GLEC Framework 3.0 what is new?

Smart Freight Centre

GLEC Framework v. 3.0

What is new?

GLEC Framework v3.0 is supporting businesses to become ISO 14083 compliant by translating the ISO requirements into less formal language using a new, accessible pdf format.

Cementing ISO 14083 alignment

- **Updated terminology:** TOC (formerly TSC), Hubs, Data types, Energy lifecycle: Energy Provision and Operation

- Reference to key elements and equations of ISO 14083 standard backed-up with more **practical examples** to reflect the ISO terminology

- **Additional transport modes**

- New **guidance on emission factors**

## Latest fuel emission factors and default intensities

- Updates resulting from **new versions of source information**

- as well as recognizing the **latest findings on higher emissions from fossil fuel production.**

- And a **wider range of fuel options** which are not covered in ISO 14083.

Smart Freight Centre

Focus is the transport chain
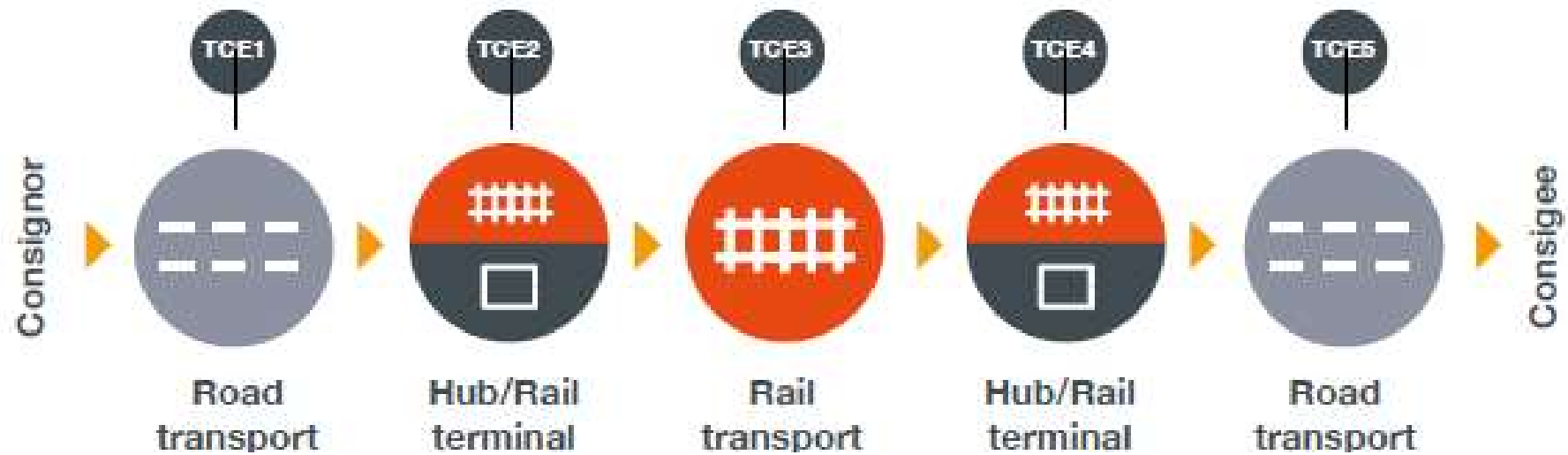
Key Concept

Relationship between transport operations and transport chain elements (TCEs)

© ISO Figure 5, ISO 14083
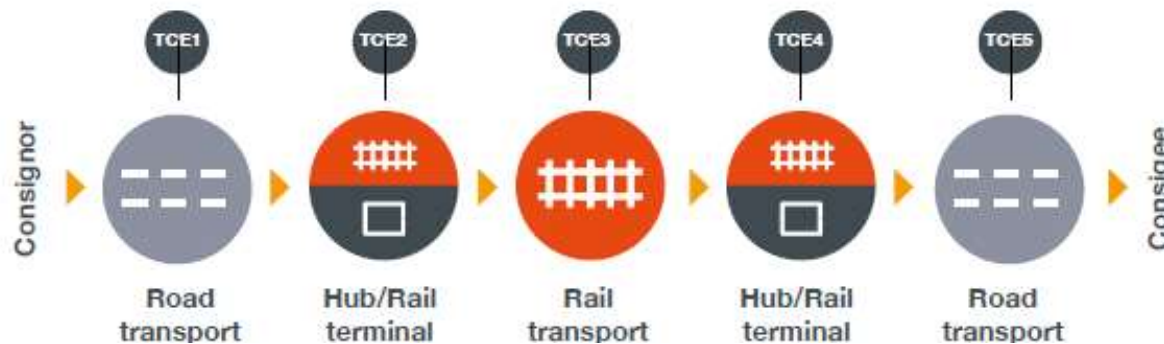
Based on this table, examples for TOCs in road transport include:

- An individual vehicle on a specific route, outbound and return
- An individual vehicle in a specific network
- Vehicles of a specific type in a fleet if they share similar or even identical characteristics, e.g. temperature controlled, on a specific route, outbound and return
- Vehicles of a specific type in a fleet if they share similar or even identical characteristics, on all routes operated by a specific organization
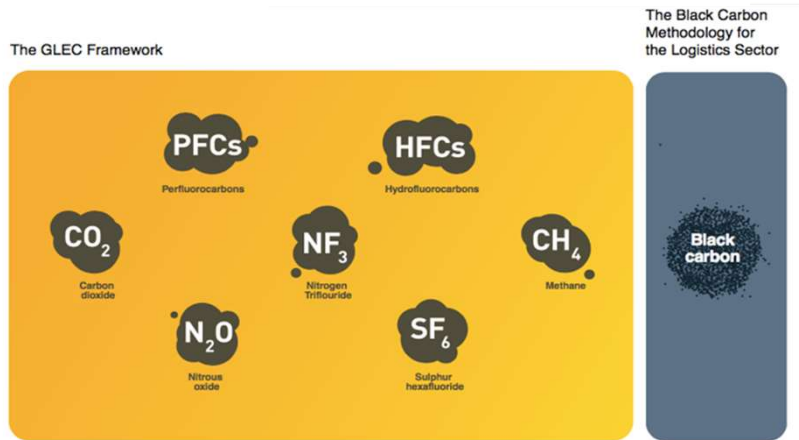- ......
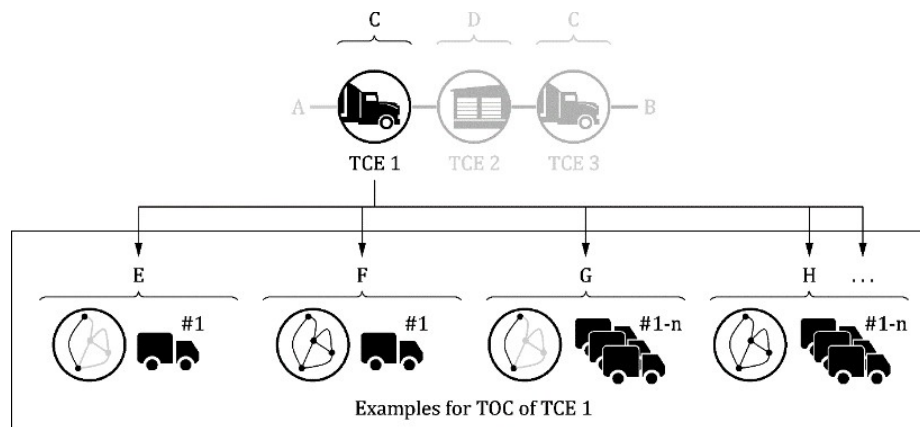
What to include in emission calculations

The new structure
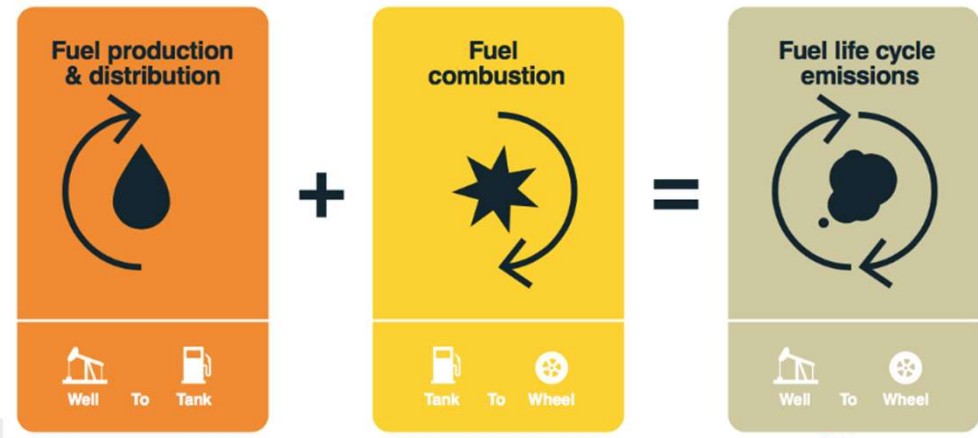
In practice, we know logistics accounting isn't always a linear process. You may find yourself going back and forth between sections to learn more about a certain mode, check the glossary or find data collection guidance. As new data becomes available, you may return to the Framework to refine calculations.

The following slides will guide you through the highlights of the new version

1 Calculating

Chapter 1
Foundations of the GLEC Framework

Chapter 2
Calculation steps

Chapter 3
Steps for establishing the Emission Intensity Factors of a TOC or a HOC

Chapter 4
Information and requirements for the individual transport modes and hubs

References

2 Using emission results

Chapter 1
Reporting emissions

Chapter 2
Beyond reporting

Chapter 3
Outlook & the path towards global uptake

References

3 Data

Module 1
Emission factors

Module 2
Default fuel efficiency and GHG emission intensity values

Module 3
Refrigerant emission factors

Module 4
Examples of emission calculations - step-by-step

References

4 Annexes

Module 5
Calculating GHG transport and logistics emissions for the European Chemical Industry

Annex unit conversions

List of abbreviations

Glossary

Calculating

Section 1 covers the calculations themselves.
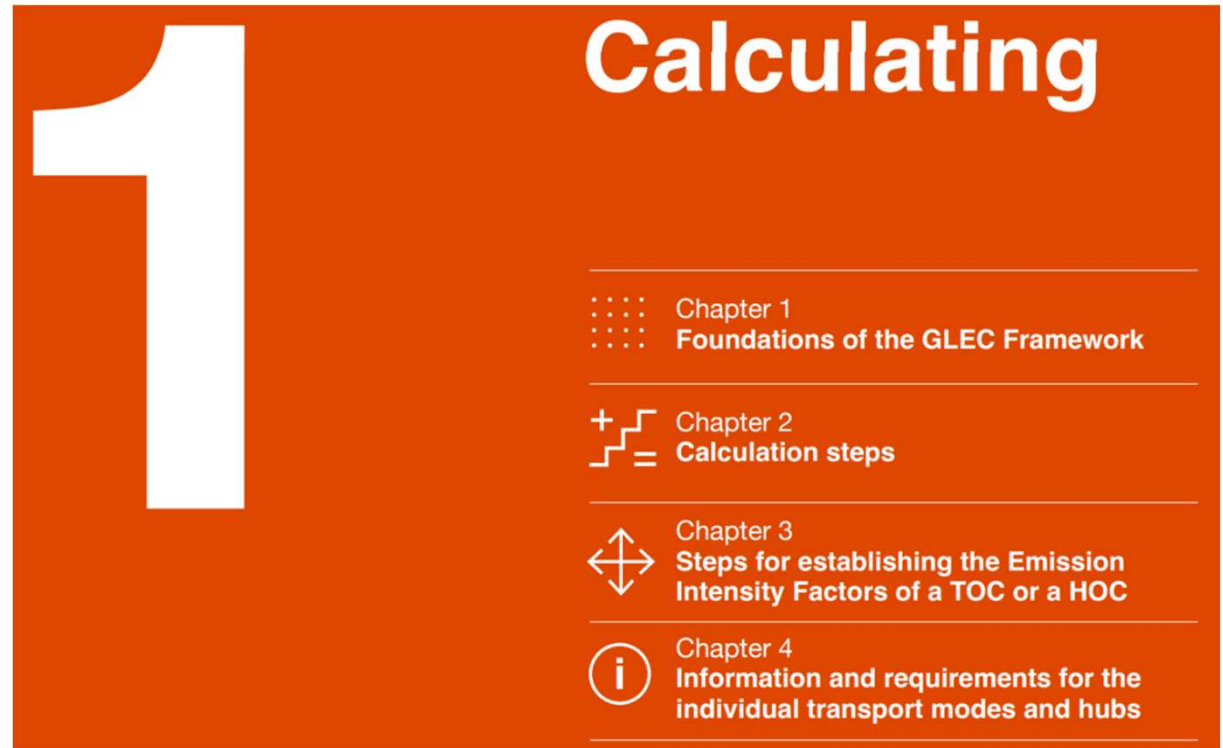
Chapter 1, provides an overview of the foundations and principles of the GLEC Framework

Chapter 2, guides you through the steps in emissions accounting

Chapter 3, explains how the emission intensity factors for TOCs and HOCs are established.

Chapter 4, provides additional information specific to each transportation mode and logistics hubs

Smart Freight Centre

Four steps towards calculating your emissions

Scope
1 & 2

Collect data from own fleet & assets (if applicable)

Calculate "scope 1 & 2" CO_2e

Scope
3

Collect data from suppliers

Calculate "scope 3" CO_2e

Calculate total CO_2e

$\div$

Activity (overall tonne-km or other divisor)

$=$

Intensity logistics CO_2e 'per unit'

Independent check of your calculation

Report your emissions

Step 1. Collect the data

Step 2. Make the calculation

Step 3. Check the calculation

Step 4. Report your emissions

Smart Freight Centre

Energy Life Cycle terminology

Role	Energy	Fossil fuel	GHG Protocol Scopes
Carrier	Energy Provision emissions	WTT	Scope 3, category 3
	Operational emissions	TTW	Scope 1
Supply chain partners	Energy Provision emissions	WTT	Scope 3, category 4 or 9
	Operational emissions	TTW	

Refrigerant emissions

More explicit consideration of refrigerant emissions

- Although released in small amounts
  - Air con & temperature controlled cargo system leakages
- High GWP
- Data captured at point of refill – there can be a disconnect to the data
- Add CO_2e to combustion & upstream fuel emissions
- Calculate emission intensity using the overall total GHG emissions & transport activity

Smart Freight Centre

Using emission results

Section 2 covers reporting and use of the calculation outputs

Chapter 1, provides the template to report emissions

Chapter 2, looks at the use of emissions and sets the basis for emission reduction actions

Chapter 3, looks briefly at the bigger picture and how initiatives interrelate.

Smart Freight Centre

Who to report to?

Internal Stakeholders	External Stakeholders
• Stakeholders • Board of Directors • Senior management • Business units • Sales and operational staff • Other…	• Shareholders / investors • Customers • Government • Public • Programs, labels, indices • Other….

Smart Freight Centre

Reporting requirements

Two options in ISO 14083 with aligned approach
(supported by explanation of boundaries, deviations, exclusions and data type used):

Organizational Level	Service Level
• **Total GHG emissions**	• **Total GHG emissions (WTW)**
• **Total GHG emissions per mode**	• **Overall GHG emission intensity (per tkm*)**
• **Overall GHG emission intensity (per tkm* or per t*)**	• **Transport activity (tkm*)**
• **GHG emission intensity per mode**	• **Hub activity (t*)**
• **Total GHG emissions =**	• **Operational GHG emissions (TTW)**
• Energy provision + operational emissions (WTW)	• **Operational GHG emission intensity (per tkm)**
• Optional to report operational (TTW) separately	• **For multimodal transport service:**
• **Default reporting period: annual**	• Total emissions & either transport activity or emission intensity for each mode
• Shorter periods are allowed in addition	• **Reporting period is flexible**

* Other options possible in specific circumstances

Smart Freight Centre

Example of B2B GLEC Declaration

B2B GLEC Declaration	
Coverage of reporting	Client contract & reference (+ description if helpful)
Reporting year	2022
Total WTW logistics GHG emissions	1800 tonnes CO_2e
GHG emission intensity	0.38 kg CO_2e / tonne km
Total transport activity included	4.7 million tonne km
Mode coverage	100% road transport
Input data type	100% primary data
Data verification statement	Data has not been independently verified by a third party

To show both TTW & WTW values

Smart Freight Centre

Section 3 Module 4

This Module contains examples of transport chains and explains – step by step – how to calculate their emissions.

Using the most prevalent modes of transport and combinations of them (multi-modal transport), we guide you through the use of the GLEC Framework.

3 Module 4
Examples of emission calculations - step-by-step
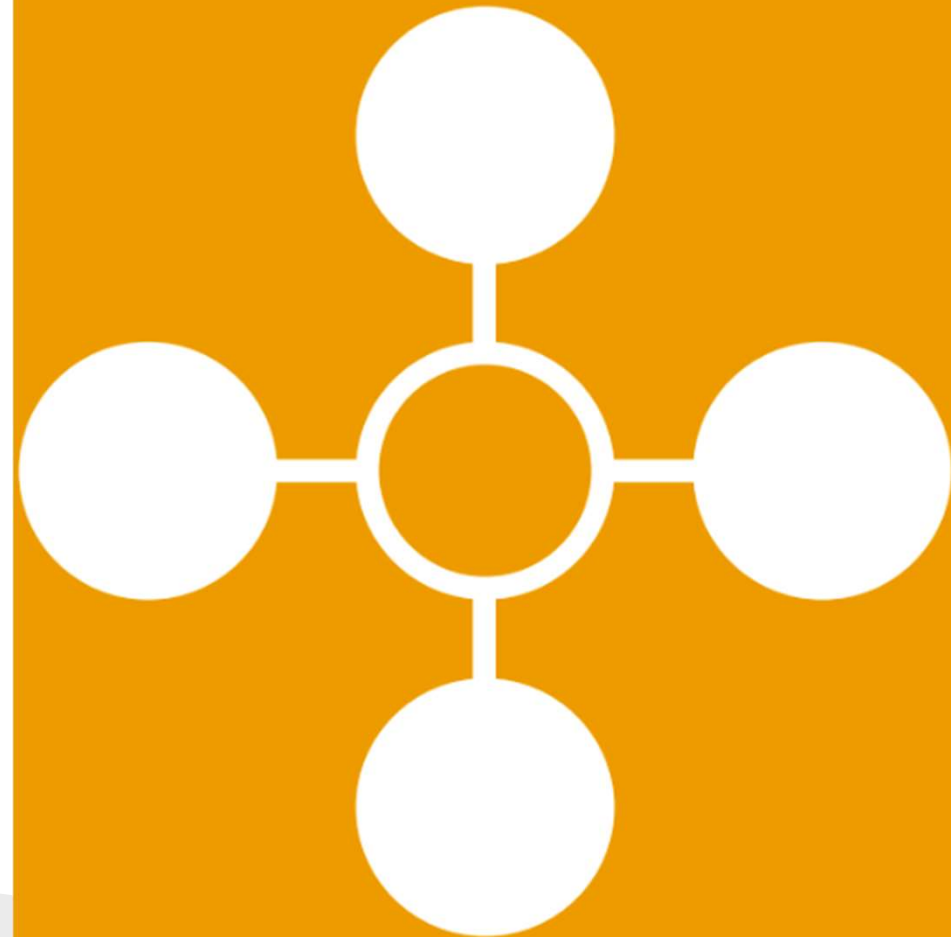
Outlook

Future developments – informed speculation!?

- Wider GHG scope
  - Vehicle LCA?
- Geographic content
  - China
  - India?
- Sector guidelines
  - CEFIC
  - RoRo
  - ?
- Emission factors

Smart Freight Centre

New Emission factor tables

Split EU & US Sources

Emission factors: European sources

Energy carrier	Lower heating value MJ/kg	Density kg/l	GHG emission (operational/TTW) g CO_2e/MJ	GHG emission (total/WTW) g CO_2e/MJ	GHG emission (operationalTTW) kg CO_2e/kg	GHG emission (total/ TTW) kg CO_2e/kg	Non-CO_2 GHG emissions (operational/TTW) g CO_2e/MJ	Source
Gasoline	42.5	0.74	75.1	99.1	3.19	4.21	0.61	ecoinvent v3.9.1[3]
Ethanol (40% maize, 35% sugar beet, 25% wheat)	27.0	0.78	0.02	47.9	0.0005	1.29	0.02	ifeu, infras & Fraunhofer IML, 2022[4]
Diesel	42.8	0.83	74.1	96.6	3.17	4.13	0.05	ecoinvent v3.9.1[3]
Biodiesel (50% rapeseed, 40% used cooking oil, 10 % soybean)	37.0	0.89	0.05	34.3	0.0019	1.27	0.05	ifeu, infras & Fraunhofer IML, 2022[4]
Liquefied Petroleum Gas (LPG)	45.5	0.55	67.1	90.3	3.05	4.11	0.33	ecoinvent v3.9.1[3]
Jet Kerosene (Jet A1 and Jet A)	43.0	0.80	74.0	93.5	3.18	4.02	0.02	ecoinvent v3.9.1[3] and CORSIA2019[5]
Heavy Fuel Oil (HFO) (2.5% sulfur)	41.2	0.97	76.8	93.7	3.18	3.86	1.33	ecoinvent v3.9.1[3]
Light Fuel Oil (LFO) (0.1 % sulfur)	42.6	0.86	75.3	95.4	3.21	4.06	1.33	ecoinvent v3.9.1[3]
Hydrogen from steam reforming of natural gas HVO/HEFA (SAF) (50% rapeseed, 50% used cooking oil)	120.0	n.a.	0	160.7	0	19.29	0.00	JEC 2020, modified[8]
HVO/HEFA (SAF) (50% rapeseed, 50% used cooking oil)	44.0	0.77	0.05	28.6	0.0022	1.26	0.05	ifeu, infras & Fraunhofer IML, 2022[4]
Electricity European average (EU 27, 2019, including average losses)	n.a.	n.a.	0	97.0	n.a.	n.a.	n.a.	ifeu, infras & Fraunhofer IML, 2022[4]

Outlook

Smart Freight Centre

Emission factor development

Dynamic situation

Emission factors will change:

- GWPs will need to be updated where not already
- Newer information about fossil fuel emissions at extraction will feed through
- Energy transition will impact on processing emissions
  - Better understanding of true geographic variation
- More transparency over methodology & (hopefully) harmonization

Smart Freight Centre

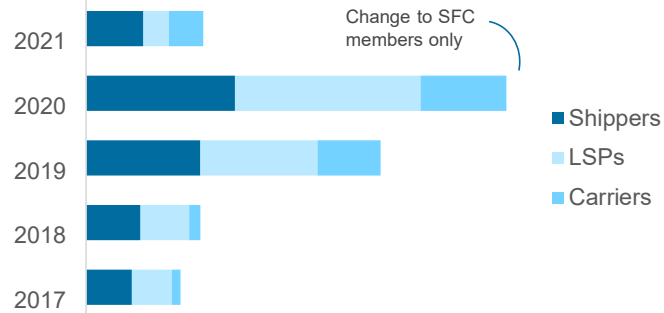# Future Work In HORIZON Europe Work Program

HORIZON-CL5-2023-D6-01-08: "Future-proof GHG and environmental emissions factors for accounting emissions from transport and logistics operations"

- Project expected around Q2 2024…

- Collaboration aimed at harmonizing methodological approach & understanding the impact of input data on the EFs

- Will also feed into updated database of default emission intensities
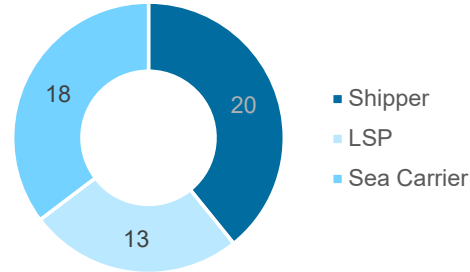 - (recognizing defaults will remain a less-preferred backup to primary data)

Smart Freight Centre

SFC GHG emission tracking results 2021

Reporting scope 2017 – 2021
No. of data sets collected

2021
2020
2019
2018
2017

Change to SFC members only

■ Shippers
■ LSPs
■ Carriers

No. of SFC members reported GHG data 2021

20
18
13

■ Shipper
■ LSP
■ Sea Carrier

Evolution of observed emission
Million tonnes CO_2e

1,0

2017   2019   2020   2021

—In-year   —Cumulative

Sea Carrier

GHG emission coverage*

| Shippers | 1.7% | LSP | 2.7% | Sea Carriers | 4.2% |

* Based on ITF Transport Outlook 2021 , baseline for 2015

51 SFC members reported GHG data
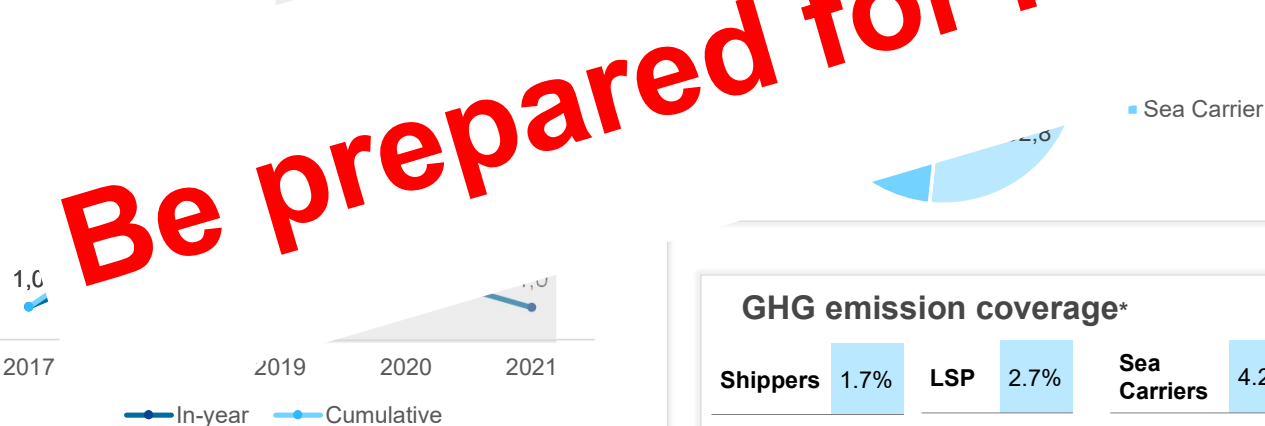
9,300,000 tonnes CO_2e Reduced since 2017

4 – 8% Indication of industry coverage

Be prepared for more of this…!

Smart Freight Centre

Smart Freight Centre can help you

- Download the GLEC Framework for free

- Training offerings around the on the GLEC Framework, which can be supplemented with technical advice.

- Guidelines and questionnaire on how to request for GHG data and climate action from suppliers through your procurement processes

- Access to accredited tools and programs that help do the calculations in conformance with the GLEC Framework

- Join the GLEC Partnership
  to stay informed on developments

Assurance can give confidence in reported results

Where assurance might be required:

1. Data input verified
2. Methodology in line with the GLEC Framework confirmed
3. Calculation is correctly applied
4. Reporting in line with the GLEC Declaration

Through independent (3rd party) check

Development of an assurance process…

Smart Freight Centre

Questions...?