Greener Materials

Swapping in Greener Materials: Example 1

by Mark Chamberlain, Megan Graham, Natasha Johnston, Stacy Parker (2017)

Note: This is a company-anonymized version of the file.

Comments:

Great work! You had more than 30 ideas, and clearly tagged them to the system map with your numbers, with more than 1 idea for each system BOM component, and you eliminated 2 steps/components - nice legend and numbering system! My only issue on your steps/component swap is most of your component eliminators are also production generators; meaning, now your client has to go into the bag/packaging making business, with its own whole system cost, etc, but definitely worth looking at. And the minimizing the color array idea is a good one too.

You clearly listed & described your winner (and runner ups) based on design brief priorities. Awesome that whole system thinking won out in your summary, good lists of assumptions there too, and I appreciate that your top choice was picked because of its reduction of washing/drying impacts, not just material impacts! One note — in your summary: fabrication should be fabric, no?

MATERIAL SWAP BRAINSTORM //

Collaborative Product Design // 9.2—Material Swap Brainstorm // 3.26.2017
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Material substitution is a reliable strategy for reducing product impact. Impact reduction can be found throughout the whole system map using this strategy, and material reduction directly supports the stated objectives for this product.

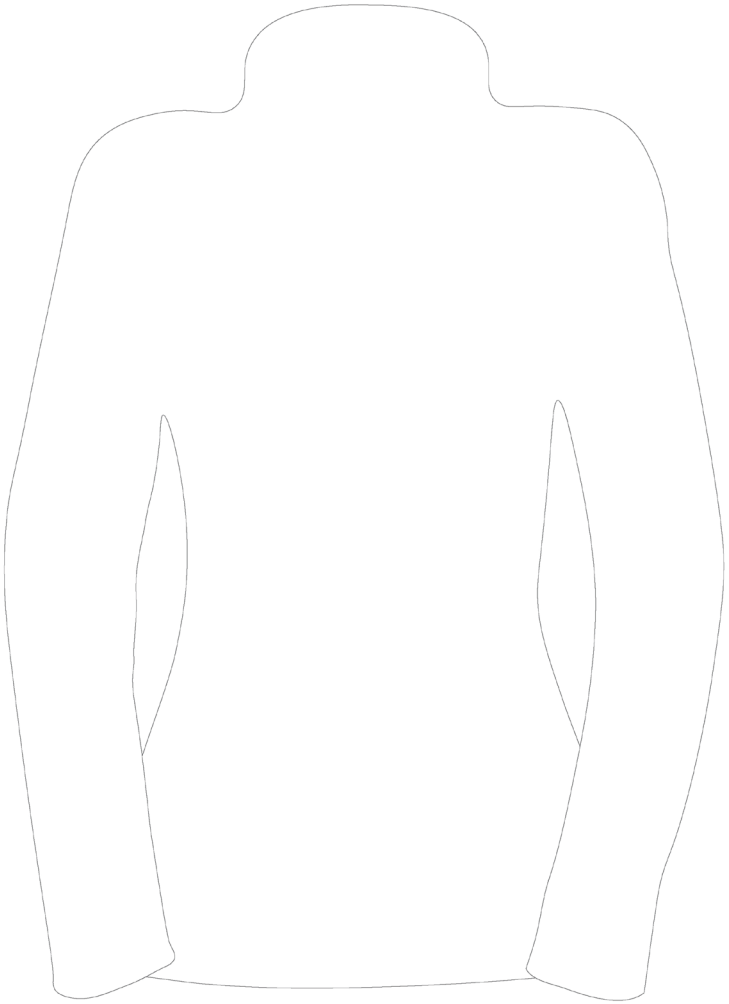
The following report shows the results of the material substitution brainstorming and research. Particular focus was placed on replacing the virgin polyester fabric, which makes up the majority of the garment (441g). At the end of the brainstorming list, two top material replacements are suggested based on their impact reduction for the garment.

SUSTAINABILITY OBJECTIVES FOR PRODUCT //

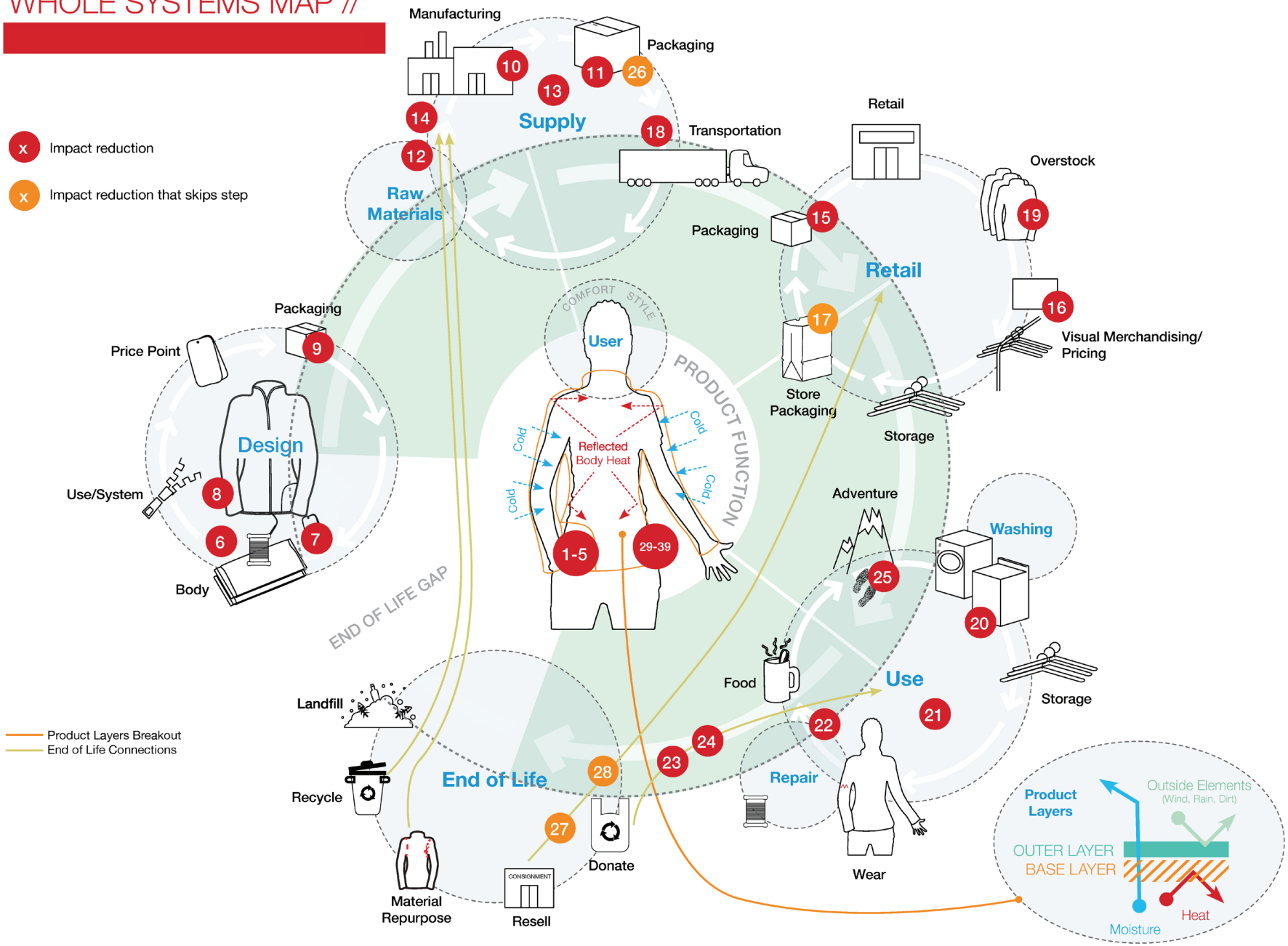
1. **Reduce total lifetime Use Phase CO2 emissions by 90%**
   (measured by CO_2 eq. kg / functional unit)
2. **Extend product life by 5 years** through end of life strategies
3. Extend product material life through recycling programs with goal to **reclaim 100% of fabricated polyester**

BUSINESS OBJECTIVES //

4. **Maintain price point** +/- **5%** of current fleece market as stated by client
5. **Maintain user experience** — to ensure brand integrity and quality for customer



WHOLE SYSTEMS MAP //



FINDING A BETTER MATERIAL //

Collaborative Product Design // 9.1—Better Material // 3.23.2017
Mark Chamberlain, Megan Graham, Natasha Johnston, Stacy Parker

BRAINSTORM IDEAS //

1. Replace virgin polyester fabric with SeaCell® a cellulose-based fiber with seaweed woven into the fabric. Both materials can be certified sustainably sourced. **smartfiber.de**
2. Replace virgin polyester fabric with Repreve® a 100% recycled polyester fabric made from #1 PET plastic bottles. **repreve.com**
3. Replace virgin polyester fabric with CRAiLAR® a fabric that combines hemp and flax bast fibers to minimize chemical and water usage. **crailar-fti.com**
4. Replace virgin polyester fabric with infinito® yarns & reworx® textiles made from cellulosic fibers and synthetic polymers. Certified as a Gold Cradle to Cradle product. **infinito.de**
5. Replace virgin polyester fabric with S.Café® fabric made from recycled polyester (from PET bottles) and coffee grounds. Certified as a Basic Cradle to Cradle product. **scafefabrics.com**
6. Minimize size range and design to be worn smaller or bigger with a pull or a tie to reduce waste. **https://furthertrade.com/portfolio/pu-long-rain-jacket-for-women/**
7. Make patterns that leave little or no waste through the cutting process. **https://hollymcquillan.com**
8. Reduce the number of dye colors over ranges to prolong use and enable take back for making new materials. Also use dyes that do not use toxic chemicals (heavy-metal free) to set color and are biodegradable. **https://oecotextiles.wordpress.com/2013/01/10/chemicals-used-in-textile-processing/**
9. Extend life of packaging coming into the factories. This might happen by using the same packaging for the manufactured goods leaving the factory or by sending them back to be reused by material suppliers. **http://www.rprinc.com**
10. Cut more garments in one cut and thus increasing manufacturing efficiency. **http://apparel.edgl.com/news/Raising-the-Bar-on-the-Cutting-Floor84721**
11. Reduce plastic use by not individually wrapping each garment. **http://www.ey.com ("Unwrapping The Packaging Industry" publication)**
12. Reduce distance of raw materials to manufacturers. **http://www.ey.com ("Unwrapping The Packaging Industry" publication)**
13. Use a lean manufacturing process to reduce overproduction and thus reduce excess impact from transportation through the supply chain. **http://leanmanufacturingtools.org/101/waste-of-transport-causes-symptoms-examples-solutions/**
14. Design shipping packaging coming into _____ storefronts for reuse into visual merchandising material, hangers, T-stands, and other store fixtures. **http://www.instructables.com/id/Easy-Cardboard-Shelves/**
15. Design shipping packaging coming into _____ storefronts for reuse into visual merchandising material, hangers, T-stands, and other store fixtures. **http://www.instructables.com/id/Easy-Cardboard-Shelves/**
16. Use visual merchandising areas to interact and educate shoppers about sustainable origins of products and recommend end of life reuse options. **http://www.vmsd.com/content/one-retailer-s-sustainability-story**
17. Use scrap fabric to create retail packaging for each jacket. The need for shopping bags would be reduced. The packaging could be used as a merchandising solution. **http://www.promodirect.com/Promotional-die-cut-handle-bag-15-h-x-12-w-6679-ccp4375.htm** *(Skips new material from coming into packaging system)*
18. Take Just-In-Time (JIT) supply to the next level, by creating a pre-order program which would allow _____ to better distribute inventory to brick-and-mortar stores. **https://www2.deloitte.com/content/dam/Deloitte/is/Documents/risk/Deloitte%20Sustainability.pdf**
19. Consolidate unsold merchandise from _____ retail stores regionally and open pop-up shops for limited engagements to liquidate stock. **http://www.triplepundit.com/special/sustainable-fashion-2014/pop-retail-solution-sustainable-fashion/#**
20. Work to extend product life by designing labels with clear care instructions and a website with easy care guides and FAQs about best practices. **https://www.circuit.co.uk/i-want-to-do-my-laundry/laundry-help/**
21. Work to extend product life by designing labels with clear care instructions and a website with easy care guides and FAQs about best practices. **https://www.circuit.co.uk/i-want-to-do-my-laundry/laundry-help/**

FINDING A BETTER MATERIAL //

BRAINSTORM IDEAS // CONTINUED

22. Work to extend product life by creating DIY video tutorials on topics such as how to dye your own North Face clothes to give them a fresh look. **http://thedailybasics.com/2014/05/31/10-of-the-best-diy-youtube-channels/**

23. Modify the scope of The North Face repair program to extend past just manufacturing faults and include damage due to product use to extend the product life for a reasonable charge. **https://eu.patagonia.com/enGB/patagonia.go?assetid=9068**

24. Create a "Find a new adventure at The North Face" web page that encourages new uses for TNF products. **http://thedailybasics.com/2014/05/31/10-of-the-best-diy-youtube-channels/**

25. Styling and augmentation—create a rating system to show warmth achieved by layering The North Face products, such as layer A, layer B, and layer C provides warmth coverage down to this temperature. **http://featheredfriends.com/choose-sleeping-bag/**

26. Use fabric scrape as packaging to give the garment a nice store presentation and pass the cost of disposing the scrap onto the consumer. **http://www.ey.com ("Unwrapping The Packaging Industry" publication)** *(Skips new material from coming into packaging system)*

27. Upcycle garments by using deadstock or garments to be transformed into other wearable fashion items. **http://daniellelvermeer.com/blog/upcycled-fashion-companies** *(Skips new raw materials needed for new product)*

28. Recycle manufacturing waste by collecting cut waste and turn it into thread for sale as separate product. **https://www.pinterest.com/pin/35395547047656078/** *(Skips new raw materials needed for new product)*

29. Replace virgin polyester with Tencel® — version of Lyocell that uses wood pulp. **http://www.lenzing-fibers.com/en/tencel**

30. Replace virgin polyester with Refibra™ recycled TENCEL® fiber. **http://www.lenzing-fibers.com/en/tencel/refibra**

31. Replace virgin polyester with Qmilch® — a 100% natural and renewable fiber derived from a protein in sour milk. Qmilch is naturally antibacterial and is ideal for activewear. **http://de.qmilk.eu/presite/index_en.html**

32. Replace virgin polyester with bamboo fleece is almost identical to cotton. **http://bambootextiles.com/fleece/super-heavy-fleece**

33. Replace virgin polyester with Monocel® — it uses an energy and water efficient closed loop system to recycle chemicals used to make its fiber from bamboo. **http://ckh.wrap.org.uk/upload/pdf/Introduction%20to%20more%20sustainable%20viscose.pdf**

34. Replace virgin polyester with SORONA® — a 37% renewably-sourced (plant-based) material by weight. **http://www.dupont.com/products-and-services/fabrics-fibers-nonwovens/fibers/brands/dupont-sorona/uses-and-applications/sorona-for-casual-wear.html**

35. Replace virgin polyester with Ingeo® — a fiber derived from the dextrose in field corn. Sugar is used to create a polymer in the form of pellets and can then be used for applications like apparel. **https://startupfashion.com/ingeo-fabric-made-from-corn**

36. Replace virgin polyester with Evrnu® — an alternative recycling that takes old clothing and creates new yarn for apparel. **https://www.fastcoexist.com/3051183/this-startup-takes-your-old-clothes-and-makes-completely-new-thread-from-them**

37. Replace virgin polyester with GreenScreen Revive® — a translucent polyester fabric designed to be recyclable. It contains pre- and post-consumer waste and industrial content. Is already C2C Bronze certified. **http://www.c2ccertified.org/products/mhcertificate/greenscreen_revive**

38. Replace virgin polyester with Bionic DPX — a 100% recycled PET yarn. DPX is suitable for both knit and woven fabric applications. C2C Bronze certified **http://www.c2ccertified.org/products/scorecard/bionic-yarn-return-textiles-llc**

39. Replace virgin polyester with Trigima Organic Cotton — a fashion collection of cotton sportswear, streetwear, and underwear. C2C Silver certified **http://www.c2ccertified.org/products/scorecard/trigema_eco-effective_cotton_apparel and https://www.trigema.de/en/sustainability/organic-cotton/**

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SUMMARY OF REPLACEMENT CONCEPTS //

- **Develop a more visible and dynamic set of care instructions**
- **Create repair program to facilitate repair rather than replacement**
- **Reduce the number of garment color offerings**

The Crescent Full Zip Jacket is unique as the most impactful phase of the product's lifecycle is the Use Phase, which is primarily driven by consumer actions. As a result, a simple material replacement would not satisfactorily address the high percentage of power used to launder the garment compared to the garment's useful life. The sustainability objective to reduce total lifetime Use Phase CO2 emissions by 90%, may be met by **developing a more visible and dynamic set of care information** to not only reduce excess machine washing and drying but to maintain the health of the garment prolonging the garment's useful life.

During the garment's useful life, there are times when wear and tear may render a garment unwearable but would continue to be wearable if repaired. To help achieve the sustainability objective of extending the product life by five years, we are encouraging The North Face to **create a repair program to facilitate repair rather than replacement of garments**. Through this and other end-of-life strategies, the product impact will be reduced by prolonging the garment's useful life.

The North Face has indicated that the increased use of recycled polyester fabric in their designs is a priority. Currently, Repreve, a brand of recycled polyester fabric, is used for some of their garments but has not fully replaced the use of virgin polyester. While this material replacement will continue to decrease the total carbon impact of the clothing, the impact of the Use Phase remains. In an attempt to further meet the sustainability objective to extend product material life through recycling programs with the goal to reclaim 100% of fabricated polyester, it is suggested that The North Face **reduce the number of garment color offerings**. By minimizing the color array, the polyester included in the garment could be collected and reused more efficiently to create other products or by recycling to create new usable fabric.

The justification for material replacement selection is based on the fact that unless the current fabrication can be replaced with an alternative that does not require routine cleaning (machine washing and drying), the significant impact from the Use Phase will remain. There are, however, specific strategies to reduce impact by extending the useful life of the garment. This extension reduces the functional unit impact of laundering on the total lifetime Use Phase CO2 emissions. The three replacement selections mentioned above support the sustainability objective as well as provide an opportunity for The North Face to transition to a garment made of 100% recycled material.