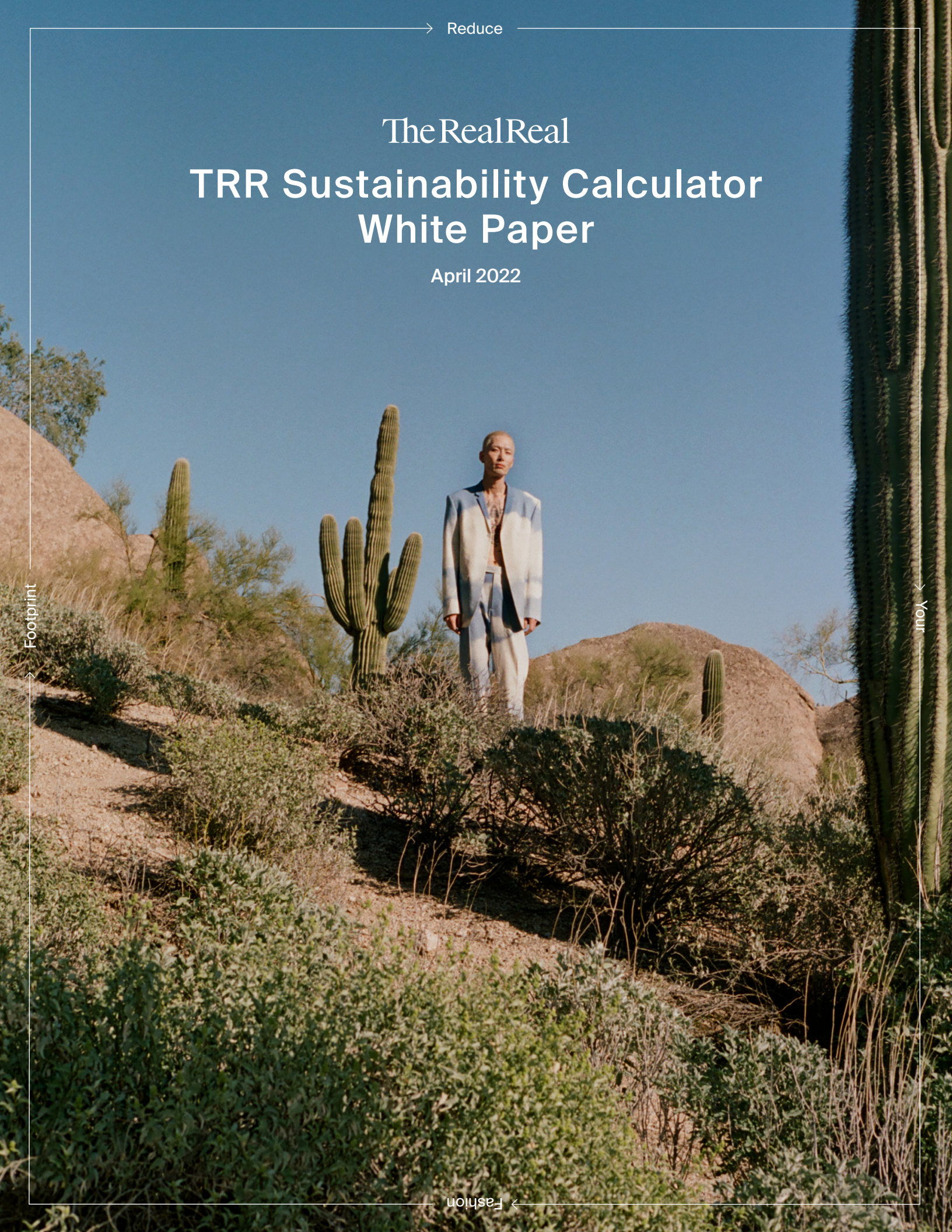
Reduce

The RealReal

TRR Sustainability Calculator White Paper

April 2022



Footprint

Your

Fashion

The Problem

Fashion is among the most polluting industries in the world. In 2018, it produced around 2.1B tons of greenhouse gas (GHG) emissions, accounting for approximately 4% or more of the global total.[1] Production contributes approximately 70% of fashion's emissions,[2] but it's the toughest to reinvent.

The Power of Resale

Unlike transforming supply chains, keeping existing items in circulation is a scalable, proven, easy-to-implement solution to the fashion waste crisis. Resale extends the life of items that have already been produced and had their environmental impact—but resale is underutilized, missing one of the most accessible ways to reduce fashion's significant and increasing carbon footprint.

Measuring Our Savings

As the largest marketplace for authenticated luxury resale, The RealReal's mission is to extend the life of luxury. We are committed to contributing to a more sustainable future, and empowering tens of millions of members to contribute too. TRR Sustainability Calculator offers shoppers and consignors insight into their environmental savings by measuring the GHG and water savings of resale as compared to new items. With access to these unique, personal statistics, members are motivated to maximize their savings.

Authenticity and transparency are key to our efforts to make the future of fashion more sustainable. In developing the rigorous methodology that powers TRR Sustainability Calculator, we are holding ourselves to a standard that we hope others will follow. The fashion industry has a long way to go in reducing its impact on the planet. We hope that with TRR Sustainability Calculator we are communicating the environmental value of resale, inspiring more people to participate in the circular economy, and motivating industry peers to support circular solutions.

[1] ourworldindata.org

[2] McKinsey & Co. and the Global Fashion Agenda's "Fashion on Climate Report"

Summary

TRR Sustainability Calculator is a custom tool developed to measure the greenhouse gas emissions (GHG) and water footprint reduction of consignment compared to producing new products.

The TRR Sustainability Calculator launched in 2018 and originally quantified the environmental savings of consigned suiting, pants, dresses, tops, knitwear, jackets, and outerwear. In 2022, the calculator was expanded to include the environmental savings of denim, kids' clothing, handbags, fine jewelry, and watches. TRR Sustainability Calculator calculates environmental savings for each item based on fabric, material, and taxon, using a methodology customized for each of the largest product categories. Item savings are then added together to arrive at totals of the cumulative estimated environmental savings of consignment on The RealReal since the company's founding.

As of March 31, 2022, with the help of shoppers and consignors, The RealReal has saved 52,767 metric tons of carbon dioxide (equivalent to the amount of CO_2 absorbed by 8.8 million trees in one year) and saved 2.8 billion liters of water (the equivalent volume of 12 billion 8oz glasses of water).[3]

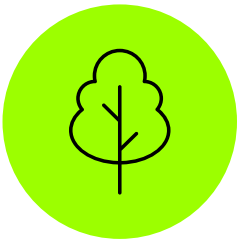
The RealReal teamed up with leading environmental consultants Shift Advantage, Inc., and Brown and Wilmanns Environmental, LLC, to build a tool for calculating the environmental benefit of consignment. These calculations are particularly complex, especially for a company like The RealReal that doesn't manufacture its own products, but sells consigned products including thousands of items from many brands, made of various materials, and ranging in size and weight. There can be significant differences in the impact of an item depending on how the raw materials are grown, extracted and processed; the types of dyes, finishes, weaves, and manufacturing techniques used; the amount and type of energy used at production facilities; the amount of water used at production facilities; and how wastewater is managed and treated at these facilities.

As of March 31, 2022

Water Saved

12 Billion

8oz. Glasses of Water



Co_2 Emissions Saved

Amount absorbed by

8.8 Million

Trees in a year

[3] EPA Greenhouse Gas Equivalencies

To address the complexities of calculating the environmental benefits of consignment:

- Shift Advantage, Inc. and Brown and Wilmanns Environmental, LLC, created environmental impact estimates for The RealReal's most common materials primarily based on ecoinvent data comprising various countries of origin.
- These included impact estimates for raw materials like cotton, silk, and nylon for apparel and handbags, as well as common materials like gold and silver used in jewelry and watches.
- TRR used these estimates to develop custom combinations that could be applied across an enormous spectrum of products and materials—for example, a dress made of both cotton and nylon where the percentages of each are accurately factored into environmental impact.
- TRR accounted for the weight of items, a critical factor since, for example, a sweater uses less wool than a coat. To create representative samples for apparel, TRR weighed a mix of items in different sizes from various brands. For jewelry, TRR uses exact weights since they are already captured in product information.
- Finally, TRR applies the Worldwide Responsible Accredited Production (WRAP) Benefits of Reuse Case Study displacement rate of 33%, conservatively assuming that for every three items consigned, one is not produced new.

Environmental Impact Data

The environmental impact assessments used in TRR Sustainability Calculator are based on cradle-to-gate life cycle inventory (LCI)/life cycle impact assessment (LCIA) data for:

- 11 generic dyed and finished woven and knit textiles for apparel
- 14 handbag taxons grouped into 3 representative styles for handbags
- 12 strap materials and 9 case materials for watches
- 16 finished metals for jewelry

Data for the estimates of environmental impact reduction are derived primarily from ecoinvent commercial databases and modeled in Excel. The ecoinvent database incorporates information collected from factories, farms, extraction, production, and a wide range of other industrial and commercial activities associated with product and service supply chains. The data within ecoinvent is verified in multiple ways including both public and private verification. The factors (known as characterization factors) for calculating impacts from inputs (e.g., energy, water, chemicals, and other resources) and outputs (products, by-products, pollution, and emissions) are updated as new scientific information is identified. Additional information for materials was obtained from life cycle assessment (LCA) studies published in peer-reviewed journals to supplement the information from commercial databases.

The cradle-to-gate life cycle analysis included in the environmental impact calculations begins with the origin of the materials (growing and harvesting crops, extracting fossil fuel resources, etc.) and includes all the processing needed to turn the raw materials into a dyed and finished textile or metal. Life cycle areas not included in the tool include distribution, consumer use and end-of-life of the product.

LCI/LCIA Impact Areas

Greenhouse Gas (GHG) Emissions (kg CO_2e)

GHG emissions represent the 100-year Global Warming Potential (in kg CO_2 equivalents). GWP100 impacts generated from ecoinvent were derived using the ReCiPe 2008 Midpoint (H) methodology for apparel, and the IPCC 2013 GWP 100a methodology for handbags, watches, and jewelry.

Water Consumption (liters consumed)

Water consumption accounts for the total water depletion potential which includes the extraction of fresh water. Water consumption is based on total water consumption as opposed to total water use. All water consumption impacts generated from ecoinvent represent the water depletion potential (WDP) derived using the ReCiPe 2008 Midpoint (H) methodology for apparel and ReCiPe 2016 Midpoint (H) for handbags, watches, and jewelry.

Displacement Rate

The production of new products results in environmental impacts, including water consumption and GHG emissions. Purchasing consigned products can reduce the number of new products purchased (produced and discarded), thus reducing the environmental impacts.

To estimate the percentage of newly manufactured products displaced by consignment, The RealReal applies the WRAP Benefits of Reuse Case Study[4] displacement rate of 33%, conservatively assuming that for every three items consigned, one is not produced new.

The RealReal adopted WRAP's displacement rate based on its well-researched and comprehensive methodology and findings, even as it includes some assumptions and average data. The WRAP methodology was developed in conjunction with a steering group comprising representatives from a range of organizations involved in the reuse of a variety of products, as well as representatives of government certifying agencies and private companies.

The RealReal considered using consumer surveys to determine displacement rate, however, due to insufficient evidence that surveys would provide more accurate data on consumer behavior, ultimately took a more conservative approach relying on objective third-party findings.

[4] WRAP Benefits of Reuse Case Study, November 2011

Stakeholder Review

A stakeholder review of the methodology and assumptions for calculating the environmental benefit of consignment products was conducted in March 2018. Stakeholder feedback included clarification on data sources and scope, environmental impacts to include, and how to report data. All feedback was considered and, where feasible, integrated into the final tool and methodology. The RealReal provided responses to the stakeholders on how each feedback item would be addressed.

The RealReal also requested stakeholder input on the displacement rate. Specifically, The RealReal asked stakeholders if a 100% or 33% displacement rate (or something in-between) should be adopted. Per stakeholder feedback, The RealReal adopted a displacement rate of 33% as specified in the WRAP study (see "Displacement Rate" section).

Many stakeholders provided their time and expertise, including: Camille Gillet, Make Fashion Circular, Ellen MacArthur Foundation; Michael Sadowski, Sustainability Consultant; and Eliot Metzger, Senior Associate at World Resources Institute (WRI). Michael Sadowski also reviewed the methodology for new categories added in 2022: handbags, jewelry, and watches.

Apparel: Calculating Savings

Given The RealReal's consignment model, the company has a highly fragmented inventory base and no visibility into a product's supply chain. To address this, TRR developed product archetypes based on the most common consignment products sold through The RealReal. The archetypes reflect what have been calculated to be "average" The RealReal products. Product weights were gathered by a random sample of items that represented the most common designer and fabric combinations found in The RealReal's inventory.

TRR built product archetypes for apparel by taking into consideration the categories that comprise most of TRR's apparel inventory, the most common fabrications of those categories, and a representative weight sample of those category and fabrication combinations.

Category

The following represent the majority of The RealReal's women's clothing inventory:

- Dresses
- Jackets
- Knitwear
- Outerwear
- Pants
- Suiting
- Tops

Fabrication

Within the categories, composites were developed for the most common fabrics and blends, allowing for accurate measurement of garments composed of several materials (e.g., a silk dress vs. a cotton dress, or a weighted average for a dress made of 60% silk and 40% cotton). For garments where a percentage of materials are unknown, dynamically calculated estimations derived from TRR category averages are applied.

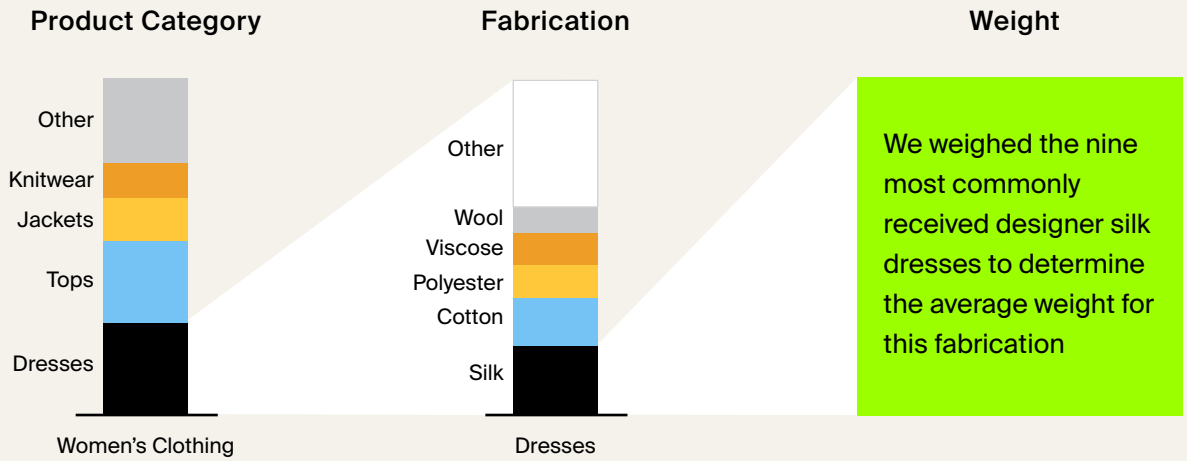
Most common fabrics:

- Acrylic
- Cotton
- Hemp
- Linen
- Lyocel/Tencel
- Nylon
- Polyester
- Silk
- Spandex/Elastane
- Viscose/Rayon
- Wool

Weight

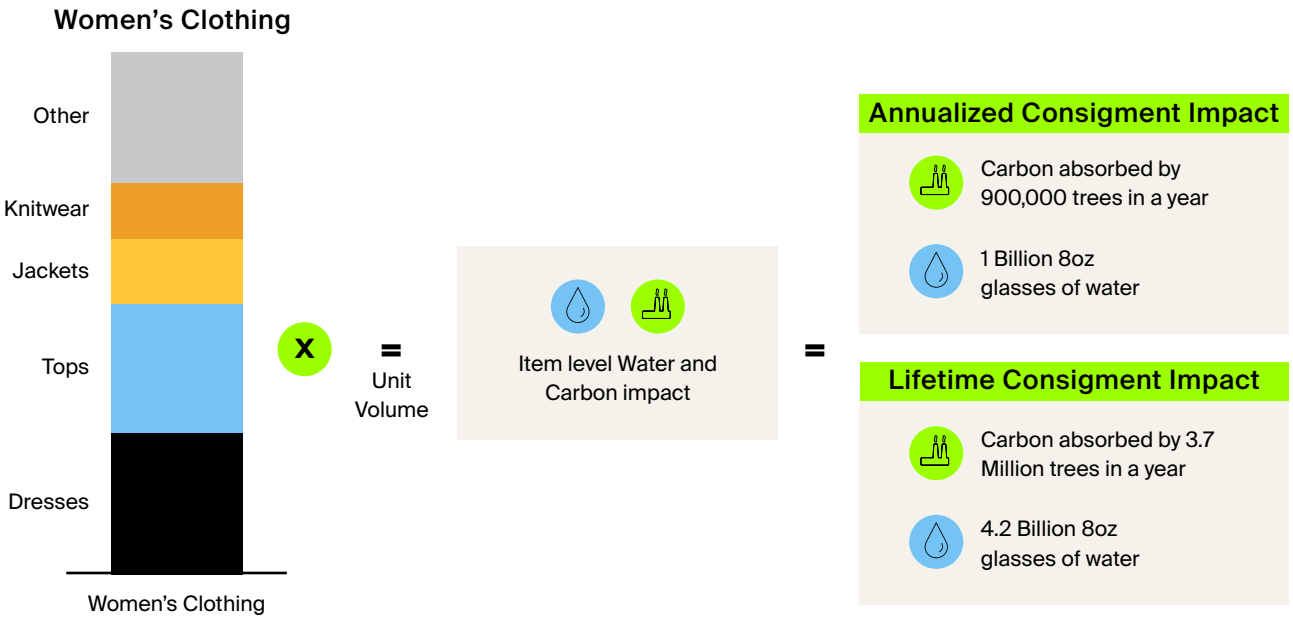
For each category and fabrication combination, TRR weighed a sample of products to develop weight averages in kilograms.

Product Archetype Example: Silk Dresses



Savings Calculation

The calculated environmental savings for items of each of these category and fabrication combinations are then summed into a total women's clothing composite (e.g., an average silk dress sold by The RealReal weighs x kg; y% of The RealReal's dresses are silk; z% of The RealReal's women's clothing are dresses; the same steps were taken for cotton dresses, silk pants, etc.).



Example: Item Level Water and Carbon Savings

SUSTAINABLE

STELLA MCCARTNEY

Wool Houndstooth Print Evening Jacket

Size: XS | US2, IT38

$230.00

ADD TO BAG

Description

- Stella McCartney Wool Evening Jacket
- Black
- Houndstooth Print
- Pointed Collar
- Zip Pockets & Zip Closure

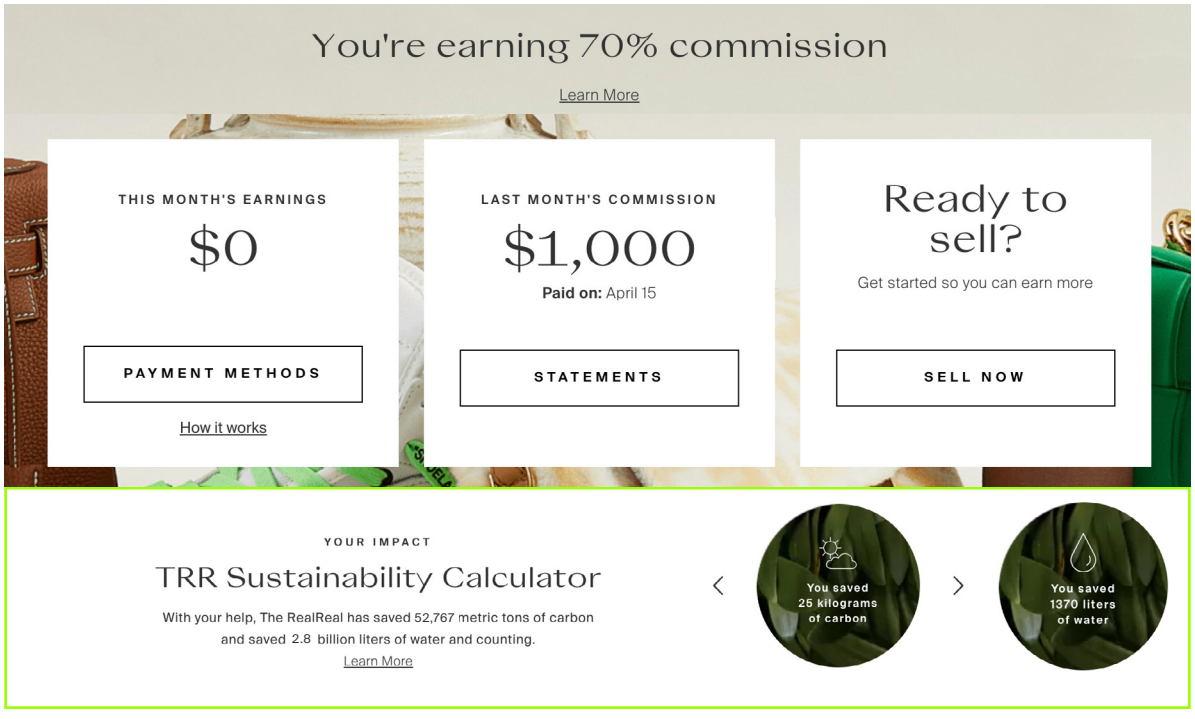
TRR Sustainability Calculator

By purchasing this item, you're contributing to a more sustainable fashion future. Learn more

175 Liters of Water Saved

7.56 Kilograms of Carbon Saved

Example: Individual's Total Water and Carbon Savings from Consigning



TRR Sustainability Calculator:
Handbags, Watches, & Jewelry

To calculate GHG and water savings for handbags, watches, and jewelry, The RealReal conducted streamlined LCAs of representative items composed of various metals, fabrics, plastics, and materials. The scope of these LCAs included material inputs, a portion of the transportation within the supply chain, market-based unit processes, and manufacturing emissions where applicable. This approach accounts for the majority of TRR's handbag, watch and jewelry inventory. Gemstones were excluded from savings calculations for watches and jewelry. These streamlined LCAs likely underestimate the savings that would be identified if full LCAs were conducted for specific handbags, watches, and jewelry and their specific supply chains.

Handbags: Calculating Savings

To calculate savings for a wide variety of styles, The RealReal focused on three representative styles of handbags: shoulder bags, clutches, and backpacks. Eleven handbag taxons of similar size and type, such as bucket bags and waist bags, were mapped to these three styles for a total of 14 handbag taxon archetypes.

Handbag Weight Measurement

Several representative samples of each of the three types of handbag were disassembled to weigh individual components for impact calculations.

Handbag Production: Materials

Most unit processes used were market-based from the ecoinvent Ver. 3.6 Cut Off database. Market-based means that the unit process includes multiple life cycle stages rolled up into one unit process including but not limited to: extraction, processing, and transportation. Market-based unit processes are designed to give a more complete snapshot of the process without estimating the additional processes and introducing uncertainties and potential inconsistencies. The end point of these processes is 1kg of material ready to be manufactured into a final product.

The materials from the representative samples which used market-based unit processes include:

- Nylon
- Cotton
- Polyester (woven and non-woven)
- Polyvinyl chloride
- Pot metal
- Steel
- Brass
- Glass
- Polyurethane foam
- Rubber
- Ethylene vinyl acetate

Handbag Production: Fabric

For fabric production, a combination of the impacts for material production, weaving (if applicable), and dyeing processes were calculated. For example, for cotton, ecoinvent included market-based unit processes for all three steps.

Handbag Production: Metals

For pot metal, a generic mixture of metals was found and their market-based unit processes from ecoinvent were combined. Plating impacts were added through a chromium plating unit process. None of the plating metals were included as it was found in the jewelry study that unless the plated metal was precious (gold, silver, platinum), the impacts were less than 1% of the total impacts and, therefore, did not contribute significant impacts to these calculations.

Handbag Production: Rubber

Rubber data sets were taken from the market-based unit processes in the ecoinvent 3.6 Cut-Off database. Because these materials leave the unit process as a kilogram of material, The RealReal added a value for selected manufacturing energy for the formation of a rubber piece.

Handbag Production: Leather

The RealReal measured leather impacts using the Product Environmental Footprint (PEF) database, which is an initiative of the European Commission and the Institute for Environment and Sustainability in the EC's Joint Research Centre. The profile chosen is "Finished leather for garments & gloves, consumption mix, at tanning plant, preserved and tanned." To align PEF leather data with ecoinvent data used in this study, values were converted from 1m2 to 1kg using density data provided in the PEF leather profile.

Handbag Production: Sewing

All seam lengths were measured before bag disassembly. A commercial sewing machine, Juki DDL 8700, was used for stitch length, speed and energy consumption. The energy demand was calculated from this information and the Greenhouse Gases, Regulated Emissions, and Energy use in Technologies (GREET) model was used to provide the electricity emission data. Impacts for energy demand and associated GHGs were added to the model. Water demands were excluded.

For all of the above production calculations, no additional transportation impacts were added. This creates a more conservative calculation that is undercounting the savings. To account for cutting losses, an 80% efficiency value of inbound fabric to final handbag was assumed.

Watches: Calculating Savings

To calculate savings for a wide variety of watch styles, The RealReal focused on 12 watch strap materials, such as stainless steel and silicone, and 9 case materials, such as 18K rose and yellow gold, that represent the vast majority of TRR watch inventory. Impacts were developed for each of these variations.

Watch Weight Measurements

Total average weights were developed from a sample mix of men's and women's watches with both metal and non-metal straps. A men's watch was disassembled to determine the weight of the unit and the band. It was assumed that the watch unit was identical for both types of men's watches (i.e., leather band or metal band), with the band type accounting for differences in weight. The women's watch unit was estimated to be half the weight of the men's watch unit.

Watch Production: Metal

Most unit processes used were market-based from the ecoinvent Ver. 3.6 Cut Off database. Market-based means that the unit process includes multiple life cycle stages rolled up into one unit process including but not limited to: extraction, processing, and transportation. Market unit processes are designed to give a more complete snapshot of the process without the practitioner estimating the additional processes and introducing their own uncertainties and potential inconsistencies. The end point of these processes is 1kg of metal/material ready to be manufactured into a final product.

The formation of the metal watch pieces is not included in the market unit process. The RealReal added an additional 6% to the market unit processes based on a jewelry study to account for watch unit and band formation. While this percentage is officially the processing for a ring, it may overestimate the production in some places (such as watch band pieces) and may underestimate in others (a single watch unit piece). Overall, it should not make a significant difference to the results as the differences across all components are likely to even out. The metals include various golds and gold tones, stainless steel, and ceramic.

Watch Production: Leather

The RealReal measured leather impacts using the Product Environmental Footprint (PEF) database, which is an initiative of the European Commission and the Institute for Environment and Sustainability in the EC's Joint Research Centre. The profile chosen is "Finished leather for garments & gloves, consumption mix, at tanning plant, preserved and tanned." To align PEF leather data with ecoinvent data used in this study, values were converted from 1m2 to 1kg using density data provided in the PEF leather profile.

Watch Production: Non-Metal

Similarly to the approach for metals, The RealReal used data sets from market-based unit processes in the ecoinvent 3.6 Cut-Off database for non-metal and non-leather materials. Because these leave the unit process as a kilogram of material, The RealReal added a value for injection molding energy for the formation of a watch band. The carbon intensity of the electricity used for injection molding was taken from the Greenhouse Gases, Regulated Emissions, and Energy use in Technologies (GREET) model.

Watch Production: Additional Components

The RealReal used the ecoinvent Ver. 3.6 Cut-Off database to calculate impacts for additional materials and components common to watches. These materials include nickel-metal hydride batteries, glass for watch faces, and brass for internal watch components. Each material's carbon emissions, water and energy consumption values were multiplied by the assumed weights above to determine the savings for each type of watch.

Jewelry: Calculating Savings

To calculate savings for a wide variety of jewelry, The RealReal focused on the 16 most common materials found in TRR's inventory, such as sterling silver, platinum, brass, bronze, 14K/18K yellow, white and rose gold, and more.

Jewelry Weight Measurements

Average weights for individual items were not calculated for jewelry since exact weights are captured in The RealReal's system. For production calculations, the densities of various metals were used to calculate the weight of a ring of the same size for each of the metals. The highest percentage of the metal contribution was used as the density.

Jewelry Production: Cradle to Metal (Raw Material)

Market-based unit processes from the ecoinvent 3.6 Cut Off database were used for the LCA. Market-based means that the unit process includes multiple life cycle stages rolled up into one unit process including but not limited to: extraction, processing, and transportation.

Market-based unit processes are designed to give a complete snapshot of the cradle-to-gate life cycle process of a material (in this case, various metals) without estimating the unit processes and introducing varying levels of uncertainty. These market-based unit processes start with the origin ore and end with 1kg of metal ready to be manufactured into a final product and do not include the unit processes for turning the metal into a finished product.

In lieu of having specific ecoinvent data for jewelry ring manufacturing unit process(es), The RealReal increased the specific market-based unit process associated with each metal by 5.56% to account for creation of the ring based on calculations in a jewelry study.

Transportation impacts were not added as they were deemed to be minimal. The metals include various golds and silvers, palladium, platinum, brass and bronze.

Jewelry Production: Plating

For the calculation of both the ring volume/mass and for the platings, the formula for the volume of a torus was used.

For solid metal rings, the calculation was straightforward and used as given. For plated rings, the interior metal was calculated as a solid ring using the torus formula; the plating or vermeil was added on top of the solid metal to calculate how much more was needed to cover the base with a given thickness. The densities of different metals then fed back into the Jewelry Percent Weight Contributions.

Additional energy is required to complete the plating process. The most relevant plating/coating process contained in ecoinvent is a “hard chromium coating” process. As this process is effectively based on a volume of coating (given thickness of coating and surface area), it was applied to the plated rings based on a volume ratio.

TRR Sustainability Calculator: Estimations

For some items, The RealReal does not have complete product information and thus cannot derive impact data. To include these items in savings calculations, TRR created estimations based on the average for a product category (i.e., women’s dresses). These estimations are calculated dynamically to ensure real-time accuracy based on TRR’s current inventory.

Sustainability Consultants

The RealReal teamed up with leading environmental consultants Shift Advantage, Inc., and Brown and Wilmanns Environmental, LLC, to build TRR Sustainability Calculator.

Shift Advantage, Inc., and Brown and Wilmanns Environmental, LLC, are sustainability consulting companies that have partnered for over a decade to bring leading solutions to companies around the world including Nike, Patagonia, and Burberry. They combine business and environmental expertise to provide sustainability support to businesses ranging from small start-ups to Fortune 500 companies.

SHIFT® advantage

bwe Brown and Wilmanns Environmental, LLC