact, that while Dell is big, we would be just the proverbial drop in the ocean against 8 million tons per year of ocean plastic.

A customer conversation with GM about our launch of ocean plastic packaging led to them asking how they could be involved. That conversation signaled there was broader interest in utilizing ocean plastics so we approached Lonely Whale, an organization founded by Adrian Grenier to support ocean health, if they would be interested in working with us in forming a working group of like-minded companies so we could bring real scale and professional supply chain practices to stemming the tide, as it were, on Ocean Plastic. The overall process took about 9 months from March 2017 to when NextWave was

formally chartered with eight member companies in December 2017.

So it sounds like Dell has been very engaged around the issue of Ocean Plastics. Can you share more about Dell’s work on this topic?

Much of the credit belongs to Adrian Grenier for bringing Ocean Health issues to our attention. We had an initial brainstorming session in June 2015 to determine how Dell Technologies could deliver value for the oceans. We came to the realization that we could leverage our experience with sustainable materials and supply chain innovation to address the growing issue of ocean plastics.

I will forever remember that meeting as it was Hollywood meets Supply Chain 101. The whole discussion had a slightly surreal feel as if Jacques Cousteau meets Titanic meets the Dell Direct Model. It seems funny in hindsight, but we came out intrigued enough to do some real research to see if an economical supply chain could indeed be constructed.

Dr. Jambeck, of the University of Georgia, is the world’s foremost authority on Ocean Plastic, so I called her to ask her advice. Talk about a call being out-of-the-blue! We hit it off, in part because one of her post docs was from my

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NEXTWAVE PLASTICS: AN OCEAN BOUND SUPPLY CHAIN NETWORK

father's department at Cornell University, so that gave us an academic connection. The other reason was that she thought we could actually do something about the problem rather than just study it. Dr. Jambeck urged us to intercept plastic before it reached the ocean for what she felt were reasons of effectiveness. It's much easier to pick up bottles rather than gather their micro-fractured particles once they are in the ocean. **I interpreted it as an ounce of prevention is worth a pound of cure which is essentially our strategy today.** Dr. Jambeck was gracious with her time in helping us. Some of the others who gave of their time to help us were the teams at Method – who related their learning's with their Ocean Bottle, and the teams at Envision and Reflex who gave of their time in helping us to understand the processing of recycled plastics collected from ditches, streets, beaches and everything in between.

One of the biggest challenges we had was where to actually collect ocean bound plastic. Dr. Jambeck's seminal work only identified ocean bound plastic flows at the country level. We needed to be more granular – like at the city level. Despite how enticing it sounded, spending a year traveling Southeast Asia scouting sites was out of the question. **So in true engineer fashion, we believed we could create a predictive Global Information Systems (GIS) model to scout locations.** We organized two Dell expeditions to Port-au-Prince, Haiti, where ocean bound plastic is visually obvious. We took GPS coordinates of large accumulations of ocean bound plastic and loaded GIS parameters of population density, proximity to rivers, proximity to the ocean, and

poverty level as the primary inputs. We validated the model against our observations in Haiti. Next, we applied the model to Southeast Asia and India to predict sites. Google Earth satellite imagery overlays provided final visual confirmation of the predicted sites. I cannot overstate the importance of this work during the summer of 2016. It laid the theoretical framework which allowed us to move confidently into application for everything that followed.

Adam Bushong, Drew Gartman, and Saanya Bhargava deserve special mention for their contributions.

I've heard concerns within the plastic recycling industry that truly "ocean bound" plastic can be hard to verify due to high demand, opaque supply chains, and possible government corruption. Do you foresee any credibility issues with the sourcing of "ocean bound" plastic? Are these valid issues?

It can be if the necessary due diligence is not performed. That's why at Dell we have invested the time and resources to ensure supply by doing the following:

We physically have walked many miles inspecting our Ocean Bound Plastic supply chains from where mismanaged waste enters the ocean, to locations where the plastic is collected, and to finally where it is processed. We understand the physical flow of material. And we meet the people involved and know their stories. My heart has

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broken a few times when I've seen the conditions in which some people live.

Next, our Procurement and Social & Environmental teams become involved by providing their best practices and training so we could start to overcome the challenges inherent in working in areas of high poverty, which is generally why there is Ocean Bound Plastic in the first place.

Finally we work with reputable third parties to ensure we have audit controls being developed for compliance. It's not easy, for sure, and I would not say we have every item figured out. But it absolutely fits with Dell's vision of using technology for the benefit of people and the planet. Just because something may be hard, is not a reason for not doing it in our view.

What is the motivation for this type of in-depth sustainability engagement at Dell? How does this translate into the bottom line?

Michael Dell has articulated that Dell's purpose is to use technology for the benefit of people and the planet. It's a vision which resonates as something bigger than us as a company. I'm proud to say we do that to a large extent through sponsorship of cancer research, developing circular economy materials, and employee's volunteering in our communities to name a few.

Regarding the question of cost parity, our internal guideline around cost ensures what we focus on are real business solutions that can actually help people or the planet, not just vanity projects. It's

not always easier, and can often be difficult, but sustainability done properly will save money. My team's innovations in something as commoditized as packaging are living proof.

What advice would you offer to those trying to create high impact sustainability efforts within their own company that may not have sustainability as engrained within the C-suite?

Well, it may help to start small, learn, grow, and gain credibility before immediately trying for the big, high impact win. **Hit a single before you try for the home run.** Also, remember that everybody is on their own journey, including oneself, so be patient with others. Persuasion, persistence, humor are three key needed traits. Speaking of which, I have one project which I've been trying to enact that is now on its seventh business case – all of which are positive. That's frustrating, but even though we haven't implemented, I remind myself that people are still listening to us, so we're still in the game – even if it's extra innings. I don't think anybody really bats 1000, but we have to keep trying. Don't let setbacks define you. Let your vision define you and take small steps to start.

Going back to NextWave, given the diversity of industries your members represent, can you talk about how that has been a challenge and an opportunity?

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We deliberately set out to have a wide variety of companies, both by industry and by size, involved. We thought that would provide the broadest mix of characteristics to innovate and to develop applications so we could start to demonstrate success quickly in order to scale the supply chains. The challenge has been creating the time necessary for supporting NextWave. **I have a real full-time job, as do the others within NextWave who are involved, and some days it's difficult to create the time. Usually it's work at night.**

What about engagement with your suppliers? How did you onboard them with this initiative?

Our suppliers are excited to be part of the NextWave Ocean Bound Plastic supply chain. They see where this can lead to given the names of the companies involved. How we harmonize supply chain requirements among individual companies for material tracking and human rights to a NextWave global standard is our largest challenge within this area. Our suppliers have been committed to that process.

As NextWave continues to grow in impact, are there activities you would like to see more of going forward? For businesses that may want to join NextWave, how can they become engaged?

As NextWave moves from incubation to first stage maturity, I see NextWave as an organization taking more control of the supply chain, rather

than individual companies as has been the case to date. Doing so will allow us to think even bigger beyond NextWave's commitment of 25,000 tons by 2025. How do we as an organization hit 100K, or 250K, or a half million tons per year in order to put a real dent into the amount of plastic flowing into our oceans? What I would like to see going forward is us continually redefining success.

For any businesses interested in joining, visit nextwaveplastics.org. We're an organization focused on doing, so making progress on developing use cases is required. If you like what you see, please reach out to Dune Ives our Executive Director.

For other businesses that may want to create organizations to tackle Circular supply issues, any advice you can offer them?

Global population demographics forecast another billion people by 2030, combined with increasingly powerful cultural trends on the environment, make this an easy call. **My advice is threefold: start now on the circular economy supply chain because if you are not starting now, your competitors probably are. Second, be thoughtful and deliberate so the effort builds on success, but don't sandbag either. Third, support the culture for sustainability within your company.** Kevin Brown does an excellent job doing exactly this within Dell as Chief Procurement and Operations EVP.

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One of my greatest fears was that if we failed on a particular project, because of our prominence, the naysayers – of whom there can be many – would end up dissuading others from trying. I did not want that burden. In new fields like sustainability there does tend to be a greater responsibility. That's why we did so much planning on Ocean Plastic as we discussed. I believed the window of opportunity was open, and that if we missed, we could set back efforts by others for a number of years. This is where having the team we do at Dell, like Trisa

Thompson – former VP Sustainability, Piyush Bhargava – my boss, VP Procurement, David Lear – VP, Sustainability, Carly Tatum – Director, Corporate Communications, Stephen Roberts – Corporate Brand, and others through their advice, counsel, and contributions really made the difference for our success.

And finally, and I have to end with this, if you don't believe me on why your organization should initiate sustainable supply chain practices, ask your teenage kids. They are your future after all.

About Dell

www.dell.com

Dell empowers countries, communities, customers and people everywhere to use technology to realize their dreams. Customers trust us to deliver technology solutions that help them do and achieve more, whether they're at home, work, school or anywhere in their world. Learn more about our story, purpose and people behind our customer-centric approach.

Author: Oliver Campbell, Director, Worldwide Procurement & Packaging Engineering, Dell



Oliver leads the global packaging effort for Dell Technologies across 19 different Dell brands. Under his leadership, Dell has led the way on circular economy materials such as bamboo, molded paper pulp, ocean bound plastic, and pollution ink to reduce packaging costs, delight customers, enhance the brand, and to make for a healthier planet. He is widely recognized as an industry thought leader, with recently his work most recently highlighted in FastCompany's listing of 2019 Most Innovative Companies

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THE SUPER BOWL: A REGIONAL CIRCULAR ECONOMY SOLUTION

THE SUPER BOWL: A REGIONAL CIRCULAR ECONOMY SOLUTION

Program Overview

- Stakeholder Perspectives
- Interview with J.T. Marburger, Founder and CEO, Circular Solutions
- Interview with Scott Jenkins, General Manager of Mercedes-Benz Stadium and Co-Founder of the Green Sports Alliance
- Interview with Liza Milagro, Resilience & Sustainability Manager at Hartsfield Jackson Atlanta International Airport

Summary: Unifi, the Hartsfield Jackson Atlanta International Airport, Circular Solutions Advisors, Georgia Aquarium, Mercedes-Benz Stadium, Coca-Cola, and Westrock turn post-consumer drink bottles into Super Bowl LIII Host Committee Volunteer Uniforms made from Repreve yarn.

Program Overview

Idea Fruition

In February 2018, Scott Jenkins, General Manager of the Mercedes-Benz Stadium and the Founder of the [Green Sports Alliance](#) and Liza Milagro, Sustainability Director of the Hartsfield Jackson Atlanta International Airport approached Unifi, the maker of Repreve yarns with the idea for a sustainability program. The idea was to collect bottles from the stadium and airport, up-cycle them into Repreve yarn, and then utilize Repreve to make uniform jackets for airport staff and volunteers during the 2019 Super Bowl LIII held in Atlanta, Georgia.

Engaging Partners

Collection Partner: Unifi identified West Rock, a materials recovery facility that could provide accurate reporting on material volume as well as material source separation with low contamination rates at a competitive price. A team led by Circular Solutions Advisors visited West Rock MRF's to evaluate their separation and processing capabilities. (Timing 90 days)

Hauling Partners: Contractual recycling haulers for the Mercedes-Benz Stadium, the Hartsfield Jackson Atlanta International Airport and Georgia Aquarium were asked to haul collected bottles



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from each facility to West Rock. (Timing 150 days, Mercedes-Benz Stadium sent first delivery on July 5, 2018, Airport sent first delivery on January 2, 2018, and Georgia Aquarium sent first delivery on January 2, 2018.)

NFL, IceBox, Atlanta Super Bowl Host Committee and Hartsfield Jackson Atlanta International Airport: Ensuring commitment from the above parties to manufacture uniforms from recycled bottles using Repreve Yarn entailed multiple steps.

1. Providing samples and pricing of the product to all parties.
2. Educating the NFL about the impact and importance of the program.
3. Convincing Icebox (the Licensee) to utilize a new manufacturer (Unifi) which involved education around the quality of the Repreve fiber as IceBox had never utilized recycled polyester prior to this.
4. (Timing – 240 days from initiation of talks to receiving the Purchase Order)

Execution

1. Collect Material: The first delivery of material from Mercedes-Benz Stadium arrived at West Rock on 7/5/2018. The Hartsfield Jackson Atlanta International Airport encountered difficulties with the collection of recyclables from high security zones which delayed delivery until 1/2/18.
2. West Rock partnered with the hauler to confirm the exact truck and weight of the

bottles delivered. *Refer to Chart 2. for exact volumes. (Timing ongoing)

3. Convert Material: Beginning in December 2018, Unifi picked up bottles delivered from West Rock and converted them into Repreve Yarn. Processing took place at the Unifi Bottle Processing Center in Reidsville, NC – one of the most advanced facilities of its kind in the United States. There, plastic bottles are sorted and chopped into flakes. After washing, the flakes are melted and reformulated into small pellets called chip or resin. The chips are then extruded and spun into REPREEVE fiber. (Timing Ongoing)
*This program utilized the “mass balance” approach. Bottles collected from the venues were turned into Repreve Yarn but not necessarily into the yarn that went into the final uniforms.
4. Sample Approval: This step involved multiple parties:
 - Licensee Approval: Circular Solution Advisors (CSA) provided IceBox, the approved licensee for the Atlanta Super Bowl Organizing Committee, samples to present for approval. CSA also provided Albrecht and Company, the approved licensee for the Hartsfield Jackson Atlanta International Airport, with samples for approval.
 - Unifi Approval: CSA provided samples to be tested by Unifi’s U TRUST® to

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THE SUPER BOWL: A
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- ensure that the samples contained Repreve.
- 3rd Party Social Compliance Approval: The product was tested for wear, color fastness, and 16 other inspection points by G&G International.
- 5. Public Bidding: Since the Hartsfield Jackson Atlanta International Airport is a city facility, a public bid was required which involved working with the City Manager, Mayor’s office, and Marketing Department. (Timing 90 days)
- 6. Production: To create each jacket, 6 plastic bottles were transformed into Repreve yarn which was woven into fabric. This fabric was then sent to the cut, sew and decorating factory. Finished product was tested utilizing the U TRUST® Fabric Certification Process to ensure that the jackets were made from Repreve recycled fiber. Lastly, the order was inspected for quality and fit by the 3rd party upon completion to verify social compliance. (Timing 90 days)
- 7. Marketing/PR: Unifi developed an integrated communications plan which

included media relations, social media content and a video highlighting the initiative. The video aired on screens throughout the Hartsfield Jackson Atlanta International Airport and ran every hour as a public service announcement during the week of the Super Bowl. In addition, ATL Host Committee volunteers were encouraged to engage with Super Bowl guests to share the story of the creation of their jacket. (Timing 90 days)

Length of the Program

The Super Bowl specific program lasted from February 2018 - February 2019. Collection and processing have continued at all locations post February 2019.

Impact




Diversion: Over 14,000 Host Committee volunteers uniforms were created. Each jacket was made using six plastic bottles, preventing 42 tons of waste from going into landfills and our oceans.

Media: Over 30 news outlets picked up the story, achieving more than 150 million earned media impressions.

PARTNERSHIPS AND COLLABORATIONS

THE SUPER BOWL: A REGIONAL CIRCULAR ECONOMY SOLUTION

Chart 2. Collection Volume of PET

SUPPNAME	SUPPCITY	SST	TICKET	GRD	GRDESCR	SFXNAME	NETLBS	SHPDTE	TONS	TRAILER#	SOURCE
GA AQUARIUM	ATLANTA	GA		822	PET BOTTLES MIXED	LOOSE	260	1/19/19	0.13		CONNEX RECYCLING
GA AQUARIUM	ATLANTA	GA		822	PET BOTTLES MIXED	LOOSE	198	2/19/19	0.10		CONNEX RECYCLING
TOTAL									0.23		
WM - MERCEDES BENZ S	ATLANTA	GA	272609	822	PET BOTTLES MIXED	LOOSE	2,560	7/5/18	1.28	415351	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	276473	822	PET BOTTLES MIXED	LOOSE	1,120	8/24/18	0.56	415158	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	277135	822	PET BOTTLES MIXED	LOOSE	1,960	9/3/18	0.98	415349	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	277958	822	PET BOTTLES MIXED	LOOSE	1,700	9/13/18	0.85	415015	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	278917	822	PET BOTTLES MIXED	LOOSE	2,480	9/25/18	1.24	415015	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	279522	822	PET BOTTLES MIXED	LOOSE	2,140	10/3/18	1.07	415015	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	282722	822	PET BOTTLES MIXED	LOOSE	2340	11/14/18	1.17	3405910	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	283121	822	PET BOTTLES MIXED	LOOSE	2603	11/20/18	1.30	3405910	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	283462	822	PET BOTTLES MIXED	LOOSE	1820	11/27/18	0.91	3405910	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	284021	822	PET BOTTLES MIXED	LOOSE	2166	12/3/18	1.08	3405910	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	284199	822	PET BOTTLES MIXED	LOOSE	2451	12/6/18	1.23	3405910	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	284436	822	PET BOTTLES MIXED	LOOSE	1584	12/10/18	0.79	3405910	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	285063	822	PET BOTTLES MIXED	LOOSE	2322	12/17/18	1.16	3405910	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	288418	822	PET BOTTLES MIXED	LOOSE	1140	1/30/19	0.57	415015	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	288806	822	PET BOTTLES MIXED	LOOSE	1450	2/5/19	0.73	415016	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	288939	822	PET BOTTLES MIXED	LOOSE	1500	2/7/19	0.75	416173	WASTE MANAGEMENT OF A
WM - MERCEDES BENZ S	ATLANTA	GA	290154	822	PET BOTTLES MIXED	LOOSE	2560	2/25/19	1.28	415010	WASTE MANAGEMENT OF A
TOTAL									59.54		

Author: J.T. Marburger, Founder and CEO, Circular Solutions Advisors



JT founded Circular Solutions Advisors to provide consulting services on how to create “circular economy” solutions for properties and corporations. Previously, JT owned and managed textile manufacturing plants for over 30 years. 11 years ago, in partnership with The Coca-Cola Company, he developed knowledge of how to most efficiently turn recycled material into up-cycled products.

PARTNERSHIPS AND COLLABORATIONS

THE SUPER BOWL: A REGIONAL CIRCULAR ECONOMY SOLUTION

Stakeholder Perspectives

Interview with Liza Milagro, Resilience & Sustainability Manager at Hartsfield Jackson Atlanta International Airport

Liza, can you share a bit about the genesis for this idea?

The idea started two years ago when I approached Scott Jenkins with the goal of creating the greenest Super Bowl in history. I looked at what Minneapolis did, as an airport and city, and thought we can do that and more!

Airport involvement is key because if you think about it, the airport is the first impression and the last impression that any visitor has of a city. For emissions, we decided to off-set all Super Bowl traveler miles by partnering with the Good Traveler program. With water, we already had a water strategy in place to benefit important conservation regions locally. With waste, we had to look at what was of value within our current stream. What were our options? We had already been using Repreve fiber for some years in our Employee Swag so I was familiar with their use of recycled PET.

Did the Atlanta Airport already have a strong focus on sustainability prior to this program?

Absolutely. We are actually the only FAA organization featured on the Ellen MacArthur Foundation case study website.

Our sustainability focus started in 2012 during the planning for the Master Plan. At that time, the FAA said that any new Master Plan had to include a Sustainability Materials Management Plan as well as a Recycling Plan. This is when we developed our strategy to focus on water, energy, and waste. Then in 2015, we created a zero waste plan. This plan includes a Public Private partnership with Green Acres energy. With this partnership we are really incentivized to create a clean materials stream to enable a faster rate of return. So this helped create the push to invest in better collection infrastructure.

I cannot stress how important already having a Sustainability Materials Management and Recycling Plan in place was for the successful launch of the Super Bowl collection program. We had been doing education and planning around collection and already had a budget in place for the actions we needed to take to support the collection of the PET. All this lead to synergistic timing for the Super Bowl perfectly!

Being a government funded entity; we have different processes we need to go through versus the private sector. Our budgets and contracts need to receive legislator approval a year in advance! For example, if you are changing your diversion stream or haulers, you need to have that spelled out in the contract or RFP and approved a year in advance.

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THE SUPER BOWL: A REGIONAL CIRCULAR ECONOMY SOLUTION

How did you put the collection program in place?

You need to start by asking what locations you are going to focus on. The airport operates over 48,000 acres! Then you need to think about how we are going to collect it? How are we going to secure it? How is the material going to be source separated since we do single stream collection? It needs to be a sterile area.

For this program, we didn't have our passenger area collection infrastructure in place yet. That involves massive coordination since haulers need to be timed with active airspace and requires badging associated with entering federal airspace (i.e. homeland security.) We'll be rolling that out next year. So we looked at what areas and contracts do we have control over? That was all of our employee offices and tenant office space. This was the low hanging fruit.

Did you create new educational materials or a campaign to spread the word? How were the contamination rates?

We did relabeling of 350 bins that we thought had clearer messaging about what could and couldn't be recycled. And we collect single stream so the PET was co-mingled in the general recycling. The employee recycling stream is generally pretty clean, mostly paper, cans, and bottles. The paper goes to Pratt, the cans go to Novelis, and the bottles went to Repreve.

Separately, from a passenger awareness perspective, we created an animated video that showed on the airport channel about "How to

Recycle" and where recycled material actually goes.

Any advice for other airport managers that want to encourage more sustainable materials management options? What kind of support and infrastructure do they need?

Pre-planning is THE step. You need to have the pre-requisites in place and outline all the steps and costs needed to reach your sustainability goals so that senior leadership are confident they can give you the budget you need to execute.

As an airport, you have to deal with both FAA requirements and City requirements around contracts and procurement. So being very detail oriented is important.

The things we did to enable success for the Super Bowl program started happening in 2015, so way before we even knew we were hosting.

Remember that it takes time to educate staff and create that sub-culture around the importance of recycling. Also, the name of the game is how to increase the value of your stream. What material needs to be removed? We banned foam. And how can you clean it? Just looking at the stream and educating the concessionaries took 4 years. One of the first steps I had to take was making sure that our concessions and leasing departments were aware of the airport sustainability guidelines. Contracts, leases and RFP's, they all need to have language in there to ensure compliance.

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About Hartsfield Jackson Atlanta International Airport

www.atl.com

Hartsfield Jackson Atlanta International Airport is the busiest and most efficient airport in the world and, by some accounts, the best in North America. ATL is the economic jewel of Georgia, generating a \$34.8 billion economic impact for metro Atlanta and providing more than 63,000 jobs on-site, making it the state's largest employer.

Author: Liza Milagro, Resilience & Sustainability Manager at Hartsfield Jackson Atlanta International Airport

Liza Milagro is the Resilience & Sustainability Manager for Hartsfield-Jackson Atlanta International Airport with 20 years of experience in sustainability, innovation and management. In this role, she is responsible for developing, executing, achieving Zero Waste by 2020, the goals set forth in the Sustainable Management Plan, and making ATL the greenest airport in the world. Liza received her undergraduate degree from Dillard University in Sociology and Criminal Justice. She went on to complete her Masters of Science Project Management with a concentration on Sustainable Program Management from Boston University.

Interview with J.T. Marburger, Founder and CEO, Circular Solutions

You were hired by Unifi to organize and manage all the pieces in this program. What can you share about some of the most challenging aspects?

The number one challenge is changing habits. The Licensee never sold merchandise made from recycled bottles and the NFL had never looked at doing “circular economy” messaging.

Logistics for material supply from the Aquarium and the Atlanta Airport was also difficult. The key was to work closely with the established property

hauler because they all want the material to be sold into the market. Unifi making the commitment to purchase the material was essential to making this project work. I also had coordinate data sharing between the hauler and MRF to provide accurate tracking and reviewed the reports on a monthly basis to provide them to the Airport, Aquarium, and Stadium.

Do you think this is a program that can be replicated in other regions? Within other airports and stadiums? What kind of foundation do you

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need within these organizations to accomplish something like this?

Actually, in partnership with Unifi, The Coca-Cola Company and other properties we are in development of many more of these programs! **Any time we execute the program we attempt to not do this as a one-time activation, but create a foundation for other properties to easily participate.** The first project is always the most difficult and we will be adding 3-5 more Atlanta properties in 2019. I am also under contract to develop more solutions for other cities through 2021.

In your Circular Economy work, have you seen any trends from the corporate side in how they are approaching materials management? What do you forecast will be the norm in 5 years?

Yes, for sure. **Corporations now want to know how much of their material is being recycled and where it is going.** Traditionally haulers did not have the technology to provide detailed recycling reporting and I see that 5 years from now, the monitoring will be accurate and technology based.

Is there something that consumers can do to help with this transition?

Consumers are absolutely the key to success. If consumers purchase merchandise made from

recycled bottles then the brands will make it. After 11 years I am finally seeing some of the great brands such as Polo Ralph Lauren and Adidas successfully selling textiles made from recycled bottles. This is the way to get bottles out of landfill and waterways because they will only be collected if the consumer wants the end product!

Were you and the other partners happy with the results of the program?

Our goals were to educate the public about what happens to recycled materials so yes, the program completely fulfilled our expectations! You can refer to our overall media impressions in the preceding pages. Also, the week of the Super Bowl I observed on numerous occasions volunteers explaining to visitors how their jackets were made from recycled bottles and what Atlanta does with its recyclables. That was extremely fulfilling.

Further, Coca-Cola has done extensive consumer studies with consumers around recycling and they have found that showing tangible products made from recovered material can help encourage more recycling behavior. Coca-Cola is taking a leadership role in spreading awareness about this through their World without Waste program.

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About Circular Solutions Advisors
circularsolutionsadvisors.com

Circular Solutions Advisors is a consulting firm that provides Circular Economy solutions for properties and corporations.

Author J.T. Marburger, Founder and CEO, Circular Solutions



JT founded Circular Solutions Advisors to provide consulting services on how to create “circular economy” solutions for properties and corporations. Previously, JT owned and managed textile manufacturing plants for over 30 years. 11 years ago, in partnership with The Coca-Cola Company, he developed knowledge of how to most efficiently turn recycled material into up-cycled products.

Interview with Scott Jenkins, General Manager of Mercedes-Benz Stadium and Co-Founder of the Green Sports Alliance

Can you share more about the Mercedes-Benz Stadium's approach to sustainability and how that led to the development of this program?

Sustainability has always been engrained into the ethos of our stadium starting with the construction and design. In 2017, we were the first LEED Platinum designated Professional Sports Stadium in North America. As part of the design for the stadium, it was clear we were going

to do things differently. **Instead of a Trash Room, we created a Resource Recovery Room. The mindset was always that these materials we collected during games had value and would be recovered. It's a responsibility to do the right thing, especially given the volume of materials we generate with 70,000 fans at events.**

Prior to the Super Bowl, we were already working with local partners, Coca-Cola and Novelis, on some of our resource recovery efforts. With Novelis we run the Recycle for Good program.

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This is a program where we collect aluminum and PET bottles for recycling from the fans during games. Novelis donates the value of the aluminum to Habitat for Humanity. Three million cans generate enough to fund a house. The program has been a great way to encourage our fans to recycle, as well as create a purposeful reason to recycle beyond the obvious environmental benefits.

Our fans and associates really appreciate the social impact of contributing to a Habitat for Humanity project. And for us, keeping aluminum out of landfills aligns perfectly with our zero waste goals. We also get to engage both Novelis and our own associates through the Recycle for Good program as the associates have an opportunity to volunteer and build a Habitat for Humanity house.

When we started looking at our PET stream, we knew it was valuable. But, we had to connect the dots to figure out what to do with the material. Teaming up with the Hartsfield Jackson Atlanta International Airport, the Georgia Aquarium, and Circular Solution Advisors was key to pulling the program together. The important thing was to continue fostering that engagement with fans around the value of recycling and ensuring there was a meaningful story to tell. **Having a story is one of the best ways of getting people's attention to drive behavior change.** So, this program was a natural continuation of efforts we were working towards.

So now that the program is over, what's next?

I'm very excited about expanding opportunities for further use of recycled materials. For marquee events such as the Super Bowl and the NCAA Men's Final Four coming in 2020, a lot of branding gets installed around the stadium and city. Why can't we print all the graphics and signs on materials made out of post-consumer material? We are buying materials that are only used for a short period of time and it seems like a good opportunity to utilize recycled material.

While we can utilize these marquee events to inspire and educate our fans, ideally, we are also setting up the local infrastructure and awareness to create regional closed loop material programs that can have a lasting impact long after a particular event is over. We've been building our supplier and vendor relationships to source more environmentally friendly materials to create opportunities for a circular economy that other companies can take advantage of. Developing these types of partnerships can provide a pathway to replace business as usual with a better way of doing business. That is my hope.

What do you think motivates brands or other organizations to engage in these efforts?

My sense is that there's a fast-growing awareness by consumers of the problems created by single use plastics particularly with our youth who are concerned about protecting our oceans and in a much broader sense, our climate. **Brands are going to need to live up to the expectations and preferences of their customers and show that they are doing the right**

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thing by acting as responsible corporate citizens.

This will fuel a value chain for recycled materials and new types of packaging that make both good business and environmental sense. Brands are going to face increasing threats to their business if they don't proactively get out in front on these issues in meaningful and authentic ways.

Inspired by our zero waste mindset and leveraging the power of sports, it's my hope that sport can play a part in developing solutions that others can adopt. Based on the success of our Super Bowl volunteer jacket program and the positive media it generated, I think it shows that we can create real value.

Can you go back to becoming the first stadium to be LEED Platinum certified? How do you get management on board with something like that especially when you might not be getting consumer pressure to do so?

I was attracted to this project by the vision and commitment of Arthur Blank to redefine the stadium experience which wasn't just focused on creating a world class fan experience but also on minimizing the environmental footprint of the project and having a positive impact on our community.

That was refreshing to me as sustainability has been something that I've been passionate about for a long time in this industry. Ever since I've been in facility management at the University of Wisconsin-Madison in the 90's, I've felt it is the facility's responsibility to think about minimizing

consumption and finding better ways of dealing with the waste we create. In stadiums with 70,000+ fans gathered for an event, you can imagine the volume of waste that is created!

I've tried to share this kind of awareness and education around how sports facilities can reduce their environmental footprint by co-founding the Green Sports Alliance in 2011. We have an opportunity to lead by example and sustainability provides a lens to view how we go about our business that challenges the status quo and inspires us to find better ways of doing business.

Any advice for other stadiums that are thinking about initiating these programs. What do they need to be aware of?

First of all, doing things differently is harder. You need to have a team that is passionate about achieving these goals within the organization. And then you need organizations such as Circular Solutions Advisors, Westrock, and Unifi that can help to execute the idea as well as including existing partners. **I'm hoping that because we've provided an example of how circular materials management can be done at a large scale, others see that it is possible and start initiating their own programs!**

Understanding the type of waste and materials landscape you operate in is also important. You have to think about what kind of rebates or incentive structures are in place for recycling material. What are the costs for landfill? Making the business case for bottom-line results cannot be overlooked.

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About Mercedes-Benz Stadium

www.mercedesbenzstadium.com

Opened in August 2017, Mercedes-Benz Stadium is a world-class sports and entertainment venue in downtown Atlanta and home to the National Football League's Atlanta Falcons and Major League Soccer's Atlanta United. The multi-purpose stadium is host to major sports and entertainment events, including the Super Bowl in 2019, the NCAA Men's Final Four in 2020 and the 2018 College Football Playoff Championship game and is the first professional sports stadium in North America to achieve LEED Platinum Certification by the United States Green Building Council. Mercedes-Benz Stadium is proud to be collaborating with twelve founding partners, which include Coca-Cola, Equifax, The Home Depot, NCR, Novelis, SCANA Energy, SunTrust, IBM, Georgia Power and American Family Insurance.

Follow us on [Facebook](#), [Instagram](#) and [Twitter](#).

Author: Scott Jenkins, General Manager of Mercedes-Benz Stadium and Co-Founder of the Green Sports Alliance



Scott is the General Manager of the Mercedes-Benz Stadium which opened August of 2017. He previously served as VP of Stadium Operations for the Seattle Mariners, Philadelphia Eagles, Milwaukee Brewers and was the Director of Facilities and Events for University of Wisconsin, Intercollegiate Athletics. Jenkins holds a degree in Construction Administration from the University of Wisconsin and an Executive MBA from the University of Washington. Jenkins is a founding member of the Green Sports Alliance and serves as the board chair.

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“These products had to be able to compete with any other product on the market in terms of aesthetics, quality and function. By doing this we show that an upcycled product isn’t just a feel good purchase that you stuff in the back of your closet, it is a durable favorite piece that speaks to your values. “

-Christina Johnson, Creative Director and Co-Founder, Up Cycle It Now

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As issues around waste, environmental degradation and resource constraints gain increasing public attention, entrepreneurs are creating businesses that are addressing all three issues simultaneously. These individuals and businesses are creating a paradigm shift around how our society understands and defines “what is waste” and how it can be utilized. They are driven by a mission to prove that waste is a resource as well as a financial opportunity.

The types of businesses highlighted in this section show that the utilization of technology and creativity within the point of collection are just as valuable as a focus on material or product innovation. Analyzing upstream opportunities to intercept materials before they become part of the traditional recycling stream through brand and retailer partnerships is one solution. Additionally, R&D efforts focused on what isn’t currently considered recyclable or recoverable are just as necessary to create truly closed loop resource systems. Lastly, enabling more data transparency around material flows and creating marketplaces for materials are also critical in creating demand for recovered materials.

KEY FINDINGS

Inertia is Your # 1 Enemy

By default, the nature of many of these solutions represents a new way of doing things. Even if the solution is arguably “better” from the standpoint of financial, performance, or environmental attributes, entrepreneurs must be prepared to

encounter resistance. Reasons for resistance may include the perception that the proposed solution will require more work due to changes in current processes, a customer base with a culture that disincentivizes risk taking (as utilizing new solutions or products can be inherently risky for whomever makes the purchase), and the lack of interest in alternatives if the existing solution is “good enough”.

Interviewees recommend tackling inertia by developing long term relationships with potential customers, starting with a smaller scale pilot project to build trust, and finding well respected third parties to offer credibility to the material or business in the form of certifications or labeling. Moreover, engaging directly with those in the C-suite who may have a more strategic outlook as opposed to those within the Purchasing or Buying departments was also recommended.

Lead with Attributes, Not Sustainability

The featured companies in this section all have a shared purpose of creating a more sustainable planet. However, it is important to remember that potential clients may not share that same goal around sustainability. (One easy way to investigate a potential client’s commitment to sustainability is to check if there are purchasing guidelines that give priority to sustainable products or materials.) Interviewees recommend that solutions must be presented in terms of how it solves a client’s pain points. What attributes does a product or solution possess that are currently not available? Are there performance, style, or durability factors that make the product

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KEY FINDINGS

or solution unique? For B2B start-ups in particular, even though more brands and retailers are publicly committing to corporate sustainability goals, sustainability may still be a nice to have and not a must have.

For specific topics, please refer directly to the particular interview.

To learn about developing solutions for brands, refer to the interview with Christina Johnson, UpcycleItNow, Pg. 113.

To learn how to bring new materials to market, refer to the interview with Joe Stapley, ECOR, Pg. 107 X.

To understand the variety of resources that may be available within the waste-as-resource field, refer to the editorial with Nima Pauline, Ecosustineri Technologies Pg. 100.

To learn about building marketplaces for materials, refer to the editorial by Daniel Kietzer, US Business Council for Sustainability Development Pg. 103.



ENTREPRENEURS: FEATURED BUSINESSES

Ecosustineri Technologies, Eco Culture Manufacturing & The Palm Springs

Textile Recapture Program - Transforming the Textiles Industry Pg. 100

The Materials Marketplace - Creating A Marketplace for Post - Industrial Waste Pg. 103

Noble Environmental Technologies - Bringing A Circular Material to Market..... Pg. 107

Upcycle It Now - Closing the Loop For Apparel Brands..... Pg. 113

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ECOSUSTINERI
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TRANSFORMING THE
TEXTILES INDUSTRY

ECOSUSTINERI TECHNOLOGIES, ECO CULTURE MANUFACTURING & THE PALM SPRINGS TEXTILE RECAPTURE PROGRAM - TRANSFORMING THE TEXTILES INDUSTRY

- Company Overviews
- Editorial: The Importance Of Partnerships By Nima Pauline, CEO And Founder



Company Overviews

EcoSustineri Technologies

EcoSustineri Technologies is a proprietary software database which works with the RFID Multi Walled Nanotubes (MWNT) e-Thread in building customer profiles for use in tracking the lifecycle of the garments. The technology allows the consumer, using Smartphones, to have direct interaction with the life-cycle of products utilizing the MWNT e-Thread.

The RFID MWNT e-Thread creates a digital birth certificate for textiles. It can authenticate the country of origin, help prevent theft and counterfeiting, quantify the carbon footprint of production including water consumption and energy use, and track the lifecycle of recycled textiles through several circulations. This technology can be used to quantify the carbon footprint of any garment that incorporates the MWNT e-Thread.

Eco Culture Manufacturing

Eco Culture Manufacturing (ECM) is a garment manufacturing business that will utilize the RFID

e-Thread technology to calculate the carbon footprint of every garment it produces. ECM will be a sustainable fashion label that will utilize solar energy for its power, and gray water and nanotechnology water filtration in all manufacturing processes. The ECM trademark will provide customers with a guarantee that they are investing in a brand that values sustainability, transparency and quality.

Palm Springs Textile Recapture Program

The Palm Springs Textile Recapture Program is a program that will divert post-consumer textile waste from landfills and utilize them in the production of new garments. There will be two streams of textiles this program will focus on; those collected from the Palm Springs curbside collection pick up as well as those collected from consumers of the Eco Culture Manufacturing brand in the form of previously worn garments. Collected textiles will be reprocessed into new collections for the Eco Culture Manufacturing brand.

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ECOSUSTINERI TECHNOLOGIES, ECO CULTURE MANUFACTURING & THE PALM SPRINGS TEXTILE RECAPTURE PROGRAM - TRANSFORMING THE TEXTILES INDUSTRY

Editorial: The Importance of Partnerships by Nima Pauline, CEO and Founder

I am building three businesses; Eco Culture Manufacturing, EcoSustineri Technologies, and the Palm Springs Textile Recapture Program. Building one company is hard enough but trying to do three at one time really requires the ability to find other partners and stakeholders who can support you. Here are some learning's from my journey thus far.

My vision for these companies began in 2009. I found it necessary to create three businesses because I realized that only a holistic approach would work in changing the second most toxic industry in the world, garment manufacturing. I had learned in design school just how unsustainable garment manufacturing was and most importantly, how no one in the fashion industry was addressing these issues. I wanted to prove that sustainable fashion could move from a concept to a reality.

By 2016 I was ready to make my vision a reality. My goal was to change how garment manufacturers were doing business. First, I wanted to bring garment manufacturing back to the U.S. and second; I wanted to create a new way of manufacturing garments and accessories sustainably. Because I was looking at tackling a whole system, I knew that the power of having the right partners and advisors were integral to my success so I was very strategic with finding those that would be the right fit.

My first key partnership began with the Palm Springs Innovation Hub (iHub), managed by the Coachella Valley Economic Partnership. iHub is a

state-designated business incubator funded by the City of Palm Springs and Wells Fargo. Since partnering with iHub, my support system has flourished. iHub has provided affordable office and manufacturing space, and enabled me to connect with a plethora of advisers who range from patent specialists, to accountants to real estate agents. Through iHub, I was also able to work with the Small Business Administration.

Additional key stakeholders include the CalRecycle Recycling Market Development Zone program which is designed to encourage the growth of California-based recycling businesses. With this program I can expand my companies' garment sorting facilities as needed by being able to tap into their loan program which offers up to \$2,000,000 of loans at a fixed 4% interest rate. In addition, there is a CalRecycle State program that recognizes and certifies green business models through the California Green Business Network. This program allows us to tap into rebates, marketing campaigns and brand support. According to a recent survey of California Green Businesses, 42% of businesses reported an increase in sales after being certified as a California Green Business.

Besides our government partners, we also will work with the Secondary Materials and Recycled Textiles trade association (SMART). SMART is an international non-profit trade association comprised of used clothing, wiping material, and fiber recycling companies. The partnership with SMART will allow me to either completely recycle

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ECOSUSTINERI TECHNOLOGIES, ECO CULTURE MANUFACTURING & THE PALM SPRINGS TEXTILE RECAPTURE PROGRAM - TRANSFORMING THE TEXTILES INDUSTRY

or reuse all textile waste in my manufacturing processes.

Finally, I have established a partnership with the Solar Impulse Foundation. They have selected my company as one of their 1000 Clean Energy solutions. This means that my companies will receive a Solar Impulse Efficient Solutions Label. This certification will enable me to implement my closed loop, cradle to cradle business model on an international scale.

In conclusion, my advice to any entrepreneur with a world-changing vision is to seek out partners and programs that can help you support your goals. Find others who understand that sustainability is not just a “nice to have” but view it as integral to business success. Also look for those partners that can provide guidance at different steps along your start-up journey from start-up incubation to supply chain support.

Author: Nima Pauline, CEO and Founder, EcoSustineri Technologies, Eco Culture Manufacturing & The Palm Springs Textile Recapture Program

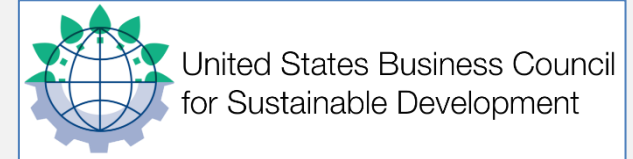


Nima is the Founder and CEO of award-winning Eco Culture Manufacturing, P.S. Textile Recapture Program and EcoSustineri Technologies, a portfolio of companies with a social concern. Nima's companies are based in Southern California in the Palm Springs iHub. Her focus is on creating environmental sustainability one thread at a time.

ENTREPRENEURS

THE MATERIALS MARKETPLACE - CREATING A MARKETPLACE FOR POST- INDUSTRIAL WASTE

THE MATERIALS MARKETPLACE - CREATING A MARKETPLACE FOR POST- INDUSTRIAL WASTE



- Organization Overview
- Editorial: Supporting Sustainable Materials Management And Recycled Materials Market Development In Michigan By Daniel Kietzer, Director Of Operations

Organization Overview

pathway21.com

The Materials Marketplace is a facilitated transaction platform that connects businesses to develop and scale new reuse and recycling market opportunities. Programs around the US aim to create a closed-loop, collaborative network of businesses, organizations and entrepreneurs where one organization's hard-to-recycle waste and by-products becomes another organization's raw material. In addition to diverting waste from landfills, these recovery activities generate significant cost savings, energy savings, and create new jobs and business opportunities.

History

The US Business Council for Sustainable Development (US BCSD) has a 20-year history of work in the materials reuse space. Originally called By-Product Synergy (BPS), companies were brought together much like today to share details of their material flows under a legally and technically secure structure. Often this would be the first time companies discussed their waste materials outside of the company walls. The BPS

process produced hundreds of unexpected and beneficial cross-company material synergies.

This original concept evolved over the years, applying new technology capabilities when appropriate to help the effort scale. This work to scale the program accelerated in 2015, when the US BCSD launched a US-wide pilot program, called the U.S. Materials Marketplace, to trial the program at a national scale. During the pilot, 23 companies engaged 78 facilities in uploading 150 materials, totaling 2.4 million tons, to the Materials Marketplace platform. 68 matches were identified during the pilot. The project earned a Circulars: Digital Disruptor award from the World Economic Forum and a Project of the Year award from Environmental Leader in 2016.

While that national scale project was successful in many ways, the sweet-spot for maximizing engagement really coalesced around regional and state-scale Materials Marketplace projects. Currently, regional projects are well underway in Ohio, Tennessee, Michigan and the City of Austin.

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THE MATERIALS MARKETPLACE - CREATING A MARKETPLACE FOR POST- INDUSTRIAL WASTE

Regional Programs and Impact

Austin Materials Marketplace

By becoming an early supporter of The Materials Marketplace, Austin, Texas established itself as a global circular economy leader. The program is supported by the City of Austin (Austin Resource Recovery) in an effort to reach its zero-waste goal of 90% landfill diversion by 2040.

- **Launch date:** August 2014
- **# of participants:** 500+
- **Pounds diverted from landfill:** 933,000lbs
- **Value creation:** \$630,000+
- **Partners:** City of Austin

Ohio Materials Marketplace

Sponsored by the Ohio EPA, this marketplace aims to create a closed-loop, collaborative network of businesses, organizations and entrepreneurs where one organization's hard-to-recycle wastes and by-products becomes another organization's raw material.

- **Launch date:** September 2017
- **# of participants:** 1000+
- **Pounds diverted from landfill:** 3,526,830lbs
- **Value creation:** \$201,954+
- **Partners:** Ohio Environmental Protection Agency

Tennessee Materials Marketplace

With funding support from the Tennessee Department of Environment and Conservation the marketplace creates collaborations working towards zero-landfill with agile, innovative small-to-medium-sized businesses, passionate nonprofits and large corporations.

- **Launch date:** August 2017
- **# of participants:** 170+
- **Partners:** Tennessee Department of Environment and Conservation

Michigan Materials Marketplace

Launched in 2018 and sponsored by the Michigan Department of Environment of Environmental Quality and the Michigan Economic Development Corporation, this program connects businesses to new circular economy opportunities, increasing recycling and reuse while reducing the environmental impact from traditional disposal practices. Additionally, it will generate new revenue paths and jobs in this emerging industry.

- **Launch date:** 2018
- **# of participants:** 70+
- **Partners:** Michigan Department of Environment of Environmental Quality and the Michigan Economic Development Corporation

Editorial: Supporting Sustainable Materials Management and Recycled Materials Market Development in Michigan by Daniel Kietzer, Director of Operations

2019 is a very exciting time to be connected to recycling, reuse, remanufacturing and zero-waste manufacturing in the state of Michigan. For the first time ever, the Michigan Department of Environmental Quality and other state agencies have sustainable, long-term funding available to support businesses and municipalities to pursue alternative approaches to landfill. At the same time, industry - both the recycling sector and manufacturing industries at-large - are dealing with very challenging disruptions in the recycling marketplace.

For many of us in the space, we see a “perfect storm” scenario beginning to emerge where end-market demand is slowly but surely beginning to pull recycled/reused materials through the recycling supply chain and into new end markets. But to see this scenario come full circle, a wide range of players - recycling companies, service providers, product manufacturers, entrepreneurs, and motivated leaders in the public and private sector - need to work together more efficiently, more effectively, and with better data that can drive measurable and repeatable results.

In Michigan, a large piece of this effort is being channeled through the Michigan Materials Marketplace, which is supported through grant funding from the Michigan Economic Development Corporation. **The MDEQ and MEDC see recycling and reuse as a strong driver of job creation in the state; and keeping resources in-**

state and in-use (as opposed to a landfill) drives value for existing businesses in the region. Combining environmental motivations with business drivers is an important approach for gaining buy-in to support programs in this space; and good data that can show measurable results provides a crucial feedback loop.

Recycling market development certainly has its challenges, and we’ve encountered quite a few along the way. Landfill tip fees are still tragically low in many parts of the US, including many areas of Michigan. **Without additional incentives, it can be very challenging to put together a business case for recycling/reuse that matches or beats landfill costs - which from our experience, is often the deciding factor when working with manufacturers. We always like to stress that when a manufacturing facility sends material to the landfill, they’re actually paying twice - once to bring the material in, and once to send it out.** Even then, that’s not always enough to tip the business case in favor of recycling/reuse alternatives.

In some cases, the infrastructure and technical capabilities to process materials generated in the state to a spec where they can be used as an input by another manufacturer just doesn’t exist in the region. More than half of the material recycled in Michigan was processed within the state in 2018, but there’s still a lot of room for increasing capabilities. New funding is being

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THE MATERIALS MARKETPLACE - CREATING A MARKETPLACE FOR POST- INDUSTRIAL WASTE

leveraged now to drive additional investment in this sector to Michigan; and combined with the Materials Marketplace's strong connection to the state's major manufacturing sectors to drive demand, we do see new circular models emerging in the near future that have very robust, sustainable and resilient business cases.

It's a long road ahead, but for us, creating the right conditions for recycling/reuse market

development is all about developing (and delivering) good data on the supply-side and demand-side, creating strong partnerships with economic development agencies already well-equipped to drive business growth in the region, and building relationships with decision makers in the manufacturing sector that can open up new end markets if the business case can be made.

Author: Daniel Kietzer, Director of Operations, US Sustainable Business Council



Daniel is a program designer, facilitator and Director of Operations with the US Business Council for Sustainable Development. Reuse and recycling market development is his specialty, but he also dabbles in social entrepreneurship, sustainability in the built environment, water, and variety of other sustainability-related efforts in the US.

ENTREPRENEURS

NOBLE ENVIRONMENTAL TECHNOLOGIES-BRINGING A CIRCULAR MATERIAL TO MARKET

NOBLE ENVIRONMENTAL TECHNOLOGIES-BRINGING A CIRCULAR MATERIAL TO MARKET

- Company Overview
- Bringing A New Material To Market: Q&A With Joe Stapley, National Accounts Manager



Company Overview

ecorglobal.com

What is ECOR:

Noble Environmental Technologies (“NET”) has developed ECOR, a product line of advanced sustainable building, design and printing substrate materials. ECOR has a true competitive advantage over traditional virgin/chemical-based materials such as wood, MDF, foam, plastics and cardboard. ECOR is designed to be lighter weight, higher performance, durable; VOC-free, up to 100% recycled material content, 100% recyclable, and can have a cradle-to-cradle certification. Using ECOR in place of other materials saves trees and reduces pollution and landfill waste. ECOR, as a “base” material can be direct printed, laminated, painted, stained, easily curved, formed, cut, glued, resined and made into most any structural product or object. In simple terms, ECOR can immediately replace materials such as plywood, particle board, MDF, styrene, foam core, coroplast and many other design and build materials. ECOR has an ability to be a disruptive and innovative starting point for circular economics.

Go to Market Strategy:

NET is going to market for ECOR manufacturing facilities, otherwise known as ECOR Living Factories (“ELF”), in three ways. The first is NET owned plants, the second is a JV with a company or municipality with off-take agreements, and the third is the direct sale and license of an ECOR plant to a customer.

As a product, ECOR is actively being marketed to the following markets: Print & Displays, Retail Visual Element Fabrication, Furniture & Fixtures, Film & Theater, and the Built Environment.

NET is looking for the right level of partnership for manufacturing facilities. Partners must be of like-mind and willing to take on some level of risk as they enter this marketplace together as NET seeks synergistic relationships. NET will bring the technology and know-how while enabling its joint ventures to create a manufacturing facility to take waste and make it into new products. The waste inputs have a typical value of approximately \$45 per ton while the end product can be upwards of \$10,000 per ton (i.e. for signage, displays & furniture).

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Potential Impact:

In the production of ECOR using old corrugated cardboard, for every 100 panels produced we would divert one ton of corrugated boxes from the landfill saving 9 cubic yards of space and 4 tons of CO₂. For every 1 ton of feedstock, 4000 square feet of ECOR at 2.5mm can be made.

Off-take:

Our financial model is growing to full line capacity by the end of year three for each ELF. NET plans to sign off-take agreements for full capacity by the end of first year. These will include

distributors for signs and graphics, building and design materials for local retail, and others to continue to seed the market. Planned off-take is 50% to distribution, 30% to JV partners, and 20% to retail products. The JV partners could include our manufacturing partner as well as a handful of local fabricators and producers that are interested in long term relationships. Companies that can provide feedstock may include waste haulers, large corrugate companies, paper mills, grocery distribution centers, large manufacturers, local farms, etc.

Bringing a New Material to Market: Q&A with Joe Stapley, National Accounts Manager

Joe, tell us about some of the challenges of bringing a new material such as ECOR to market.

If this were easy, it would not be an opportunity...

Working with Fabricators - There is always the issue of replacing materials that are mature in the market, i.e. foam core, plywood, and MDF. Making sure that the fabricator has the equipment to work with ECOR has been a challenge. Fabricators are reluctant to try new materials as they are usually busy or don't want to risk a current job or customer. They don't know how the material will work. How long it will last. So we find sometimes that they either won't

quote a job having to use ECOR or won't risk their relationship with a customer on a new material.

Distribution - Another roadblock to entry with a new material is the need to have distribution. While we have a number of distributors that are excited about a new material, until we have capacity, it only makes sense to sell directly.

Capital - In order to do this correctly, and prove the circular economy is more than just a concept, we need regional plants to start and prove the model. That keeps our capital costs low while minimizing the carbon footprint with shipping finished panels. There is never a conversation where there isn't great enthusiasm; however getting a customer/investor/municipality to truly

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commit has been difficult. Once we find the right fit for feedstock supply, customer and capital, a market can be realized. We believe we have found that recipe for success.

What have been some effective ways of combatting these challenges?

To date, we have raised the working and R&D capital internally through very generous and patient individual and Family Office investors. We have also partnered with a few fabricators and printers that have learned how to use ECOR so when we do have opportunities to help prove the market and use of ECOR, we have shops that can give us quotes in timely fashion. We have also built our own internal fabrication/print capabilities in our plant in Serbia. Where it makes sense, we produce finished products from there.

We have worked with a number of large brands including Avery, General Mills, Schiphol Airport, Levi's, Heineken, Nike, Taylor Guitars, and Sketchers to use their waste to create panels to showcase the future of various applications of the circular economy in action. Whether we are taking beer grain from a large beer company and making packaging and displays from their waste or teaming up with number of small companies in a municipality that is seeking higher diversion rates, ECOR is a natural fit.

We created a customer facing Research and Development Center in Venlo, Netherlands where potential customers of all shapes and sizes can work with us to bring their waste cellulose to create ECOR panels to solve or give solutions for their own circular ambitions.

Is it confusing for potential clients when you talk about the breadth of potential use cases for ECOR? How do you make ECOR relevant to their particular needs?

To simplify the understanding of ECOR, it can be seen as a commodity type panel material to make visual elements that brands are already making with current materials readily on the market. Brands like Patagonia and Ann Taylor sell clothing and other finished goods. Historically, they don't get into the weeds of what materials are used in their visual displays and store buildouts. **We do our best to focus on the easiest path to get ECOR specified into something that is already designed. Once a brand is using ECOR, it is an easy conversation to talk about the future of using their own waste to make ECOR.** All brands have waste that is an issue for them. But we no longer lead with this approach as it takes down the "wait until we can do that!" conversation. In the meanwhile, the store chain is printing thousands of temporary signs on a petroleum based material.

In working with General Mills, it is easy to see that they have waste fiber from their production that can be used in packaging and point of purchase displays. Schiphol had a very specific need for temporary wall systems used during construction as well as potentially in construction. And they had a very good quality waste material that makes for great ECOR panels.

As you've built these relationships, what advice can you offer to businesses that

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are also looking to develop relationships with retail brands and potential clients? How do you find the right teams to work with?

The most important thing to identify in selling anything is who is the decision maker and how does your product help them. We have been incredibly persistent in “showing up” to every meeting, conference, and event where we can meet the right people at brands and companies that could use our product.

Retail is a very specific market with its own set of needs. ECOR is just a part of what Retail wants designed and built. We have had to become like a chameleon in what we offer to stay in the conversation. We do our best to educate on sustainability without overwhelming them.

I think we have become much better listeners in launching ECOR. There is not a silver bullet to solve all the problems of a project. Being a good fit for part of a project has been rewarding.

What has been imperative is the need to be cost competitive. It doesn't matter how great ECOR is if our price point forces it to be engineered out of a project.

What we find is that there it takes dedication and perseverance to find the right partners. We attended and participated with Sustainable Brands for 5 years before they gave us a shot at working with them in a meaningful way. Ann Taylor took 2 years to get out our first order.

With a new material, we need to be in the time frame of when a customer is looking to make

something along with their willingness to allow in a new vendor. In terms of building facilities, we need to find partners that have a waste problem that can understand the value in utilizing their waste, either in monetary or environmental terms

Are there any pilots that didn't go as planned? What happened? Looking back what would you have done differently?

Nothing is dead, however, there are pilots that we have worked on for long periods of time that have not been built for various reasons. Sometimes it is that the partner doesn't want to invest in the necessary R&D to develop their material from ECOR. And sometimes, companies make assumptions that we are further along than we are. They aren't willing to take the risk on a new process and material.

What has been frustrating, which is now shifting to become extremely satisfying, is that ECOR is ready for the market. We have advanced our material variables for thickness, density, size and speed of production. The cost of our facilities have come down by 60% while the capacity of that same footprint has gone up by 600%! We have some testing to do for many markets for this new material; however, there are plenty that can use what we have today. Even these few markets are game changers and disruptive. They are furniture & fixtures, point of purchase, visual elements and decorative wall panels.

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With your experience developing pilots with different industries and different departments, can you share any trends or surprises you encountered regarding attitudes towards sustainability (or lack thereof)?

Educating the customer will not stop even after ECOR is in the DIY retail stores and is a known commodity. As a company, we are just getting started with the materials and products we will be able to make with the ECOR technology. It has been very exciting to see the markets we have focused on turning into real opportunities.

In the past when we have introduced ECOR, there was usually one Champion of Sustainability in an organization. Getting everyone in on the excitement of ECOR is what it takes for a company or organization to make a move. **More and more, we are seeing larger groups within an organization making the leap of faith. This has allowed deeper action to test feedstock (hemp, spent beer grain, coconut, miscanthus), develop material for high volume products (beer case separators, tradeshow booths), and have deeper conversations with municipalities (Los Angeles, Denver, Detroit, Minneapolis, Austin and New York.)**

The tide has turned. “Sustainability” is no longer an eye rolling inducer. The circular economy is real and adds a layer of profitability that currently

doesn’t exist for most entities. ECOR is the catalyst for real growth, people empowerment and real diversion of high energy waste streams.

ECOR has national expansion plans! As you start working with local cities to locate sites, what is your ask of those within Public Works or EDC to help facilitate the scaling of manufacturers and Upcyclers such as ECOR?

ECOR is already an International company. Our HQ is in San Diego, California and we have some of our US team in Texas and Colorado. We also have offices in the Netherlands, a fully functioning manufacturing facility in Serbia, and offices in Shanghai. In addition, we have representatives working at various levels in a number of countries as well. Sweden, Mexico, Brazil, India, Japan, Singapore and Samoa are all countries we are looking into.

Nationally, we are actively working on a short list of cities for our first North American facility. A few of those cities are Los Angeles, Denver, Detroit, Minneapolis, Austin, New York and several cities in Mexico and Canada. Whether it is a plant we will self-fund through our investors or private public partnership is still to be determined. We are confident that once the first plant drops in North America, the rest of the cities we are working with will jump in.

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Author: Joe Stapley, National Accounts Manager, ECOR



Joe is a passionate solutionist in finding connections between industries using toxic materials to build the things they need while looking for an ecofantastic alternative. Joe manages major accounts, is developing distribution, finding Environmental Living Factory (ELF) opportunities and represents ECOR at tradeshow and public meetings. Graduate of the University of Southern California in Business and Entrepreneurship, Class of '92.

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UPCYCLE IT NOW- CLOSING THE LOOP FOR APPAREL BRANDS

UPCYCLE IT NOW- CLOSING THE LOOP FOR APPAREL BRANDS

- Company Overview
- Building Relationships With Brands:
Q&A With Christina Johnson, Creative
Director And Co-Founder



Company Overview

www.upcycleitnow.com

Upcycle It Now is a mother/daughter owned business, born out of a shared entrepreneurial spirit and steadfast determination to become sustainability change agents. The mission of Upcycle It Now is to partner with textile companies to upcycle their textile waste into beautiful, high quality and functional products for the active lifestyle.

The beginnings for Upcycle It Now started after Christina completed her design degree at UC Davis and headed to India for an internship with a sustainable design company. It was here where Christina saw the urgent need for sustainable textile manufacturing and knew in her heart that she had to be part of creating a meaningful change.

Christina's mother, Liz Bordessa, had already developed a successful tailoring and alterations business. During Liz's visit to India, both Christina and Liz saw the alignment between their collective experiences, passion for social and environmental sustainability and the growing

need to address the growing textile waste issue. The idea for Upcycle It Now was born!

Upcycle It Now helps companies bring their sustainability values to life by putting the evidence right in the hands of their consumers via an upcycled product made from the company's own textile waste. The company designs and creates customized upcycled products to not only reflect, but to also extend, their clients' sustainability values. In addition, Upcycle it Now is also focused on social impact by engaging with the local community to build additional job opportunities. All team members are treated with respect and compassion and valued for the truly skilled and talented craftspeople that they are.

Upcycle It Now's relationship with partners varies depending on the partner's needs and access to their post-consumer material. Predominately, and as is the case with the company's main partner Patagonia, Upcycle It Now takes used post-consumer products or promotional material that

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the partner collects to the Upcycle It Now facility in Long Beach, California. At the facility the recovered material is cut, washed and sewn into a new product. Product designs are developed over time with the partner to ensure the products are brand aligned and speak to their audience. Once a production run is done, items are shipped back to the partner's stores or distribution channels. The partner then sells these products made out of post-consumer waste as co-branded

pieces made by Upcycle it Now and the brand partner.

Upcycle it Now's goal is to be a change agent for the textile industry. The company believes in the power of business for good and is guided by the core principles of fostering ideas, people, and partnerships. The hope is to inspire the entire textiles industry to embrace upcycling and take steps to create a more positive social and environmental impact.

Building Relationships with Brands: Q&A with Christina Johnson, Creative Director and Co-Founder

Describe your organization's mission and how it relates to supporting market demand for recovered material

Our mission is to "Support manufacturers in creating a second life for used or unwanted textiles by designing and producing beautiful, high quality and functional products, while providing local skilled jobs for our community."

It was incredibly important to us to add "beautiful, high quality and functional" to our mission statement to describe the products we wanted to make. We didn't want to just make upcycled products. These products had to be able to compete with any other product on the market in terms of aesthetics, quality and function. They had to be desired by the consumer and they had to be useful otherwise they would still be trash.

By doing this we show that an upcycled product isn't just a feel good purchase that you stuff in the back of your closet, it is a durable favorite piece that speaks to your values.

Wastefulness is similar to a pet peeve but much more intense for us. We built this company because we cannot stand to see quality materials thrown away and lose all their value.

What material do you work with? How do you manage logistics and supply?

Upcycle it Now works mostly with post-consumer textile waste, some pre-consumer textile waste and promotional street banners. By reusing these materials we are keeping quality product in the market and reducing the extraction costs of virgin material products. We primarily work with partners that have an established take back

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program or we work closely with our partners to help them begin a take back program. We stay in very close contact with those that run the take back programs and are in constant communication about where material quality and quantities are at.

I think it is important to remember that repurposing materials is in no way a new concept! We are just pushing to bring it back into the forefront at a time when we have steered too far into a linear, disposable culture.

What has been your impact thus far?

We have diverted around 40,000 pounds of textiles and street banners from the landfill. This equates to thousands of garments and hundreds of street banners.

Best Practices for Partnerships

Christina, tell us about the development of your relationship with Patagonia. How did it begin and was there a pilot or test stage?

Our relationship with Patagonia started in a very serendipitous way. Liz and I attended a speaker series at FIDM in LA that included Elyssa from Patagonia's environmental team. She was speaking about their Common Threads Initiative (now Worn Wear) and how they encourage their customers to send back end-of-life product so that they can find a responsible way to recycle it. We connected at the meeting and started visiting their offices in Ventura. We went through a long testing phase. They would send us

materials, we would brainstorm what we could do with it, make samples, and then go the offices to present them. We went through several iterations and some small runs in the stores before we landed on the products that we continue to create today.

How has this relationship progressed?

In the beginning we were creating small runs of no more than two hundred pieces or so a couple times a year. They were test pilots to demonstrate the products viability. In 2015 after working more closely with their sales team we created the travel pouches which took off. With that product we began fulfilling orders in the thousands a few times a year and now are at 5 times that rate.

When you think about your partnerships with other brands, were there reasons this relationship with Patagonia became so successful while others did not?

The main advantage Patagonia has is pre-established reverse logistics. They already had a system in which they collected, sorted and stored their take back products. When we came in we were helping solve a pain point by creating another avenue they could send stored product and have it responsibly recycled. The reverse logistics aspect is a huge hurdle for most brands as it takes lots of space, time and coordination.

What would be your advice to entrepreneurs that want to provide

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sustainability solutions to brands? Are there are ways to establish credibility and structure a partnership to allow room for trial and error and also future scale?

I would tell other entrepreneurs to really look at how they can solve a pain point for a brand. Go for something that the brand actively wants to solve already. **It is hard to ask a brand to take another project onto their plate but if you are part of the solution to something they have already deemed as important then it's an easier transition.**

To me the second part of this question really depends on the brand and who you work with within that brand. I feel it is key to either have leadership buy-in to give you the room to test and work together to figure out the perfect fit. Or it is key to work with a department within the brand that has a certain amount of autonomy and ability to see the trial process through.

What would you tell larger brands that are exploring working with entrepreneurs? What factors should they take into account? Can sustainable materials management be a profit stream for them?

I would tell brands to look for entrepreneurs that are unwavering in their commitment to the bigger cause (ie. reduce waste, fight climate change) but are flexible and adaptable in how they will do this within their business structure. **Introducing sustainable practices is a fairly large deviation to how we've been doing business for the last**

century, it takes time to find the right fit and reiterations of the process are important.

I think materials management has always been key to profit to a certain extent but as we moved to mass production and gained price reductions due to economies of scale we were accepted larger and larger amounts of waste as a 'natural' byproduct. **I think that type of thinking is changing right now and companies are finding that they can realize tremendous cost savings with the proper management of their materials, especially cutting down pre-consumer waste.** Recovering value from used and post-consumer materials is growing but has a few more hurdles than reducing pre-consumer waste.

Material and Design Learning's

Through your company, you've really been able to understand the challenges around deconstruction in fashion. Are there some key aspects that designers should think about when creating their product design?

First and foremost it is important to design for a certain amount of durability. Quality fabrics are important if the item is going to be repurposed and if it is going to last.

What are some of the most challenging materials or designs to re-work?

It is very difficult to work with fast fashion and low grade fabrics. If the material barely served the original garment (i.e. it fell apart after a few wears and a wash) then it is difficult to make a new product of quality that you can confidently put out

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to the market. If it is designed to be disposable, then it is hard to recover.

How would you teach for the design of products in a circular economy?

I would encourage a constant conversation between product designers and recyclers and upcyclers. Every material has certain features that are only realized at the end-of-life and there are features that might be difficult to see in the end-of-life phase that the original product designer can help the recycler or upcycler with.

What are your largest barriers to scale? Do you see policy as a tool to drive further industry growth?

Our largest barrier is collection and sorting of used materials. It is getting the right materials to the right upcyclers and recyclers who specialize in recovering those materials. Currently the cheapest and easiest stream for used materials is the landfill. I believe that the companies that are producing mass amounts of disposable products are not currently paying the true cost of landfilling tons of material. Policy could help tie the end-of-life costs to those that produce them and spur responsibility for material recovery.

Author: Christina Johnson, Creative Director and Co-Founder



Christina was raised in her family's tailoring and alteration shop learning to appreciate and love textiles at a young age. Passionate and resourceful, Christina is determined to galvanize the textile businesses and consumers to embrace upcycling and inspire them to make a positive environmental impact. From her roots in alterations to her growth into manufacturing, she sees our existing used textiles and clothing as resources just waiting for a meaningful transformation.

A photograph of three people participating in a ribbon-cutting ceremony. On the left, an older woman with short white hair and glasses, wearing a dark blue blazer, holds a large pair of black scissors. In the center, a man in a dark suit and tie is smiling. On the right, a man with a beard, wearing a light blue button-down shirt, is also smiling and holding the red ribbon. They are standing in front of several large, cylindrical rolls of a light-colored, textured material, possibly insulation or a type of fabric, which are stacked on a wooden pallet. The background shows a clear sky and some greenery.

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