

Supply Chain 2030

Benefits:

- Fully Circular Supply Chain
- +200bps increase in total retail margin
- >30% reduction in retail inventory
- >20% reduction in System Waste
- Eliminate need to Air finished goods
- Stand up advance manufacturing Onshore (10% of total demand)
- Collect, Sort, Refurbish and recycle

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Supply Chain 2030

If we knew then, 1990's, what we know now we would never have built the global supply chains the way we did. It's not that the current Supply Chains are bad, far from it, the supply chains today are more capable than at any time in history and will remain the mainstay of the apparel supply base, they are simply incomplete. Our relentless obsession to chase low-cost Goods, at whatever quality level is required, which we equated to low-cost labor, blinded much of industry to the real objective of driving profitable sales & sustainable growth.

We compromised on so many things in that collective race:

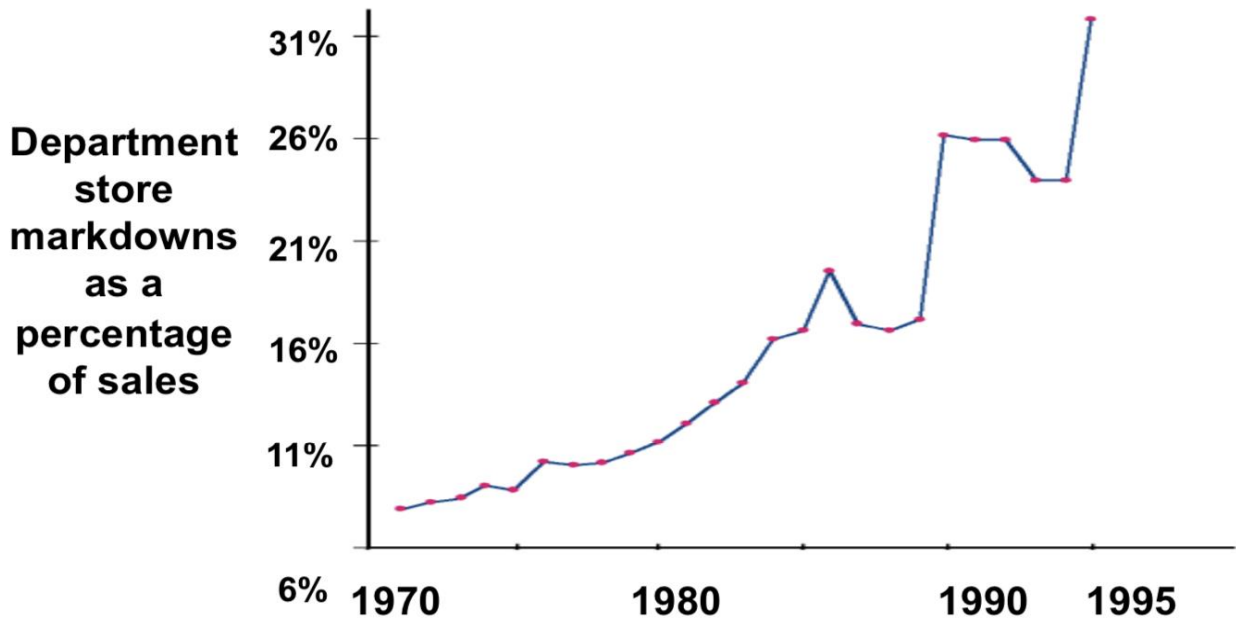
- We moved away from the consumer by adding months to the product development and manufacturing processes
- Friction was added at every part of the process through Agents, Importers and, sometimes, retailers own field supply teams.
- Supply chains didn't just move further away from the EU and US consumer, they fractured and splintered across the world.
- Long lead times and fictitious terms like MOQ's, forced the dumbing-down of demand and supply planning tools. Retailers attempts to capture every sale, often resulted in overbuying by up to 25%, the second largest contributor of apparel waste, landfill and a Brands Carbon footprint.
- Overbuying resulted in deep and continuous discounting which created a consumer culture of Bargain-only shopping, driving a shift away from full price retail, shrinking margins and an accelerating race to the bottom. (See Chart Below)
- Supply chains that were never built to respond to upsides on winning styles result in lost profits and declining customer loyalty.

Note: Interestingly too few companies accurately track lost sales, mainly because it's a more depressing metric than markdowns, but also because so few people understand how it can be addressed, except by airing goods and as the saying goes; "You can't claim to be a sustainable then air your goods"

- Knowledge loss. Brands and retailers have few people left that remember how innovation centers, collaborative Design centers, manufacturers, mills and spinners work. The, now traditional, retail teams one-or-two-week trip overseas into a

prepared and well-orchestrated environment has only accelerated that knowledge bleed.

- Real time collaborative innovation and design was lost resulting in the transfer of innovation ownership from the retailer to the supply chain.



Note: As supply chains lengthened the need to forecast over longer periods resulted in less accurate purchasing and increased markdowns & loss full price sales. However only Markdowns are captured in above chart.

It may be an age thing:

If you are under 45 years old, you will probably read this and scratch your head wondering what is this person talking about? *“It works, it has always been like this, yes it’s not perfect but our finance teams have built in all the appropriate markdown and liquidation allowances to achieve our maintained margin targets”.*

However maybe, just maybe, the more recent supply and inventory swings from Excess to Famine to extreme Excess and the rise of ultra-fast fashion brands make more retailers question the old model.

It wasn't always like this!

Before Jet Lag, early morning or late-night calls, FX rates and interpreters there was a time where product was designed, sampled, consumer tested, produced and consumed all in the same country or region. People spoke the same language, manufacturers and factory staff were also consumers, everyone had similar vacation times, communication was in real time in a single time zone, no agents, few material importers, it was all Point to Point with the minimum of friction.

Back then most of a product was produced “to-demand”, requiring agility across every discipline. Retailers would provide rolling projections, calling off inventory on a weekly basis against actual sales, the term MOQ hadn't yet infected the industry. Suppliers would keep small amounts of finished goods inventory to immediately dispatch against a retailer's weekly call offs. Suppliers would then cut, sew, pack and replenish that inventory by the end of the same week, or shortly thereafter. Back then design concepts to production-ready-samples was measured in weeks not months. Back then retailers would never have accepted 3-to-6-month PO-to-delivery or 10 weeks of “target” on-hand DC inventory with only 2.5 – 3.5 actual turns a year.

Note: for those that think they have solved for Speed and agility by using airfreight, think again. Airfreight is one of the single largest contributors to a products carbon footprint, 40X to 50X higher than sea freight and often larger than the consumers post purchase carbon footprint, increasing the total carbon footprint of an item by >30%. Even for those who don't think the consumer cares about environmental impact, ignore at your own pearl, as governments start to impose Carbon Taxes on goods that don't meet the same requirements they impose on their own domestic industries as they all head to Net Zero.

Note: See EU's Carbon Border Tax: Testing in 2023 with full implementation expected in 2026. Expect USA to follow under a Biden Administration.

Just to be clear; that “old” world was far from perfect with most Brands, retailers, spinners, mills and factories today being much more capability than those that existed back then.

The challenge is **not** with the individual players but with the outdated planning tool set, 1st cost focus and missing supply components that would address many of the challenges & opportunities Retailers, Brands and the supply chains have been looking for.

In addition to the current, capable, global supply chains there are 5 complimentary components that would substantially improve retail margins (+200Bps), lower inventories by >33%, free up cash, all but eliminate apparel waste and respond to consumers with a new level of speed, agility, personalization and customization.

The 5 Components:

1: Multi Dimension, Dynamically Optimized (MDDO) Planning tools

2: Retail Market situated Manufacturing “Eco-Parks”

3: Vertically Integrated Mass Regeneration Zones

4: Ground to consumer transparency & traceability

5: End-of-life Carbon Capture

The focus of this document will be on the interplay between the core, current, supply chains, and components 1, 2 and 3 of the above. There is already significant work underway to address both the Digital and Physical flows of Component 4. Component 5 may be some way off depending on the speed at which legislation that taxes retailers / manufacturers on end-of-life Landfill is introduced, but work has started with companies like “Earth Protex Platforms”

Clearly there are many other areas the current supply chain, machine manufacturers, innovators and retailers are working on that I don’t refer to as that work is well underway. Many of these are now base-line requirements for reputable players.

- Shifting to renewable energy and moving away from fossil fuels
- Products made using recycled materials and components, where possible
- Recycling Manufacturing waste at the local level
- Product Designed to minimize waste and maximize recycling
- Core items developed to last longer through better quality materials and processes
- Seasonal Fashion items that are developed for shorter life and recycle ready

1: Multi-Dimensional, Dynamically Optimized, Planning

Multi-Dimensional: Factors in time, cost and risk across three dimensions of Offshore, Near-Shore and Onshore manufacturing. Manages across at least 2 Levels of Supply, Garment assembly and Raw Materials

Dynamically Optimized: considering all the dimensions it is dynamically adjusting order quantities and multiple nodes, recognizing which factors are adjustable and which have become fixed. Eliminate PO's, *Purchase Orders*, and move away from fictitious MOQ's, *Minimum Order Quantities*, to more efficient OOO's, *Optimal Order Quantities*.

A planning tool that optimizes the flow of the same style from Off-Shore, Near-Shore and On-shore facilities in order to maximize each programs profitability. Maximum profitability, minimum inventory and zero waste is only achieved by the Dynamic use of all models (Dimensions). Without this tool the Eco Parc, On-Shoring, becomes nothing more than another example of an expensive failure. This is Step 1.

Most AI planning models are improving consumer demand sensing but still inform a Linear Physical supply flow, often a single supply chain per SKU. These were never built to react to dynamic consumer demand signals.

An MDDO Planning tool supports multiple flows for the same SKU where each flow has different elements of Time, Cost and OOO's.

The On-shore Eco Parc becomes the primary enabler to test consumer trends and a first responder to upsides, without the need for taking inventory risks. Offshore is still the mainstay of supply.

MDDO Planning also addresses the, often, ignored environmental and social impact of the traditional planning models.

- 20%-25% waste create at the point the PO is written
- Excessive airfreight during periods of marginally higher demand

- Lost wages and unemployment when demand slows marginally
- High Overtime when demand improves slightly.

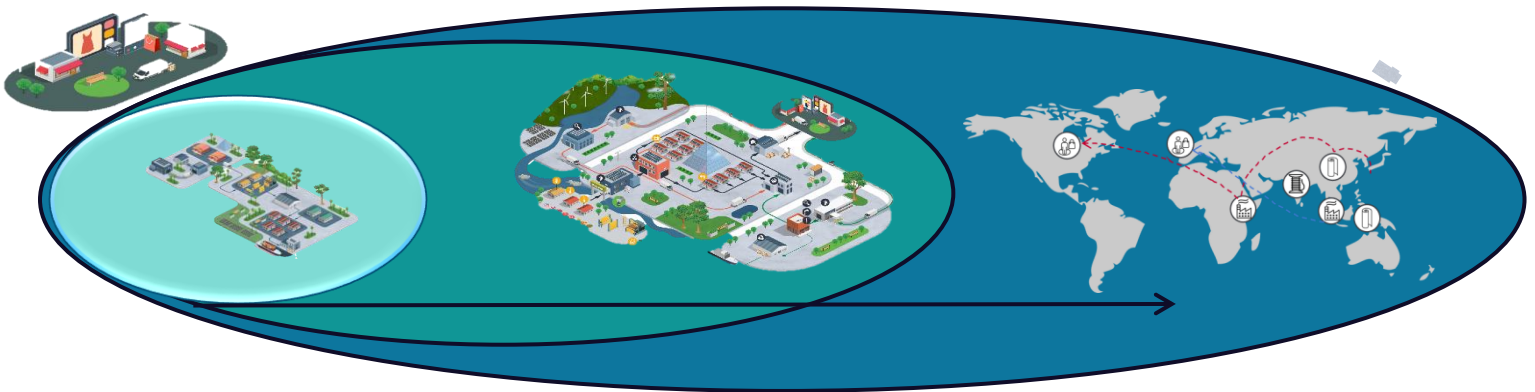
Note: a 7% change in demand results in the next PO either being doubled or cancelled.

These last 2 bullets are one of the reasons more and more suppliers are turning their attention to Ultra-Fast Fashion brands. Their order flow remains relative constant regardless of demand fluctuation.

On-Shore
Express

Near-Shore
High & Fast

Off-Shore
Low & Slow

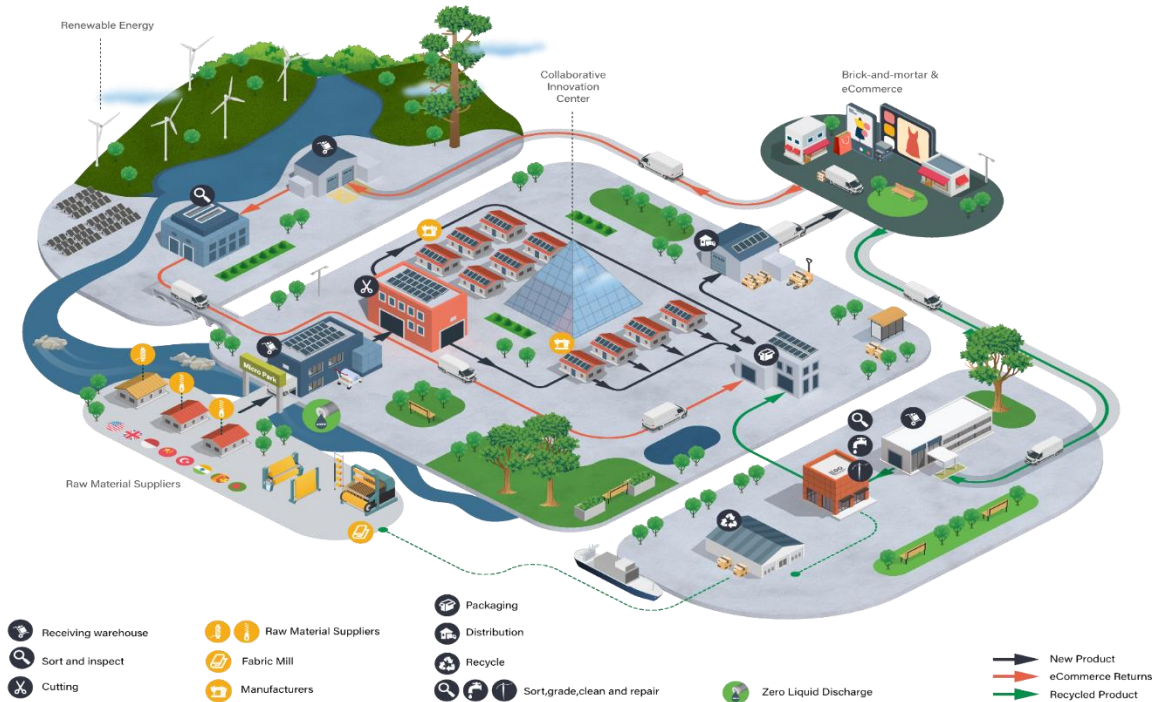


	Onshore	Nearshore	Offshore
Cost	\$\$\$	\$\$	\$
Inventory	Zero	Medium	High
Full Price Sales	High	Medium	Low
Lost Sales	Zero	Low	High
Markdowns	Zero	Low	High
IMU (Initial Markup)	Low	Medium	High
Program Profitability			

Critical Enablers of MDDO tool

- Same supplier, or partners, operates across all 3 flows for a single style.
- Same style can be produced across all 3 flows
- Eliminate MOQ and use OOQ, “Optimal Order Quantity”
- The tool must be able to plan & position at the Material level

2: Retail Market Eco-Parc:



When retailers, suppliers and innovators work together, not only do Eco Parks solve many of the historical opportunities, but they also address two of the newer supply chain needs.

- E-Com returns, refurbish and resale
- Used apparel: Mass acquisition, sortation, refurbishment, resale and recycle

The following pages look at the individual capabilities, shown as Islands, and their value.

Lower Left-Hand Island: Represents the flow of raw materials to the Park from different countries around the world.

Large Central Island: The primary manufacturing flow. Including the Innovation, Design and collaboration center (Pyramid)

Upper Right-Hand Island: The consumer Point of sale through whichever mechanism they choose.

Top Left-Hand Island: E-com returns, refurbishing and prepare for resale.

Lower Right-Hand Island: Used clothing sortation, cleaning and prepare for resale or segregation for 3rd location resale and transfer to the mass regenerations zones.

Primary Production Flow



This visual represents the primary production flow for new products.

Working from Left to right.

Blue Building

- Represents a single goods-receiving warehouse. Fabrics, trims, etc for all manufacturers would be stored until required for production. By leveraging a common warehouse, it reduces lost production space in individual manufacturing units, increases the level of specialization within the warehouse and lowers the overall operating cost for each manufacturing company, lowering cost of goods.
- A common warehouse also allows Retailers to preposition materials for test and react where the material may be used across multiple styles and manufacturers.
- Allows the positioning of commonly used core materials in greige or PFP that can be pulled for use by either retailers or manufacturers as required to test or react with new styles, print or color trends in days not months

Coral Building

- Represents a single Cutting, Digital printing and Pre-Production facility.
- By leveraging a common set of advanced preproduction assets, it is possible to ensure the latest equipment is available to everyone while lowering the overall cost of investment for any single supplier
- Leveraged assets have higher aggregate utilization, faster ROI
- This environment benefits the preproduction equipment manufacturers. It creates a single location to engage multiple retailers and manufacturers in future developments.

Multiple Sewing Units

- Represent the individual suppliers sewing units.
- Each Strategic Supplier would have a facility within an EcoParc. This ensures continuity and seamless flow of technical data between On and Offshore facilities.
- Set up for Unit-of-one up to small batch production
- Set up to maximize agile automation.
- Individual suppliers' specialization can be leveraged by other suppliers in the Park.

Right Hand Side Grey Building

- Represents a centralized finishing facility.
- Laser and wash finishing assets would be housed in a common location. Increase specialization, lower cost, Higher ROI.
- Specialized skillsets concentrated across all suppliers.
- Final item packaging. Focus on automation and common recycled materials across retailers.

Upper Right Grey Building

- Centralized finished goods warehouse and packing facility.
- Pick and Pack for both Store and consumer direct.
- Common set of recycled packaging for all retailers. Individually Branded
- logistic runs from the Eco Parc are higher frequency and for multiple retailers / Brands.

Primary Objective:

- Assort, test and read new styles in a few days by developing and producing local to Consumer.
- “Read-Data” becomes the Planning teams primary data source to signal and refine demand using MDDO planning tool.
- Eliminate overbuying for upsides. EcoParc reacts to upsides on winning styles.
 - Make to-Demand
 - Lower inventory
 - Lower markdowns
 - Higher full price sales
- Pulse new fashion more frequently to engage the consumer.
- Respond to, or trigger, social media, Tik Tok type, trends

Secondary Value:

- Customization and personalization. Make to-Order.
- Test environment for new designers that cannot access large scale manufacturers
- NFT to Physical apparel production

Key Model Changes:

Retailers

- Implement MDDO Planning tools, (Page 6). Lower IMU%, Higher MMU%.
- Collectively position and own basic materials.
- Individually own unique materials
- Commit to Eco-Parc capacity.
- Where possible agree to common sustainable packaging and distribution

Suppliers

- Own replenishment level supply planning. Optimize across Eco-Parc and offshore flows.
- Leverage capacity across peers to reduce peaks and troughs
- Leveraged warehousing, cutting, additive manufacturing and Distribution. Spread investment costs, increase specialization.

E-Com Return, Refurbish, repack and reflow.



Primary Objective

- Collect, repair, refurbish, clean and repack E-Com returns then send back into the new product flow.

Key model changes

Retailers:

Eliminate friction from product acquisition, lower logistics carbon footprints

- Agree to collectively leverage reverse logistics, both directly from the consumer and from stores. All delivery vans are collection vans for all retailers and Brands

Suppliers:

- Repair on e-com product as required.

Sortation and Re-sale, recycle (Lower Right Hand Island)



Primary Objective

- Collect and Sort 3 levels
 1. Resale Onshore: Refurbish, clean, pack and distribute.
 2. Resale Offshore: Sent to the right offshore markets for 2nd life
 3. Unusable apparel is sorted to pass directly to a Mass Regeneration Zones.
(See Mass Regeneration Zone: Page 14)

Key model change

Retailers:

Eliminate used goods acquisition friction and lower transportation carbon footprint.

- Agree to leverage reverse logistics, both directly from the consumer and from stores. All delivery vans are collection vans
- All retailers collect back any retailers Brand used product.
- Create a common credit token across Investor Brands to remove consumer friction.

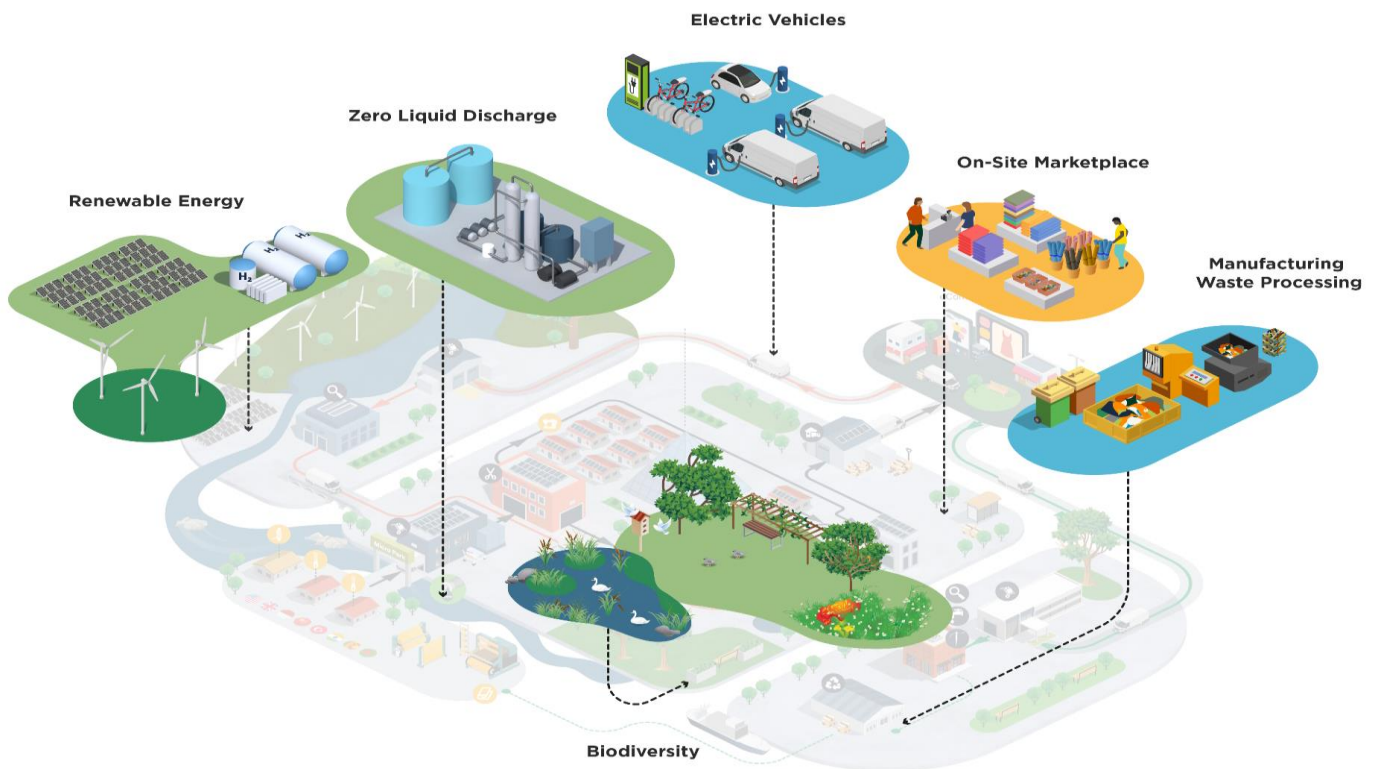
Suppliers:

- Local repair any lightly used, product.

Potential trip points:

- As Recycling scales, it is important that we do not circumvent the opportunity for a product to have a 2nd life in order to supply recycling centers with feedstock.
- ***“Don’t move waste to the recycling centers. Move the recycling centers to the waste, the waste is there for a reason”*** Do not disrupt natural used product flows. A substantial amount of European apparel waste flows to Pakistan and West Africa. There is a positive aspect to this in that 60% is purchased locally having a 1 to 2 year 2nd life. Diverting these flows to other manufacturing locations, simply to feed recycling centers, substantially increases the industries Carbon footprint.

Sustainability built into every aspect of the Eco-Parc



Key Elements:

- 100% Renewable energy
- Increase Biodiversity
- Zero Liquid Discharge
- Pre & Post Manufacturing Waste 100% Upcycled

- Engage local community through a Marketplace that offers excess Material and Trim to artisans and crafters.

Innovation, Design and Collaboration Center



An environment where retailers, suppliers, advanced machine manufacturers, academia and innovators work together to address both retailer specific, as well as industry wide, opportunities. Need to strike balance between Brand IP & competitive advantage versus collaborative efforts.

4 Key Elements:

1. Collaborative Design space for retail / Brand design and development teams to work with their suppliers in real time. Connect with regional centers using AR and VR
2. Advanced machine and process testing center where Machine Manufacturers, Innovators, Retailers, Suppliers and Academia work together, in real time, to address unique or Industry level opportunities

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3. Innovation Incubator that attracts and supports startups solve for both White & Black Swan opportunities. Seed the innovator community with opportunity statements. Incubate, test and launch the best solutions.
 4. A collaboration center for likeminded groups across the industry.

Mass Regeneration Zone:



A unique opportunity for apparel Brands, recyclers, manufacturers, academia, governments and special interest groups to rally together to address the environmental devastation being caused by the dumping of used apparel in developing markets around the world

I applaud all the great work the industry is doing to tackle climate change and our environmental impact. However, as good as these individual efforts are, they are always diluted by the lack of scale any one Brand, retailer, manufacturer, region has. If the

Industry is going to scale these efforts it will require everyone involved in the value chain, from the ground to the consumer, Design to Store, to work together to tackle climate change and our environmental impact. Governments and regulators need to encourage, demand!!, the industry **to collude and conspire against climate change**, removing barriers and legislation is in our way.

Tackling climate change today is like a race between a Sports car and a collection of push bikes. Climate Change sits in the sports car powered by many decades of ignorance. None of us deliberately set out to damage the environment, we simply never understood the long-term impact of our actions. However today we do! and now that we do, we are individually, or with a few supply partners and peers, trying different approaches to reduce and our impact. Our efforts, as good as they are, can be compared to each of us on bicycles chasing that sports car. No matter how good each bicycle is, how heroically hard we peddle or how many bicycles there are, the Sports car will continue to accelerate away. Only by working together to focus our efforts do we have any chance of slowing the impact and, maybe one day, reversing it.

Other industries have shown their businesses can be fierce competitors around product and brand yet be formidable allies when fighting against climate change. The food and Beverage industry have shown its possible to be both a competitor and partner at the same time.

In a few cases some industries initiatives and government policies are having the opposite effect to the one intended. Collecting back used apparel, donating excess inventory is great. However, passing this off unsorted to traders for resale around the world, simply push the problem into less regulated environments, with serious environmental consequences. Or disrupting the natural demand for 2nd hand, usable, clothing in developing markets in order to feed commercial recycling units in developed markets, which shortens the lifespan of products that may have stayed in circulation for years.

What I don't believe we need is anymore Philanthropic Funds to be established to support the Industries efforts. IN the 1990's when manufacturing shifted from the US and EU into Asia, there were now fund created to support this. What drove it was Retailers and Brands drive for low cost goods and a willingness to take risk by placing their US\$ Billions of PO's into a new region. I would ask all retailers and Brands to make that same shift now and

place PO's against the new circular models rather than marketing the fact they have given a few US\$ Million to a fund but continue to place PO's to the old model.

I have spoken with many recycling start ups and suppliers who call out this discrepancy. There seems to be no shortage of financial institutions willing to support these new models but question why some retailers and brands don't place orders or simply declare an intent to use.

Impact by the Numbers:

- 92 million Tonnes of apparel waste each year
- Equivalent to one garbage truck of apparel going landfill every second



- Only 12% of used apparel is returned for recycling.
- The 12% that is returned is often sent to the markets in like Ghana, Pakistan, Chile and others around the world. +40% is un-sellable and goes directly to landfill with the balance 60% having a positive 2nd life but eventually ends up in their landfill.

By establishing Mass regeneration Zones in these countries there is a unique opportunity to close the loop on a new supply model, one that along with the core supply chains and Eco-Parcs becomes the Blueprint for future sustainable supply chains, not just apparel

The West Africa region contains almost all the attributes required to make this successful.

1. Leverages the natural flow created by the local consumers demand for Europe's used apparel. The eventual waste is simply a commodity waiting to be used.
2. Produces 5% of the worlds raw cotton supply, key input for strengthening recycled yarns
3. Labor force to compliment automation in the sortation processes
4. Large scale investment in sustainable industrial Parks is already underway
5. Proximity to Europe, 10 days sailing either direction
6. Deep water port infrastructure in place
7. Governments eager to incentivize industry to come to the region

Prior to the pandemic many apparel retailers, manufacturers and mills had visited the region and started to draw up plans to open the region as an apparel manufacturing location. The pandemic slowed this work. As we emerged from lockdowns and start to look forward there is a renewed interest in the region.

The vision for a West Africa Regeneration Zone compliments the more traditional, job creating, apparel manufacturing industry. But by adding a new step in the process, the breakdown of the apparel waste polluting the region, mixed with local cotton, into new fibers and materials does not only create new high value jobs, it would accelerate the original objective by attracting the investments of manufacturers and Mills who are also on the sustainability journey.

In a world where retailers and brands have 30+ low-cost countries to choose to manufacture or are looking at opportunities to set up on-shore manufacturing, (See Eco-Parc), establishing West Africa as one of the world's largest apparel recycling center creates its reason-for-being and ensures long term growth.

Mass Regeneration Zone

The following pages we will look at each capability (Islands) and their value.



innovation and collaboration center” (The Pyramid)

Upper Left-Hand Island: Local Cotton production using regenerative farming techniques. Cotton is produced with full transparency and traceability through the Global Cotton Clearing House tool.

Main Island: With a local commodity input this Island represents the new product flow. Spinning, Weaving, Knitting, Dying and manufacture of new product to supply retailers around the world.

Right-Hand Island: Recycled Yarn, Fabrics and finished goods Exports to the rest of world.

Circularity Innovation & Collaboration Center



An environment where circular startups, designers, suppliers, advanced machine manufacturers, academia and special interest groups can work together to address both specific and industry wide opportunities.

4 Key Elements:

- Design space to develop and test recycle ready product
- Advanced manufacturing testing center where Advanced Machine Manufacturers, Recyclers, Suppliers and Academia can work together in real time to test new methods.
- Innovation Incubator to attract and support startups working on recycle solutions
- A collaboration center for likeminded groups across the industry to meet and discuss current Challenges, gaps, JV opportunities. This becomes the Dynamo at the center of apparel recycling.

Where the diagram above represents the end state vision, with significant investment required, an initial step would be to have Brands & Suppliers incentivize innovators to develop solutions to consume their apparel waste readily available in the region. One such innovator, already producing a key recycle yarn for Nike has already visited and is eager to scale their technology. Recycled yarn could initially be exported around the world as the demand for it is now far exceeding the demand for virgin commodities. As soon as a sustainable and scalable supply of these recycled materials are available the vertical supply chain would rapidly stand up.

The demand and opportunity for the apparel industry to address its environmental impact is real and waiting. Only by working together, scaling our efforts will we have any real & meaningful impact.

