



**Smart Freight  
Centre**



# **Carbon Insets for the Logistics Sector**

Innovating carbon offset practices  
to accelerate freight decarbonization

White Paper  
November 2020

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Suggested citation: Smart Freight Centre and DPDHL Group. Carbon insets for the logistics sector: Innovating carbon offset practices to accelerate freight decarbonization. 2020.

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**Acknowledgements**

This whitepaper was written by Suzanne Greene in collaboration with Kathrin Brost, Noelle Fröhlich and Joachim Kunz of Deutsche Post DHL Group. The paper builds on Suzanne's work at the Massachusetts Institute Technology's Sustainable Supply Chains initiative, including the 2019 Nature Sustainability paper [Carbon Offsets for Freight Transport Decarbonization](#), written in collaboration with Cristiano Façanha of CALSTART, and the research of Catherine Dame and Abdelrahman Hefny with the MIT Supply Chain Management Program. The paper also benefited from the contributions of Eszter Toth-Weedon and Sophie Punte of Smart Freight Centre as well as Janina Gröhn, Bettina Paschke, Stephan Schablinski and Christoph Schönwandt from DPDHL.

**About Smart Freight Centre**

Smart Freight Centre (SFC) is a global non-profit organization dedicated to an efficient and zero emissions freight sector. We cover all freight and only freight. SFC works with the Global Logistics Emissions Council (GLEC) and other stakeholders to drive transparency and industry action – contributing to Paris Climate Agreement targets and Sustainable Development Goals.

Our role is to guide companies on their journey to zero emissions logistics, advocate for supportive policy and programs, and raise awareness. Our goal is that 100+ multinationals reduce at least 30% of their logistics emissions by 2030 compared to 2015 and reach net-zero emissions by 2050.

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# Executive Summary

Carbon offsets are being put forward by shippers, carriers and logistics service providers as a means to reaching climate targets for freight transportation – compensating emissions that they are unable to mitigate within their operations or supply chains.

While offset projects for transport exist, they make up only 0.2% of the US\$269 million voluntary carbon offset marketplace. Funds spent outside the transport sector, such as on forestry projects, are meaningful, but won't advance the decarbonization of the global freight transportation network itself.

This white paper proposes a new pathway for freight decarbonization, where offset funding is directed to address impacts inside the logistics supply chain – a practice known as carbon insetting.

There are many types of projects that could be widely applied to freight, such as for sustainable fuels, fleet renewal programs, engine retrofits, and efficiency projects – all of which would provide meaningful climate impact reduction, as well as benefits for public health and safety.

Freight carbon insets can build on the existing experience with Renewable Energy Credits as well as worthwhile projects for aviation, shipping and road freight.

## We propose five key actions to advance carbon insets for freight transportation:

1. New methods and guidelines for carbon inset accounting and reporting, based on the GLEC Framework and other existing and emerging standards. This should take into consideration accounting issues such as additionality, double counting, leakage and co-benefits.
2. Acceptance of carbon inset investments as a viable means for scope 3 emissions reduction.
3. A communications strategy that showcases the climate impacts and co-benefits of freight decarbonization projects.
4. A pledge for investment in freight-related carbon insets by shippers and logistics service providers.
5. A suite of diverse and meaningful freight decarbonization projects in the marketplace

Freight carbon insets are the missing piece in the decarbonization puzzle. Through a carbon insetting strategy, companies can work together to finance the low-carbon trucks, ships, planes and trains required to meet global climate goals and individual company climate targets.

We invite you to join us on this journey to explore how freight carbon insets can accelerate the decarbonization of the global freight networks that we all share.

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# Why carbon insetting

The freight transport sector and its millions of users are facing a challenge: how can we achieve global climate goals while carrying billions of tons of cargo each year on equipment powered largely by fossil fuels?<sup>1</sup> The green transport revolution – usually framed as an electrified, autonomous, shared and connected transport system – will require sustainable technologies to be deployed on a global scale.<sup>2,3</sup>

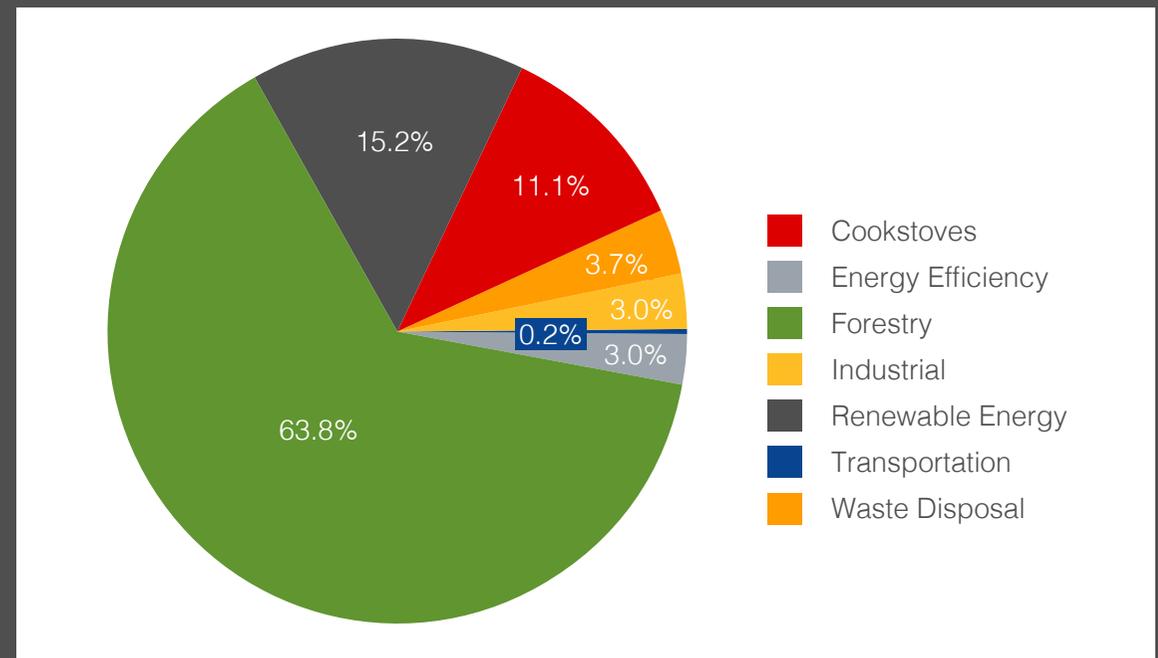
The shared nature of global freight networks illuminates an opportunity for transport operators and users to band together to jointly invest in green transport. Carbon offsets that decarbonize transportation do exist but are an under-represented sector in the global offset marketplace. In 2018, they represented only 0.2% of the nearly US\$269 million voluntary carbon offset market.<sup>10</sup>



## Did you know?

### INVESTMENTS IN OFFSETTING BY CATEGORY

Only 0.2% of US\$269 million voluntary carbon offset investment in 2018 went to transportation.



Source: Ecosystem Marketplace. Financing Emissions Reductions for the Future: State of the Voluntary Carbon Markets 2019

Instead, these funds went to forestry, renewable energy, and other offset projects. While these are certainly beneficial projects, the fact is, they don't reduce greenhouse gas emissions from the transport sector itself, nor its related co-pollutants, like black carbon, ozone, and nitrogen oxides.<sup>4</sup>

Spending money on non-related offsetting projects creates a repetitive cash-out without any correlation to the business. We believe there is another way forward. Aligning carbon offset investments with supply chain climate impacts – a practice referred to as carbon insetting – would unlock vital funds that could be used to decarbonize the global freight transportation network.

Carbon insets would not only contribute to achieving the UN Sustainable Development Goals, Paris Agreement targets and corporate climate goals, but would also result in structural improvements to logistics assets and infrastructure.

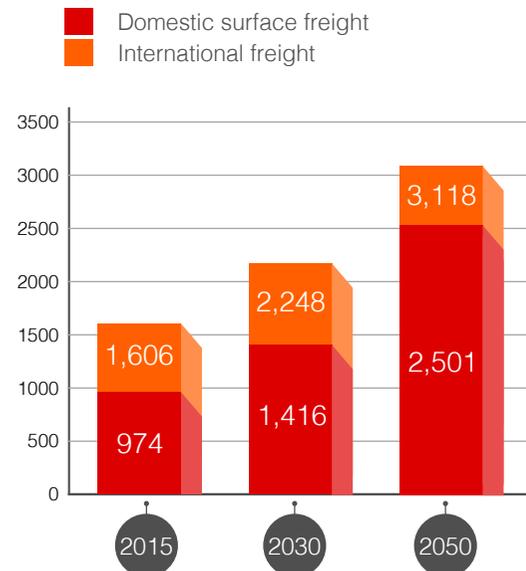
While there is vast potential to apply carbon insets to freight transportation, there is a need for an industry-wide initiative to further develop and advance the concept.<sup>7</sup>

➤ This white paper provides a starting point for discussion, exploring promising applications for carbon insets within the freight sector, identifying roadblocks, and proposing a strategy to move forward.

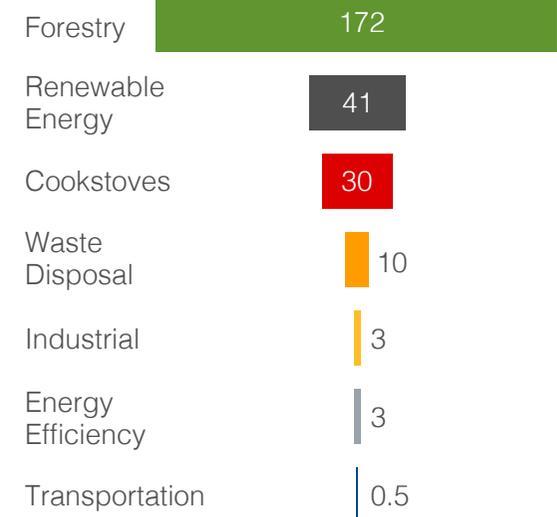


## Did you know?

**Growth in CO<sub>2</sub> (in million tonnes) emissions from freight in transport if business continues as usual**



**Millions of dollars spend on voluntary carbon offsets in 2018**



Source: ITF & OECD. 2019 International Transport Forum Outlook. 2019.

Source: Ecosystem Marketplace. Financing Emissions Reductions for the Future: State of the Voluntary Carbon Markets. 2019.

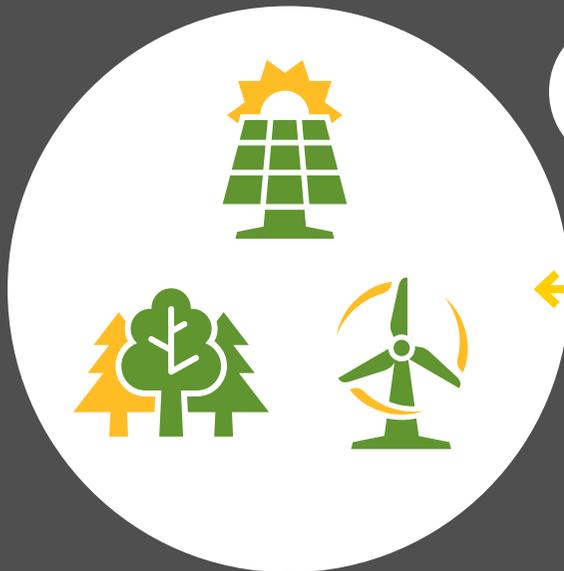


### Did you know?

## OFFSETTING VS. INSETTING

**Inseting makes sense** - you invest money in your subcontractors and/or the freight transportation industry as a whole and help to drive the decarbonization of the sector.

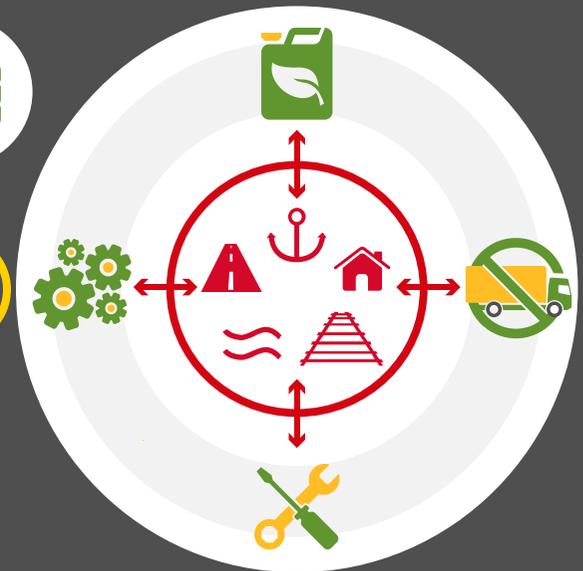
### OFFSETTING



### LOGISTICS SECTOR



### INSETTING



**Carbon offset:** Compensating for climate impacts by funding a carbon reduction project outside the sector of impact.

**Carbon inset:** funding decarbonization measures within the sector where the emissions originated.

# Building on Renewable Energy Certificates

Carbon insets for freight can follow the road paved by renewable energy investment. Organizations routinely invest in Renewable Energy Certificates (RECs) – certificates for energy generated by renewable energy sources. Energy producers register or “book” the amount of renewable electricity they have generated, and customers purchase or “claim” the green electricity. REC is then issued as a proof of purchase, eliminating double counting. Customers may not receive the resulting green electricity themselves but accept that any investment collectively drives our shared energy infrastructure towards carbon neutrality.

When accounted for by accepted practices, RECs are acknowledged by the Greenhouse Gas Protocol as a valid practice to reduce scope 2, electricity-related, emissions. In the US, electricity customers bought nearly 112 million mega-watt hours of green power in 2017 – enough to provide renewable electricity to over 10 million American homes.<sup>8,9</sup>

Like electricity, freight transport is a “sharing economy,” in which freight buyers (shippers and logistics service providers) contract with carriers across the globe to perform the actual movement of goods by train, ship, plane, truck, (motor) cycle or foot, as well as the logistics sites that store and transfer cargo. A freight-focused carbon inset could operate with a similar mechanism to RECs, allowing companies to use their carbon offset dollars to

invest inside the freight sector. With a carbon insetting approach, companies can invest in projects anywhere in the sector, whether they ship their goods using these vehicles, vessels and other logistics assets or not.

Currently, CDP, World Resources Institute, and the Science-Based Targets initiative recognize RECs as a means for reducing scope 2 emissions, but do not allow carbon offsets (or insets) to be used as a means for reducing scope 3 emissions. While this certainly makes sense in some cases – a tree planting does not equal an actual reduction in a company’s impact – for carbon insets, it could be seen differently. For example, if a shipper applies carbon inset funding to the transport networks they engage to ship their cargo, this could be

considered as a quantifiable carbon reduction in that carrier’s scope 3 emissions.

Allowing carbon insets – where the investment matches the sector of impact – will not only enable the financing of decarbonization activities, but will also help shippers and carriers better understand the emissions in their own supply chains – a perennial struggle for many companies. If an accepted protocol for carbon insetting is established, following the REC example, could insets for freight become a meaningful practice to reduce supply chain carbon emissions and reach corporate climate targets?

➤ The next section highlights projects that can be used to do exactly that.



# Carbon insets for freight transport

There are many types of carbon offset and inset projects that can be advanced within the logistics sector. A few examples of projects that could qualify as insets are shown below, though there are certainly others project types that could be advanced.



## Did you know?

### PROMISING INSETTING SOLUTIONS

Some of the top inseting solutions:



Sustainable fuels



Engine retrofits



Fleet renewals/equipment decommissioning



Shipping/logistics efficiency

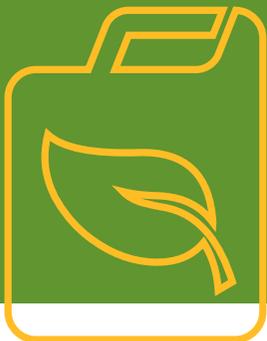
Each solution should be assessed for specific situations, as options are not everywhere equally available or feasible



## Sustainable fuels



- Scaling sustainable fuels like hydrogen, biofuels, or renewable-based electricity will require not only a new set of vehicles, vessels, and locomotives, but also new infrastructure for fuel production and distribution. This leads to a price premium that needs to be surmounted to apply these fuels at scale.
- Similar to offsets for renewable energy, a company could buy into sustainable fuels via a certificate system like RECs, whether they ultimately use the fuel for their own transportation activities or not. This will increase demand for sustainable fuels, speed up the production mid to long term, and accelerate the price breakeven point compared to fossil fuels.



## Equipment decommissioning

- Transportation networks are burdened with old, polluting equipment – especially in the developing world, where out-of-date equipment from developed countries often continues to run for decades.
- Similar to common carbon-offset projects that eliminate high-emission cookstoves, carbon inset funding can also be used to remove high-emission transportation equipment from the global freight transportation network: motorbikes, vans, trucks, ships, or planes.





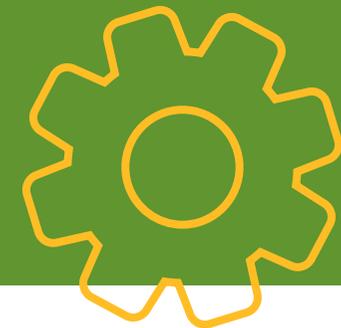
## Engine retrofits

- Existing equipment can be retrofitted by applying technologies such as diesel-particulate filters, which reduce black carbon, or by replacing fossil fuel engines with ones that burn low-carbon fuel.
- This type of project can be less expensive than buying a new truck or ship, and can preserve the truck, ship or train body to eliminate the need for newly manufactured equipment.



## Logistics efficiency

- Upgrading transportation networks with lower carbon technologies is one component of reaching global climate goals – the other is improving efficiency through measures like optimized logistics, driver training programs, and route planning.
- Through efficiency projects, carbon reductions are made by reducing fuel consumption, and thus avoiding emissions that would have been made under business as usual.



# Freight carbon insets in practice

A robust market for insetting solutions in the freight and logistics sector yet has to be developed. Its success is dependent on carbon inset projects being acknowledged by carbon accounting standards and climate target-setting initiatives. However, some lighthouse projects and small-scale insetting solutions already exist and provide a roadmap for how these ideas can be enacted and scaled.

## Towards a “book & claim” mechanism for sustainable aviation fuels – Decarbonizing the global air freight market

Sustainable aviation fuels (SAF) are widely regarded as one of the main solutions to the decarbonization of the aviation industry. However, the availability of these fuels is still limited, and their significantly higher costs compared to fossil-based kerosene does not make their use economically viable. This is why international carbon reduction schemes for aviation – such as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) program implemented by UN’s International Civil Aviation Organization (ICAO) – currently focus mainly on carbon offsets.<sup>10</sup>

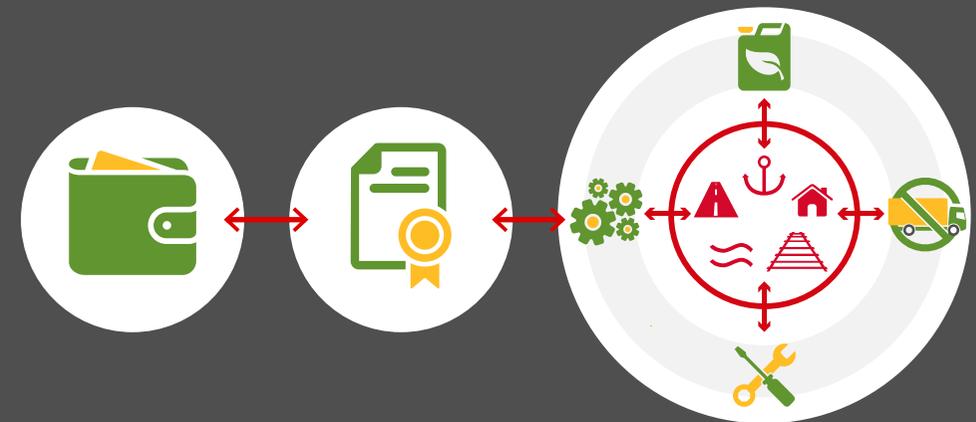
However, offsetting outside the aviation sector will not support the technological shift required to advance carbon neutral air freight solutions. Thus, more and more airlines are taking steps to individually increase their use of sustainable aviation fuels in their operations, in some cases jointly with their customers through green premium products. These efforts offer a roadmap for the advancement of sustainable aviation fuels though they are currently limited to very small amounts of fuel.



### Did you know?

#### INSETS COULD SIMPLIFY DECARBONIZATION

A ‘book & claim’ mechanism can be used to invest in sustainable fuels, similar to RECs.



To connect money with projects a ‘book & claim’ mechanism is needed similar to green electricity certificates.



### An insetting solution.

Setting up parallel supply infrastructures for sustainable fuels at the individual airline level increases the cost for their supply and reduces the environmental benefit of using these fuels.

Furthermore, the current lack of this infrastructure prevents scaling the use of sustainable fuels. A 'book and claim' mechanism similar to what exists for renewable electricity would remove the requirement for physical traceability through a supply chain.

This could operate via the sale and purchase of certificates or inset credits. Such a mechanism would reduce the cost and effort to replace fossil-based kerosene by sustainable alternatives, which would serve to drive the market uptake of certified sustainable aviation fuels and eventually make their use economically viable.

### Accounting methodology & external validation.

An accounting methodology including relevant reporting guidelines, quality criteria and boundaries for sustainable aviation fuel certificates still needs to be developed. This methodology is imperative to ensure sustainability, correct the allocation of emissions, and comparability of efforts taken by all market participants.





## Skicka Grönt – Investing locally into green road freight technologies

The climate-friendly shipping program Skicka Grönt (Swedish for “Send Green”) was initiated by DHL Freight in Sweden as far back as 2002 and relaunched with its current name in 2019. Customers using the program pay a fixed surcharge for every parcel or pallet shipped and the income generated from these surcharges is fully invested in clean technologies within the Swedish transport network.



### An insetting solution.

The concept is simple. DHL signs agreements with carriers in their domestic network in Sweden who want to invest in more expensive clean technologies and helps them to pay for these extra expenses from the Skicka Grönt fund.

Technologies implemented so far include biogas, bio-ethanol, bioDME and renewable electricity. Skicka Grönt contributes to an accelerated technological shift in the Swedish transport system and reduces the additional costs and risks for carriers when investing into climate-smart technology.

This is an example of collaborative action by logistics service providers, carriers and shippers in the shift to more climate-friendly alternatives in the Swedish transport network and has seen a significant increase in volume in years 2019-2020.

### Accounting methodology & external validation.

When customers choose to use this service, they receive a carbon report for their consignment(s) describing the total metric tonne-kilometers shipped by the more expensive climate-smart technology. For quality assurance, the program is audited by an independent Swedish agency. Vehicles and fuels are monitored each month in a capacity-coordination process to ensure that at least as many low-emission metric tonne-kilometers as the total sum of Skicka Grönt ordered by customers are delivered.

## GoodShipping – An insetting solution for sea freight

GoodShipping aims to accelerate the transition to low-carbon transport by increasing the use of biofuels in the industry. Acknowledging the fact that all ship emissions enter the same atmosphere, GoodShipping believes that it does not matter for our climate where or in which ship biofuel is replacing fossil fuel. In this way, GoodShipping developed a flexible but effective way to reduce the emissions from cargo shipments. Apart from reducing carbon emissions, biofuels are essentially free of sulphur which meets the requirements of the IMO 2020 regulation regarding low-sulphur operations. In this way, the transition to clean-burning biofuels allows for substantial reductions of particulate matter, including black carbon, and some improvement of NOx performance.

### An insetting solution.



Shippers using this system contribute to truly green twenty-foot equivalent unit (TEU) kilometers, and the resulting carbon emissions reductions are allocated by GoodShipping to its customers. The exact amount of biofuels purchased by all customers is injected by GoodShipping into ships at several bunkering events throughout the year. The more shippers that use the new service, the higher the share of advanced biofuels for container ships and the lower the carbon emissions.

Within this system, customers do not have to change the current logistics operations of their business by ensuring that their goods are physically shipped on a low-emission vessel. This has several advantages. First, it avoids shippers having to waste valuable resources, and potentially creating even more emissions, chasing down a biodiesel-fueled vessel. Secondly, because biofuels are not yet the norm in the shipping industry, there are not enough locations in the world where

biofuels are currently produced to be able to supply to all ports. And lastly, most climate models measure the emissions of the shipping industry as a whole, which is an approach GoodShipping supports.

### Accounting methodology & external validation.

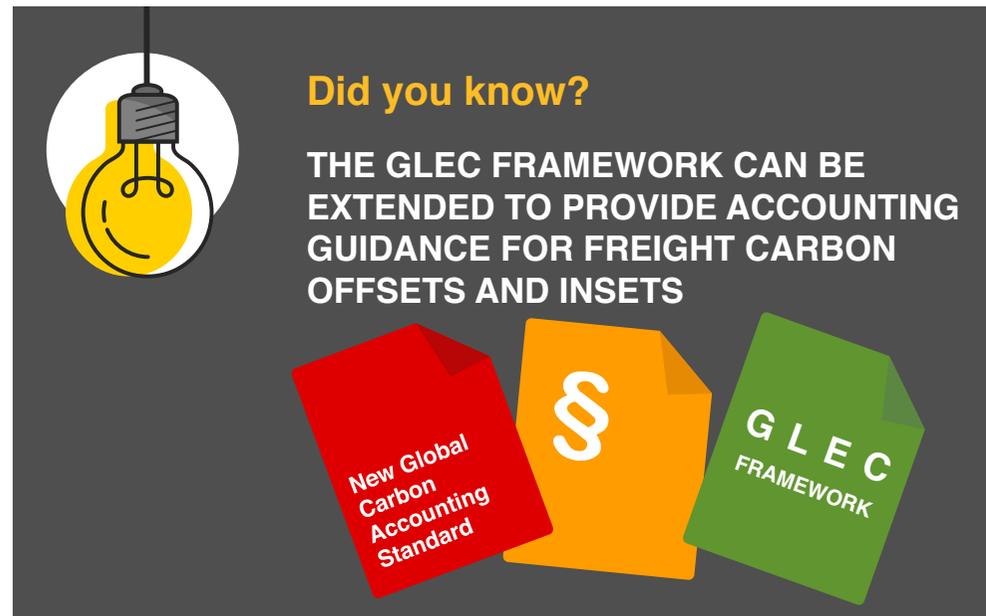
The calculation of carbon emissions is done based on the recommendations in the GLEC Framework, using emissions data from the Clean Cargo initiative and the EcoTransIT World Initiative calculation tool. GoodShipping's environmental benefits are quantified and protected from double claims, and the CO<sub>2</sub> benefits are allocated to the customer. The whole process is audited at least once a year by an external auditor (Ernst & Young in 2020), after which the customer receives an official certificate for the amount of biofuels purchased as well as the corresponding emissions reductions compared with bunker fuel.

# Accounting for freight carbon insets

In order to deliver freight decarbonization at scale, new ideas are needed to accelerate the uptake of sustainable fuels and transport equipment. Carbon insets provide a promising mechanism for the shared funding of these investments.

However, agreement is needed between industry and stakeholders on how these projects can be accounted for and included in supply chain emissions reduction strategies. We must define how carbon insets could evolve within the freight sector. A set of key topics for carbon offsets and insets are presented below as a starting point for discussion with industry and stakeholders.

Industry wide collaboration is needed to define quality and scalable global standards & frameworks to enable decarbonization in logistics.



## Additionality.

A core tenet of carbon offsets is that they must reduce emissions beyond what would have occurred under business as usual. Typically, additionality is assessed on a project-by-project basis, and involves some level of subjectivity, but in general carbon offsets must prove their reductions through a set of tests.

For example, an offset project can't address emissions reductions mandated by law, must be applied towards carbon reduction first and foremost, and can't be used to address capital constraints.<sup>11</sup> How additionality should be interpreted and applied for freight carbon insets is something that should be further explored and defined.

For example, policies for reducing air pollutants such as particulate matter from transport are already common. Could an inset project that addresses greenhouse gases in a region where air quality pollutants are controlled still be considered? Rethinking

additionality in the context of supply chain insets may help to advance more transportation projects.

In another example, if a logistics service provider has substantial aviation emissions, would an inset need to be applied to the aviation sector directly, or can these investments cross to other transport modes if they ultimately amount to logistics supply chain emissions reductions?

## Leakage.

Carbon offset projects must ensure that leakage does not occur – meaning that increases in carbon emissions outside the offset project's boundaries must be tracked and avoided.<sup>12</sup> An example in the freight industry might be if an offset project decommissions a truck, but that leads a company to buy a more efficient diesel truck that they use much more heavily, the project might lead to a net increase in emissions.

The same issue could occur with insets. There is a need to define the



threshold above which a project owner might need to make a deduction, and to further examine pitfalls in freight-related projects that might lead to leakage.

Furthermore, as freight demand is expected to triple in the next three decades, it is imperative that inset investments go towards technologies and fuels that are truly low carbon – allowing carriers to increase their operations without increasing their carbon footprint.

### Double counting.

The rule of thumb in carbon offsets is that a ton of avoided or reduced carbon can only be registered, purchased, and retired one time. Double counting is viewed as a risk to the credibility of carbon offsets, which is why the carbon offset marketplace is backed up with a robust set of verification and certification schemes.

Carbon insets should abide by the same standards of rigor and transparency that govern carbon offsets. Assurance is needed to prevent an inset to be unwittingly, or intentionally, sold twice. A neutrally-governed marketplace could provide

this structure, either through the existing offset marketplace or another similar mechanism.

### Co-benefits.

Carbon offsets that provide an ecological or socio-economic uplift beyond carbon emissions reduction are popular in the marketplace. Addressing a heavy-emitting ship or truck would provide numerous community benefits like improved air quality or safer roads. Industry needs to point out the additional socio-economic benefits of carbon offsetting within the freight sector – an element required for these projects to compete in the marketplace with forestry projects.

The same is true for freight carbon insets. Here the hurdle is not only communicating the compelling co-benefits of freight decarbonization, but also helping audiences to appreciate the meaningful nature of investing within the global freight transportation network.

Quantifying emissions reductions and co-benefits in a robust and transparent way is important and necessitates a widely accepted

method. Ultimately, broad uptake might also require the work of skilled communications experts who can clearly show the public the health, safety, and climate benefits of a clean freight network.

### Accounting method.

Both carbon offset and inset projects must prove avoided or reduced carbon emissions in a transparent and credible way. But the lack of an accounting method that can be applied for logistics projects hinders emissions calculation and verification.

A handful of mode-specific methods exist under the Clean Development Mechanism,<sup>13</sup> the Kyoto Protocol's mandatory carbon offset marketplace. However, there is no overarching method that addresses the specific issues related to transportation for the non-compliance market, nor is there a method to specify the use of carbon insets for supply chain emissions reduction.

Past attempts at developing such a method suffered from a lack of emissions factors to estimate baseline and avoided emissions.<sup>14</sup> However the Global Logistics Emissions



Council (GLEC) Framework – for greenhouse gases – and the Black Carbon Methodology for the Logistics Sector – for black carbon – have bridged that data gap and shored up carbon accounting practices.<sup>15,16</sup>

Most notably, both methods provide carbon intensity factors for all modes of transport, and in some cases for multiple regions, that would form the backbone of an accounting

practice. Both methods also include guidance for suppliers and buyers of freight, allowing both scope 1 and 3 accounting.

The freight sector, its customers, and stakeholders should work to develop guidance based on these two methods that also meets ISO standards, European norms, and the Greenhouse Gas Protocol. This guidance should also be compatible

with carbon offset standards such as those developed by The Gold Standard and the American Carbon Registry. The method should include guidance on how avoided emissions should be calculated, reported, and monitored – and clarify the issues raised above.

Carbon insets, as a new concept with the potential for broad application, may need its own rulebook that

steps beyond the traditional norms of offsetting. An agreed inset method could, for instance, set the rules on how to embed insets in Science-Based Targets and CDP reporting. It could also define how funding can be directed to insets, such as via a surcharge on normal transportation costs charged by a carrier.



# Moving freight carbon insets forward

Moving beyond business as usual is at the core of climate change mitigation. Carbon insets embrace that spirit, adding a new twist to the carbon offsetting trend, matching investments directly to the transport network, presenting a potential for meaningful change. A shift to insetting will require industry and consumers to see the value of an offset applied within the sector, looking beyond optics and marketing to actions that address the impacts of one's own company.

The widespread adoption of insets is hampered by the traditional rules of carbon offsets and their acceptance within carbon accounting and climate goal-setting programs. Reconsidering the status quo, and reinventing business as usual, is something worth taking on as we reach towards our mutual goals to limit climate change.



## **In summary, there are five actions we believe are needed to advance freight carbon insets:**

- 1.** New methods and guidelines for carbon inset accounting and reporting, based on the GLEC Framework and other existing and emerging standards. This should take into consideration accounting issues such as additionality, double counting, leakage and co-benefits.
- 2.** Acceptance of carbon inset investments as a viable means for scope 3 emissions reduction.
- 3.** A communications strategy that showcases the climate impacts and co-benefits of freight decarbonization projects.
- 4.** A pledge for investment in freight-related carbon insets by shippers and logistics service providers.
- 5.** A suite of diverse and meaningful freight decarbonization projects in the marketplace.

Through a carbon inset strategy, companies can jointly invest in a more sustainable transport network while meeting their individual company climate targets. We invite you to join us on this journey to explore how carbon insets can be used to reduce the climate impact of our shared transportation network.

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**Join our journey towards efficient and  
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