THE LIFE CYCLE
OF A JEAN

Understanding the environmental impact of a pair of Levi’s® 501® jeans

LEVI STRAUSS & CO.
Levi Strauss & Co. (LS&Co.) conducted the apparel industry’s first lifecycle assessment (LCA) study in 2007 to assess the entire lifecycle impact of a core set of products. The study focused primarily on the company’s U.S. operations and uncovered that the greatest water and energy impact was in two areas: cotton cultivation and consumer care.

Since then, LS&Co. has made tremendous progress addressing areas within its control, leading to more than one billion liters of water saved to date through the Levi’s® Water<Less™ process and implementation of the apparel industry’s first water recycle/reuse standard in its supply chain. The company has also taken bold steps to reduce the environmental impact of its products in the areas outside its direct control. This includes educating consumers through its Care Tag for the Planet initiative that encourages consumers to adopt care methods that use less energy and water. LS&Co. also joined the Better Cotton Initiative® to invest in cotton that uses less water and chemicals and improves farmer livelihoods.

In an effort to dig even deeper into the ways it can reduce its global impact, LS&Co. conducted a new global lifecycle assessment study to understand consumer behaviors by market and cotton agriculture globally.
BACKGROUND

The new study, initiated in 2013, looked at three LS&Co. products: a pair of Levi’s® 501® jeans, a pair of Levi’s® Women’s jeans, and a pair of Dockers® Signature Khakis. This latest study benefited from the latest advancements in LCA scientific methods, tools and data collection processes and gives greater insight into the two biggest impact areas by expanding the scope of data collected.

This presentation dives deeply into the findings related to a pair of Levi’s® 501® medium stone wash jeans. The goal is that these findings will help LS&Co. and others in the apparel sector take more effective and holistic approaches to our industry’s environmental impact.
WHAT IS AN ENVIRONMENTAL LIFE CYCLE ASSESSMENT?
LIFECYCLE ASSESSMENT DEFINITION

• An **LCA** is a systems-based, quantitative method for evaluating the environmental impact of a product.*

• **It is a tool** used to assess the stages and impact of a product’s entire life, from raw material extraction (cradle) to waste treatment (grave).

• An LCA typically does **not include:**
  – Social impacts
  – Economic impacts

*LS&Co. used the ISO 14040 Series as a basis for its LCA which details the requirements for conducting and administering a Life Cycle Assessment*
LIFECYCLE ASSESSMENT BENEFITS

• Allows us to focus on the most significant environmental impacts as we develop and evaluate sustainability programs and policies

• Informs product decisions to reduce the environmental impact from design, materials, and manufacturing

• Supports engagement with external stakeholders to reduce the impact of materials and consumer care
NEW AREAS STUDIED: GLOBAL COTTON CULTIVATION AND NEW CONSUMER MARKETS

<table>
<thead>
<tr>
<th>FUNCTIONAL UNIT</th>
<th>WORLD’S PRIMARY COTTON PRODUCING COUNTRIES STUDIED</th>
<th>LEVI’S® 501® PRODUCT ATTRIBUTES STUDIED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levi’s® 501® jeans &amp; other core LS&amp;Co. products</td>
<td>• United States  • Brazil</td>
<td>• 5 fabrics</td>
</tr>
<tr>
<td></td>
<td>• India    • China</td>
<td>• 8 finishes (low to high complexity; highest volume)</td>
</tr>
<tr>
<td></td>
<td>• Pakistan • Australia</td>
<td>• 2012 production year</td>
</tr>
</tbody>
</table>

MULTIPLE CONSUMER MARKETS INCLUDED

- United States
- United Kingdom
- France
- China

PRIMARY DATA SOURCES

- LS&Co.
- 11 supplier factories
- 6 fabric mills

STUDY CONDUCTED BY: Industrial Ecology Consultants and LS&Co.

STUDY BASED ON

LS&Co.’s product lifecycle categories and the required impact categories of the Sustainable Apparel Coalition’s Product Category Rule guidance

PANEL REVIEWED: Conforms with ISO 14040 and 14044 standards
THE LIFECYCLE OF A LEVI’S® 501® JEAN

1. COTTON PRODUCTION
2. FABRIC PRODUCTION
3. GARMENT MANUFACTURING
4. TRANSPORTATION & DISTRIBUTION
5. CONSUMER CARE
6. RECYCLING

END OF LIFE
SEVERAL IMPACT CATEGORIES RELEVANT TO APPAREL WERE ANALYZED

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>DESCRIPTION</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLIMATE CHANGE</td>
<td>Global warming potential of greenhouse gases released to the environment</td>
<td>kg CO$_2$-e</td>
</tr>
<tr>
<td>WATER INTAKE</td>
<td>Freshwater taken from the environment</td>
<td>liters</td>
</tr>
<tr>
<td>WATER CONSUMPTION</td>
<td>Net freshwater taken from the environment minus water returned to the same</td>
<td>liters</td>
</tr>
<tr>
<td></td>
<td>watershed at the same quality or better</td>
<td></td>
</tr>
<tr>
<td>EUTROPHICATION</td>
<td>Oxygen depletion as a result of nitrogen and phosphorous deposit into</td>
<td>g PO$_4$-e</td>
</tr>
<tr>
<td></td>
<td>freshwater or marine environments</td>
<td></td>
</tr>
<tr>
<td>LAND OCCUPATION</td>
<td>Total land occupied to support the product system assessed</td>
<td>m$^2$-yr</td>
</tr>
<tr>
<td>ABIOTIC DEPLETION</td>
<td>A measure of the depletion of non-renewable resources that includes</td>
<td>mg Sb-e</td>
</tr>
<tr>
<td></td>
<td>fossil energy, metals and minerals</td>
<td></td>
</tr>
</tbody>
</table>
IMPACT PHASE ANALYSIS SPANNED AREAS INSIDE AND OUTSIDE OUR DIRECT CONTROL

RAW MATERIALS PRODUCTION
- Natural Fibers
- Synthetic Materials
- Regenerated Fibers
- Metals
- Livestock Derived Materials
- Fossil & Renewable Fuel Extraction (petroleum, natural gas, coal, renewable energy, nuclear fuel, etc.)

INTERMEDIATES PRODUCTION
- Extrusion
- Pre-spinning & Spinning
- Weaving
- Dyeing
- Finishing
- Sundries Production (including molding, forming)

APPAREL PRODUCTION
- Garment Assembly (Cutting, Sewing, Gluing, Welding, Seam Taping, Sundries Application)
- Garment Finishing
- Garment Dyeing

PRODUCT PACKAGING

CHEMICALS PRODUCTION AND ENERGY CARRIERS
- Energy Carriers (Electricity, Steam, Hot Water, Liquid Fuels)
- Fertilizers
- Pesticides and other agricultural chemicals
- Monomers
- Process chemicals
- Dyes
- Detergents
- Finishing Chemicals
- Paper & Plastics for packaging

MANUFACTURING CAPITAL GOODS

LABOR AND PERSONNEL TRAVEL TO WORK

TRAVEL TO AND FROM RETAIL

USE PHASE
- Wearing
- Washing
- Drying
- Ironing
- Repairing

END OF LIFE
- Landfill
- Incineration
- Recycling
- Biodegradation

Transport, Waste, and Distribution – in all phases

RECYCLING MATERIALS

TRANSPORT PROCESS
EXECUTIVE SUMMARY
OF OUR FINDINGS
CONSUMER CARE AND COTTON CULTIVATION REMAIN THE MOST SIGNIFICANT IMPACT AREAS

CONSUMER CARE

COTTON CULTIVATION
COTTON AND CONSUMER HABITS HAVE A BIG IMPACT ON WATER AND ENERGY USE

General Findings:

• **Water Consumption**: Fiber production, predominantly cotton, contributes by a wide margin to water consumption.

• **Climate Change**: Consumer care and fabric production are the most significant phases for climate change impact and energy.

• **Expanded Scope**: By expanding our scope to include the leading cotton-producing countries, we’ve seen the water consumption from cotton cultivation increase to 68% of the total impact.

Consumer Use Findings:

• **Washing every 10 times** a product is worn instead of every 2 times reduces energy use, climate change impact, and water intake by up to 80%.

• **Significant differences between regions**:
  - **Consumers in China are leading the pack**: when it comes to laundering their jeans, they mostly wash in cold water and air dry
  - **American consumers had the highest water intake and use of non-renewable energy**: The good news is that Americans more prevalently use cold water
  - **Consumers in the UK and France mostly air dry their jeans but they use more hot water** than American or Chinese consumers
  - **Consumers in the USA, UK and France wash their jeans more frequently than in China**
Materials, Production and other findings:

- **Fabric assembly**, which includes yarn spinning, dyeing, weaving, and fabric finishing had notable contributions related to climate change impact and non-renewable energy consumption.

- **Life cycle stages that had minimal contribution** to impact include: fabric transport, product transport, packaging, production wastes, distribution, retail, and end of life waste.

Other stages still have an impact, but to lesser degrees.
ON ‘AUTO PILOT’ WHEN IT COMES TO WASHING YOUR JEANS?
IT’S TIME TO WASH LESS AND LINE DRY.
LEVI’S® 501® JEAN LIFECYCLE IMPACT

The entire lifecycle of one pair of Levi’s® 501® jeans equates to:

- **Climate Change:** 33.4 kg CO$_2$-e...
- **Water Consumed:** 3,781 liters...
- **Eutrophication:** 48.9 g PO$_4$-e...
- **Land Occupation:** 12 m$^2$/year...

- 69 miles driven by the average US car
- 246 hours of TV on a plasma big-screen
- 3 days worth of one US household’s total water needs
- The total amount of phosphorous found in 1,700 tomatoes
- Seven people standing with arms outstretched, fingertips touching, would form one side of a square this size
CONSUMER WATER CONSUMPTION VARIES DEPENDING ON WASHING FREQUENCY AND EQUIPMENT

WATER INTAKE OVER ONE YEAR OF CARE

<table>
<thead>
<tr>
<th></th>
<th>CONVENTIONAL WASHING MACHINE</th>
<th>EFFICIENT WASHING MACHINE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WASHING WEEKLY</strong></td>
<td>958</td>
<td>659</td>
</tr>
<tr>
<td><strong>WASHING BI-WEEKLY</strong></td>
<td>479</td>
<td>330</td>
</tr>
<tr>
<td><strong>WASHING MONTHLY</strong></td>
<td>221</td>
<td>152</td>
</tr>
</tbody>
</table>

Note: analysis is for one pair of pants worn by the average American consumer.
The climate change impact of consumers washing and drying their jeans varies greatly depending on washing frequency, methods, and equipment.

Climate change impact from one year of care

**Conventional Washing Machine**

- **Wash in Warm**
  - Use Dryer: 14.58 kg CO₂e
  - Line Dry: 7.29 kg CO₂e
  - Wash in Cold
    - Use Dryer: 10.31 kg CO₂e
    - Line Dry: 3.77 kg CO₂e

**Efficient Washing Machine**

- **Wash in Warm**
  - Use Dryer: 9.92 kg CO₂e
  - Line Dry: 4.96 kg CO₂e
  - Wash in Cold
    - Use Dryer: 4.51 kg CO₂e
    - Line Dry: 2.29 kg CO₂e

Note: for one pair of pants worn by the average American consumer
CONSUMER CLIMATE CHANGE IMPACT VARIES DEPENDING ON WATER TEMPERATURE AND MACHINE EFFICIENCY

ONE DAY OF WASHING AROUND THE GLOBE

<table>
<thead>
<tr>
<th>Country</th>
<th>Warm Water Wash</th>
<th>Cold Water Wash</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>.28</td>
<td>.20</td>
</tr>
<tr>
<td>Efficient Washer</td>
<td>.19</td>
<td>.15</td>
</tr>
<tr>
<td>U.K./France</td>
<td>.25</td>
<td>.20</td>
</tr>
<tr>
<td>Efficient Washer</td>
<td>.20</td>
<td>.15</td>
</tr>
<tr>
<td>China</td>
<td>.58</td>
<td>.31</td>
</tr>
<tr>
<td>Efficient Washer</td>
<td>.49</td>
<td>.28</td>
</tr>
</tbody>
</table>
Fiber production, predominantly cotton, contributes by a wide margin to water consumption.
LEVI’S® 501® JEANS: CLIMATE CHANGE IMPACT

Consumer Care phase dominates the climate change impact area (driven by high use of non-renewable energy).

**Cradle to Grave Climate Change Impact:**

- **Percentage by Phase:**
  - Fabric: 27%
  - Consumer Care: 37%
  - Transport, Logistics, Retail: 11%
  - Cut, Sew, Finish: 8%
  - Sundries & Packaging: 5%
  - End of Life: 3%

- **Amount by Phase (kg CO₂-e):**
  - Fabric: 9.0
  - Cut, Sew, Finish: 2.6
  - Sundries & Packaging: 3.8
  - Trans., Logistics, Retail: 12.5
  - Consumer Care: 1.7
  - End of Life: 2.9

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LEVI’S® 501® JEANS: EUTROPHICATION (NITROGEN AND PHOSPHOROUS DEPOSIT)

Fiber production, predominantly cotton, contributes by a wide margin to eutrophication impact.

Cradle to Grave Eutrophication

**Percentage by Phase**
- Fiber: 37%
- Consumer Care: 16%
- Transport, Logistics, Retail: 7%
- Sundry & Package: 16%
- End of Life: 7%
- Cut, Sew, Finish: 6%

**Amount by Phase (g PO₄-e)**
- Fiber: 18
- Fabric: 5.5
- Cut, Sew, Finish: 2.9
- Sundry & Package: 7.9
- Trans., Logistics, Retail: 3.1
- Consumer Care: 7.9
- End of Life: 3.5
Fiber production, predominantly cotton, contributes by a wide margin to land occupation impact.

CRADLE TO GRAVE LAND OCCUPATION
PERCENTAGE BY PHASE

- Fiber: 78%
- Fabric Production: 2%
- Sundries & PKG: 4%
- Trans., Logistics, Retail: 11%
- Consumer Care: 14%

CRADLE TO GRAVE LAND OCCUPATION
AMOUNT BY PHASE (m²/year)

- Fiber: 9.3
- Fabric: 0.2
- Sundries & PKG: 0.5
- Trans., Logistics, Retail: 0.3
- Consumer Care: 1.7

*END OF LIFE AND TRANSPORT, LOGISTICS, RETAIL HAVE NEGLIGIBLE CONSUMPTION
CONSUMER HABITS VARY BY COUNTRY
ON AVERAGE, AMERICANS USE MORE WATER AND ENERGY TO WASH THEIR JEANS

LIFETIME CONSUMER USE
NON-RENEWABLE ENERGY (kwh)

<table>
<thead>
<tr>
<th></th>
<th>U.S.</th>
<th>U.K./FRANCE</th>
<th>CHINA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60</td>
<td>53</td>
<td>17</td>
</tr>
</tbody>
</table>

LIFETIME CONSUMER USE
WATER INTAKE (liters)

<table>
<thead>
<tr>
<th></th>
<th>U.S.</th>
<th>U.K./FRANCE</th>
<th>CHINA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,049</td>
<td>619</td>
<td>679</td>
</tr>
</tbody>
</table>

For sources and additional consumer use data, please see the Appendix.
ON AVERAGE, CONSUMERS IN CHINA WASH LESS FREQUENTLY

AVERAGE WASH FREQUENCY BY COUNTRY

<table>
<thead>
<tr>
<th>Country</th>
<th>Wears Between Washes</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>2.3</td>
</tr>
<tr>
<td>U.K./FRANCE</td>
<td>2.5</td>
</tr>
<tr>
<td>CHINA</td>
<td>3.9</td>
</tr>
</tbody>
</table>
IN AMERICA:
WEARING JEANS 10X BEFORE WASHING COULD REDUCE WATER USAGE BY 77%

AMERICA: LIFETIME WATER INTAKE

<table>
<thead>
<tr>
<th>Wash Frequency</th>
<th>Water Usage (Liters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. AVERAGE</td>
<td>1,106</td>
</tr>
<tr>
<td>WASH EVERY TIME YOU WEAR</td>
<td>2,543</td>
</tr>
<tr>
<td>WASH EVERY 2x</td>
<td>1,272</td>
</tr>
<tr>
<td>WASH EVERY 5x</td>
<td>509</td>
</tr>
<tr>
<td>WASH EVERY 10x</td>
<td>254</td>
</tr>
</tbody>
</table>

Note: Analysis is for one pair of pants worn by the average American consumer over the typical product lifetime
IN THE UK/FRANCE: WEARING JEANS 10X BEFORE WASHING COULD REDUCE WATER USAGE BY 75%

UK/FRANCE: LIFETIME WATER INTAKE

Note: Analysis is for one pair of pants worn by the average European consumer over the typical product lifetime.
IN CHINA:
WEARING JEANS 10X BEFORE WASHING COULD REDUCE WATER USAGE BY 61%

Note: Analysis is for one pair of pants worn by the average Asian consumer over the typical product lifetime.
IN AMERICA: WEARING JEANS 10X BEFORE WASHING COULD REDUCE ENERGY USAGE BY 77%

Note: Analysis is for one pair of pants worn by the average American consumer over the typical product lifetime.
IN UK/FRANCE:
WEARING JEANS 10X BEFORE WASHING COULD REDUCE ENERGY USAGE BY 75%

UK/FRANCE: LIFETIME CLIMATE CHANGE IMPACT
VARIANCE BY WASHING FREQUENCY

UK/FRANCE AVERAGE

<table>
<thead>
<tr>
<th>Wash Frequency</th>
<th>Kg CO₂-e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every time you wear</td>
<td>27.92</td>
</tr>
<tr>
<td>Every 2x</td>
<td>13.96</td>
</tr>
<tr>
<td>Every 5x</td>
<td>5.58</td>
</tr>
<tr>
<td>Every 10x</td>
<td>2.79</td>
</tr>
</tbody>
</table>

UK/FRANCE: LIFETIME NON-RENEWABLE ENERGY USE
VARIANCE BY WASHING FREQUENCY

UK/FRANCE AVERAGE

<table>
<thead>
<tr>
<th>Wash Frequency</th>
<th>Kilowatt Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every time you wear</td>
<td>153.1</td>
</tr>
<tr>
<td>Every 2x</td>
<td>76.5</td>
</tr>
<tr>
<td>Every 5x</td>
<td>30.6</td>
</tr>
<tr>
<td>Every 10x</td>
<td>15.3</td>
</tr>
</tbody>
</table>

Note: Analysis is for one pair of pants worn by the average American consumer over the typical product lifetime.
IN CHINA:
WEARING JEANS 10X BEFORE WASHING COULD REDUCE ENERGY USAGE BY 61%

Note: Analysis is for one pair of pants worn by the average Asian consumer over the typical product lifetime.
WASH IN COLD VS. WARM BY COUNTRY

CONSUMERS WHO WASH IN COLD

- U.S.: 65%
- U.K./FRANCE: 51%
- CHINA: 84%

CONSUMERS WHO WASH IN WARM

- U.S.: 35%
- U.K./FRANCE: 49%
- CHINA: 16%

For sources and additional consumer use data, please see the Appendix.
IN AMERICA: WASHING IN COLD INSTEAD OF WARM REDUCES NON-RENEWABLE ENERGY USE BY 21% AND CLIMATE IMPACT BY 24%

Note: analysis is representative for the average American consumer, with a typical product lifetime, with average wash frequency and equipment.
IN U.K./FRANCE: WASHING IN COLD INSTEAD OF WARM REDUCES NON-RENEWABLE ENERGY USE BY 20% AND CLIMATE IMPACT BY 21%

Note: analysis is representative for the average European consumer, with a typical product lifetime, with average wash frequency and equipment.
IN CHINA: WASHING IN COLD INSTEAD OF WARM REDUCES NON-RENEWABLE ENERGY USE BY 59% AND CLIMATE IMPACT BY 69%

Note: analysis is representative for the average Asian consumer, with a typical product lifetime, with average wash frequency and equipment.
# Line Dry vs. Dryer by Country

## Consumers Who Line Dry

<table>
<thead>
<tr>
<th>Country</th>
<th>Line Dry %</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>18%</td>
</tr>
<tr>
<td>U.K./France</td>
<td>68%</td>
</tr>
<tr>
<td>China</td>
<td>88%</td>
</tr>
</tbody>
</table>

## Consumers Who Use a Dryer

<table>
<thead>
<tr>
<th>Country</th>
<th>Dryer Use %</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>82%</td>
</tr>
<tr>
<td>U.K./France</td>
<td>32%</td>
</tr>
<tr>
<td>China</td>
<td>12%</td>
</tr>
</tbody>
</table>
IN AMERICA: LINE DRYING INSTEAD OF USING A DRYER REDUCES NON-RENEWABLE ENERGY USE BY 64% AND CLIMATE IMPACT BY 67%

Note: analysis is representative for the average American consumer, with a typical product lifetime, with average wash frequency and equipment.
IN UK/FRANCE: LINE DRYING INSTEAD OF USING A DRYER REDUCES NON-RENEWABLE ENERGY USE BY 65% AND CLIMATE IMPACT BY 66%

UK/FRANCE: LIFETIME CLIMATE CHANGE IMPACT

<table>
<thead>
<tr>
<th></th>
<th>KgCO₂e</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK/FRANCE AVERAGE</td>
<td>9.7</td>
</tr>
<tr>
<td>LINE DRY</td>
<td>4.4</td>
</tr>
<tr>
<td>LINE DRY &amp; IRON</td>
<td>9.5</td>
</tr>
<tr>
<td>DRYER</td>
<td>12.9</td>
</tr>
<tr>
<td>DRYER &amp; IRON</td>
<td>18.0</td>
</tr>
</tbody>
</table>

UK/FRANCE: LIFETIME NON-RENEWABLE ENERGY USE

<table>
<thead>
<tr>
<th></th>
<th>Kilowatt-Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK/FRANCE AVERAGE</td>
<td>53.3</td>
</tr>
<tr>
<td>LINE DRY</td>
<td>24.5</td>
</tr>
<tr>
<td>LINE DRY &amp; IRON</td>
<td>52.5</td>
</tr>
<tr>
<td>DRYER</td>
<td>70.7</td>
</tr>
<tr>
<td>DRYER &amp; IRON</td>
<td>98.9</td>
</tr>
</tbody>
</table>

Note: analysis is representative for the average UK/French consumer, with a typical product lifetime, with average wash frequency and equipment.
IN CHINA: LINE DRYING INSTEAD OF USING A DRYER REDUCES NON-RENEWABLE ENERGY USE BY 62% AND CLIMATE IMPACT BY 65%

Note: analysis is representative for the average Chinese consumer, with a typical product lifetime, with average wash frequency and equipment.
CONTINUE TO LEAD, EDUCATE CONSUMERS & EXPAND THE BETTER COTTON INITIATIVE
CONTINUE TO LEAD, EDUCATE CONSUMERS & EXPAND THE BETTER COTTON INITIATIVE

Call to action to Levi's® fans around the world:
1. Take the quiz to understand your impact and pledge to wash less
2. If you have to wash, use cold water and try our tips
3. Line dry
4. Donate your old jeans to give them a new life

Call to action to our global apparel industry peers:
1. Understand your impact and take actions to reduce your impact on the environment
2. Use your marketing muscle to educate consumers on how they can reduce their impact by washing less, line drying and donating
3. Influence your global supply chain partners to procure Better Cotton Initiative cotton and adopt water recycling and reuse standards
LS&Co. water stewardship programs:
1. Water<Less™
2. Water Recycling & Reuse Standard
3. Global Effluent Guidelines
4. Better Cotton Initiative
5. CEO Water Mandate

LS&Co. sustainable product development:
1. Terms of Engagement
2. Chemical Management Programs
3. Responsible Sourcing Initiative
4. Wellthread™: Holistic approach to sustainable product design & manufacturing
5. Waste<Less™: Uses at least 20% post-consumer waste in each product
<table>
<thead>
<tr>
<th></th>
<th>Fiber</th>
<th>Fabric Assembly</th>
<th>Cut, Sew, Finish</th>
<th>Sundries &amp; Packaging</th>
<th>Transport, Logistics, Retail</th>
<th>Consumer Care</th>
<th>End of Life</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Climate Change (kg CO₂-e)</strong></td>
<td>2.9</td>
<td>9.0</td>
<td>2.6</td>
<td>1.7</td>
<td>3.8</td>
<td>12.5</td>
<td>0.9</td>
<td>33.4</td>
</tr>
<tr>
<td></td>
<td>9%</td>
<td>27%</td>
<td>8%</td>
<td>5%</td>
<td>11%</td>
<td>37%</td>
<td>3%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Water Consumption (liters)</strong></td>
<td>2,565</td>
<td>236</td>
<td>34</td>
<td>77</td>
<td>10</td>
<td>860</td>
<td>0</td>
<td>3,781</td>
</tr>
<tr>
<td></td>
<td>68%</td>
<td>6%</td>
<td>1%</td>
<td>2%</td>
<td>0%</td>
<td>23%</td>
<td>0%</td>
<td>100%</td>
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<tr>
<td><strong>Eutrophication (g PO₄-e)</strong></td>
<td>18.0</td>
<td>5.5</td>
<td>2.9</td>
<td>7.9</td>
<td>3.1</td>
<td>7.9</td>
<td>3.5</td>
<td>48.9</td>
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<td></td>
<td>37%</td>
<td>11%</td>
<td>6%</td>
<td>16%</td>
<td>6%</td>
<td>16%</td>
<td>7%</td>
<td>100%</td>
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<tr>
<td><strong>Land Occupation (m²/year)</strong></td>
<td>9.3</td>
<td>0.2</td>
<td>0.0</td>
<td>0.5</td>
<td>0.3</td>
<td>1.7</td>
<td>0.0</td>
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<td>78%</td>
<td>1%</td>
<td>0%</td>
<td>4%</td>
<td>2%</td>
<td>14%</td>
<td>0%</td>
<td>100%</td>
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<tr>
<td><strong>Abiotic Depletion (mg Sb-e)</strong></td>
<td>19.9</td>
<td>7.2</td>
<td>1.9</td>
<td>118.5</td>
<td>4.4</td>
<td>17.9</td>
<td>0.1</td>
<td>29.1</td>
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<tr>
<td></td>
<td>12%</td>
<td>4%</td>
<td>1%</td>
<td>70%</td>
<td>3%</td>
<td>11%</td>
<td>0%</td>
<td>100%</td>
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</tbody>
</table>

**LEVI’S® 501® JEAN LIFECYCLE IMPACT**
Data was collected from several sources in the supply chain.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Product Data</th>
<th>Facility or General Data</th>
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<tbody>
<tr>
<td>Spinning</td>
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<td>Fiber Country of Origin</td>
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<td>Transport Mode and Distance</td>
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<td></td>
<td>Fiber Loss</td>
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<tr>
<td>Dye, Weave, Finish</td>
<td>Fiber Loss</td>
<td>Energy</td>
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<tr>
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<td>Chemical Use &amp; Transport Mode &amp; Distance</td>
<td>Water</td>
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<tr>
<td>Cut &amp; Sew</td>
<td>Transport Mode &amp; Distance</td>
<td>Packaging</td>
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<td>Cutting Efficiency</td>
<td>Waste</td>
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<td>Material Use</td>
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<td>Sundry Material and Weight</td>
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<td>Packaging Material and Weight</td>
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<td>Garment Finish</td>
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<td>Transport Mode &amp; Distance</td>
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<td>Product Transport</td>
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<tr>
<td>Retail</td>
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<tr>
<td>Consumer Care</td>
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<td>Consumer washing habits</td>
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</table>
SENSITIVITY: FABRIC LOSS, FIBER LOSS, AND WASH AND DRY FREQUENCY ARE IMPORTANT TO THE FINAL RESULTS

<table>
<thead>
<tr>
<th></th>
<th>CHANGE MEASURED</th>
<th>IMPACT ON CLIMATE CHANGE</th>
<th>IMPACT ON WATER CONSUMPTION</th>
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<tbody>
<tr>
<td>FABRIC LOSS</td>
<td>± 10%</td>
<td>± 3.8%</td>
<td>± 7.4%</td>
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<tr>
<td>FIBER LOSS</td>
<td>± 10%</td>
<td>± 2.6%</td>
<td>± 6.7%</td>
</tr>
<tr>
<td>FREQUENCY OF CARE</td>
<td>± 10%</td>
<td>± 3.8%</td>
<td>± 2.3%</td>
</tr>
<tr>
<td>PRODUCT TRANSPORT</td>
<td>± 50%</td>
<td>± 1.0%</td>
<td>± 0.0%</td>
</tr>
<tr>
<td>CARE TRANSPORT</td>
<td>± 50%</td>
<td>± 0.3%</td>
<td>± 0.0%</td>
</tr>
</tbody>
</table>

• Fabric loss and fiber loss are both very important to measure because they have a significant impact on the final results
• Differences in transport distances have very little impact on the overall product results
LCA SOURCE DATA

References for consumer use habits:
• LS&Co. Consumer Surveys (2012)

References for Wash, Dry, and Ironing Impacts: