Towards efficient and zero emissions global freight and logistics
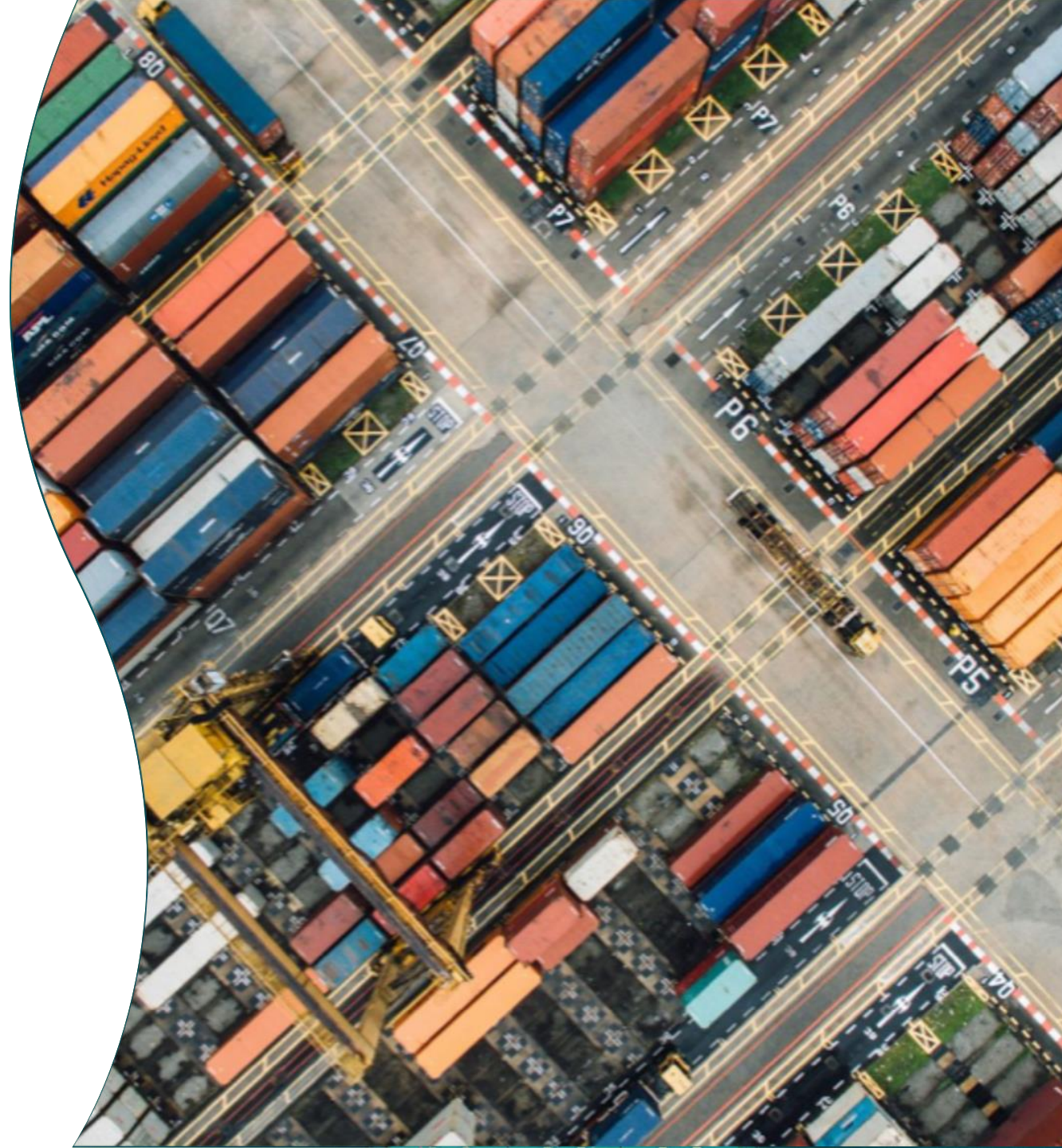
Violetta Matzoros
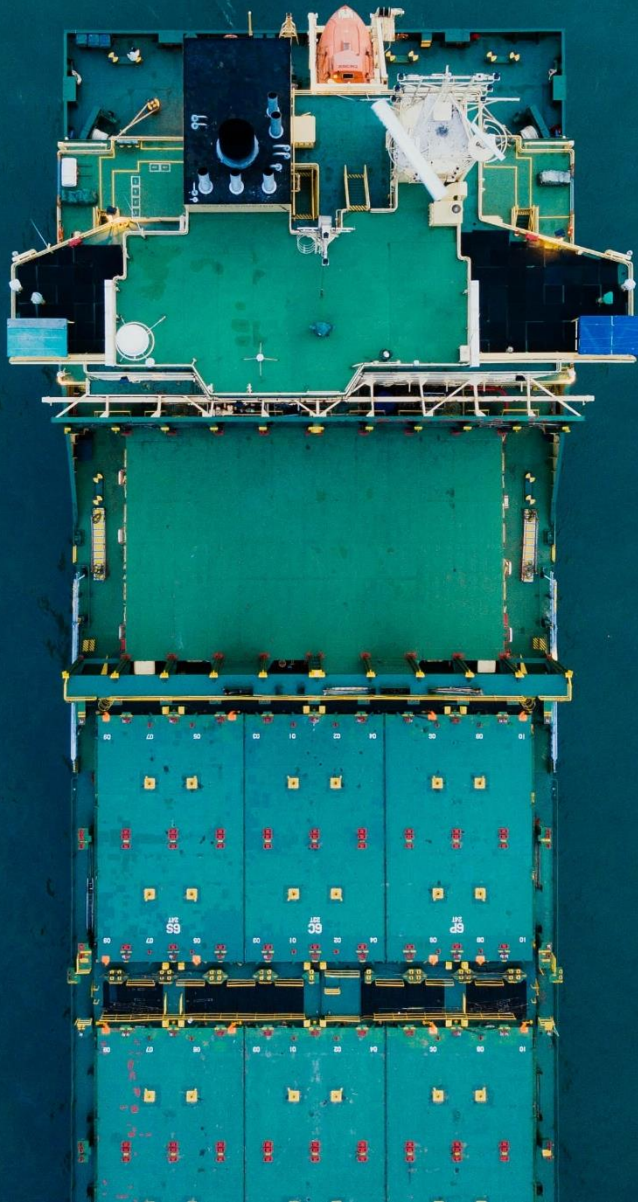Technical Manager, Digitalization Lead

Gabriela Rubio Domingo
Technical Manager, Digitalization

Smart Freight Centre

Who are we?

We guide the global logistics industry to track and reduce its GHG emissions to

Reduce ONE billion tonnes CO_2e by **2030** and to reach **ZERO** emissions by **2050** *or earlier!*

We are an international non-profit organization focused on reducing greenhouse gas emission from freight transportation

We collaborate with our global partners to quantify impacts, identify solutions, and propagate logistics decarbonization strategies

Zero emissions in the logistics industry

How we guide the industry to make impact

Drive transparency and set the standard
to simplify, increase efficiency and measure performance

Facilitate solution pathways and catalyze collaboration
to share knowledge and act together

Educate, influence, and scale-up organizations
to allow the sector to accelerate decarbonization

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Standardizing calculation methods

The foundation for calculating logistics emissions

For now, the only globally recognized methodology to calculate GHG emissions consistently across the multi-modal logistics supply chain

Recognized by

A basis for ISO14083 standard

Used by

200+
Multinationals

20+
Programs, tools, initiatives

Count Emissions.EU

Global Logistics Emissions Council Framework

Logistics Emissions Accounting and Reporting
Version 2.0

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BUILT ON GHG PROTOCOL

GLEC GLOBAL LOGISTICS EMISSIONS COUNCIL

wbcsd   Smart Freight Centre

Watch 3-min video, Download the GLEC Framework, Join our GLEC Framework e-training
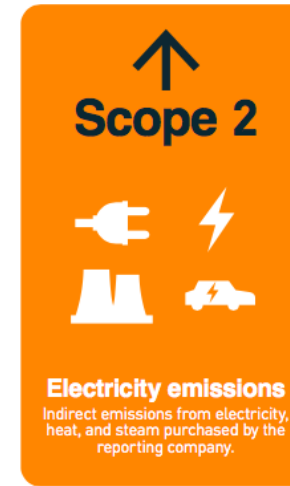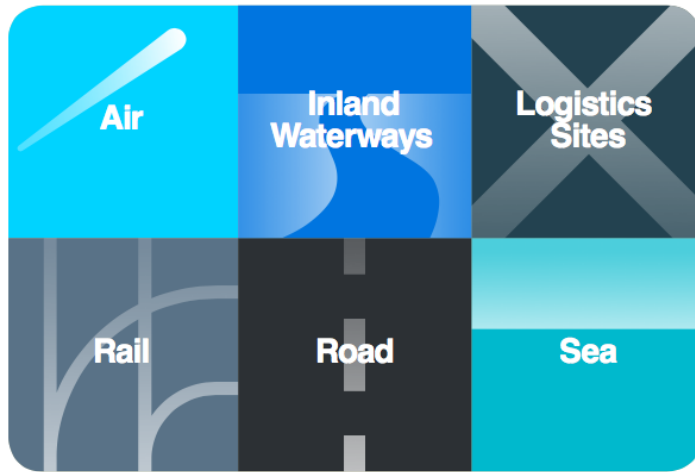
GLEC Framework Methodology - Baseline of logistics emissions

Foundation of logistics carbon accounting

All Modes

Air	Inland Waterways	Logistics Sites
Rail	Road	Sea

All GHGs

The GLEC Framework

PFCs — Perfluorocarbons
HFCs — Hydrofluorocarbons
CO2 — Carbon dioxide
NF3 — Nitrogen Triflouride
CH4 — Methane
N2O — Nitrous oxide
SF6 — Sulphur hexafluoride

The Black Carbon Methodology for the Logistics Sector

Black carbon

Total Scope

Scope 1
Direct emissions
Direct emissions from assets that are owned or controlled by the reporting company.

Scope 2
Electricity emissions
Indirect emissions from electricity, heat, and steam purchased by the reporting company.

Scope 3
Supply chain emissionsv
Transportation emissions required to move goods from suppliers to the reporting company.

Full Life Cycle

Fuel production & distribution
Well To Tank

+

Fuel combustion
Tank To Wheel

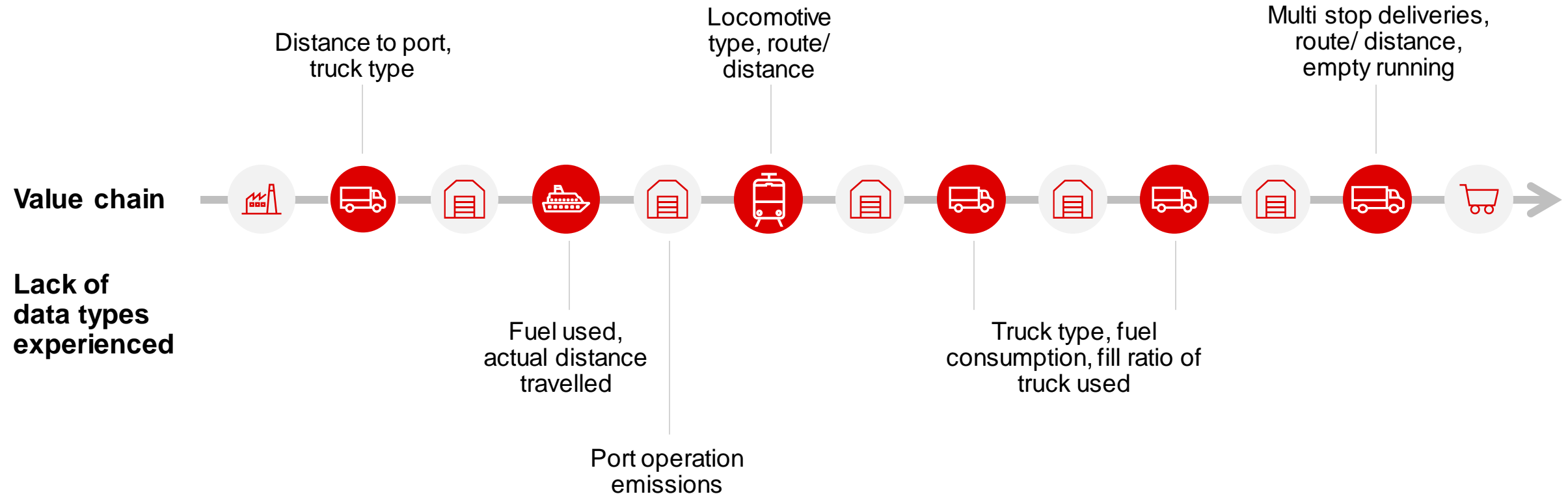**=**

Fuel life cycle emissions
Well To Wheel

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Data Focused Projects at Smart Freight Centre

How does a transport chain look like ?
Granularity, granularity, granularity

Distance to port, truck type

Locomotive type, route/ distance

Multi stop deliveries, route/ distance, empty running

Value chain

Lack of data types experienced

Fuel used, actual distance travelled

Truck type, fuel consumption, fill ratio of truck used

Port operation emissions

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Overview of Data Focused Projects
What has / is happening on the Digitalisation front of SFC?

Data Access & Exchange

Defining the semantics underlying logistics IT systems

End-to-End
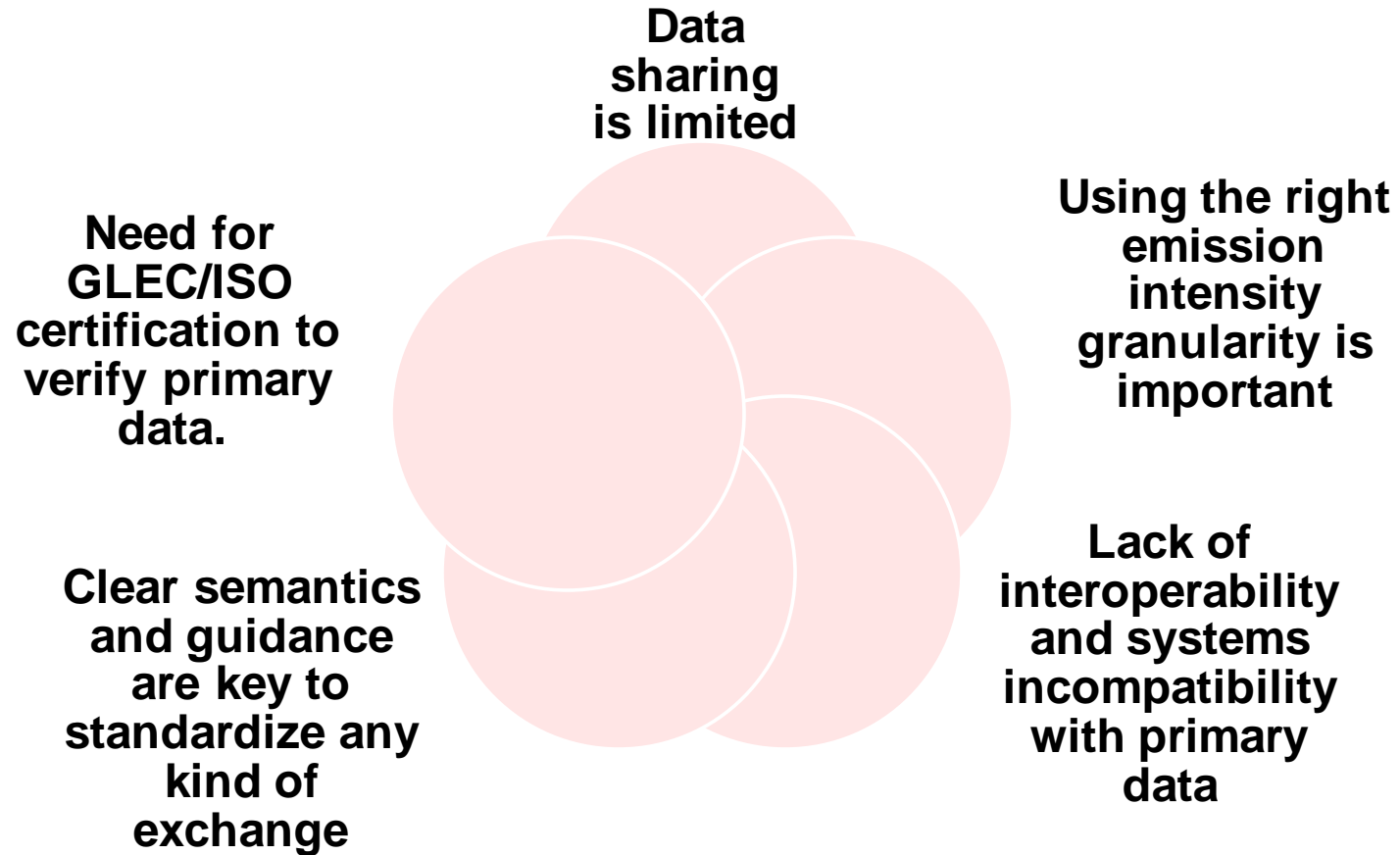
Expanding on the GLEC methodology, focus on primary data
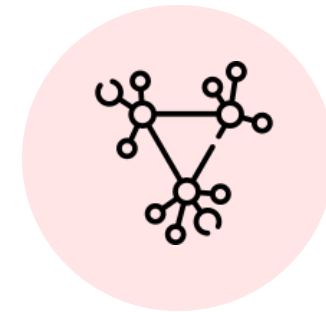
SFC Exchange Network

Defining rules for federated data exchange

Download the End-to-End Guidance
Download the Data Access & Exchange Guidance

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Data Access & Exchange Project
The challenges in the industry in terms of data exchange

Data sharing is limited

Using the right emission intensity granularity is important

Need for GLEC/ISO certification to verify primary data.

Clear semantics and guidance are key to standardize any kind of exchange

Lack of interoperability and systems incompatibility with primary data

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Data Access & Exchange Project
Our 2023 strategy

Our proposed data model is aligned with the PACT data model (from WBCSD) to achieve **semantic interoperability**
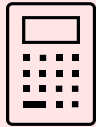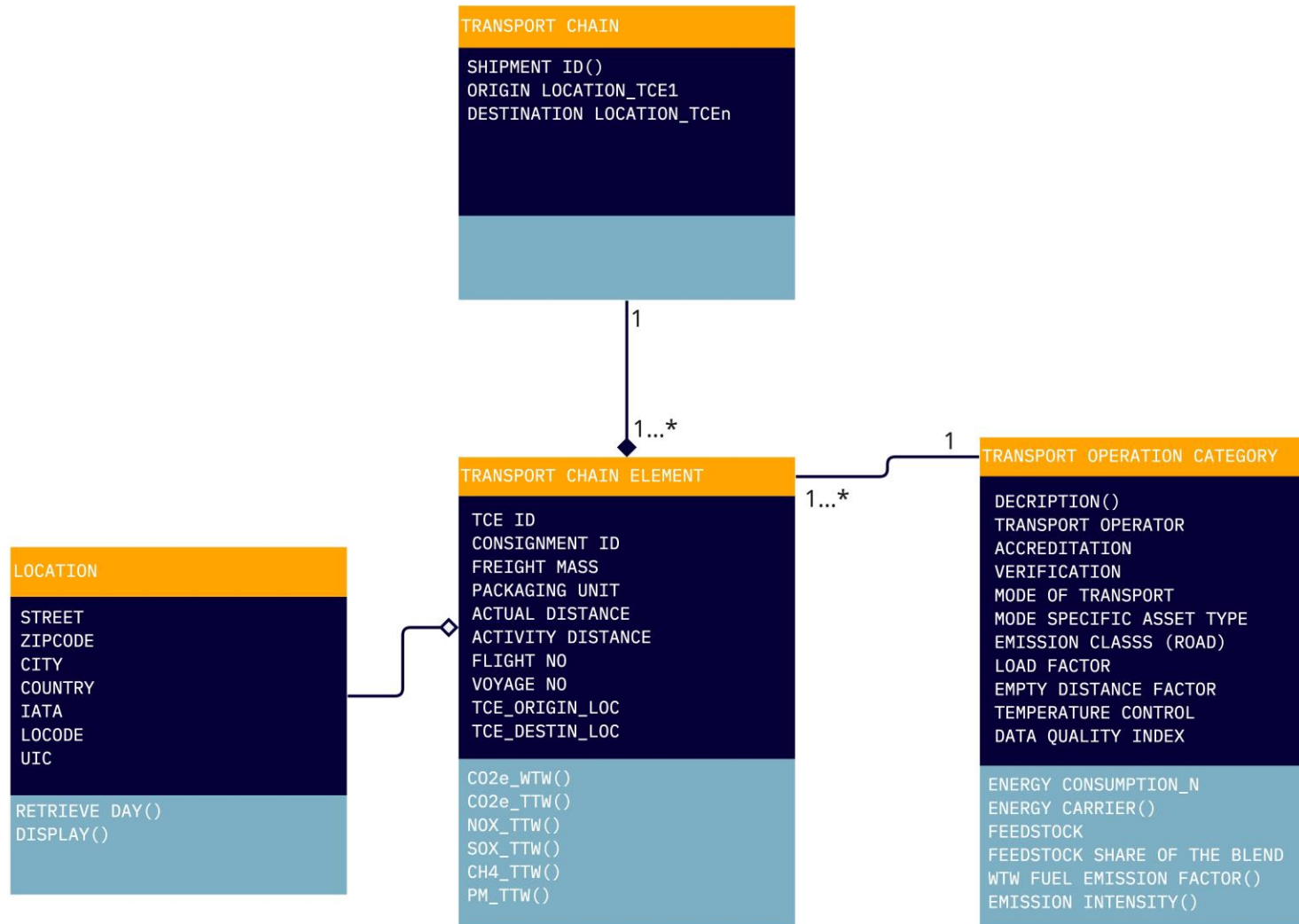
By enabling the emissions calculation and exchange we help companies understand the **logistics footprint as part of the total PCF**
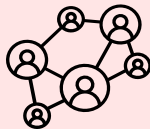
Grow the SFC and PACT ecosystems with **pilots and testing** of to ensure **scaling** of the work to reach more companies

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Data Access & Exchange Project

Proposed data model to address challenges in logistics emissions data sharing

TRANSPORT CHAIN

SHIPMENT ID()
ORIGIN LOCATION_TCE1
DESTINATION LOCATION_TCEn

TRANSPORT CHAIN ELEMENT

TCE ID
CONSIGNMENT ID
FREIGHT MASS
PACKAGING UNIT
ACTUAL DISTANCE
ACTIVITY DISTANCE
FLIGHT NO
VOYAGE NO
TCE_ORIGIN_LOC
TCE_DESTIN_LOC

CO2e_WTW()
CO2e_TTW()
NOX_TTW()
SOX_TTW()
CH4_TTW()
PM_TTW()

TRANSPORT OPERATION CATEGORY

DECRIPTION()
TRANSPORT OPERATOR
ACCREDITATION
VERIFICATION
MODE OF TRANSPORT
MODE SPECIFIC ASSET TYPE
EMISSION CLASSS (ROAD)
LOAD FACTOR
EMPTY DISTANCE FACTOR
TEMPERATURE CONTROL
DATA QUALITY INDEX

ENERGY CONSUMPTION_N
ENERGY CARRIER()
FEEDSTOCK
FEEDSTOCK SHARE OF THE BLEND
WTW FUEL EMISSION FACTOR()
EMISSION INTENSITY()

LOCATION

STREET
ZIPCODE
CITY
COUNTRY
IATA
LOCODE
UIC

RETRIEVE DAY()
DISPLAY()

1

1...*

1

1...*

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"End-to-End" Project
Supplement to the GLEC Fw, focus on primary data use

Objectives

1. Providing a **step-by-step practical approach** to calculate logistics emissions end-to-end – from an initial supplier to a final customer – compliant with existing methodologies

2. Reflecting reality and **organizational use cases** to ensure solutions can be embedded today in daily practices for reporting and reducing logistics emissions

3. Creating logic for **ambition levels** that encourage companies to improve data granularity, quality, and reliability over time

Aligned with GLEC Framework 2.0, Pathfinder Framework 2.0, and newly ISO 14083 compliant.

Crucial for alignment with B2B, B2C, B2G reporting.

End-to-End GHG Reporting of Logistics Operations
Guidance
January 2023

Smart Freight Centre GLEC GLOBAL LOGISTICS EMISSIONS COUNCIL wbcsd PACT

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SFC Exchange Network

Key principles
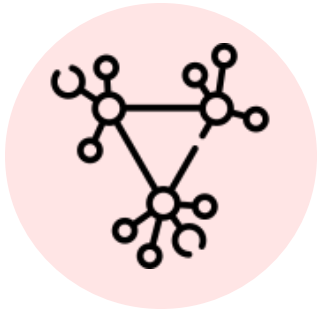
Decentralized multiple party exchange

to enable automatic data transfer while protecting the sovereignty of data of the data owner

Neutrality & interoperability

Neutral, open source, free technology standards that other players can use to build their own interoperable solutions

Data ownership and confidentiality

Members own their own data

Members can revoke access to data at any time

Data Security

All data is encrypted at rest and in transit

Two-factor authentication will be applied for all data exchange access

Data governance

All data follows consistent formatting and nomenclature, defined in data model

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SFC Exchange Network for logistics transparency

Smart Freight Centre — The output from the Data Access Project defines the semantics to enable end-to-end emissions calculation

Shipper

Carrier

Sub-contractor

Ask

Ask

Emission data

Activity data

Carbon calculator
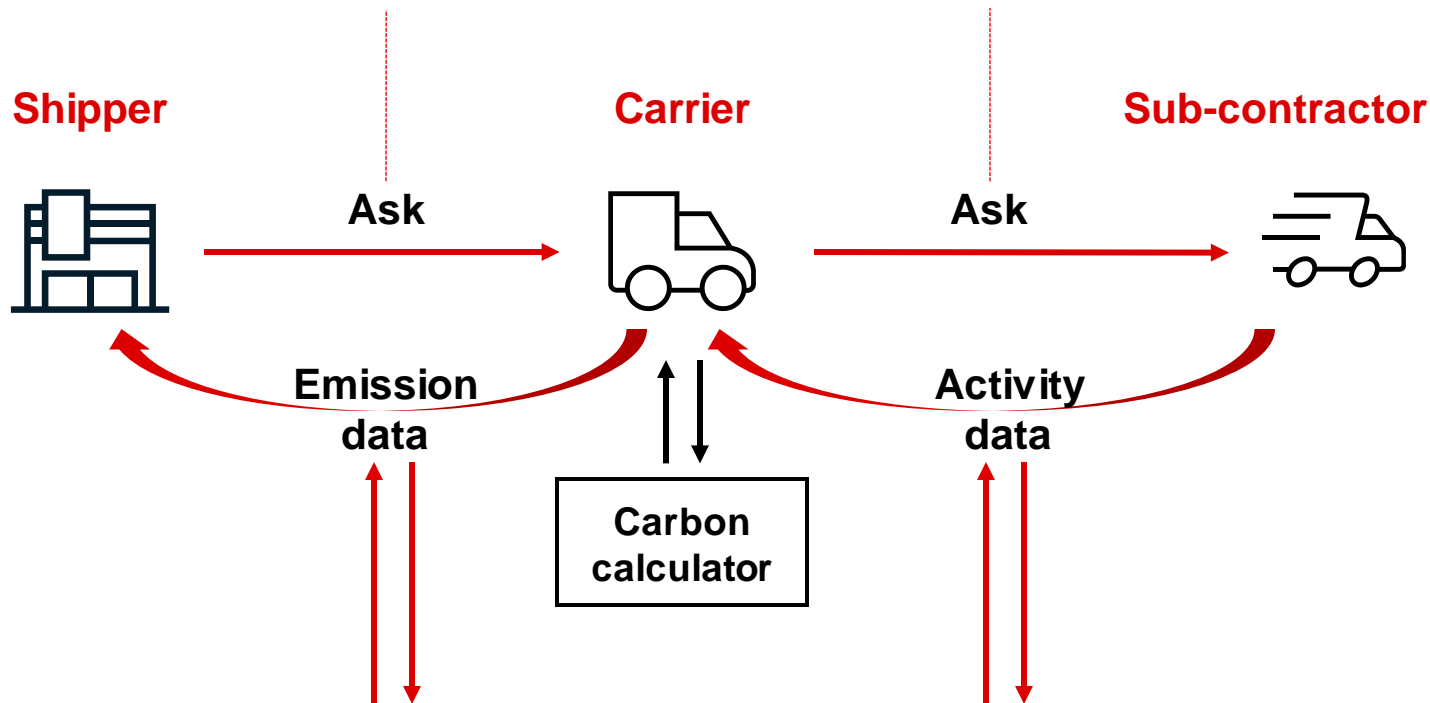
Smart Freight Centre — The SFC Exchange Network securely facilitates the exchange between the relevant parties, ensuring each player only gets the data that that they should receive based on policies

We define all the building blocks necessary to enable the secure exchange of emissions data. **Collaboration** with other technical parties will be key. This includes:

- Data models and formats

- Data exchange API

- Identity management

- Trusted exchange (i.e., security)

- Access and usage control

- Overall data space governance

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Using Big Data and AI to drive sustainability in the logistics industry

How SFC contributes to EU Data Strategy

What are some examples?

EU Data Governance Act

- Working on a PoC to be **a trustworthy intermediary** within a common data space

- Facilitating data sharing across companies to allow **the intended data to be available for the intended purposes**

EU Artificial Intelligence Act

- Even though the logistics industry is not a high-risk domain, **human rights and PII needs to be protected**

- **Auditing AI systems will be needed to be done** in the logistics industry especially in regards to Carbon Accounting

Implementing Act on High Value datasets

- Promoting **primary data to be exchanged** and used which boosts information quality towards collective societal benefits such as reducing CO_2 emissions

Goal: The European Union aims to be a data-driven society based on sound measures to ensure digital resiliency

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What is the role of big data in reducing CO2 emissions?
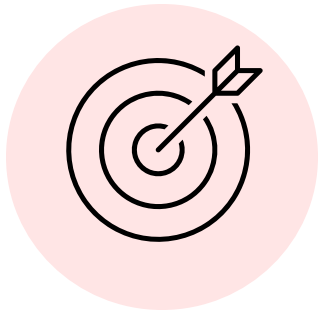
Improving accuracy of reporting emissions to enhance B2B/B2G reporting

Monitoring corporate targets to catalyze decarbonization
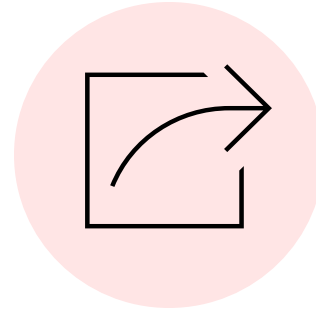
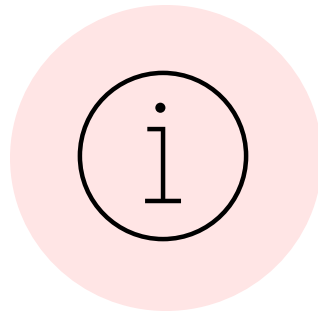**Sharing product-level E2E** emissions with customers to inform consumer choices
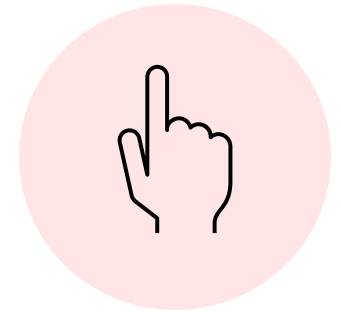
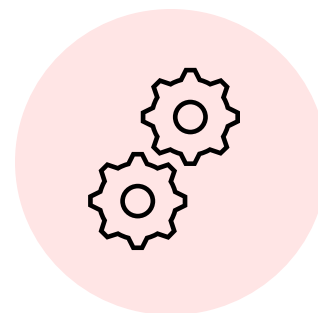**Selecting suppliers** based on sustainability criteria

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How does AI enable decarbonization efforts?
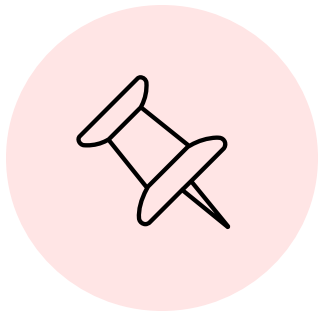
Identifying carbon hotspots to pinpoint where decarbonization efforts should be focused

Informing low-carbon investments to invest in initiatives with most efficient abatement potential
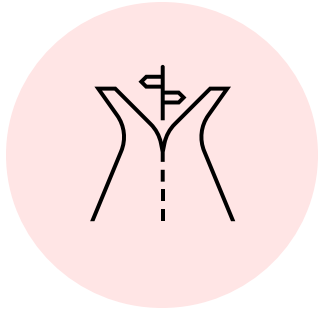
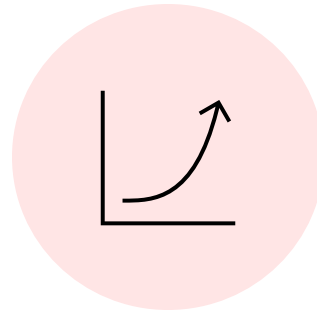**Optimizing route** to factor in emissions impact when optimizing exact route and mode of transport
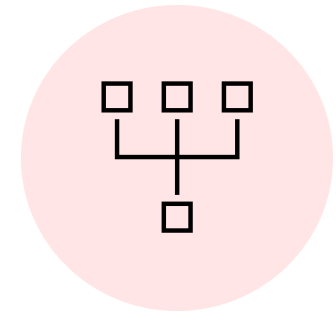
Consolidating freight to maximise load avoid unnecessary runs
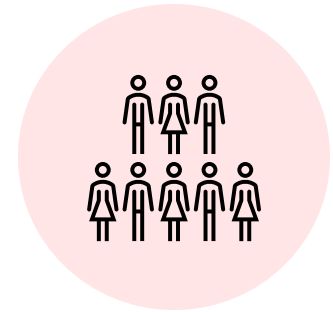
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Why is this important?

Summary

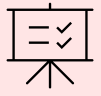Support overall **decision making** in logistics operations

Accelerate **decarbonization** efforts & meet policy requirements

Improve **horizontal collaboration** across the logistics industry while preserving data sovereignty

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Our key message

Don't discount the future
for present gains

Decarbonization strategy payoffs
are long-term

It is crucial to think of a strategy
to reach net zero

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Q&A

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Gabriela.rubiodomingo@smartfreightcentre.org

Thank you!