



ENVIRONMENTAL FOOTPRINT ASSESSMENT AND POLICY

Version 1.1 July 2022



1.

INTRODUCTION

The purpose of this document is to identify the environmental footprint impact factors of Starling Cycles both internally, externally (i.e. within suppliers) and for the product lifecycle.

It will aim to quantify and record the impact at regular intervals to help us understand where improvements can be made and form the basis of developing a policy to achieve them.

Additionally, a lifecycle comparison to epoxy carbon fibre frames is given for information.

1. Introduction
2. Environmental footprint impact factors
 - 2.1 Internal
 - 2.2 External
 - 2.3 Downstream impact
3. Future policy
4. Comparison to carbon fibre
5. Summary

A full-page background image of a mountain biker in a yellow shirt and helmet performing a wheelie in a forest. The biker is in the center-left, with the bike's front wheel lifted. The forest has many trees, some with green leaves and others with brown, suggesting autumn. The lighting is natural, filtering through the trees.

2.

ENVIRONMENTAL FOOTPRINT IMPACT FACTORS

INTERNAL

Environmental impact of factors that are directly under the control of Starling Cycles.

ELECTRICITY

Average energy usage 8kWh per day (Sep 2020 - Oct 2021)

From supplier, Opus Energy who supply from 100% renewable sources.

WATER

Water consumption is limited to domestic use (toilets, hand washing, drinking) and very small quantities to clean frames and bikes.

Of note however, is that the storm drain outside the unit runs directly into a nearby open watercourse, therefore this is not used as a means of water disposal. The sewer drains are used for all waste.

All bike washing supplies are bio-degradable (Kingud).

MANUFACTURING PROCESS

The majority of manufacturing processes use electricity, accounted for above.

Welding processes use a range of bottled gases.

The environmental impact of these methods is mostly due to localised pollution affecting the weld operator and the local area. Starling Cycles uses extraction equipment to ensure any fumes are not inhaled by the operator. The fumes are expelled into the local environment.

TRANSPORTATION

Taking frames to and from the powder coaters is Starling Cycles main reason for use of transportation (other than shipping covered elsewhere).

- We have a small 1.3l petrol van to drive the short distance of 3.5miles to get frames painted.
- Round trips are made approximately once per week.
- Otherwise, occasional trips are made to collect gas and other supplies.
- Extremely occasionally we travel around the UK for events and meetings.

WORKSHOP OVERHEADS

This includes all of the materials and consumables used within the workshop.

Paper goods, such as tissues are used in small quantities, then sent to landfill.

Welding consumables, along with bottled gas mentioned previously, are used to join tubes together for frame manufacture.

Other consumables include:

- Abrasives which currently go to landfill after use.
- Holesaws, drill bits and lathe inserts are re-sharpened, where possible, and then recycled.

WASTE

- All non-recyclable waste is sent to landfill, but the amount is small, approximately one bin bag per month.
- As already discussed, all bike washing solvents are bio-degradable and disposed of through the sewer system.
- Any solvents or liquids not suitable for disposal through sewers are put into landfill.
- All metallic waste from manufacturing is separated into ferrous and aluminium, stored, then taken for recycling.
- All cardboard, paper, plastic, glass waste is collected for recycling.

Where possible cardboard, and packaging is re-used, for example:

- Shipping small items to customers use packaging we have received and reuse.
- Plastic bags received from materials and components are reused to ship frames.

EMPLOYEES

There are four Starling Cycles employees

- 3 of 4 cycle to work.
- 1 of 4 commutes round trip of approx 80 miles, four days per week.
- 1 employee is vegan.
- 3 of 4 eat meat once per week.
- We are all very environmentally aware!

75% Cycle to work



25% Drive to work

EXTERNAL

2.2.1 Suppliers

The following companies have been contacted to get information on their environmental impact. They have been listed in order of quantity of supply to Starling Cycles.

- ORA
- Reynolds Technology
- Öhlins
- Funn
- BikeYoke
- Magura
- Michelin
- Cushcore
- Hope Technology
- Rockshox
- Shimano
- EXT Suspension
- Middleburn
- Bear frame supplies



Not available*

Environmental impact report

Sustainability report

Not available

Not available

Not available

Top level statement

Not available

Not available

Top level statement

Top level statement

Not available

Corporate responsibility policy

Not available



Taiwan

UK

Sweden

Italy

MANUFACTURE

TRANSPORT

ENVIRONMENTAL POLICY

* A Starling visit to the ORA facility revealed very good levels of control, cleanliness and efficiency. Although not quantifiable, it did not appear they used any overly damaging practises and all metallic waste is recycled.

2.2.2 Powdercoating

This is completed by Reality Motorworks in Bristol, which is a short distance from the Starling workshop. It is a tough coating which protects steel frames from rust. Powdercoating is also considered to be relatively non-harmful:

- Powdercoating is a clean process, allowing exhaust air from the coating booth to be returned to the plant, and less oven air is exhausted to the outside. Heating and cooling costs are eliminated for make-up air and the cost for maintaining oven temperatures is minimized.
- Powder coatings contain no solvents and therefore emit negligible, if any, polluting VOCs into the atmosphere.
- Powder overspray can be retrieved and reused and no costly waste disposal equipment is required.

An environmental assessment of powdercoating, by Powdercoating Institute, can be seen [here](#).

2.2.3 Shipping and packaging

SENDING STARLING CYCLES PRODUCTS TO CUSTOMERS

Starling ships either frame only, frame plus parts, and very occasionally full bikes.

All items are packaged in double wall cardboard boxes. Cardboard, is sometimes but not always made from recycled materials. Polystyrene, cardboard and foam packing materials are used to protect the parts, although in all cases we try to reuse packing materials we have received in shipments from our suppliers.

For UK shipments, parcels are moved by land. For overseas shipment, parcels are moved by air.

In addition to frames, Starling Cycles ship various small parts such as gear hangers, spares and merchandise. In all cases these use recycled or reused packing materials.

PARTS SUPPLIED TO STARLING CYCLES

We receive shipments from many different sources. Packaging and shipping standard vary hugely.

Where possible, we try to ensure any large shipments, i.e. from Taiwan are via sea routes and where possible we reuse all packaging we can.

Packaging that needs to be disposed of is sent to a recycling contractor in Bristol.

2.3

DOWNSTREAM IMPACT

Once Starling Cycles manufactured products have left the workshop and been delivered to the customer, there is still a duty of care to ensure their environmental impact is reduced.

All frames have a two year warranty during which any defects will be resolved with the customer at no cost. After this two year period, Starling will endeavour to resolve any frame issues with customer at minimum cost to customer. In all cases we try to resolve by fixing or repairing, rather than by replacing the item.

For example, a dent to the downtube can be resolved by adding a plate on top of the dent. The repair work is straightforward, but there is an environmental impact of the shipping of the frame back to Starling workshop and the powdercoat needing to be removed before work can be completed and redone after the repair. In some cases, we have enlisted the work of suitable contractors more local to the customer to repair their frames. This reduces impact of shipping.

Steel is very tough and will last for many years compared to carbon frames that are susceptible to impact damage, or aluminium frames that suffer from fatigue. Rust is a risk to steel but it can be easily managed with suitable treatments.

Once a Starling frame finally reaches the end of its life, steel is readily recycled and a worldwide network of facilities exists to perform this.

FUTURE POLICY

INTERNAL

- Moving from air to sea freight for overseas customers would have a large benefit.
- An electric van (or ecargo bike) would reduce emissions for local transportation, such as to the powdercoaters. However, running the current vehicle, rather than building a new one, may be a better solution in the short term.
- Electricity use, which accounts for the majority of frame manufacture, is 1.87kg CO₂e a day. This is the equivalent of an average domestic household, which is not considered excessive.
- Improvements to localised extraction of fumes from frame building needs to be considered, along with the impact of the production of frame joining materials.
- An assessment of packaging materials used for customers should be completed and changes made, if beneficial.
- Workshop waste paper goods should be bagged and recycled, if possible.

EXTERNAL

- Of the 14 main suppliers to Starling Cycles, only 2 have environmental policies in place: Öhlins and Reynolds. Michelin, SRAM and Shimano have top level statements, but their impact on behaviour is unclear.
- A key action going forward is to try to push suppliers harder for them to take responsibility and to demonstrate their impact and processes for reduction.
- Starling should ensure that appropriate planning is in place so that all overseas supplies can travel by sea rather than air.
- Excess packaging from suppliers is the biggest cause of cardboard waste. It should be noted, Shimano use more packaging, judged to be excessive, than any other supplier.

DOWNSTREAM

- Starling needs to obtain data from its customers so the full life cycle can be understood and, if possible, improvements made.
- Where possible we should enlist the work of suitable contractors more local to the customer to resolve warranty issues. This reduces the impact of shipping.

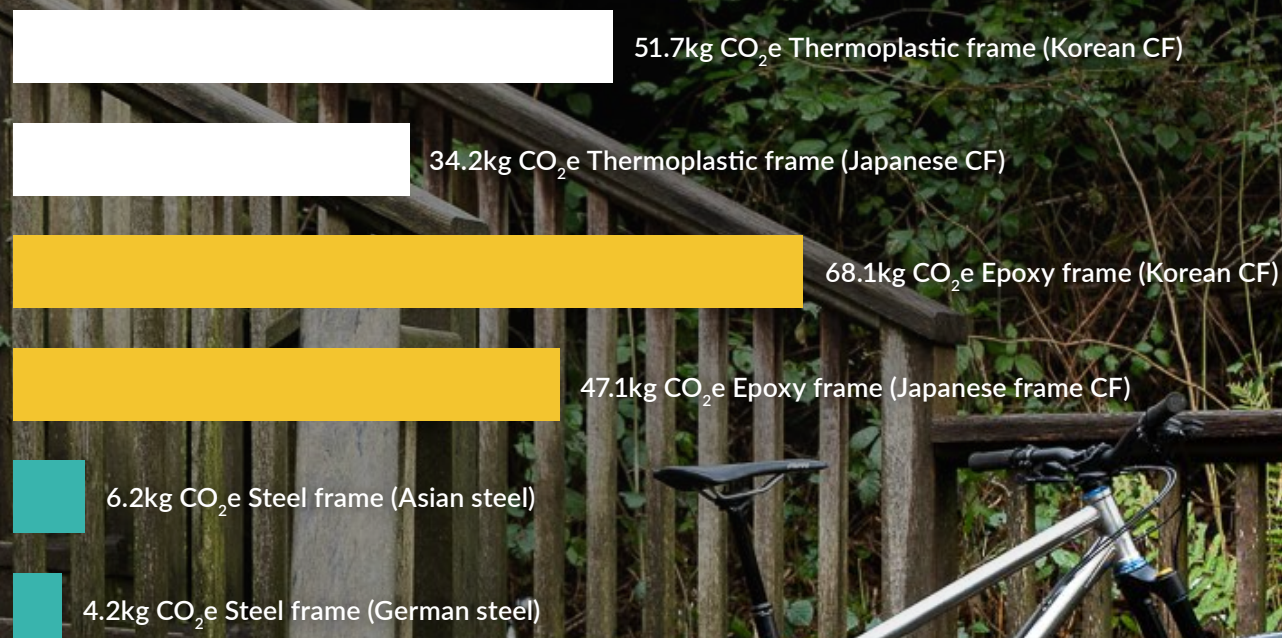
Where possible, more effort needs to be put into measuring environmental impact. This includes quantification of benefits of potential changes, which will help guide priority for improvements and ensure continuous improvement is achieved.

COMPARISON TO CARBON FIBRE FRAMES

A Life Cycle Analysis of bicycle frames was made by the National Composite Centre (NCC) in Bristol, which compares the environmental impact of the manufacture of bike frames made from steel, thermoplastic carbon composite and epoxy carbon composite.

- The energy used for manufacture of Starling (German Steel) steel frame is 16 times less than that used for a typical carbon frame, (Epoxy Prepreg with Korean fibres).
- If we add in the additional benefits of steel in terms of toughness, longevity and repairability, then with all else equal they present a significantly less environmentally damaging solution.

It should be noted, that although the study by the NCC was completed by experienced professionals and has been signed off internally, the data has not been externally peer reviewed and is provided for information only.



SUMMARY

+ Internally, at Starling Cycles, we have a relatively small impact. For example, our electricity use, which accounts for the majority of frame manufacture, is 1.87kg CO₂e a day. This is the equivalent of an average domestic household.

+ Steel frames have a small carbon footprint from manufacture, a long life due to tough material and repairability, and a worldwide system for recycling already in place. Carbon fibre does not address any of these factors and is much more harmful.

68.1kg CO₂e Carbon frame

4.2kg CO₂e Steel frame

- We have identified that, in order to enable future internal improvements, we need to quantify our footprint better.

- Externally we need a much better understanding of the impact that our suppliers are having; this will enable us to select suppliers with minimum impact. Furthermore, we *all* need to work hard at this to improve!

- Air freighting of products to customers is probably our greatest carbon impact. We need to find ways to reduce this.

Air freight 500g per km per tonne

Road transport 60-150g per km per tonne

Sea freight 10-40g per km per tonne

Starling Cycles will revisit this policy on a yearly basis to quantify the impact we are having on the environment and to report any progress and improvements that are being made.