Reducing Emissions and Climate Impacts in the Exxel Supply Chain

Purpose

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Exxel Outdoors is a leading, global provider of innovative outdoor recreational and commercial products with ten brands including Kelty, Sierra Designs, and Ultimate Direction within their portfolio. Exxel Outdoors is committed to achieving a 30% greenhouse gas (GHG) emissions reduction by 2030 while simultaneously attaining consistent, sustainable growth. In pursuit of that objective, Exxel has engaged our team to assist them in identifying opportunities for Scope 3 emissions reductions across their supply chain.

Methods

Our methodology was broken into multiple stages throughout the course of our project.

Our team began by conducting research into the material science behind sleeping bags, and the rationale behind product design decisions.

With GHG emissions reductions in mind, we thoroughly researched life cycle assessments of the various materials used by Exxel manufacturers for a clearer idea of the specific environmental i environmental impacts.

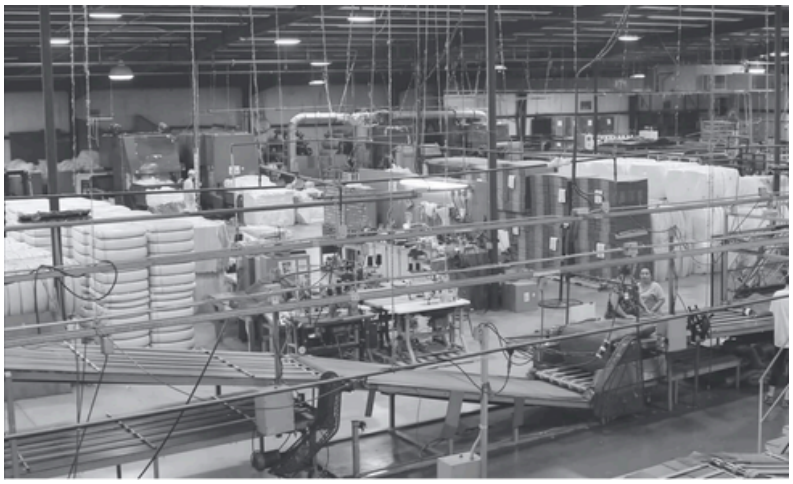

Figure 2.

Our team then created an emissions calculator in Microsoft Excel that utilizes publicly available emissions factors as well as proprietary Exxel information. This Excel model takes into account all emissions factors within the supply & development chain, including: transportation, overhead factory emissions, material impacts, and wastage. All of these factors combined, display an overall GHG emissions per sleeping bag, as well as an annual total impact value for each .

Outcomes

Our Capstone team has focused on impact analyses of two sleeping bags; the Kelty Cosmic Down 20 and the Ozark Trail 50. We are providing a programmable tool (calculator) that Exxel can use to understand the impact of products within their portfolio. This tool takes into account factors like transportation, manufacturing processes, energy use, materials impact, and wastage in deriving both the per unit as well as total impact.

Figure 5.

Kelty Cosmic Down 20

Figure 3.

Ozark Trail 50

Figure 4.

Additionally, we virtually collaborated with Exxel Outdoors' Shanghai Manufacturing Office. From this, we identified all of the material inputs, including where they are sourced, and how they are transported from distribution centers to the consumer. With this data, our team developed a supply chain map, utilizing a software tool called Kumu. This tool allowed us to organize the complex data from our emissions calculator and merge that data into visually appealing flow chart that matched the products' value chains.

Final Steps

We will be providing Exxel Outdoors with a comprehensive roadmap detailing specific recommendations that will have the greatest impact for GHG Emissions reduction. Our team is excited to share these deliverables with Exxel Outdoors in order to advance their sustainability goals.

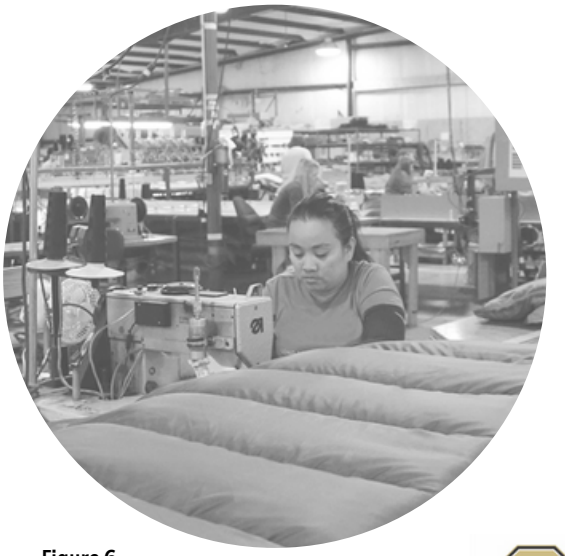

Figure 6.

Acknowledgements

We would like to thank both our Capstone Advisor, Derek Fehrer and Capstone Partner, Russell Rowell for guiding and assisting our team throughout the project.

Masters of the Environment

Citations

Figure 1. Exxel Outdoors Team Photo. Team Photo. 5 April, 2023. Team's Personal Collection.
Figure 2. Rowell, Russell. Exxel Outdoors Factory. 2023. Exxel Outdoors Product Development. https:exxeloutdoors.sharepoint.com
Figure 3. Rowell, Russell. Cosmic Down 20 Degree Sleeping Bag. 2023. Exxel Outdoors Product Development. https://exxeloutdoors.sharepoint.com
Figure 4. Rowell, Russell. Ozark Trail 50 Degree Sleeping Bag. 2023. Exxel Outdoors Product Development. https://exxeloutdoors.sharepoint.com
Figure 5. Rowell, Russell. Exxel Outdoors Factory. 2023. Exxel Outdoors Product Development. https://exeloutdoors.sharepoint.com
Figure 6. Rowell, Russell. Exxel Outdoors Factory and Employee. 2023. Exxel Outdoors Product Development. https://exxeloutdoors.sharepoint.com