

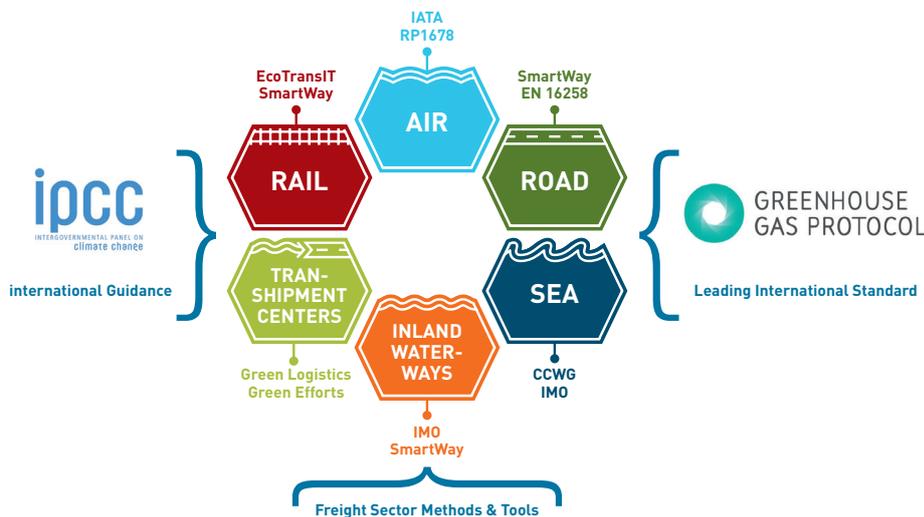
GLEC FRAMEWORK FOR LOGISTICS EMISSIONS METHODOLOGIES

HARMONIZED EMISSIONS ACCOUNTING ACROSS THE MULTI-MODAL TRANSPORT CHAIN.

Freight transport forms the backbone of today's global economy. Companies are increasingly being asked to report and systematically reduce their greenhouse gas (GHG) emissions, giving companies with smaller carbon footprints a competitive advantage. Tracking GHG emissions can be challenging because there are so many methodologies and reporting formats requested by different customers, countries and programs. To create a universal way of calculating logistics emissions, Smart Freight Centre established the Global Logistics Emissions Council, or GLEC. GLEC is a group of companies, industry associations and programs backed by leading experts, governments and other stakeholders. Together we created the GLEC Framework for Logistics Emissions Methodologies to make carbon accounting work for industry.

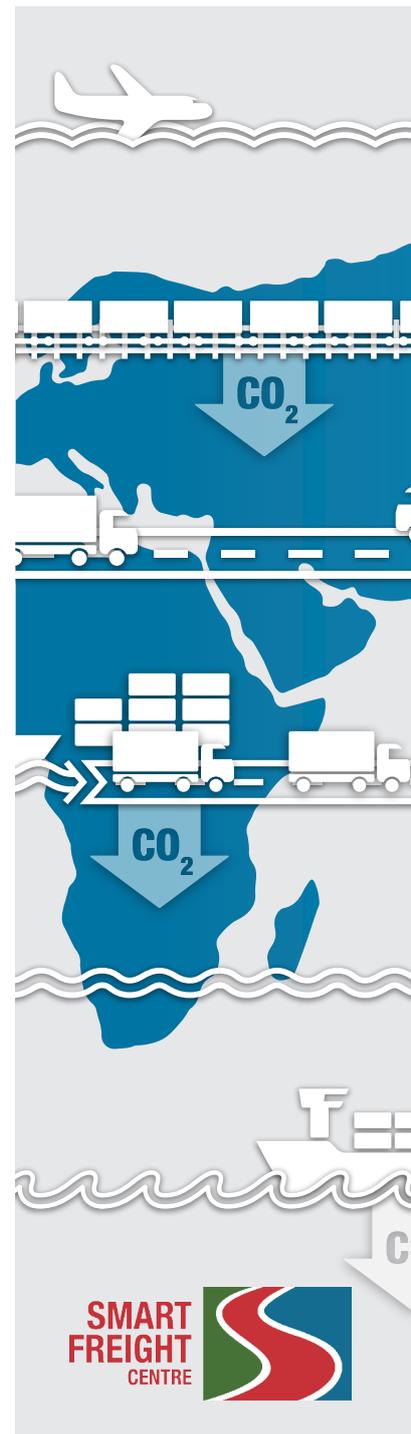
The GLEC Framework

- Can be used by shippers, carriers and logistics service providers
- Covers all modes of transport and transshipment centers across the global logistics supply chain
- Combines existing standards and methodologies and carries the Built on the GHG Protocol Mark



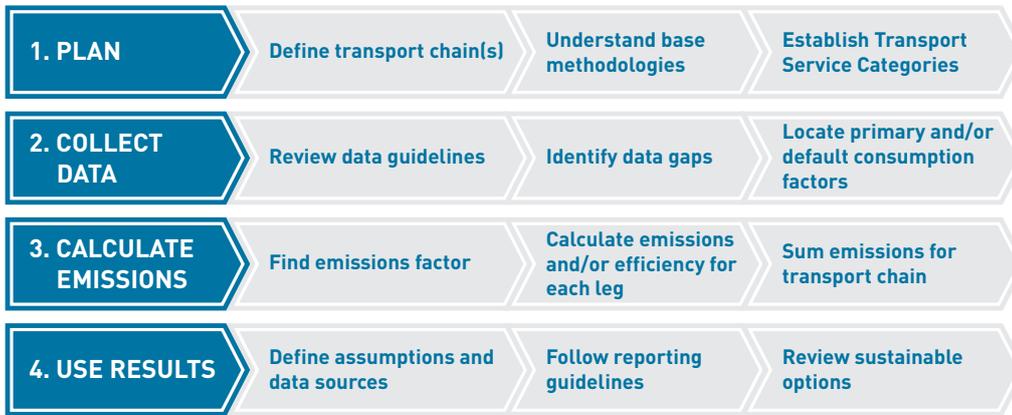
Benefits of the GLEC Framework

Greenhouse Gas Emissions Reporting	Logistics Business Decisions
<ul style="list-style-type: none"> ■ Corporate GHG accounting (scope 1 & 2) 	<ul style="list-style-type: none"> ■ Informing emission reduction strategies
<ul style="list-style-type: none"> ■ Value chain GHG accounting (scope 3) 	<ul style="list-style-type: none"> ■ Mode or route choice
<ul style="list-style-type: none"> ■ Product carbon footprinting 	<ul style="list-style-type: none"> ■ Fuel efficiency monitoring
<ul style="list-style-type: none"> ■ Voluntary and mandatory reporting 	<ul style="list-style-type: none"> ■ Carrier selection
<ul style="list-style-type: none"> ■ Eco-labels 	<ul style="list-style-type: none"> ■ Risk management
<ul style="list-style-type: none"> ■ Carbon trading programs 	



ESTIMATING EMISSIONS WITH THE GLEC FRAMEWORK

Unlike regulated air pollutants like Particulate Matter or SO_x, GHG emissions are typically estimate, not directly measured. The process flow for calculating emissions from a multi-modal supply chain using the GLEC Framework is shown below.



KEY STEPS IN THE GLEC FRAMEWORK

→ Define transport chain

Find the mode of transport and start/end point for each element of the transport chain. Note the type and location of transshipment centers such as ports, terminals or warehouse.



→ Establish Transport Service Categories

Transport service categories (TSCs), such as those for sea shown below, represent the way that freight transport services are procured and provided. Round trip journeys with similar characteristics are considered over a 12-month period to best represent the energy intensity and resultant emissions of the actual transport service.

ALLOCATION UNIT	CONDITION	JOURNEY TYPE	CONTRACT TYPE
Dry Bulk	Ambient	Trade Lane	Shared
Liquid Bulk			
Containers	Temperature Controlled	Other Route	Dedicated
Pallets			
Mass-limited General Cargo			
Volume-limited General Cargo			

→ Collect shipment data

For each transport chain element:

- Determine the weight of the freight being shipped. Depending on the mode of transport, this may include packaging materials like pallets
- Determine the distance by following the modal guidance for distance calculation in the Framework

→ Choose appropriate consumption factor

The consumption factor is a fuel efficiency metric specific to freight movement - it represents the average fuel use to move one tonne of freight for one kilometer. Specific guidance for conditions specific to each mode and node is in the GLEC Framework.

- Ideally the carrier for each transport chain element will calculate the consumption factor for their operations based on their actual fuel use
- If the carrier is not able to provide the consumption factor for their operations, default consumption factors are provided in Module 1 of the GLEC Framework
- Improve accuracy by using consumption factors for transport service categories, as defined in Section 4 of the GLEC Framework

$$\text{Consumption factor} = \frac{\sum \text{fuel}}{\sum (\text{tonne} * \text{km})}$$

→ Calculate greenhouse gas emissions

Find the fuel use for each transport chain element by multiplying the shipment information (tonne-km) by the consumption factor (fuel use per tonne-km). Multiply the amount of fuel used by the fuel-specific emissions factor to calculate the GHG emissions. Calculate each fuel separately; emissions factors can be found in Modules 2 and 3.

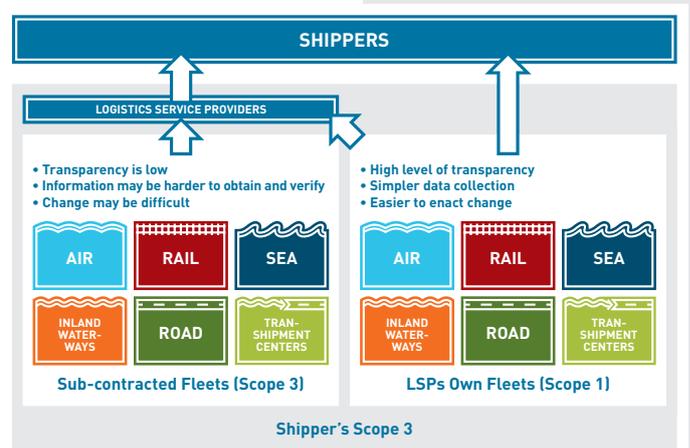
$$\text{Greenhouse gas emissions} = \text{fuel} \times \text{fuel emission factor}$$

→ Use results for sustainable decision making

Results from the GLEC Framework have many applications. Consider the emissions from individual transport chain elements to understand where hotspots are within a transport chain. Add the emissions from each transport chain element to find overall transport chain emissions and how they contribute to corporate emissions. Use the consumption factor to understand the GHG efficiency of different modes, carriers and transport service categories.

IMPROVING ESTIMATES WITH THE GLEC FRAMEWORK

Primary data based on actual fuel use lead to more informed decision-making and improved GHG estimates, but the data are not yet widely available across the supply chain. Establishing structure and consistent data collection guidelines based across the transport chain based on the GLEC Framework will help to reduce the resource intensity of gathering data and improve the quality of emissions estimates. Guidance for data collection can be found in Chapter 5, and default data in Modules 1, 2 and 3.



DRIVING ADOPTION OF THE GLEC FRAMEWORK

The next step towards aligning carbon accounting in the logistics sector is to drive the acceptance and use of the GLEC Framework by industry, government and other players.

Our plans are as follows:

- Promote adoption by companies and advocate for the integration of the GLEC Framework into, for example, carbon accounting tools, green freight programs, ISO and national standards and the Global Green Freight Action Plan.
- Continue to deepen the GLEC Framework through further harmonization and adding detail for air, inland waterways and transshipment centers, developing factors for emissions per tonne-km for different modes and regions, and expansion with black carbon and other emissions.
- Develop enablers for carbon accounting and reporting to drive action towards a low carbon and efficient logistics sector. Enablers include methodology application guidance, verification & certification, data interface & exchange, and eco-labels and other business incentives.

SUPPORT THE ADOPTION OF THE GLEC FRAMEWORK

Several multinational companies have already started applying the GLEC Framework, leading the way for adoption across industry. We invite your company to join a growing group of GLEC companies and stakeholders. Test how the GLEC Framework can provide a more accurate carbon footprint for your business decisions, and share your experience. Demonstrate your commitment to a more competitive and environmentally sustainable freight sector today. Support the adoption of the GLEC Framework as the universal logistics standard.

GLEC Members

Companies:

- DB Schenker
- DHL
- Electrolux
- GEODIS
- Hapag-Lloyd
- HP
- Kuehne + Nagel
- Maersk
- Sainsbury's
- SNCF
- STEF
- TNT

Consultees:

- Ahlers
- BNSF
- Dearman
- ERG
- Greencarrier
- Intel
- NPRC
- Ron Finemore Transport
- STC-Group
- Waterwegen en Zeekanaal NV

Industry Programs:

- Clean Cargo Working Group (BSR)
- Green Freight Asia
- Green Freight Europe
- Lean and Green
- NTM

Associations:

- AUTF
- CLECAT
- IATA
- IRU
- TIACA
- UIRR

Consultees:

- European Barge Union
- ECTA
- European Shippers Council
- European Skippers Organisation
- FTA
- Global Shippers Forum

Experts:

- Buddy Polovick, US EPA SmartWay
- Colin Smith, Energy Savings Trust
- Jens Froese, Jacobs University
- Kerstin Dobers, Fraunhofer IMP
- Marc Cottignies, ADEME

Institutes/other:

- ACEEE
- Clean Air Asia
- EcoTransIT World
- EICB
- Energy Saving Trust
- Fraunhofer IML
- ICCT
- ITBA
- TK'Blue
- The University of Sheffield
- World Resources Institute

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