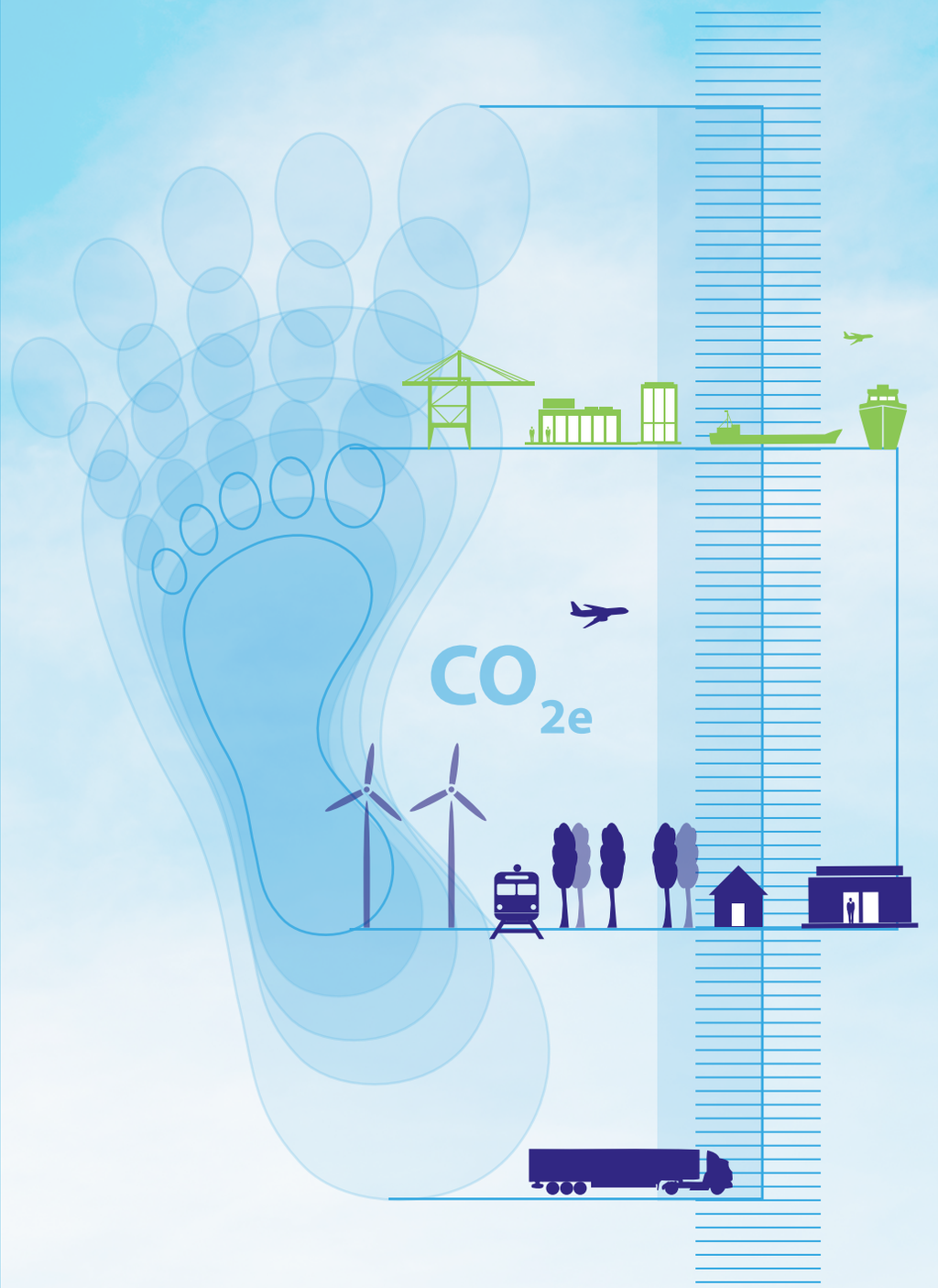
GUIDELINE 17 - CARBON FOOTPRINT IN LOGISTICS



(Inter)national supply chains

Insight into overall transport worldwide

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Topsector Logistiek

Colophon

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Carbon Footprint in logistics

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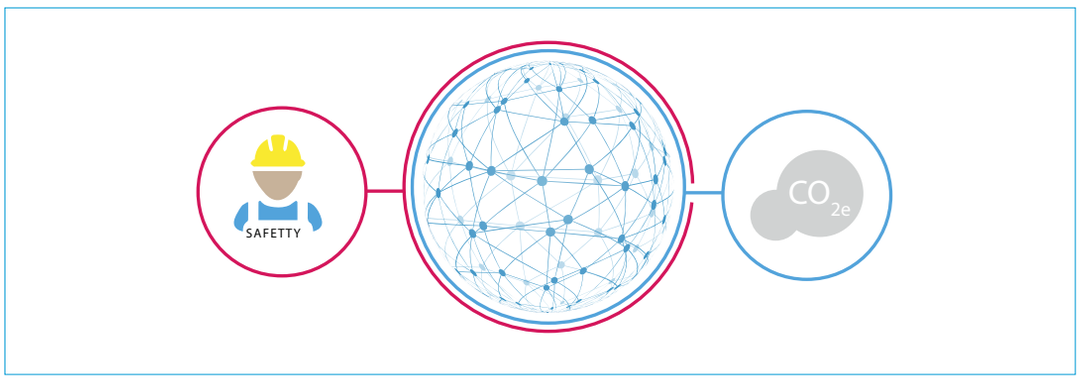
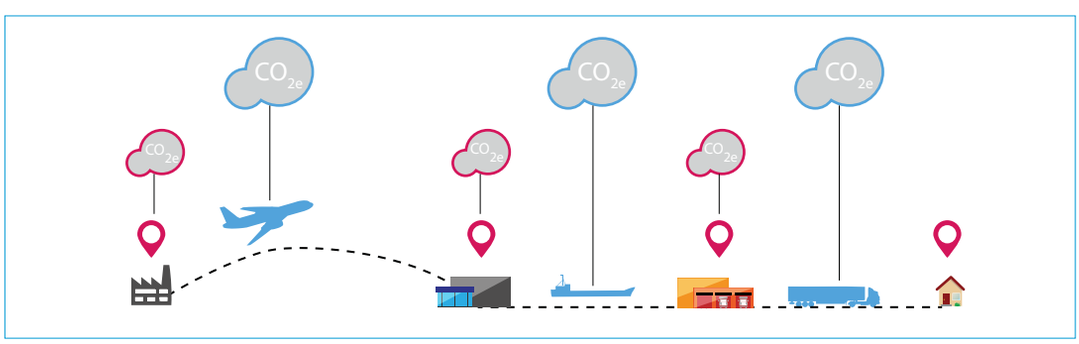
(Inter)national supply chains

Insight into overall transport worldwide

This guideline deals with the international supply chains that have developed over the past 50 years.



The globalization of production locations, increasing specialization in production and ever more efficient transport have resulted in complex supply chains that span the globe.
It is becoming more and more important for companies to gain an understanding of their entire chain: ultimately, the public and governments will be demanding accountability across the whole of the chain, whether this relates to good working conditions, pollution or CO_{2e} emissions.

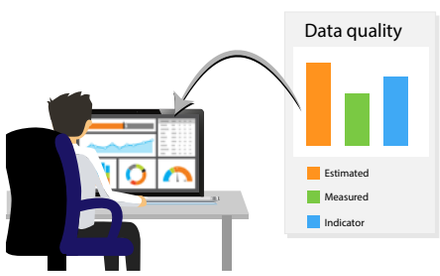


Transport (including transshipment/storage) is the starting point for supply chain accounting. It links production locations and customers together. If these emissions are clearly mapped out, it is relatively easy to add the emissions from production to gain a complete picture.

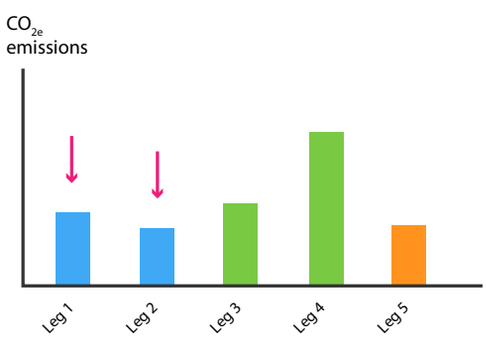
Information position: from estimating to measuring, starting with the most important

The first challenge for companies (or their service providers) that want to analyze their entire chain is obtaining good, measured information. Due to the high degree of specialization and subcontracting in transport, many different parties actually take care of parts of the chain, but are initially invisible to the final customer.

In most cases there is good knowledge of what the cargo is and what the origin and destination are. The route to be followed and the modes that are used are also known. The problem often lies in inadequate information, or a lack of information, on the allocated emissions (CO_{2e}) for each leg, or on the fuel consumption of the mode used in that leg, as well as on whether the cargo was transported in combination with other cargo. There are tools[1] incorporating models that allow this to be predicted, but it remains a complex process and involves using assumptions to a greater or lesser extent.



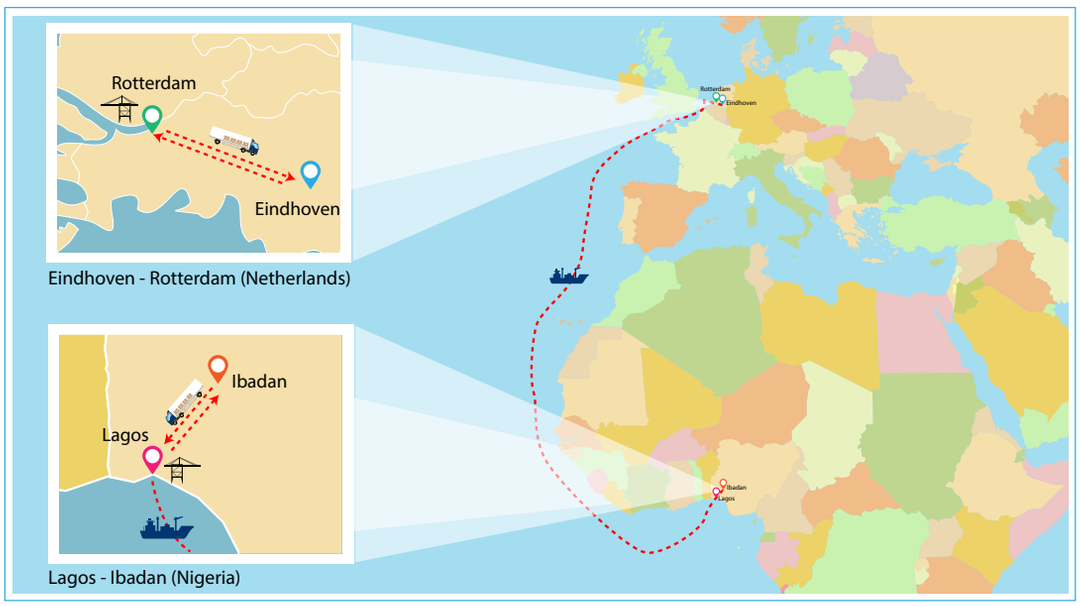
The solution involves starting with what you have available: for some parts of the chain you have good, measured information and for others information based more on estimates or derived values, with standard values as a final fallback option. By working with different levels of data quality (see guideline 21) and linking these to the input figures, you can clearly see what the information position is in the calculated results.



For each leg in a chain you can see the following:
- *The size and importance of the CO_{2e} contribution of that leg.*
- *The reliability of this information (e.g.: 15% is based on measured data, 85% is based on standard values).*

1 Such as EcoTransIT

Taking this information together, it quickly becomes apparent where attention needs to be focused: the link that makes the greatest contribution and has the lowest data quality. It is well worth discussing this with service providers. Could the standard value be replaced by a measured value?
An example is presented here.



Route	km_{gcd}	Consumption or emissions	Number	Kilometers	Liters of diesel	per 40 ft container	Total
Eindhoven - Port of Rotterdam	**112**	**90** Measured fuel consumption per container incl. empty kilometers	**40** trips		**3,600**	**290.7** kg CO_{2e} per container	**11,628** kg CO_{2e}
Port of Rotterdam transshipment		**8** Measured emissions per transshipment 40 ft container	**40** x transshipment			**8** kg CO_{2e} per container	**320** kg CO_{2e}
Port of Rotterdam - Port of Lagos	**5,065**	**77** Standard value for container shipping* CO_{2e}/TEU_{km} (sailed)	**40** x 2 TEU	**7,708** estimated km sailed		**1,187** kg CO_{2e} / container	**47,481** kg CO_{2e}
Lagos transshipment		**12** Standard value for emissions per transshipment 40 ft container	**40** x transshipment			**12** kg CO_{2e} per container	**480** kg CO_{2e}
Lagos - Ibadan	**108**	**42** Standard value for truck (liters/100 km)	**40** trips	**260** estimated km driven	**4,368**	**353** kg CO_{2e} per container	**14,109** kg CO_{2e}

Cargo
40 ft container **25 tons per container** **40 containers** **1,000 tons total**

Measured Indicator Estimated

1,850 kg CO_{2e} per container

74,018 total kg CO_{2e} of which 62,070 on basis of indicators

74 kg CO_{2e} per ton of which 62 kg CO_{2e} on basis of indicators

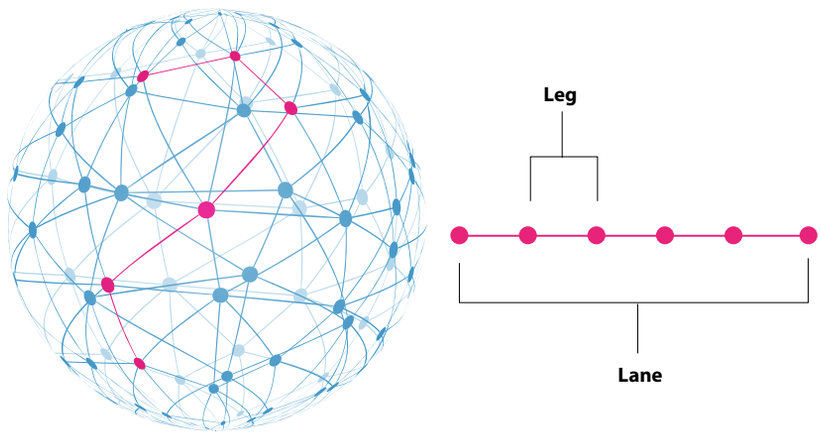
For the emission factor for diesel the figure indicated at www.co2emissiefactoren.nl is used

* *The standard value for container shipping to Lagos is trade-lane-dependent. There is a considerable imbalance in the shipping to Lagos, which is why this figure is almost twice as high as the standard value for Rotterdam-Shanghai, for example: this is 47 grams of CO_{2e}/TEU_{km}.*

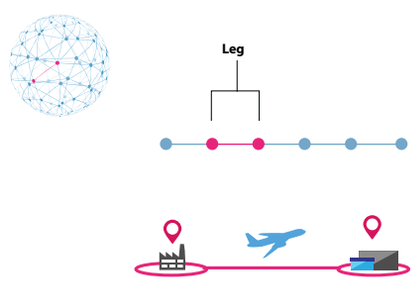
In practice, especially in long international supply chains, all variants may be used at the same time. The basis applied for each fuel or CO_{2e} figure needs to be specified.

Legs, lanes and overall chain

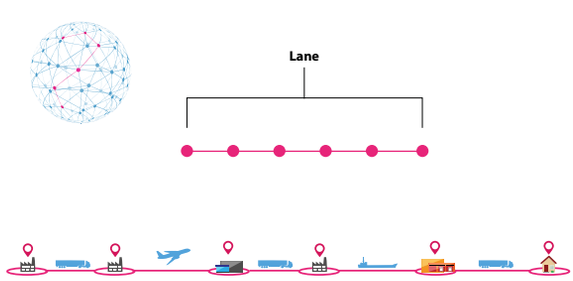
In everyday language a distinction is made between overall chains, lanes and legs.



An overall chain from a production location in China to an assembly plant in the Netherlands, followed by delivery of the end product to a retailer's DC, is made up of individual legs, which are linked together. The collection of the full container in China for transport to the port, the maritime transport or the collection of the full container at the port in Rotterdam are legs.



In a leg a single mode of transport is used (FTL or combined cargoes). This can also be a distribution trip involving parcels, groupage and part loads. All kinds of load carriers may be used, from packages through to pallets and roll cages, etc.

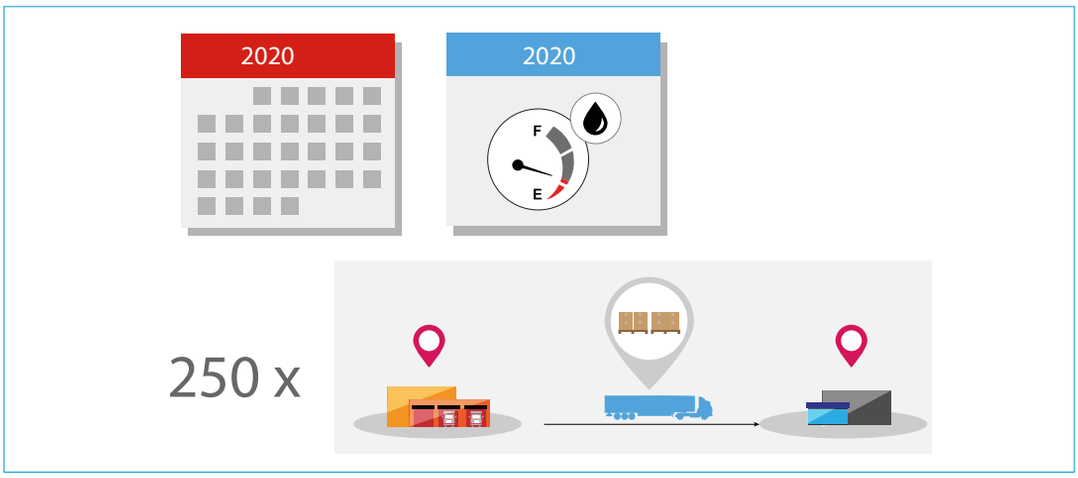


A lane often refers to a logical set of legs that are frequently repeated, such as the lane from China to the production location in the Netherlands. In this case you come across different modes of transport, as well as storage and transshipment.

The term 'supply chain' covers more than just one or more "lanes": this is the entire production chain, including the production stages. A supply chain can consist of one or more lanes, plus additional supply steps. This is considerably more complex than an individual lane.

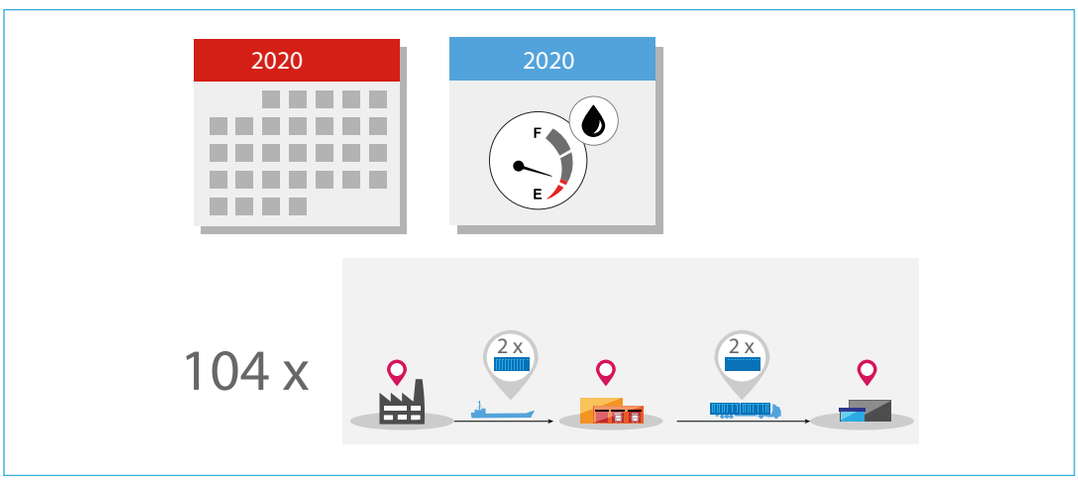
Aggregated data

In cases where large volumes of the same type of cargo are shipped with a reasonably predictable purchasing pattern across the year, use is often made of regular transport with a fixed frequency. Aggregated data are commonly used in such a situation.



Etappe/leg

An example is a fixed route with fixed stops, e.g. a line haul (fixed stops, fixed cities/ports/distribution centers) involving a regular exchange of goods at a certain location.
Another example is a regular delivery of 2 pallets a day to a single fixed address, 250 times a year. In such cases it is useful to take the annual or monthly volume and link it to the fuel consumed over the period concerned.



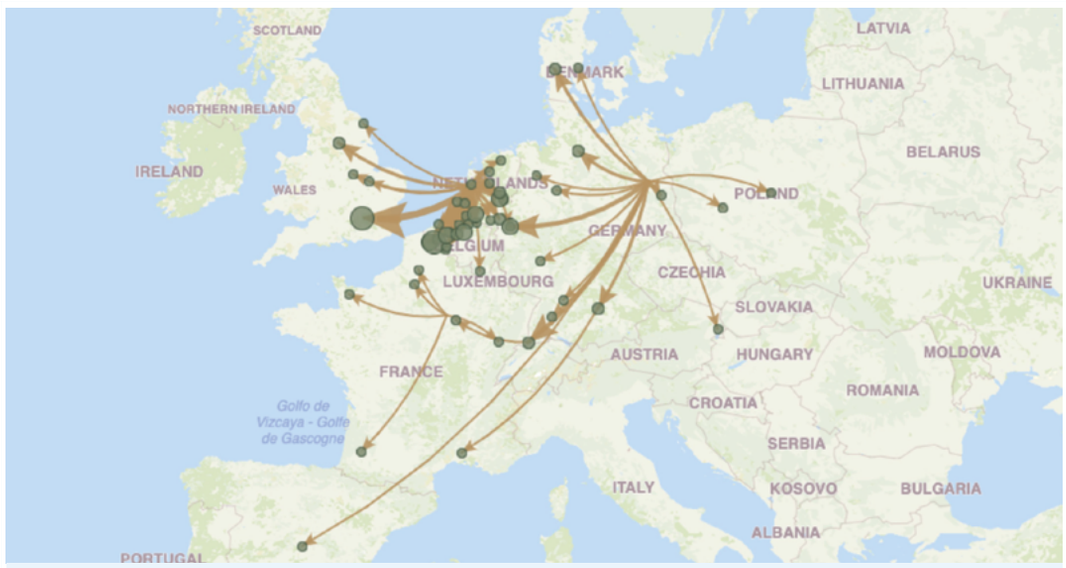
Lane ABC

An example is a fixed lane over which goods are repeatedly transported, e.g. from a producer in Spain to a customer in the Netherlands, by truck, train and then truck again. The steps in the lane are known: a fixed route is always followed, there are fixed modes of transport and the route is repeated regularly.

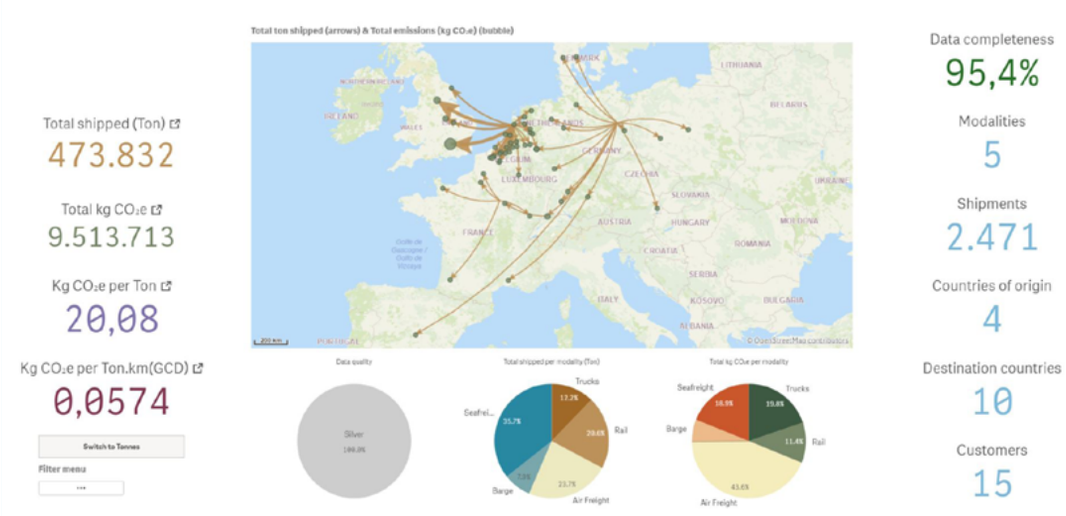
A fixed lane may involve transporting 2 containers of beer a week to the same address in Spain, for example. This can be summarized as 1 lane that is traveled 104 times a year.

It is customary to take the annual or monthly volume and link it to the fuel consumed over the period concerned.

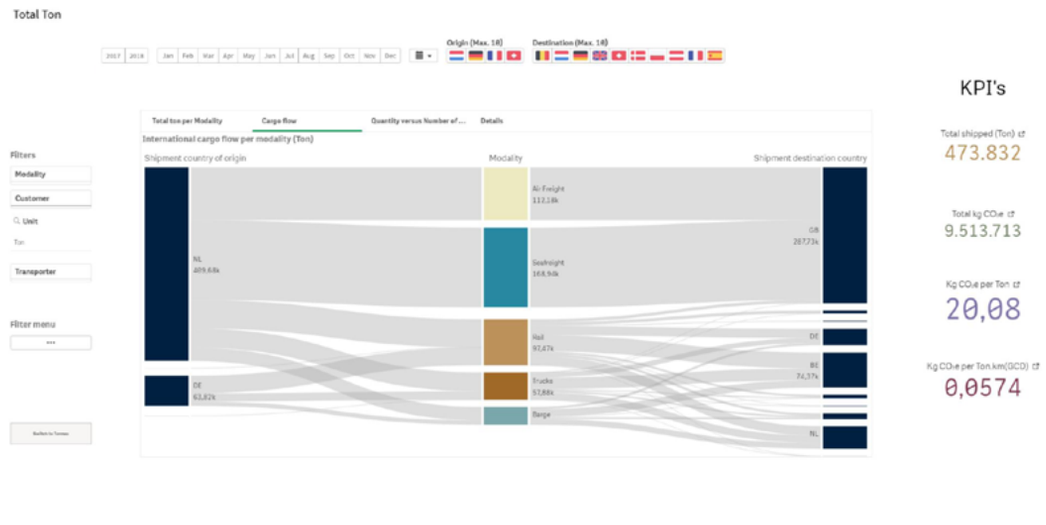
Here again there will be little data relating to certain parts of a lane in the beginning and assumptions will have to be made. That is not a problem, as long as the data quality is clearly indicated and incorporated into the calculations and results. The figures below present a number of analyses that can be derived from good carbon footprint recording. These are examples of analyses that prove to be extremely useful in practice.



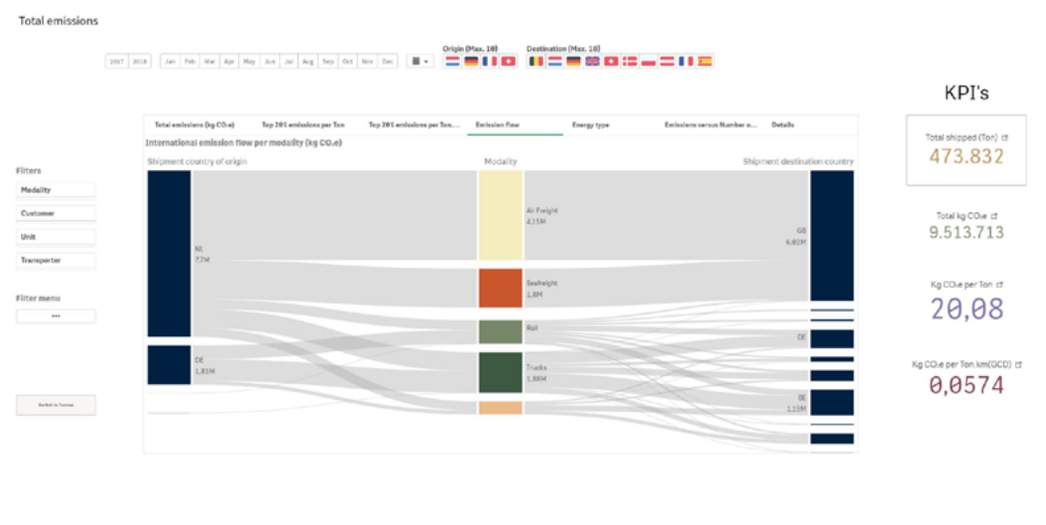
Graphical representation of flows.



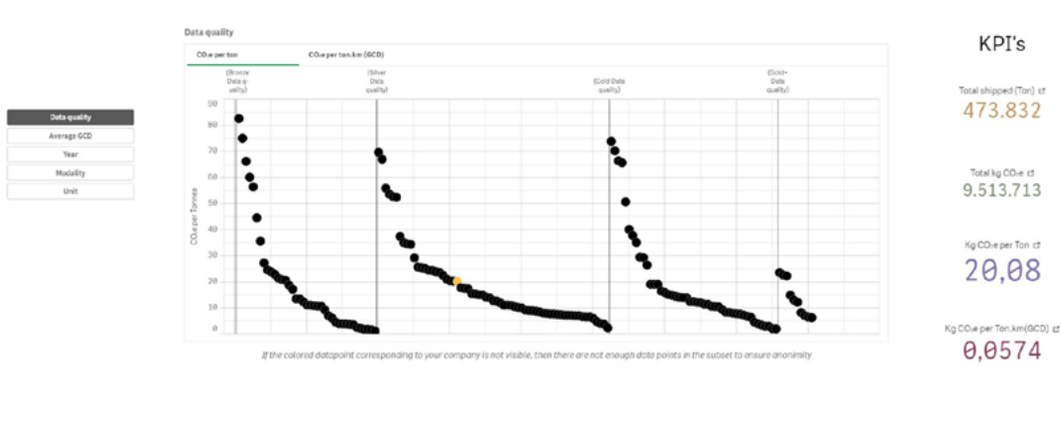
Graphical representation of flows, with indicators.



Graphical representation of goods flows by mode of transport.



Graphical representation of emissions per flow.



Anonymous benchmark against other comparable shippers or transporters.

Carbon Footprint guidelines

0. Measuring, calculating, allocating and reducing

1. Allocating

2. Cargo

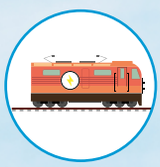
3. Origin and destination

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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