COFRET is co-financed by the European Commission Directorate General for Research & Innovation within the 7th Framework Programme

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CALCULATING CO_2 EMISSIONS ALONG SUPPLY CHAINS – The COFRET PROJECT & APPROACH

Talking Freight

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TTR

Structure

INTRODUCTION

APPROACH

REVIEW

METHODOLOGY

DEVELOPMENT STEPS

COFRET
Carbon Footprint of Freight Transport

SEVENTH FRAMEWORK PROGRAMME

COFRET is a collaborative research and demonstration project funded by the European Commission, which will deliver a methodology for the calculation of the carbon footprint along the full supply chain.

Scope

- Transport-related carbon footprint along supply chains
- Use currently available methods and provide solutions for any gaps
- Consider all transport modes and all logistics operations
- Comply fully with the CEN standard EN 16258 to be published in 2012

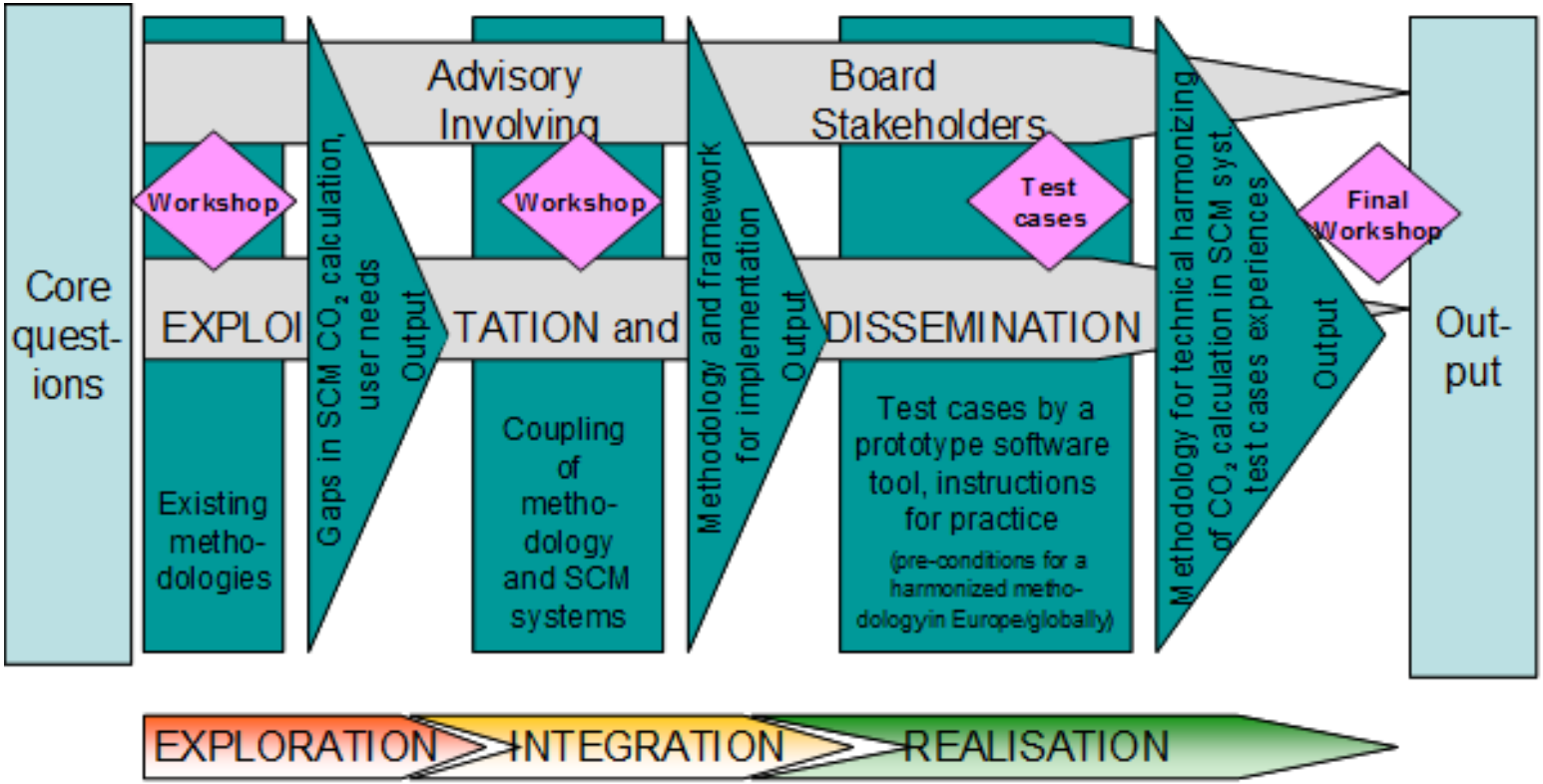
COFRET's Objectives

- To establish a complete GHG emission calculation methodology for transport-related elements within supply chains
- To cover all types of shipments at supply chain level and aggregated level of transport and logistics
- To provide a methodology that is flexible across different configurations of supply chain
- To embed practical exploitation as a key element of the technical work programme to maximise the eventual project output

COFRET
Carbon Footprint of Freight Transport

Approach

- Review current situation: user needs and gaps in existing approaches
- Work with the existing initiatives - close co-operation between the COFRET team and industry stakeholders
- Develop a comprehensive methodology to be used in in-house and commercial applications
- Use a supply chain elements (SCE) approach to provide flexibility
- Test the methodology in real supply chain applications
- Encourage the use of actual data to increase the accuracy of calculations
- Work to maximise the eventual uptake of the COFRET methodology

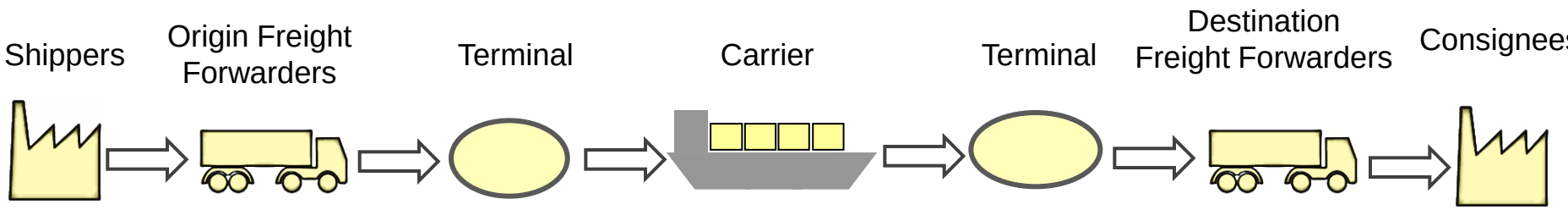

Core quest-ions
Advisory Involving
Board Stakeholders
Workshop
Workshop
Test cases
Final Workshop
EXPLOI
TATION and
DISSEMINATION
Out-put
Gaps in SCM CO_2 calculation, user needs
Output
Methodology and framework for implementation
Output
Methodology for technical harmonizing of CO_2 calculation in SCM syst. test cases experiences
Output
Existing metho-dologies
Coupling of metho-dology and SCM systems
Test cases by a prototype software tool, instructions for practice
(pre-conditions for a harmonized metho-dology in Europe/globally)
EXPLORATION
INTEGRATION
REALISATION

First standards have been established: GHG Protocol, ISO 14064-1, **EN 16258-2012**

Many valuable starting points but different approaches, depending on:

- which greenhouse gases are taken into account
- which supply chain elements are taken into account
- which modes are considered
- what data (if any) is embedded

→ **'Neutral' approach that aligns the best practice elements** is required.



Source: based on IATA 2010

Review of existing resources and user needs

The main tasks were to identify, review and assess:

1. existing methods, tools and databases
2. user needs, practices and experiences
3. future technologies and innovations

in the context of freight transport carbon footprint calculation.

1. Existing methods, tools and databases

A total of 102 items were identified as relevant to the COFRET project.
Review and assessment was carried out using a structured review template.

Four types of items:

- carbon footprint methodologies
- carbon footprint calculation tools
- emission factor databases
- other activities and initiatives.

Assessment criteria:

- transport modes, vehicles and equipment covered
- supply chain elements and logistics operations covered
- emission compounds and life cycle phases covered
- geographical and methodological approaches and data sources used, etc.

2. User needs, practices and experiences

Subtasks:

- in-depth interviews (29 interviews)
- on-line survey (62 answers)
- stakeholder workshop (17 external participants) in Berlin January 2012.

Stakeholders involved include transport and terminal operators, logistics service providers, manufacturers, wholesalers, retailers and consumers, researchers and policy makers.

Topics covered:

- motivations to carbon footprinting
- current practices: use of calculation tools and results
- current shortcomings
- future needs and expectations, etc.

3. Future technologies and innovations

Review of potential solutions to improve measurement or calculation of carbon footprint.

Focus on future technology development and system integration opportunities with carbon footprinting.

Three main areas of interest:

- supply chain and transport planning systems
  (e.g. multimodal routing systems)
- information and communication systems
  (e.g. positioning and internal vehicle systems)
- business applications
  (e.g. enterprise resource planning and fleet management systems).

Contribution to the COFRET project

Main contributions of the state-of-the-art review:

- up-to-date knowledge base of existing methods tools and databases: highlights the wide variability in the methodological base and fragmentation in tools and data
- identification of the most relevant methods, tools and databases from the COFRET point of view
- clarified user needs: strong pull for harmonisation
- potential to employ future technology systems identified
- confirmation to the COFRET objectives (methodology to cover all transport and logistics along the supply chain)

Identified users' needs

Four reasons why users calculate their CO_2(e) emissions:

(1) to increase energy efficiency & hence reduce fuel costs,

(2) for internal control and communication with subcontractors,

(3) for their customers on different levels (e.g. product level) and

(4) to see the effect of different company initiatives on the carbon footprint (e.g. modal switch)

Users' perspective

Requirements of Customer:
- Carbon footprint of product
- Shipper

Requirements of Company:
- Reducing of costs/cost-savings
- Image reasons
- Climate protection strategy

Reasons to calculate $CO_{2(e)}$

Future political requirements

Weaknesses of existing situation

- many tools focus on only one transport mode
- differences in calculation methods lead to incomparable results
- missing interfaces to tools used by subcontractors, in other companies or in other countries
- lack of primary data and clarity of what default data is used
- Taken together these prevent the calculation of emissions along (global) supply chains

Approach

- work with the existing initiatives - close co-operation between the COFRET team and industry stakeholders
- Define appropriate supply chain elements
- Review how to handle data

NOTE: COFRET will develop a methodology and a prototype to test the methodology. A freeware calculation tool is not an project output!

Formulating the methodology

- Compatibility with EN16258 paramount
- **36 items** have been **selected** for an in-depth assessment

  4 methodologies

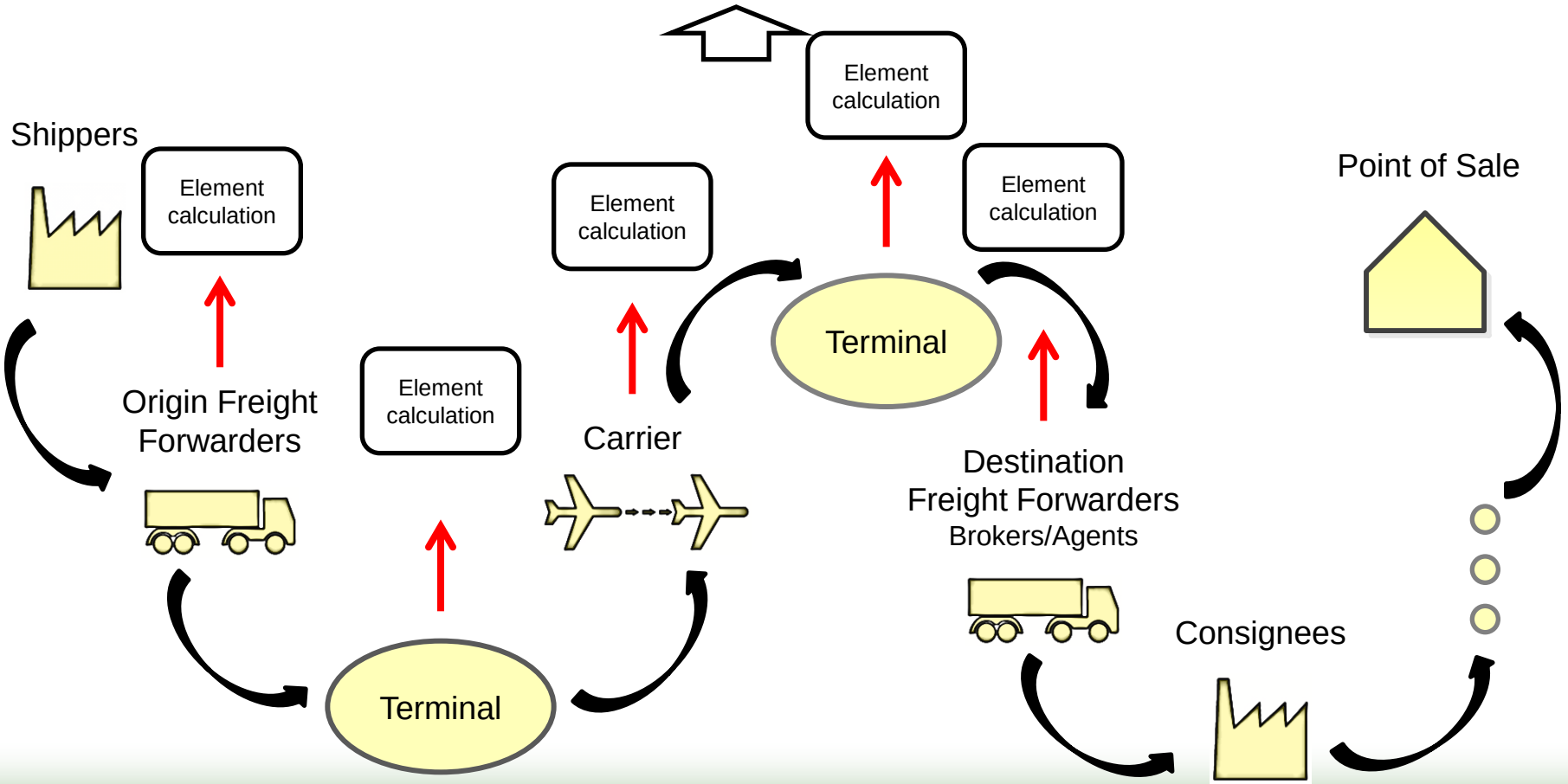
  18 calculation tools

  6 databases

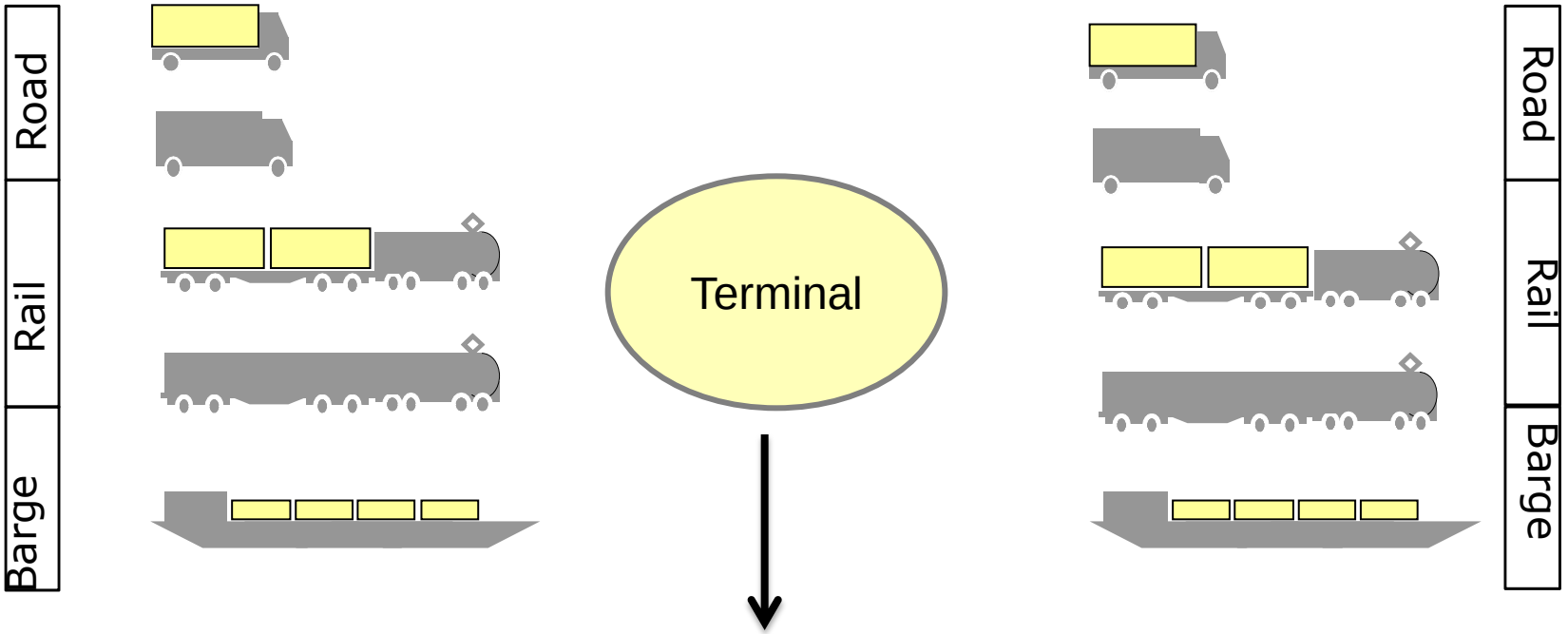
  8 other resources

- About half of these will be strongly involved within the remaining part of COFRET
- The other initiatives will be considered as background information

Supply chain emission calculation

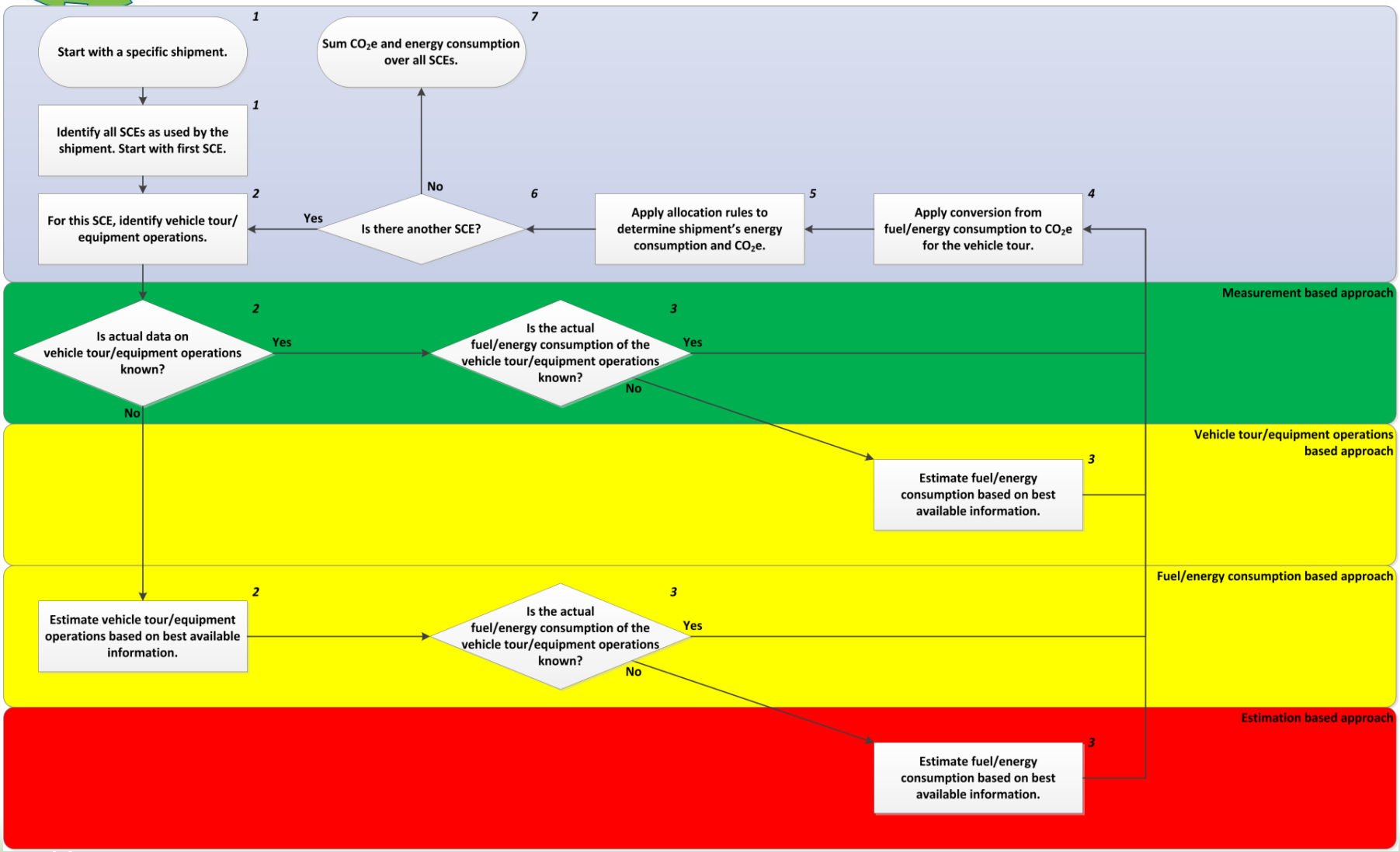


SCE class	Mode/type	SCE
Links	Road freight	Road freight transport
	Rail freight	Rail freight transport
	Inland waterways (IWW) freight	IWW freight transport
	Sea freight	Sea transport
	Ferry	Ferry transport
	Air freight	Air freight transport



Many non-transport processes which cause emissions:
Load, unload, storage, cooling processes and more

SCE class	Mode/type	SCE
Nodes	Terminals	Manoeuvring
		Transhipment
		Internal transport
		Shuffle, sort
	Warehousing/cross-docking	Unload
		Sort
		Unconditioned storage
		Cooled storage
		Deep freeze storage
		Order picking
		Preparing for dispatch
		(Re)packaging
		Load
Other		Cooling system F-gases leakages


1
Start with a specific shipment.
1
Identify all SCEs as used by the shipment. Start with first SCE.
2
For this SCE, identify vehicle tour/ equipment operations.
2
Is actual data on vehicle tour/equipment operations known?
Yes
No
3
Is the actual fuel/energy consumption of the vehicle tour/equipment operations known?
Yes
No
Measurement based approach
3
Estimate fuel/energy consumption based on best available information.
Vehicle tour/equipment operations based approach
2
Estimate vehicle tour/equipment operations based on best available information.
3
Is the actual fuel/energy consumption of the vehicle tour/equipment operations known?
Yes
No
Fuel/energy consumption based approach
3
Estimate fuel/energy consumption based on best available information.
Estimation based approach
4
Apply conversion from fuel/energy consumption to CO_2e for the vehicle tour.
5
Apply allocation rules to determine shipment's energy consumption and CO_2e.
6
Is there another SCE?
Yes
No
7
Sum CO_2e and energy consumption over all SCEs.

Further steps

- Finalise and consult on the methodology = iteration
- subsequent step will investigate incorporation into supply chain management software, and development of a prototype for use in the COFRET case studies

Links to other initiatives

- World Economic Forum: Consignment Carbon
- Green freight Europe
- CEN/TC 320 “Transport – Logistics & services”
- etc.

Advisory Board

BSR/Clean Cargo Working Group (International)

CEN (European)

Conlogic (TBC)

Connekt (The Netherlands)

Deutsche Bahn/ECO TransIT (Germany)

DHL (Germany)

Ewals Cargo Care (The Netherlands)

Fiege AG (Germany)

Green Freight Europe (European)

IATA (International)

Kühne + Nagel (UK/Switzerland)

Maersk Line (Denmark)

Myclimate (Switzerland)

NTM (Scandinavia)

Sainsbury‘s (UK)

Swiss WorldCargo (Switzerland)

UPM (Finland)

World Economic Forum (International)

WWF (International)

Get in touch with us

If you have a specific query or a more general issue which you would like to discuss with the COFRET team please use the list below to contact the most appropriate team member.

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Queries relating to Calculation Tools	PTV (florian.krietsch@ptv.de)
The COFRET Case Studies	NEA (j.kiel@panteia.nl)
COFRET Evaluation Queries	DLR (andreas.lischke@dlr.de)
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