

Product Carbon Footprint: Life Cycle Assessment Report for Orion Corporation, Orion Pharma



Results benchmarking of 6 Easyhaler® products and
protective cover

September 2025

1. Overview of changes since previous assessment

1.1. Changes in the life cycle of the product

- A switch to a nuclear power tariff at the assembly facility in Espoo, Finland.
- Removal of transport of final products to distribution centre in Hungary.
- Global distribution centres were updated to those in current countries.
- Addition of transport routes to other global distribution centres.
- Changes in the percentage of final product sent to each country.
- Modelled that, at end of life, 83% of inhalers would be incinerated and the remaining 17% would be sent to landfill (previously 70% incinerated and 30% sent to landfill)¹.

1.2. Changes in the emission factors used

- Ecoinvent v3.11 database (previously Ecoinvent v3.9.1).
- Department of Environment Food and Rural Affairs (Defra) 2024 (previously Defra 2022).
- Association of Issuing Bodies (AIB) 2024 used (previously AIB 2021).

2. Benchmarking of results

The table below shows historical emissions per lifecycle stage per Easyhaler® product.

¹ Eurostat (2022 data):

https://ec.europa.eu/eurostat/databrowser/view/env_wastrt_custom_15885536/default/table

Table 1: Benchmarking of Cradle-to-Grave CO₂e emissions per Easyhaler® product

Process	Easyhaler® with salbutamol			Easyhaler® with salmeterol-fluticasone propionate			Easyhaler® with formoterol			Easyhaler® with budesonide-formoterol			Easyhaler® with budesonide			Easyhaler® with beclomethasone		
	2023	2025	%	2023	2025	%	2023	2025	%	2023	2025	%	2023	2025	%	2023	2025	%
Raw materials – embodied	129.24	143.83	+11.3	130.76	145.40	+11.2	128.69	143.19	+11.3	128.98	143.54	+11.3	129.05	143.62	+11.3	129.09	143.70	+11.3
Raw materials transport	11.61	10.90	-6.1	11.6	10.71	-7.7	11.57	10.68	-7.7	11.52	10.62	-7.8	11.49	10.63	-7.5	11.6	10.74	-7.4
Manufacture	379.55	314.87	-17.0	331.1	268.38	-18.9	304.74	243.1	-20.2	245.43	186.2	-24.1	246.87	187.58	-24.0	370.64	306.32	-17.4
Product distribution	8.88	8.0	-10.2	8.81	7.94	-10.2	8.78	7.91	-10.3	8.7	7.84	-10.2	8.7	7.84	-10.2	8.87	7.99	-10.3
Disposal	51.04	55.31	+8.4	51.04	55.31	+8.4	51.04	55.31	+8.4	51.04	55.31	+8.4	51.04	55.31	+8.4	51.04	55.31	+8.4
Total gCO₂e	580.30	532.91	-8.2	533.30	487.74	-8.5	504.81	460.19	-8.8	445.66	403.51	-9.5	447.15	404.98	-9.4	571.23	524.06	-8.3

The Cradle-to-Grave product life cycle emissions for 1 Easyhaler® (averaged across all 6 products) is **468.90 gCO₂e**. This is an 8.7%² reduction in the emissions calculated in the previous assessment, and a 20.3% reduction in the emissions calculated in the 2019 assessment.

On average, the embodied emissions associated with raw materials have increased by 11.3% compared to the 2023 assessment. The specific types of raw materials used in the manufacture of each Easyhaler® and their respective weights have remained the same, so the increase in emissions is as a result of updates in the emission factors used from the Ecoinvent database. As newer or higher quality data becomes available, values within the dataset are updated to reflect this.

The emissions generated from the transport of raw materials to the manufacturing facilities have decreased on average by 7.4%. The source locations of each raw material in Europe and the routes to their respective manufacturing facility have remained the same, so the decrease in emissions is as a result of updates in the Defra emission factors used. Improvements in vehicle technology and efficiency, shifts in the energy mix used to power freight transport, and ongoing methodological updates in the calculation of these factors, cause the emission factors to decrease year-on-year.

² Following an update to the emissions arising from the manufacture of budesonide's API and carrier, to produce an updated average product life cycle emissions of 513.74 gCO₂e.

Manufacturing emissions have also decreased by 20.3%. This is primarily due to the nuclear power electricity tariff at the assembly facility in Espoo, Finland, resulting in a zero-emission manufacturing process here. The emissions associated with the manufacture of the Active Pharmaceutical Ingredient (API) and its carrier at the Oulu facility in Finland have also decreased slightly. The previous Ecoinvent factor used in the 2023 assessment has been replaced with a combination of the AIB and Defra emission factors for the generation and transmission and distribution of electricity in Finland to be consistent with other manufacturing calculations in the assessment. Although a reputable source, Ecoinvent's data includes a broader range of data points and historical data which can lead to higher emission factors.

Product distribution emissions have decreased by 10.2%. For the most part, this is due to updates in the Defra emission factors used (for the same reasons as listed above). In some cases, for example the distribution route to Germany, travel via sea is incorporated more in 2025. As the emissions associated with transporting goods via sea instead of road are more than 100% less, this change in the life cycle of the Easyhaler® also significantly contributes to the overall reduction of emissions.

The emissions associated with the disposal of the inhalers at their end of life have increased by 8.4%. In the 2023 assessment, it was modelled that 70% of inhaler products would be incinerated and the remaining 30% would be sent to landfill, whilst in this assessment, it was modelled that 83% of product would be incinerated and the other 17% sent to landfill³. Due to a higher modelled proportion of product incinerated, and an increase in the Ecoinvent emission factors used for this disposal method (resulting from the availability of newer or higher quality data), emissions related to the incineration of the inhalers at end of use have increased.

³ Eurostat (2022 data):

https://ec.europa.eu/eurostat/databrowser/view/env_wastrt_custom_15885536/default/table

The table below shows historical emissions per lifecycle stage per Easyhaler® protective cover.

Table 2: Benchmarking of Cradle-to-Grave CO₂e emissions per Easyhaler® protective cover

Process	Emissions per life cycle stage 2023 (gCO ₂ e)	Emissions per life cycle stage 2025 (gCO ₂ e)	% change
Raw materials – embodied	45.39	68.29	+50.5%
Raw materials transport	4.64	4.23	-8.8%
Manufacture	10.90	10.53	-3.4%
Product distribution	4.55	3.01	-33.8%
Disposal	0.45	0.14	-68.9%
Total gCO₂e	65.94	86.20	30.7%

The product life cycle emissions arising from the protective cover are 30.7% higher than the emissions calculated for the previous assessment. This is for the most part due to a 50.5% increase in the embodied emissions of the raw materials, following increases in the emission factors used from the Ecoinvent database. This is particularly the case for the polypropylene emission factor. As newer or higher quality data becomes available, values within the plastic production dataset are updated to reflect this.

3. Carbon Footprint Standard

Orion Corporation, Orion Pharma in conjunction with Carbon Footprint Ltd, has assessed and reduced the **Cradle-to-Grave** carbon emissions associated with its Easyhaler® (Easyhaler® with salbutamol, Easyhaler® with salmeterol-fluticasone propionate, Easyhaler® with formoterol, Easyhaler® with budesonide-formoterol, Easyhaler® with budesonide and Easyhaler® with beclomethasone), and assessed the carbon emissions associated with its Easyhaler® protective cover.

By achieving this, Orion Corporation, Orion Pharma has qualified to use the Carbon Footprint Standard branding. This can be used on all marketing materials, including web site and customer tender documents, to demonstrate your carbon management achievements.



The Carbon Footprint Standard is in recognition of your organisations commitment to managing your products' carbon emissions. The text to the right-hand side of the logo demonstrates what level you have achieved in line with international best practice.

In addition to assessing the carbon emissions associated with its Easyhaler® products, Orion Pharma also offset these emissions via high quality carbon offset projects. As a result, Orion Pharma has qualified to use the below Carbon Footprint Standard Branding too.



The Carbon Footprint Standard is in recognition of your organisations commitment to managing your products' carbon emissions. The text to the right-hand side of the logo demonstrates what level you have achieved in line with international best practice

4. Other environmental factors

Environmental burden shifting refers to the process by which efforts to reduce environmental harm in one area unintentionally cause harm in another. With reference to the production of the different Easyhaler products, the switch to nuclear-generated electricity at the manufacturing facility in Espoo, Finland, creates a zero-emission manufacturing process here, but also has unintentional negative impacts on other environmental factors. Exposure to radioactive materials during mining, accidents, or waste handling can cause serious human health risks, whilst the large volume of water required for plant cooling can strain local water resources. Additionally, reductions in the emission factors associated with freight transport reflect the rapidly increasing proportion of electric and HVO (Hydrotreated Vegetable Oil) lorries in the logistics sector. Despite reductions in atmospheric carbon, the production of lithium-ion batteries used in electric lorries requires energy-intensive mining and manufacturing processes powered by fossil fuels. Meanwhile, the agricultural land use impact of crop-based HVO production includes deforestation, biodiversity loss, and soil degradation. If the HVO is waste based, for example produced from used cooking oil, the impact on this environmental factor is minimal. Despite these negative impacts, these technologies reduce GHG emissions significantly. With better planning, regulation, and innovation, many of the negative impacts can be reduced.

It should be noted that due to updates in the environmental impact methodology used in this current assessment compared to the previous assessment, we do not recommend that the 2025 calculated results are benchmarked against the 2023 calculated results as it would not allow for a meaningful comparison. Changes in the results associated with each environmental impact at each life cycle stage do not necessarily cause similar changes in the extent of relevant environmental burden shifting. The changes are at a result of updates to the source of conversion factors in the methodology and are not associated with changes in the life cycle of the different Easyhaler products.