LEADING CIRCULAR 2021

The Climate Crisis, Carbon and Circular

DECEMBER 2021
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Climate change is the largest existential crisis facing humanity.

We hear these words everywhere now. They are in headlines, podcasts, reports, and are even being adopted into the plots of blockbuster movies and TV dramas. The crisis feels too big, too complex, and too far gone but it is those feelings that create a bigger threat. The invisible power of fear deludes us into believing that we do not have choices - that as individuals, as communities, and as business leaders, we cannot change.

That is only as true as we choose to make it.

At the core of the climate crisis is the emission of greenhouse gases into the atmosphere. The science is explicit. Carbon exponentially increases the planet’s temperature. The recent IPCC report urgently calls for the reduction of human created carbon. It’s not complicated.

It is, however, hard. It will require sacrifice. Businesses will have to invest more and take less profit for a period of time. We will all need to lead differently and to cede power to those who have been systemically cut out of opportunities to lead. Our shared values and our capacity to be accountable to each other and to the next generation will be tested. There are no more urgent choices than these. We are simply out of time.

It is this urgency that frames the Leading Circular 2021 report on The Climate Crisis, Carbon and Circular. For six years, we have pleaded, cajoled, coached and done everything in our power to convince brands to adopt circular strategies. This year, our desperation is going to show. We made a decision not to sugarcoat anything anymore. We asked people we respect whose voices have not been heard or heeded to speak plainly and freely, to hold us all to account for our actions and inactions. Every word and thought shared is animated by a
deep and abiding love for this planet. We invite you to listen to each of the women who contributed to this year’s report through that lens.

We’re also asking every apparel and textile brand that makes products to commit to a meaningful change. We founded The Renewal Workshop to transform the apparel and textile industry from linear to circular. We offered a new business model based on the concept of displacement. Utilize the products already produced instead of making more carbon by creating new ones. This year’s report includes new research on the carbon reduction that displacement generates. Please don’t just read the research and put the topic up for discussion at your weekly leadership meeting. Make a decision. **Our challenge to every brand that creates products is to adopt renewal and resale as one part of your carbon reduction efforts. Commit to displacing 10% of your new production over the next 5 years and invest those resources into renewal instead.**

The transition of our industry to circular is too slow and too incremental. It doesn’t have to be. There are a number of amazing companies ready to support brands willing to make meaningful commitments. The brands that make the products that drive this economy have the power to reverse the largest existential crisis facing humanity.

Use it now.

None of us have another minute to wait.

*Nicole and Jeff*

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**Land acknowledgment**

We acknowledge that our work is only possible because we had access to land upon which to build our business. In Oregon, The Renewal Workshop occupies the land of the Confederated Tribes of Warm Springs, Grande Ronde and Yakima.
WE CANNOT RECYCLE OUR WAY OUT OF THE CLIMATE CRISIS

By Ayesha Barenblat, Elizabeth Cline and Chelsey Grasso, re/make

The climate crisis is here and fashion brands (responsible for between 4% and 8% of carbon impact) are struggling to tackle the problem. It’s not hard to see why: Fashion is built around churning out disposable trends. It will take bold collective action to transform the industry into one that can sustain life on our planet, all without losing the creativity and self-expression of fashion, not to mention the jobs fashion provides around the globe.

The good news is that circularity, namely the reuse and refurbishment of clothing, is a powerful opportunity for fashion to tackle climate change. Unfortunately many circularity efforts today are one off sustainability “initiatives” and misleading marketing tactics. These incremental efforts will simply not get us to where we need to be. According to McKinsey, the industry’s current carbon reduction efforts will curb emissions by exactly zero between now and 2030.

For example, H&M advertises their clothing take back programs as a part of their circularity efforts, yet the volume of virgin production being put out by them remains staggering. Like buying carbon offsets, take back programs have become a way for fashion brands to co-opt increased customer interest in sustainability without making real changes.

Circularity can have real and massive benefits to the environment, ones that far outstrip brands’ current efforts. McKinsey estimates that circular business models, including rentals, resale, repair and refurbishment could enable the industry to cut around 143 million tonnes of GHG emissions by the end of the decade. The potential is there but what we need is a fundamental shift in business models.

To start, fashion simply cannot view reuse and circularity as an additional revenue stream to
their main business of selling more and more clothes every year. Currently, the circular economy is running parallel to the linear economy, not replacing it, resulting in limited benefits.

Today the circularity data shared by brands is not that helpful. At Remake we would prefer to see how much of what is taken back is reused and actually recycled? How much energy is consumed in these recycling efforts? And is the year over year volume of virgin products and natural resources decreasing for companies that pledge to be more circular?

Today every fashion brand points to market demand needing to drive investments in circularity. The climate crisis is upon us and waiting for customer demand is flawed reasoning. We need bold leadership from fashion brands and policy makers alike to divest from linear production to circular production. Unless we replace linear income with resale and refurbishment business models, we will not get where we need to be.

Moreover there is a clear pecking order to the sustainable potential of circularity. Reuse, repair, refurbishment and otherwise extending the life of clothing is absolutely far and away the most sustainable option, and yet far too many brands are starting their circularity journeys with recycling. Today textile-to-textile recycling, while innovative and exciting, has high energy and resource consumption impacts. We need better data around how much water, carbon and other inputs the industry will gain from textile-to-textile recycling compared to virgin resource consumption. In general, brands have to stop taking the low-hanging fruit of recycling and work towards the reuse and product life extension aspects of circularity.
The LCA data on fashion rentals is currently incomplete. The main concern with renting fashion comes from the carbon impact of shipping clothes back and forth and dry cleaning, as well as the chemical toxicity associated with some types of dry cleaning. If consumers move away from buying clothes to keep and towards renting large volumes of trendy clothes for short periods of time, that will actually drive up their carbon footprint. However, if consumers replace one-off consumption (including items like maternity clothes and kids clothes that people inherently grow out of) with rental, this would have net positive impacts. We simply need better data before we advertise rental as a circularity solution.

For us at Remake, circularity is just a rebranding of commonsense. Our planet cannot sustain the volume of throwaway fashion we are currently churning out.

We know that reusing and wearing our clothes for longer is the most time-tested sustainability strategy we have. This is why our community of conscious citizens takes the #nondnewclothes pledge each summer for 90 days. Together we spend that time and money we save by buying nothing to focus on our communities and repair the clothes we have. This year our 1,297 pledge-takers saved 18,587,740 gallons of water, prevented 7,187,434 pounds of CO2e and 7,187,434 pounds of waste.\(^1\)

Our community reports that this break from fashion leaves them happier and better connected with what they already own. This is a part of the cultural shift we will continue to tirelessly work on while advocating for brands and policy makers to stop the madness of rampant overproduction.

Learn more about re/make here.

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\(^1\) Calculated using data from Deloitte Christiansen and World Wildlife Fund
Brands can achieve an average reduction of 51.5% in carbon emissions by renewing an existing product instead of producing a new one.

According to the 2020 Fashion On Climate report, the “global fashion industry produced around 2.1 billion tonnes of GHG emissions in 2018, equalling 4% of the global total. This is equivalent to the combined annual GHG emissions of France, Germany and the United Kingdom. Around 70% of the fashion industry’s emissions came from upstream activities such as materials production, preparation and processing.”

Brands must immediately take action to reduce their carbon emissions if they want to survive. Carbon reduction through multipronged practical efforts that address all the ways the industry generates carbon must be the highest priority for everyone right now. While we are seeing some momentum with the adoption of Science-Based Targets, carbon reduction commitments, and transitions to renewable energy, as a whole, the industry is not doing enough. As long as the only acceptable business model is based on making and selling new things, we will not achieve the kind of radical changes necessary to stem the devastation of the Climate Crisis.

The arguments for shifting from traditional commerce to resale have largely been based on the intuitive logic that if we use products longer, we reduce the need for creating new ones. If we generate revenue out of what we already made, we start to decouple the relationship of resource extraction and financial benefit. The Renewal Workshop has been making that argument publicly for the past six years. Privately, we have also been measuring the impact of decarbonization.
through Renewal. While we have always collected data for our brand partners and shared how their Renewal programs are contributing to their carbon reduction strategies, it has been difficult to show the comparison of carbon impacts between new and renewed products more broadly for the industry for multiple reasons.

First, in order to make comparisons, primary data from the brands and from the renewal facilities is required. One of the benefits TRW brand partners have always had is access to this primary data from our Renewal Process. From the outset, we made it a priority to track the purchased energy (renewable and non-renewable), chemicals, water, propane, natural gas, carbon dioxide, and waste used/generated at our facilities so that over time we could create a quantitative comparison between the environmental impact of renewed vs. new products. Second, the results of life cycle assessments can vary greatly depending on the methodologies and data sources used.

Recently, the Sustainable Apparel Coalition (SAC) and its technology partner, Higg, introduced a common methodology to calculate apparel, home textile, and footwear carbon impact in a consistent manner. The SAC and Higg technology and underlying database called the Higg Product Module (Higg PM) allows for rapid calculation of LCAs that enables comparable results between studies and methodologies.

The release of this tool made it possible for TRW to take the primary data we have been collecting on our facility
impacts and conduct a study to calculate a carbon impact comparison between creating new products and renewing existing ones. Julie Brown, formerly with the SAC, guided the use of the Higg Product Module to ensure project and data aligned with the intention and methodology of the tool. The purpose of this study was to explore the quantitative carbon reduction potential that can result from adopting a renewal and resale business model.

RESULTS OF THE ANALYSIS

The impact results for the Higg PM can be reported as either the absolute or the “per use” cradle-to-grave impacts of a product.

The absolute impacts are the total life cycle impacts and can be useful for Scope 3 greenhouse gas impact reporting and covers Category 1 (Purchased goods and services), Category 4 (Upstream transportation and distribution), Category 5 (Waste generated in operations), Category 9 (Downstream transportation and distribution), Category 11 (Use of sold products), and Category 12 (End-of-life treatment of sold products). However, a limitation of the absolute impacts for a product is that the longer a product lasts, the more washing and drying it may withstand during its lifecycle, increasing the overall cradle-to-grave impact.

The “per use” impact divides the absolute impacts of the product and divides it by the expected number of uses of the product. This calculates the impact associated with a single use of the product, which enables recognition of the benefits of longer lasting products. This is the expected reporting unit for the Apparel and Footwear Product Environmental Footprint Category Rules (PEFCR) being developed for regulation in the EU.

For this analysis, new and renewed versions of a basic pair of pants, a jacket, and a t-shirt were assessed. The images below show the Global Warming Potential results using CO2 equivalent for both the “per use” and absolute impacts.
Figure 1: Higg PM PER USE Impacts of New and Renewed Products

- NEW Men’s Pants: 0.116 kg CO2 eq
- RENEWED Men’s Pant: 0.058 kg CO2 eq
- NEW Women’s Jacket: 0.054 kg CO2 eq
- RENEWED Women’s Jacket: 0.017 kg CO2 eq
- NEW Men’s Short Sleeve Tee: 0.103 kg CO2 eq
- RENEWED Men’s Short Sleeve Tee: 0.066 kg CO2 eq

Figure 2: Higg PM ABSOLUTE Impacts of New and Renewed Products

- NEW Men’s Pants: 8.03 kg CO2 eq
- RENEWED Men’s Pant: 4.01 kg CO2 eq
- NEW Women’s Jacket: 5.35 kg CO2 eq
- RENEWED Women’s Jacket: 1.71 kg CO2 eq
- NEW Men’s Short Sleeve Tee: 4.23 kg CO2 eq
- RENEWED Men’s Short Sleeve Tee: 2.69 kg CO2 eq
REDUCTION OF IMPACTS WITH THE RENEWAL OF PRODUCTS

There is an average 51.5% reduction in GWP achieved by switching to selling renewed products in lieu of new products as calculated in the Higg PM.3

Renewal Impact Reduction

<table>
<thead>
<tr>
<th>Men’s Pant</th>
<th>Impact Per Use</th>
<th>Absolute Impact</th>
<th>% Impact Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>GWP for New Item (kg CO2e)</strong></td>
<td><strong>GWP for Renewed Item (kg CO2e)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Impact Per Use</strong></td>
<td>0.116</td>
<td>0.058</td>
<td>50%</td>
</tr>
<tr>
<td><strong>Absolute Impact</strong></td>
<td>8.04</td>
<td>4.01</td>
<td>50.06%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Women’s Jacket</th>
<th>Impact Per Use</th>
<th>Absolute Impact</th>
<th>% Impact Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>GWP for New Item (kg CO2e)</strong></td>
<td><strong>GWP for Renewed Item (kg CO2e)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Impact Per Use</strong></td>
<td>0.054</td>
<td>0.017</td>
<td>68.51%</td>
</tr>
<tr>
<td><strong>Absolute Impact</strong></td>
<td>5.35</td>
<td>1.71</td>
<td>68.04%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Men’s Short Sleeve Tee</th>
<th>Impact Per Use</th>
<th>Absolute Impact</th>
<th>% Impact Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>GWP for New Item (kg CO2e)</strong></td>
<td><strong>GWP for Renewed Item (kg CO2e)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Impact Per Use</strong></td>
<td>0.103</td>
<td>0.066</td>
<td>35.92%</td>
</tr>
<tr>
<td><strong>Absolute Impact</strong></td>
<td>4.23</td>
<td>2.69</td>
<td>36.41%</td>
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3. This information was calculated using the Higg Product Module 1.0 at Higg.org. They were calculated by Julie Brown and are not verified, as SAC has not yet formed a verification scheme for the Higg PM. This is expected in the next two years. The assessment includes cradle-to-grave impacts.
When comparing just the impacts of the product manufacturing steps involved in making a new product with the manufacturing steps required for renewing a product, the reduction becomes more extreme. There is an average 95.5% reduction in GWP impact between the manufacturing steps of a new product and the manufacturing steps of renewing a product as calculated in the Higg PM.

### Manufacturing Impacts Carbon Comparison

<table>
<thead>
<tr>
<th>Product</th>
<th>Impact Per Use</th>
<th>Absolute Impact</th>
<th>% Impact Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men’s Pant</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GWP for New Item</td>
<td>0.059</td>
<td>4.126</td>
<td>90.64%</td>
</tr>
<tr>
<td>(kg CO2e)</td>
<td>(kg CO2e)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GWP for Renewed Item</td>
<td>5.521*10^-3</td>
<td>0.11</td>
<td>97.33%</td>
</tr>
<tr>
<td>(kg CO2e)</td>
<td>(kg CO2e)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact Reduction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Women’s Jacket</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GWP for New Item</td>
<td>0.035</td>
<td>3.471</td>
<td>97.81%</td>
</tr>
<tr>
<td>(kg CO2e)</td>
<td>(kg CO2e)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GWP for Renewed Item</td>
<td>7.659*10^-4</td>
<td>0.077</td>
<td>97.78%</td>
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<tr>
<td>(kg CO2e)</td>
<td>(kg CO2e)</td>
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<td></td>
</tr>
<tr>
<td>Impact Reduction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Men’s Short Sleeve Tee</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GWP for New Item</td>
<td>0.044</td>
<td>1.8</td>
<td>94.71%</td>
</tr>
<tr>
<td>(kg CO2e)</td>
<td>(kg CO2e)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GWP for Renewed Item</td>
<td>2.328*10^-3</td>
<td>0.097</td>
<td>94.61%</td>
</tr>
<tr>
<td>(kg CO2e)</td>
<td>(kg CO2e)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact Reduction</td>
<td></td>
<td></td>
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CONCLUSIONS

The logic that investing in renewing and reselling items to reduce GWP is no longer simply intuitive. The data is powerful. If the goal is to reduce carbon emissions, with an average 51.5% reduction in cradle-to-grave CO2e and an average 95% reduction in manufacturing CO2e when products are renewed rather than new, the choice not to invest in renewal and resale is illogical.

Even if renewed products only make up 10% of a brand’s portfolio, significant carbon reductions occur. The process for achieving these reductions also creates opportunities to engage customers and make them part of achieving your company climate goals. Someone will capture the renewed customer and galvanize them around the carbon reduction of renewed. The question is will it be the brand that the customer started the relationship with or not? This is where brands may not realize that they are making decisions today that will impact who has the lifetime relationship with their customers.

We applaud the efforts that brands are making to develop new kinds of materials, invest in renewable energy, and create more efficient supply chains. These are all useful tools. Now is the time to make more fundamental changes to create more resilient carbon strategies with long-term commitments to carbon economics. Reduce what you produce by 10% over the next five years and reinvest that into renewal and resale. Take responsibility for everything you create and make it easy for your customers to make responsible choices for the products that they no longer use. These are the meaningful choices within your control right now. These investments will contribute to achieving your Science-Based Targets and carbon neutral goals, they will create new kinds of customer relationships and they will drive the development of the circular infrastructure that is absolutely necessary for the planet to survive the damage from everything we have already made.
I first learned about this idea of “circularity” in college while studying sustainable development. At this time, everyone was content with sustainability being defined as ‘meeting the needs of the present without compromising the needs of the future’. This idea of circularity became the pulse of responsible fashion conversations - specifically honing in on product development systems that utilize natural resources and used fair labor practices, while eliminating waste throughout the fashion supply chain. Reading what felt like revolutionary books such as - *Cradle to Cradle* and *The Story of Stuff* - brought this innovative and fresh approach to waste reduction based design to the marketplace. Throughout my academic studies in Business: Environmental Management and Sustainable Entrepreneurship and Fashion (MA via NYU) - I watched, particularly as pretentious white women narrated this idea of sustainable and ethical fashion. From academics and bloggers to independent designers and influencers, the monolithically white movement was buzzing with a symphony of climate change and labor rights solutions that prioritized this idea of transparency and circularity.

BUT if transparency is about 100% honesty and integrity - how was this idea of circular thinking and practice constructed and informed from the white gaze? Why were those who ancestrally created and perfected circular strategies being diminished, devalued and erased? How were white folks who had the savior-IST agency to travel to Africa, India and South America to “partner” with
Indigenous craft geniuses receiving all the notoriety and funding (I vividly remember how nobody questioned why BIPOC folks were only seen in images as the labor)? How can design models truly be circular if they omit the cultural currency of Black contribution and oppression? Why weren’t Black and Brown vanguards the premier stakeholders, conversation leaders and people in positions of developmental power? While white voices received praise and payment - why were melaninated communities disproportionately affected by environmental degradation by white orchestrated institutions? How the hell did a movement think that true holistic SCALABLE progress would be made without addressing the aggregated strategies of Neo-colonial fuckery as the root and current functions of un-sustainability?

The answer is ... selective transparency has been used in sustainability as a tool to continue the colonial control of power dynamics while keeping the veil of “Doing good for people and planet” as a facade of noble action. I call BULLSHIT on the stagnant, archaic and white painted conversation of circularity. It’s impact only touches a fraction of conditions and activations that need to be considered for authentic transparency throughout the entire value chain.

Here’s a bit of what is missing:

- Colonial historic relevance (i.e. local and global history of: raw materials used, Indigenous land occupied, racist policy, prison industrial complex, local community circularity models)
- Environmental racism mapping
- White privilege perspective and an honest assessment of limitations towards progress
- Black and Brown Indigenous intellectual property
- Agency of BIPOC voices within brand structures
- Cultural appropriation in craftsmanship and marketing
- Labor stakeholdership
- Authentic community collaboration
- Labor compensation throughout entire supply chain (i.e. Black social media marketing experts)
- Holistic brand committee commitment assessment and evaluation regarding accountability and accessibility
Let’s give an example shall we …

Say there’s a successful white owned “ethical” fashion brand that has been operating in Oakland, CA for about 10 years. They have been overtly praised, recognized and funded for their vertically integrated model - having their own local factory, producing garments using low impact materials and being 100% carbon neutral. They are even in the works of starting a garment composting program so “regenerative fashion” language has been hot on their radar.

This is all really amazing … however, if we are working to redefine circularity and truly adopt and apply sustainable systems, these are just a few of the types of questions that would need to be asked of this brand:

- Whose Indigenous land are you operating on? Have you acknowledged and connected directly with that community? If so, how?
- Did the emergence of your factory displace local community? How?
- What research has your company done regarding Oakland and racial justice (i.e. Black Panther Party)? And how has that research circled back into your brand ethos?
- What environmental/social injustices (water scarcity, food apartheid, waste management, poverty) are a priority in this community? Is there a clear Environmental Justice strategy for your brand?
- Who are your garment workers, where are they from and what type of voice and agency do they have in the company?
- Is there responsible material/natural resources sourcing throughout the entire supply chain?
- What local projects, practices and/or programs have you created? And what percentage of funding goes towards that?
- How “diverse” is your board of directors? Partners?
- Are any of your traceability endeavors published and how accessible are they?
· How are products being marketed? By whom and with equitable approaches?

· With your composting program - how are you educating communities about composting? Are you sharing how composting derived from women in West Africa and was perfected by Black agro-scientists?

· What are your circular waste management strategies? How are you vocalizing that waste and extraction are colonial constructs? How are you crediting and giving back to BIPOC folks who have literally substantiated most of the creative waste models we use today?

· What resources has the CEO and supporting staff learned from to decolonize their thinking about sustainability? (Books, podcasts, reports, etc.) Have you listened to The Root: Decolonizing the Sustainable Fashion Agenda via Conscious Chatter x MelaninASS - A 6-part podcast series (shameless but necessary plug)

· What are the short term and long term environmental/ social/ cultural/ economic benefits of your current model?

This type of assessment is only a minute glimpse of how we need to scrutinize information and develop circular frameworks. Creating an integrated circular economy of localized regenerative based ecosystems is the only way to holistically elevate past our racist, stagnant and inefficient system. From First Nations and Black African Indigenous ancestry to the historical liberation movements and the modernity of systematically oppressed communities creating resourceful flow systems out of scarcity - these vanguards have been the historical and contemporary disposable sacrifice zones for white sustainability advancement. We are the source for circularity knowledge! In order to not stay on this treadmill of surface bullshit solution building - there has to be a disassembling of this entire fake ass movement-model. The vocal vibrations of whiteness who have weaponized the sacred regenerative practices of Black and Brown Indigenous communities has to be addressed and mitigated in order to reach restorative planetary and social justice. This is how we get to the impactful and scalable circular wellbeing that’s necessary!

Learn more about Dominique Drakeford’s work [here](#).
It’s 1pm on August 12th, 2019 and I am standing in front of my friend’s shop. David is a retailer in Kantamanto Market in Accra, Ghana. He sells men’s and women’s suits exported from the UK and he has been kind enough to allow me to use his shop as a meeting spot. I am waiting for Asana, a young woman working as a kayayo.

Kantamanto is the largest secondhand market in West Africa, probably the largest secondhand market in the world. It sees 15 million garments a week arriving in containers that were exported from all over -- the UK, USA, Canada, Holland, Australia, Korea, China, Germany and many more countries. The USA is the largest exporter of used clothing in the world and Ghana is the second largest importer. Kantamanto itself is a model of sustainability, recirculating over 25 million garments every month through resale and upcycling. The market is not only a place to shop, it is also a studio and factory all in one with every skill set necessary to renew, rehabilitate and transform clothing. There are people ironing, cleaning and steaming clothes; people mending, patching and cutting threads; people resizing and overdyeing and hundreds of tailors who redesign and remake the Global North’s discards. And yet, much like fashion retailers and resale platforms in the Global North, Kantamanto is not a retail utopia where every garment can be re-commodified, sold and loved forever. We have found that of the 15 million garments that flow through Kantamanto, 40% leave as waste. This is not necessarily because the garments are unusable. There is simply too much clothing.

I am watching David steam and measure lower-quality suits, preparing them for
alteration, when Asana arrives. She is smiling but I can see that she is in pain, shuffling her feet along and limping. When I look down I see that her left foot, swollen and pouring over her flip flop is wrapped in gauze.

As a kayayo, a term that translates to “she who carries the burden,” Asana works as a head-porter transporting bales of secondhand clothing from importers to retailers, from retailer to tailor and everywhere in between. These bales weigh 120-200 lbs, more than Asana’s body weight, and when she reaches her destination Asana relieves herself of her burden by bending at her waist and throwing her neck forward, the bale falling to the ground with a thud. As you might imagine, bales often fall short, landing on the kayayo’s foot or crushing anything else that gets in the way. Sometimes it’s children’s limbs that get in the way. Sometimes kayayei are killed when their necks break under the weight of the clothing they carry, falling dead in the market, leaving another kayayo to pick up the bale and get it to its destination so that the garments inside -- donations, unwanted clothing from retailer take-back bins, un-renewed returns and deadstock from the Global North -- can be re-commodified.

Asana was “lucky” given that it was only the corner of a bale that hit her foot. Without money for the doctor her roommates tended to her injury, but in that process they accidently spilled scalding hot water on her foot, leaving an open sore on top of fractured bone. Asana, like most kayayei, lived hand-to-mouth, paid only 30 cents to one dollar per trip carrying clothing, with very little savings and often laboring in a system of debt slavery. This meant that she had to work,
even with a burnt and broken foot. Asana had carried twelve 120 pound bales between the day she was injured and that afternoon when we met outside David’s shop.

We left Kantamanto, grabbed something to eat and went back to Asana’s place. I asked her what she normally does after work and if I could help. She showed me her wardrobe, six dresses and a few other items. Despite carrying the weight of the fashion industry’s excess on her head, she alone transports an average of 5,000 garments every week, Asana can only afford a small wardrobe. Asana got her sewing kit and her kettle and she showed me how she washes and mends her clothes. This is how she spends her free time after work, maintaining the garments under her care.

I often think about that day, renewing clothes with Asana. We also made paper cranes, a random skill I picked up in third grade when my teacher, Mrs. Graves, had us read Sadako. In both cases, using our hands helped us connect when we couldn’t speak one another’s language.

A week ago there was a massive demolition, or “slum clearance” in Old Fadama, the informal settlement where Asana once lived and some 80,000 other people live today, many of them kayayei. Old Fadama is home to one of the dump sites where Kantamanto’s excess ends up. I’ve visited this dumpsite over 100 times in the last three years and it has grown to be over 50ft tall, slowly toppling over into the once sacred Korle Lagoon that runs alongside. The only way to make room for the never ending supply of waste is to burn it. This waste is toxic to the more than 80,000 people who live here, and yet this waste is blamed not on those who generated it, but on those who figure out how to survive despite being dumped on. Last week’s demolition destroyed two rows of homes and businesses around the perimeter of the community. This was done in the name of sustainability, claiming that the people who lived here were at fault for the ecological collapse of the lagoon. Our friends’ homes were bulldozed and many of the kayayei we work with were thrown onto the streets with nowhere to live. Just a few days later, I have already heard news of one kayayo who was raped and another who was run over by a car due to the displacement. The impacts of fashion’s waste are so immense.

And just three miles away in Kantamanto, kayayei continue to carry bales on their heads, risking their lives to transport clothing that is just as likely to become waste in their backyard as it is to be resold.
If you work in the fashion industry, the garments you produce are not only likely to end up on a kayayo’s head in Kantamanto but they are just as likely to end up in the dump that burns outside the room where Asana once stayed. There is no market in the world that can absorb the excess generated by the fashion industry every day. This is a fact. Kantamanto exists at the end of fashion’s oversupplied chain. There is too much clothing in the world and not nearly enough being done to care for what already exists.

Launching take-back programs and reselling “like-new” clothing is not enough.

Brands must go further and work with organizations like The Renewal Workshop to not only divert clothing from landfills but to learn from their waste stream, to learn how to design garments worthy of many lives, to design for durability, for renewal, for repair and for extended use.

It is time that we accept Asana’s reality as our collective reality. Just as we are being called to make the connection between carbon emissions, an invisible but destructive foe, and the various climate disasters unfolding across the globe, so too we must recognize that it is the cleanest looking places on our planet that are causing the most destruction. Just because you do not see and feel the weight of fashion’s excess does not mean it is not there closing in on us and destroying the industry we love.

Asana mends her clothing out of necessity and survival. So too we must recognize that renewing and upcycling our clothing that already exists is necessary for our collective survival.

**Asana cannot carry us any further.**

Learn more about Katamanto’s kayayei and how you can support change [here](#).
As part of presenting actions that brands can immediately take to reduce their carbon impacts, Nicole Bassett, TRW Co-Founder and Co-CEO sat down with Beth Jensen, Climate+ Strategy Director at Textile Exchange to talk about where the industry is going on Science Based Targets (SBT). SBT is an agreed upon methodology for companies to measure their Greenhouse Gas (GHG) impacts, set reduction targets based on how and where their companies create carbon emissions, and establish a plan for reducing that carbon. As this is new work and it isn’t completely straightforward, both of our organizations are working hard to understand the best ways to move forward and to help the broader industry community move forward.

Can you tell us a little bit about you and your history with carbon emissions?

I first started really digging into the environmental impacts of apparel, footwear, and gear companies in my role as head of sustainability for Outdoor Industry Association from 2010-2018. When I started at OIA in 2010, some forward-thinking companies were already measuring their GHG footprints, and coming to the realization that the majority of their impacts were occurring in the supply chain - in the extraction, processing and production of materials and manufacturing of products. At a time when most corporate sustainability efforts were focused on employee carpooling and home office recycling, this was an eye-opening finding, and it was a key driving force behind the development of the Eco Index by outdoor
industry sustainability leaders - a sustainable product benchmarking and measurement tool that would eventually evolve into what we know today as the Higg Index.

Then, in my role as Director of Sustainable Materials and Products for VF Corporation over the next several years, I had the opportunity to understand GHG impacts and implications from the corporate and brand perspective.

Now, in my role at Textile Exchange (the leading nonprofit organization supporting sustainable fiber and materials usage across the global apparel, footwear, and textiles industry) I am working to ensure that we are supporting brands, suppliers, and other stakeholders across the industry in their efforts to measure and reduce GHG impacts and drive positive outcomes specifically related to raw materials extraction.

There are a growing number of brands with public commitments to reducing their GHG impacts, what is driving these companies to invest?

The obvious answer is that meaningful climate action is increasingly seen as an opportunity for many brands to establish leadership with consumers, particularly as the younger generations - who are increasingly concerned about climate change and their future on the planet - increase their purchasing power.

I do think the Science-Based Targets Initiative has been a real game-changer in pushing companies to set consistent targets related to GHG emissions reduction - they provide the technical “playbook” around how to set a meaningful, credible target, and have created a bit of a competition within the industry around which companies have and have not set their SBTs.

Forward-thinking companies are recognizing that climate change is a business resiliency issue, and one that is likely to be regulated fairly soon.

For publicly-traded companies, I think a key driver is also the ESG (environmental, social, governance) reporting requirements that have proliferated over the past several years. Increasingly, investors are interested to know what these companies are doing to manage their risks related to environmental impacts, fair labor and human rights issues, etc. There is skepticism that ESG reporting is actually driving significant impact reduction
and positive outcomes; however, investor awareness of these issues to continue the “pull” on corporations to take action is certainly a good thing.

**Establishing a common way to measure a company’s impact is critical to compare efforts. Can you describe Science Based Targets?**

Science-Based Targets, or SBTs, provide the “rules” for how companies can set meaningful and comparable climate targets. These rules are grounded in climate science and align companies around the Paris Agreement goal of limiting warming to 1.5 degrees Celsius. Targets measure reductions in greenhouse gas emissions achieved by the company, and are expressed as percentage reductions from a clearly defined baseline year - for example: “An absolute reduction of greenhouse gas emissions 30% from a 2017 baseline year by 2030.”

Science-Based Targets, or SBTs, provide companies across industries with a clearly-defined path and set of measurement rules to reduce GHG emissions in-line with the Paris Agreement. Without SBTs, there would be no consistency in how companies are setting targets and whether they are credible, meaningful, and in-line with the latest climate science - the effort to minimize warming to 1.5 degrees C. The Science-Based Targets initiative, or SBTi, also provides guidance for companies on how to measure progress against the targets.

The apparel sector was an early leader in adoption of SBTs, and continues to be a leader in terms of number of companies engaged with SBTi.

**Are SBTs voluntary and how can people trust the data that is being disclosed by the brands? How important is it to validate the SBTs?**

SBTs are voluntary, though well over 1,000 companies across industries and sectors have now committed to (or have already set) their targets. Each company’s target is validated by the SBTi, which then provides the company with guidance on the specific language that can be used to publicly describe the target it has set.

SBTs are really focused on target-setting, leaving how the targets are achieved up to the individual participating companies. However, as they go forward with developing action plans to achieve their SBTs and
assessing the impact reduction potential of various initiatives/interventions in which they might engage, it is beneficial for them to leverage the guidance from SBTi around what can and cannot be accounted for.

What are the criticisms of SBTs and how are champions of this approach addressing those criticisms?

Some may say that the rigor involved in setting SBTs is pulling precious resources away from doing the actual, urgent work of decarbonization in order to meet a 1.5 degree warming pathway. This is a fair concern. My take on this: carbon accounting, and sustainability in general, is technical in nature - there’s no getting around that. Without a harmonized process for working through the different potential pathways and complexities around setting and accounting against GHG impact reduction targets, we’d have no collective understanding of what we need to do and what the most effective interventions might be to get there. My advice for companies is to work on setting your SBTs as quickly and efficiently as you possibly can, so that you can get on with the business of actually reducing impacts. Setting an SBT is just the first step - stopping there is not an option.

If a brand wanted to get started in reducing their carbon footprint what advice do you give them?

First - you need to ensure you have an understanding of where the greatest amount of impact is occurring within your business. One of the first steps in the process of setting an SBT is to conduct a greenhouse gas (GHG) footprint for your company. For apparel and footwear brands, the majority of GHG emissions (typically between 95-99%) occur in Scope 3 - related to the extraction and production of materials and products and the transportation, distribution, use and service, and end of life of those products.

Once you have a sense of your company’s GHG footprint, you can hone in on the largest contributors to your impact and identify interventions to reduce those impacts. For example, your company can consider opportunities to source lower-carbon and recycled materials, to minimize waste in the production process, or to support key supplier partners in transitioning to cleaner sources of energy.
The August release of the IPCC report models what the world could look like with increases in global warming. How can this information inform leaders in brands to think about their GHG emissions reduction strategy?

I think the most recent IPCC report draws attention to the necessity of Science-Based Targets, which are based on IPCC climate science - and, even more importantly, the urgent need to take action to reach those targets.

There is a lot of work in researching, and building a de-carbonization strategy within brands, almost to the point where it slows down the process. What actions really make change?

My recommendation is to use strategy to determine (as quickly as possible) where your largest impacts are coming from. Then, you can hone in on those areas to drive reduction in GHG emissions most efficiently through various projects or investments.

The specific actions that will really make change will vary from company to company. At a high level, it will be a combination of a few key levers, some of which include addressing energy use at facilities; producing fibers and materials in less impactful ways; and overall, extracting less new materials to make less new products (where concepts like waste reduction, circularity, and degrowth all come into play.) The apparel and footwear industry will need to figure out how to significantly decouple the concepts of “growth” and “business value” from the traditional idea of new products if we are to have any chance of achieving our collective climate goals.

What is the strategy at Textile Exchange to accelerate decarbonization in the apparel and textile industry?

Textile Exchange, the apparel and footwear industry’s leading nonprofit organization focused on fiber and material production, announced its Climate+ (pronounced “Climate plus”) strategy several years ago. The strategy aligns the organization and its activities around driving impact reduction and positive impacts related to climate as well as to biodiversity, soil health, and water. Textile Exchange believes that these additional impact areas are important to address directly along with climate, given the interdependent nature of impacts in these different categories within an ecosystem.
While the risks of the Climate Crisis have never been greater, the opportunities for action have never been clearer. We want to amplify the work of two collegial organizations who recently produced incredibly important reports.

**WRI REPORT - ROADMAP FOR NET ZERO**

September 2021, World Resources Institute (WRI) released their Roadmap for Net Zero. The Roadmap was developed by WRI and the Apparel Impact Institute, with generous support from the Laudes Foundation. Using data from the Sustainable Apparel Coalition (SAC) and Textile Exchange, they developed a new estimate of apparel sector emissions and projected these emissions out to 2030 under a business as usual growth scenario. They also outlined the potential for emissions reductions from circular business models and practices.

The target audience for the Roadmap is apparel companies and the organizations that need to be part of the effort to reduce emissions.

- The apparel industry has seen a recent proliferation of companies setting and committing to science-based targets (SBTs). Currently, over 100 companies have approved SBTs or commitments to set them – up from a dozen just three years ago.

- Given this momentum, identifying how companies and the sector will deliver on these ambitious targets is imperative. Determining the “how” is the central objective of the Roadmap.

- Using data from the Sustainable Apparel Coalition and Textile Exchange, we estimated apparel sector emissions at 1.025 gigatons CO2e in 2019. Unchecked,
emissions will grow to 1.588 gigatons by 2030 – off pace to deliver the 45 percent absolute reduction required to limit warming to 1.5°C.

- This report identifies six interventions to deliver roughly three-quarters of the reductions needed to align with a 1.5°C scenario: maximizing material efficiency, scaling sustainable materials and practices, accelerating the development of innovative materials, maximizing energy efficiency, eliminating coal in manufacturing, and shifting to 100% renewable electricity. The latter is particularly essential as electricity is used for various processes across the apparel value chain.

- Also discussed is the potential benefits of circular business models and practices, though data on GHG reductions from circularity are sparse and need to be improved.

We urge you to read the whole report [here](#).

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**FASHION ON CLIMATE**

In 2020, The Global Fashion Agenda and McKinsey released the Fashion on Climate report. The report is rooted in a desire to provide the industry data on where the levers of change exist within the supply chain and business models, and how brands, suppliers and innovators could act quickly in implementing solutions.

“This report presents an analysis on the fashion industry’s GHG emissions and outlines areas in which players can focus their efforts to meet climate targets. By triangulating GHG emissions data, analysing current and accelerated trajectories, and quantifying the gap to meeting the Paris targets, it offers insight into the industry’s potential for decarbonisation and presents recommendations for moving forward.”

The report is robust and should be sitting on the desk of every CEO in the industry as a roadmap for where and how to take action. The report can be found [here](#).
CIRCULAR IMPACT

Together with our brand partners, TRW’s total environment impact from June 2016 through June 2021:

Raw data

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green House Gas Emissions (KG/Co2)</td>
<td>533,206</td>
</tr>
<tr>
<td>Water (L/KG)</td>
<td>366,170,615</td>
</tr>
<tr>
<td>Toxins (kg 1,4-DB eq)</td>
<td>240,765</td>
</tr>
<tr>
<td>Energy (MJ/kg)</td>
<td>9,752,456</td>
</tr>
<tr>
<td>Waste (lbs)</td>
<td>587,967</td>
</tr>
</tbody>
</table>

Or the equivalent of:

- The energy of 72,765 light bulbs per year
- The carbon of 59,997 gallons of gas
- The water of 146 Olympic swimming pools
- 530,887 lbs of toxic chemicals
- 587,967 lbs of textile waste diverted from landfill
CIRCULAR RESOURCES

World Business Council for Sustainable Development’s “CEO Guide to the Circular Economy”
http://docs.wbcsd.org/2017/06/CEO_Guide_to_CE.pdf

Fashion For Good’s report “The Future of Circular Fashion”

IDEO’s “Circular Design Guide”
https://www.circulardesignguide.com/

The World Resources Institute article “The Elephant in the Boardroom”

The Ellen MacArthur Foundation’s paper “Towards a Circular Economy”

PRACTITIONERS OF CIRCULAR

Cradle to Cradle
The Cradle to Cradle Products Innovation Institute is dedicated to powering innovation for the circular economy through products that have a positive impact on people and planet.
https://www.c2ccertified.org/

Ellen MacArthur Foundation
The Ellen MacArthur Foundation works to inspire a generation to re-think, re-design, and build a positive future circular economy.
https://www.ellenmacarthurfoundation.org/
**Sustainable Apparel Coalition**
The Sustainable Apparel Coalition’s vision is of an apparel, footwear, and textiles industry that doesn’t cause any unnecessary environmental harm and has a positive impact on the people and communities associated with its activities.

[https://www.apparelcoalition.org](https://www.apparelcoalition.org)

**Closed Loop Partners**
Closed Loop Partners is a New York-based investment firm comprised of venture capital, growth equity, private equity, and project finance as well as an innovation center focused on building the circular economy.

[https://www.closedlooppartners.com/](https://www.closedlooppartners.com/)

**Circular Economy Practitioner Guide**
The Practitioner Guide is designed to help companies accelerate their transition towards the circular economy.

[https://www.ceguide.org/](https://www.ceguide.org/)

**Global Fashion Agenda**
Global Fashion Agenda (GFA) provides a leadership forum for industry collaboration on sustainability. The mission of the non-profit organization is to mobilize the fashion industry to take immediate action on sustainability. Its advocacy centers on industry collaboration and public-private cooperation. The GFA considers brands and retailers the core of securing comprehensive change and increasing the industry’s sustainability performance across the value chain.

[https://www.globalfashionagenda.com](https://www.globalfashionagenda.com)

**Circle Economy**
The Circle Economy is a not-for-profit organization with a mission to accelerate the practical and scalable implementation of the circle economy.

[https://www.circle-economy.com/](https://www.circle-economy.com/)
Accelerating Circular
Accelerating Circular is a collaborative industry project developed to accelerate the textile industry’s move from linear to circular.
https://www.acceleratingcircularity.org/

Fashion for Good
Fashion for Good is a platform for sustainable fashion innovation. Its mission is to bring together the entire ecosystem to make fashion a force for good.
https://fashionforgood.com/

Remake
A community of fashion lovers, women rights advocates, and environmentalists on a mission to make sustainability accessible and inclusive across three pillars of work: education, advocacy, and transparency.
https://remake.world/

The OR Foundation
Working at the intersection of environmental justice, education and fashion development, our mission is to identify and manifest alternatives to the dominant model of fashion. Our goal is to catalyze a Justice-Led Circular Economy.
https://theor.org/

London College of Fashion - Centre for Sustainable Fashion
Based at London College of Fashion (LCF), we provoke, challenge, and question the status quo in fashion; contributing to a system that recognises its ecological context and honours equity.
https://www.sustainable-fashion.com/

Centre for Circular Design
CCD aims to accelerate the transition towards designing for a circular future where textiles, materials and ‘things’ are designed, produced, used and disposed of in radical new ways.
https://www.circulardesign.org.uk/
BOOKS
Consumed by Aja Barber

Cradle to Cradle: Remaking The Way We Make Things by Michael Braungart and William McDonough
https://mcdonough.com/writings/cradle-cradle-remaking-way-make-things/

The Business of Less by Roland Geyer
https://www.news.ucsb.edu/2021/020457/business-less

Less is More by Jason Hickel
https://www.jasonhickel.org/less-is-more

PODCASTS OR OTHER MEDIA BASED RESOURCES
GreenBiz – Circular Economy articles
https://www.greenbiz.com/topics/circular-economy

Trash Talking with Eco Warriors

Conscious Chatter
https://consciouschatter.com/

How to Save a Planet
https://gimletmedia.com/shows/howtosaveaplanet

Conscious Style Podcast
https://www.consciouslifeandstyle.com/category/podcast/
REPORTS
thredUP “Resale Report”
https://www.thredup.com/resale

WRAP “European Clothing Action Plan – Driving Circular Fashion and Textiles” report
https://www.wrap.org.uk/ecapsummaryreport

Global Fashion Agenda “Pulse of the Fashion Industry”

WRAP - Textiles 2030
https://wrap.org.uk/taking-action/textiles/initiatives/textiles-2030

Global Fashion Agenda “Fashion on Climate”
http://www2.globalfashionagenda.com/initiatives/fashion-on-climate/#/

WRI - Roadmap to Net Zero: Delivering Science Based Targets in the Apparel Sector

EVENTS
World Circular Textiles Day
https://worldcirculartextilesday.com/
ABOUT THE RENEWAL WORKSHOP

Nicole Bassett and Jeff Denby founded The Renewal Workshop in 2015 to change the apparel industry from linear to circular. They set out on this ambitious mission with a tiny team of people equally committed to creating circular systems to make the planet healthier. Six years later, while the team has changed and grown, the commitment to Nicole and Jeff’s vision has not.

We still believe that businesses have multiple responsibilities for generating positive, lasting value.

We are still here solving hard problems and creating circular systems to make things better.

We work every day to do what is good and right for people and for the planet.

We reduce waste and restore value. We create jobs and treat people fairly. We serve customers kindly and work with partners cooperatively.

We consciously choose to act with love in what we do and how we do it.
Our business is founded on six core values:

**Self-determination**
We are confident in our beliefs, in our ideas, and in our vision. We lead in our own style and set our own course in how we treat people, the environment, the brand, and the business. We hold most strongly to who we are and what we are trying to accomplish.

**Service**
We see service as a way of being and behaving. We think of others first, from our brand partners to our customers to the environment. We exist to be of service to the bigger picture, solving problems to create a more positive world.

**Systems Thinking**
Systems expertise is in our DNA. We use processes and systems as tools to free ourselves from inefficiency and to solve big problems. Good systems do not restrict innovation and collaboration, they cultivate them.

**Sensibility**
We look for simple solutions to complex problems. We value common sense. We believe in the wisdom of nature, looking to evolve, adapt, and learn constantly from our changing environment.

**Presence**
We manage our time by being present to what is here right now, remaining in the moment, and giving ourselves time to absorb and process. We allow things to happen in flow.

**Love and Light**
We encourage each other to follow whatever personal path brings us joy. We dwell in the positive and live lightly without being dragged down by burden. We recognize that living true to oneself is freedom.
For more information, please reach out to hello@renewalworkshop.com.

We are incredibly grateful to each of the amazing women who contributed to this year’s Leading Circular report. A special thanks to our gifted designer, Yoshini White.

To all of the brand partners with whom we have worked along the way, thank you taking actions to move from linear to circular.

This report is dedicated to The Renewal Workshop team, past and present. It is the embodiment of a shared vision of a better world, strong values in how we show up and a sensibility to not waste anything that has driven our work together.

TRW is a leader in the industry because of each one of you. You are the ones solving the hard problems and making it possible for brands to reduce their carbon emissions through Renewal. That is the difference you make every day, and we are forever grateful to you for it.
The invisible power of fear deludes us into believing that we do not have choices - that as individuals, as communities, and as business leaders, we cannot change.

That is only as true as we choose to make it.

Our challenge to every brand that creates products is to adopt renewal and resale as one part of your carbon reduction efforts. Commit to displacing 10% of your new production over the next 5 years and invest those resources into renewal instead.

For more information on going circular, visit us at renewalworkshop.com/gocircular or email us at hello@renewalworkshop.com
METHODOLOGY
The Higg PM is a product environmental assessment tool that uses an LCA approach to measure the cradle-to-grave environmental impacts of apparel, footwear, and home textiles. The assessment includes the impacts of all materials used in a product, adjusted to the specific amounts of each material used, the impacts from finished goods manufacturing processes, and the impacts associated with distribution, use, and end of use. Users can create and adjust a Bill of Materials using materials, trims, and packaging and can also select and adjust the finished goods manufacturing processes to analyze factors affecting environmental impact. For distribution, use, and end of use, users can select the defaults provided by the Higg PM or input their own data for more representative environmental impact results.

The Higg PM calculates five different impacts:
- Global Warming Potential
- Eutrophication (nutrient pollution in water)
- Water scarcity
- Abiotic resource depletion, fossil fuels
- Chemistry

Datasets cover all relevant environmental flows, such as resource extractions, emissions, as well as all material and energy inputs and products of an activity. Background datasets, such as raw materials and energy, are used to build models of each process. Using a single background database is important for consistency within the database. The Higg PM (2020) uses GaBi as its background database.

The main impact studied in this project is Global Warming Potential (GWP). The GWP characterization model was developed by the Intergovernmental Panel on Climate Change (IPCC). Factors are expressed as GWP for time horizon 100 years (GWP\textsubscript{100}), in kg carbon dioxide equivalent (kg CO\textsubscript{2}e). A majority of this is emitted through the combustion and consumption of fossil-based energy sources. However, there are also several more substances and processes that contribute to climate change, including
agricultural and soil emissions, landfill gas, and some refrigerants, which are characterized in terms of CO2e.

Higg PM users can calculate the impacts of new products and second-hand products if a product has previously been owned by another end user (customer) and is re-sold rather than entering the waste stream. By including Previously Used Products into the Higg PM methodology, the tool enables users to also assess used products in a consistent manner to new products. Products processed by TRW are an excellent use case for this functionality. In the Higg PM, assessing Previously Used Product functions similarly to assessing a new product, with key differences below:

- The weight of the incoming used product is a required field. Any new materials needed for repair or refurbishment are added to the Bill of Materials.

- The incoming previously used product comes into the system “burden-free” at the point of its disposal (similar application of the cut-off principle as recycled materials).

- Transportation impacts associated with shipping the previously used product are still included in the impacts and are based on the shipping mode and shipping distance.

- Users can specify any additional materials that are used during refurbishment using the Bill of Materials screen; however, you can proceed to Finished Goods Manufacturing without adding further materials.

- Finished Goods Manufacturing processes can be entered to show any refurbishments made.

**PRODUCTS CHOSEN**

It is important to assess a variety of products using a variety of materials and renewal processes. If results look consistent for different types of products, the confidence in the results strengthens. For this project, the following products were chosen for the assessment:

- Pants: Men’s Pants (90% / 0.675 lbs polyester; 10% / 0.075 lbs Elastane for a total weight of 0.75 lbs.)
  - Renewal: button replacement

- Jacket: Women’s Jacket (100% / 0.40 lbs Nylon)
  - Renewal: zipper stop replaced

- T-Shirt: Men’s Short Sleeve Tee (100% / 0.35 lbs Cotton)
  - Renewal: broken stitching repaired (hem)
**ASSUMPTIONS**

Proxies are included in the Higg PM where data is often unknown and accuracy rarely leads to significant value changes. These proxies were often used in the new product assessments because the data was unavailable, and because the proxies provided were reasonable. Higg PM proxies were included for the following data entries:

- Percentage of each new product is sold through your own distribution (known for renewed products)
- Percentage of product sold online and in store (known for renewed products)
- Rate of Products Returned
- Restock Rate (known for renewed products)
- Material shipping distance and mode
- Material Net Use of 80% (known for renewed products)
- Disposal rates and modes for manufacturing waste samples, and excess finished goods (known for renewed products)
- Inbound and Outbound Transportation (inbound updated for renewed products)
- Distribution Center Electricity, Natural Gas, and Water
- Retail Electricity, Natural Gas, and Water
- Product Care amounts and methods (washing and drying)
- Amount of the product made that is landfilled/incinerated and recycled/downcycled

However, there were additional assumptions made for each product. New products are intentionally simple in materials and processes in an effort to not overestimate their impacts (main materials and their weights were known). A good amount of data was collected from The Renewal Workshop for renewed products.

Additional assumptions for Men’s Pants - NEW

- Bill of Materials: Added a polyester button and an aluminum zipper
- Finished Goods Manufacturing processes:
  - Cutting: 436.88 cm (size is Medium = 32x32 in for waist and seams; 12 in for ankles)
  - Sewing: 436.88 cm (size is Medium = 32x32 in for waist and seams; 12 in for ankles)
  - Pressing: 1 minute
  - Sundries application: 2 cm²
• Packaging
  - Shipping: 2 polybags (1 for product and 1 for shipping - used Higg PM default shipping bags)
  - In store: One large shopping bag (Higg PM default shopping bag)

• End of Use: no additional requirements met
• Duration of Service: no additional requirements met

Additional assumptions for Men's Pants - RENEWED
• Percentage of the product sold through own distribution: 100%
• Percentage of Product sold online: 100%

Bill of Materials: Added a 12 mm polyester button

• Finished Goods Manufacturing processes:
  - Sundries application: replace button 1 cm²
  - Water only wash to replace CO₂ wash

• Packaging:
  - Shipping: 2 polybags (1 for product and 1 for shipping - used Higg PM defaults)
  - In store: One large shopping bag (used Higg PM default shopping bag)

• End of Use: no additional requirements met
• Duration of Service: no additional requirements met

Additional assumptions for Women's Jacket - NEW
• Bill of Materials: Added a nylon zipper

• Finished Goods Manufacturing processes:
  - Cutting: 388.62 cm (size is Medium = 39 in for waist; 32 for inseams; 16 in for neck; 34 in for sleeves)
  - Sewing: Cutting: 388.62 cm (size is Medium = 39 in for waist; 32 for inseams; 16 in for neck; 34 in for sleeves)
  - Sundries application: 2 cm²

• Packaging
  - Shipping: 2 polybags (1 for product and 1 for shipping - used Higg PM defaults)
  - In store: One large shopping bag (used Higg PM default shopping bag)

• End of Use: no additional requirements met
• Duration of Service: no additional requirements met

Additional assumptions for Women's Jacket - RENEWED
• Percentage of the product sold through own distribution: 100%
• Percentage of Product sold online: 100%
· Bill of Materials: 1 nylon zipper (Higg PM default option)

· Finished Goods Manufacturing processes:
  - Sundries application: 2 cm² (zipper replacement)

· Packaging: Custom recycled cardboard band (0.2 kg recycled cardboard), Higg PM default shipping box

· Inbound Transportation: 1000 mi by truck

· End of Use: no additional requirements met

· Duration of Service: no additional requirements met

Additional assumptions for Men’s Short Sleeve Tee - NEW

· Percentage of the product sold through own distribution: 100%

· Percentage of Product sold online: 100%

· Finished Goods Manufacturing processes:
  - Cutting: 270.84 cm (size is Medium = 32 in for waist and seams; 16 in for neck; 34 in for sleeves)
  - Sewing: 270.84 cm (size is Medium = 32 in for waist and seams; 16 in for neck; 34 in for sleeves)
  - Pressing: 0.5 minute

· Packaging
  - Shipping: 2 polybags (1 for product and 1 for shipping - used Higg PM defaults)
  - In store: One small paper shopping bag (used Higg PM default shopping bag)

· End of Use: no additional requirements met

· Duration of Service: no additional requirements met

Additional assumptions for Men’s Short Sleeve Tee - RENEWED

· Percentage of the product sold through own distribution: 100%

· Percentage of Product sold online: 100%

· Finished Goods Manufacturing processes:
  - Sewing: new stitching along hem 81.28 cm
  - Water only wash to replace CO2 wash

· Packaging: Custom recycled cardboard band (0.2 kg recycled cardboard), Higg PM default shipping box

· Inbound Transportation: 1000 mi by truck

· End of Use: no additional requirements met

· Duration of Service: no additional requirements met