

# STARBOARD

An Annual Report on the Carbon Footprint  
for the Fiscal Year 2020



*Presented by Starboard Blue*  
*Verified by Carbon Footprint™*

## Executive Summary

In this report we will disclose Starboard's carbon footprint for fiscal year 2020 (June 2019 – May 2020). The purpose of this report is to highlight and be totally transparent about Starboard's CO<sub>2</sub> emissions and role as an industrial polluter. Measuring our impact is the first step towards identifying where we need to improve and then implementing positive changes.

At Starboard we began calculating our Carbon Footprint for the 2017 Fiscal year and since then we have continuously improved our calculation process to create the most accurate picture of our environmental impact. As in previous years, this report includes Starboard's Carbon Emissions associated with production, travel and energy use at Starboard HQ. All calculations used and presented in the report have been verified as correct by Carbon Footprint™.

Starboard's total carbon footprint for 2020 was 2584.3 Tonnes CO<sub>2</sub>e, a 16% reduction in emissions compared to 2019. That's 418.7 tonnes less carbon dioxide being released into the atmosphere.

This report will break down the causes of these changes in emissions, identify key learnings and elaborate on Starboard's efforts to lead the way to a climate positive future.

<b>1.0 Introduction</b>	<b>4</b>
1.1 Starboard's Mission	4
1.2 Verification & purpose	4
1.3 Scope	5
1.4 Abbreviations	5
<b>2.0 Production</b>	<b>6</b>
2.1 Production Methodology	6
2.1.1 Raw Materials	6
2.1.2 Manufacturing	7
2.1.3 Distribution	7
2.2 Composite SUP Boards	8
2.2 Windsurf Boards	10
2.3 SUP Inflatables & WindSUP's	11
2.4 Accessories	12
2.5 Paddles	13
2.6 Apparel	14
2.7 Production Emission Summary	14
<b>3.0 Travel</b>	<b>15</b>
3.1 Flights	15
3.2 Car Travel	15
3.3 Travel Emission Summary	16
<b>4.0 Starboard HQ Energy Use</b>	<b>17</b>
<b>5.0 Total CO2 Emission &amp; Sequestration 2020</b>	<b>17</b>
5.1 Total Emission Summary	17
5.2 Carbon Sequestration	18
5.3 More Than Carbon Offsetting	18
<b>6.0 Conclusion</b>	<b>20</b>

# 1.0 Introduction

## 1.1 Starboard's Mission

***"Starboard's Mission Is Not Only To Make The Best Boards In The World,  
But Also The Best Boards For The World"***

Starboard is a world-leading water sports company that specializes in designing and manufacturing equipment, accessories and apparel for Windsurfing, Stand Up Paddleboarding (SUP) and Foiling. Starboard Blue is at the heart of our company and hopes to lead and inspire environmental change and to protect the big blue playground that we share.

## 1.2 Verification & purpose

To ensure that this report shows an honest and accurate representation of Starboard's carbon footprint, it has been verified by Carbon Footprint™. This provides a limited level of assurance

(as defined by ISO 14064-3) for the GHG emissions shown in our carbon footprint. The Starboard products examined in this report, were reviewed on several product lines that comply with GHG Protocol Product Life Cycle Accounting and Reporting Standard.

The following aspects of our footprinting process were carefully reviewed by Carbon Footprint™:

- Scope of calculation/boundary
- Input datasets and any assumptions made
- Emissions factors used
- Calculation methodology
- Carbon Emission Calculations
- Results

The purpose of this report is to disclose Starboard's carbon footprint for the fiscal year 2020 (June 2019 – May 2020). This third-party verification has certified Starboard under the Carbon Footprint Standard. The report is made public in an effort to be completely transparent about Starboard's emissions and role as an industry polluter.

## 1.3 Scope

In terms of Scope this report investigates the carbon emissions from Production (Using Life Cycle Analysis), energy consumption at Starboard HQ in Thailand and travel emissions from flights, daily commutes and Starboard company cars.

To analyse the life cycle emissions of each product, a 'Cradle to Gate' Life Cycle Assessment is used. This method includes calculating the carbon emissions from the following:

1. Raw Materials
2. Manufacturing
3. Packaging & Distribution

Furthermore, we will examine the amount of Starboard's total emitted CO<sub>2</sub> versus CO<sub>2</sub> absorbed through our Carbon Offset Program. This will show Starboard's overall progression towards a climate positive future.

## 1.4 Abbreviations

- CO<sub>2</sub> - Carbon Dioxide
- LCA - Life Cycle Analysis
- BEIS - Department for Business, Energy & Industrial Strategy
- GHG - Greenhouse Gas
- SUP - Stand Up Paddleboarding
- kgCO<sub>2</sub>e - Kilograms of Carbon Dioxide Emissions

## 2.0 Production

### 2.1 Production Methodology

To analyse the life cycle of each product, a 'Cradle to Gate' Life Cycle Assessment is used. This method includes calculating the carbon emissions from the following:

1. Raw Materials
2. Manufacturing
3. Packaging & Distribution

*To note; the methodology for this report does not include the product use and the final disposal of the product.*

#### 2.1.1 Raw Materials

Calculating the footprint of a products Raw Materials involves breaking it down into its material components and using the following equation to calculate the embodied emissions of individual component:

$$\text{Embodied Emissions of component (kgCO}_2\text{e)} = \text{Mass (kg)} \times \text{Emissions Factor (kgCO}_2\text{e per kg material)}$$

The embodied emissions from all components are then added together along with an additional percentage to account for wasted materials (10-20% depending on the product category), providing the final raw material footprint.

This same formula is used to calculate the carbon emissions of product packaging.

## 2.1.2 Manufacturing

Carbon Footprint UK have recommended Starboard to, *"Select the most appropriate method by which to allocate emissions to product assembly."*

For this report, the manufacturing emissions are related to energy use within the production facilities. Energy per product is found by calculating the amount of operational time and floor area used during the assembly of each product.

The following formula is used to calculate the emissions during assembly:

$$\text{(Area used for production of 1 product (m}^2\text{) x Minutes to Produce 1 Unit)}$$
$$\div$$
$$\text{(Hours of Factory Operation x 60 x Total Factory Area)}$$

## 2.1.3 Distribution

Finally, to calculate the emissions associated with product distribution (kg CO<sub>2</sub>e) the following is used:

$$\text{Distribution Emissions (kgCO}_2\text{e) = Mass (kg) x Distance (Miles) x}$$
$$\text{Emissions Factor for transport mode (kgCO}_2\text{e per mile)}$$

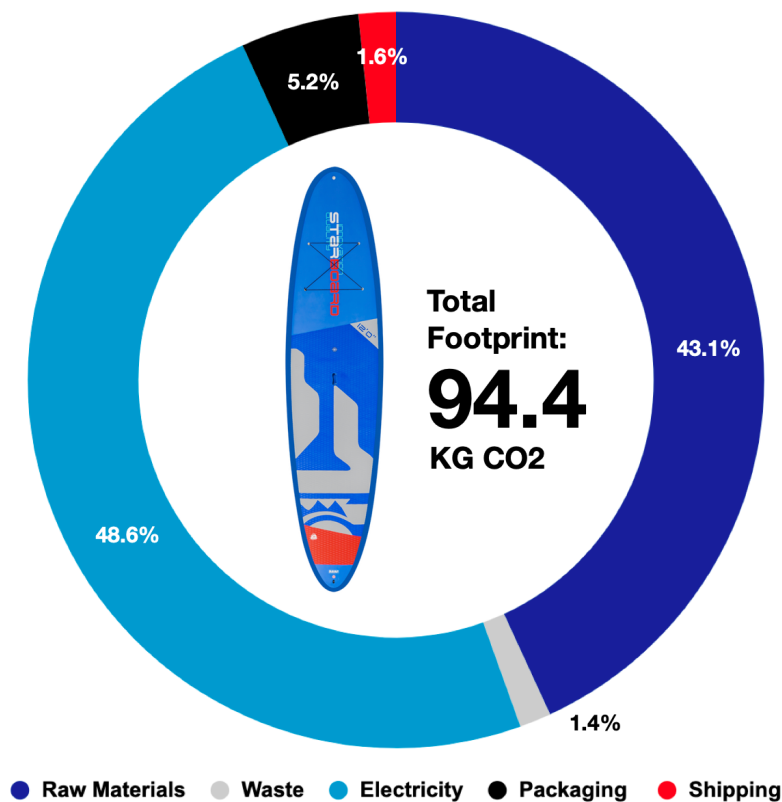
The mass of the material includes the weight of the packaging materials. The distance takes into consideration the journey itinerary of the product.

## 2.2 Composite SUP Boards

A composite SUP board generally refers to a Stand Up Paddleboard made with a foam core that uses materials such as carbon, glass and/or wood fibers. You can view the [SUP hardboard range](#) here.

Overall the production of Composite SUP boards is responsible for between around 95kg and 120kg of CO<sub>2</sub> per board. This varies depending on the board's size and the technology (materials and techniques) it is made using. We have used our most popular board model, the Whopper, in our most eco friendly technology, Blue Carbon, to demonstrate the breakdown of these boards emissions (Figure 1). As the Whopper in Blue Carbon has been a core product for several years it is also perfect for comparing changes year on year.

Figure 1: Graph Showing the CO<sub>2</sub> Emission Breakdown of SUP 10'0"x 34" Whopper Blue Carbon

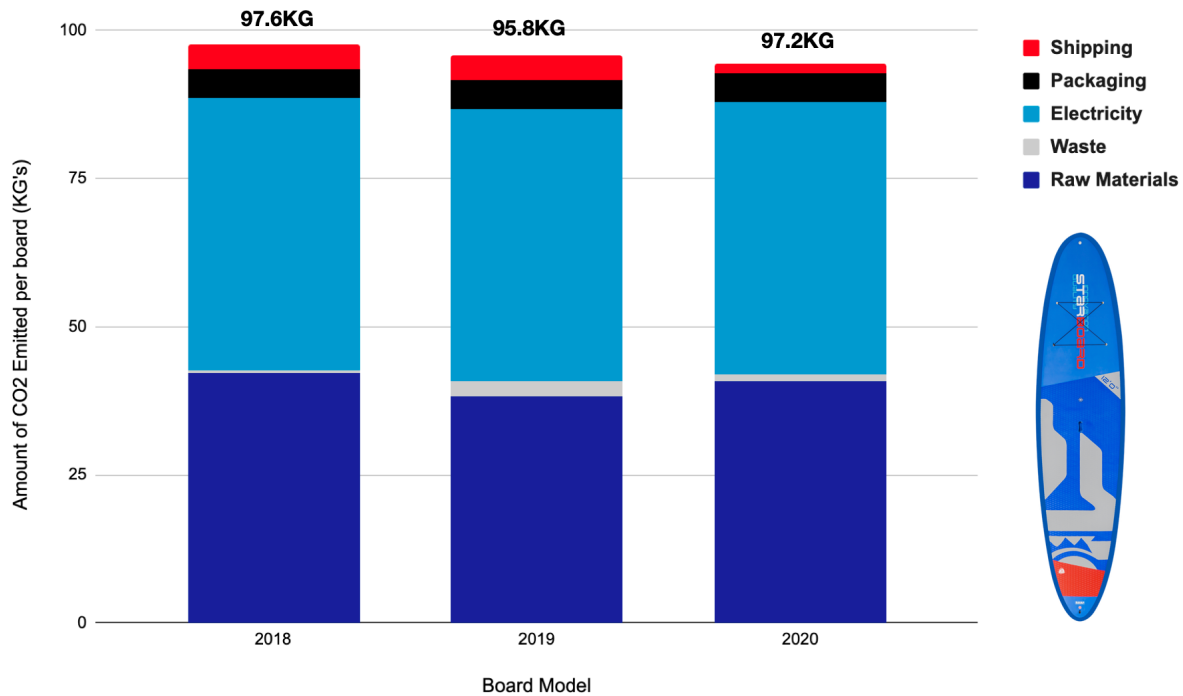


In 2020, the Whopper in Blue carbon technology was responsible for the release of 94.4kg of CO<sub>2</sub>, this is a 1.4% decrease compared to the previous year (Figure 2). The decrease is



primarily due to a decrease in our estimation of emissions associated with shipping. This decrease comes from a new, more accurate emission factor provided by Carbon Footprint UK™. There was also a slight increase in the 2020 models raw material emissions due to the reintroduction of chemical based resin. In 2019 we replaced this with a more environmentally friendly bioresin, but unfortunately due to an increase in reports of damages and breakages we decided to move back to our original resin material. We believe that extending and maintaining the lifespan of our boards is as important as reducing their carbon footprint.

**Figure 2: Graph Comparing the CO2 Emissions of Different Models of the SUP 10'0"x 34" Whopper Blue Carbon**

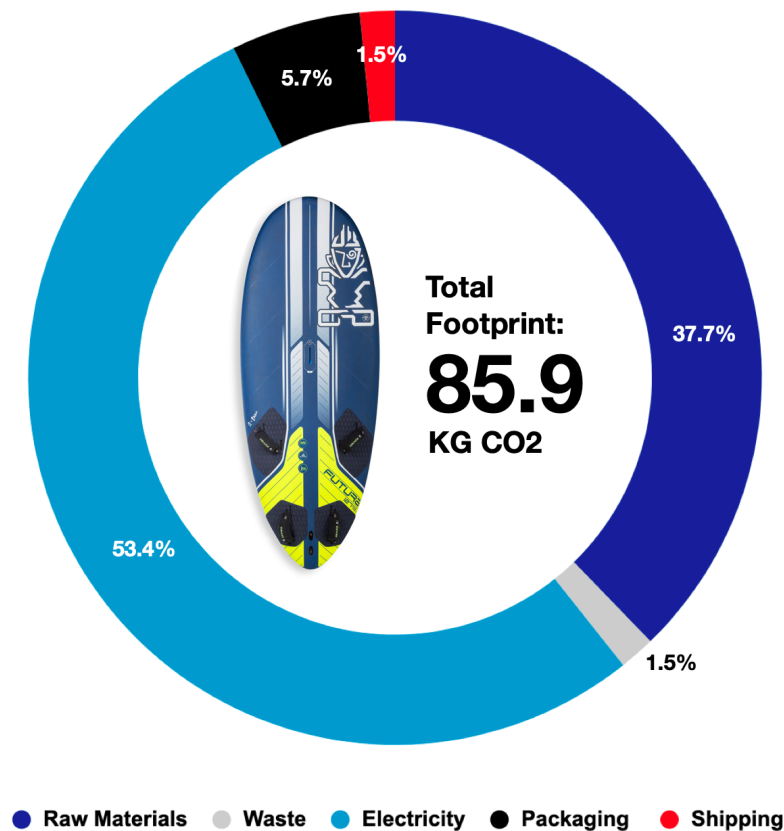


## 2.2 Windsurf Boards

The Windsurf board category encompasses boards across all disciplines from smaller wave boards to larger race and foil boards. Inflatable WindSUP are calculated separately because they are constructed using very different materials and manufacturing processes.

Primarily due to their size, windsurf boards release slightly less emissions on average than composite SUP boards, between 85kg and 100kg per board. To demonstrate the general emission breakdown for a windsurf board we have used the popular Futura 97 in one of our most eco friendly constructions, the Flax Balsa (Figure 3).

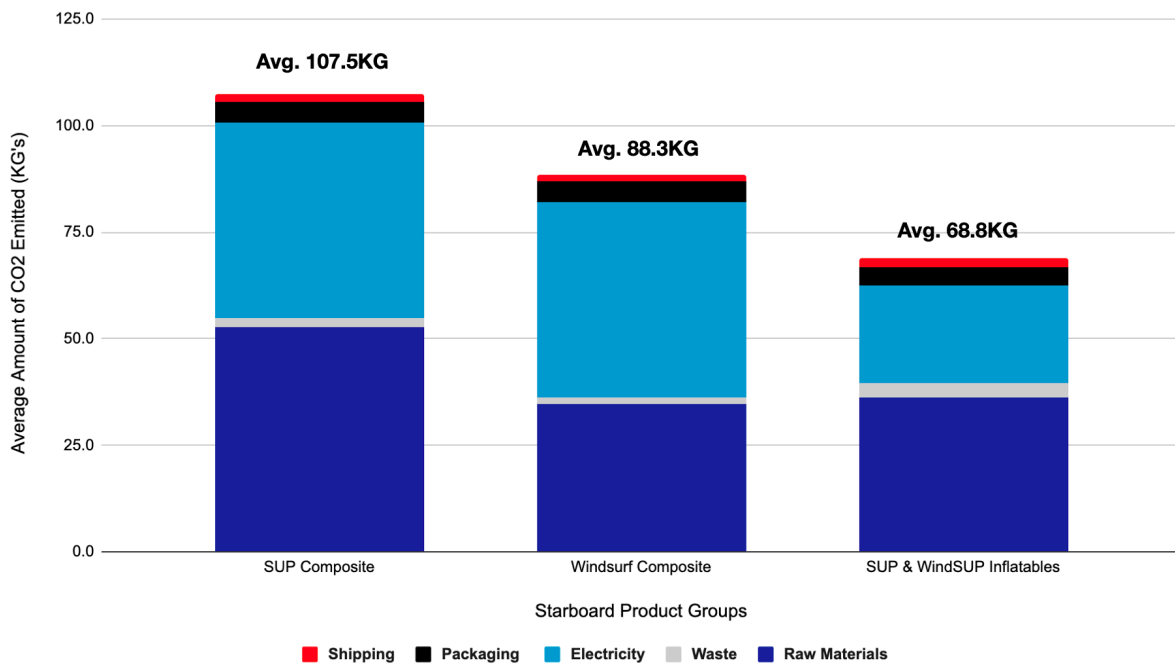
Figure 3: Graph Showing the CO2 Emission Breakdown of Futura 97 Flax Balsa Windsurf Board



## 2.3 SUP Inflatables & WindSUP's

Starboard SUP Inflatables and WindSUP's have a slightly lower carbon footprint on average than our composite boards, emitting around 70kg of CO<sub>2</sub> each. This is primarily because they use less energy and less weight of raw material to manufacture. However it is worth noting that despite being made with less raw materials than composite boards they are primarily made from plastic which, being a product of crude oil, has a high emission factor. This means that the raw material emissions released from composite and inflatables are still very similar, as the graph below shows (Figure 4).

Figure 4: Graph Comparing the Average CO<sub>2</sub> Emissions of SUP Composite Boards, Windsurf Boards & Inflatables



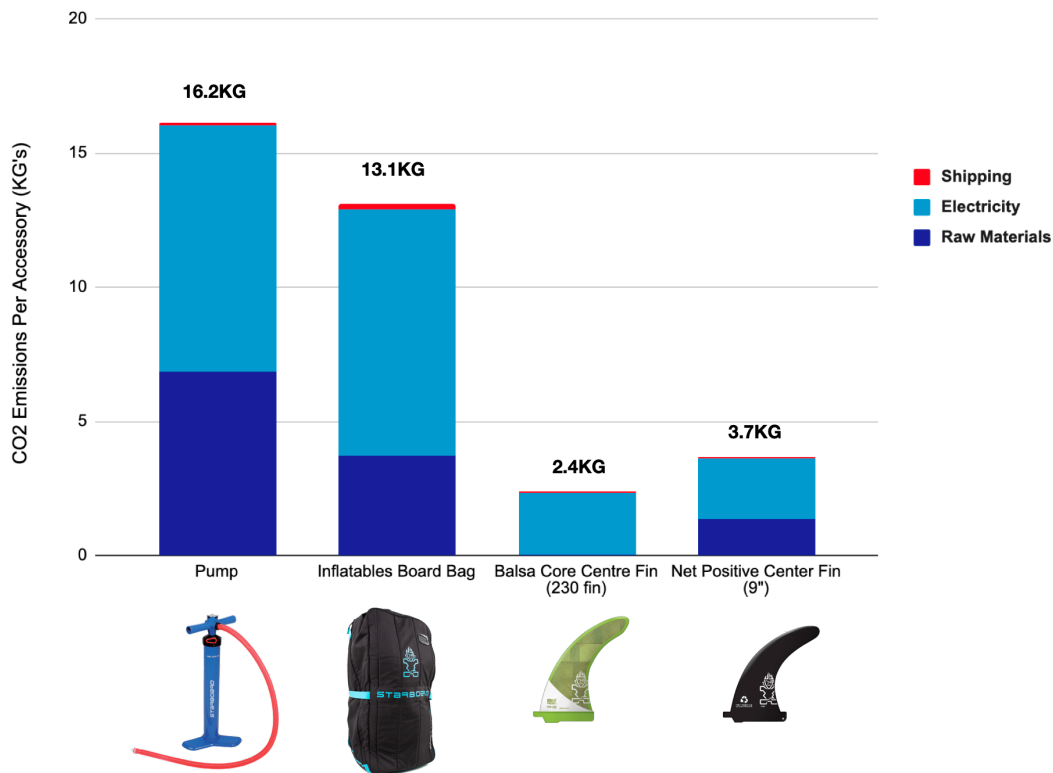
## 2.4 Accessories

Accessories encompasses a wide range of Starboard products including:

- Fins & daggerboards
- Footstraps (for windsurf boards)
- Board & paddle bags
- Pumps (for inflatable boards)
- Bottle holders (for inflatable boards)
- Starboard Catalogues

Individually these accessories each have a small carbon footprint in comparison to a composite of inflatable board. However when large quantities are produced this adds up to a significant amount of emissions. We calculated our 2020 carbon emissions from accessories alone as 222.9 tonnes CO<sub>2</sub>e. The graph below shows the emissions that are released by the raw materials, production and distribution of a variety of Starboard accessories (Figure 5). Understanding that all products have a carbon footprint is a good incentive for us to look after them carefully and make them last.

**Figure 5: Graph Comparing the CO<sub>2</sub> Emissions of a Variety of Starboard Accessories**

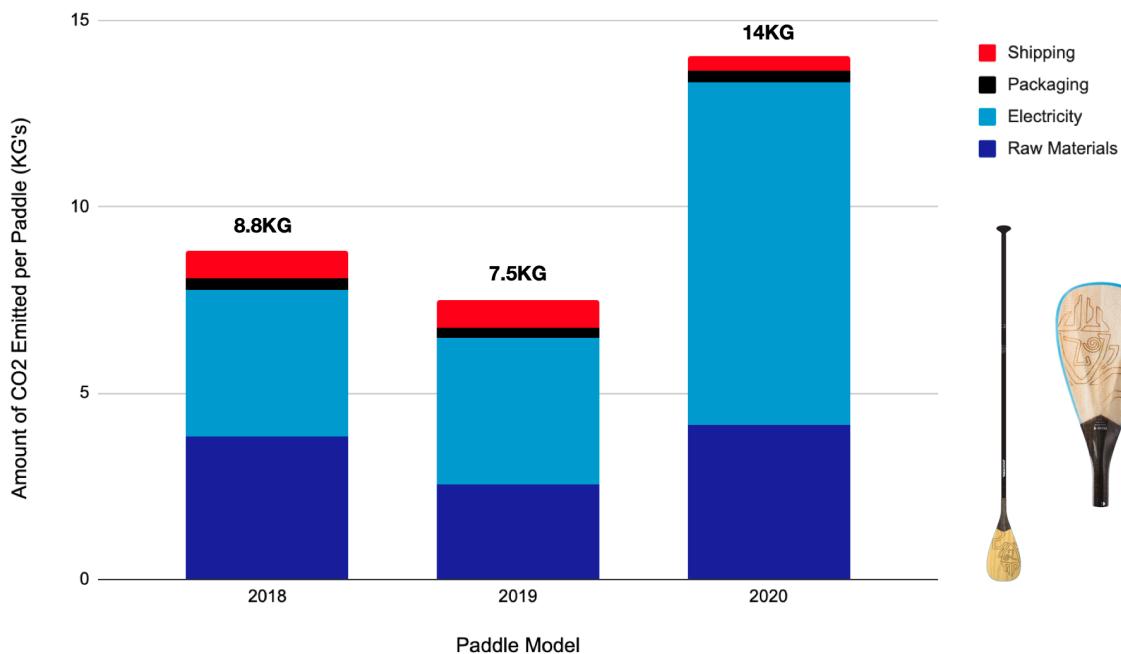


## 2.5 Paddles

We have a huge variety of paddles at Starboard, each made up from different combinations of blades, shafts and handles. Each of these combinations has a different associated carbon footprint because of the different materials and features they have but on average they are each responsible for the release of between 13kg and 15kg of CO<sub>2</sub>.

As you can see from the Enduro 2.0 Balsa Paddle comparison below (Figure 6) this is a significant increase compared to last year's emissions. The reason for this is not because of big changes in the paddles raw materials or manufacturing, but because after further research we believe that more energy is used in the production process than we had previously allocated. Carbon Footprinting is not an exact science and we are working hard to make our calculations more accurate year on year.

**Figure 6: Graph Comparing the CO<sub>2</sub> Emissions of Different Models of the Enduro Balsa Core Paddle**



## 2.6 Apparel

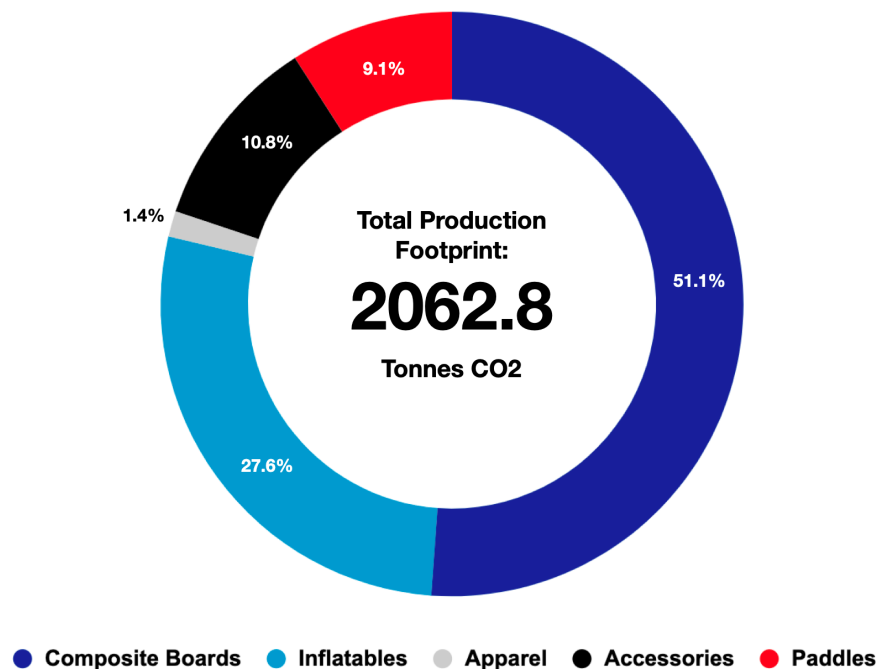
There was no change in the carbon footprint associated with the 2020 Starboard apparel items as there were no changes in the raw materials or manufacturing processes used. However we did reduce the quantity of garment styles produced from 22 down to 20. Removing less popular or more carbon intensive styles from our apparel collection is a great way to avoid producing any surplus clothing.

## 2.7 Production Emission Summary

In order to find the overall carbon footprint associated with production at Starboard we multiply the carbon footprint of each board, accessory or garment by the number of that item sold within the year. We then add the total emissions together to find the number of tonnes of CO<sub>2</sub> released. The 2020 total production emissions came to 2077.8 tonnes CO<sub>2</sub>, a 13.4% decrease on last year's production total of 2356.9 tonnes CO<sub>2</sub>. This is despite the introduction of a whole new product line (Freewings & Wingboards), new IQFoil accessories and the addition of bottle holders with all inflatable boards.

There are a variety of factors that have contributed to this reduction in production emissions including reduced energy usage in some products, changes in design and materials and also slightly reduced sales numbers at the beginning of 2020 due to the COVID 19 pandemic. The graph below shows the total emissions released by the production of different product categories (Figure 7).

Figure 7: Graph Showing the Total 2020 Production Emissions at Starboard



## 3.0 Travel

### 3.1 Flights

As we know, air travel is a CO<sub>2</sub> intensive activity and where possible it should be reduced or avoided altogether. However, the nature of our global business means that flights are a necessary evil for our staff visiting international suppliers and distributors and our team riders travelling to compete in events all over the world.

Between June 2019 and May 2020 we saw a slight increase in emissions from both staff flights (+2.1%) and team rider flights (+0.8%). We believe that the key reason for this increase is that many international staff members and team riders were forced to take unexpected flights home at the beginning of 2020 when the COVID 19 pandemic hit.

### 3.2 Car Travel

At Starboard HQ in Thailand we have 2 company vehicles used to transport staff and equipment between our offices at Taco Lake and Pattaya beach where we perform a lot of our product testing. We estimate that around 45 testing trips are taken each year and based on the distance and the car models we have calculated that the total emissions from this are around 5.6 tonnes of CO<sub>2</sub>.

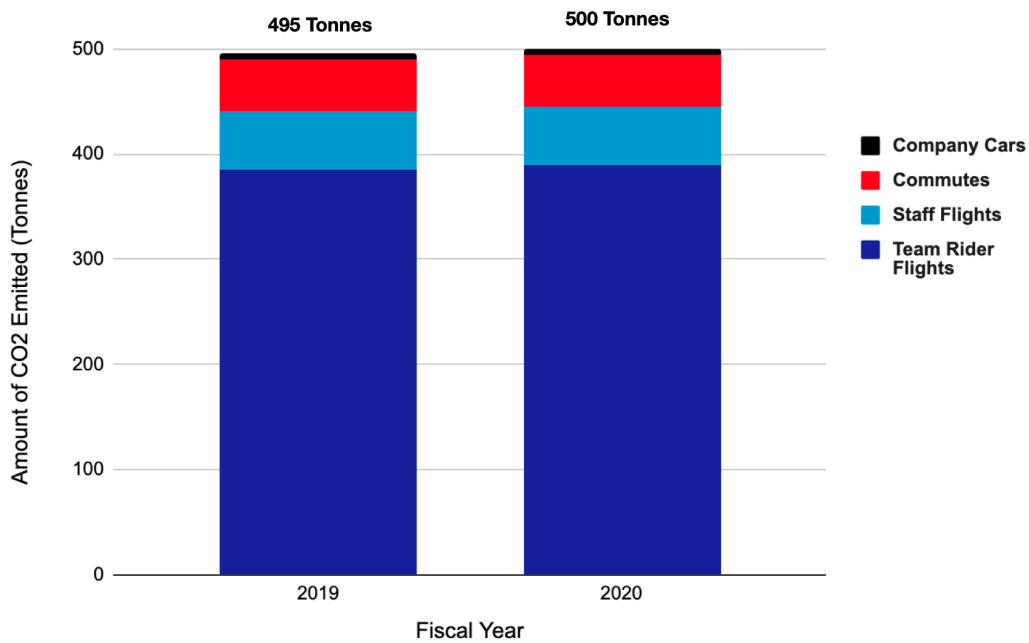
Emissions from our company cars are not the only emissions that we calculate. We also include an estimation of emissions from staff who commute to the office by car based on the number of employees commuting by car, the distance they travel and the number of working days they commute. This year we estimate the emissions to be around 49.1 tonnes of CO<sub>2</sub>.



### 3.3 Travel Emission Summary

The graph below shows Starboard's total travel emission summary compared to 2019 (Figure 8). As you can see travel emissions have remained mostly the same with a slight increase in 2020 due to increased flight emissions.

**Figure 8: Graph Comparing the CO2 Emissions from Travel in 2019 and 2020**



## 4.0 Starboard HQ Energy Use

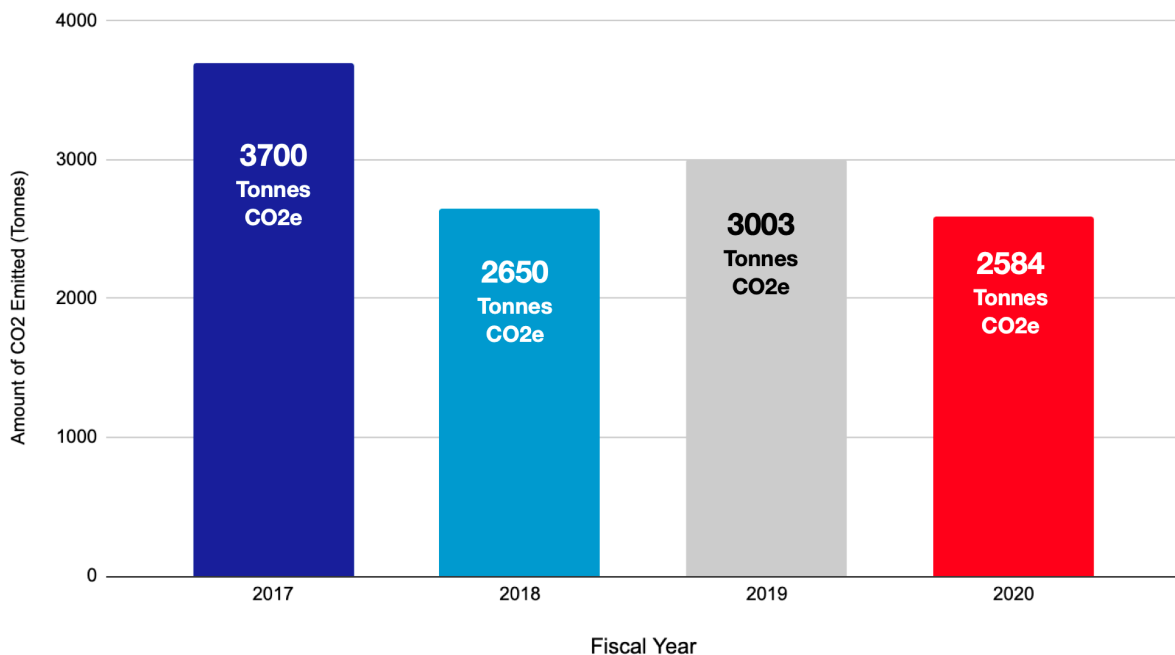
This year has seen a small 5% increase in carbon emissions from energy consumption at Starboard HQ. While variation is likely to occur each year as requirements fluctuate we believe this increase is due to the introduction of more rooms with air conditioning including our shaping rooms and inflatables workshop. The best way we can ensure a reduction in carbon emissions is through the introduction of more solar panels. Currently solar power makes up 50% of all energy used at Starboard HQ. We are hoping that in the coming few years we will be able to increase this to 80% and then 100%.

## 5.0 Total CO2 Emission & Sequestration 2020

### 5.1 Total Emission Summary

We are pleased to say that in the fiscal year 2020 (June 2019 – May 2020), the Starboard's CO2 emissions have reduced by 16% from 3003 tonnes of CO2 to 2584.3 Tonnes of CO2 as demonstrated in the graph below (Figure 9).

**Figure 9: Graph Comparing Starboards Total Annual Emissions From 2017 to 2020**



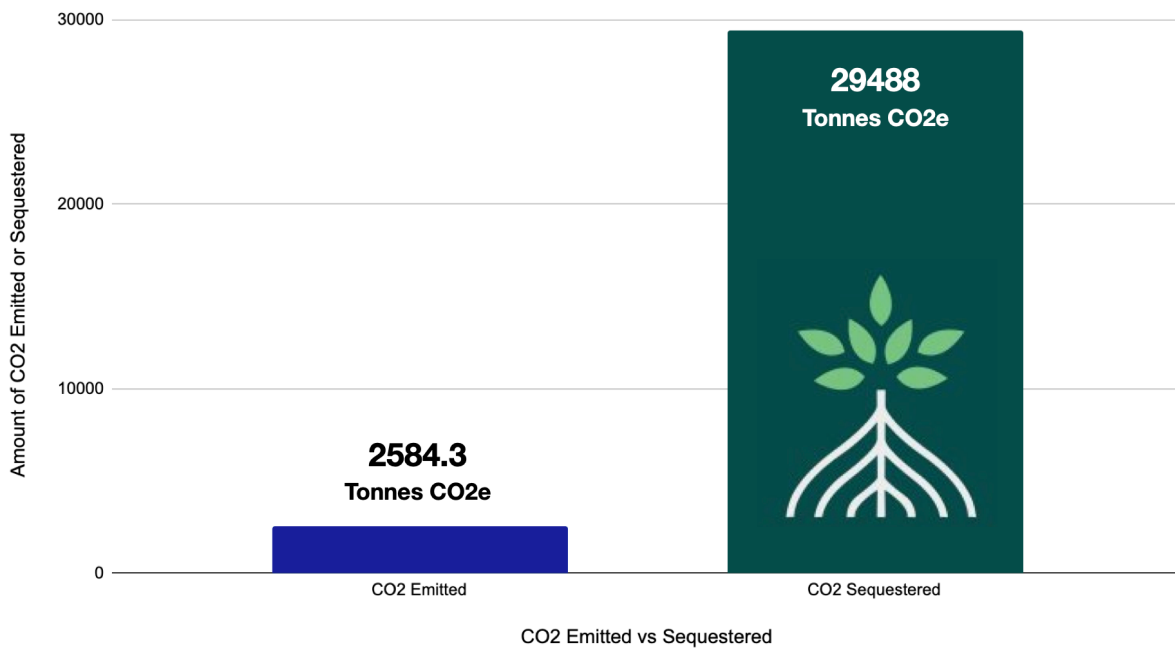
### 5.2 Carbon Sequestration

At Starboard we take responsibility for the emissions we produce by implementing a carbon offset (sequestration) program. In collaboration with Worldview International Foundation, Starboard plants mangroves in Myanmar. The mangrove tree is able to sequester 1 ton of CO2 over the first 20 years of its life.

To have the biggest impact possible, we plant 1 mangrove tree per composite and inflatable board sold and then 1 mangrove tree for every 100kg of CO2 emitted via the

production of accessories and apparel, travel and energy use at Starboard HQ. This adds up to a total of 29423 mangrove trees, absorbing our emissions more than 10 times over. The graph below shows the amount of CO<sub>2</sub> emitted in the 2020 fiscal year vs the amount of CO<sub>2</sub> that will be absorbed by the mangroves we have planted in their first 20 years (figure 10).

**Figure 10: Graph Comparing the Amount of CO<sub>2</sub> Emitted by Starboard in 2020 vs the Amount Sequestered**



## 5.3 More Than Carbon Offsetting

Mangroves are more than just natural carbon dioxide super filters, and planting them generates a huge variety of other benefits to both the local area and the global environment.

However, the planet has seen up to 80% of mangrove forests being cut down for firewood or to make space for salt farms, shrimp farms or housing. The need to repopulate these trees is essential to all living beings on the planet. To absorb carbon from the atmosphere, protect shorelines from erosion, create a nursery for young fish and provide a habitat for biodiversity to thrive. Worldview International Foundation, has been planting mangroves in their millions and are seeing the true signs of hope that nature can thrive again. Right now the mangrove parks are seeing the return of elephants, seagrass, dugongs (sea cows), and a huge array of other endangered animals and birds!



Planting with WIF has showcased that the survival rate of these plants is extremely high, at 96%. By investing in these miracle trees we help to protect life within the mangroves and allow it to continue to grow.

It is not just the environmental impact of mangroves that is important. Planting, maintaining and protecting the mangrove parks provides important livelihoods to the local

community. Each person who plants mangroves with WIF is paid 50% above the national level of salary for a labourer. The majority of the planters are women. Further support is given to support girls from very low-income families to receive a scholarship to help them towards university. There are many other areas of support WIF's program offers, read more [here](#).

Year on year, WIF work with regional Forest Departments to secure more land to plant mangrove trees on, with a minimum of 2.5 million trees to be planted in the first years of planting on new land areas.

Starboard has planted 650,000 mangrove trees so far to absorb our company's emissions. But we know that the positive impact is so much larger and more important than the number of emissions absorbed.

## 6.0 Conclusion

To conclude, in 2020 we have seen a clear reduction in our carbon footprint of 16%. This is not just 418.7 tonnes less than last year, but a huge 1,116 tonnes than the first carbon footprint we calculated in 2017.

Going forwards we will be taking learnings from these calculations and this report to reduce our carbon footprint further. The first clear take away is that around 40-50% of emissions associated with our boards is coming from the energy consumption in manufacturing. To combat this we are in discussions with our primary production partner to help finance and fast track the installation of solar panels in their factory. In this situation the move to renewable energy is the biggest single change we can make to reduce our climate impact.

As we move into 2021 we will also be looking to increase the scope of our carbon footprint. In particular we hope to take into account the emissions associated with the transportation of Raw Materials from their location of extraction / production to our factories and suppliers. While increasing our scope is likely to cause our carbon footprint to look bigger, it is actually just highlighting a source of emissions that has always been there and that we should also be looking to reduce and offset. Measurement is only the first step towards understanding, reducing and offsetting our environmental impact.

Starboard will continue to work to best possible practices to protect the beauty of nature and to reduce the company's impacts of climate change to the planet. The goal will be to continue to plant a tree per each board sold, to remove ten times the amount of CO<sub>2</sub> released into our atmosphere during the cradle to gate life of a board. In the case of the iQFoil, Starboard will plant 10 mangroves per board with the aim to take 10 tonnes of CO<sub>2</sub> from our atmosphere and sink it back down into the ground.

***Starboard's passion is not only for water sports, but for the whole planet.***