Nuuly Rental Impact Model

May 2026

CONTEXT

Is Nuuly gentler on the planet?

Third Partners & Nuuly developed a dynamic data model to assess theclimate & water impact of three garment types being rented through Nuulyvs purchased new through ACC*

Model inputs include industry data & benchmarks, summary statisticsproduced from Nuuly business data (rental performance, laundering cycles,shipping, etc.) and various assumptions.

*ACC = Anonymous Clothing Company, the fictional jeans, dresses, and jackets brand constructed from aggregated industry reports against which we're comparing Nuuly's carbon & water impact



A Comment from *Professor Roland Geyer* (UC Santa Barbara)

While circular business models in apparel have attracted much attention in recent years, robust environmental assessments are still lacking. Nuuly & Third Partners developed an environmental data model to assess the carbon and water intensity of Nuuly's business model versus conventional retail, and invited me to review the model on its scientific merits.

Overall, I found the impact model to be scientifically, methodologically, and technically sound, and I believe it marks significant, and much needed, progress towards measuring the environmental performance of apparel circularity in a transparent and credible fashion.

Based on my review, the model is transparent and consistent, and the quality of the input data is sufficient to support the overall claim of the study, which is that, relative to conventional apparel retail, Nuuly's business model increases the total number of wears over the lifetime of apparel items, reduces the life cycle greenhouse gas emissions per wear, and reduces the life cycle water use per wear. The parametric nature of the model facilitates extensive scenario and sensitivity analyses, which show that the above results hold for a wide range of plausible assumptions.

Ideally, an environmental assessment of Nuuly's business model would measure how Nuuly's existence changes overall apparel production, use (washing, drying, etc.), and ancillary activities (apparel shipping, customer driving, packaging use, etc.).

Though Nuuly's impact model goes a significant way towards answering these questions, the most important data that is currently missing is how customers' apparel purchasing changes post-Nuuly subscription. This would be valuable to investigate further. however, iIn the absence of this information, the number of wears appears to be a reasonable proxy for the amount of apparel purchases.

The data quality ranges from very good to good and could be strengthened with the use of commercially available LCA databases. One weakness of the model is the lack of detail in the consumer use phase model and underlying data, and another includes the data and assumptions behind the customer and consumer transport model.

Overall, Nuuly's environmental impact model and supporting data represent a major contribution towards a better understanding of the absolute and relative environmental performance of apparel business models based on rental as opposed to conventional retail.

While the professional affiliation of the external reviewer has been provided, the review effort was personally compensated. Thus, the review does not represent any endorsements by UCSB.

Overview

Leaders in sustainable fashion including Ellen MacArthur Foundation[1], BCG, and various researchers advocate for studying the environmental impact intensity of fashion consumption[1]

Nuuly modeled the lifecycle carbon & water impact of renting 3 types of garments compared to the purchased alternative

This effort required:

- Developing a much deeper understanding of our businesses' relationship with energy and water consumption
- Consulting with data, analytics, compliance, and product teams
- Working with primary & secondary data, including meter-level energy & water consumption data, rental performance data, machine-level laundering data, and subscriber engagement
- Developing various submodels to reflect unique components of Nuuly's business model

Study Design



OBJECTIVE

Evaluate the *amortized* lifetime carbon & water footprint of Nuuly garments



Hypothesis

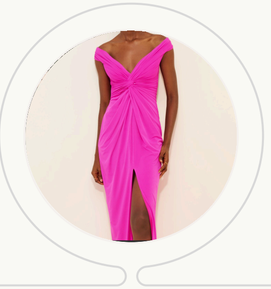
(+) Across one or more categories or styles, Nuuly gets additional utilization out of the rental model compared to the purchased alternative (e.g. higher # wears over lifetime of garment)

(–) Nuuly accrues additive carbon & water impact compared to purchased alternative through transport & laundering

(+) Nuuly may be environmentally preferable (vs purchased alternative) after normalizing environmental impact based on # of wears

Scope

We selected three clothing categories to study in order to understand how utilization and resource intensity varies across different types of garments

	 Jeans	 Occasion Dresses	 Puffer Jackets
RATIONALE FOR INCLUSION	Most studied garment type from a life cycle assessment (LCA) perspective Inherently durable construction, staple wardrobe Assumed to have high lifetime utilization	Less durable construction, use is typically event-based Assumed to have low lifetime utilization Strong rental use case when consumer preference is to wear once	Potentially medium to high lifetime utilization Seasonal utilization, dependent on weather/climate

Introducing impact intensity

Why taking the bus is environmentally preferable to driving

Evaluating transportation options on the basis of impact intensity (in this case: fuel emissions / riders) allows for a more meaningful comparison. While the bus has a higher lifetime carbon footprint than the car, its impact intensity is lower - since it is spread across many riders.

Impact intensity (per rider) of car vs bus

 *car*	 *one riders*	***impact intensity = lifetime impact / one rider***
 *bus*	 *many riders*	***impact intensity = lifetime impact / many riders***

Impact intensity: renting vs buying

Why renting clothing can be environmentally preferable to owning

Nuuly's efficiency gains from increased product utilization are similar to how a bus uses more fuel than a car, but is more efficient per passenger. While a rented garment with Nuuly generally has a higher lifetime carbon footprint than the purchased alternative, the incremental wears from multiple users can lower impact intensity.

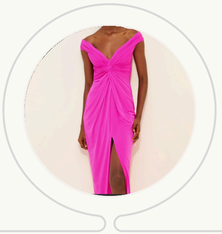
Impact intensity (per wear) of new vs Nuuly jeans

 *new jeans*	 *one owner*	***impact intensity = lifetime impact / owner wears***
 *rented jeans*	 *many renters*	***impact intensity = lifetime impact / renter wears***

Model Outputs

The average utilization for Nuuly rented jeans, occasion dresses, and puffer jackets is higher than for purchased alternatives





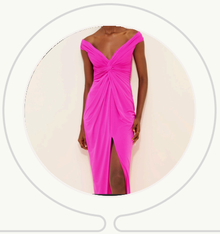


	JEANS		OCCASION DRESSES		PUFFER JACKETS	
	NEW	NUULY	NEW	NUULY	NEW	NUULY
Expected lifetime wears	42.0	53.1	3.1	8.8	28.5	63.1
Expected wears per Nuuly rental cycle	-	3.2	-	0.8	-	6.0
Expected wears from Nuuly rental phase	-	19.8	-	6.5	-	40.0
Expected wears post-Nuuly	-	33.3	-	2.2	-	23.1
Ratio: Nuuly / purchased alternative wears	**~1.3**		**~2.8**		**~2.2**	

Higher ratio = environmentally gentler relative to to typical purchased alternative

Nuuly rented garments generally have a greater expected lifecycle carbon impact, but higher utilization reduces carbon intensity





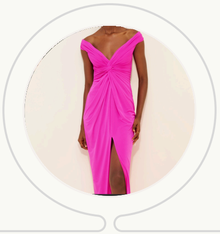


	JEANS		OCCASION DRESSES		PUFFER JACKETS	
	NEW	NUULY	NEW	NUULY	NEW	NUULY
Expected lifecycle carbon impact kg CO2e	37.2	36.2	11.1	17.4	17.0	17.6
Amortized carbon impact kg CO2e/wear	**0.88**	**0.68**	**3.55**	**1.98**	**0.60**	**0.28**

Lower value = environmentally gentler relative to typical purchased alternative

Nuuly rented garments are typically less water intensive per wear than purchased alternatives







	JEANS		OCCASION DRESSES		PUFFER JACKETS	
	NEW	NUULY	NEW	NUULY	NEW	NUULY
Expected lifecycle water use gallons	1002	970	106.0	118.4	94.9	102.5
Amortized water use gallons/wear	**23.9**	**18.3**	**34.0**	**13.5**	**3.33**	**1.62**

Lower = “better” for planet relative to typical purchased alternative

Model Inputs

Three-phase model structure

To quantify the lifecycle impact of Nuuly garments, we modeled out the full value chain for each of the chosen categories.



PHASE ONE

Pre-Nuuly

Captures the environmental footprint of garment production through arrival at Nuuly DCs



PHASE TWO

Nuuly Rental

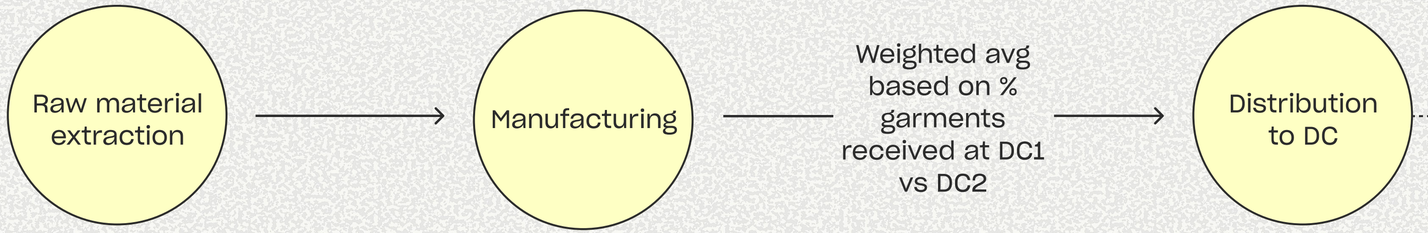
Measures carbon & water impacts from all activities in the rental loop



PHASE THREE

Post-Nuuly

Evaluates garment end-of-life impact across various rental exit channels



PHASE ONE

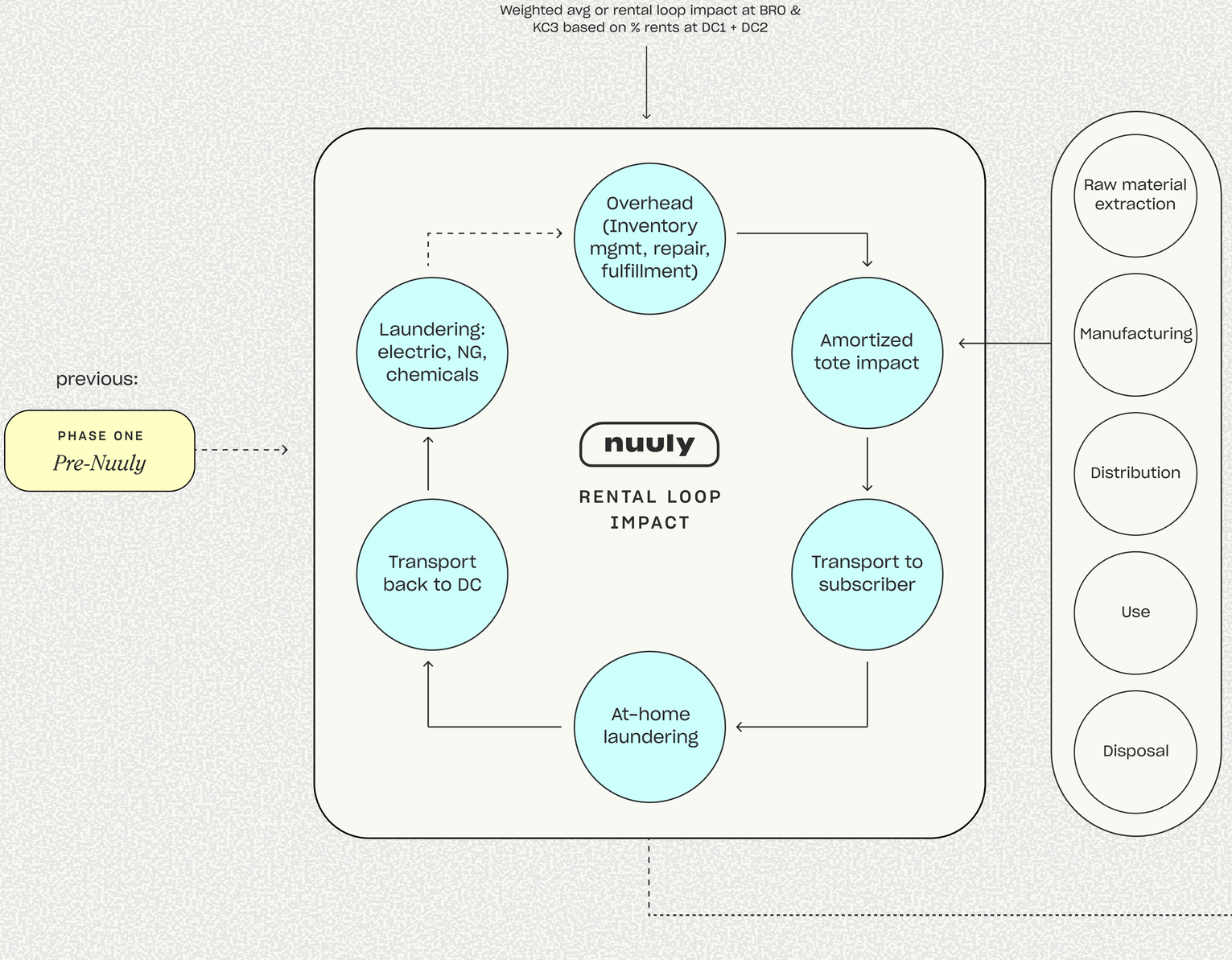
Pre-Nuuly

This is the pre-Nuuly phase, capturing the carbon and water impact of garments before they arrive at our distribution center to enter rental inventory. Covered stages include (1) Raw material extraction (2) Manufacturing and (3) Distribution to DC[2].

next:

PHASE TWO

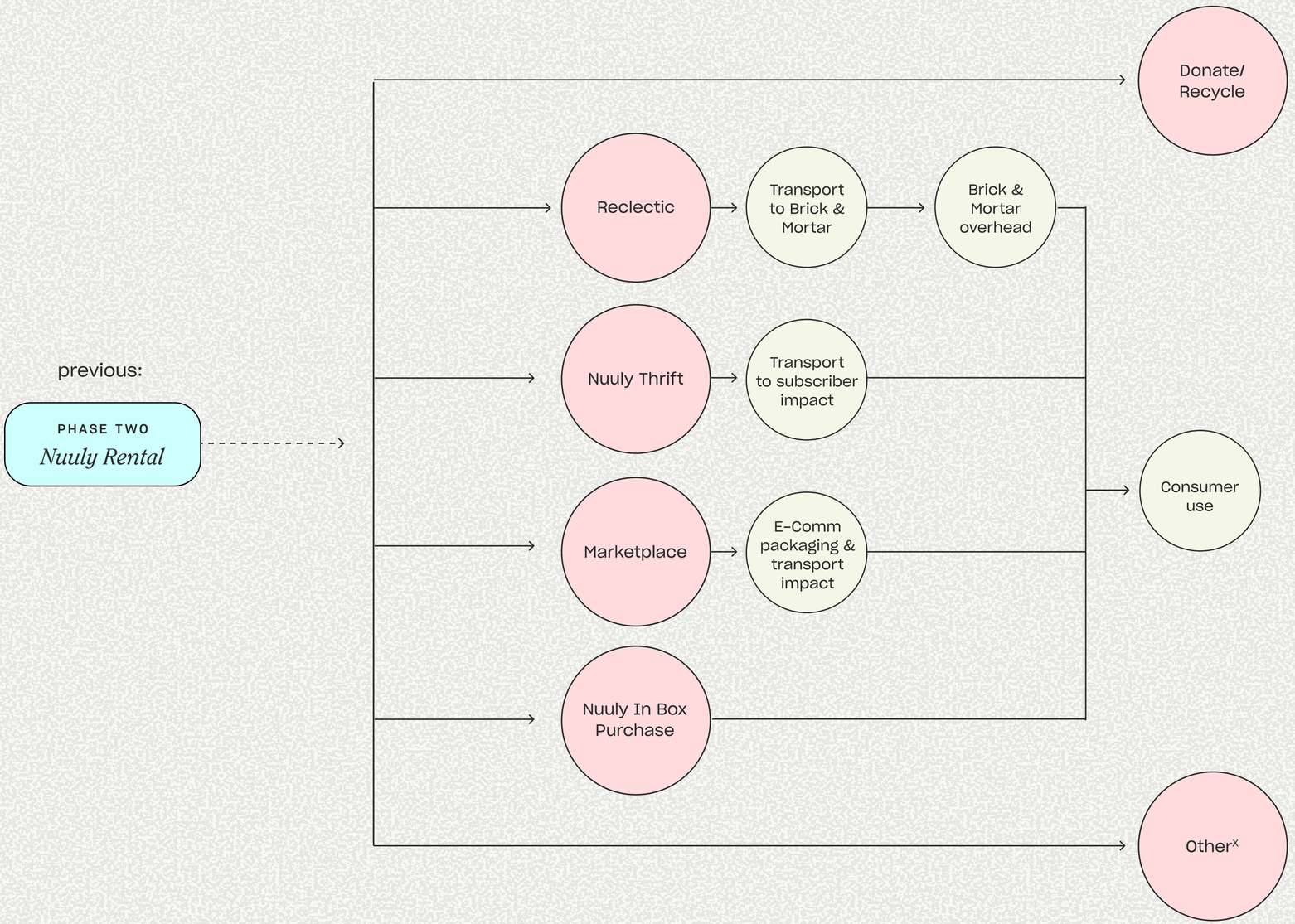
Nuuly Rental



PHASE TWO

Nuuly Rental

This is the Nuuly rental phase, capturing the carbon and water impacts associated with each activity in the rental loop. The rental loop can be understood as all that goes into preparing one Nuuly garment to go from one subscriber to the next (e.g., transportation, laundry, DC energy use[3], etc.). This phase includes two associated sub-models to most accurately model impacts of laundry operations and Nuuly tote use.



PHASE THREE

Post-Nuuly

This is the post-Nuuly phase, mapping out what happens to our garments after they leave rental inventory, and the associated carbon and water impact of various end-of-life channels.

PHASE ONE: PRE-NUULY

Modeled garment composition & mass inputs off of three styles representative of Nuuly's jeans category

Model Jeans Composition

Type	Cotton	Elastane	Lyocell	Polyester	Inventory Weighting	Mass (kg)
Cotton Only	100%	0%	0%	0%	30.0%	0.3534
Cotton + Stretch	99%	1%	0%	0%	40.0%	0.4410
Cotton Blend	81%	2%	11%	6%	30.0%	0.6568
Representative Nuuly jeans for rental impact (weighted average)	**94%**	**1%**	**3%**	**2%**	–	**0.4795**

GARMENT INGREDIENTS

Implications: Ingredients are associated with distinct climate & water impact, from raw material extraction to manufacturing

MASS

Implications: Garment mass drives incremental climate impact from transportation; used to allocate water & energy consumption associated with laundering

PHASE ONE: PRE-NUULY

For occasion dresses, garment ingredients & mass inputs are modeled off of four representative styles

Model Occasion Dress Composition

Type	Cotton	Lyocell	Polyester	Inventory Weighting	Mass (kg)
Cotton	100%	0%	0%	8.0%	0.3154
Cellulosic	0%	100%	0%	17.0%	0.3154
Synthetic	0%	0%	100%	51.0%	0.3154
Blend	20%	0%	80%	22.0%	0.3154
Representative Nuuly occasion dress for rental impact (weighted average)	**13%**	**17%**	**70%**	–	**0.3154**

GARMENT INGREDIENTS

Implications: Ingredients are associated with distinct climate & water impact, from raw material extraction to manufacturing

MASS

Implications: Garment mass drives incremental climate impact from transportation; used to allocate water & energy consumption associated with laundering

PHASE ONE: PRE-NUULY

Puffer jacket composition & mass inputs are modeled off of one representative style

Model Puffer Jacket Composition

Type	Polyester	Inventory Weighting	Mass (kg)
Synthetic	100%	100.0%	0.355907
Representative Nuuly puffer jacket for rental impact	**100%**	**–**	**0.4795**

GARMENT INGREDIENTS

Implications: Ingredients are associated with distinct climate & water impact, from raw material extraction to manufacturing

MASS

Implications: Garment mass drives incremental climate impact from transportation; used to allocate water & energy consumption associated with laundering

PHASE TWO: NUULY RENTAL

The lifecycle carbon and water impact of the Nuuly bag is amortized per garment rented, and included in Rental Phase impact

Activity Group	Activity	Node Type	Impact Type	Unit
Activities Upstream Pre-Production		Single	Carbon	lb
Material Production	rPET, flake to factory (China)	Single	Carbon	lb
Material Production	EVA, raw material and injection molding (China)	Single	Carbon	lb
Material Production	PP webbing (China)	Single	Carbon	lb
Material Production	Polyacetal for zipper	Single	Carbon	lb
Material Production	Nickel zip pull (cradle to gate nickel products)	Single	Carbon	lb
Material Production	Polyester for zipper tape	Single	Carbon	lb
Material Production	Nylon for interior mesh pocket	Single	Carbon	lb
Material Production	PVC for exterior sleeve	Single	Carbon	lb
Product Assembly	comp=backpack manufacturing per kg final ??	Single	Carbon	lb
Distribution to Nuuly DC1	ocean - pound miles, Shanghai to Long Beach	Route 1	Carbon	boat miles
Distribution to Nuuly DC1	truck - pound miles, Long Beach to Bristol	Route 1	Carbon	truck miles
Distribution to Nuuly DC2	ocean - pound miles, Shanghai to Long Beach	Route 2	Carbon	boat miles
Distribution to Nuuly DC2	truck - pound miles, Long Beach to Kansas City	Route 2	Carbon	truck miles
Use Phase	Transport to subscriber (covered in carrier's shipping emissions)		Carbon	air miles
Use Phase	Transport from subscriber to DC		Carbon	truck miles
Use Phase[4]	Total number cycles	Loop	Carbon	cycles

PHASE TWO: NUULY RENTAL

Transport to subscriber and back to DC

Transport to subscriber (outbound)[5]

Air shipment to subscriber: Avg GHG emissions per shipment provided by the carrier, divided by avg # of garments in bag

Ground shipment to subscriber: Avg GHG emissions per shipment provided by the carrier, divided by avg # of garments in bag

Transport back to DC (inbound)

Subscriber travel to return Nuuly (UPS store, Access Point, UO store, etc.): Avg GHG emissions per return trip (calculated from survey data), divided by avg # of garments in bag

Ground shipment to Nuuly DC: GHGs based on average shipment distance from customer to DC & weight of garment

- ~550 miles to customer, DC1
- ~815 miles to customer, DC2

AIR SHIPMENT

Implications: Carrier data is on a per shipment basis. The per garment allocation is based on the average # of garments per shipment in the period. Nuuly could use average weight per shipment to calculate on a per lb basis.

GROUND SHIPMENT

Implications: Greater distance to subscriber -> more emissions per shipment.

PHASE TWO: NUULY RENTAL

Laundering

Laundering at the DCs is modeled according to the care instructions of our representative styles:

- Jeans: wet wash & machine dry
- Occasion dresses: dry clean only
- Puffer jackets: wet wash & machine dry

LAUNDERING

Implications: Each wet wash, dry cleaning, and drying cycle accrues incremental environmental impact due to energy, water, and chemical consumption.

Water impact:

- Usage estimates (per cycle) derived from specification and programming data from Nuuly's wet washing machines

Carbon impact:

- Energy consumption estimates per wet washing, dry cleaning, and drying cycle
- Estimated carbon contribution from laundry chemicals[6] use (wet washing & dry cleaning solution)



PHASE TWO: NUULY RENTAL

Rental use-phase insights from subscribers

At-home laundering

42.4% of subscribers reported washing rented jeans

Subscribers reported 1.51 average washes in previous rental cycle (if washed)

0.639 at-home washes per jeans rent on avg

LAUNDERING

Implications: At-home washing accrues incremental carbon impact through energy use & water impact

Returns (subscriber travel to return carrier)

7.86 miles driven per car return round trip on average

84% of subscribers return via car

64% of subscribers return via multi-errand trip

4.27 passenger vehicle miles allocated to Nuuly per subscriber rental return

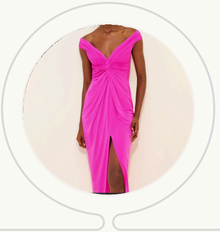
RETURNS

Implications: Passenger vehicle trips drive additional carbon emissions on a per mile basis

PHASE TWO: NUULY RENTAL

Product utilization insights from subscribers







	JEANS	OCCASION DRESSES	PUFFER JACKETS
Sample Size	69,377	107,381	6,378
Wear rate	72%	59%	85%
Avg wears/rent	**3.2**	**0.8**	**6.0**
Avg wears/rent (if worn)	4.4	1.3	7.1

WEARS/RENT

Implications: Used to calculate the total # of wears accrued over Nuuly rental phase.

exp. # wears from renting = [# wears/rent] x [# expected rental cycles]

PHASE THREE: POST-NUULY

Exit distribution estimates, by category

Expected Exit Distribution	Jeans	Occasion	Outerwear
Donated / Recycling	2.2%	0.2%	1.0%
In Box Purchase	48.9%	18.3%	42.8%
Other[7]	13.1%	16.7%	12.3%
Resale to Consumers (e-commerce)	16.9%	25.2%	24.1%
Resale to Consumers (brick-and-mortar)	18.2%	39.4%	18.8%
Nuuly Thrift	0.7%	0.2%	1.0%

EXIT DISTRIBUTION

Definition: % Likelihood of a single garment exiting inventory by way of one of 6 exit channels, by category

Implications: Exit channels have distinct environmental impact profiles due to variation in transportation/distribution, expected customer use, etc.

PHASE THREE: POST-NUULY

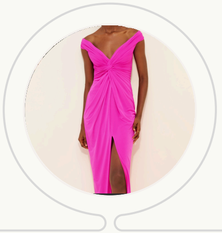
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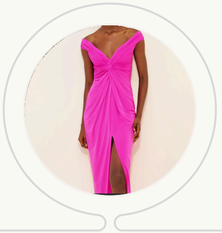
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PHASE THREE: POST-NUULY

Post-Nuuly exit channels: transportation & consumer use

Average distance traveled by garments to Resale (brick & mortar):

903 truck miles

Implications: Ground transport accrues additional carbon impact based on weight/distance

Average distance traveled by Resale (E-comm packaging & transport impact) shipments:

728 truck miles & 246 air miles

Implications: Air shipping accrues additional carbon impact based on weight/distance

Modeled consumer use impact (washing) from industry benchmarks

Implications: **In Box Purchases, Marketplace, and Thrift are considered to be "like new" exit channels,** and are assigned the total benchmark value for post-rental # of wears and consumer impact. **Reclectic purchases are derated and assigned 70% of the total benchmark value for post-rental # of wears & consumer impact.**

Key Findings



KEY FINDING 1

More *life* in your jeans

Impact model suggests that Nuuly jeans are worn 26% more over their lifetime than the purchased alternative

Nuuly rental phase accounts for roughly 37% of jeans lifetime wears, which eventually exit inventory through various channels

Nuuly jeans are worn on average 20 times across 6 to 7 rental cycles before exiting inventory

How people rent jeans fundamentally includes at home "try on" behavior and it's part of the denim rental story (with 28% of Nuulyers reporting 0 wears based on subscriber surveys)

Method detail

Measuring fashion utilization is tricky because it relies on self-reporting over years of activity; no single, authoritative source exists for benchmarks. A peer-reviewed study from 2017, based on surveys of ~4,600 adult consumers from Germany, Poland, Sweden and the US, found that jeans are generally worn 36-48 times over their lifetime. We used the midpoint of this range (42 wears) as the benchmark for the expected lifetime utilization of purchased jeans. When modeling the "post-Nuuly-rental" # of wears we allocated typical lifetime wears based on the economic value of each rental exit channel (with e-comm marketplace being the highest); this is a common approach in other LCA studies when allocating "by-products" of primary materials.



KEY FINDING 1

Renting Nuuly jeans is less GHG- and water-intensive on "per wear" basis than purchased alternative

Absolute (total lifecycle) carbon emissions of a pair of Nuuly jeans is comparable to purchased alternative*

Factoring in additional wears from rental, Nuuly jeans have a 23% lower carbon impact on a “per wear” basis vs ACC jeans

Normalized on a "per wear" basis, the lifecycle water impact of Nuuly jeans is 23% lower than the purchased alternative**

*Includes manufacturing, distribution, rental shipping & ops, and post-Nuuly shipping, consumer use and end of life"

"**Includes water use from wet washing, overhead water & steam use for garment shaping at the DCs, as well as subscribers washing rental jeans at home



KEY FINDING 2

One dress, *many* occasions

The average occasion dress in Nuuly's inventory is worn 9 times across its rental lifecycle and post-rental use – approx. 3x more than the purchased alternative.

The rental phase accounts for roughly 75% of lifetime wears for Nuuly occasion dresses, which eventually exit inventory through various exit channels.

Method detail

We chose 3 wears as the benchmark for the typical lifetime wears of purchased occasion/formal dresses. This comparative estimate is derived from Indyx' 2025 study where respondents' reported that dresses in their closets have an average of 3 wears per item.



KEY FINDING 2

*Dressing up with Nuuly is gentler on the planet**

Carbon Impact

- Absolute lifecycle carbon emissions of Nuuly occasion dresses roughly 1.5x the purchased alternative**
- Factoring in additional wears from rental, Nuuly occasion dresses have a 44% lower carbon impact on a “per wear” basis vs ACC dresses

Water Impact

- Absolute lifecycle water impact of Nuuly occasion dresses roughly 10% greater than the purchased alternative**
- Factoring in additional wears from rental, Nuuly occasion dresses have a 60% lower water impact on a “per wear” basis vs ACC dresses

*From the perspective of amortized lifecycle carbon footprint & amortized lifecycle water footprint based on our data model.
**Includes manufacturing, distribution, rental shipping & ops, and post-Nuuly shipping, consumer use, and end of life

Method detail

How Nuulyers rent occasion dresses fundamentally includes at home 'try on,' and is part of the rental story. Subscribers might choose multiple options for the same event to ensure they find the perfect one. Based on subscriber surveys, 40% of Nuulyers did not wear a rented occasion dress - this is why the average Nuuly occasion dress is worn <1x per rental (0.8 wears).



KEY FINDING 3

Puffer jackets: built to *last*, great to *share*

The average Nuuly puffer jacket is worn 63 times across its lifecycle (incl. post-Nuuly use), with approx. 60% of lifetime wears coming from the rental phase.

Absolute lifecycle carbon footprint of Nuuly puffers is roughly 10% greater, and lifecycle water use is roughly 4% greater, than the purchased alternative*

Factoring in additional wears from rental, Nuuly puffer jackets have a 53% lower carbon impact per wear, and 51% lower water impact per wear, than the purchased alternative

*Includes manufacturing, distribution, rental shipping & ops, and post-Nuuly shipping, consumer use, and end of life

Method detail

Benchmarks vary, but we chose 29 wears as a comparative estimate of typical lifetime wears for purchased jackets based on Indyx' 2025 study and internal benchmarks. Considering the durable nature of puffer jackets, lifetime wears for purchased alternatives are especially challenging to benchmark. Also at play is the role of regional climate variance - e.g., necessity to own a cold-weather jacket.

Takeaways



TAKEAWAY 1

Nuuly now has a method for measuring the impact of rental, data to compare against standard purchasing

Understanding the carbon + water impact of the rental phase allows us to:

- Compare the relative contribution of the rental phase against the rest of the value chain (1.1)
- Assess the materiality of various activities within one rental cycle (1.2)
- Define the level of product utilization (number of wears) where renting becomes environmentally preferable to traditional ownership

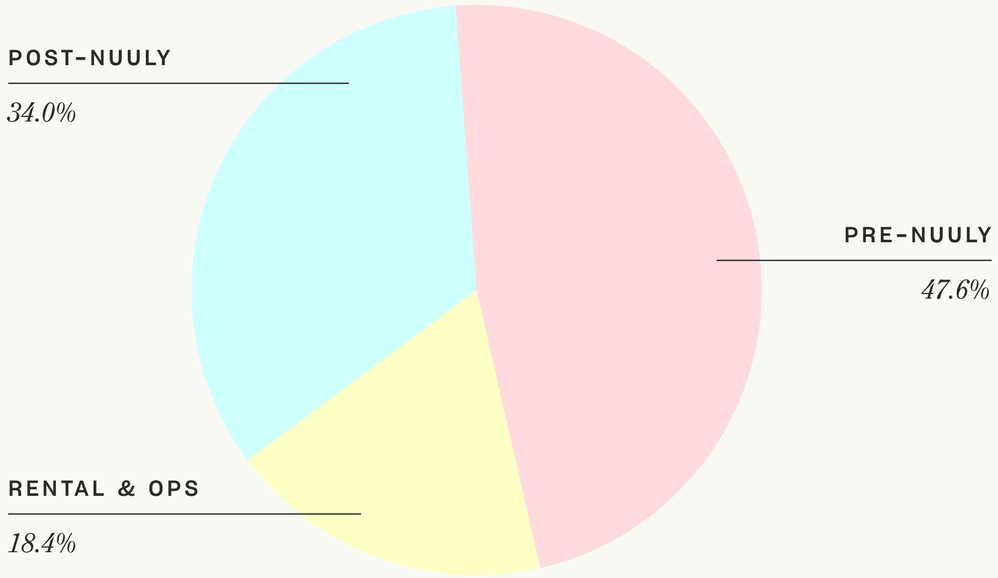
Measuring the impact intensity per wear allows for a more meaningful comparison between rental and purchased clothing

- And between Nuuly's current and future operations/processes – i.e., the model is dynamic which allows us to benchmark/compare against a baseline as Nuuly grows

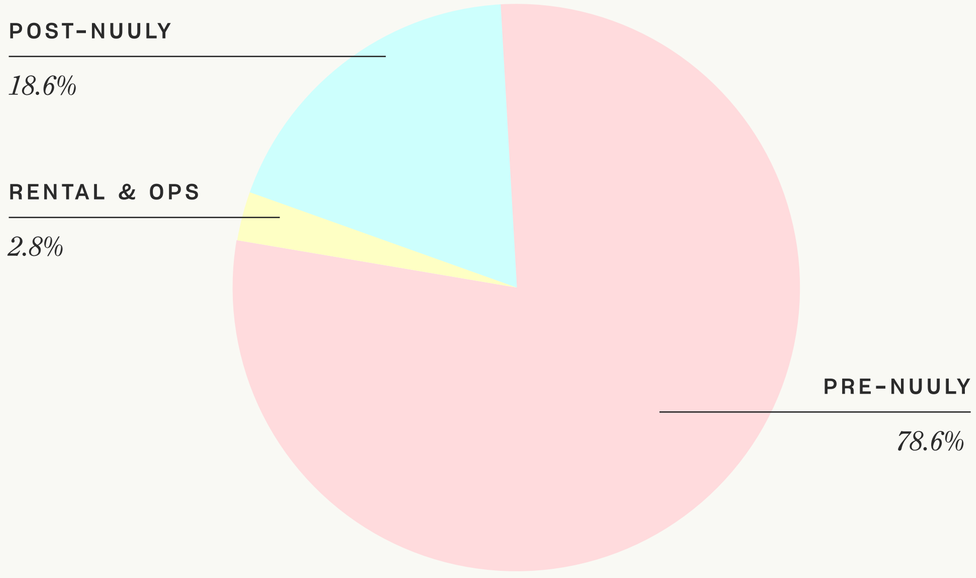
1.1: Rental phase contribution to garment lifecycle impact

Nuuly rental phase drives ~18% of lifecycle carbon impact, <3% of lifecycle water impact for the average pair of jeans* in inventory

CARBON IMPACT OF NUULY JEANS, BY LIFECYCLE PHASE

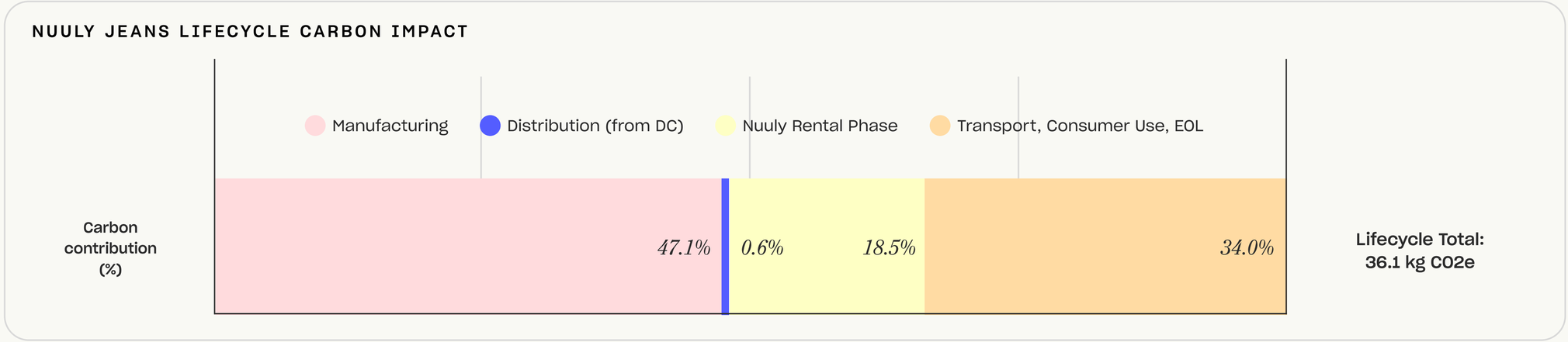


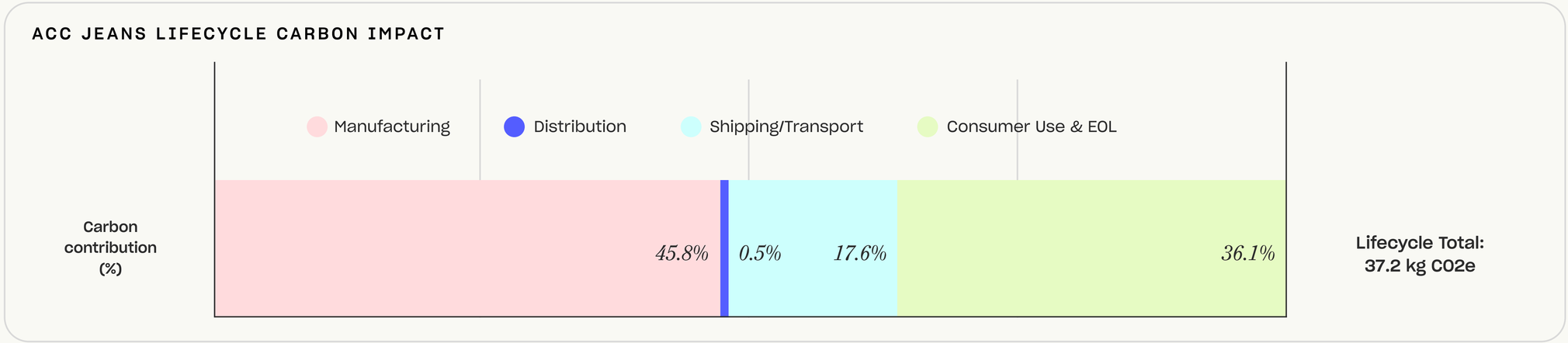
WATER IMPACT OF NUULY JEANS, BY LIFECYCLE PHASE



*[Data for Occasion Dress + Puffer categories in Appendix]

Nuuly vs ACC jeans lifecycle impact, by activity [1.1]*





*[Data for Occasion Dress + Puffer categories in Appendix]

1.2: Materiality of activities within the rental cycle

Data model outlines the relative carbon contribution of each activity occurring in a single Nuuly rental cycle

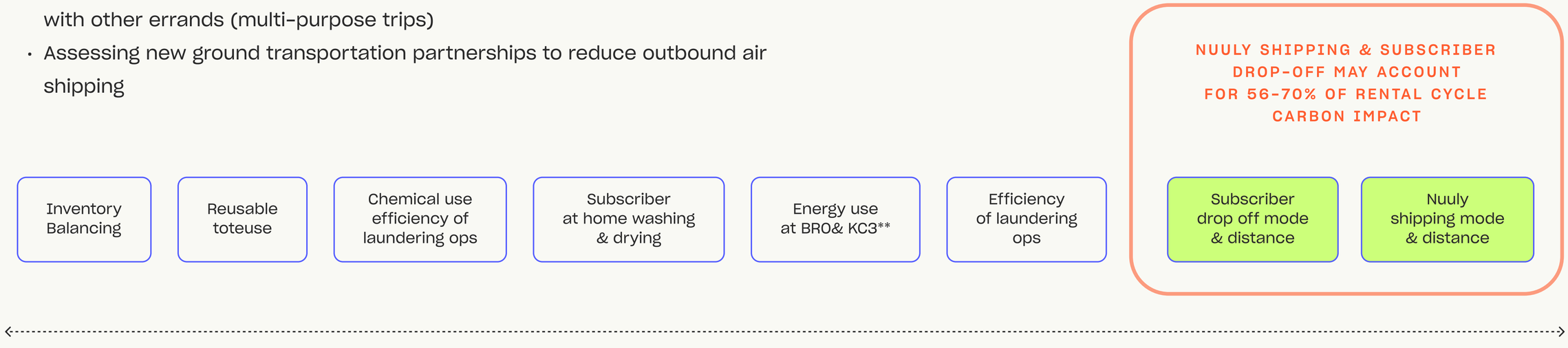
1x Rental Cycle at DC1

	Jeans	**Occasion Dresses**	**Puffer Jackets**
Activity	**Relative carbon contribution (%)**	**Relative carbon contribution (%)**	**Relative carbon contribution (%)**
Energy Use Overhead	10%	13%	12%
Inventory Balancing Overhead	0.2%	0.3%	0.2%
Tote Use (amortized per fingerprint rent)	7%	9%	8%
Blended Transport to Subscriber	25%	32%	29%
Subscriber Washing & Drying	12%	---	---
Subscriber Return Carrier Drop-Off	26%	34%	31%
Ground Transportation to DC	5%	4%	5%
Washing – Energy	1%	---	2%
Washing – Chemicals	8%	---	7%
Dry Cleaning – Energy	---	4%	---
Dry Cleaning – Chemicals	---	3%	---
Drying – Energy	6%	---	7%
Avg Rental Loop Carbon Impact	**100%**	**100%**	**100%**

1.2: Relative impact of activities within one rental loop

Nuuly now understands the relative impact of each activity within one rental cycle, making it clearer to identify efficiency opportunities, such as:

- Exploring renewable energy + water recycling options at our DCs
- Encouraging subscribers to return their Nuuly to return carrier in conjunction with other errands (multi-purpose trips)
- Assessing new ground transportation partnerships to reduce outbound air shipping



*From a carbon intensity perspective **Operational energy-related factors are 17% (jeans); 17% (dresses); and 20% (puffers) of rental cycle carbon impact



TAKEAWAY 2

Utilization is key

Renting as a better way to wear depends directly on product utilization–getting the most life out of our clothes

Nuuly's part of the deal is keeping a commitment to maximizing garment longevity where possible - e.g., repair, resale, upcycling, etc.

- Nuuly can also help/encourage subscribers to make the most out of their rented clothes–creative challenges, rewards, etc.
- Operational efficiency is an important part of this commitment–not using any more water or energy than is necessary to keep garments in circulation

Understanding nuance is important:

- There are many use cases for rental, and a special occasion dress will have less wears than a pair of jeans that can be worn every day
- There can be trade-offs between durability (which allows for higher utilization) and garment material (where some fabric types are less impactful, but more damage-prone)
- Try-on behavior and garments not fitting is always going to be a part of renting
- Not washing a rental item may prohibit more than one wear per cycle

TAKEAWAY 3

Model findings inform/inspire future areas of rental impact study

We hope this work can inspire other circular fashion models to be creative in their impact measurement, and be used in broader studies on impact intensity

Opportunity areas for further study/literature gaps:

- We recognize the impact of overconsumption in fashion for traditional purchasing–there is an opportunity to dive deeper into rental as a way to curb clothing consumption (e.g., displacement)
- Diving deeper into durability and garment material trade-offs
- New research on consumer clothing utilization (e.g., wardrobe studies)

Appendix

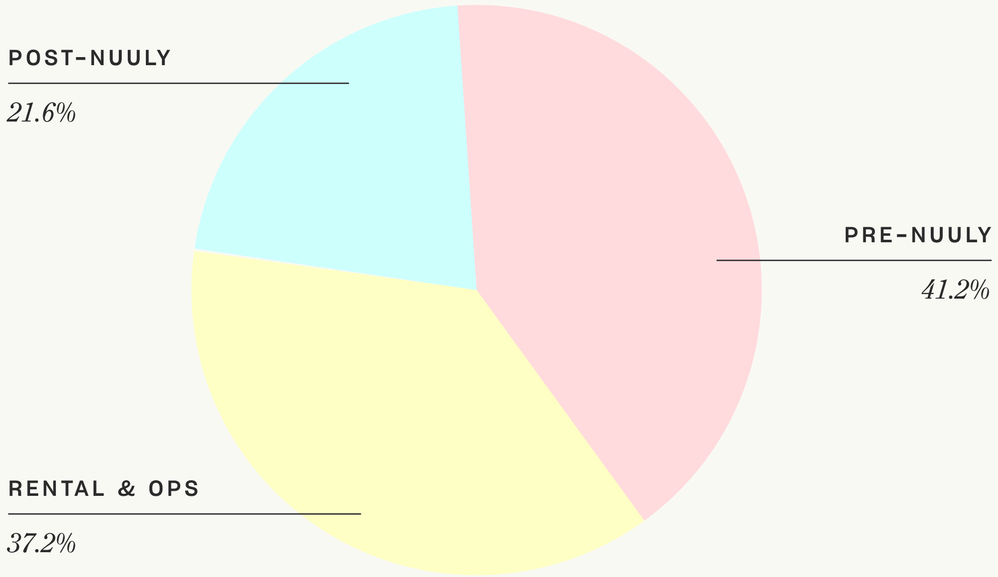
Notes & assumptions

1. Ellen MacArthur Foundation & BCG reference report: Circular Business Models, Redefining growth for a thriving fashion industry
2. Distribution to DC: Transportation impact modeled out using proxy supply chain developed from Nuuly intel: Manufacturing location - Istanbul; Port of Entry - New York (~1,600 boat miles to port); ~79 truck miles to DC (avg. distance DC1 & DC2)
3. Overhead energy use: Accounts for all energy use inside the DCs that is not reflected in laundering processes, including: (a) repairs; (b) lighting; (c) HVAC systems; (d) equipment to manage and move inventory
4. Bag impact: Lifecycle carbon & water impact of bag is amortized per garment rented, based on # of expected rental cycles per bag, and # of average garments per bag. Calculations based medium size Nuuly tote.
5. Transport to subscriber (outbound shipping): weighted average of shipping mode breakdown (85% ground and 15% air) from 2025 Nuuly transportation data.
6. Laundering: Nuuly wet washing solution is non-alkaline and phosphate-free, and dry cleaning solution is 100% PERC- and TCE-free
7. Post-rental exit distribution (Other): This category includes garments that are (a) lost in transit; (b) stolen; or (c) not suitable for further rental or URBN-operated resale channels due to damage or style considerations. These garments are typically sent to third party excess inventory partners specialized in bulk resale. While many of these garments remain in circulation post-rental, the exact quantity & lifecycles are not currently known. To avoid overstating the environmental benefits of Nuuly's business, we model the environmental impact of this path as if these garments were disposed of (landfill).

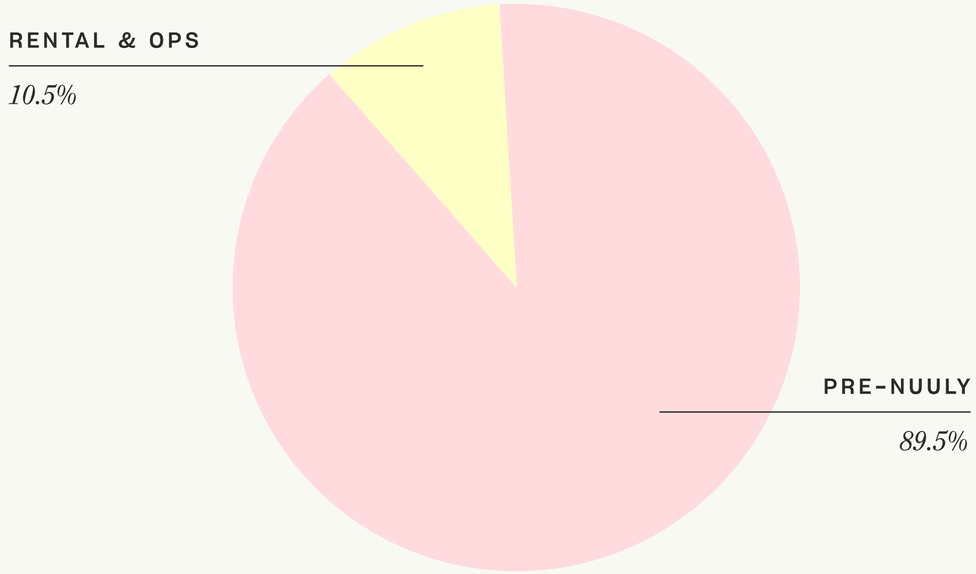
1.1: Rental phase contribution to garment lifecycle impact

Nuuly rental phase drives ~37% of lifecycle carbon impact, ~11% of lifecycle water impact for the average **occasion dress** in inventory

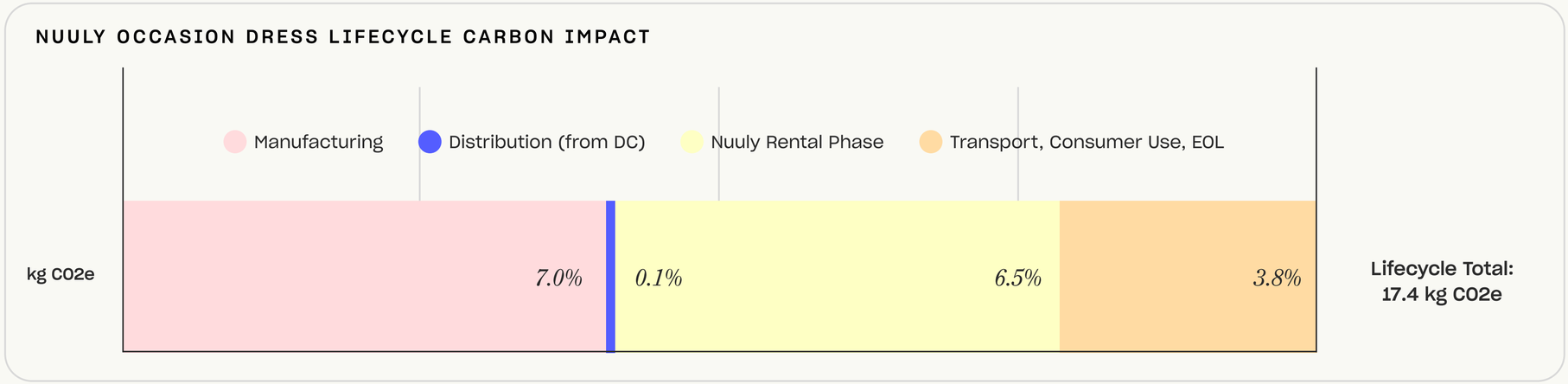
CARBON IMPACT OF NUULY OCCASION DRESS, BY LIFECYCLE PHASE

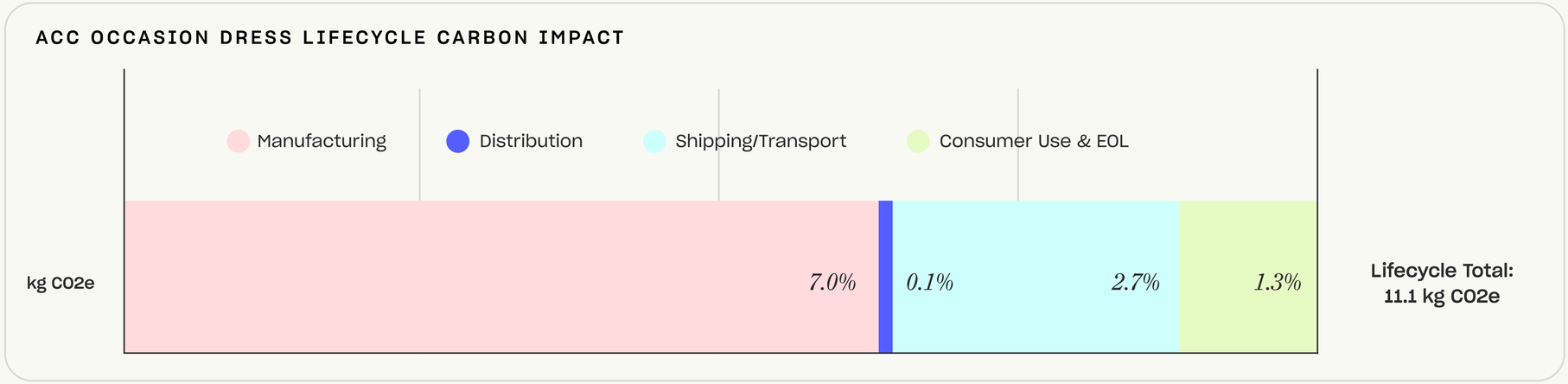


WATER IMPACT OF NUULY OCCASION DRESS, BY LIFECYCLE PHASE



Nuuly vs ACC occasion dress lifecycle impact, by activity [1.1]*

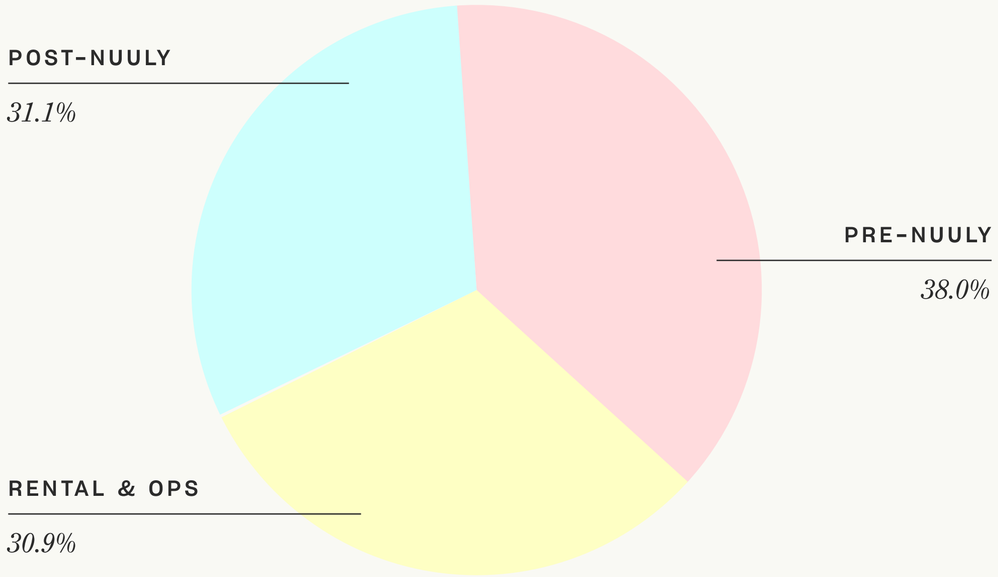




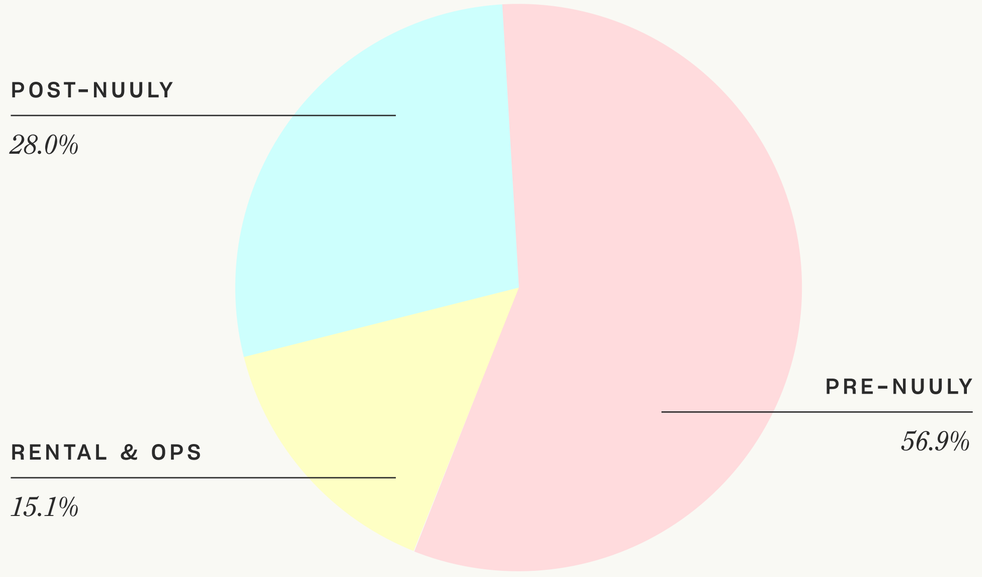
1.1: Rental phase contribution to garment lifecycle impact

Nuuly rental phase drives ~31% of lifecycle carbon impact, 15% of lifecycle water impact for the average **puffer jacket** in inventory

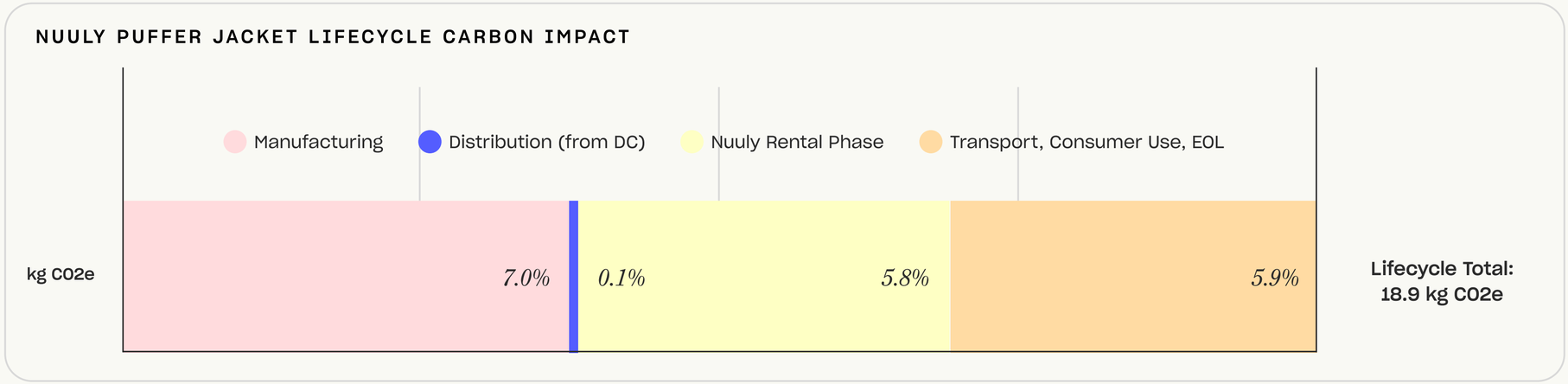
CARBON IMPACT OF NUULY PUFFER JACKET, BY LIFECYCLE PHASE

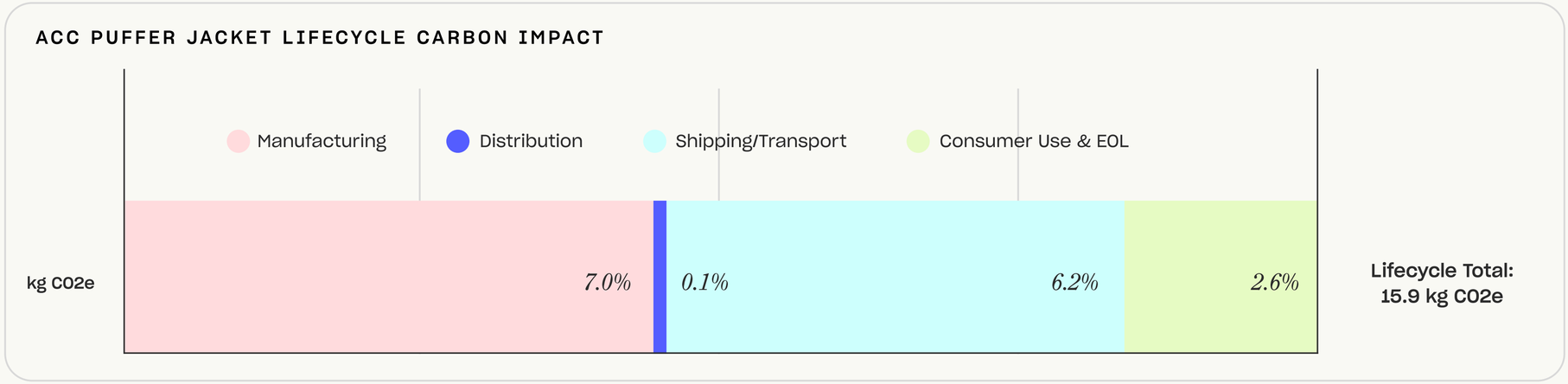


WATER IMPACT OF NUULY PUFFER JACKET, BY LIFECYCLE PHASE



Nuuly vs ACC puffer jacket lifecycle impact, by activity [1.1]*





Contributors

NAME	WHO	ROLE
Third partners	**Sustainability Strategy Consultancy**	Primary data model architect. Led modeling strategy, data collection, analysis, and interpretation.
nuuly	**Subscription Clothing Rental Service**	Gathered rental performance data, surveyed subscribers, supported analysis, and validated business assumptions.
DR. ROLAND GEYER	**Professor at UC Santa Barbara**	External reviewer with lifecycle assessment (LCA) expertise. Evaluated specific components of the lifecycle model, poked holes, asked good questions.*

*Dr. Geyer's views are his own... he does not endorse URBN, Nuuly, or the findings & interpretations presented in this report beyond the statement provided on page 3.

Thank you!