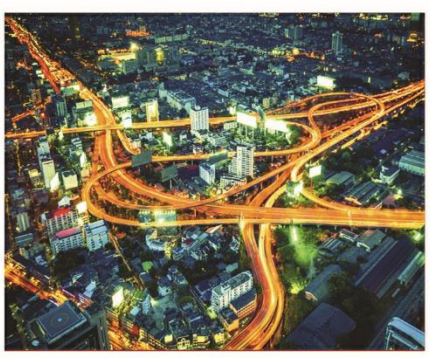
SMART FREIGHT CENTRE

ACCOUNTING FOR LOGISTICS EMISSIONS IN CITIES USING INDUSTRY BEST PRACTICES

Comparison of the Global Protocol for Community-Scale GHG Emission Inventories and the GLEC Framework for Logistics Emissions Methodologies









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This document was developed by Smart Freight Centre at the request of ICLEI with the goal of considering how a logistics-centered methodology could be developed for cities that capitalizes on the success of industry initiatives.

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About Smart Freight Centre

Smart Freight Centre is a global mission-driven organization dedicated to a more efficient and low-emissions global freight sector. We bring together the global logistics community to drive transparency and mobilize multinational companies and their logistics partners to take action. This is done through global industry guidelines and solutions for emissions calculation, reporting and reduction, the first of which is the GLEC Framework, and by recognizing Smart Freight Leaders. To scale our impact we are present in Europe, the Americas and Asia and collaborate with existing initiatives, partner organizations and experts worldwide.

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1. Introduction

The logistics sector is expected to triple over the next two decades, largely due to global supply chains connected by fossil fuel powered vehicles and vessels. Ultimately these trucks, planes, trains and ships intersect with urban areas, raising local air quality concerns alongside global climate issues.

Balancing logistics growth with sustainable development goals will require the alignment of industry, government and investors, and the interface of freight with cities offers a unique potential for collaboration. Carbon emissions[1] are a beneficial starting point for interaction; carbon is emblematic of sustainability as a whole and offers a common metric for tracking climate and air quality impacts that resonates with stakeholders from all perspectives.

For companies, the most common application of carbon emissions is annual disclosure reports, allowing for year to year tracking and benchmarking for cities or companies. Carbon is also growing as a valuable decision-making metric, allowing for a data-driven consideration of climate against cost, quality and other considerations. For example, shippers can consider the emissions of a transport supplier or mode when making supply chain decisions, and carriers can use emissions to drive vehicle selection, facility location or vehicle routing.

From the government perspective, reporting is also a clear mandate, as part of the Paris Accords and other initiatives. Beyond reporting, it is vital that long-term investment decisions around freight transportation infrastructure, such as ports, bridges and highways, align with climate and air quality goals. Emissions can also be used to identify where subsidies and/or policies could support the adoption of low emissions vehicles or vessels.

While climate change disclosure has become somewhat of a norm, tracking logistics emissions remains a challenge. Many companies still struggle to understand how to track and reduce logistics emissions in their supply chains. Cities, regions and countries often exclude logistics emission from climate commitments or rely on partial information.

This document will put forth a strategy to improve collaboration between industry and cities in order to improve the ability to use carbon as a meaningful climate-tracking mechanism. The discussion will be framed around how companies currently track emissions using the *Global Protocol for Community-Scale GHG Emission Inventories: An Accounting and Reporting Standard for Cities* (henceforth Global Protocol) and the *Global Logistics Emissions Council Framework for Logistics Emissions Methodologies* (GLEC Framework). Areas where current emissions accounting methodologies align and diverge will be laid out, with the goal of identifying the best practices established by both methods. Particular focus will be on data availability and quality. The report will conclude with recommendations for a path forward for implementation.

[1] Carbon emissions is used here to represent climate pollutants including greenhouse gases and black carbon.

2. Aligning Calculations

This section provides a summary of the key elements of the two methodologies, highlighting areas of harmonization, areas of misalignment and suggesting how harmonization could be achieved.

Scope and Boundaries

Carbon emissions. Both methods account for all Kyoto Protocol gases, although the reporting structure differs. The GLEC Framework asks for GHGs to be converted to CO2e, while the Global Protocol asked for each gas to be summed separately. The GLEC Framework also provides a module for black carbon.

Time period. Both ask for emissions to be calculated based on an annual basis.

Fuel life cycle. The GLEC Framework asks for well-to-wheel accounting, or full life cycle emissions, for all energy sources. The Global Protocol specifies full life cycle emissions for stationary energy, but does not specify a method for transport. If well-to-wheel emissions factors are adopted, the methodologies align.

Base methodologies. Both methods tie to the IPCC Guidelines for National Emissions Inventories as a baseline. The GLEC Framework is in alignment with the Global Protocol's sister method, the Greenhouse Gas Protocol, and a number of other mode or country specific methods.

Scopes of accounting. The three scopes of emissions accounting are applied in each method, though they are used differently in some cases. The below table summarizes emissions scopes for cities versus industry.

	Global Protocol	GLEC Framework	Alignment
Scope 1	Emissions occurring inside a city's geographic boundary.	Emissions from a company's equipment or infrastructure assets.	There is alignment in the concept of one party's own assets, though the boundary is different: one is dictated by a company's where the other is by geographic boundary. Alignment is most similar to transhipment centers, which are often distinct geographic areas that include various buildings, equipment and vehicles/vessels but also interface with equipment from shipping or receiving companies. There is also a similarity with the role of shippers under the Framework, where many logistics activities are provided by a third party.
Scope 2	Emissions from electricity consumed within a city.	Emissions from electricity consumed by a company's own assets.	The principle is the same, though again the difference is by corporate and geographic boundary.
Scope 3	Emissions that occur outside the city boundary as a result of activities taking place within the city.	Emissions resulting from subcontracted logistics services or activities.	The principles for cities are similar to a shipper's scope 3, though the ability to understand freight delivery to a city is more limited.

Logistics coverage. Simply put, the GLEC Framework covers all modes of freight transport (air, rail, road, sea, inland waterways) and transhipment centers (ports, warehouses, terminals). For the Global Protocol, all of these items occur in the scope 1 and 3 of most cities, organized as follows: stationary energy, transportation and industrial processes. The Global Protocol allows for different levels of reporting, BASIC or BASIC+; the areas that related to the logistics sector are summarized below.

	Scope 1	Scope 2	Scope 3	Alignment?
Stationary Energy A) Fuel and electricity related to the operation of buildings and facilities within the city boundaries	Required for BASIC	Required for BASIC	Required for BASIC+	√ This category corresponds to transhipment centers. This is required for the GLEC Framework, but transhipment centers are more difficult to track in the industry scope 3 - this is where cities may contribute to industry knowledge.
B) Intentional and unintentional emissions from the extraction, processing, storage and transport of fuel to the point of final use.	Required for BASIC	Not required	Not required, lumped into "Other Scope 3" category	√* This is required in the GLEC Framework for all scopes, referred to as well-to-tank emissions from fuel and electricity. Alignment is possible if well-to-wheel emissions factors are used. Fugitive emissions are not required, but recommended.
Transportation Fuel and electricity related to the operation of air, inland waterways, sea, rail and road.	Required for BASIC	Required for BASIC	Required for BASIC+	√* This covers the transport modes in the GLEC Framework for both scope 1 and 3. * The Global Protocol includes all modes of transport, not only those related to freight movement.
Industrial processes GHG emissions related to the use and disposal of refrigerants.	Required for BASIC	Not required	Not required, lumped into "Other Scope 3" category	√* This aligns with the GLEC Framework's requirements for refrigerants used for cooling activities during freight transport and storage.

Method. Approaches to emissions accounting are typically top-down or bottom-up, often depending on the scope or the information available. Both the GLEC Framework and Global Protocol allow both methods in different scenarios - the GLEC Framework depends on the of reporting scope while the Global Protocol depends on the information available.

	Global Protocol	GLEC Framework	Alignment?
Top down	All fuel sold within city boundaries is converted to CO2e, regardless of where it's burned. Data source: government fuel records	All fuel burned in scope 1 is converted to CO2e Data source: fuel receipts or financial records	√ The Global Protocol recommends starting with a top-down assessment and the refining towards a bottom up approach.
Bottom up	Kilometers driven are allocated by vehicle	Scope 3 tonne-kilometers are refined by	Misalignment is based on the lack of inclusion of shipment weight in the

	Global Protocol	GLEC Framework	Alignment?
	type, and converted to fuel based on default factors, then to CO2e. Data source: government records, academic research, statistical data	mode and vehicle type (where available), and converted to fuel burn then CO2e. Data source: cargo shipment records, supply chain maps	Global Protocol. In the end, freight efficiency is judged on the tonne-kilometer. There are ways cities can estimate this. That said, shipment data is a major challenge for cities and for company supply chains, which can be improved through collaboration.

Data

As with all carbon accounting, finding data is the biggest challenge, and the type of data required varies by the top down or bottom up methodological approaches described above.

Carriers have the trifecta of data that will lead to the most precise figure: fuel burn, kilometers driven and weight shipped. Alongside vehicle information, these data provide the information needed to calculate GHGs and black carbon. For shippers, they know what is being carried and often know who carried it, but don't necessarily know the vehicle or route employed.

Cities typically have a more experience with passenger transport and generally don't have information about the freight is being moved around the city, the weight, origin, carrier are likely unknown. Cities do tend to understand vehicle movements, such as kilometers driven, as well as information on the vehicles registered within city limits.

Weight and distance are the key to estimating freight emissions, and the Global Protocol references a model for passenger transport that could be adapted to freight activity, substituting tonne-km for passenger-km. Default values for empty running and load factor provided by the GLEC Framework, or collected from carriers operating in the city, can be used alongside information on vehicle type and kilometers traveled to get to a tonne-kilometers.

Tonne-kilometers = Vehicle capacity * distance travelled * % loading (when loaded) * % miles loaded

Tools or reporting protocols should work gather and share these types of information, and drive towards increasing levels of harmonization and accuracy.

Reporting

Emissions reports from either method can be done multiple ways, depending on the audience or purpose. As long as the calculations are generally aligned and any deviations or assumptions are clearly defined, there is no difference in the reporting requirements that would preclude results from being used for reporting and decision making.

Reporting for the Global Protocol is based on total emissions, whereas the GLEC Framework allows for reporting by annual emissions and emissions intensity. Intensity metrics include annual average emissions per tonne-kilometer, tonne shipped, product or other areas of analysis. This is a practice that should also be applied for cities, as different intensity metric could be useful for different types of policy or infrastructure decisions.

The Global Protocol suggests ways in which annual emissions figures can be separated by fuel, sector or subsector. This strategy has also been suggested in the Framework, particularly for differentiating emissions for profiles for different activity types, such as refrigerated transport, or for different fleets, such as a fleet of electric vehicles. This type of detailed reporting is typically reserved for companies doing more advanced emissions accounting, but the technique shows strong promise for improving data driven decision making that could align well with cities.

A small difference that could impede easy communication is the requirement of the Global Protocol to report emissions separately for each greenhouse gas, which would require a potentially significant challenge to industry systems particularly for supply chain reporting. While disaggregating CO_2e would help to track potentially growing emissions for methane, allowing for CO2e as a sum total would help to broken information sharing at least at a starting point.

Similarly, the GLEC Framework allows for the accounting of black carbon, due to its impact on climate coupled with air quality concerns. This practice could also be applied to cities, and may even be easier to apply for road freight, as cities often have estimates of kilometers traveled, the metric used for black carbon.

3. Towards Improved Urban Freight Emissions Accounting

Through emissions accounting, cities and companies can work together to track and reduce emissions. In fact, the simple process of aligning methodologies is a beneficial step to improving communication, opening the lines of communication, finding commonalities in climate goals and allowing for benchmarking.

The practices undertaken by the GLEC offer a roadmap for how a city and country collaboration could take place and how tools can be developed to support calculation and data sharing. The GLEC Framework was novel for its coverage of all logistics services and activities, which brought together a group of transport suppliers and buyers, governments and industry groups around the globe. Understanding how each stakeholder currently calculates emissions through structured, in-person and virtual interactions led to the development of a Framework that has garnered broad buy-in and credibility. Beginning with CO2e allowed for a build-up of internal expertise and data required for the next level of GLEC implementation - black carbon accounting.

It is important to assemble a team of experts from industry, government and beyond that can contribute practical knowledge on how emissions accounting strategies are implemented. Ideal partners from companies include sustainability reporting specialists, logistics procurement professionals, logistics managers and other transportation or sustainability specialists. From government, ideal candidates might be from the Department of Transportation, Urban Planning, Environment or Air Quality. Other stakeholders may include subject matter experts from green freight programs, academia, calculation tools and NGOs.

It is important that the convening group is neutral. The GLEC was led by Smart Freight Centre, which acted an impartial agent, listening to both sides of the table and providing opportunities for engagement. A neutral party can also process sensitive data that companies may be reticent to share with government or public bodies, allowing for communication of information without a perceived business risk.

Funding is also an important point. The convening party should be independently funded, or funding should be equally shared between stakeholders. Funding will be required for at least two years, ideally fully funded beforehand in order to find and keep high quality staff for the duration of the project and to eliminate the need to fundraise mid-project. The project should include funding for two to three in-person meetings per year. Travel grants may be needed to encourage the engagement of underfunded entities or experts.

Tools created as part of the methodological development have an opportunity to align with company and city practices. Beyond following the harmonized methods, tools should make room for data to mature over time, providing a clear pathway for companies and cities to grow from default to actual data. Tools can also serve as a data collection receptacle, following the practices established by US EPA SmartWay or Clean Cargo Working Group.

4. Conclusions

The growth of the logistics sector, coupled with its heavy dependence on fossil fuel, makes it a prime target for climate action. Logistics has proven itself a difficult industry to track for both cities and industry, which creates an opportunity for collaboration between various stakeholders to meet mutual climate and air quality goals.

Current methodologies used by industry and cities are close in alignment, but require some changes to reach full harmonization. A collaborative effort to create a city-based logistics methodology would be a helpful process in opening communications between government and industry, allowing for open discussions and providing a neutral space for data sharing and tool development.

Improving the communication on climate will help both sides of the table. Companies and cities can use carbon as a data-driven decision metric, which is critical for long-term investments like warehouses, ports, vehicles, vessels, bridges and so on. Creating low carbon strategies for fuel savings, renewable energy adoption and fleet renewal can all be tracked by carbon emissions accounting, allowing communities to make progress towards climate goals.




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