ALPI GO GREEN
On our way to a more sustainable future

Carbon impact

REPORTING

Calculation Methodology Disclaimer, May 2024

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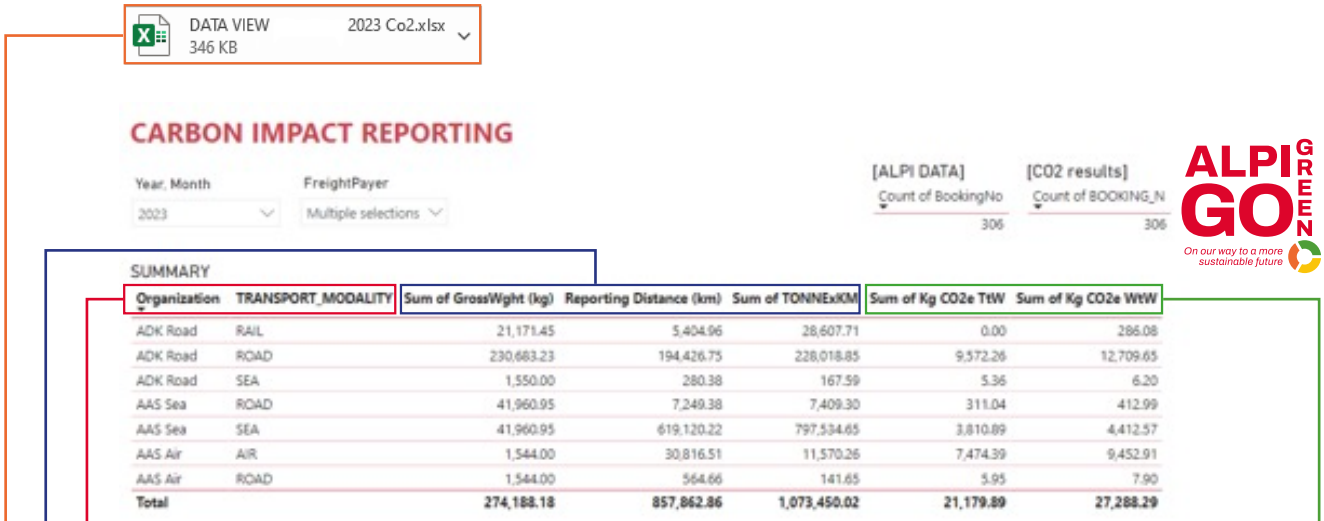
Glossary

	Description
TTW (Tank-to-Wheel)	Measures the emissions from a vehicle's engine during operation, from when the fuel leaves the tank to when it powers the wheels. It 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.
GLEC 3	The 3rd version of a standardized method for calculating logistics emissions, including all modes of transport.
CO_2e	Combines the effects of different greenhouse gases into a single number by comparing their impact to that of carbon dioxide, helping to understand total climate impact.
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 chosen for moving goods, such as by truck, train, ship, or airplane. Each mode has its own cost, speed, and environmental footprint.
Ton-km	This measurement helps assess the efficiency of transporting goods by multiplying the weight of the cargo by the distance traveled.
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.
Incoterm	A set of international rules that define the responsibilities of buyers and sellers for the delivery of goods in international trade. They specify who is responsible for paying for and managing the shipment, insurance, and tariffs. Incoterms are further utilized by ALPI to determine obligations in CO_2e calculations. This ensures that the CO_2e emissions are calculated only for the transport for which ALPI is responsible.
GreenRouter	ALPI's partner specialized in CO2e calculation methodology.

How to read the CO_2 Report

The CO_2 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 2023, which should be read from left to right. Each field including numbers, represents summed values for specific categories.



Organization	TRANSPORT_MODALITY	Sum of GrossWght (kg)	Reporting Distance (km)	Sum of TONNExKM	Sum of Kg CO2e TtW	Sum of Kg CO2e WtW
ADK Road	RAIL	21,171.45	5,404.96	28,607.71	0.00	286.08
ADK Road	ROAD	230,683.23	194,426.75	228,018.85	9,572.26	12,709.65
ADK Road	SEA	1,550.00	280.38	167.59	5.36	6.20
AAS Sea	ROAD	41,960.95	7,249.38	7,409.30	311.04	412.99
AAS Sea	SEA	41,960.95	619,120.22	797,534.65	3,810.89	4,412.57
AAS Air	AIR	1,544.00	30,816.51	11,570.26	7,474.39	9,452.91
AAS Air	ROAD	1,544.00	564.66	141.65	5.95	7.90
Total		**274,188.18**	**857,862.86**	**1,073,450.02**	**21,179.89**	**27,288.29**

"Organization" 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.

"GrossWght" 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 kilometers.

Instead of CO_2, we report CO_2e, which combines various greenhouse gases into a single number. We report both TtW and WtW. TtW 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 CO_2 report. Additional information such as E/I, freight terms and pickup and delivery locations for each transport step where relevant. 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. Please refer to the summarized overview instead.

For further details please read the section "Reporting & Historical data", for more general calculations rules might be found throughout the document.

General Introduction

ALPI Denmark A/S (ADK) & ALPI Air & Sea (AAS) reports CO_2 emissions for road, sea, air, Rail & ferry activities. Where data is available the calculation includes the entire route from the sender's address (shipper's) to the recipient's address (consignee's). This approach is always applicable unless INCOTERMS and/or other general freight conditions state that ALPI is not responsible for parts of or the entire transportation.

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 transshipment is included in the total emission calculation.

All parameters are summed up to a total of the Co_2-equivalent emitted by the 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 in GreenRouter's documentation.

The mass of freight is defined as the gross weight, which is used to calculate CO_2e. The use of gross weight for the calculation is in full compliance with GLEC-3 and ISO-14083 standards. This means that loading meters (LDM) and the volume of the goods are not included in the CO_2e 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 producing varying CO_2e emissions.

We maintain a continuous focus on improving data quality in our ERP systems to ensure that the CO_2e 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 ensure and enhance the data quality on the issues not captured by the automated processes.

On the invoice, the result from the CO_2e calculator is reported as TTW. TTW shows the direct CO_2 emissions from the combustion of fuel. The result is measured in CO_2e equivalence that includes all greenhouse gases, not only CO_2. A 5% error margin has been incorporated into the comprehensive reports. This means that there could be errors in up to 5% of the data. 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 CO_2 emissions. GreenRouter provides a certified tool for calculating CO_2e 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 CO_2 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 a member of Alice, which is a European Technology Platform, that promotes international efficiency and sustainable logistics.

Introduction to GLEC 3

The GLEC Framework v3, 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 CO_2 reports for customers. The results from the CO_2 calculator are reported in both TTW and WTW and are expressed in CO_2e. For reports with data newer than April 4, 2024, air pollutants from "Black Carbon" (PMX) and energy consumption (MJ) can be provided upon request.

Back in 2020, ALPI, in collaboration with Aarhus University's Center for Energy Technologies, developed a CO_2 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 builds upon the previous version, is based on GLEC 3 and ISO 14083. Consequently, we have recalculated all ALPI's Scope 3 CO_2 data for 2020, 2021, 2022, and 2023 to ensure a future-proof basis for comparison. This improved calculation includes

the CO_2e emissions from the handling of goods during modality changes, such as transshipment at a port, container terminal, or hub. Additionally, emissions data related to transshipment regarding modality changes from bookings made after May 2, 2024, can be provided upon request.

The summary table provided in the delivered historical reports, are aggregated to present data on organization and modality level. The organization category presents in which department, such as Sea (AAS), Air (AAS) or Road (ADK), the booking was completed. This also most likely shows where the main part of the transport was conducted. Modality level shows which type of transportation was used under this part of the organization.

Since the calculations are performed at each transportation stage, it is strongly recommended that customers do not summarize the gross weight and distance from the detailed Excel sheet. Doing so would result in incorrect results for weight and distance, as the parameters are static values, and the distance may be divided into multiple trips under the same booking number. The Excel data provided has been assigned a unique CO_2 calculation ID, which identifies instances where the distance does not match the booking number. In cases where the shipment exceeds the weight limit and is therefore divided into multiple calculations within the same booking, this methodology ensures accurate results.

Ferries & Ro-Ro's

Ferries are included on all relevant networks and are assumed to be a RoRo-vessel. More comprehensive vehicle details are expected to be added as soon as these are available for reporting. Moreover, in the carbon impact reporting, ferry transportation is referred to as "Sea" modality.

Courier

Currently, courier orders are not included in the calculations due to the lack of data from our courier partners. We are actively investigating solutions to address this issue as quickly 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 described in this document.

Calculation of CO_2 Emissions from road freight

The CO_2e data, which appears both on the invoice and is provided in reports on road transport, includes empty kilometers to be 8% and an expectation that trucks operate with 80% load. The CO_2e 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, with an ambition of reaching 100% EURO VI trucks soon.

Currently, the only available fuel included in the calculation is 5% biodiesel. It is expected to be expanded to different fuel types in future versions of the CO_2 calculator, such as HVO, which is currently undergoing pilot testing. Also, 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.

Calculation of CO_2 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 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 trade-lanes are used.

The main indicator for sea freight CO_2 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. To account for deviations from the shortest possible route, a 15% distance length is added. This is recommended by the GLEC 3 standard and accounts for stops in ports, weather conditions, and other deviations.

Calculation of CO_2 emissions from air freight

Currently, data from specific types of aircraft is not included. Instead, emission factors are assigned based on flight distance, distinguishing between short, medium, or long air freight. From there, standard values from the GLEC-3 methodology are utilized. In the short term, in collaboration with GreenRouter, there is an effort to use IATA data to obtain primary and modeled data about the specific aircraft and use these for a more

precise calculation. This will include data about the aircraft's specifications such as fuel consumption during takeoff, landing, climbing, descent, and cruising phases.

Additionally, there is a desire to distinguish between cargo and passenger versions of the same aircraft model, which currently possess difficulties as these share the same ICAO aircraft type designation. The distance is calculated for air transport from the Greater Circle Distance (GCD) from airport to airport.

Calculation of CO_2 Emissions from rail freight

Depending on the rail route either electric or diesel have been used. In Europe, a rule of thumb is that it is mainly electric depending on the location. This also results in TTW in the calculations being "0" meaning that the train does not emit CO_2e through a combustion due to it being electric. While WTW will still have a CO_2e value representing the emissions from producing the electricity. In other locations, such as the US, diesel is considered the main type of fuel and will therefore often have both WTW and TTW values. Unless anything else is specified in the data, default train values will be applied from GreenRouter. Meaning that short, medium and long-distance trains will be assumed to have an empty weight of respectively 500, 1000, and 1500 tonnes. And the following have a load capacity of 28 tonnes divided between 15, 25, and 35 containers.


ALPI
Where there's a will
there's a way