Annual treatment with Rybelsus®

incl. drug

Carbon Footprint Report

October 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.

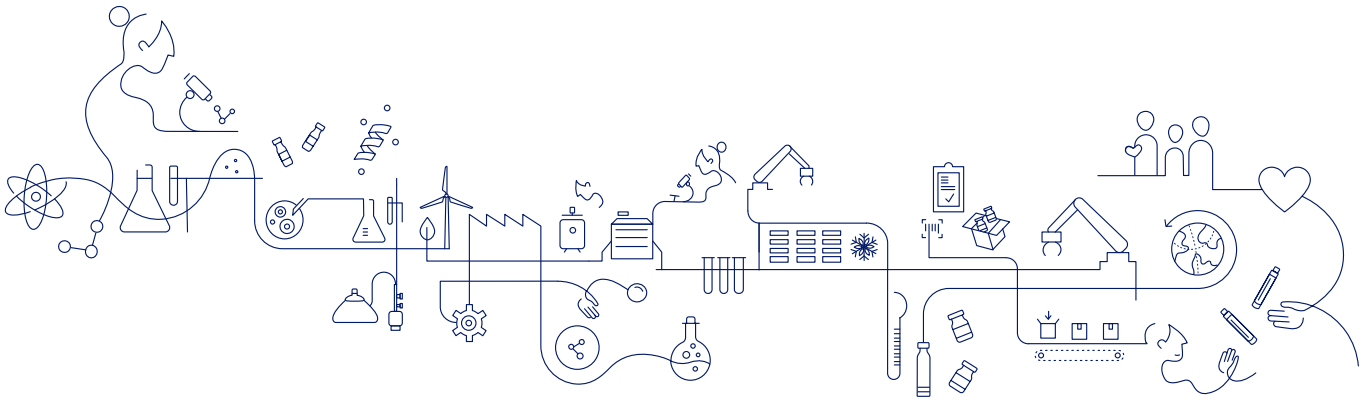
This document presents the Product Carbon Footprint of one year treatment with Rybelsus® tablets for the different doses (drug substance (API) concentrations) available.

The carbon footprint for the yearly treatment is based on full third-party verified carbon footprint reports for the drug substance and delivery solution (oral) 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, the delivery system and the needle[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 relevant drug substance, delivery system and packaging as shown in Table 1. For each product, 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 Rybelsus®.

Drug substance	Delivery system[1]
• GLP-1 analogues	• Tablet in blister or HDPE bottle • Excipients

[1] Including primary, secondary and tertiary packaging for the delivery system. Primary packagng for Rybelsus® is either a blister or a HDPE bottle.

[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 at the market, see Table 2. The only drug substance in the Rybelsus® tablet is oral semaglutide.

Rybelsus® 2G is the next generation of the products and will be launched in 2025. The 2G tablets has significantly lower content of API and excipents, while obtaining the same therapeutic efficacy. Thus, each row in the table below is comparable in therapeutic efficacy despite a significantly lower API content for the 2G.

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

Brand name	Frequency	Drug substance	
		Rybelsus® 1G (current)	Rybelsus® 2G
Rybelsus®	Daily	3 mg oral semaglutide	1.5 mg oral semaglutide
	Daily	7 mg oral semaglutide	4 mg oral semaglutide
	Daily	14 mg oral semaglutide	9 mg oral semaglutide
	Daily	N/A	25 mg oral semaglutide

2.2 Delivery system

Rybelsus® is a drug product composed the drug substance oral semaglutide together with all excipients used in the formulation. The total weight of the finished product is 400 mg, in the form of an oral tablet, packed in either blister or a HDPE bottle (depending on the market).

Figure 1. Rybelsus® 1G in blister card sales pack (left) and HDPE bottle (right) for 3, 7 and 14 mg semaglutide.

3. Carbon footprint

This section presents the carbon footprints for specific treatments (assumptions described in Section 2) with Rybelsus® in the three representative markets, Europe, US and Japan. The contribution to the carbon footprints from the 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 **Error! Reference source not found.**).

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, 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 3. 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 Rybelsus ®. Primary packaging: Blister pack of 30 tablets.

Brand name	**Drug substance** [kg CO_2-eq./year]	**Rybelsus®** [kg CO_2-eq./year]			**One year treatment** [kg CO2-eq./year]	
		Drug product (Excipients only)	**Delivery system (Blister pack of 30 tablets)**	**Packaging**	**Excl. packaging**	**Incl. packaging**
Rybelsus® 3 mg	6.3	9.0	1.0	0.7	16.3	17.0
Rybelsus® 7 mg	14.5	9.0	1.0	0.7	24.5	25.2
Rybelsus® 14 mg	29.1	9.0	1.0	0.7	39.2	39.9
Rybelsus® 1.5 mg (2G)	3.1	2.6	0.6	0.8	6.3	7.1
Rybelsus® 4 mg (2G)	8.2	2.6	0.6	0.8	11.4	12.2
Rybelsus® 9 mg (2G)	18.4	2.6	0.6	0.8	21.6	22.4
Rybelsus® 25 mg (2G)	50.8	7.6	1.1	0.9	59.5	60.4

3.2 US 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 **US** market with Rybelsus ®. Primary packaging: HDPE bottle of 30 tablets.

Brand name	Drug substance [kg CO_2-eq./year]	Rybelsus® [kg CO_2-eq./year]			One year treatment [kg CO2-eq./year]	
		Drug product (Excipients only)	Delivery system (HDPE bottle of 30 tablets)	Packaging	Excl. packaging	Incl. packaging
Rybelsus® 3 mg	6.3	9.2	4.4	1.0	19.8	20.9
Rybelsus® 7 mg	14.5	9.2	4.4	1.0	28.0	29.1
Rybelsus® 14 mg	29.1	9.2	4.4	1.0	42.7	43.7
Rybelsus® 1.5 mg (2G)	3.1	2.6	4.2	1.1	9.9	11.0
Rybelsus® 4 mg (2G)	8.2	2.6	4.2	1.1	15.0	16.1
Rybelsus® 9 mg (2G)	18.4	2.6	4.2	1.1	25.2	26.3
Rybelsus® 25 mg (2G)	50.8	7.8	4.3	1.0	62.9	63.9

3.3 Japanese 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 **Japanese** market with Rybelsus ®. Primary packaging: Blister pack of 100 tablets.

Brand name	Drug substance [kg CO_2-eq./year]	Rybelsus® [kg CO_2-eq./year]			One year treatment [kg CO2-eq./year]	
		Drug product (Excipients only)	Delivery system (Blister pack of 100 tablets)	Packaging	Excl. packaging	Incl. packaging
Rybelsus® 3 mg	6.3	9.1	1.6	0.6	16.9	17.5
Rybelsus® 7 mg	14.5	9.1	1.6	0.6	25.1	25.7
Rybelsus® 14 mg	29.1	9.1	1.6	0.6	39.8	40.4
Rybelsus® 1.5 mg (2G)	3.1	2.6	0.9	0.6	6.7	7.2
Rybelsus® 4 mg (2G)	8.2	2.6	0.9	0.6	11.7	12.3
Rybelsus® 9 mg (2G)	18.4	2.6	0.9	0.6	21.9	22.5
Rybelsus® 25 mg (2G)	50.8	7.7	1.6	0.6	60.0	60.7

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[4].

One year of treatment Rybelsus® corresponds to driving 67-601 km in an average new car in Europe. For a more detailed comparison, select a specific treatment in Table 6.

Table 6. 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**
	Km travelled	*Km travelled*	*Km travelled*
Rybelsus® 3 mg	160	196	165
Rybelsus® 7 mg	237	273	242
Rybelsus® 14 mg	375	411	380
Rybelsus® 2G 1.5 mg	67	103	68
Rybelsus® 2G 4 mg	115	151	116
Rybelsus® 2G 9 mg	210	247	211
Rybelsus® 2G 25 mg	568	601	570

[4] 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[5] 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 Rybelsus® in the three representative markets, Europe, US and Japan. The contribution to the plastic footprint from the delivery system and packaging is shown as well as the total plastic footprint per patient per year.

Table 7. Plastic footprint the delivery system (including primary packaging) and packaging (secondary and tertiary) required for one year's treatment of a patient with *Rybelsus®*.

	Rybelsus® [g plastic/year]						**One year treatment (all)** [kg plastic/year]				
	Delivery system			**Packaging**			**Excl. packaging**			**Incl. packaging**	
Brand Name	**EU**	**JP**	**US**	**EU**	**JP**	**US**	**EU**	**JP**	**US**	**EU/JP**	**US**
Rybelsus® 3 mg	51	51	219	4	4	0	0.05	0.05	0.22	0.05	0.22
Rybelsus® 7 mg	51	51	219	4	4	0	0.05	0.05	0.22	0.05	0.22
Rybelsus® 14 mg	51	51	219	4	4	0	0.05	0.05	0.22	0.05	0.22
Rybelsus® 1.5 mg (2G)	33	37	219	4	0	0	0.03	0.04	0.22	0.04	0.22
Rybelsus® 4 mg (2G)	33	37	219	4	0	0	0.03	0.04	0.22	0.04	0.22
Rybelsus® 9 mg (2G)	33	37	219	4	0	0	0.03	0.04	0.22	0.04	0.22
Rybelsus® 25 mg (2G)	51	51	219	4	4	0	0.05	0.05	0.22	0.05	0.22

[5] Rubber not included

References

Glucagon-like peptide-1 (GLP-1) analogues Carbon Footprint Report, Liraglutide, semaglutide and oral semaglutide, Novo Nordisk, April 2024

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

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