



Cotton & the Climate Roadmap

Strategies for the Apparel Industry to Reach Net Zero



With hundreds of easily searchable resources, we're your go-to textile tool for discovering what's possible with cotton.

cottonworks.com



@cotton_works



Type your questions in the Q&A window at any time during the webinar.



Find the presentation slides and other resources at **cottonworks.com** at the conclusion of the webinar.



Please turn off your pop-up blocker to participate in this webinar.

Webinar Support

Today's Speakers



Dr. Jesse Daystar

Vice President &
Chief Sustainability
Officer



**Cotton
Incorporated**



Michael Sadowski

Advisor, Sustainable
Apparel Coalition &
Textile Exchange



**WORLD
RESOURCES
INSTITUTE**



Sean Cady

Vice President, Global
Sustainability &
Responsible Sourcing

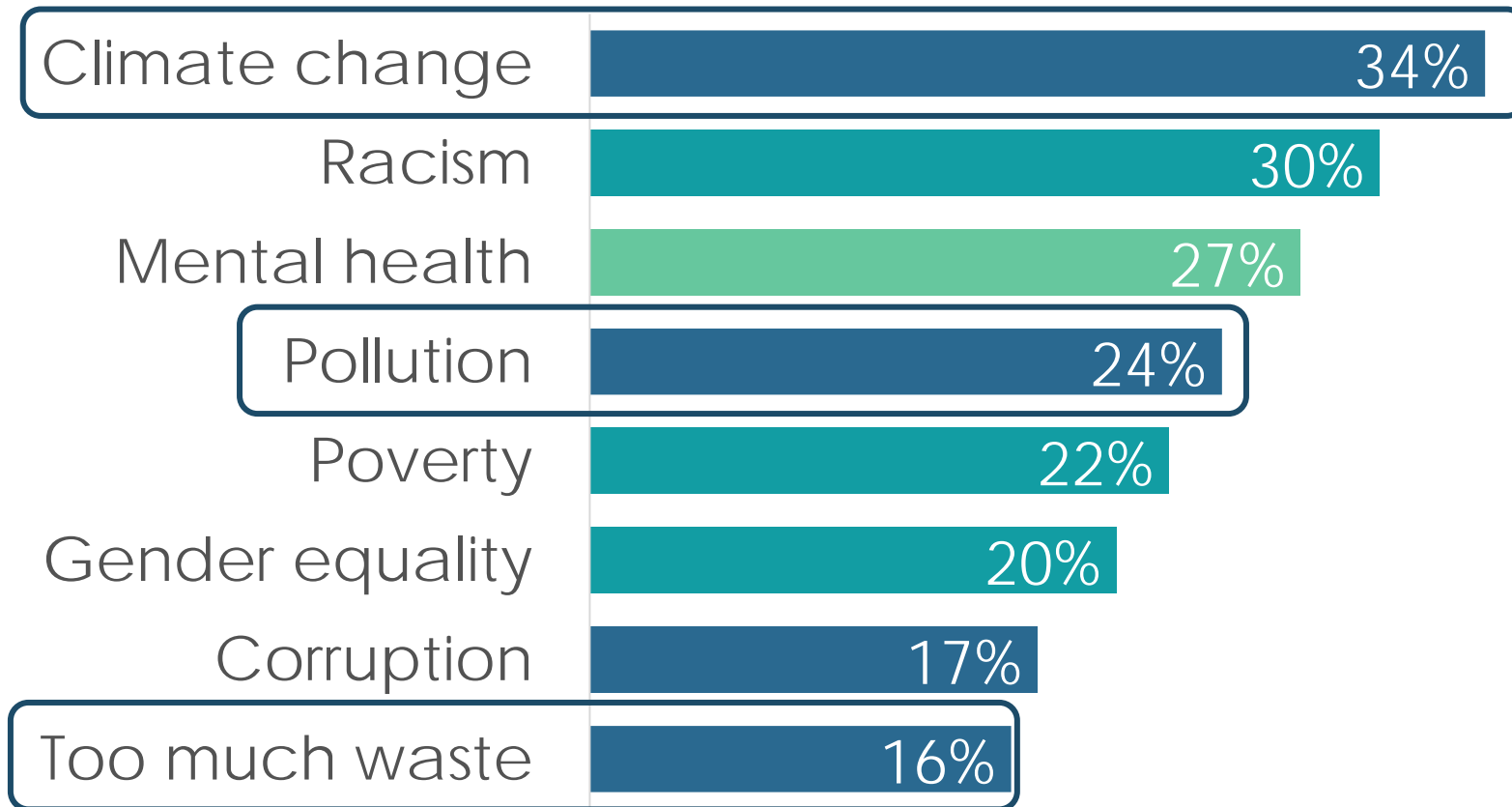


CORPORATION

Generation Z highly concerned about climate

Environmental issues top list of Gen Z concerns

Most important challenges facing our world today:



Science-Based Targets Initiative



SCIENCE
BASED
TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION



SUBSCRIBE TO NEWSLETTER



SCIENCE BASED TARGETS

SET A TARGET

COMPANIES TAKING ACTION

NEWS & EVENTS

FAQ

THE INITIATIVE

Join the companies striving for a 1.5°C future

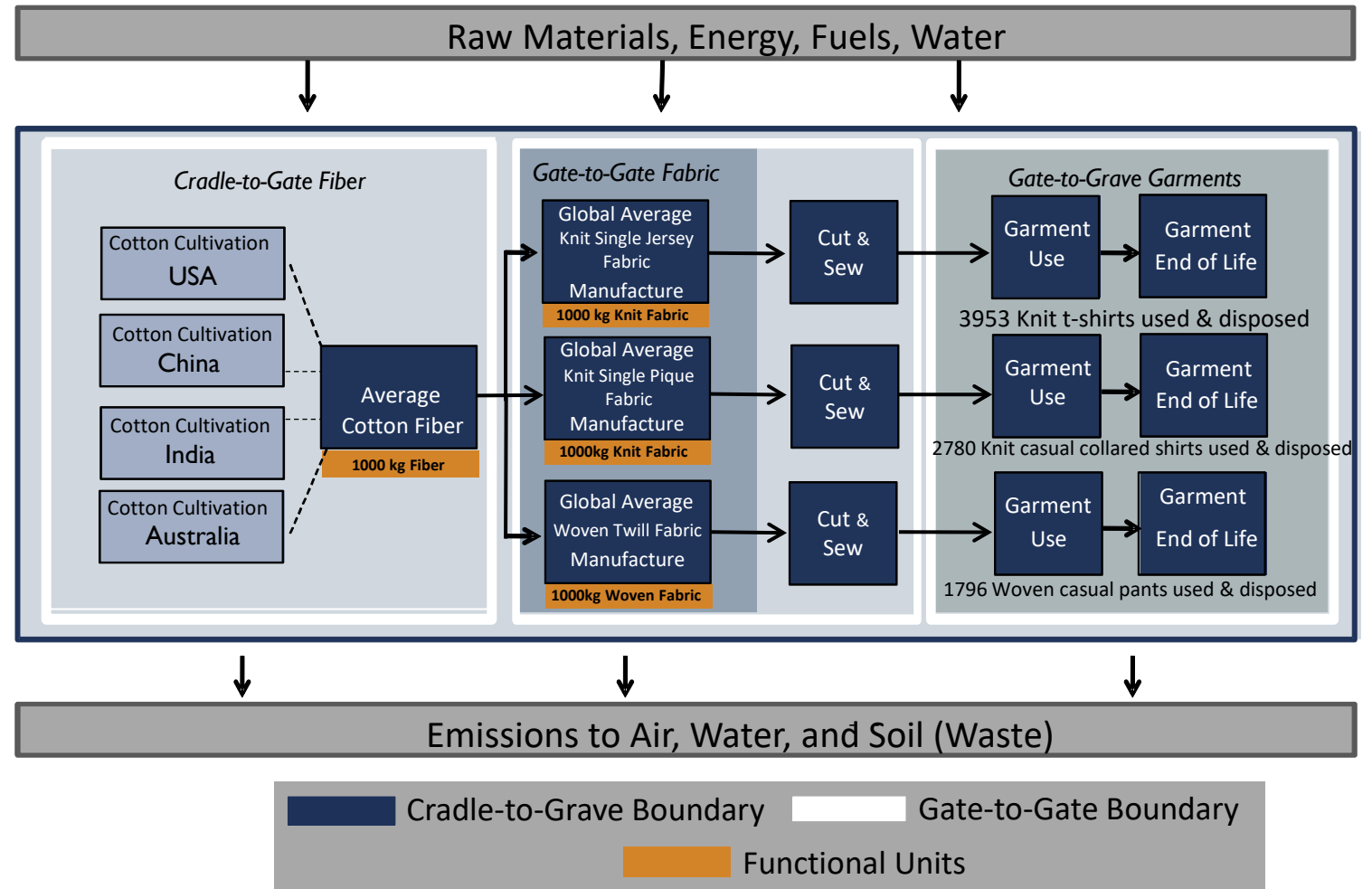
Sign the pledge



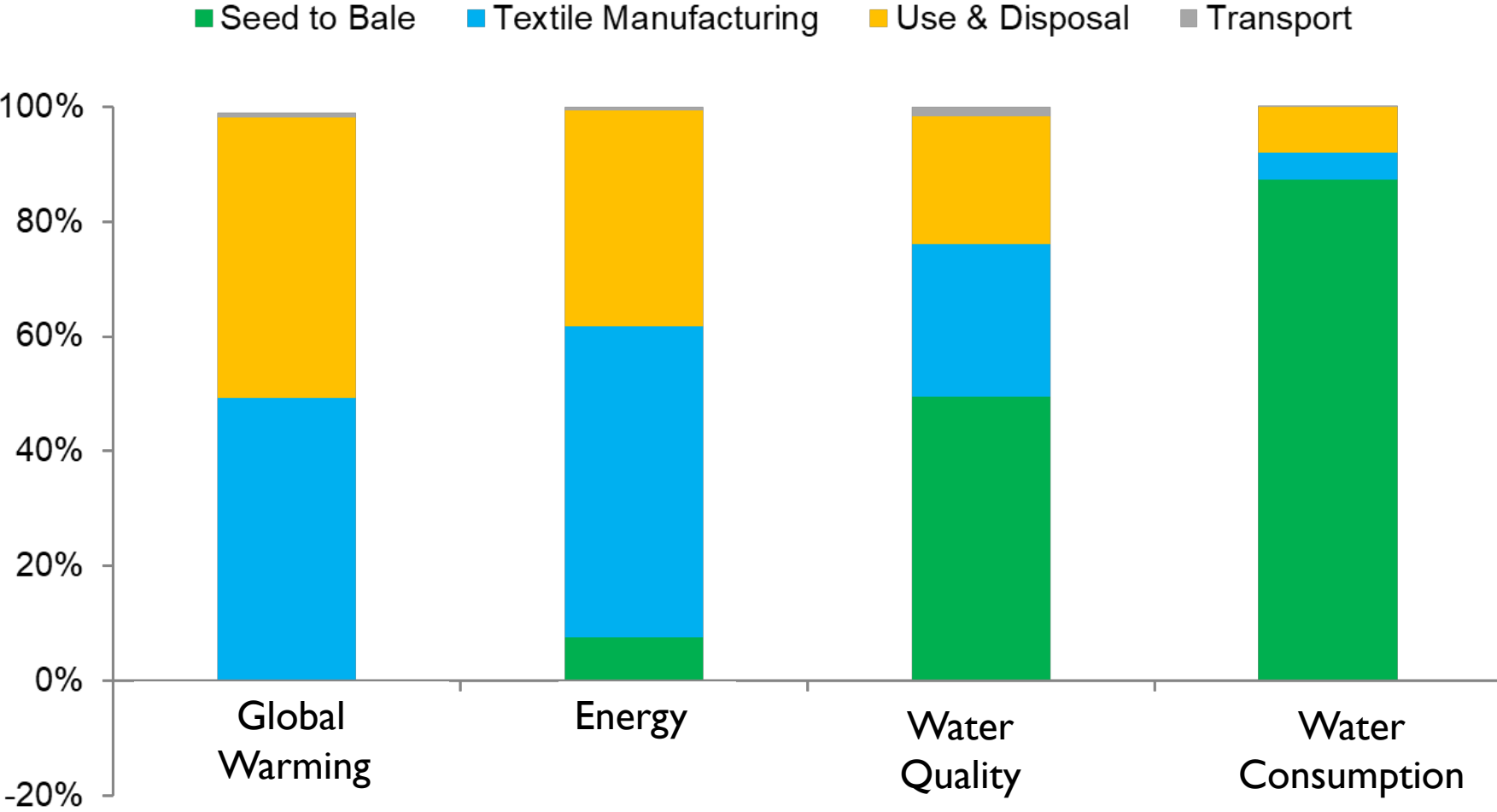
Life Cycle Assessment Overview



LCA Goal, Scope Functional Units

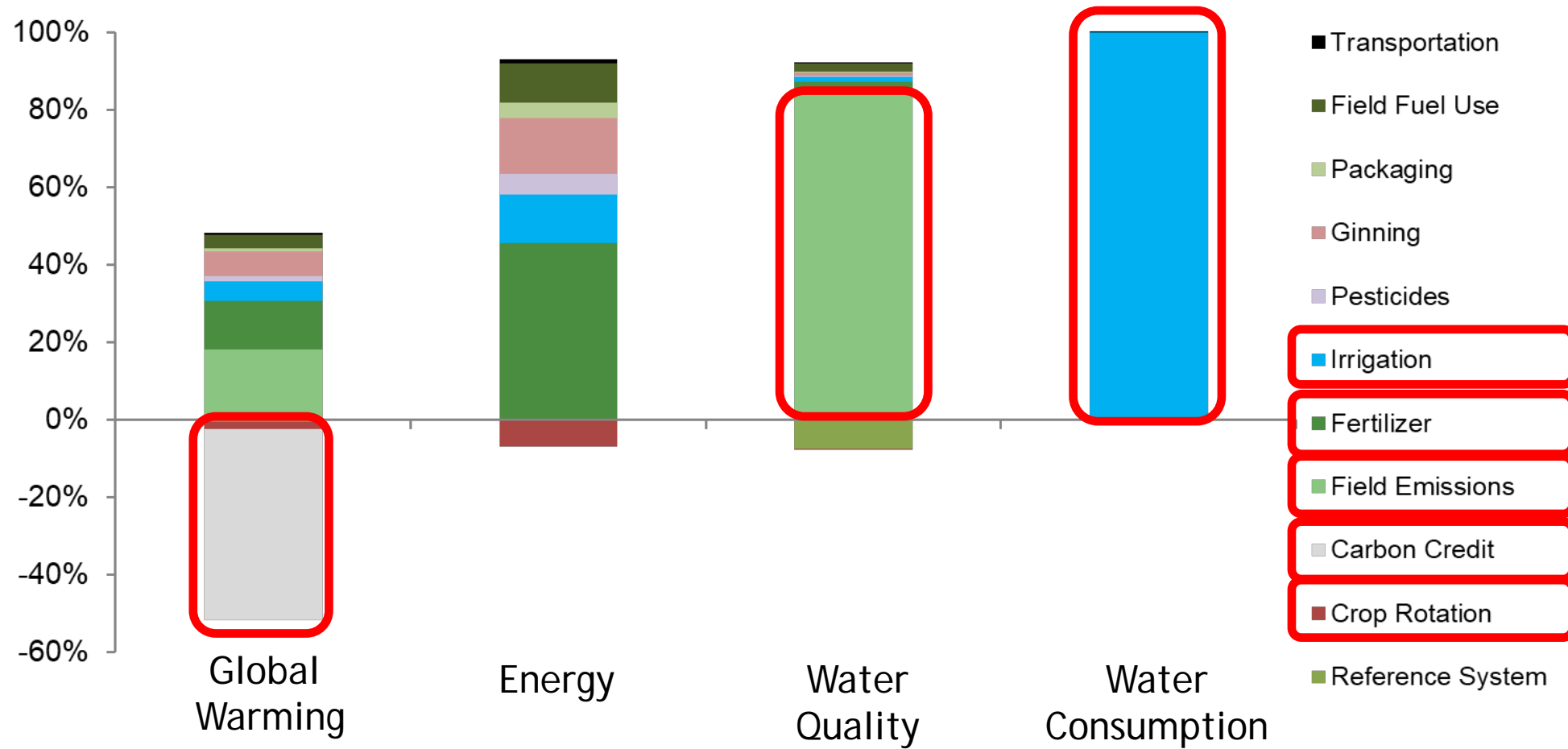


Overall Results for a Knit Collared Shirt



Source: Cotton Incorporated (2017). LCA Update of cotton fiber and fabric life cycle. <https://cottontoday.cottoninc.com/wp-content/uploads/2019/11/2016-LCA-Full-Report-Update.pdf>

Agricultural Phase Details



35 Years of Reduced Environmental Impact

Land Use



49%

Soil Loss



37%

Water



79%

Energy



54%

GHG

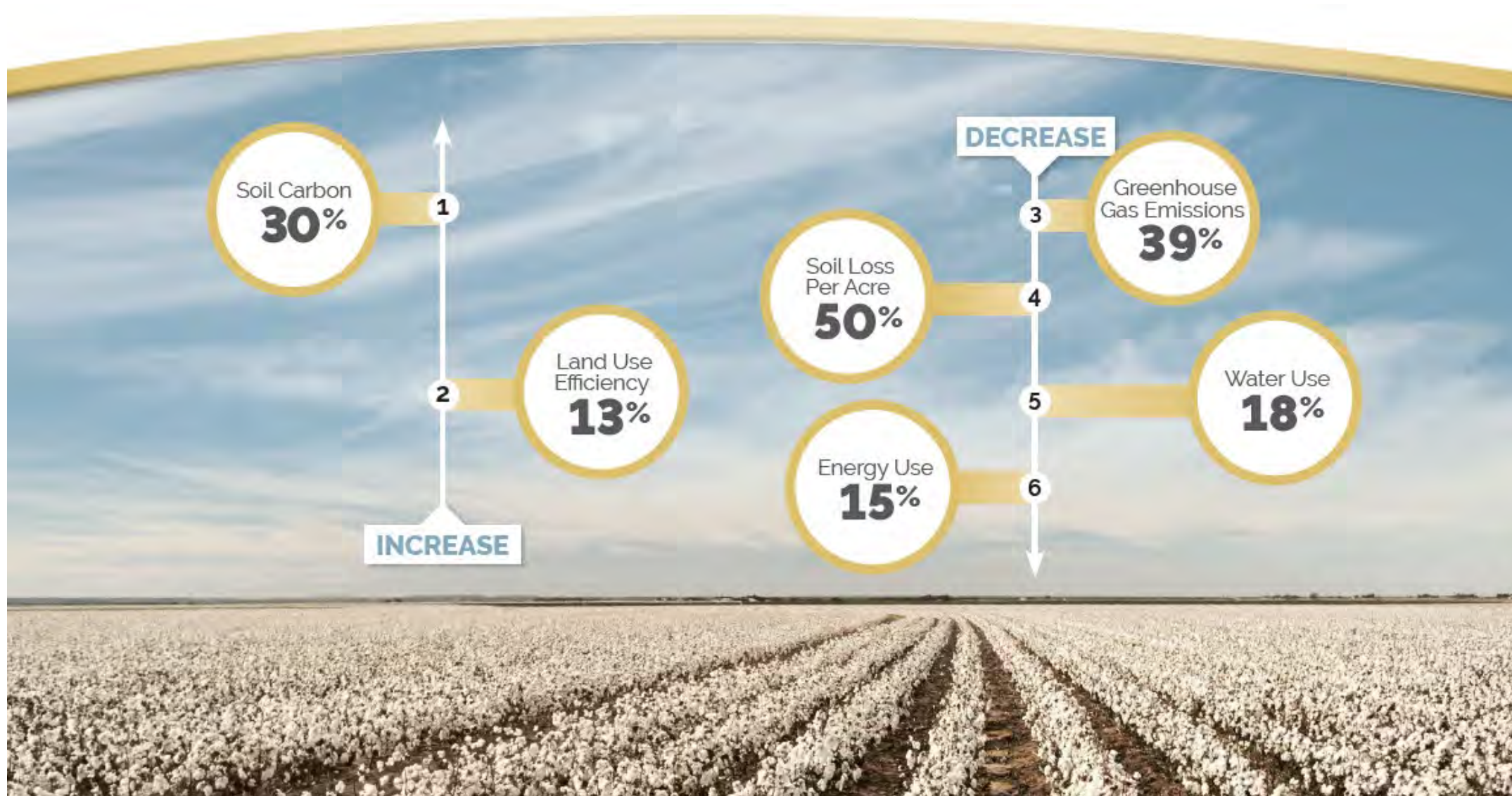


40%



Field to Market

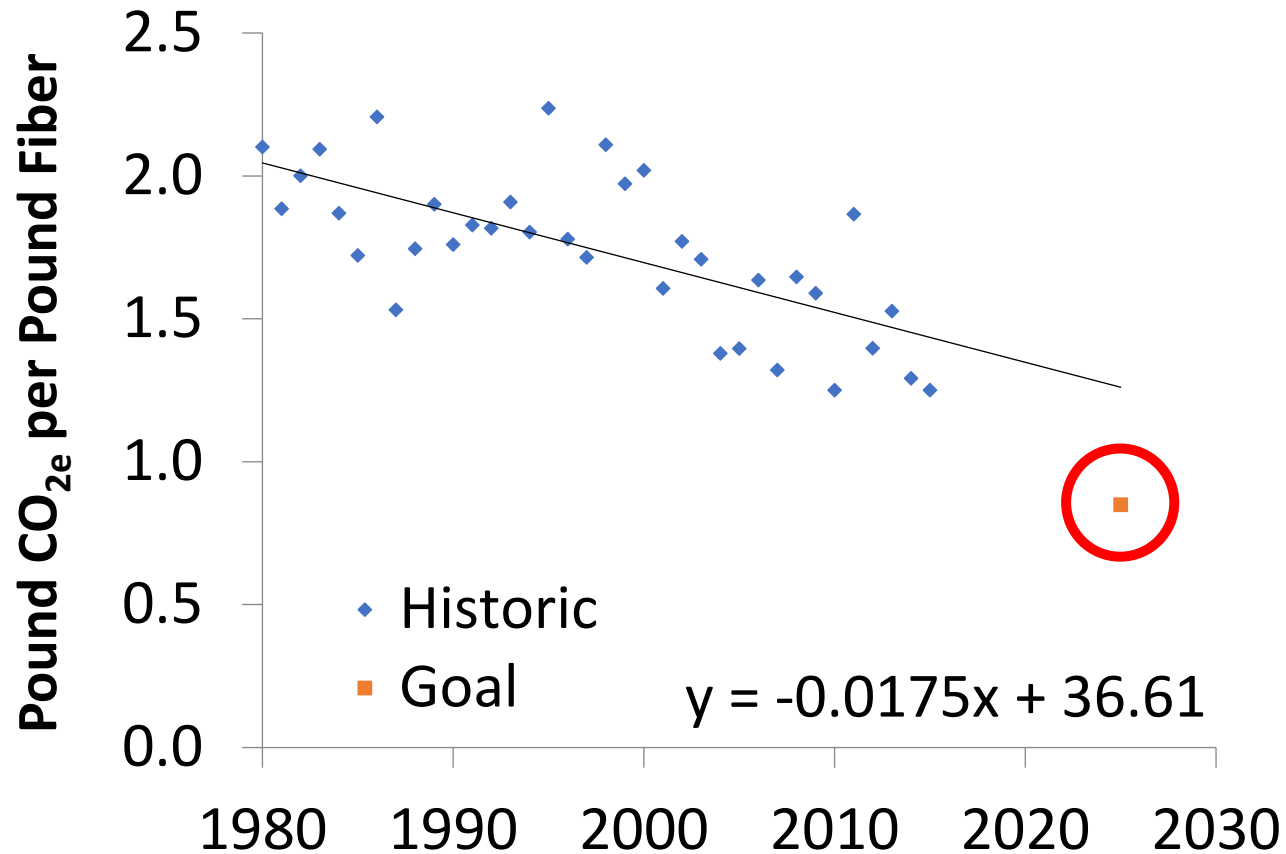
U.S. Cotton's Sustainability Goals for 2025



Source: Cotton Incorporated (2018). U.S. Cotton ten-year sustainability goals, Pathways to progress. https://www.cottoninc.com/wp-content/uploads/2018/02/Cotton_Sustainability_2018.pdf

Greenhouse Gas Emissions

Goal: 39% Reduction



The Greenhouse Gas Goal of 0.85 lbs. of CO_{2e} per pound of fiber is ambitious since it matches the spirit U.S. commitment under the Paris Accord and exceeds our historic trend line by 30% and our current F2M FieldPrints.

This metric does not account for carbon sequestered in the fiber (biogenic carbon) which matches current GHG emissions and would designate cotton as carbon neutral.

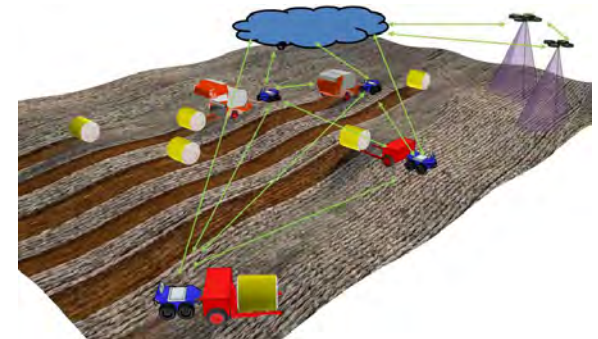
Drivers for this GHG improvement include:

- Yield and Nitrogen Use Efficiency gains
- Carbon capture from cover crops & no-till



Common Themes for Improvement

- Yield Increase
- Cover Crops
 - Soil improvement (erosion, quality & carbon)
 - Weed suppression
 - Rainfall capture (Water Quantity & Quality)
- Precision Management
 - Optimizing fertilizer and water use
 - Robots to reduce GHG, energy, labor, and as harvested when boll opens, less field loss and better quality.





U.S. COTTON TRUST PROTOCOL --- SUSTAINABILITY



Meeting Brand Needs for More Sustainable Cotton

Increased Trust | Lower Brand Risk | Lower Environmental Impacts

U.S. Cotton Trust Protocol

Enrollment

Farm Profile

Sustainable
Farm Practice
Checklist

Do you use cover crops?
Do you follow product labels?
Do you irrigate?

Fieldprint
Calculator

Yields
Soil type
Fertilizer use
Water use

Independent
Verification

Data checks
Practice verification
Connection to further
resources

U.S. COTTON TEN YEAR
SUSTAINABILITY GOALS
PATHWAYS TO PROGRESS



Wrangler




Fieldprint Calculator



Field to Market®

The Alliance for Sustainable Agriculture

seconds per year of data entered causing longer than normal results processing times. Selecting "No" will turn WEPS off. Please click on  for more information.

Location


Soil


Crop Rotation

Management

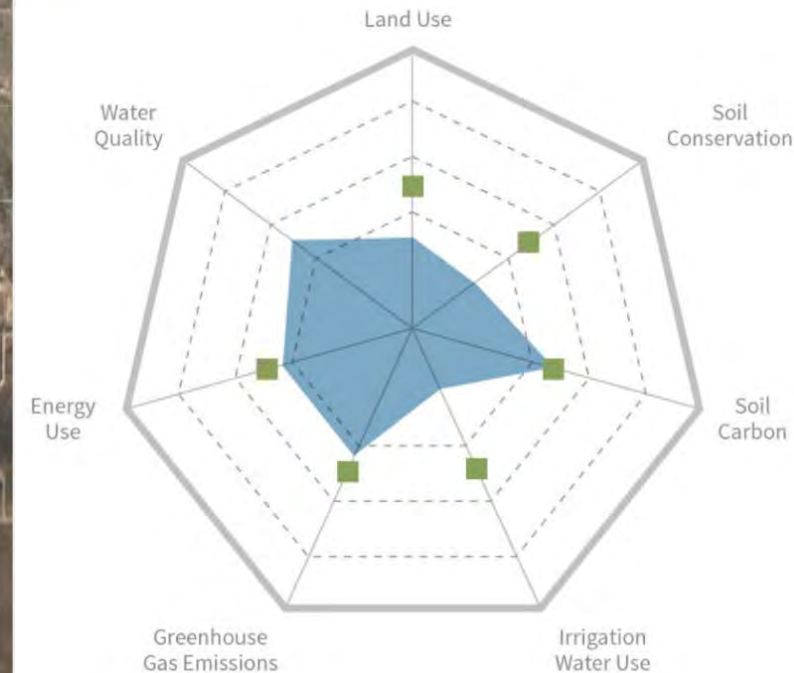
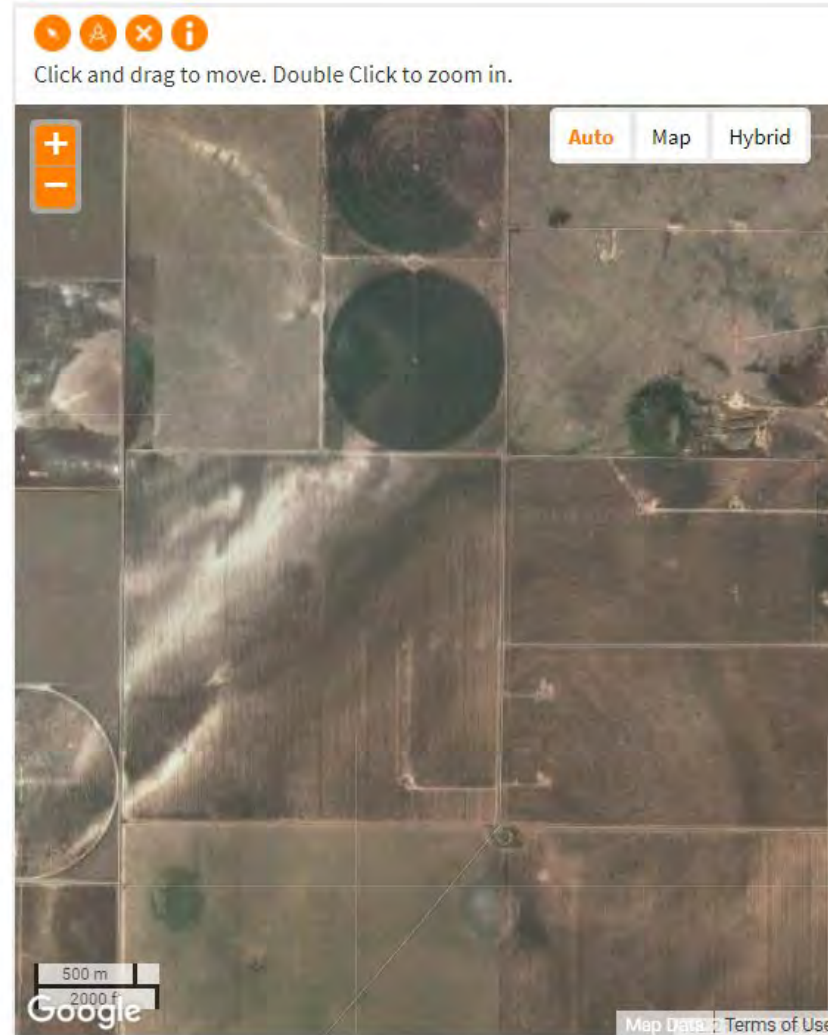
Product Transportation/Hauling




Drying

Planted But Not Harvested 

Conservation Practices 

Farm Demographics



<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
 Grower Index	 National Average	 State Average



Roadmap to Net Zero

Delivering Science-Based Targets in the Apparel Sector

Michael Sadowski
World Resources Institute



WORLD
RESOURCES
INSTITUTE



apparel
impact
institute

Context

- In June 2019, WRI published guidance for apparel and footwear companies to set science-based climate change Targets (SBTs)
- The objectives: bring clarity and consistency to target setting, resulting in more companies establishing targets
- The guidance includes a high-level description of how to reduce GHG emissions in the sector



The guidance has accelerated the pace of SBTs

Companies with **approved SBTs** (as of September 2020)

Walmart

ARC'TERYX

C&A

KERING

VF

OLIVE
APPAREL

AMERICAN EAGLE
OUTFITTERS

PINE TREE COMPANY FOR
TEXTILE MANUFACTURING

TESCO

SELFRIDGES & CO

Levi's

TOKMANNI

M&S

PATTERN
GROUP

skunkfunk

Gap Inc.

H&M

TAI WAH
GARMENTS

zalando

asics

NIKE

Lenzing
Innovative by nature

CC

JFR

J. FRONT RETAILING

Target

PVH

INDITEX

peak design

lululemon

EILEEN
FISHER

RALPH LAUREN

BURBERRY
LONDON ENGLAND

PUMA

BOSS
HUGO BOSS

DECATHLON

ALDO
GROUP

The guidance has accelerated the pace of SBTs

Companies with SBT commitments (as of September 2020)



The need for a sector Roadmap to Net Zero

- The guidance has helped increase SBTs amongst apparel companies, yet the sector has not been not fully aligned on:
 - The contribution of the apparel sector to global GHG emissions
 - The hotspots of GHG emissions across the value chain
 - How the sector can deliver the needed emissions reductions
- Such alignment will allow companies to see a viable pathway to Net Zero and align their actions accordingly
- This Roadmap will serve as a foundation for the system-wide collaboration needed to drive emissions to zero by 2050



To prevent 1.5°C of warming, global CO₂ emissions must fall 45% from 2010 levels by 2030, reaching 'net zero' around 2050.

Project objectives

1. Map the major sources of GHG emissions across the apparel value chain
2. Identify the actions companies can take to reduce emissions
3. Highlight the challenges to these actions and potential solutions
4. Landscape the organizations and initiatives working to reduce emissions



Project approach

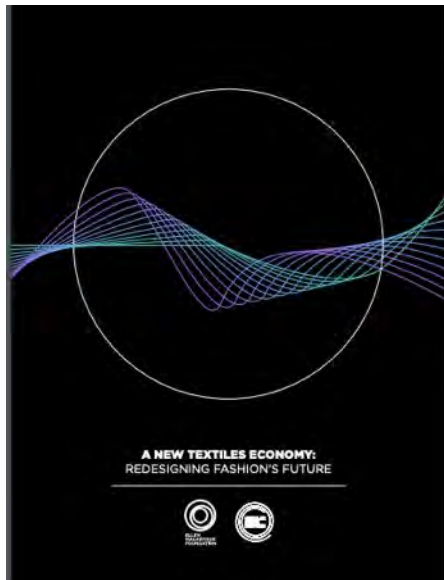
- Desk research on sources of GHG emissions across the value chain
- Interviews with industry experts to deepen our understanding of sources of emissions and potential solutions
- Collaboration with the Sustainable Apparel Coalition and Higg Co to:
 - Produce the first estimate of apparel sector GHG emissions based on Higg Index and Textile Exchange data
 - Model potential GHG reductions from key interventions
- Feedback (now through November 1), revision and final publication



Previous apparel sector GHG estimates

Over the last several years, several organizations have calculated apparel sector emissions

Ellen MacArthur Foundation &
McKinsey (2017)



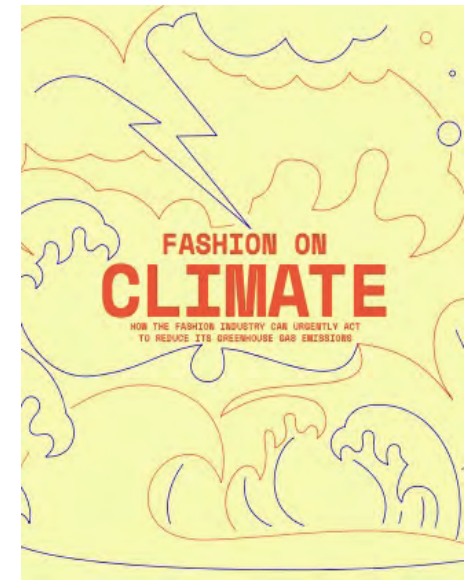
1.2 billion tonnes CO₂e
2% of global budget

Quantis (2018)



3.29 billion tonnes CO₂e
6.7% of global emissions

Global Fashion Agenda &
McKinsey (2020)



2.1 billion tonnes CO₂e
4% of global emissions

See the Roadmap for additional examples of sector GHG estimates

Introducing a new sector GHG estimate

- Previous estimates are valuable for identifying hotspots of emissions, though the results differ due to varying assumptions and methodologies
- They provide a snapshot of emissions in time, not a means to track sector progress over time
- We worked with the SAC and Higg Co to create the first estimate of apparel sector GHG emissions using Higg and Textile Exchange data
- Our analysis is also based on various assumptions and imperfect data - we don't purport to have a "better" estimate
- But, using the Higg will allow us to continuously improve the underlying data over time and more readily track progress



We started with apparel given the availability of data. We will include footwear in the future.

Summary of our approach to calculating sector emissions



Fiber volume data
from Textile Exchange
x MSI emissions factors
for raw materials



Fiber volume (with
loss rate) x MSI
factors for yarn
formation



Yarn knit or woven
into fabric, then
prepared, colored,
and finished (x MSI
factors)

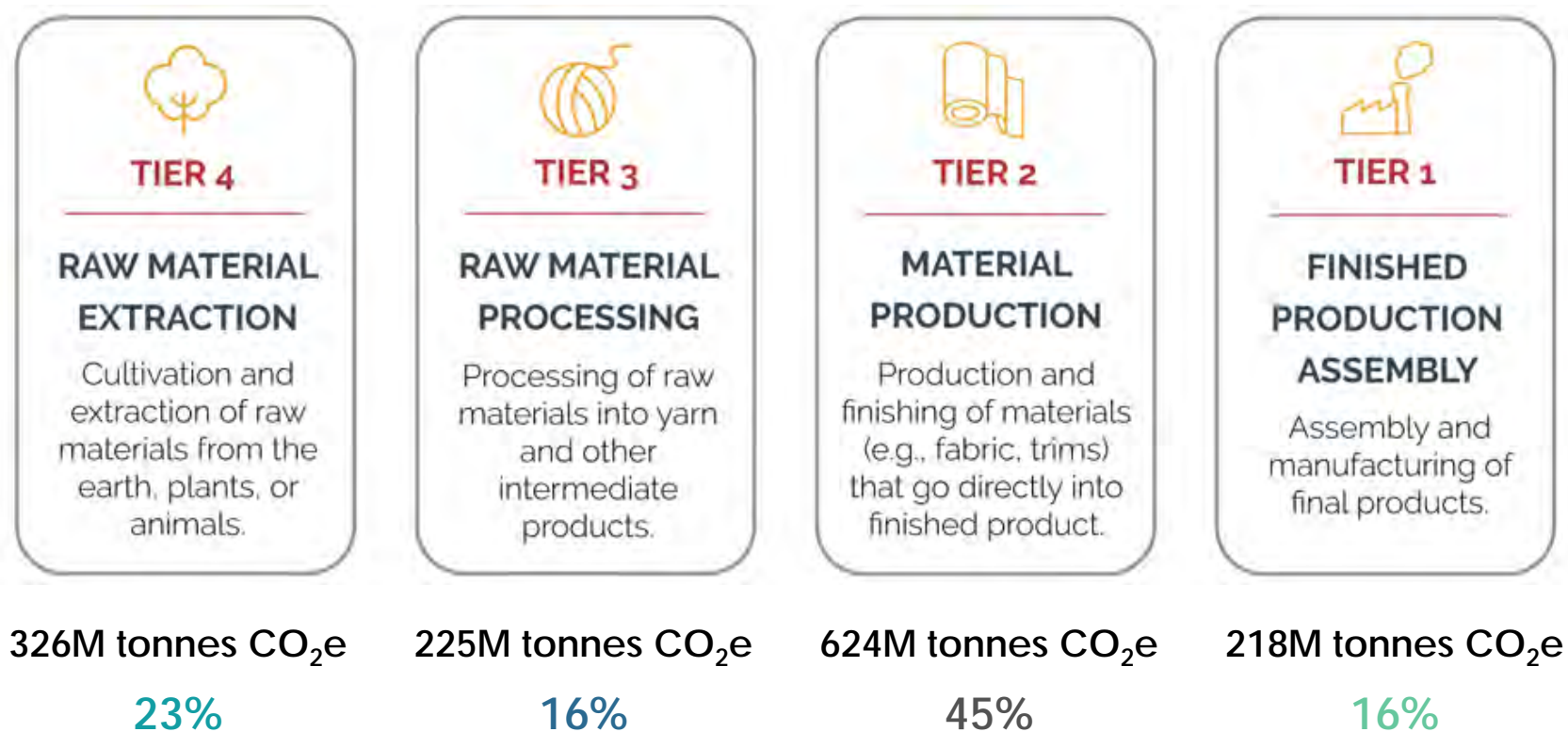


Finished fabric
turned into
garments: fabric x
average emissions
factor for tier 1

The MSI includes a base level of logistics between the above phases. We did not include offices, retail, use phase and end of life. See the Roadmap for more details.

The results

Total Apparel GHG Emissions: **1,393 million tonnes CO₂e**



Snapshot of key findings



TIER 4

Polyester is highest volume of fiber used (>50%) and source of emissions (>40%)

Cotton is second (~24%, 14%)

Primary solution: material substitution, field-level interventions*

326M tonnes CO₂e

23%



TIER 3

Focused on yarn spinning

Results sensitive to aspects e.g. yarn density and spin type

Primary solution: renewable electricity

225M tonnes CO₂e

16%



TIER 2

Thermal energy for wet processing is primary driver of emissions (>70% of total)

Coal is the main fuel in many countries

Primary solution: efficiency, fuel switching

624M tonnes CO₂e

45%



TIER 1

Electricity is main driver of emissions

Access to renewables dependent on country (see country profiles in roadmap)

Primary solution: efficiency, renewable electricity

218M tonnes CO₂e

16%

Driving emissions to Net Zero: Key interventions



TIER 4



TIER 3



TIER 2



TIER 1

1

Maximize material efficiency

2

Scale preferred materials

3

Accelerate development of "next gen" materials

4

Maximize energy efficiency

5

Eliminate coal in material and product mfg.

6

Shift to 100% renewable electricity

Deep dive on tier 4: findings and limitations

- Polyester is majority of fiber used in textiles and highest GHG emissions, most of which are hard to abate
- Cotton farming is second highest by mass and ~3% of value chain emissions
- Using the MSI presents a number of limitations (e.g. missing data points, average data) - goal is to improve MSI and move to primary data over time
- Switching to “preferred” cotton can reduce emissions, but there are real limits
- Ultimately, we need to reduce GHG emissions across all forms of cotton (and other fibers) to stay within 1.5°C
- Sequestration will be a critical component for cotton



326M tonnes
CO₂e
23%

Next steps for the Roadmap to Net Zero

- The draft roadmap is open for public comment until **November 1**
- Feedback can be shared via the survey at

surveymonkey.com/r/apfwroadmap

or via email to:

Michael Sadowski

michael.sadowski.5@wri.org

Emily McGarvey

emily@apparelimpact.org

- Based on this feedback, refine our calculations, including projected emissions
- Organize virtual workshops to go deeper on potential solutions (e.g. renewable energy, material substitutions)
- Conduct internal WRI review
- Publish a final version of the Roadmap by end of 2020

Roadmap to Net Zero
Delivering Science-Based Targets in the Apparel Sector
Preliminary Draft for Stakeholder Feedback
September 2020

Authors
World Resources Institute
Apparel Impact Institute

1

A black and white photograph of hands working on a piece of fabric. One hand holds a pen, and the other holds a ruler, suggesting a process of measurement or marking. The background is dark and out of focus.

Thank You

Questions and more information:

Michael Sadowski
michael.sadowski.5@wri.org

Visit sciencebasedtargets.org



Sustainability: Climate Roadmap

SEAN CADY



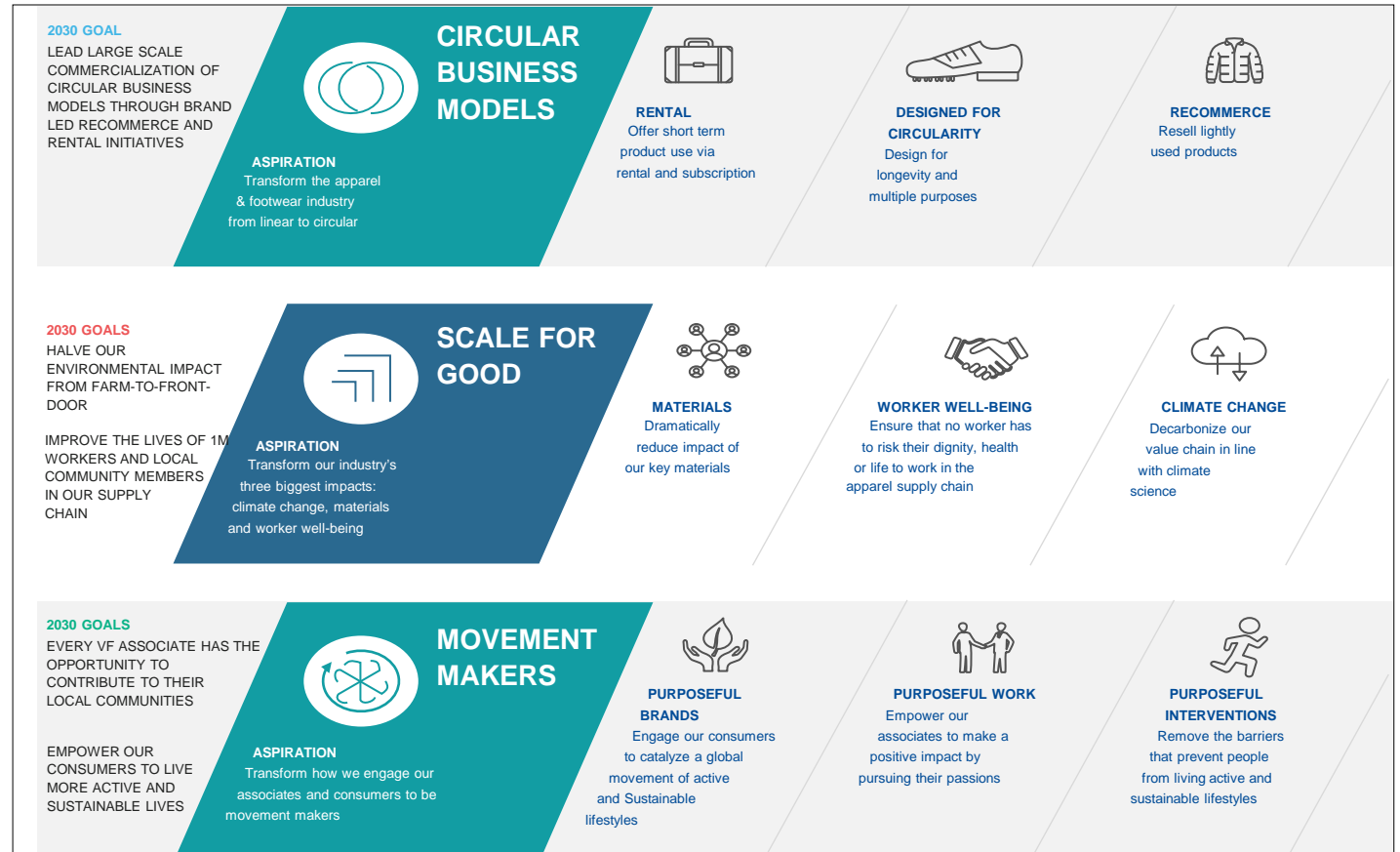
VF Corporation



MADE FOR CHANGE

VF'S SUSTAINABILITY + RESPONSIBILITY STRATEGY

- Made for Change strategy is foundational
 - Renewable Energy
 - Sustainable Materials (products, packaging)
 - Operations (distribution, offices, retail)
 - Science-Based Targets
- Stakeholder expectations increasing
- Barron's #1 ranking by social factors



Material Goals Under Our 2017 Made For Change Strategy



SCALE
FOR GOOD

<div>ASPIRATIONAL GOALS</div> <div>CLIMATE</div> <div>MATERIALS</div>	Halve our upstream environmental impact, farm-to-front door	2030	<div></div>
	Improve the lives of 1M workers and their communities	2025	<div></div>
	Announce science based climate change goals	2019	<div></div>
	100% renewable energy in owned and operated facilities	2025	<div></div>
	Reduce the average impact of our key materials by 35%	2025	<div></div>
	100% of all footwear leather will be finished in Leather Working Group audited tanneries	2021	<div></div>
	50% of nylon and polyester will come from recycled materials	2025	<div></div>
	100% PFC-free outdoor apparel	2025	<div></div>
	100% Responsible Down Standard down	2019	<div></div>
	All cotton purchased by VF that is not from the U.S. or Australia is grown under a cotton growing sustainability scheme	2025	<div></div>

We have 12 years to limit climate change catastrophe, warns UN

Urgent changes needed to cut risk of extreme heat, drought, floods and poverty, says IPCC

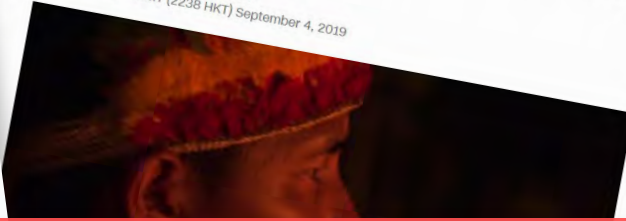
Overwhelmed by climate change? Here's what you can do



The Amazon is burning. The climate is changing. And we're doing nothing to stop it

Analysis by Nick Paton Walsh, CNN

Updated 1438 GMT (2238 HKT) September 4, 2019



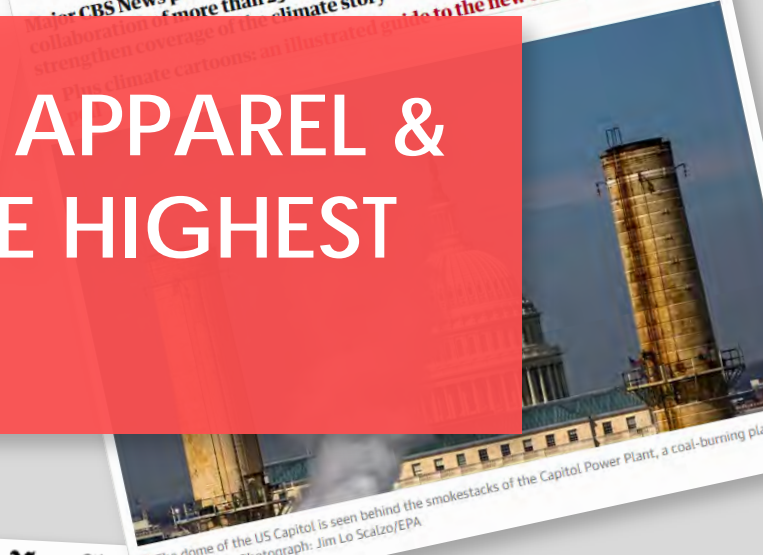
'Our house is on fire': Greta Thunberg, 16, urges leaders to act on climate

Greta Thunberg

'Americans are waking up': two thirds say climate crisis must be addressed

Major CBS News poll released as part of Covering Climate Now, a collaboration of more than 250 news outlets around the world to strengthen coverage of the climate story

Climate cartoons: an illustrated guide to the new climate



▲ The dome of the US Capitol is seen behind the smokestacks of the Capitol Power Plant, a coal-burning plant in Washington DC. Photograph: Jim Lo Scalzo/EPA

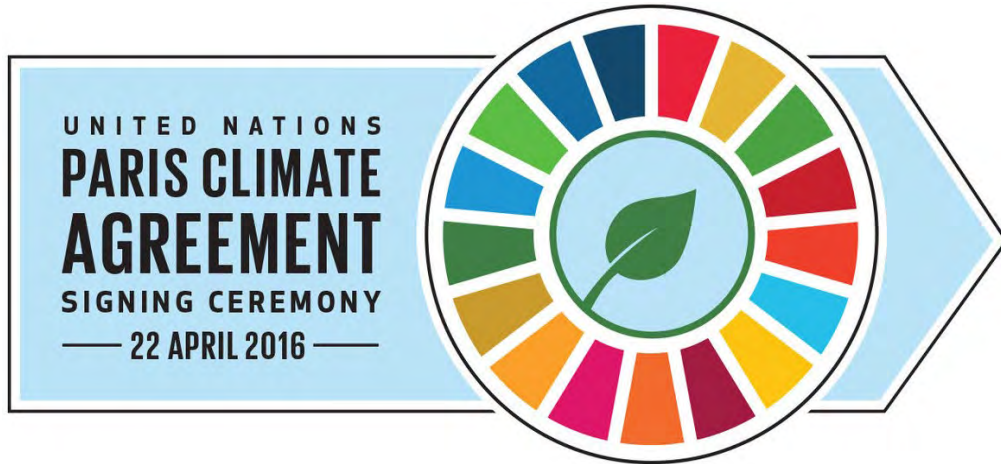
Humanity has wiped out 60% of animal populations since 1970, report finds

The huge loss is a tragedy in itself but also threatens the survival of civilisation, say the world's leading scientists

Extreme Weather Displaced a Record 7 Million in First Half of 2019

GLOBAL WARMING IS URGENT & THE APPAREL & FOOTWEAR INDUSTRY IS ONE OF THE HIGHEST CONTRIBUTORS ...

The Landscape Has Shifted & The Industry Is Stepping Up To The Challenge...



Companies have united behind **science-based targets**, which align emissions targets to the <2 degree (and in many cases to 1.5 degrees) warming needed by 2030

Our Value Chain Is The Largest Contributor

GREENHOUSE GAS PROTOCOL SCOPES

VF'S 2017 GREENHOUSE GAS FOOTPRINT

CO₂

CH₄

N₂O

HFCs

PFCs

SF₆

NF₃

Total VF Emissions: 6.3 million mtCO₂e

Scope 2
INDIRECT

Scope 1
DIRECT

Scope 3
INDIRECT

Scope 3
INDIRECT

purchased
goods and
services

capital
goods

fuel and
activities

transportation

waste
generated in
operations

purchased electricity, steam,
heating & cooling for own use

leased assets

employee
commuting

business

company
facilities

company
vehicles

transportation
and distribution

processing of
sold products

use of sold
products

end-of-life
treatment of
sold products

investments

franchises

leased assets

UPSTREAM ACTIVITIES

REPORTING COMPANY

DOWNSTREAM ACTIVITIES

Scope 1&2
1%

Scope 3 99%

Public Facing Actions Drive Reputation and Engage Consumers and Employees

22%

Renewable energy

12

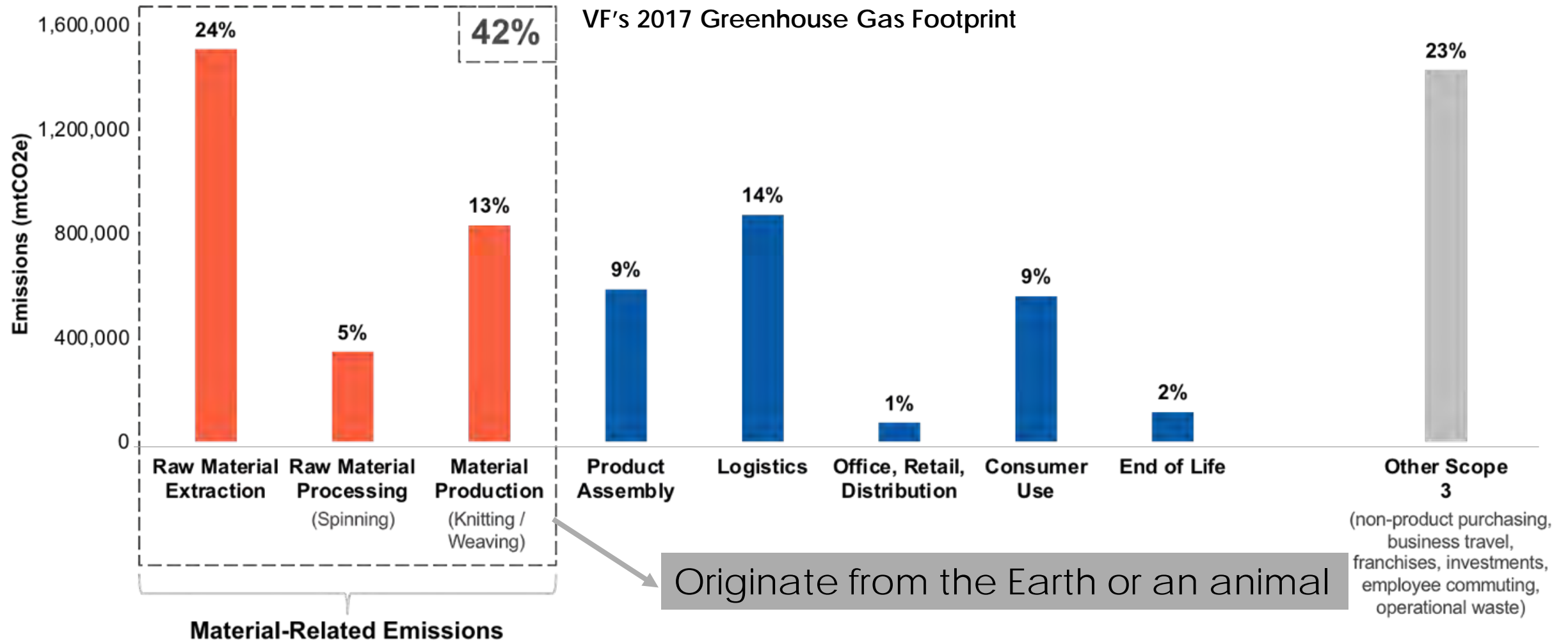
Zero waste large DCs

14

LEED / BREEAM certified
key buildings



Materials are the Largest Driver of Impacts Across our Business Functions



Closing The Gap Will Require Transformational Change & Bold, Ambitious Leadership

Aspiration A net positive impact on the planet and its inhabitants

Vision

By 2030, 100% of our top 9 materials will be **Regenerative**, Responsibly Sourced **Renewable**, or **Recycled**



Circularity



DESIGN

- Materials
- Marker efficiency
- Disassembly
- Use

MATERIALS USE

- Regenerative
- Responsibly Sourced
- Renewable
- Recycled

TAKE BACK

- Infrastructure
- R&D technology
- Infrastructure
- Partnerships



Stakeholders are Expecting Leadership and Responding to Opportunities

Consumer



- **67% of Gen-Z and Millennials** indicate they have **already changed** their purchasing habits due to climate change
- Buy 2027, **Millennials and Gen Z** will account for **2/3rds** of Apparel and Footwear Revenue (US)²

Retail



- Wholesale partners setting **sustainability guidelines** for products
- Many retailers **guide shopping behavior** through sustainable search bars / calls to action

Investors



- **Sustainable mutual funds** brought in \$40.5 billion in new assets in the first quarter of 2020, a **41% YoY increase**³

Government & Policy



United Nations
Framework Convention on
Climate Change

- EU setting standards and incentives for **circularity, recycled content and new business models**



Thank You

Sean Cady

Vice President

Global Sustainability & Responsible Sourcing

VF Corporation



Cotton & the Climate Roadmap

Strategies for the Apparel Industry to Reach Net Zero

Biodegradability of Cotton

Topics > Sustainability > Cotton Sustainability

ADD TO LIST ?

Biodegradability of Raw Materials

Fashion has an impact beyond the closet.

What happens when your favorite cotton shirt finally reaches the end of its functional life? In most cases, the shirt is donated, repurposed for things such as rags around the house, or thrown away.

Did you know **the average American disposes of 70 pounds of textiles each year**, according to the Council for Textile Recycling? If only about 10 pounds are donated, the remaining 60 pounds end up in landfills or other disposal environments.



Biodegradability of Cotton

Learn about cotton's biodegradability in water and soil, microplastic pollution, natural fabric alternatives, and more.

Life Cycle Assessment of Cotton

Topics > Sustainability > Cotton Sustainability

[ADD TO LIST](#) 

From fiber sourcing to end product, stakeholders and consumers alike are demanding methods of measuring and reducing the environmental impact of textile products. Tools such as Life Cycle Inventories and Assessments can aid in environmental decision-making by identifying key impact areas and benchmarking success over time.

Executive Summary

The Cotton Foundation has completed the most comprehensive assessment of cotton product life cycles to date — The Life Cycle Inventory & Life Cycle Assessment of Cotton Fiber and Fabric. Download the full summary on this topic and then listen to the webinar below for the synopsis.

[Download the Executive Summary](#)

Life Cycle Assessment of Cotton

Learn how Life Cycle Inventories measure and reduce the environmental impact of textile products.

U.S. Cotton Traceability

Topics > Sustainability > Cotton Sustainability

ADD TO LIST ?

Leading the way in traceable cotton production.

The United States is leading the way in traceable cotton production. Implementation of research and technology at every stage enhances fiber properties and minimizes the environmental footprint of U.S. cotton. Federal agencies such as the EPA, FDA and OSHA ensure that cotton is produced in a regulated and reported manner, including publicly available data for on-field inputs.* The USDA Agricultural Marketing Service uses Permanent Bale Identification to identify U.S. cotton along the supply chain. Throughout the Cotton Belt, from the gin to the mill, U.S. cotton is traceable, transparent and efficient.



*U.S. Environmental Protection Agency (EPA), U.S. Food and Drug Administration (FDA), Occupational Safety and Health Administration (OSHA), U.S. Department of Agriculture (USDA)

U.S. Cotton Traceability

Learn about the traceability of U.S. cotton.

From the gin to the mill, U.S. cotton is traceable, transparent, and efficient.

Webinars

PAST WEBINARS:

Cotton & Science-Based
Targets: Industry
Progress & Path to Net
Zero

Cotton & Soil Health: A
Solution to Global
Challenges

Navigate the Market:
Economic, Consumer, &
Retail Insights

Cotton & Water:
Understanding Metrics &
Use in Industrial Tools

Cotton & Water:
Demystifying
Agricultural Water
Management

Stop the Leak:
Addressing Plastic
Leakage in Your Supply
Chain

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Submit all final questions now
using the Q&A box on your screen.



Please take our brief survey on today's
presentation prior to exiting the webinar.