PRESENTATION

Session: **Sustainability**

Title: **The Environmental Impact of Using U.S. Cotton in the Manufacture of T-Shirts**

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Presentations are available in the conference archive: https://baumwollboerse.de/en/competencies/international-cotton-conference/speeches/

Conference Organization

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The Environmental Impact of Using U.S. Cotton in the Manufacture of T-Shirts

Roger Gilmartin, Special Advisor, CCI

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1. Background

- Cotton Council International (CCI), the export promotion arm of the National Cotton Council of America (NCC), is a non-profit trade association that promotes U.S. cotton fiber and manufactured cotton products around the globe with the COTTON USA Trademark.
- CCI works with spinning mills, fabric and garment manufacturers, and textile associations to facilitate the usage of U.S. cotton. The company exists in more than 50 countries through 20 offices around the world.
- Since 2018 we have been offering guidance and assistance to customers of U.S. upland cotton on how to get the best performance and value from what we believe is the best cotton in the world.
- Every year, research projects using independent consultants are commissioned.
- In 2017 we commissioned a project in Bangladesh to compare cottons from **USA, Indian** and the **CIS.**
- In 2018 - a follow-up project, again in Bangladesh, compared cottons from the **USA, Brazil** and **West Africa.**

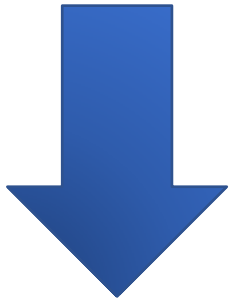
1. Background

- Although the research was conducted in two different mills, in both studies, the technical parameters of the cottons to be compared, for example Staple Length, UI%, GPT, Micronaire, Elongation etc. were matched as closely as possible.
- The same machines, operating procedures and parameters were used to process each different fiber source at every stage of manufacturing to minimize potential mill variables and to ensure, as much as possible, that we were comparing “apples with apples”.
- Decisions regarding fabric and garment quality, rejection rates, color matching etc. were all made by the partner mill’s quality control teams and the management of the departments being observed.
- The consultant’s role was to observe, control and monitor every stage of the trials, technically and financially.
- At the completion of each process, in thanks for their cooperation, the consultants prepared and presented detailed reports and recommendations, with action points, on potential improvement to the operations, to the partner mill’s management.

1. Background

- In both studies, the technical superiority of the U.S. COTTON was clearly demonstrated.

Fiber and fabric losses were **LOWER** with U.S. cottons



Machine productivity – **GREATER** with U.S. cottons

Yarn, fabric and garment quality – **higher** with U.S. cottons

- Financial evaluations showed final cost per pound of the garments made from U.S. cotton **was significantly lower** than that achieved with the other cottons as the next slide shows.

- Further research was commissioned to evaluate **the environmental impact** of the superior technical performance of U.S. cotton.

Final Cost Difference with U.S. Cotton ($)

Results from 2018 Study

Per Pound	U.S.		Brazil		West Africa	
Fiber Price	**0.94**	**Added ¢**	**0.93**	**Added ¢**	**0.95**	**Added ¢**
Final Garment Equivalent Cotton Cost	**1.42**	0.48	1.60	0.67	2.06	1.11
Final Cost Difference with U.S. Cotton				**More 0.18**		**More 0.64**

1. Background

2020 – Search began for Qualified Consultants

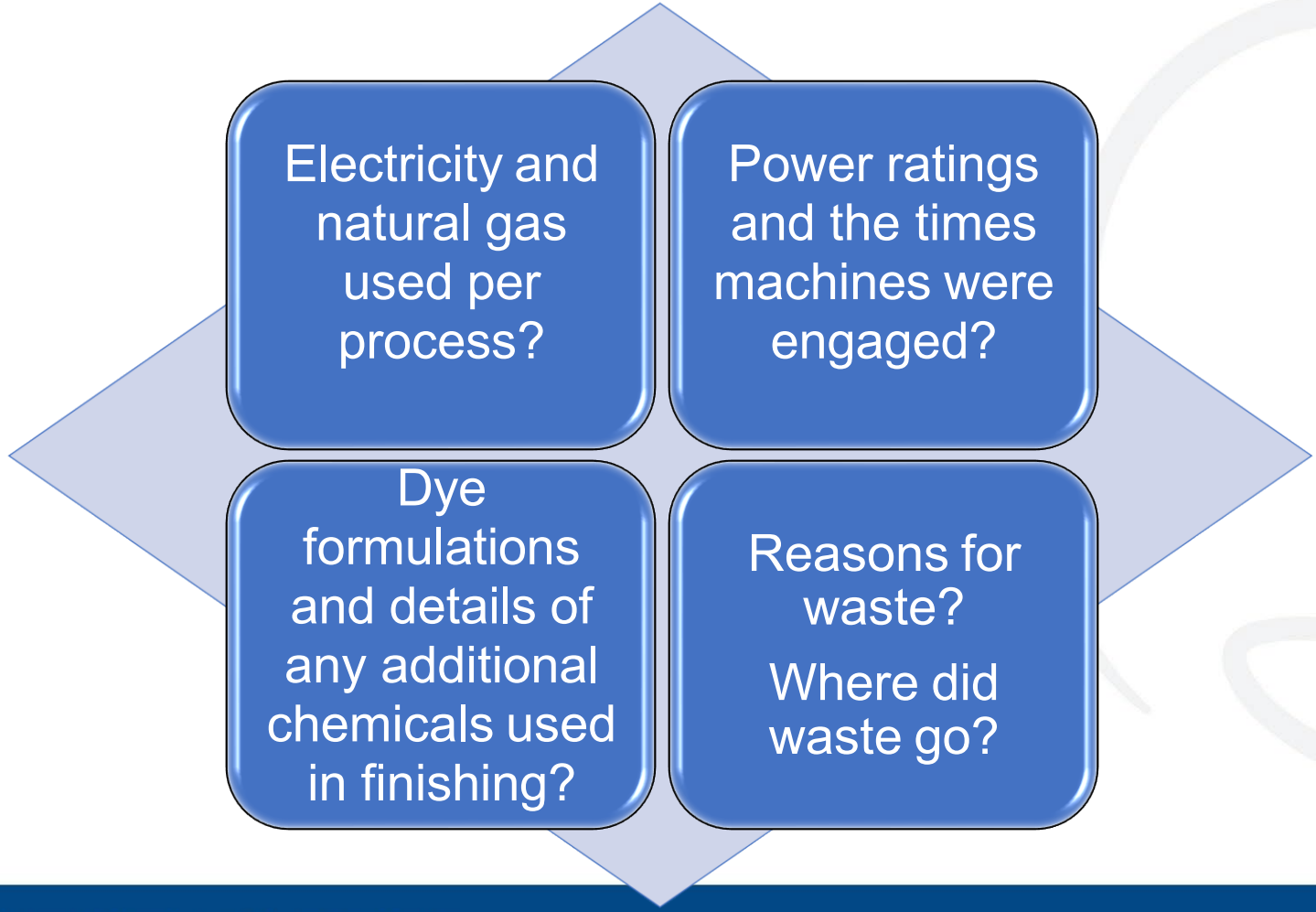
UK based Sustainability Advisors chosen

Established if CCI data had enough information

Peer Group consulted to determine if method satisfied requirements for ISO compliant LCA

2. Data Gaps

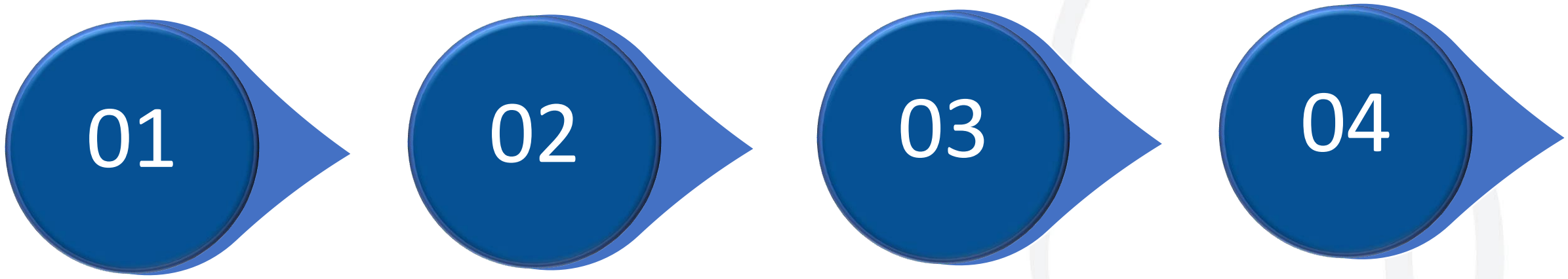
- Consultant's pre-analysis identified **data gaps**:



3. What is a Life Cycle Analysis?

LCA - method used to evaluate the environmental impact of a product through its life cycle.

Key stages include:



What are you looking at?
(Goal and scope definition)

What data is going in?
(Life cycle inventory analysis)

What are the results?
(Life cycle impact assessment [LCIA])

What does it mean?
(Interpretation of results)

4. Methodology

LCA - “cradle to grave”

This study - “cradle to gate”

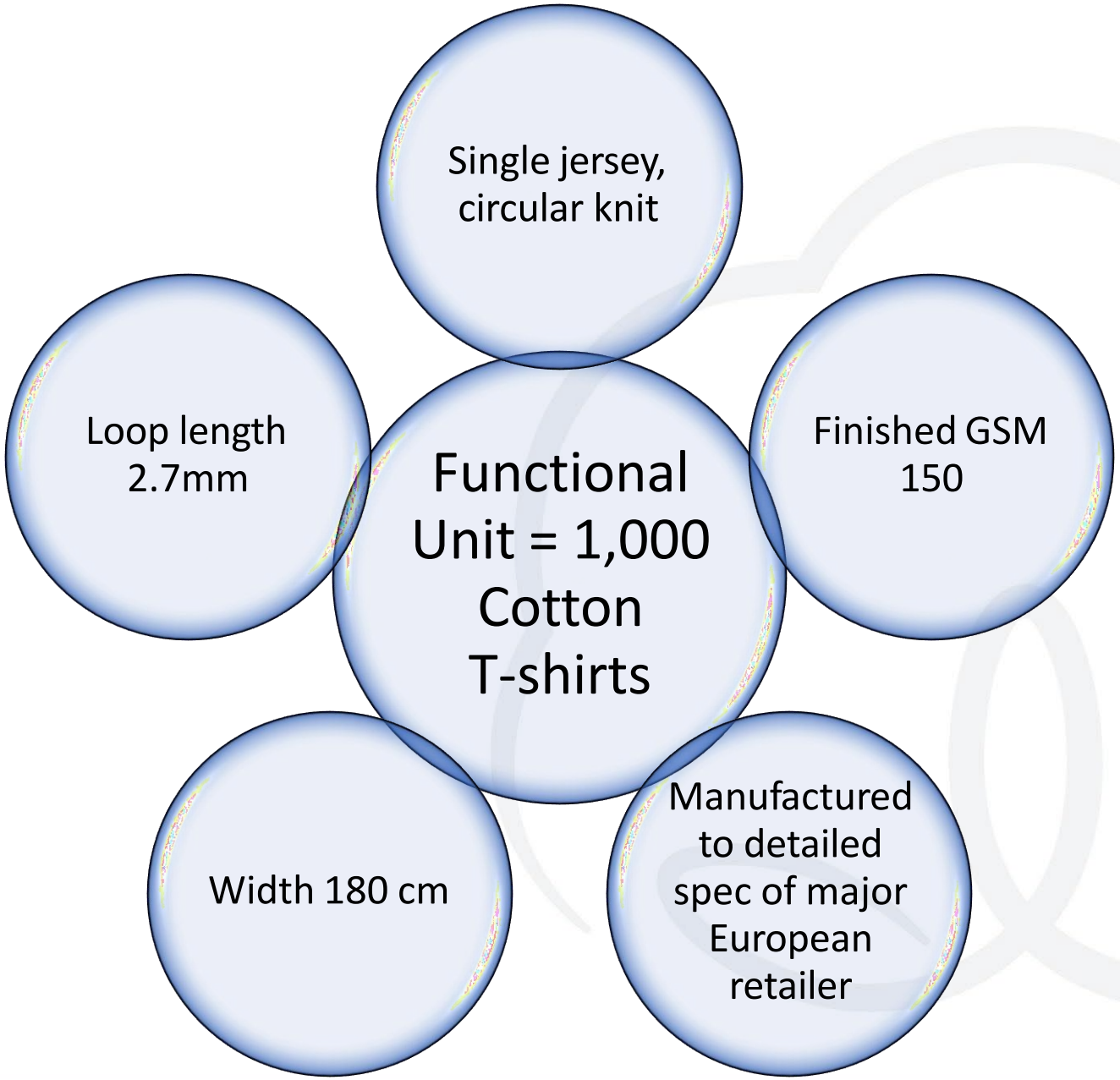
2018 study – “bale to garment”

Cotton cultivation section of analysis used pre-published LCA’s

ISO’s 14040, 14044 and 14025 rules followed

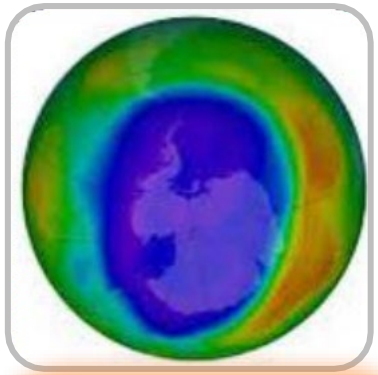
4. Methodology

- Previously published LCA's use a given amount of processed fiber, for example 1 ton of cotton, as the measure of comparison.
- This is called the **Functional Unit.**

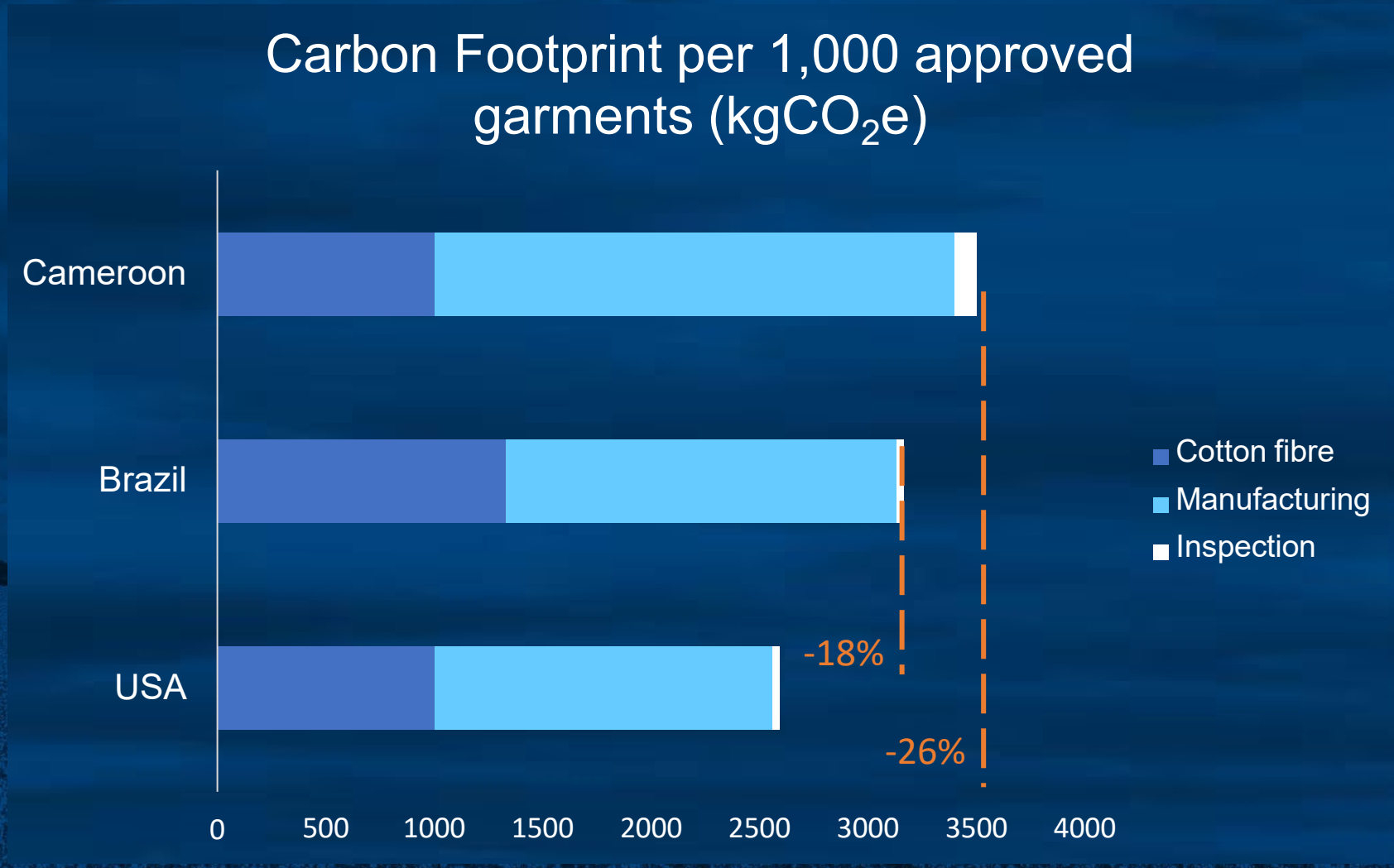


4. Methodology

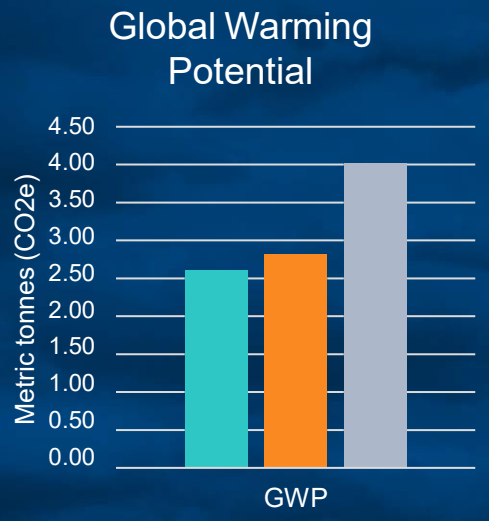
The consultants used the mid-point approach of ILCD 2.0 (2018) to develop the profiles of:

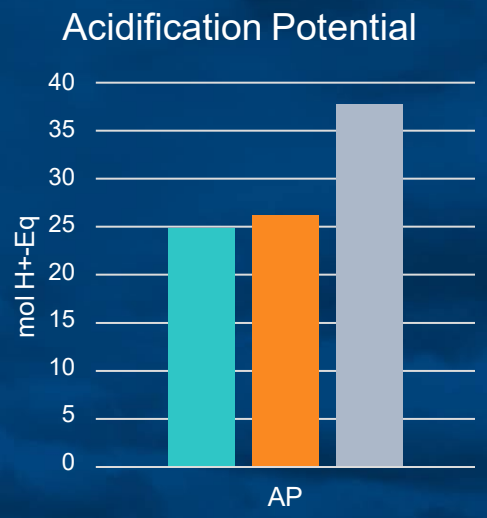
GWP	ODP	POCP	ED FW	AP	EU FW
					
Global Warming Potential – greenhouse gas	Ozone Layer Depletion – damage to Ozone layer	Photochemical Ozone Creation Potential – "summer fog" – respiratory complaints	Freshwater Ecotoxicity – freshwater pollution	Acidification Potential – decrease in pH value of rainwater	Freshwater Eutrophication – linked to overuse of fertilizers

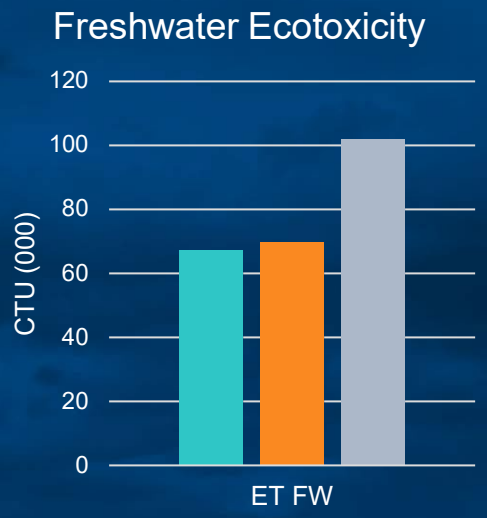
5. Carbon Footprint



6. Comparison by Life Cycle Stage





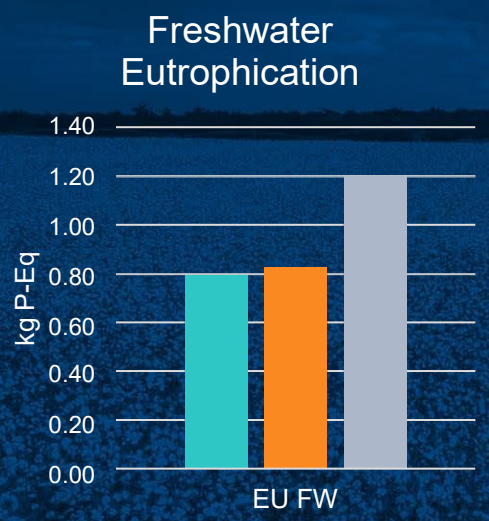


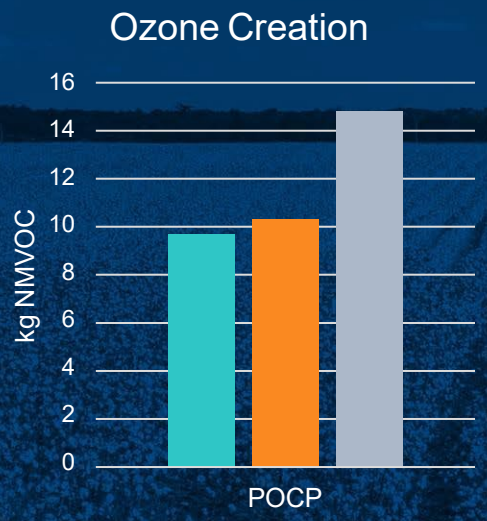
Each cotton type performs differently for each impact characteristic per 1,000 t-shirts that passed inspection

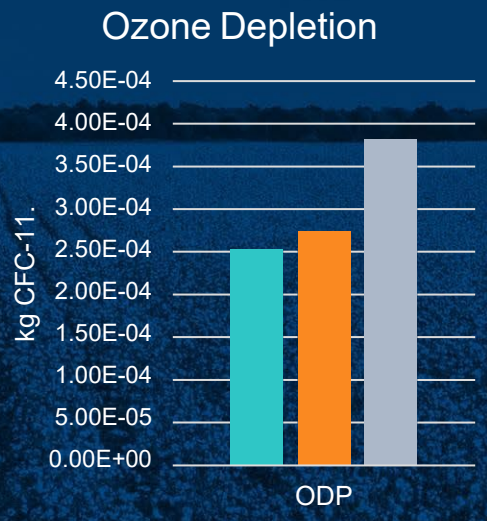
USA

Brazil

Cameroon







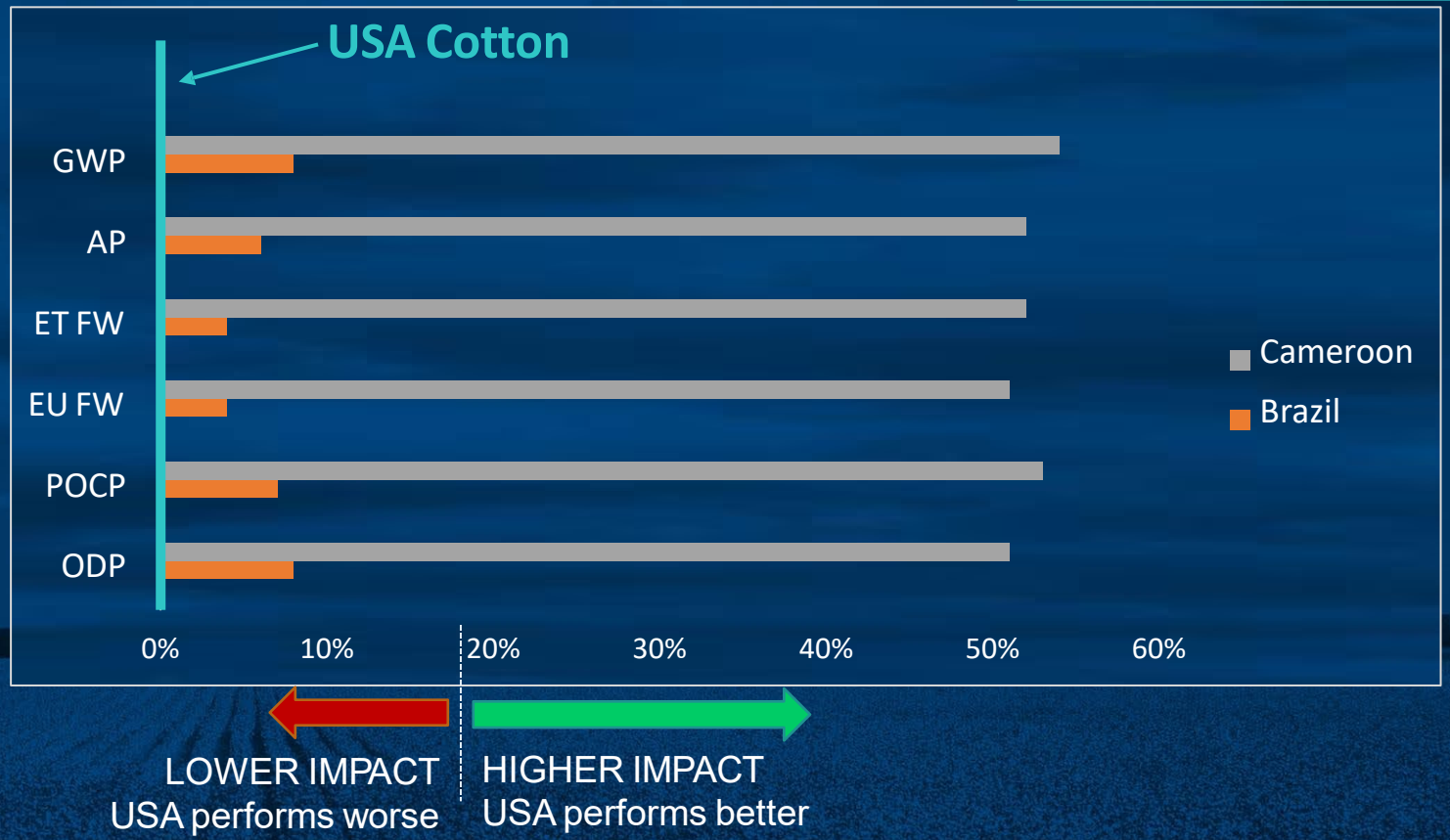
Impact Indicator	Acronym
Global Warming Potential	GWP
Acidification Potential	AP
Freshwater Ecotoxicity Potential	ET FW
Freshwater Eutrophication Potential	EU FW
Photochemical Ozone Creation Potential	POCP
Ozone Layer Depletion Potential	ODP

6. Comparison by Life Cycle Stage

USA cotton bales have a lower impact across all environmental indicators when considering garment acceptance

Each cotton type performs differently for each impact characteristic.

The USA cotton performs better than the other two cottons across all environmental metrics.



Impact Indicator	Acronym
Global Warming Potential	GWP
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Freshwater Ecotoxicity Potential	ET FW
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Photochemical Ozone Creation Potential	POCP
Ozone Layer Depletion Potential	ODP

7. Summary of all Parameters Measured

Less damaging to environment

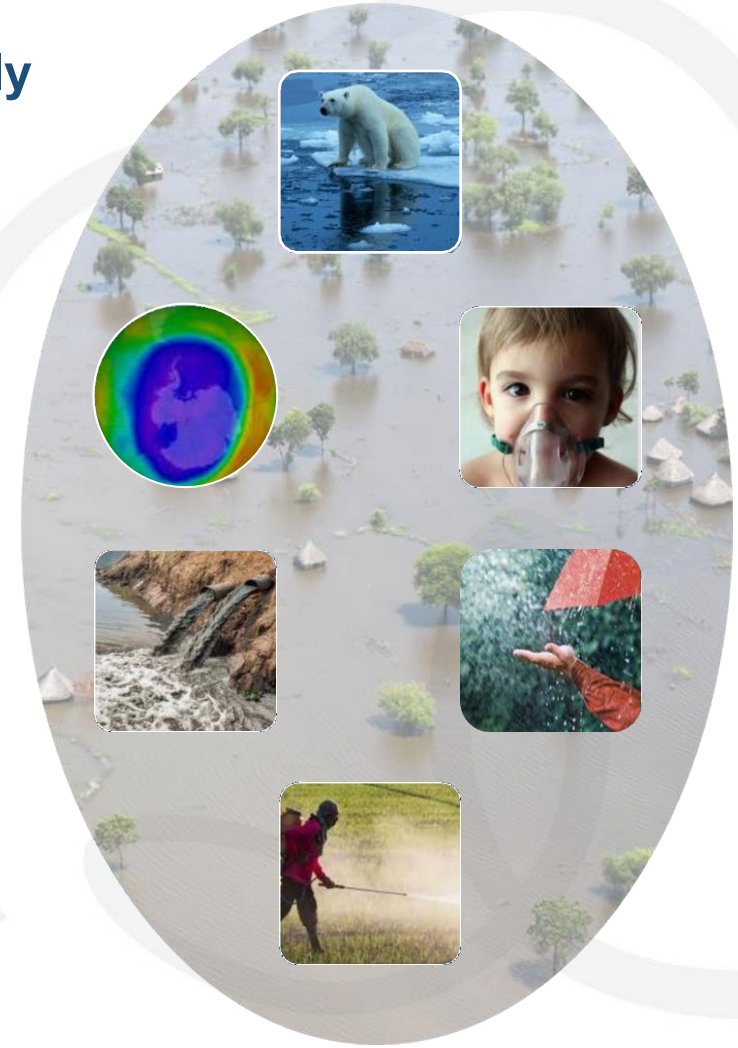
compared to

7. Summary

- Previously LCA's that have looked at cotton have focused primarily on cultivation.

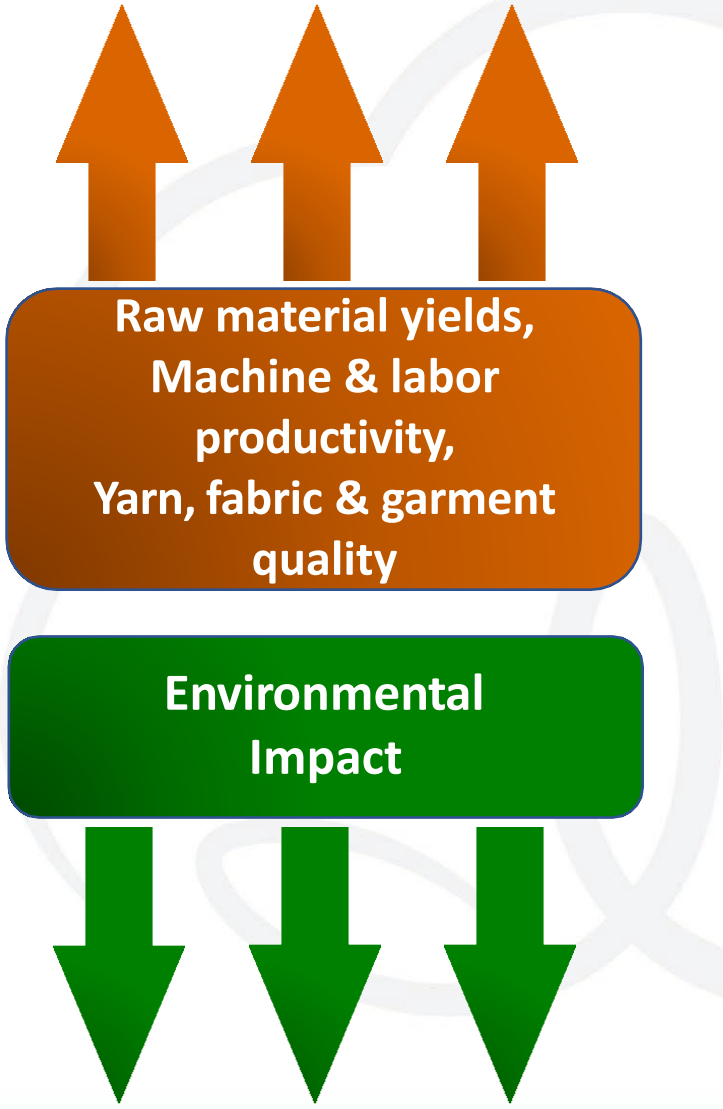
- This study adds detailed manufacturing data into the equation, probably for the first time.

- **The study clearly demonstrated that across all the six environmental categories analyzed, U.S. COTTON had a significantly lower impact than either of the two other cottons with which it was compared.**



7. Summary

- The Peer Group review confirmed that the study was:
  - ISO compliant
  - The calculation approach and the result presentation corresponded to the goals of the research, and
  - The conclusions and recommendations included in the report outlined the most important influence factors in a reasonable and transparent way.
- They stressed that, as this was a “single trial”, no generalized comparison under normal manufacturing conditions should be concluded.



8. Conclusion

U.S. COTTON, a proven win/win/win for our customers

THANK YOU …

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