Annual treatment with Single Dose Device (SDD SHL)

incl. drug

Carbon Footprint Report

September 2025 (version 1.0)

Contents

1. Background

Novo Nordisk's environmental strategy, Circular for Zero, and the certified ISO14001 Environmental Management System, drive continuous improvements in our environmental performance by setting high ambitions and integrating environmental considerations into daily business activities. Here, life cycle assessment/product carbon footprint is an integrated part of our product development process.

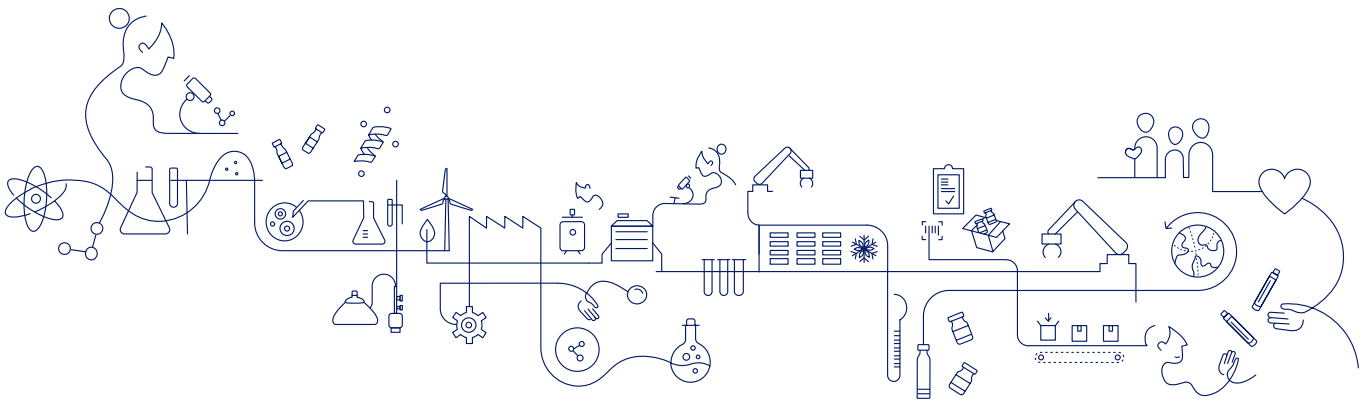
This document presents the Product Carbon Footprint of one year treatment with Single Dose Device (SDD) provided by the CMO SHL in combination with a drug substance (API), referred to as the [drug product's brand name] carbon footprint, e.g. Wegovy® carbon footprint. The SDD SHL has an integrated needle, and no additional needles are therefore included in the assessment.

The carbon footprint for the annual treatment is based on full third-party verified carbon footprint reports for the drug substance and delivery solution (device) included in this report.

The data presented in this document supports marketing claims and Q&As about the product carbon footprint. The data should not be used for comparison with competitor products or for claims related to 'green' or 'environmentally friendly' products.

2. Methodology

The carbon footprint of a product is calculated by adding the greenhouse gas emissions (in kg CO_2 equivalents) from different stages of the product life cycle. The product carbon footprint of one year of treatment is calculated by adding the contributions from the drug substance and the delivery system[1].



The Novo Nordisk carbon footprint calculations follow the Greenhouse Gas Accounting Sector Guidance for Pharmaceutical Products and Medical Devices[2], which is built on international life cycle assessment standards. The reports are third-party reviewed by PricewaterhouseCoopers Advisory.

The carbon footprint calculations are based on production data from 2022-2024 and cover the relevant drug substance and delivery system (incl. needle) as shown in Table 1. For each brand, the carbon footprints are calculated for the use in three major markets: Europe, the US and Japan. The calculations are made using Excel and the life cycle assessment tool *LCA for Experts*[3].

Table 1. Products involved in the calculations for one year of treatment with SDD SHL.

Drug substance	Delivery system[1]
• GLP-1 analogues	• SDD SHL • Excipients* (incl. WFI)

* Excluded due to proven low impact on carbon emissions, except for water for injection.

[1] Including the primary, secondary and tertiary packaging for the delivery system. Primary packaing is considered part of the prefilled device (pre-filled syringe in the SDD SHL).

[2] Greenhouse Gas Accounting Sector Guidance for Pharmaceutical Products and Medical Devices, GHG Protocol Product Life Cycle Accounting and Reporting Standard, November 2012. At: http://ghgprotocol.org/sites/default/files/ghgp/Summary-Document_Pharmaceutical-Product-and-Medical-Device-GHG-Accounting_November-2012_0.pdf.

[3] Formerly GaBi.

2.1 Drug substance

The defined doses are reflecting the maintenance doses of the actual products on the market, see Table 2. The only drug substance currently delivered in SDD SHL is semaglutide for the two brands Ozempic® and Wegovy®.

Table 2 Overview of defined dose of drug substance for the different products.

Brand name	Frequency	Drug substance 1
Ozempic®	Weekly	0.5 mg semaglutide
	Weekly	1.0 mg semaglutide
Wegovy®	Weekly	2.4 mg semaglutidce

2.2 Delivery system

SDD SHL is currently compatible with one Novo Nordisk's drug product (semaglutide), available in different strengths tailored to the specific therapy area, see Table 3.

Table 3 Overview of drug product strength based on substance concentration and primary packaging size.

Brand name	Drug substance content	Cartridge [mL]	Strength
Ozempic® 0.5 mg	0.5 mg	0.5	1 mg/mL
Ozempic® 1.0 mg	1 mg	0.5	2 mg/mL
Wegovy® 2.4 mg	2.4 mg	0.75	3.2 mg/mL

Due to the physical design of the cartridge, a small volume of drug product is lost between the neck and the shoulders of the cartridge. The filling volume is adjusted to account for this loss with an additional 2.4% drug product volume. This has been considered as well for the estimation of the carbon footprint.

The SDD SHL includes a pre-filled syringe (PFS), which includes a fixed needle. Therefore, no additional needles are used for the treatment.

A packaging configuration including 4 pieces (devices) has been considered for all brands, strengths and markets For the Japanese market, a packaging configuration with 2 pieces has been considered as well for all brands and strengths.

3. Carbon footprint

This section presents the carbon footprints for specific treatments (assumptions described in Section 2) with SDD SHL in combinations with relevant drug substances in the three representative markets, Europe, US and Japan. The contribution to the carbon footprints from drug substance and delivery system are shown as well as the total carbon footprint per patient per year.

To put the results into perspective, the resulting carbon footprints has been recalculated into the distance driven by an average car (see Section 3.4).

The carbon footprint has inherent uncertainties and should be regarded as an indicative level and not as a precise measure. The uncertainties relate to the data collected from Novo Nordisk production, the data on carbon footprint for of each of the processes (e.g. plastic granulate production), carbon footprint impact factors and the key assumptions (e.g. distribution patterns). Moreover, the calculations consider that Novo Nordisk sources renewable energy through certificates, which results in a lower carbon footprint than if average electricity was used.

3.1 European market

Table 4. Carbon footprint for the drug substance, delivery system (including primary packaging) and packaging (secondary and tertiary) required for one year's treatment of a patient in the **European** market with SDD SHL. *Note that SDD SHL includes PFS (prefilled cartridge incl. build-in needle). Cartridge and needle are therefore already a part of the delivery solution and should not be included separately.*

Brand name	**Drug substance** [kg CO_2-eq./year]	**SDD SHL incl. PFS** [kg CO_2-eq./year]		**One year treatment** [kg CO2-eq./year]	
		Delivery system	**Packaging**	**Excl. packaging**	**Incl. packaging**
Ozempic® 0.5 mg	0.4	17.7	1.8	18.2	19.9
Ozempic® 1.0 mg	0.8	17.7	1.8	18.6	20.4
Wegovy® 2.4 mg	2.0	17.7	1.8	19.7	21.5

3.2 US market

Table 5. Carbon footprint for the drug substance, delivery system (including primary packaging) and packaging (secondary and tertiary) required for one year's treatment of a patient in the **US** market with SDD SHL. *Note that SDD SHL includes PFS (prefilled cartridge incl. build-in needle). Cartridge and needle are therefore already a part of the delivery solution and should not be included separately.*

Brand name	**Drug substance** [kg CO_2-eq./year]	**SDD SHL incl. PFS** [kg CO_2-eq./year]		**One year treatment** [kg CO_2-eq./year]	
		Delivery system	**Packaging**	**Excl. packaging**	**Incl. packaging**
Ozempic® 0.5 mg	0.4	12.1	1.9	12.5	14.4
Ozempic® 1.0 mg	0.8	12.1	1.9	12.9	14.8

Brand name	Drug substance [kg CO_2-eq./year]	SDD SHL incl. PFS [kg CO_2-eq./year]		One year treatment [kg CO_2-eq./year]	
		Delivery system	Packaging	Excl. packaging	Incl. packaging
Wegovy® 2.4 mg	2.0	12.1	1.9	14.1	16.0

3.3 Japanese market

Table 6. Carbon footprint for the drug substance, delivery system (including primary packaging) and packaging (secondary and tertiary) required for one year's treatment of a patient in the **Japanese** market with SDD SHL. *Note that SDD SHL includes PFS (prefilled cartridge incl. build-in needle). Cartridge and needle are therefore already a part of the delivery solution and should not be included separately.*

Brand name	Drug substance [kg CO_2-eq./year]	SDD SHL incl. PFS [kg CO_2-eq./year]		One year treatment (all) [kg CO_2-eq./year]	
		Delivery system	Packaging	Excl. packaging	Incl. packaging
Ozempic® 0.5 mg	0.4	21.4	1.5	21.8	23.3
Ozempic® 1.0 mg	0.8	21.4	1.5	22.2	23.7
Wegovy® 2.4 mg	2.0	21.4	1.5	23.4	24.9

Table 7 Carbon footprint for the drug substance, delivery system (including primary packaging) and packaging (secondary and tertiary) required for one year's treatment of a patient in the **Japanese** market with SDD SHL **2 pcs pack.** *Note that SDD SHL includes PFS (prefilled cartridge incl. build-in needle). Cartridge and needle are therefore already a part of the delivery solution and should not be included separately.*

Brand name	Drug substance [kg CO_2-eq./year]	SDD SHL incl. PFS [kg CO_2-eq./year]		One year treatment (all) [kg CO_2-eq./year]	
		Delivery system[4]	Packaging	Excl. packaging	Incl. packaging
Ozempic® 0.5 mg	0.4	23.1	2.2	23.5	25.7
Ozempic® 1.0 mg	0.8	23.1	2.2	23.9	26.1
Wegovy® 2.4 mg	2.0	23.1	2.2	25.1	27.3

[4] The impact for the delivery system increases for the 2 pcs pack due to the increased packaging weight per device, which increases the transport impacts (transport assigned to the delivery system).

3.4 Comparison to other measurements

To put this into perspective for a non-expert, the carbon footprint of the yearly treatment (including API, delivery system and packaging) has been recalculated into a distance driven by an average new car at the European market in 2023[5].

One year of treatment with SDD SHL corresponds to driving 139-256 km in an average new car in Europe. For a more detailed comparison, select a specific treatment in Table 8.

Table 8. The distance (km) travelled in an average new car in Europe that would equal the carbon footprint of one year's treatment of a patient with the specified treatment.

Brand name	**EU**	**US**	**JP**	**JP 2 pcs pack**
	Km travelled	*Km travelled*	*Km travelled*	*Km travelled*
Ozempic® 0.5 mg	187	136	219	242
Ozempic® 1.0 mg	191	139	223	245
Wegovy® 2.4 mg	202	150	234	256

[5] European Environment Agency (2023). Average carbon dioxide emissions per km from new passenger cars (106.4 g CO2 eq/km), CO2 emissions performance of new passenger cars in Europe | European Environment Agency's home page

4. Plastic footprint

The plastic footprint is defined by Novo Nordisk as the amount of plastic[6] used by a patient or an organisation during a specific treatment. The footprint includes any plastic placed on the market by Novo Nordisk, regardless of its origin (virgin, recycled, fossil or non-fossil). The plastic footprint is calculated both with and without secondary and tertiary packaging.

This section presents the plastic footprint for specific treatments (assumptions described in Section 2) with SDD SHL in combination with the relevant drug substance in the three representative markets, Europe, US and Japan. The contribution to the plastic footprints from the delivery system (including primary packaging) and packaging (secondary and tertiary) is shown as well as the total plastic footprint per patient per year.

Table 9 Plastic footprint for the delivery system (including primary packaging) and packaging (secondary and tertiary) required for one year's treatment of a patient with *SDD SHL*. The footprint is shown with and without packaging. *Note that SDD SHL includes PFS (prefilled cartridge incl. build-in needle). Cartridge and needle are therefore already a part of the delivery solution and should not be included separately.*

	SDD SHL incl. PFS [g plastic/year]			**One year treatment (all)** [kg plastic/year]		
	Delivery system	**Packaging**		**Excl. packaging**	**Incl. packaging**	
Brand Name	**All**	**All**	**JP 2 pcs packs.**	**All**	**All**	**JP 2 pcs packs.**
Ozempic® 0.5 mg	886	14	17	0.89	0.90	0.90
Ozempic® 1.0 mg	886	14	17	0.89	0.90	0.90
Wegovy® 2.4 mg	886	14	17	0.89	0.90	0.90

[6] Rubber not included

References

GLP-1 analogues carbon footprint, Novo Nordisk, Apr 2024

Single dose device, SDD SHL & SDD YpsoMate (Columbus and Zilti), Carbon Footprint Report, August 2025, vs. 1.1

Assumptions and background for carbon footprint assessments, Novo Nordisk, Apr 2025

Novo Nordisk A/S
Novo Allé
DK-2880 Bagsværd
Denmark
Telephone +45 4444 8888
www.novonordisk.com