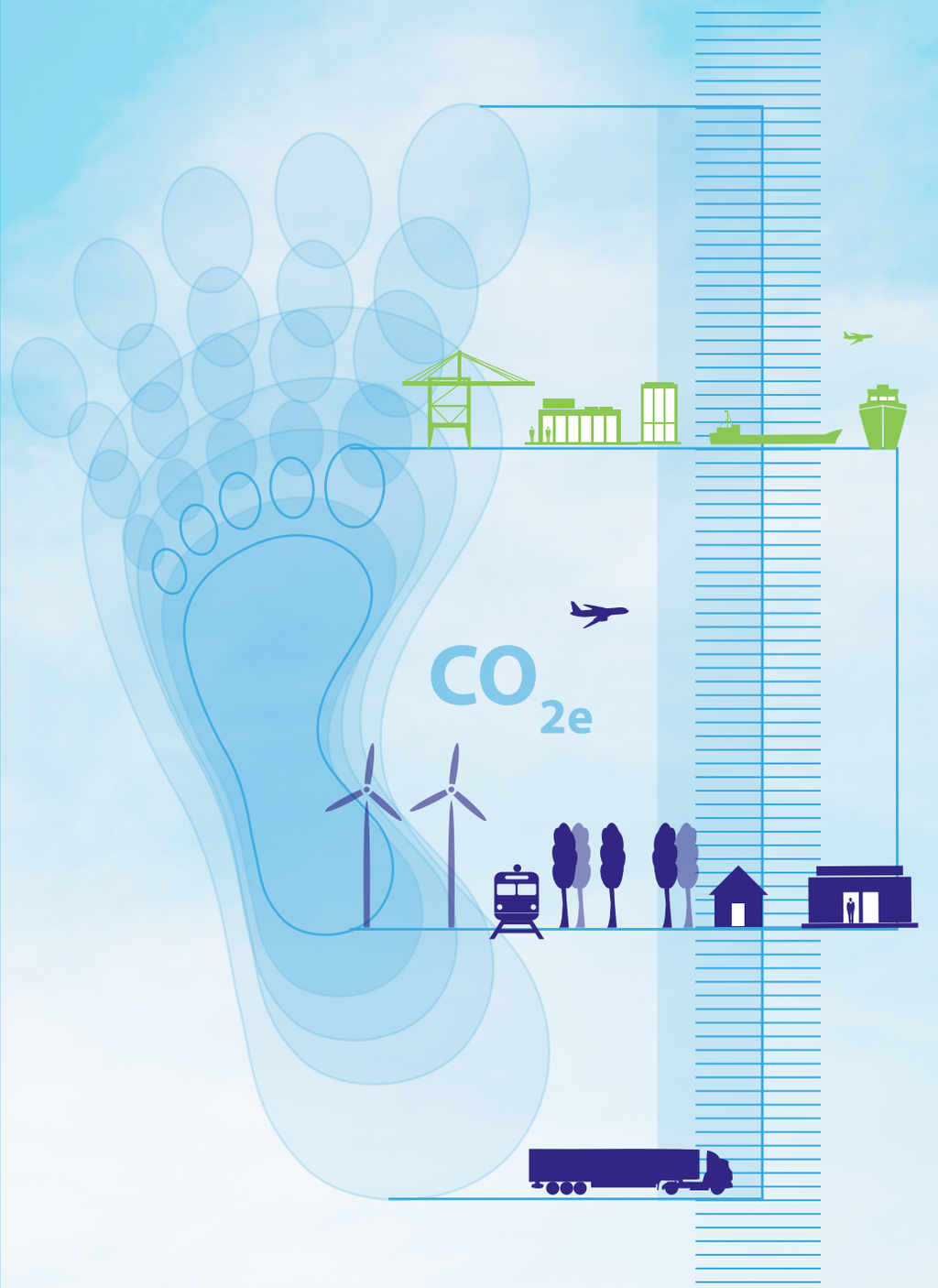
GUIDELINE 7 - CARBON FOOTPRINT IN LOGISTICS



Freight transport by rail

Dry bulk, liquid bulk, containers and other goods

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Carbon Footprint in Logistics

January 2021

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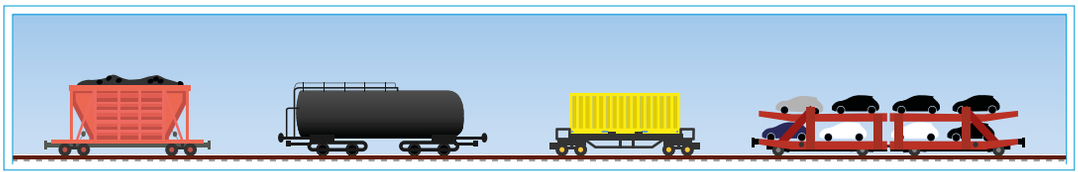
Freight transport by rail

Dry bulk, liquid bulk, containers and other goods

This guideline focuses on the allocation of CO_{2e} to cargo that is transported by rail. At first glance, allocating CO_{2e} to cargo may seem a straightforward task, but if you take a closer look a more complex picture emerges. The fallback option of working with indicators also provides only a very rough estimate of the actual situation. More research is therefore needed in this area in the future.

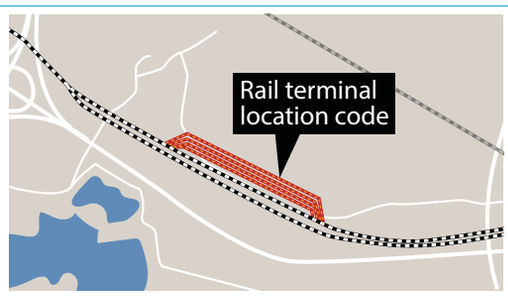
Goods

Rail is often used to transport heavy bulk goods with a relatively low value density, e.g. agricultural/ food products, ores, coal, sand and other building materials, mineral oil and bulk chemicals. Containers represent a second category, alongside other cargo flows, such as cars and roll-on/roll-off trucks.



Origin and destination

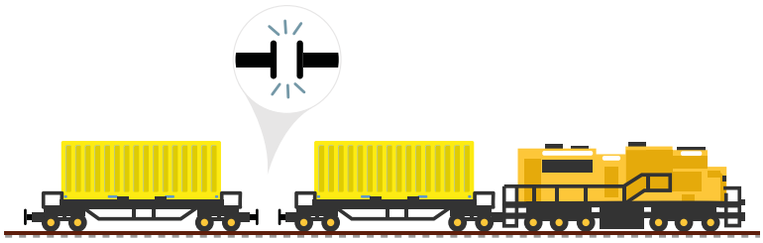
Rail networks have fixed, identifiable end points: terminals at ports, multimodal transshipment points and processing-industry sites, for example. These have location codes or addresses.



Rail terminal.

Fixed terminals are designated using location codes or addresses.

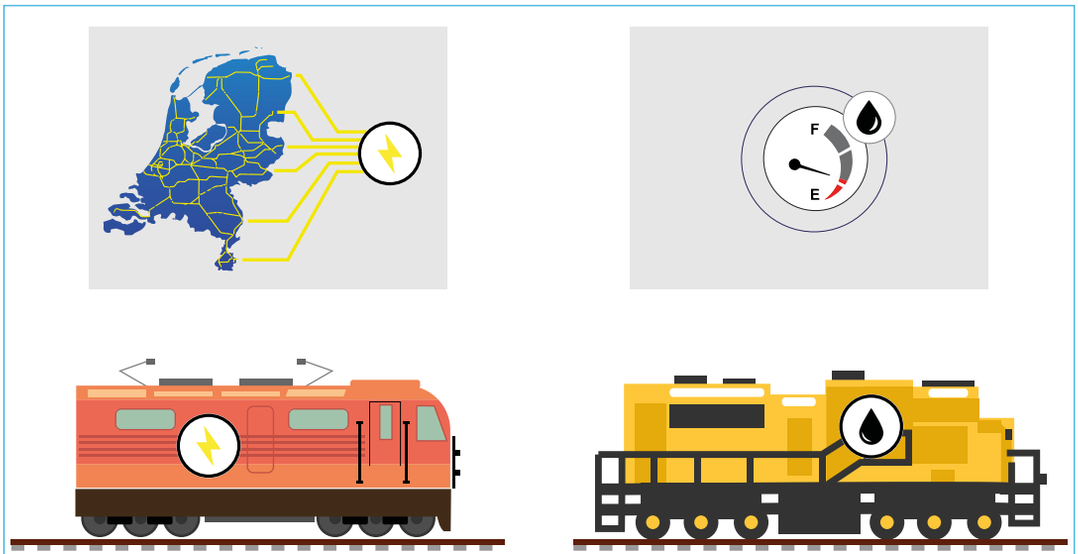
Trains are assembled from individual units (flat wagons for carrying containers, car transporter wagons or bulk carrier wagons) and uncoupled again as and when necessary. The journey undertaken by a specific cargo may therefore comprise a number of different legs, which together make up the complete trip.



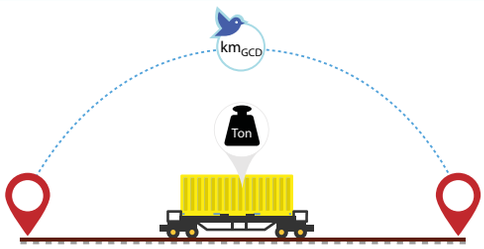
Fuel consumption

In Europe the majority of locomotives are powered by electricity. Whether consumption is actually measured or is subsequently allocated based on the total consumption of the rail system (including passenger transport) depends on the country in question.

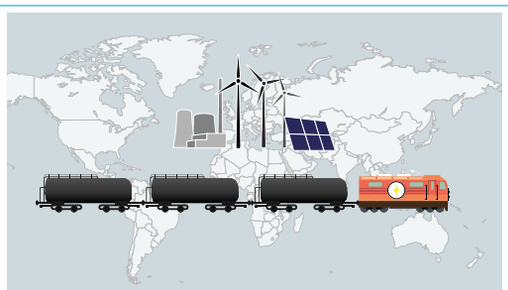
Diesel-electric locomotives are often used in parts of the network where a lot of train assembly and shunting take place, e.g. at ports. They are also used to help deal with peaks or disruptions on the network and at these times operate in parts of the network equipped with overhead lines. Consumption is usually only measured when the diesel tanks are topped up.



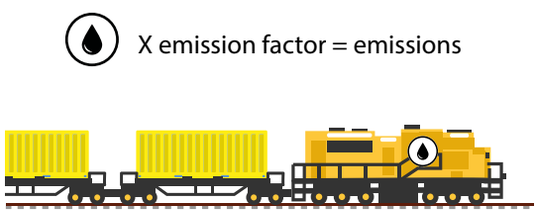
Allocation



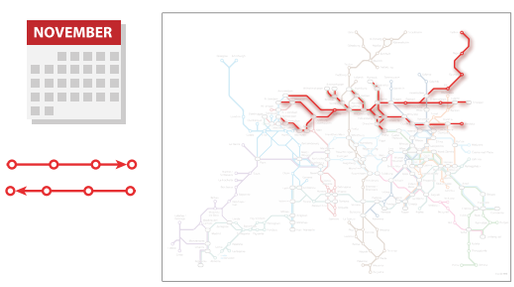
Allocating CO_{2e} emissions on the basis of weight and the distance between the origin and destination is straightforward in theory. In practice, it is more problematic, however. Often there is a lack of good records on the energy consumed. If you want to perform allocation properly, you therefore have to take a complete round trip as the minimum scope, or focus on a particular period and allocate emissions on the basis of the distance covered.



The emissions from the electrical energy consumed depend on the country in which the locomotive is traveling and the generation mix used in that country.

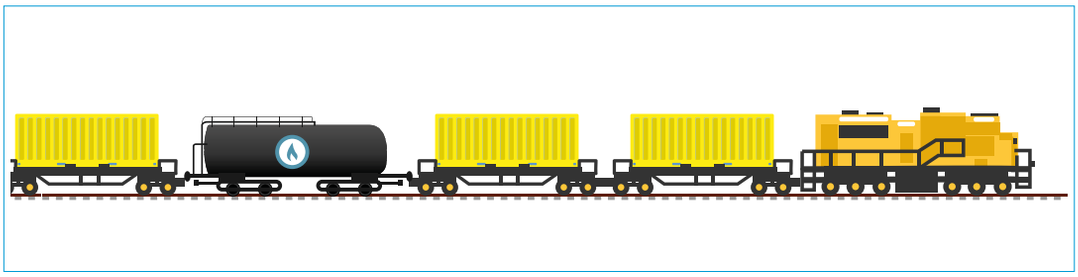


Emissions from the diesel consumed are easy to calculate using a standard emission factor.



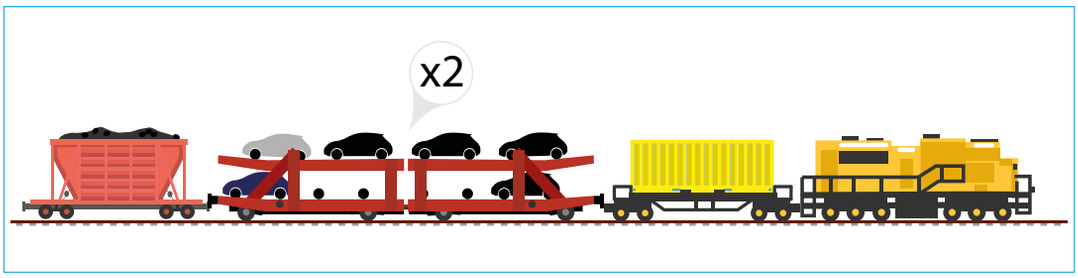
To perform allocation, a logical leg is chosen within the supply chain (feeder network, long trip, distribution network) and within this a round trip and a logical period (e.g. a week) are selected. This ensures that repositioning is also taken into account in the calculation.

With regard to the cargo, a choice can be made from two different approaches, depending on whether a mixed or homogeneous cargo is being carried. Practical measurements have shown that the number of starts or stops has relatively little impact on total consumption, in spite of differences in train weights. Weight is, of course, a factor that impacts on consumption. If, as a result of less frequent maintenance, the bearings in the wagon axles are causing more and more resistance, the length of the train has an increasing influence on consumption.



Homogeneous cargo

For trains carrying broadly the same kind of cargo, weight (bulk) or quantity (containers, cars) is a good unit of measurement.

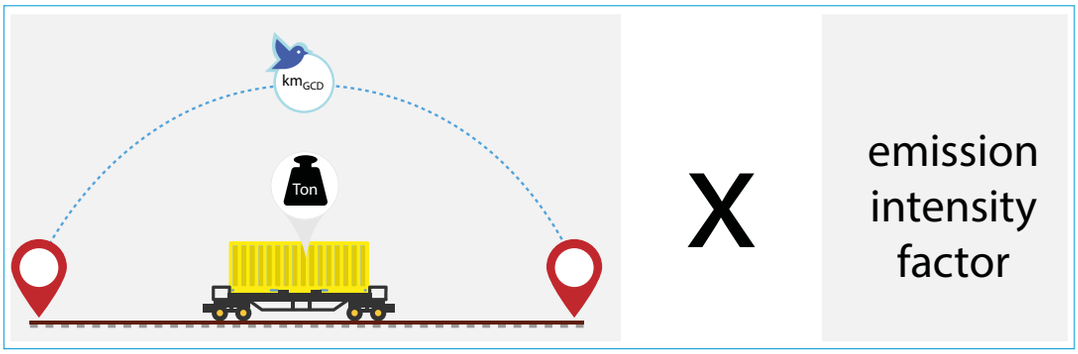


Mixed cargo

If a mixed cargo is being carried, in which case the weight of the cargo can differ significantly from one wagon to another, a correction factor can be applied to the weight of light cargo. There is not yet an accepted standard for this correction factor. One practical way of achieving such a factor is to take the invoiced transport costs as a measure.

Extrapolating emissions if there is a lack of measured data

If no measured data are available, various tools[1] and methods[2] can be used as a fallback option.



By taking the weight of the cargo in tons as a basis, together with an estimate of the distance covered, it is possible to estimate emissions using an 'emission intensity factor'.

For Europe GLEC indicates the following:

Diesel locomotive: 28 g CO_{2e} per ton.km_planned distance (WTW)

Electric locomotive: between 10 and 28 g CO_{2e} per ton.km_planned distance (WTW)

1 such as EcoTransIT
2 such as GLEC

Carbon Footprint guidelines

0. Measuring, calculating, allocating and reducing

1. Allocating

2. Cargo

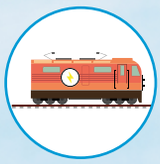
3. Origin and destination

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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