

## Summary of Findings

Report for:

**The Reformation, LLC.**

Date: July, 2020

## Anthesis Consulting Group

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## Findings Statement related to GHG Inventory and Product Footprint tools Prepared for Reformation

### Terms of Engagement

This Review has been prepared for The Reformation LLC. (“Ref”).

Anthesis LLC (“Anthesis”) was commissioned by Ref to review the approach used by Ref to prepare:

1) the tool used by Ref to calculate product footprints in comparison to alternative products.

The product lifecycle comparison tool (“RefScale”) relates to direct and indirect GHG emissions as well as water withdrawals over the cradle-to-gate lifecycle of Ref goods as well as alternative ‘conventional’ goods.

The following documents were reviewed as part of the engagement:

- RefScale Tool: “(Anthesis Copy) of 2019 RefScale” (Google Sheets)
- RefScale Sources: “(Updating) RefScale Method\_Source 2\_11” (Microsoft Excel)
- RefScale Methodology description: [“RefScale Methodology”](#) (HTML link)

### Management Responsibility

Ref was responsible for preparing and RefScale and for maintaining effective internal controls over the data and information disclosed. Anthesis’ responsibility was to carry out a review of the approach used to compile and calculate RefScale. Through the course of the methodological review Anthesis did not review any specific environmental claims made by Ref about a product or the company as a whole. Anthesis did not review any changes made to the RefScale tool during the course of the engagement not related to the recommended items included in Appendix A.

The RefScale remain the responsibility of Ref.

### Anthesis Approach

#### RefScale

Our review has been conducted in accordance with the principles found in ISO 14040, 2006. ‘Environmental management – life cycle assessment – principles and framework.’ International Standards Organization, Second Edition, EN ISO 14040. An ISO 14040 standard LCA has not been independently conducted by either Ref or Anthesis for any of the materials included in RefScale.

### Level of Assurance & Materiality

The opinion expressed in this review has been formed on the basis of a limited level of assurance and at a materiality of the professional judgement of the Anthesis reviewer.

### Summary Statement

In reviewing the four (4) documents described above, Anthesis opened 43 items (4 critical) for comment regarding RefScale. A critical item is that which may affect the validity of claims/results derived from the tool. Anthesis has worked with the Reformation team to address these items. As of June 29, 2020:

Zero (0) critical items remain open regarding RefScale.

There are zero (0) open requests for clarification where the reviewer was not able to make a judgement.

## Anthesis' Summary of Findings: RefScale

Grade	Count (total)	Closed	Open
<b>MIS</b>	<b>4</b>	<b>4</b>	<b>0</b>
<i>OFI</i>	19	19	0
<i>Clarification</i>	20	20	0

## Findings Key

Grade	Description
NCN (Non-conformity)	A nonconformity with the requirements of the assurance criteria that, in the professional judgement of the reviewer, affects the validity of any claims and/or results derived from the reviewed material. If such a finding is left 'open' at the end of the review, then an overall favorable judgement will not be possible.
MIS (Misstatement)	A misstatement, (omissions, misrepresentations, and errors) in an assertion, data, or information that, in the professional judgement of the reviewer, could affect the validity of any claims and/or results derived from the reviewed material. If such a finding is left 'open' at the end of the review, then an overall favorable judgement will not be possible.
OFI (Opportunity for Improvement)	An opportunity for improvement is a suggestion from the reviewer to improve or update an element of the material but does not invalidate the material.
Clarification	A clarification is an area where the review is not able to be completed due to lack of clarity or incomplete information.

## Appendix A - Findings Log: RefScale

ID	Grade	Category	Evidence	Finding	Corrective Action	Status
B1	MIS	Commercial Wash	Assumes that all Reformation fabrics besides denim are not washed/handwashed, while conventional non-denim fabrics are washed	Reformation indicated that “all garments other than denim” should have no commercial wash. This is not reflected in current version of tool.	Ref updated as indicated	Closed
B2	OFI	Commercial Wash	Emissions factor from EGRID, California, 2010.	Because this represents both Ref and conventional production, Ref could use the US average emissions rate (1,004.167 lb/MWh, 2016, EGRID). For commercial wash at Ref, should use the CA average emissions rate (454.059 lb CO2e/MWh, 2016, EGRID) or utility-specific factor if applicable).	Ref updated as indicated.	Closed
B3	Clarification	Commercial Wash	2.23 kWh/cycle	Is this wash and dry or just wash? (wash = .133 kWh/cycle, dry = 1.27 kWh/cycle, <a href="https://www.regulations.gov/document?D=ERE-2006-STD-0127-0118">https://www.regulations.gov/document?D=ERE-2006-STD-0127-0118</a> )	Ref team indicated that this is just wash.	Closed
B4	Clarification	End of Life	Assumes Reformation products are recycled at 30% and conventional products are recycled at 15%	Substantiate assumption that Ref garments are recycled at 30% and conventional at 15%	Ref team updated that Conventional goods are recycled at 14% and Ref goods at 16%. Premium recycling rate for Ref is owed to the 2.19% of Ref customers that used thredUP to resell goods.	Closed

B5	Clarification	Fabric Dyeing	Ref uses 'reactive batch India/China' and conventional uses 'avg b/w'	What accounts for the difference between Ref and Conv?	Ref clarified that this difference would be called in methodology as an assumption. Ref requires a clean chemistry certification for the dyehouses and printers they use and thus expect an environmental B6benefit compared to conventional goods.	Closed
B6	OFI	Fabric Dyeing	Avg b/w reactive/vat/ sulphur dye batch - India / China impact factor of 5.2 lb. CO2e/lb.	Update CO2 and H2O to match Higg factors.	Ref clarified that they prefer to use Ecolnvent database factor.	Closed
B7	MIS	Fabric Dyeing, Conventional Print	Conventional products use 'ave b/w' dyeing process while Ref uses Conv. Print for 'Print' fabric types.	Ref indicated that tool should use "conv. Print" impact factors for both Ref and conventional goods, but this indication is not reflected in the tool.	Ref updated as indicated.	Closed
B8	Clarification	Fabric Manufacturing	Impact factors for blended fabrics are hard-coded. "Fabric Blends" tab of the RefScale tool is blank.	Recommend composing factors for fabric blends in a modular format based on standard factors for each component material	Updated so that fabric blends are calculated in a modular fashion using impacts from 100% fabric calculations.	Closed
B9	Clarification	Fabric Manufacturing	Blend of Organic Cotton/cotton/TENCEL™ Modal/spandex/Tencel/rayon/modal/elasta/linen/refibra/EA replaces conventional cotton	Substantiate assumption that blended fabrics replace conventional cotton goods and/or call our assumption in RefScale methodology.	Ref will call out all assumptions regarding replacement fabrics in public methodology.	Closed

B10	MIS	Fabric Manufacturing	Fabric impacts scope includes 'cradle to gate'	Inconsistent methodology used currently regarding the 'cradle to gate' boundary for fabric manufacturing. Impact factors should include raw materials as well as all processing phases prior to dyeing, which is included additionally in RefScale tool.	The methodology used in the "100% fabric impacts" tab of the RefScale tool calculates cradle to gate impacts according to a consistent methodology. However, all the lifecycle phases are not carried through to the garment calculation. This item may be closed out when the same methodology is demonstrably applied to blended fabrics, and all lifecycle phases are included in the final garment impact factors. Updated: Ref updated fabric impacts to include up to 5 lifecycle phases required to produce a garment-ready fabric from feedstock.	Closed
B11	Clarification	Fabric Manufacturing	Lenzing Modal (Ref) replaces conventional cotton	Substantiate assumption or make clear in methodology	Ref team updated so that Lenzing Modal replaces Generic Viscose fabric.	Closed

B12	Clarification	Fabric Manufacturing	Lenzing Tencel (Ref) replaces conventional cotton	Substantiate assumption or make clear in methodology	Ref team updated so that Lenzing Tencel replaces Generic Viscose fabric.	Closed
B13	Clarification	Fabric Manufacturing	Linen (Ref) replaces conventional cotton	Substantiate assumption or make clear in methodology	Ref team updated so that Linen replaces Linen fabric.	Closed
B14	OFI	Fabric Manufacturing	100% Recycled cotton, .1 lb. CO2e/lb.	Align with Higg (H2O and CO2).	Ref team updated	Closed
B15	OFI	Fabric Manufacturing	ABS impact factors.	Align with Higg (H2O and CO2).	Ref team updated, indicated that change has been made to "shoe tool" (Anthesis has not reviewed "shoe tool").	Closed
B16	MIS	Fabric Manufacturing	Alpaca Ref and Conventional use different factors.	What accounts for the difference between Ref and Conv? Recommend aligning with Higg (H2O and CO2). This is not reflected in the RefScale tool.	Updated to have equal impact factors.	Closed
B17	OFI	Fabric Manufacturing	Conv. Cotton impact factors.	Align with Higg (H2O and CO2).	Ref team updated.	Closed
B18	OFI	Fabric Manufacturing	Conventional Silk impact factors.	Align with Higg (H2O and CO2). Higg factor is 85.16 kg CO2e/kg material. RefScale uses 37.3 lbs. CO2e/lb material (16.7 kg).	Updated to have equal impact factors.	Closed
B19	OFI	Fabric Manufacturing	Hemp impact factors.	Align with Higg (H2O and CO2).	Ref does not use hemp.	Closed
B20	OFI	Fabric Manufacturing	Jute impact factors.	Align with Higg (H2O and CO2).	Ref team updated, indicated that change has been made to "shoe tool" (Anthesis has not reviewed "shoe tool").	Closed
B21	OFI	Fabric Manufacturing	Lenzing Modal impact factors.	Align with Higg (H2O and CO2).	Ref team updated.	Closed

B22	Clarification	Fabric Manufacturing	Lenzing Tencel impact factors.	Account for difference between cited factors and Higg.	Ref team updated.	Closed
B23	OFI	Fabric Manufacturing	Lenzing Viscose (conventional) impact factors	Align with Higg (H2O and CO2).	Ref team updated.	Closed
B24	OFI	Fabric Manufacturing	Lenzing Viscose ASIA impact factors.	Align with Higg (H2O and CO2).	Ref team updated.	Closed
B25	OFI	Fabric Manufacturing	Lenzing Viscose AUSTRIA impact factors.	Align with Higg (H2O and CO2).	Ref team updated.	Closed
B26	Clarification	Fabric Manufacturing	Linen/Flax impact factors.	Account for difference between cited factors and Higg.	Updated to have equal impact factors.	Closed
B27	OFI	Fabric Manufacturing	Nylon impact factors.	Align with Higg (H2O and CO2).	Ref team updated.	Closed
B28	OFI	Fabric Manufacturing	Organic cotton India impact factors.	Align with Higg (H2O and CO2).	Ref team updated.	Closed
B29	Clarification	Fabric Manufacturing	Polyester (USA) impact factors.	Account for difference between cited factors and Higg.	Updated to have equal impact factors.	Closed
B30	Clarification	Fabric Manufacturing	Recycled Cashmere impact factors.	Please cite source.	Cited the Re.VerSo material impact factors ( <a href="https://www.classsecohub.org/re-verso-circular-by-origin-beautiful-by-design/">https://www.classsecohub.org/re-verso-circular-by-origin-beautiful-by-design/</a> )	Closed
B31	OFI	Fabric Manufacturing	Recycled cotton (USA) impact factors.	Align with Higg (H2O and CO2).	Ref team updated.	Closed
B32	OFI	Fabric Manufacturing	Viscose impact factors.	Align with Higg (H2O and CO2).	Not aligned. (7.5 kg CO2e/kg in Higg. 5.2 kg CO2e/kg in RefScale). Updated: Aligned with Higg	Closed

B33	Clarification	Fabric Manufacturing	Wool impact factors.	Account for difference between cited factors and Higg.	Updated to align with Higg.	Closed
B34	Clarification	Garment care	Assumes that all Reformation fabrics besides denim are handwashed, while conventional non-denim fabrics are washed in machine wash warm	Substantiate assumption.	Updated so that garment care is treated equally between Ref and Conventional.	Closed
B35	Clarification	Garment care	Hand wash goods has zero CO2 impact factor.	Does this assume cold water?	Ref indicated that hand washing garments assumes cold water only and does not include the electricity provided to provision municipal water supply.	Closed
B36	Clarification	Manufacturing	All manufacturing impacts (CO2, H2O, waste) are measured at a flat rate based on Inhouse/OH/overseas.	Underlying factors are on a per lb. of material basis, so impacts should scale with garment weight or be expressed as CO2e per piece, rather than CO2e per lb of garment. Impact factor for overseas (cut & sew – China) manufacturing should be on a per piece basis. It is not clear where the overseas impact factor (2.11 lb CO2e/lb) is coming from.	Ref team clarified that underlying production data is collected on a per piece basis and so best represents an average of impacts across garments.	Closed
B37	Clarification	Manufacturing	Manufacturing - Send-out impact factors.	What is the source and what does this process describe? (underlying calculation is .21 kWh/lb. * .61328 CO2e/kWh).	N/A	Closed
B38	Clarification	Manufacturing	In house USAGE impact factors.	How is this measured?	Applies a zero-impact factor for In House manufacturing electricity. Zero-impact factor calculated based on renewable energy supply.	Closed

B39	Clarification	Packaging	Assumes that conventional product includes a 100% recycled content mailer AND a conventional polybag, while the Ref product includes a 100% recycled content mailer only	Substantiate assumption.	Calculations for Ref impacts of 3.181 lbs. CO2e per garment are hard-coded. Ref team updated so that Ref uses 100% recycled content mailer & 100% recycled LDPE polybag. Conventional uses 100% poly bubble mailer and a conventional poly bag.	Closed
B40	Clarification	Shipping	Shipping (Conventional) impact factors.	Recommend this factor scale with the weight of the good. How is this calculated? Source documentations point towards UPS but no factors are found. If Ref is purchasing offsets for each shipment, Ref should have the data from UPS on CO2 per shipment which could be used to calculate conventional impacts.	Ref team clarified that 1.36259 lb CO2e is the average emissions from a UPS domestic shipment.	Closed
B41	OFI	Transportation	Truck impact factors. No source/methodology listed	Recommend .45 lb. CO2e/ton-mi ("product transport" section of CarbonFund site that includes CH4 and N20 radiative forcing)	Ref team updated.	Closed
B42	OFI	Transportation	Air Cargo impact factors. No source/methodology listed	Recommend 2.91 lb. CO2e/ton-mi	Ref team updated.	Closed
B42	OFI	Transportation	Ship impact factors. No source/methodology listed	Recommend .13 lb. CO2e/ton-mi	Ref team updated.	Closed



