



CO₂ impact

REPORTING

CO₂-calculation disclaimer, October 2025



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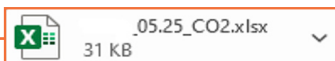
Glossary

	Description
TTW (Tank-to-Wheel)	Describes the emissions from a vehicle's engine during operation, from when the fuel leaves the tank to when it powers the wheels. TTW focuses on the vehicle's direct emissions.
WTW (Well-to-Wheel)	Considers all emissions related to fuel from extraction (the well) to vehicle use (the wheel). This includes drilling, refining, distributing, and burning the fuel, giving a fuller picture of its environmental impact and recommended by GLEC 3.1.
GLEC 3	The 3rd version of a standardized method for calculating logistics emissions, including all modes of transport.
CO₂e	Combines the effects of different greenhouse gases into a single number by comparing their impact to that of carbon dioxide, helping to understand and report the total climate impact in a simple manner.
Organization	Describes which part of the organization, which is responsible for the booking-process, and typically reflects the primary modality utilized.
Modality	Refers to the method of transportation such as by truck, train, ship, or airplane. Each mode has its own cost, speed, and environmental footprint.
Ton-km	This parameter helps assess the efficiency of transporting goods by multiplying the weight of the cargo in tonnes by the distance traveled in km.
ADK	ALPI Denmark manages mainly road freight.
AAS	ALPI Air & Sea manages mainly air and sea freight.
ALPI	In the document ALPI refers to both ADK and AAS together.
Reporting responsibility	To ensure transparent and accurate reporting, ALPI limits CO ₂ -calculations to transport and activities, which ALPI considers itself to have economic ownership within our supply chain. In this way, ALPI ensures that GHG emissions are only calculated for the transport for which ALPI holds responsibility.
GreenRouter	ALPI's partner specialized in CO ₂ e calculation methodology.

How to read the CO₂ Report

The CO₂ report provides both a summary table for overview purposes, together with an excel spreadsheet containing more details on a booking level.

Below is a summary table from 2025, which should be read from left to right. Each field including numbers, represents summed values for specific categories.



CARBON IMPACT REPORTING

[RESULTS COUNT]
671

Reporting date: Flere markeringer | Reporting Organisation: Flere markeringer | Export / Import: Alle | ALPI Organisation: Alle

SUMMARY

Organisation	Modality	Reporting Weight (kg)	Reporting Distance (km)	Sum af TONNExKM	Sum af Kg CO ₂ e TrW	Sum af Kg CO ₂ e WtW
ADK Road	SEA	27.148,00	57.077,29	9.592,62	266,41	312,13
ADK Road	ROAD	175.753,20	625.558,28	239.811,30	10.087,62	13.005,67
ADK Road	RAIL	21.969,00	3.148,70	26.967,53	0,00	188,77
AAS Sea	SEA	74.893,00	380.140,49	641.005,36	6.138,58	8.896,88
AAS Sea	ROAD	74.893,00	25.716,69	21.049,02	887,28	1.134,57
AAS Air	SEA	170,00	811,26	68,96	2,12	2,49
AAS Air	ROAD	14.447,50	57.851,56	10.509,30	441,82	565,48
AAS Air	AIR	14.147,50	597.203,75	114.214,59	74.266,62	93.923,62
Total		265.093,70	1.747.508,02	1.063.218,68	92.090,45	118.029,61

"Organisation" is the department that completed the booking.

"Modality level" shows the actual transportation type used.

For example, AAS Air bookings can have shipment made with airplane, but also truck.

"Reporting Weight" is the shipment's actual weight.

"Reporting Distance" is the distance measured by GreenRouter routing systems.

"TONNExKM" is a technical unit, calculated by multiplying weight in tonnes by kilometer.

Instead of CO₂, we report CO₂e, which combines various greenhouse gases into a single number. We report both TrW and WtW. TrW covers emissions from fuel use in the engine, while WtW includes most of the supply chain for a fuller environmental impact picture.

The attached Excel spreadsheet provides detailed information on each step of every booking included in the CO₂ report. This includes information such as Export(E), Import(I), together with pick up and delivery locations. As bookings are calculated for each leg of the transport, customers are advised not to perform their own weight and distance calculations, as this could lead to errors. Instead use the total value on the dashboard above. Additional details about the calculations can be found throughout the document.

General Introduction

ALPI Denmark A/S (ADK) & ALPI Air & Sea (AAS) reports CO₂ emissions from road, sea, air, Rail & ferry activities. Where data is available the calculation includes the entire route from the sender's address (shipper) to the recipient's address (consignee). This approach is always applicable unless general freight conditions or financial ownership dictate that ALPI is not responsible for parts of or the entire transportation. In these circumstances, the calculation will exclude irrelevant parts.

Each segment of the route is calculated separately. When changing the mode of transport, it is assumed that terminal, hub, or similar activities have been conducted in between, depending on the transport mode. The used data for terminal, hub, or similar activities is industry-standard values and not primary data. The transshipment is included in the total calculation if relevant.

All parameters are summed up to a total of the CO₂ equivalent emitted by a given shipment. The data for these calculations are sourced from Alpi's internal systems and are then calculated by our partner, GreenRouter.IT. This calculation method and partnership were launched in April 2024. Documentation and various parameters included in detail can be found on GreenRouter's website.

The mass of freight is defined as the gross weight, which is used to calculate CO₂e. The use of gross weight for the calculation is in full compliance with GLEC-3.1 and ISO-14083 standards. This means that loading meters (LDM) and the volume of the goods are not directly included in the CO₂e calculation. Additionally, all shipments are considered as less than container load (LCL). This is recognized as a limitation, which may result in freight requiring the same space but having different weights result in varying CO₂e emissions.

We maintain a continuous focus on improving data quality in our ERP systems to ensure that the CO₂e calculations are valid and of high quality, thereby accurately reflecting the actual emissions as closely as possible. This is achieved through the implementation of various automated processes that both safeguard and enable monitoring as well as ongoing improvements. Additionally, periodic random sample testing is performed on the datasets to improve the data quality on issues not captured by the automated processes.

Currently, emissions results for customers are only shown in CO₂-reports and were removed from invoices in the latest iteration. This change was made to improve data quality and ensure that ALPI delivers valid and reliable data. A 5% error margin has been incorporated into the comprehensive reports. However, in our endeavor to deliver high-quality reports, we naturally strive to get as close to zero errors as possible.

Introduction to GreenRouter

As we partnered up with GreenRouter.it, we are committed to reducing our CO₂ emissions. GreenRouter provides an ISO-14083 certified tool for calculating CO₂e emissions and offers specialized consulting services. With external partners like GreenRouter and investments in internal resources and expertise at ALPI, we ensure a strong position in our green transformation. GreenRouter is an associate partner of the Global Logistics Emission Council (GLEC) and is actively involved in the development of industry guidelines for CO₂ calculations and various projects such as Low Emissions Fuels and Vehicles (LEFV) and The Fleet Electrification Coalition (FEC). GreenRouter is also a founding member of GILA, which focuses on global efforts on logistic site data and reducing their environmental impact. Moreover, GreenRouter is additionally a member of Alice, which is a European Technology Platform, that promotes international efficiency and sustainable logistics.

Introduction to GLEC 3.1

The GLEC Framework v3.1, developed by the Global Logistics Emissions Council, provides detailed guidelines for the accurate calculation and reporting of greenhouse gas emissions in the freight transportation sector. This framework is in accordance with and builds upon previous international standards. Additionally, it aligns with ISO 14083, ensuring transparent and consistent documentation of emissions data. This supports companies such as ALPI in making more sustainable logistical choices. By offering these guidelines, the standard actively contributes to achieving reduced emissions, which is essential for meeting global climate commitments and promoting the development of efficient transport solutions with minimal environmental impact.

Reporting & Historical Data

ADK & AAS (ALPI) prepares comprehensive CO₂ reports for customers. The results from the CO₂ calculator are reported in both TTW and WTW and are expressed in CO₂e. For reports with data newer than April 4, 2024, air pollutants from "Black Carbon" (PMX) and energy consumption (MJ) can be provided upon request.

In 2020, ALPI collaborated with Aarhus University's Center for Energy Technologies to develop a CO₂ calculator. We have now partnered with an international partner, GreenRouter, to ensure a certified and compatible tool for both customers' and our own CO₂ data. The new calculator, which is built upon the previous version, is based on GLEC 3.1 and ISO 14083. Consequently, we have recalculated all ALPI's Scope 3 CO₂ data for 2020, 2021, 2022, and 2023 to ensure a future-proof basis for comparison. This improved calculation includes the CO₂e emissions from

the handling of goods during modality changes, such as transshipment at a port, container terminal, or hub. Additionally, emissions related to transshipment regarding modality changes from bookings made after May 2, 2024, can be isolated and provided upon request.

Our CO₂-calculator calculates emissions for each individual transport sequence. This means that gross weight sometimes appears multiple times on the same shipment by one time each sequence. Hence, is it not allowed to summarize or calculate these from the detailed Excel sheet, since this will give an incorrect result.

Also note, that historical bookings before 4th of April 2024 can have shipments divided into multiple shipments in cases where the weight surpassed the capacity of one truck. This was a previous adjustment made to ensure a correct calculation method. In these cases, is it discouraged to summarize or use distance for calculations from the detailed Excel sheet.

Ferries & Ro-Ro's

Ferries are included in all relevant transport networks and are assumed in the calculations to be a typical Ro-Ro ferry. A transport network should be understood as a digital model of the infrastructure, where possible routes and connections are registered.

ALPI uses GreenRouter's internal predefined networks to identify if a given shipment includes ferry activities. This method can in few cases result in route-errors, which is a known limitation. Until more reliable primary data is acquired, this method is used as our best possible current solution.

Courier

Currently, courier orders are not included in the calculations due to the lack of data from our courier partners. In late 2025 different alternative solutions will be investigated, to ensure this limitation gets resolved as fast as possible.

Intermodal-transport

ALPI offers intermodal transport mainly on rail, and sometimes other modalities where the first and last mile is completed on truck. This is calculated with the same approach as regular transport and through the respective modalities and transshipment-activities described in this document.

Calculation of CO₂ Emissions from road freight

The CO₂-data, which appears in the handed CO₂-reports relating to road freight, is based on internal data analysis. It is assumed that trucks on average have 8% empty driving and have a loading factor of 80% of their capacity. The CO₂-calculator uses the gross weight as the main indicator for the goods dispatched. Currently to reflect our actual fleet it is assumed in the calculations that we have 95% EURO VI trucks and 5% EURO V trucks.

Currently, the only available fuel included in the calculation is 7% biodiesel. The truck's total carrying capacity is set at 26 tons, although this is adjusted in some scenarios where countries have different legislation on total carrying weight. ALPI offers HVO as a green alternative supplementary purchase. Reductions by HVO do not appear through CO₂-reports, but are documented through certificates, which specify the proper reduction amount.

Calculation of CO₂ emissions from sea freight

The sea freight calculation, performed through GreenRouter's API with internal data from ALPI, mainly uses modeled data. This involves using an IMO number, which is an identification system of the International Maritime Organization, where emission data about the specific ship or vessel is used from various databases that GreenRouter has available, which can also be seen in their documentation to arrive at a result. If the ship cannot be found or if there is insufficient data, standard values from GLEC 3.1 trade-lanes are used.

The main indicator for sea freight CO₂ calculation is the gross weight of the shipped goods, which is identical to the other modalities. Though there is consideration to distinguish the calculations whether FCL or LCL has been used specifically on sea freight. However, this is not currently implemented, and all shipments are calculated as LCL. To account for deviations from the shortest possible route, a 15% distance length is added. This is recommended by the GLEC 3.1 standard and accounts for stops in ports, weather conditions, and other deviations.

Calculation of CO₂ emissions from air freight

When sufficient data is available, we apply modeled emission factors based on specific aircraft types used for transportation. This is done in collaboration with GreenRouter and by using IATA identification, which makes it possible to determine

the exact aircraft that carried out the transport and hereby calculate emissions with greater accuracy. Identifying the aircraft provides access to detailed data related to its specifications, including fuel consumption across different flight phases: take-off, climb, cruising, descent and landing.

If such data is not available, emission factors based on flight distance and aircraft type (freighter-/passenger aircraft) are applied. A distinction in distance is made between short, medium and long-haul air freight. In all cases, distances are calculated using “Great Circle Distance” (GCD) between airports, with an additional 95 km added as prescribed by GLEC 3.1 to account for deviations.

Calculation of CO₂ Emissions from rail freight

Depending on the rail route, either electricity or diesel is applied as the energy source in the CO₂-calculation. In Europe, trains are primarily electric. In markets such as the United States, where diesel is the main fuel type, both WTW and TTW values are reported.

Unless otherwise specified in the data, ALPI uses the GreenRouter database to calculate CO₂ for rail transport and to determine whether a train is a diesel or electric. The calculations follow the guidelines from GLEC 3.1. Rail transportation outside the EU and the US is automatically classified as either diesel or electric, depending on how it is registered in GreenRouters database. For example, most trains in India are treated as electric, as this reflects the actual situation in practice.

