GlaxoSmithKline PLC

Product Carbon Footprint Certification Summary Report

All of us at Carbon Trust Certification are delighted that you have been successful in your product carbon footprinting certification goals. You should have already received your certification letter and and certificate of achievement. This report has been put together to provide you with a quick summary of the work we completed together. This report is intended to help you easily communicate the work you have done both internally and externally.

Summary

GlaxoSmithKline approached Carbon Trust Certification in December 2013. You contracted with us for a Pre-Assessment and Certification of the product carbon footprints associated with your treatment of Chronic Obstructive Pulmonary Disease (COPD) and asthma. The certification of these product carbon footprints was successfully awarded to you on the 26th of March 2014.

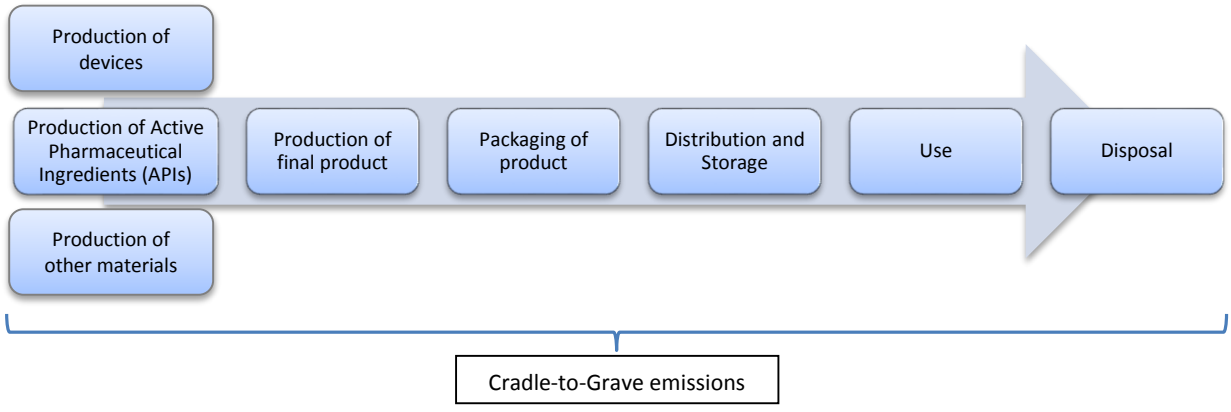
The footprinting work was carried out internally by your Sustainability Manager, Richard Henderson, with the support of Paul Taylor and John Hsu from Carbon Trust Advisory Services.

Scope of Certification

We worked together to certify the cradle-to-grave (business-to-consumer) product carbon footprints of your Chronic Obstructive Pulmonary Disease (COPD) and asthma treatment products. This certification covered 15 indivual product carbon footprints representing three individual Stock Keeping Units (SKUs). These product carbon footprints were certified against the requirements of the following internationally recognised standards:

- PAS 2050: 2011 – Specification for the assessment of the life cycle greenhouse gas emissions of goods and services;
- Greenhouse Gas Protocol – Product Life Cycle Accounting and Reporting Standard (2011);
- The Code of Good Practice for Product Greenhouse Gas Emissions and Reduction Claims (2008); and,
- The certification requirements of the Footprint Expert™ Guide – version 3.3.

As pharmaceutical products, the Listed Carbon Footprint results were also checked against and confirmed to be consistent with the requirements set out in the 2012 Greenhouse Gas Protocol Pharmaceutical and Medical Device Sector Guidance for Product Life Cycle Accounting.



The cradle-to-grave product carbon footprints include all emissions from the full life cycle of your SKUs, from raw material production all the way to consumer use and disposal.

CARBON TRUST CERTIFICATION LIMITED
Dorset House
Stamford Street
London
SE19NT

T: +44 (0)20 7170 7000
F: +44 (0)20 7170 7020
certification@carbontrust.com

Footprint Results

In the tables below you will find the carbon footprint results of your SKUs. For full details of all of your product carbon footprint results, please refer to your certification letter (CERT-10039).

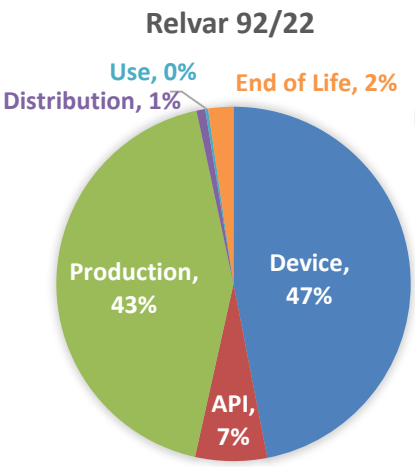
Product Category: Asthma and COPD Treatment

Product	Stock Keeping Unit	Geographic Area	Net CO_2e not rounded	Net CO_2e rounded	Functional Unit
Treatment for Chronic Obstructive Pulmonary Disease (COPD)	Relvar / Breo 92/22 in the Ellipta Device	United Kingdom	764.66	750	**gCO_2** per unit
			764.66	750	**gCO_2** per 30 day treatment
			25.50	26	**gCO_2** per actuation
			25.50	26	**gCO_2** per dose
			25.50	26	**gCO_2** per day
	Seretide 50/500 Accuhaler (Diskus) Device	United Kingdom	1.25	1.3	**$kgCO_2$** per unit
			1.25	1.3	**$kgCO_2$** per 30 day treatment
			20.86	20	**gCO_2** per actuation
			20.86	20	**gCO_2** per dose
			39.68	40	**gCO_2** per day
Treatment for Asthma	Seretide 25/250 Metered Dose Inhaler (MDI)	United Kingdom	20.37	20	**$kgCO_2$** per unit
			20.37	20	**$kgCO_2$** per 30 day treatment
			169.73	170	**gCO_2** per actuation
			339.46	340	**gCO_2** per dose
			678.52	700	**gCO_2** per day

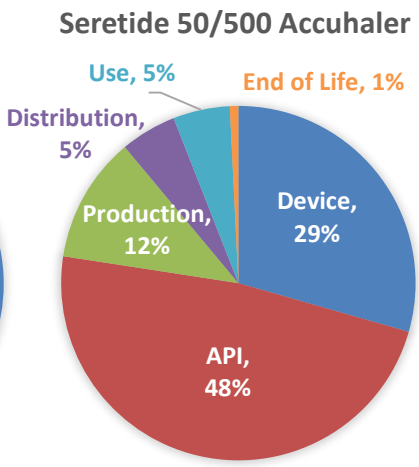
Breakdown of emissions

Total Carbon Footprints

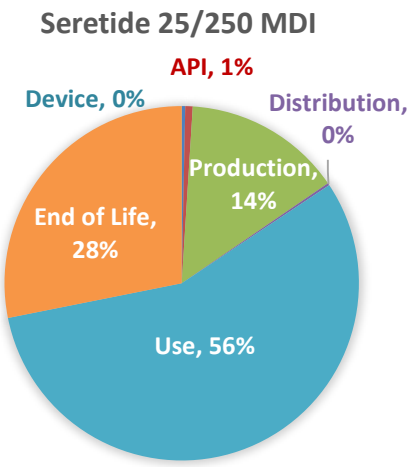
Due to the different ways in which the three treatments are produced and used, the carbon footprints and the breakdown of those footprints vary drastically between the 3 products.



0.75 $kgCO_{2e}$
per 30 day treatment



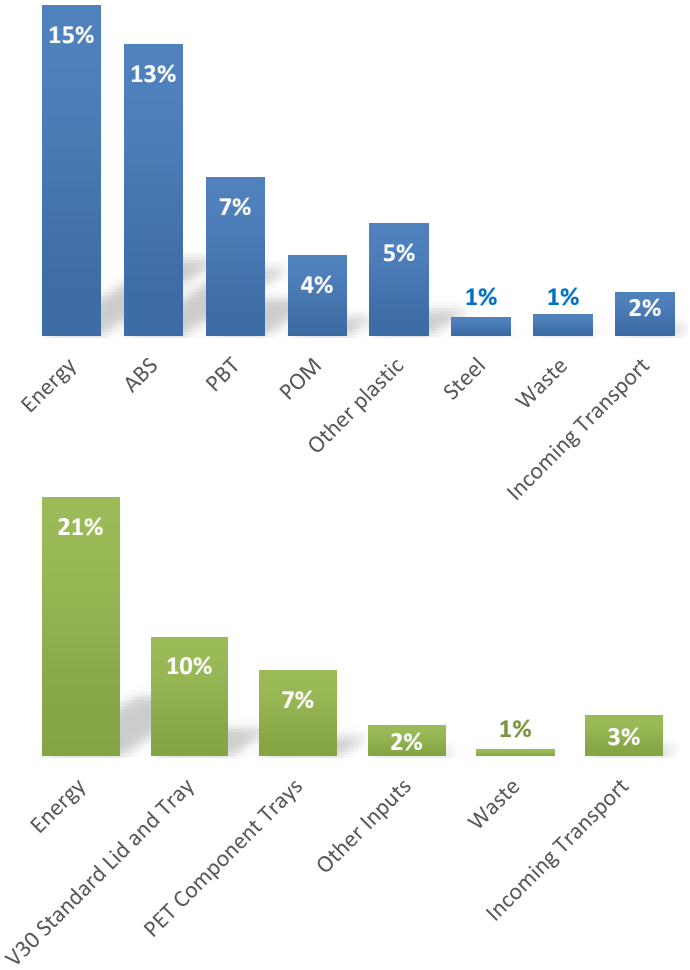
1.25 $kgCO_{2e}$
per 30 day treatment



20 $kgCO_{2e}$
per 30 day treatment

The following sections provide a more detailed analysis of the sources of emissions within the largest contributors to each footprint. The same colour coding has been used in the graphs below as the wedges above and the percentages provided remain contributions to the entire product carbon footprint.

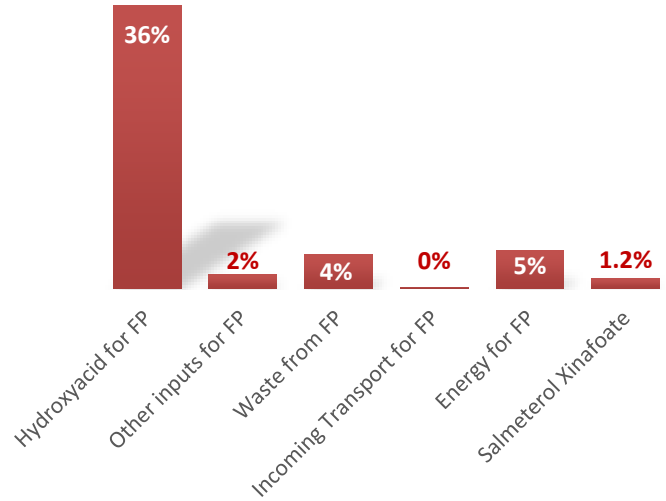
Largest Contributors to the Relvar 92/22 Carbon Footprint



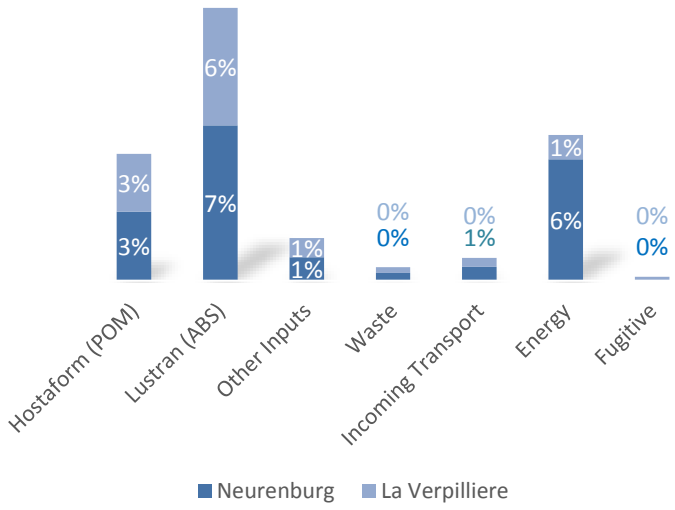
About half of the emissions associated with the full life cycle of the Relvar 92/22 product are a result of the production of the **Rexam Ellipta Device**. If we break down the device production wedge further, it is clear that the emissions are mostly from the plastic inputs (ABS, PBT, POM and others make up 29% of total carbon footprint) and electricity used during this stage (15% of total carbon footprint).

43% of the emissions associated with the full life cycle of the Relvar 92/22 product are a result of the **production** of the final product at the Ware site. If we break down the production wedge further, we can see that the emissions are mostly from the energy use, particularly natural gas (21% of total carbon footprint), followed by the V30 Aluminium Standard Lid and Tray and the PET Component Trays (10% and 7% of total carbon footprint respectively).

Largest Contributors to the Seretide 50/500 Accuhaler Carbon Footprint

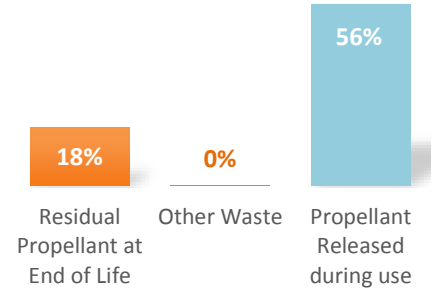


About half of the emissions associated with the full life cycle of the Seretide 50/500 Accuhaler product are a result of the production of the **Active Pharmaceutical Ingredients (APIs)** Fluticasone Propionate (FP) and Salmeterol ZInafoate (SX). If we analyse the source of the emissions from the production of the APIs further, it is clear that the emissions are mostly from the Hydroxyacid which is required for the FP production (36% of total carbon footprint).



A third of the emissions associated with the full life cycle of the Seretide 50/500 Accuhaler product are a result of the production of the **Rexam Diskus Device**. The main contributor to the emissions associated with the diskus device is the Lustran (ABS) (13% of total carbon footprint), the energy (7% of total carbon footprint) and the Hostaform (POM). The diskus device for this product is produced at two Rexam site, one in Neurenburg, Germany and the other in La Verpilliere, France. The emissions from the two sites are roughly the same with the only difference being the amount of emissions from energy. The reason for the difference is that the French site uses a mix of energy sources (Electricity, Natural Gas and Fuel Oil), while the German site only uses electricity. Most importantly however, the French site has lower emissions than the German site because of the emissions associated with the electrical grid in the two countries (France has a cleaner grid than Germany in terms of greenhouse gas emissions).

Largest Contributors to the Seretide 25/250 MDI Carbon Footprint



Over three quarters of the emissions associated with the full life cycle of the Seretide 25/250 MDI product are a result of the release of HFC – 134a gas which is used as a propellant. This release occurs both during **use** of the product (56% of the total carbon footprint) and at **end of life** when the product is disposed of (18% of total carbon footprint).

Data Collection

Richard and his team diligently collected all the required primary data to calculate the footprints:

- The data from the production of the APIs was primary data taken directly from the Jurong Factory for the 2013 year.
- The data for the production of the devices was collected from the manufacturers of these devices. This data was collected for the 2010 or 2011 calendar year. However, since the manufacture of these devices is highly regulated and no changes have been implemented to their production, this data was still considered accurate.
- The data for the production of the final products was primary data taken directly from the Ware and Evreux production sites. Energy at these sites was allocated based on floor space since the majority of the energy required at the production stage was for environmental controls (temperature, filtration, etc.).

- The retail stage (i.e. pharmacy storage) was considered to be immaterial to these footprints since all three products are stored at ambient temperature. Therefore retail emissions were not calculated.

- The distribution and end of life stages were calculated using the Footprint Expert calculators which were populated with good quality secondary data on transport distances (i.e. google maps) and product weights.

- The use phase was calculated using the known propellant release of each actuation (for Seretide Advair) and the instructions for use of the products in their patient panflets.

Preferential application of primary emissions factors were used where available. Where no primary emissions factor was available, conversion factors (emissions factors) were taken from the Footprint Expert database (version 4.0) which were provided to you with your Footprint Expert Toolkit licence. Where no relevant emissions factor was available in the Footprint Expert™ database, emissions factors were taken from the GlaxoSmithKline emissions factor database or a proxy emissions factor was applied.

Communications

You have achieved full certification against all the required standards for use the Carbon Trust's 'Carbon Measured' label. As a valued customer we have provided a free licence for use of the label. You have indicated that use of this label on pack would not be practical due to the regulations on packaging changes which apply in your industry. However, we would like to encourage you to use this label in other ways, such as in your Corporate Social Responsibility (CSR) report and on your website. Please get in touch to discuss how you could use this label and promote the work you have done on product carbon footprinting. We understand that your current communication plans are to promote your successful certification in your upcoming CSR report.

We would be more than happy to work with you on options for joint marketing and PR in association with this certification.

Recommended Future Actions

We would like to highlight the importance of continuing to gather primary data on all aspects of the supply chain which you own or operate as this will ensure you have the correct data to monitor your product carbon footprint over time.

Since the manufacture of the device is such a large contributor to the Seretide 50/500 Accuhaler and Relvar 92/22 footprints, we would recommend that you investigate gathering newer primary data for this aspect of the supply chain. Within the device manufacture, we would recommend you concentrate particularly on collecting newer data for the energy usage, as this may change over time without changes to the material inputs (i.e. through efficiency gains or newer equipment).

For the Seretide Accuhaler footprint, we would highly recommend gathering better quality, preferably primary, data to calculate the emissions associated with the production of Hydroxyacid used in the FP production since this is such an important emissions source.

For the Relvar 92/22 product we would also highly recommend you contract with us for a surveillance check of your footprint. This is recommended due to the short period of time over which the product has been in production, therefore in 6 months or a year the emissions associated with the production

may have changed due to intentional or unintentional changes (e.g. economies of scale). Your account manager, John Newton, should be in touch with you shortly to discuss this.

Should you wish to expand your footprinting work into more product lines we would also be more than happy to discuss all your options.

Contact Details

Account Manager
E-mail: John.Newton@carbontrust.com
Telephone: +44 (0) 20 7832 4519

Technical Project Lead
E-mail: Erika.Warnatzsch@carbontrust.com
Telephone: +44 (0) 20 7832 4516