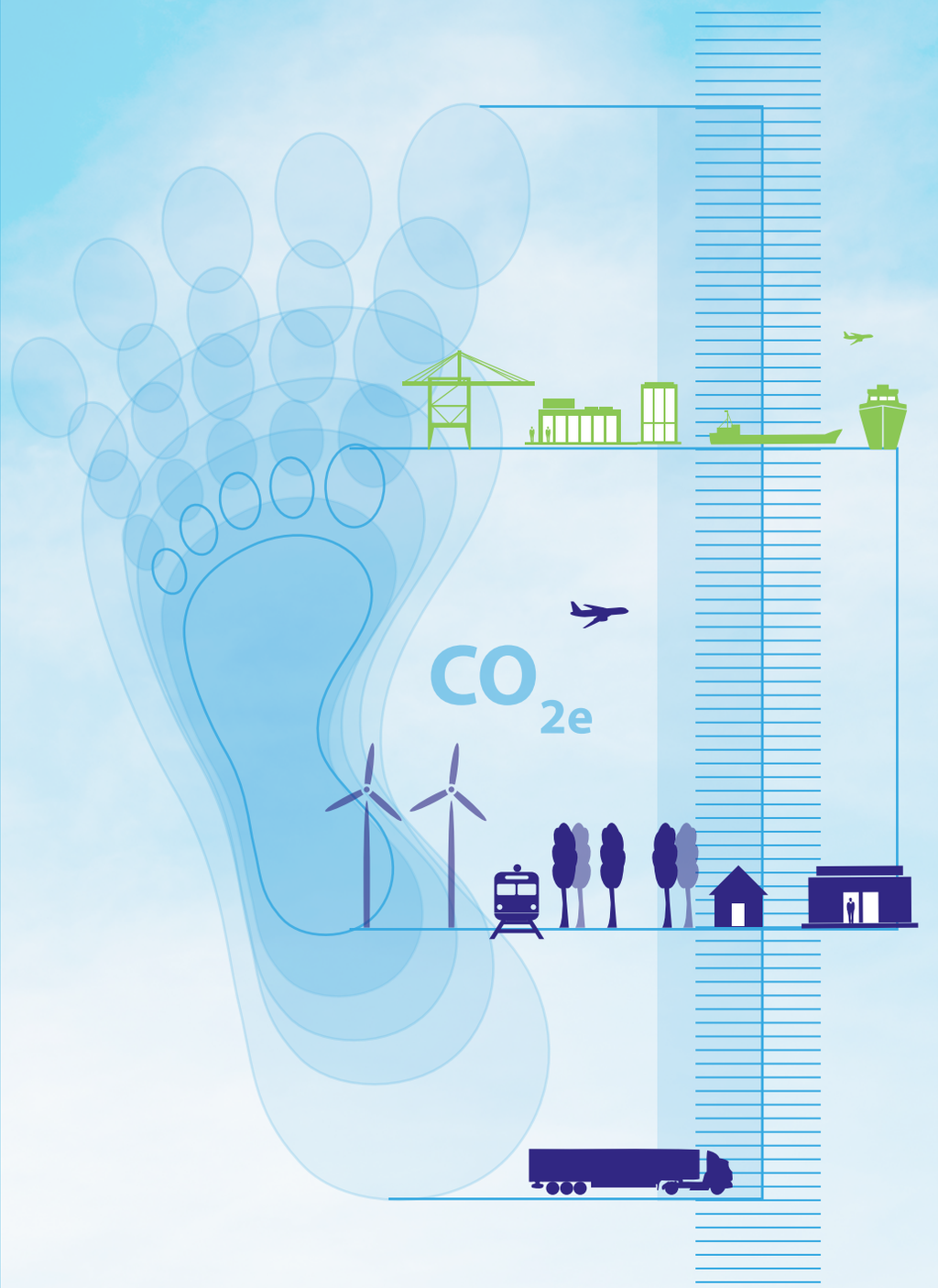
GUIDELINE 22 - CARBON FOOTPRINT IN LOGISTCS



The relationship between social goals and corporate goals

Absolute emissions from logistics

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Absolute emissions from logistics

Carbon Footprint in logistics

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The relationship between social goals and corporate goals

Absolute reduction in emissions

The aim of the Climate Agreement is to substantially reduce the absolute volume of greenhouse gas emissions per year. This target also applies in the area of logistics. Logistics is the organization of the transportation of goods within a supply chain. Raw materials are processed to produce semi-finished goods, and these semi-finished goods are assembled to make end products, which are delivered to customers.

Today's global economy is characterized by a very high number of long and complex chains. Some of these are outside and some inside the Netherlands.

In practice, all kinds of different terms are used to describe the differences between the legs within such chains, such as city distribution and hinterland transport.

Hinterland transport is volume transport to and from seaports and airports, while continental transport looks the same but remains within mainland Europe. Common cargo flows include:

- dry bulk (raw materials such as grain, sand, coal and salt);
- wet bulk (raw materials and semi-finished products such as oil, oil products and chemicals);
- semi-finished products (packed or in containers);
- perishable goods (in temperature-controlled transport or refrigerated containers);
- end products in containers.

City distribution involves supplying urban environments, with the main flows being:

- post and parcels;
- foodstuffs;
- fresh and refrigerated products;
- deliveries to shops;
- building materials and raw materials;
- facility-related deliveries (to offices, hospitals, educational institutions, authorities, etc.).

On the other hand, parcels are also delivered to homes outside cities, so this breakdown is not absolutely precise. What matters is that flows and chains are divided up in a useful way that is both in keeping with practice and also facilitates the achievement of the aim in question: measuring and monitoring emissions from logistics.

These guidelines lay down the methodology for obtaining this overall insight from basic operational data derived from practice and for working with this as a sector or an individual shipper or transporter.

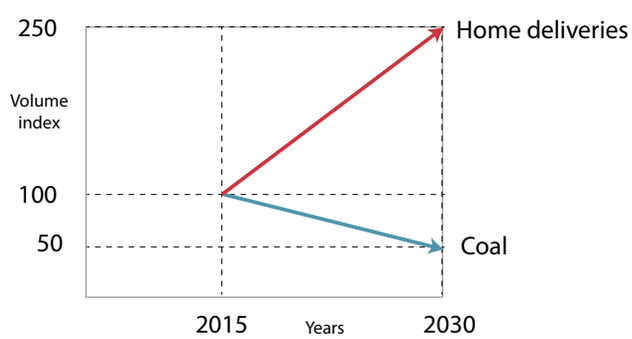
From total to target per segment

To begin with, we distinguish between distribution and hinterland/continental transport, and then put a segment under the microscope in each case. How nuanced the subdivision needs to be is a balance between accuracy and workability: the most important thing is that the shippers and transporters find the activities comparable.

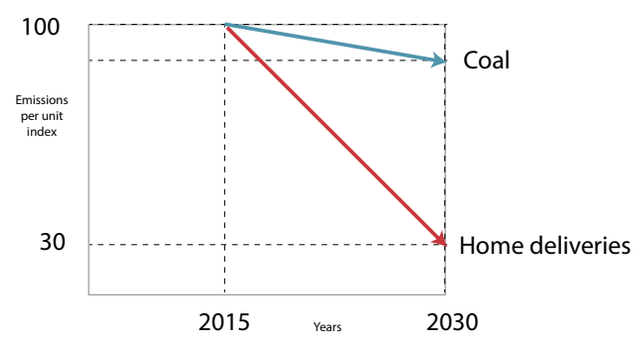
We are taking two completely different segments in our example: home delivery (e-commerce) in distribution and coal in hinterland transport.

The first point that needs to be taken into consideration is how the volume of the cargo will develop between now and 2030: a sharp rise is expected in the case of home deliveries, while the volume of coal is expected to halve.

The second point is the volume of emissions per unit of cargo required for the transport within a (sub-) chain: there are many more opportunities to realize substantial reductions between now and 2030 in the area of home deliveries than there are for the transportation of coal.



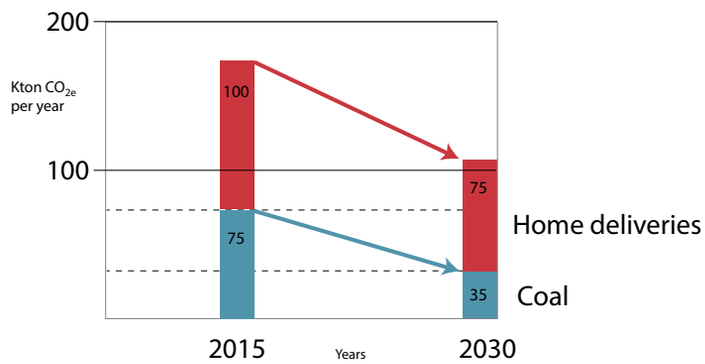
Cargo segment: *Volume development.*



Cargo segment: *Development of emissions per unit.*

Emissions per unit of cargo naturally depend on the distance that needs to be traveled, but for this purpose calculating an average for a (sub-)chain in the Netherlands is a workable option. Furthermore, if a party is able to save emissions by shortening the chain, or by organizing long distances differently (using railways, for example), then that counts towards the necessary emissions reduction.

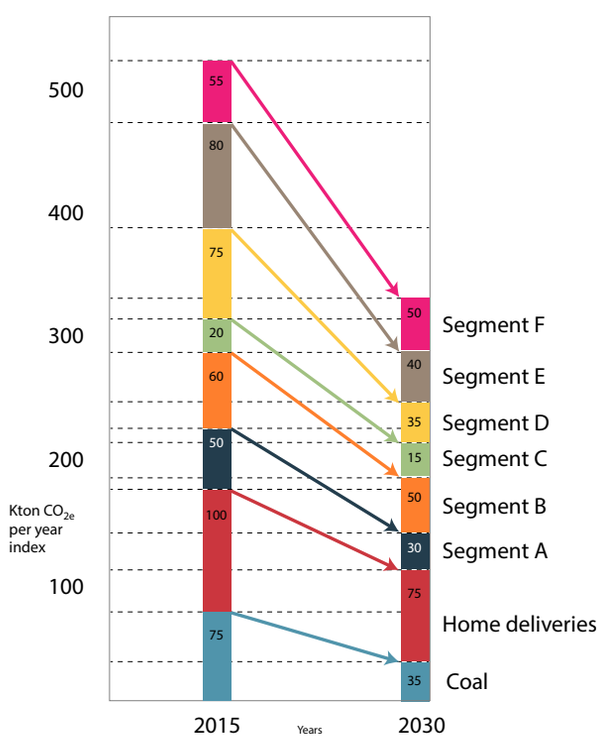
The product of volume development and the development of emissions per unit shows how the absolute emissions per segment will develop.



Absolute emissions are the result obtained
Takeovers and shifts in market share can occur within a cargo segment: the target for emissions per unit remains the same for all players.
NB: to a large extent the growth in home deliveries is a substitute for shop purchases; an additional drop in emissions from supplying shops is therefore expected.

The advantage of this approach is that the sum is not affected by shifts in market share or takeovers between parties, which means year-on-year comparisons remain possible.

By repeating this measurement and prediction for all segments, it is possible to forecast the absolute reduction in emissions for logistics in the Netherlands. It is also possible to monitor how the situation develops by means of annual measurements.



Sum of all cargo segments: Absolute emissions of logistics are the result obtained
By repeating these steps for all segments, it is possible to measure, predict and monitor the overall picture.

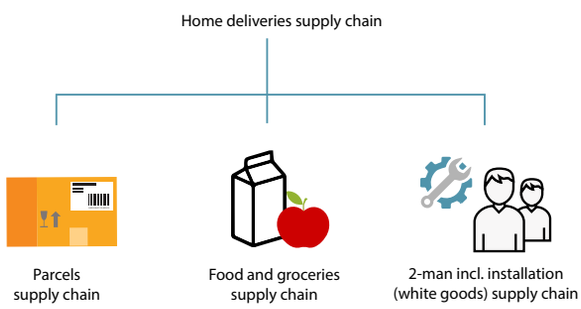
Emissions per unit: roles

The wish to transport cargo is the primary driver. How do we measure the emissions per unit within a sub-segment, and what is the role of the shipper/customer, and that of the service provider performing the transportation or transshipment/storage?

The CO_{2e} emissions within a chain are the result of all manner of standalone decisions by various actors (producer, shippers, retailer, sales territory, service provider):

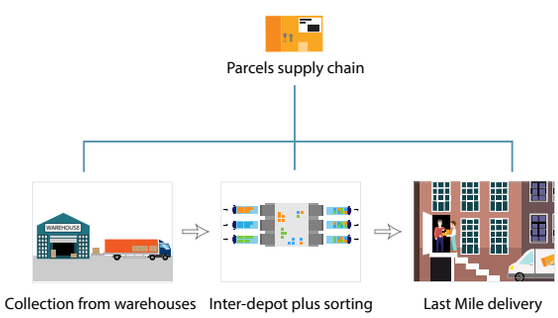
- Locations (these determine the distance that goods are transported);
- Delivery frequency;
- Quantity per delivery;
- Service-level requirements (punctuality, response time);
- Planning volatility;
- Marketing campaigns, disruptions, failure to keep to plan;
- Mode;
- Groupage (sometimes a customer prohibits groupage based on marketing considerations);
- Planning;
- Use of people and resources;
- Legislation (e.g. Driving Hours Decree);
- Delivery time windows;
- Type of vehicle and fuel;
- Behavior (driver's accelerating/braking behavior, tire pressure).

Supply chains: examples of differences



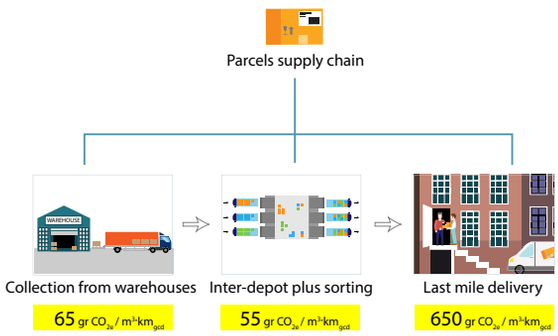
An example: the 'home delivery' supply chain. This chain can be subdivided into 3 categories:

- *Parcels supply chain;*
- *Food and groceries supply chain;*
- *2-man incl. installation (white goods) supply chain.*

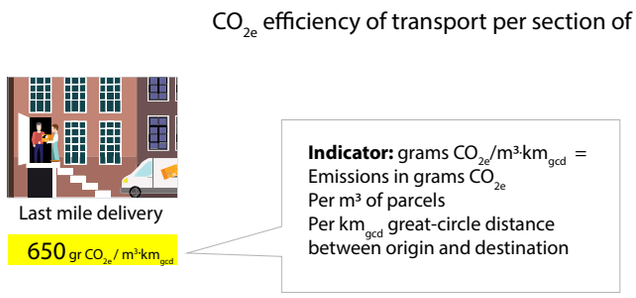


The parcels supply chain can be subdivided into different legs:

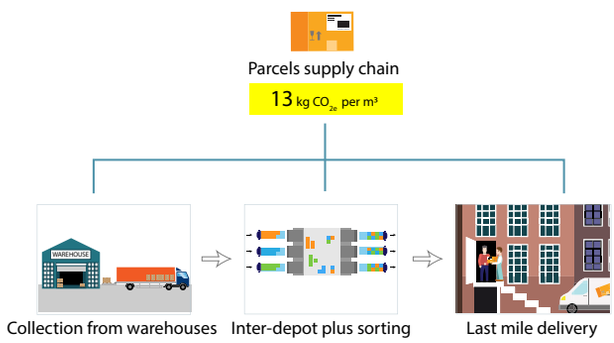
- *Collection;*
- *Inter-depot;*
- *Last Mile delivery.*



The transport efficiency of each leg can be measured in the form of an emissions indicator. In this example fictitious sample figures are used. To obtain a complete picture, the emission contributions from storage and transshipment also need to be added, but we have omitted them from this simple example.



This indicator shows the CO_{2e} efficiency of the transport in that part of the chain. The lower the figure, the fewer emissions are required to deliver something one kilometer further (net). In order to determine the emissions per unit, the distances in the chain still need to be taken into account, together with the emissions involved in storage and transshipment.

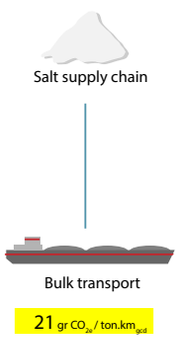


In this way, the emissions per unit of a chain can be determined on the basis of indicators for a leg. The indicator for parcels is a good estimate of the reality in the Netherlands in 2017.

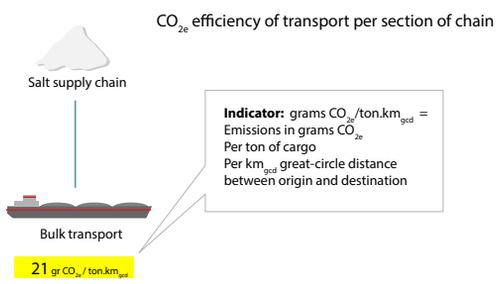
Supply chains: examples of differences

A completely different supply chain is the transportation of salt from the place of extraction to Rotterdam, in the dry bulk segment.

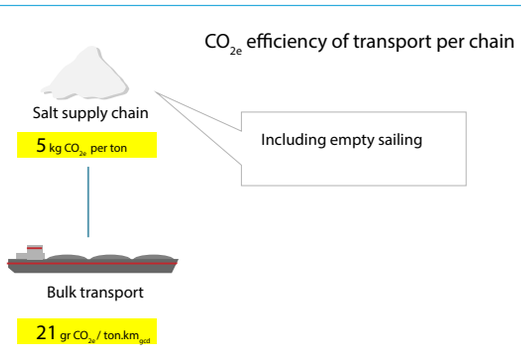
The salt supply chain has just 1 leg: bulk transport.



This leg has its own emissions indicator. In this case the fact that the ship first has to return empty in order to pick up new cargo is also factored in.



In this way you gain an insight into the CO_{2e} efficiency of the transport for each section of the chain.

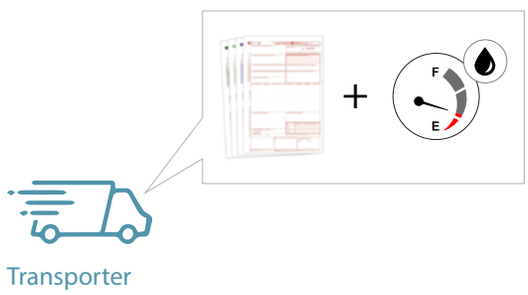


Lastly, the chain length provides an average for the emissions per ton of salt. And, as we have mentioned, the fact that the ship first has to return empty in order to pick up new cargo is factored in.

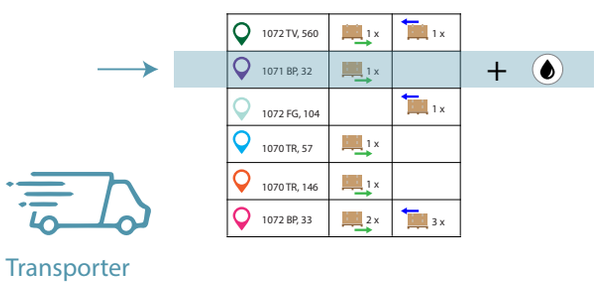
Information sharing and indicators

For a customer to calculate these average emissions per unit, it will require certain data from its service providers. How does this work?

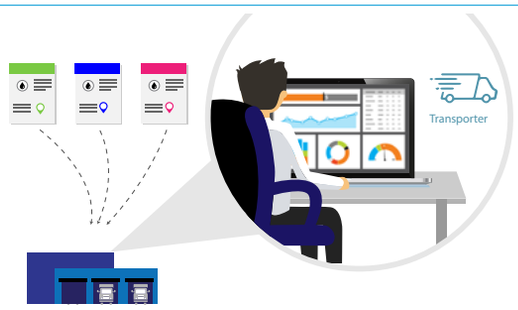
A customer sends orders to a transporter to have a cargo transported.



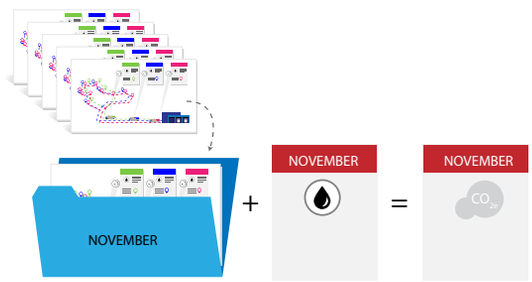
The transporter can allocate emissions to these transport orders, as the transporter knows how much fuel it consumes. Following allocation, the transporter can pass on information to the customer in 3 ways.



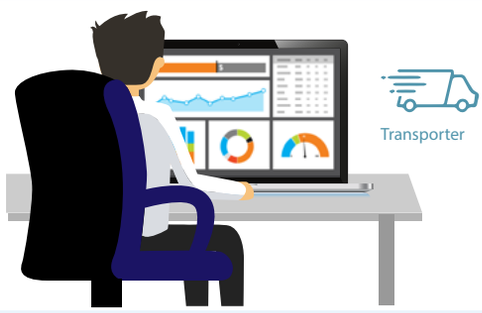
1. Emissions per transport order, in gr CO_{2e}/unit.
This means that the transporter shares the detailed results of the allocation directly.



2. Specific indicator gr CO_{2e}/unit.km_{gcd}
In this case it is not the details that are shared, but the indicator that is calculated automatically during allocation.



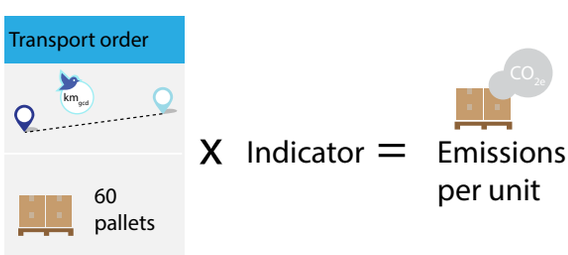
3. Average indicator: grams CO_{2e}/unit.km_{gcd}
Rather than sharing the indicator calculated specifically for these orders, the average for the transporter itself or for the sector is shared.



These data also give the transporter an insight itself into the average for all its transport orders. That means the transporter has a good insight into its own performance or is able to compare itself with its peers to see if there are any discrepancies that cannot be explained.

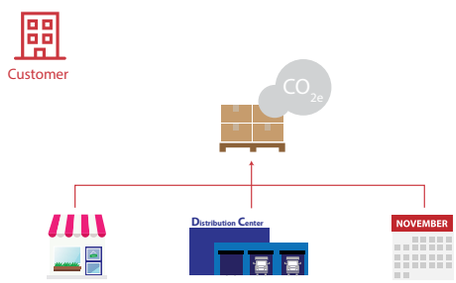
Information sharing and indicators

The customer needs to know the emissions per unit per transport order to be able to determine averages. Even if it does not receive these data directly, it is still possible to perform the calculation in a simple way using the correct indicator.

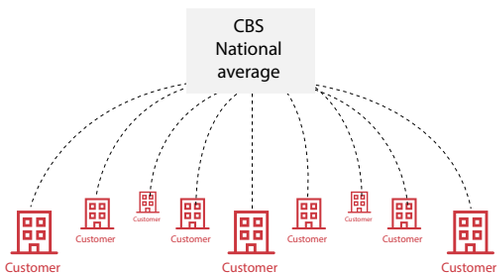


By taking the transport orders (quantity, place of origin and destination), calculating the great-circle distance between the place of origin and destination, and multiplying this by the indicator received, the emissions per unit are easily obtained. There is no need to know the route. This calculation will usually be performed by software. The more specific the indicator is, the more accurate the result.

The customer counts the emissions involved in transshipment and storage in the emissions for each leg. This provides a total.



In this way the customer gains an insight into the chain as a whole.
Emissions per unit in the chain ***gr CO_{2e}/unit.***
And also into the average for the chain.
Average emissions per unit ***gr CO_{2e}/unit.***



If the key customers in a segment share their average with the government, the latter can determine a national average. The figures from Statistics Netherlands (CBS) on volumes of cargo provide the other input needed to calculate a total for the segment. By taking a closer look at the chains, it is possible to identify and predict savings. Every little helps: shorter, more economical, better packaged, fewer empty kilometers or less empty space. These are quick actions that can reduce net emissions before alternative fuels or vehicles are brought into use.

Carbon Footprint guidelines

0. Measuring, calculating, allocating and reducing

1. Allocating

2. Cargo

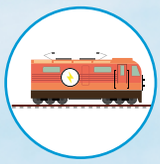
3. Origin and destination

4. Fuel

5. Inland shipping - containers

6. Inland shipping - bulk

7. Freight transport by rail



8. Air freight

9. Maritime and short sea shipping

10. Transshipment

11. Storage

12. Parcel transport and post

13. General road transport

14. Perishable and temperature controlled

15. Outsourced transport

16. Repositioning and empty kilometers

17. (Inter)national supply chains

18. Benchmarking

19. Intermediaries and platforms

20. Auditors and accountants

21. Data quality

22. The relationship between social goals and corporate goals

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