

Our carbon emissions – Methodology

The numbers presented are based on robust hypothesis and calculation on averaged data and emission factors available in 2022 but remain best estimates by EcoRes. Below is presented the methodology for calculation and key hypotheses:

Calculation method for average CO₂e emissions consider well-to-wheel emissions so include fuel combustion, electricity for traction, and upstream direct emissions for the energy used (well to tank production, distribution, losses), but it excludes indirect emissions from construction of the energy infrastructure. The direct emission for transport mode excludes manufacturing/construction and maintenance of vehicle and infrastructure (road, rail, port, airport, etc.) and for aviation it excludes the condensation trail and cirrus effects.

For train emissions for the Eurostar Group: average CO₂e emission per passenger travelling 1km was calculated by EcoRes on the basis of internal Thalys+Eurostar data for 2022 for the entire Eurostar-Thalys network (annual consumption of traction electricity, number of passengers transported, number of km travelled by these passengers), and on the basis of CO₂e emission factors attributed to traction electricity produced in the respective countries crossed. These electricity emission factors are calculated on the basis of the IEA for the direct emission and the EcoTransIT database for the upstream emissions. Dutch electricity factor for train traction considers 100% electricity supply from offshore wind turbines in the North Sea covered by the power purchase agreement contract with Eneco and NS. UK electricity factor for train traction includes 20% of consumption covered by renewable energy power purchase agreement (PPA). Those PPA are accounted at 14kgCO₂e/kWh.

			FR	BE	NL	GE	UK
Eurostar-specific Electricity EF	WTW - Well To Wheel	kg. eq CO ₂ / kWh	0,046	0,180	0,014	0,383	0,189

The emissions on each specific train route are calculated on the basis of rail mileage data for the different country rail networks crossed by the train. The kilometers in the Channel Tunnel are considered to be on the French network, as 90% of the electricity used in the tunnel comes from the French electricity network (GetLink data).

Average CO₂e emissions per passenger for flights are calculated using combustion emissions from International Civil Aviation Organization (ICAO) calculator, with an additional upstream emissions (WTT) based on the DGAC (direction Générale de l'aviation civile) ratio of 22%. The additional non-CO₂ effects (condensation trails and cirrus clouds) are not taken into account.

Distance travelled by 1 passenger making the same specific journey by car (thermal and electric) are calculated by Google maps "fastest journey" option in accordance with the

recommendations of the methodological guide published by the French government for GHG information on transport services.

For thermal cars, the emissions factor used is average for a combustion-powered car (averaged fuel) on a long-distance journey at 171gCO₂/km, taken from the ADEME (French Agency for Ecological Transition) Carbon Base.

Average CO₂e emissions for electric vehicle journeys (alone and carpooling), excluding manufacturing and infrastructure, are based on the hypothesis of average consumption of 18kW/100km with an assumption of random recharging during the journey (electricity emission factor using the emission factors of the electricity mix of the countries crossed, weighted by the number of kilometres travelled in each country). Electricity emission factors are calculated on the basis of the IEA for the direct emissions and the EcoTransIT database for the upstream emissions, using the values in the table below.

			FR	BE	NL	GE	UK
Country Emission factor	WTW - Well To Wheel	kg. eq CO ₂ / kWh	0,046	0,180	0,405	0,383	0,233

For car-sharing journeys (thermal and electric), 2.2 passengers are considered, as per ADEME long-distance car travel load factor.

For coaches, the distance travelled on the same specific journey by coach are calculated by Google maps "fastest journey". Emission factors for coach (well-to-wheel) is 25.5 gCO₂e/person-km on a long-distance journey, taken from the ADEME Carbon Base (French Agency for Ecological Transition), HBEFA modelling (Manual of Emission Factors for Road Transport), ARAFER (Autorité de Régulation des Activités Ferroviaires et Routières) 2019 data, and the CGDD (Commissariat Général au Développement Durable), thus using an average occupancy rate of 62%, i.e. around 30 people per coach.

For the channel crossing, an average of 2kgCO₂e per car per channel crossing on the Shuttle train though the tunnel is considered, based on the Getlink/Shuttle study performed by Carbone4. Coaches transported through the tunnel on the Shuttle are accounted for 5 equivalent-cars (as per Getlink/Shuttle recommendation).