



SUSTAINABLE IMPACT ANALYSIS

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GOALS

WHAT DO WE AIM FOR WITH THIS PROJECT?



1

3

To quantify the impact of Project Cece

To identify the gaps in transparency

To provide our customers with data on their sustainable choices

What are you doing well, in numbers?

4

2

THE ANALYSIS

WHAT ARE WE TAKING INTO ACCOUNT?



Complexity

There is a large amount of data available on the impact and footprint of the different materials. However, data from different sources are not consistent as the fashion industry is enormous and very complex. Thus, a selection is made to provide the most valuable, transparent, and consistent data as possible.

Focus

Three phases of the total supply chain are taken into account: material growth (fiber production), textile production, and textile manufacturing. Due to lack of transparent data, the transportation and the consumer use phase are left out of the analysis

Comparison

Organic cotton and recycled cotton are compared with conventional cotton. Tencel is also compared with conventional cotton as Tencel is often used as a sustainable alternative to cotton.

Sources

This analysis is based on sustainability reports from the brands as well as general life-cycle assessment reports.





ASSUMPTIONS

WHERE DO WE BASE OUR ANALYSIS ON?



The impact is calculated taking the following weights into account ¹ Jeans: 500 g Cotton T-shirt: 150 g (short sleeve) : 200 g (long sleeve)

Jeans are taken into account when they are made from either cotton-denim or tencel-denim.



To calculate the numerical impacts, the data is normalized to 1 kg



The weight of one jeans is equal to amount of cotton required for that jeans. The data that is used is cotton lint data.



For this analysis, the impact of the textiles and production process is analysed, leaving the impact of the transport and packaging out of account as this differs per brand, and we currently don't have enough data available to provide truthful information.



7000 L water is used per jeans in **the total process** of cotton growing (blue water), ginning, spinning, dyeing and weaving. This is an average of different countries and production processes. 2

The weight of a conventional cotton garment is equal to the weight of an organic cotton garment piece 3



For the production of 1 kg conventional cotton, up to 3 kg of chemicals are used.



The weight of Tencel products are equal to the weight of conventional products.



The growth process of conventional cotton requires 2120 litres of **blue** water per kilogram. Therefore, 1060 litres of blue water is required for the cotton lint of one pair of jeans.



The growth process of organic cotton requires 182 litres of **blue** water per kilogram. Therefore, 91 litres of blue water is required for the cotton lint of one pair of organic



jeans.

The CO2 emissions are only taking the production process into account: the transportation process is excluded from this analysis.



For brands that use recycled materials, we calculated the amount of fabric (in kg) saved from a landfill per pair of jeans. We did this by looking at the percentage of recycled materials used by the brand in total and assuming that that same percentage of recycled material was used per pair of jeans.



There are 472 jeans from 14 brands on Project Cece..





alchemist



Kings Of Indigo.

enna NATURMODE



MUD JEANS

ARMEDANGELS

BRAINTREE

wunder[werk]

Nudie JeAnsco





brainshirt.



b.young[®]





COTTON GROWTH

BLUE WATER CONSUMPTION DURING THE GROWTH PROCESS

Blue Water Consumption

The blue water consumption is the amount of water that has been taken from surface or groundwater sources; it takes all fresh water into account except for rainwater.³Irrigated agriculture has a blue water footprint. In this section, we focus blue water and solely on on water consumption which is based on the losses of freshwater during water use. Hereby we follow the logic of Textile Exchange, who argue based on ISO14046 that blue water consumption is the impact category with the highest environmental relevance and thus the most interesting category to take into account while conducting a LCA. They assume that the green water footprint (rainwater usage), would follow the natural hydrologic cycle regardless of the land use type and will eventually transpire or evaporate through plants. Therefore, the green water footprint has no environmental burden. However, it remains arguable when green water should or should not be taken into account during water assessments.

Conventional cotton vs organic cotton

The growth process of cotton requires a large amount of water.

According to the Textile Exchange data,⁶ organic cotton production requires approximately 15,000 litres of water per kilogram, of which almost everything is *consumed*. This is 7,500 litres water for the weight of the cotton of one pair of jeans. Nonetheless, 95% of this water is green water (precipitation) and this is stored in the soil as moist or used for plant growth.

Organic cotton requires **91% less blue water** than conventional cotton. This is due to the soil conservation practices that go hand in hand with organic cotton cultivation in arid areas (for instance, crop rotation). Rich soils with high levels of carbon store water better, which results in less irrigation requirements. Organic cotton growth is hence predominantly reliant on natural rainfall, according to the data from Textile Exchange. Keep in mind that these numbers are averages of the locations that were analyzed; these numbers are highly region and climate dependent.



TOTAL WATER CONSUMPTION

GROWING-GINNING-SPINNING- DYEING- WEAVING-WASHING

Data uncertainty



7000 L The industry average per jeans

Project Cece's Jeans Brands

The majority of jeans brands on Project Cece did not (yet) have the data from a life-cycle analysis of the water consumption of their denim ieans.

However, MUD Jeans and Kings of Indigo did an LCA_7 resulting in the following water footprint over the total process from cottonseed to jeans.

Moreover, People's Tree produced the Ariel Wide Leg jeans with 87.2% less water than the industry average.

Wunderwerk offers the Josy Navy jeans, made 10 from Tencel (Lyocell). Tencel does not require any blue water during its growth process and therefore every pair of jeans made from Tencel saves 1060 L blue water.

large variety for different brands. Each denim manufacturer decides on their own practices which makes it difficult to get an absolute number on the amount of water that is required for one pair of jeans in the complete production process.

The average of the data that we analysed is a water consumption 7000 litres of water per pair of jeans throughout the process of conventional cotton growing, ginning, spinning, dyeing and weaving. In this number, only blue water is taken into account, since green water doesn't have a large environmental impact



TOXIC CHEMICALS



PESTICIDES

During the growth of conventional cotton, an average of 364 grams of pesticides is used per kilogram of cotton lint. This is, Thfor a pair of jeans of 500 grams, **182 grams of pesticides.** No pesticides are used during the growth of organic cotton, and the cotton plants are non-GMO. The methods and materials have a lower impact on the environment, enhances biologically diverse agriculture and maintains soil fertility. As all jeans on Project Cece are made with organic cotton, 182 g toxic pesticides are avoided per pair of jeans on Project Cece.

Avoid I82 g pesticides per organic cotton jeans



CHEMICALS



Avoid I500 g Toxic chemicals per jeans During the total production of cotton garments, an average of 3 kilograms of toxic chemicals per kilogram of cotton is used. This is approximately 1.5 kilograms of toxic chemicals per pair of jeans. The process of dyeing and washing the jeans often relies on chemicals to obtain colour, softness or fading effects. However, there are radical transformations taking place in the sustainable fashion industry to reduce this toxic environmental impact. New techniques are used that require less water and fewer chemicals.

Project Cece's Brands

The jeans brands on Project Cece that have a **GOTS certified production process** do not use harmful chemicals throughout the total production process. Hence, with these denim brands, 1500 grams of toxic chemicals are avoided per pair of jeans. The denim brands on Project Cece are constantly looking for less hazardous ways of producing. In Appendix II, you are able to read several initiatives.





GOTS CERTIFIED PRODUCTION PROCESS

THE BRANDS

alchemist

bleed.



MUD JEANS

Nudie Jeans co

brainshirt.

People Tree

Kings Of Indigo.





BRAINTREE environmental clothing since 1995







R E C Y C L E D M A T E R I A L S

CIRCULARITY



In their 2018 collections, 4 of the 14 jeans brands have used recycled materials in their jeans that are sold on Project Cece. This is a great step towards a circular future, in which a value is given to materials that are labeled as waste. More detailed data of the recycled materials per brand is provided in Appendix I.

Kuyichi launched a PCRD-collection with jeans made from 20% post-consumer recycled denim. The waistband and the pockets of **Brainshirt's** jeans are made with residual materials from their shirts. **Mud Jeans** saved 5500 pairs of jeans from landfills and incineration in 2018. Currently, MUD Jeans uses either 23% or 40% recycled cotton in the majority of their jeans.

At **Kings of Indigo**, both the waistband patches and pocketing are made with 30% recycled polyester, and they generally use 15% recycled cotton for each pair of jeans in the 2018 collection. Last year, Nudie Jeans has collected 10557 pairs of jeans. The denim of these jeans is either used for patches for their free repair services, or for recycling. The 2018 fall collection contained bucket hats made with recycled denim: 23 kilograms post-consumer recycled denim was used here. More recycled denim is used in the 2019 collections. Several 2018 collection jeans from Nudie Jeans contain recycled polyester (6%). A total of 1,466 kilograms of recycled polyester was used in 2018. It is important to mention that polyester (even though it is recycled) releases microplastics into the environment while being washed.



KUYICHI: SAVES FROM 60 UP TO 150 GRAMS OF MATERIAL PER JEANS FROM A LANDFILL OR INCINERATION



MUD JEANS: SAVES FROM II5 GRAMS UP TO 200 GRAMS OF MATERIAL PER JEANS FROM A LANDFILL OR INCINERATION



KINGS OF INDIGO: SAVES 75 GRAMS OF MATERIAL PER JEANS FROM A LANDFILL OR INCINERATION



BRAINSHIRT : SAVE 50 GRAMS OF MATERIAL PER JEANS FROM A LANDFILL OR INCINERATION





The primary energy demand for conventional lint cotton for one pair of jeans is 7,5 Mega Joules of energy, according to the lifecycleanalysis of Textile Exchange.¹² This is the energy demand for non-renewable resources, which is important to take into account for its link with resource depletion and its connection with climate change.

The energy demand of non-renewable resources³ for organic cotton lint for one pair of jeans is 2,9 Mega Joules. Hence, choosing a pair of jeans of organic cotton instead of conventional cotton **saves 4,6 Mega Joules** in the cotton growth process.

The energy that is needed to make a pair of jeans is mainly used in the ginning process and any process during growth of the cotton that is done with machinery. Moreover, the transportation to the ginning facility requires energy from non-renewable resources as well. The difference in energy use between conventional and organic cotton could be explained according to the use of mineral fertilizer in not-organic cotton. This mineral fertilizer has a high primary energy demand as it is derived from petroleum.



In the process after ginning to your final jeans, each jeans brand uses a certain amount of energy. Several jeans brands on Project Cece are trying to use green energy during their production processes. However, precise data on the amount of energy that is used in the production process is not available yet for each brand in this 2019 report.



G R E E N E N E R G Y

PRODUCTION PROCESS & SUPPLIERS

Nudie JeAnsco



MUD JEANS

WAREHOUSE



OFFICE

Nudie JeAnsco





The use of organic cotton instead of conventional cotton results in a reduction of CO2 emissions. According to a life-cycle assessment of Textile Exchange, the cultivation of 1 kilogram organic cotton emits **46% less CO2** than the same system with conventional cotton. This is mainly because organic cotton cultivation has different agricultural practices on the land, less tractor operations, less irrigation and uses less fertilizer.

During the growth process, approximately 900 grams of CO2 is emitted for a pair of conventional jeans. Per jeans of organic cotton, this is 490 grams of CO2. That saves **410 grams of CO2** per organic cotton jeans, solely based on the cotton growth process.





In the jeans production process, a large part of the total CO2 emissions is emitted in the process after the cotton ginning. However, most brands on Project Cece did not, or not yet, conduct an analysis on the amount of CO2 that is released during this process. Therefore, it is currently not yet possible to provide transparent data from each brand on their emissions.

MUD Jeans conducted such an analysis with Bluedot Lifecycle, which resulted in a total emission of 9 kilograms of CO2 per jeans. **Armedangels** calculated that they use 64% less CO2 per meter of their DetoxDenim in comparison to conventionally produced jeans.¹⁵

Levi Strauss & Co have conducted a lifecycle analysis in 2013, from which resulted that 14,4 kilograms of CO2 are emitted in the production process of a pair of jeans. Hence, MUD Jeans saves **5,4 kilograms of CO2** with their process compared to a conventional LS&Co jeans. It is important to take into account that consumers play a large role in the emissions and water use in the lifecycle of their jeans. According to the LS&Co lifecycle analysis, fiber growth accounts for 9% of the total CO2 emissions in a jeans lifecycle, the production process accounts for 43% and the transport accounts for 11%. The consumer care phase accounts for the leftover 37%, depending on the washing habits of the consumer.

By washing your jeans after wearing it IO times instead of after every time you wear it, you save up to I483 L water, 496 MJ energy and 25.I kg CO2.¹⁶

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WOULD YOU LIKE TO KNOW MORE?

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T H A N K Y O U

In this first impact analysis, we have once again experienced the complexity of the fashion industry. We aimed to provide you, as a conscious consumer, with as much information as possible on our jeans brands. We like to thank our jeans brands for their collaboration and the publication of their own sustainability reports, points of attention and lifecycle analysis data. The brands that we exemplified in this report are the brands that provided transparency in reports, on their websites or during direct contact. However, we are all still developing and we aim for more and more clarity in the future. Therefore, if you are amongst Project Cece's jeans brands: do not hesitate to contact us to provide more information about the practices of your brand. We will be happy to revise this report if this leads to more transparency.

CONTACT US we would love to hear from you



DROJECTCECE

APPENDIX

PERCENTAGE RECYCLED MATERIAL PER BRAND

I

*derived from composition information and sustainability reports

			Amount of material saved from waste (in gram)
Alchemist		4.5% Currently, 4.5% of Alchemists collection is made from recycled materials.	The Alchemist jeans that are sold on Project Cece do not contain recycled material.
Wunderwerk		0%	
Brainshirt		10% Waistbands and pockets made from surplus shirts-material	50 g
Braintree		0%	
Kings of Indigo		15%*	75 g
Kuyichi		12-30%*	60-150 g
Lanius		0%	
MUD Jeans	5500	23%-40%*	115 g-200 g
Bleed Clothing		0%	
People Tree		0%	
Enna		0%	
B.young		0%	
Nudie jeans	10557 These jeans were either repaired and sold in the re- use range or used to make bucket hats and patches*	6% Nudie Jeans has several jeans in its collection made with 6% recycled polyester.	The Nudie Jeans that are sold on Project Cece do not contain recycled material
Armedangels		0%	

***Nudie Jeans** has started a new excited denim recycling project that they promised to provide more information on in 2019. Moreover, they began selling their old stock fabrics to Rekotex in 2018, where fabric can be bought en repurposed by other players.

***Kuyichi's PCRD- collection** (post-consumer recycled denim) consists of several jeans with 20% recycled material. You can track the PCRD jeans on Project Cece, named: Nick Lived In, Nick Pale Blue, Nick Classic Blue, Jamie Sympany Blue, Jamie Dark Blue, Nora Faded Blue, Scott classic blue, Jenna sympany blue, Amy faded black, Lisa Indigo, Carey Black Again (30%), Joy Classic Blue. Other jeans are made with recycled polyester: Roxy ever black (16%) and Amy herbal blue (12% recycled polyester).

*The MUD Jeans sold on Project Cece are made with 23% and 40% post-consumer recycled cotton

*Kings of Indigo: The Juno, Christina, Emi, Yama, Kimberley Mid Sky Used, Leila Gleen Rinse, Alice Gleen Light, Dido black rinse contain 15% recycled cotton

APPENDIX II: ZERO IMPACT JEANS WHAT ELSE ARE THE BRANDS DOING?



Vegan due Jacron paper or cork patches

#DetoxDenim by Armedangels
MUD Jeans
Kuyichi
Bleed Clothing
Nudie Jeans

Chlorine-free bleaching: use of lazer and ozone techniques



Kuyichi #DetoxDenim by Armedangels MUD Jeans Kings of Indigo



Heavy metal-free buttons

#DetoxDenim by Armedangels



Repair service



Natural Indigo Dye



Kuyichi MUD Jeans

Kings of Indigo