Smart Freight Centre

GLEC GLOBAL LOGISTICS EMISSIONS COUNCIL

In partnership with

alice | Alliance for Logistics Innovation through Collaboration in Europe

ADEME AGENCE DE LA TRANSITION ÉCOLOGIQUE

Low Emission Fuels and Vehicles

Presentation to La Fabrique de la Logistique

25 March 2021

Smart Freight Centre

Introduction

Mission:

- Dedicated NGO to global zero-emissions freight and logistics
- We cover all freight and only freight

Our role:

- Guide companies, advocacy, and raise awareness to reduce logistics emissions

Our goal:

100+ multinationals reduce logistics emissions by

2030

30%
(from 2015)

2050

net
ZERO
emissions

GLEC Framework

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

Recognized by

BUILT ON GHG PROTOCOL

CDP
DISCLOSURE INSIGHT ACTION

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

CLIMATE & CLEAN AIR COALITION
TO REDUCE SHORT-LIVED CLIMATE POLLUTANTS

A basis for new ISO standard

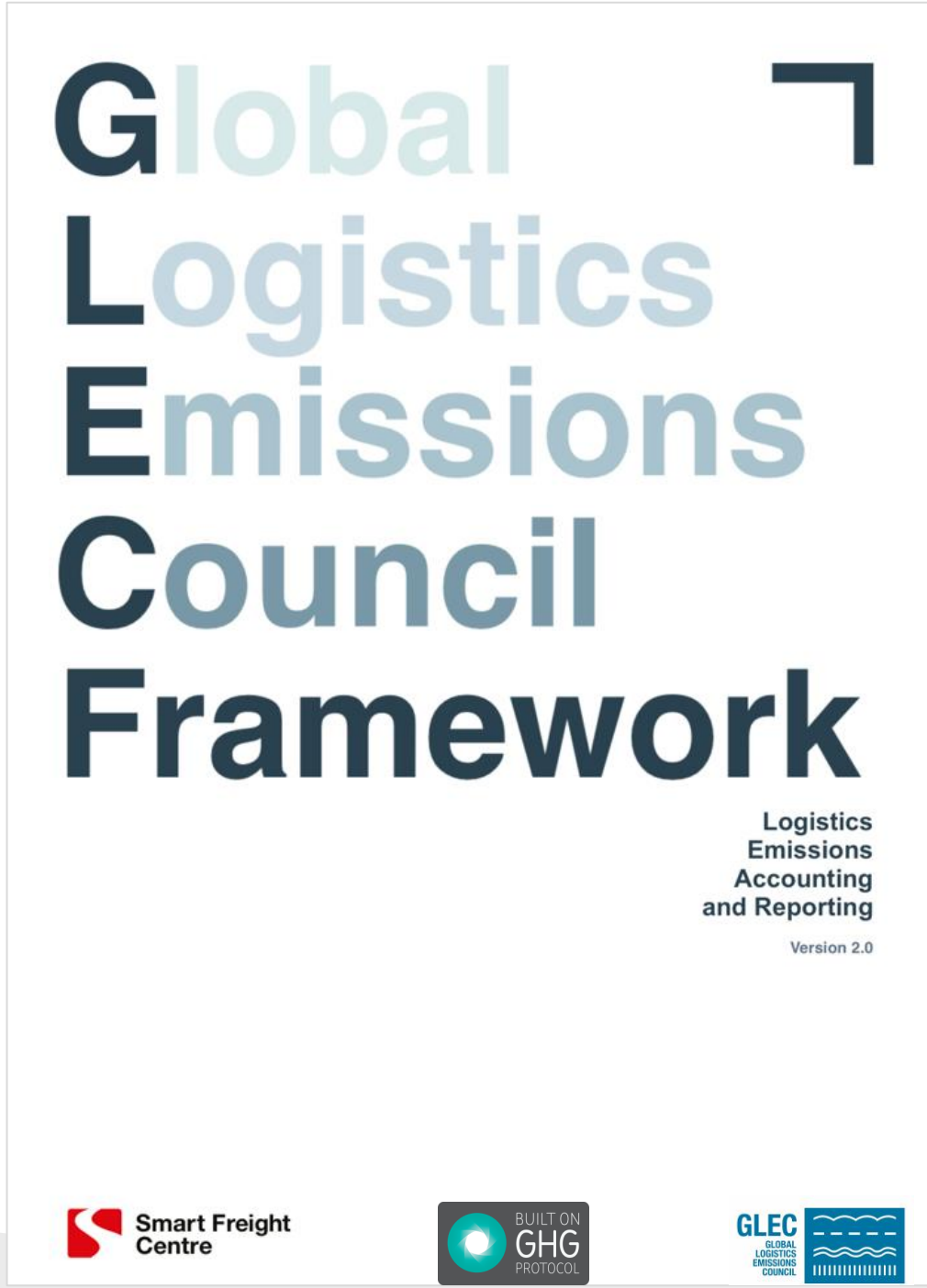
ISO

Used by

100+
multinationals

20+
Programs, tools, initiatives

Watch 3-min video,	Download the GLEC Framework	Join our GLEC Framework e-training

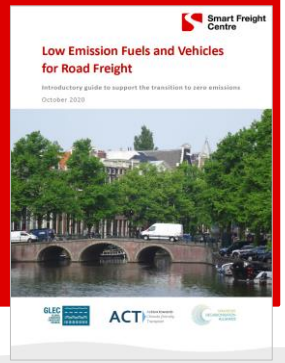


LEFV Program

Objective: Remove barriers for companies' uptake of LEFV solutions

What are Low Emission Fuels?

Introduction Guide on LEFV for Road Freight (completed)



How to report?

Default emission factors

Guidance on Total Emissions of Ownership

How to decide?

Decision Making Matrix

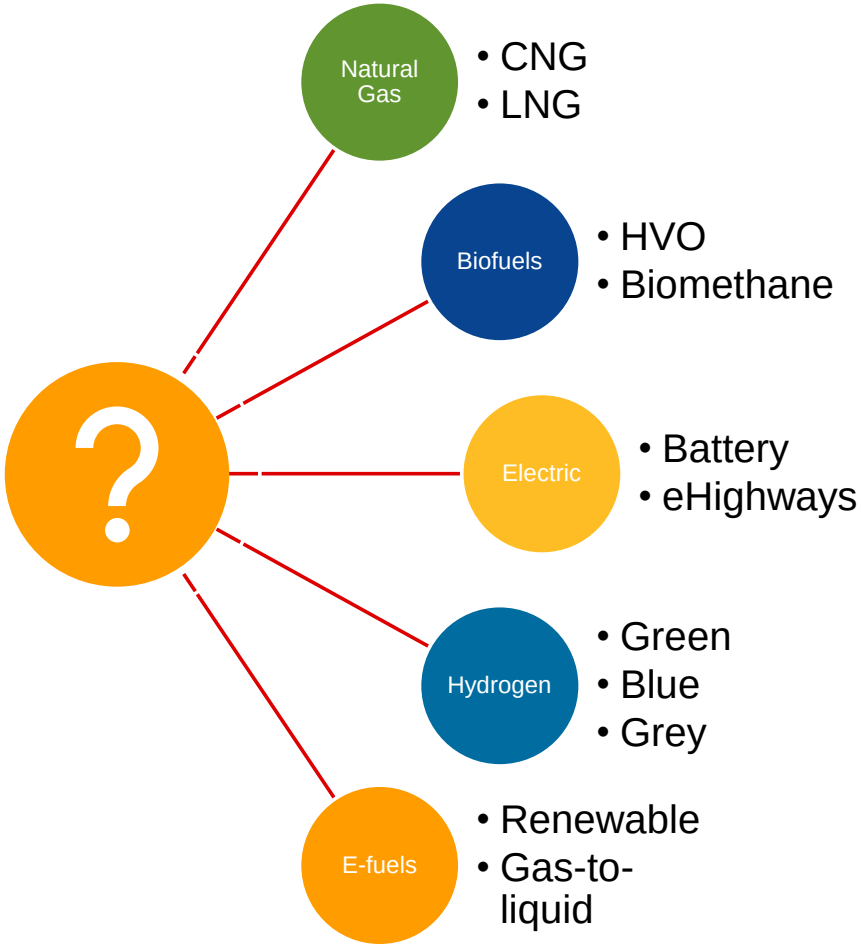
How to implement?

Establishing collaboration in France

The challenge for selecting a Low Emission Fuel and Vehicle?

- Operators
- Shippers
- Energy Providers
- Policymakers
- Vehicle Manufacturers

Challenge: which way to go?

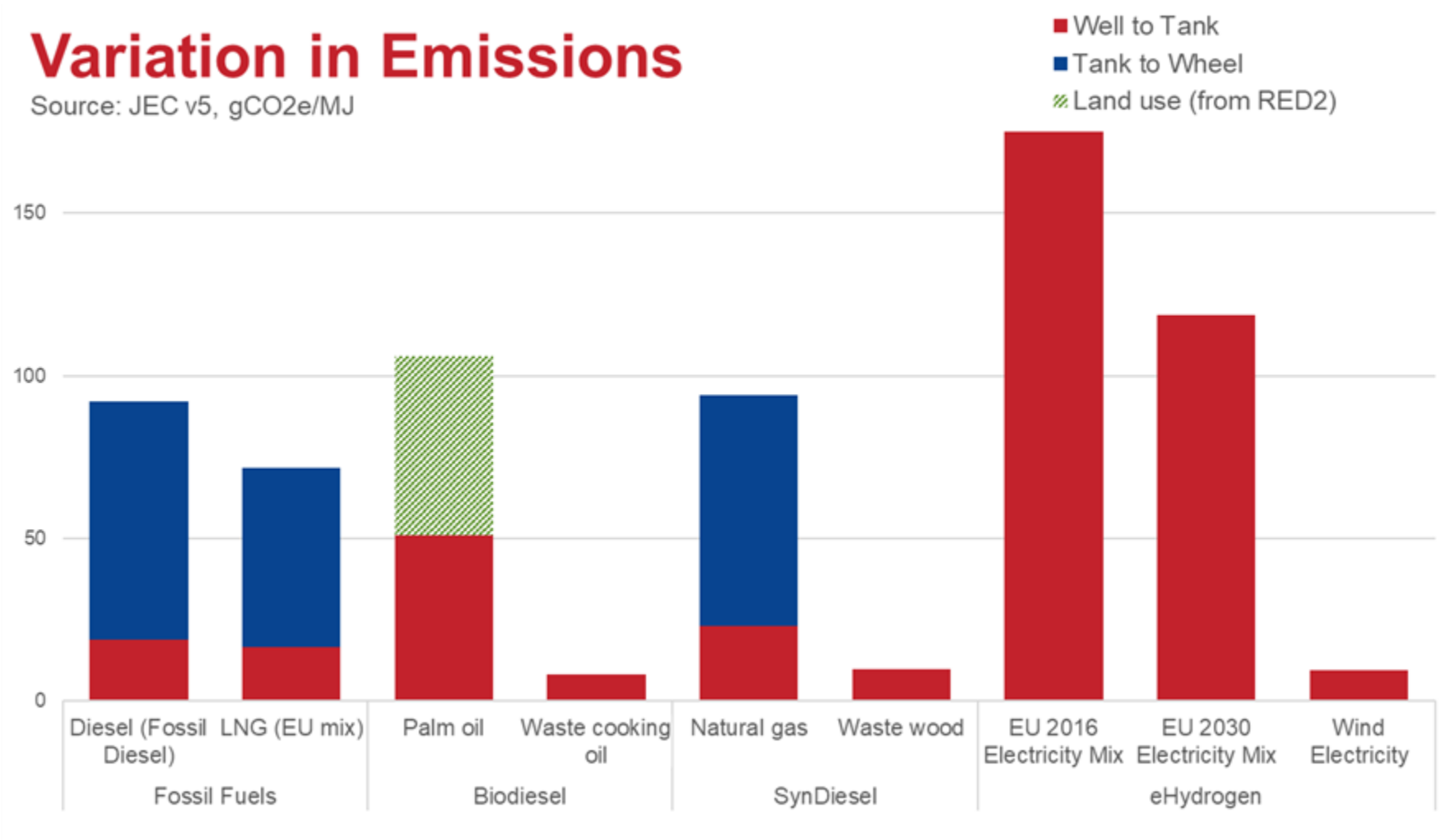


Considering:

- Emission Factor
- Energy consumed
- Costs

Breakdown of Emissions

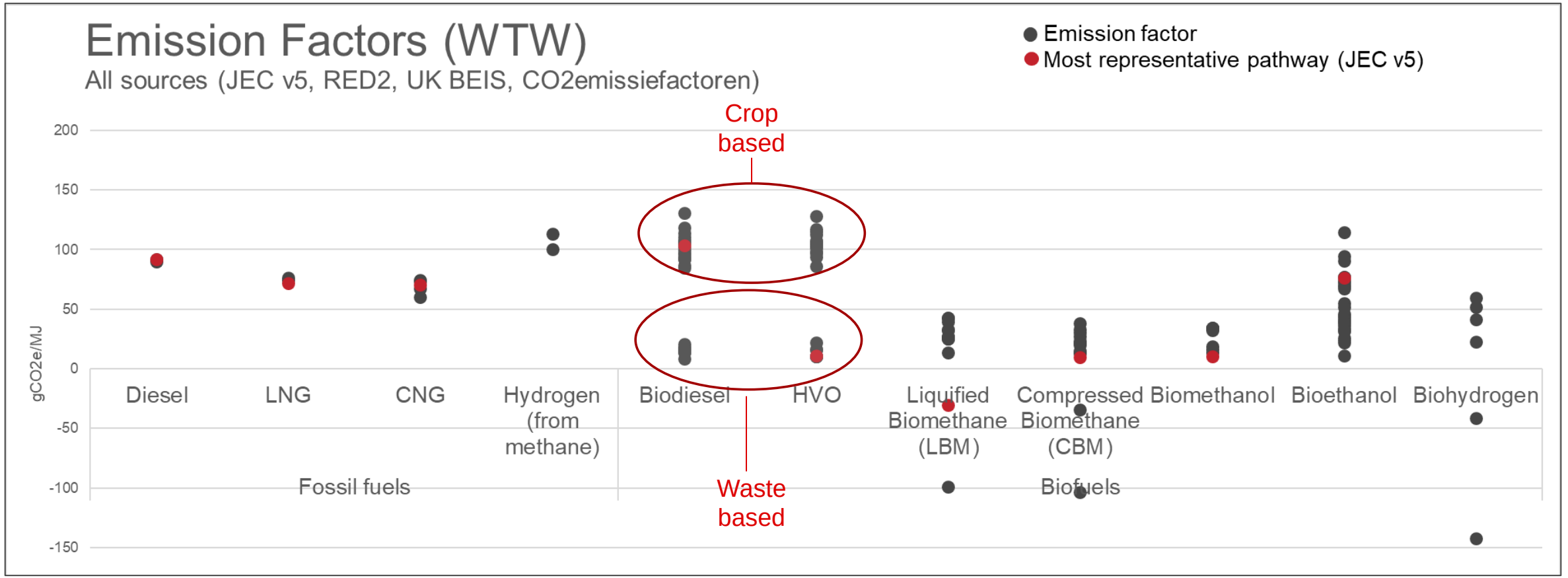
- Feedstock matters
- Origin of electricity matters



Variability Within Fuel Type

The difference is explained in the feedstock used for the production

[1] The most representative pathway shown in the graph is based on the JEC v5 study. However, several pathways are still open to market and technical development. For instance, the most representative pathway for Liquified Biomethane (LBM) is from using the feedstock Open Manure, whereas the Compressed Biomethane most representative pathway is based on the Municipal waste. This explains some of the variation in the 'red' dot.

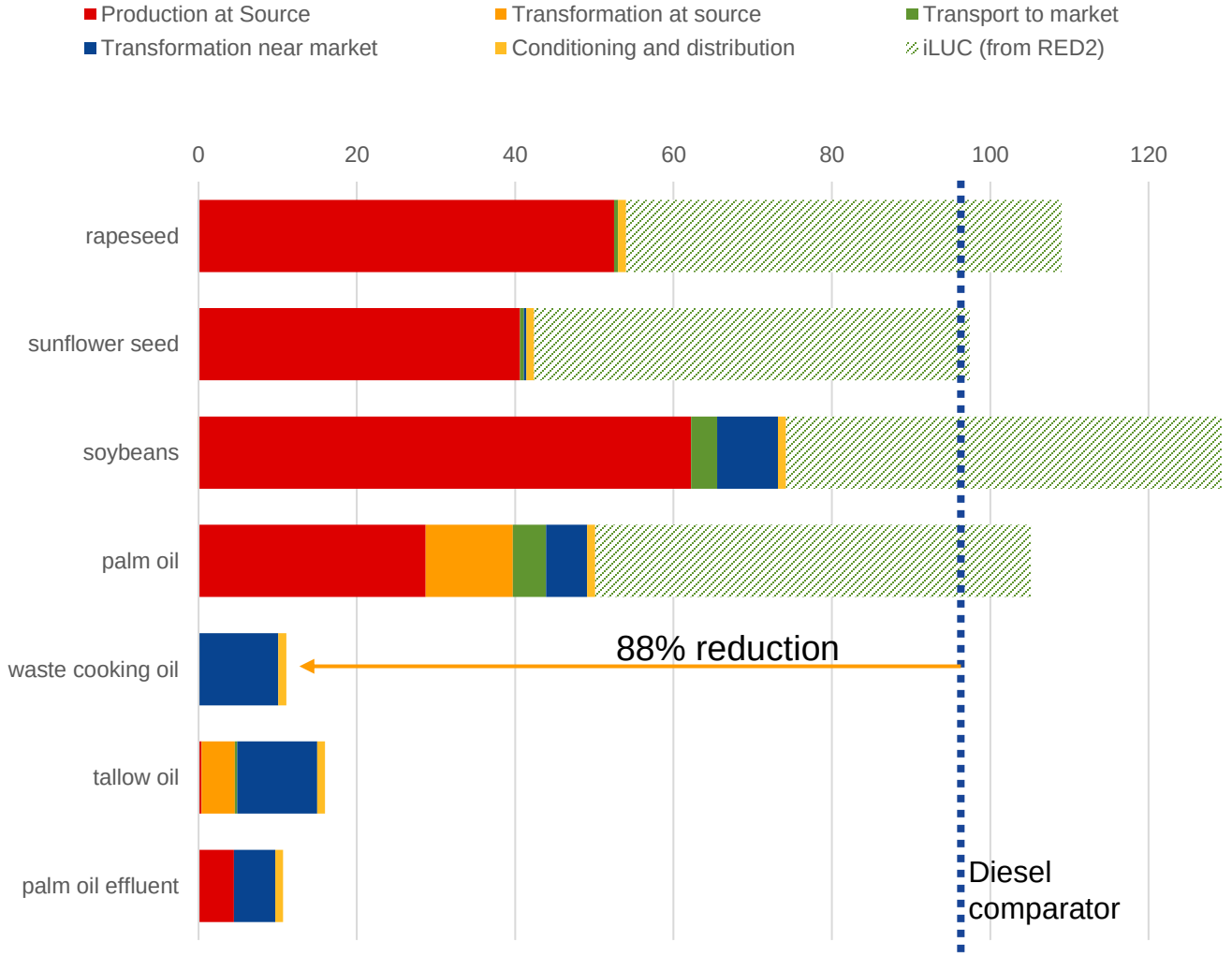


Biofuels (HVO)

Well-to-wheel GHGs

Variation in HVO Emission Factors

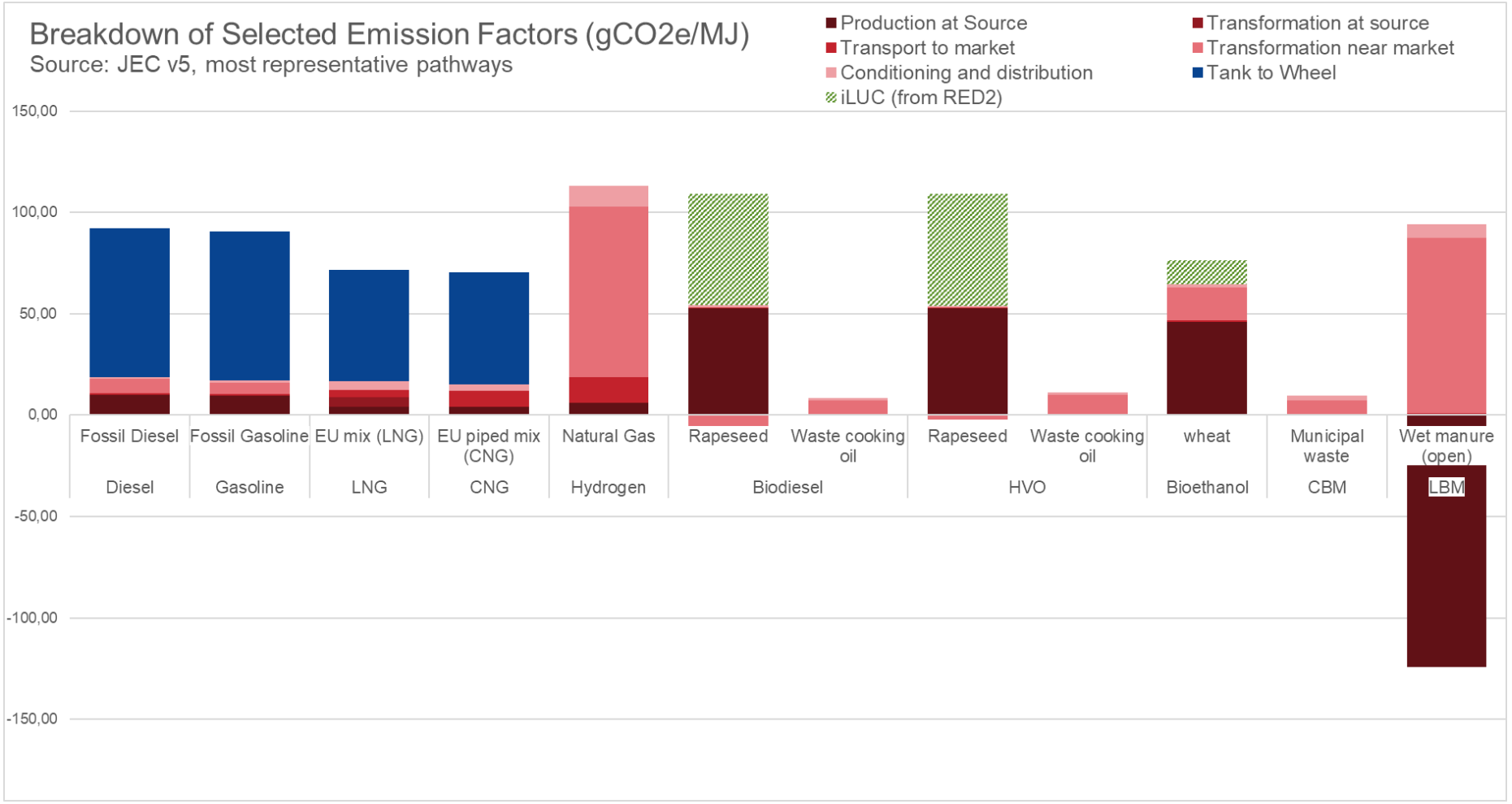
Source: JEC v5; gCO2e/MJ; WTW incl iLUC



Fossil and Biofuels

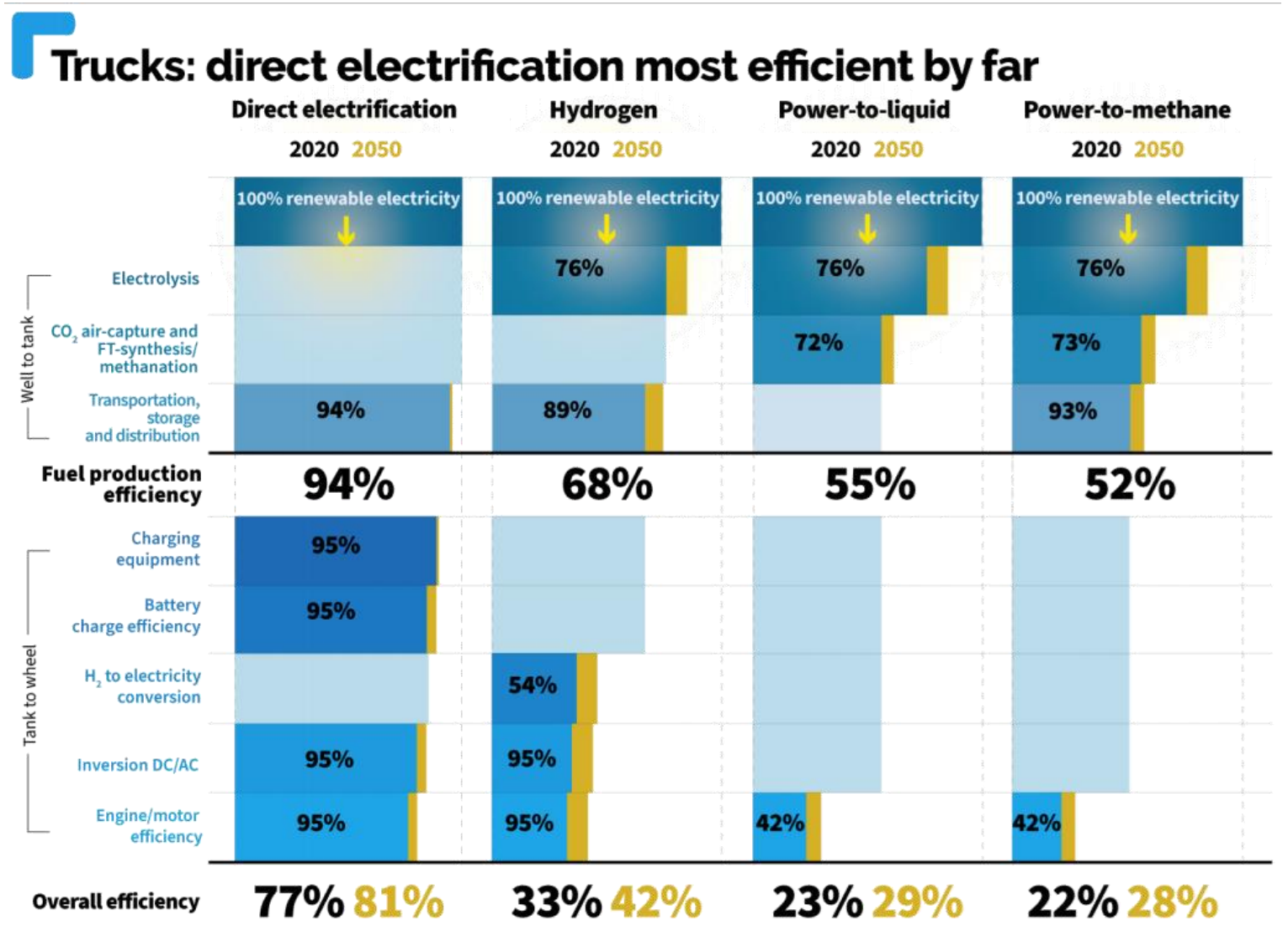
Breakdown of Upstream Emissions

Feedstock matters



Efficiency of energy used

- Hydrogen requires 2-3x the energy consumed
- eFuels require 3-4x the energy consumed



Sources: Transport & Environment

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LEFV Decision Making Matrix

LEFV Decision Making Template

Determine in three steps the potential solutions:

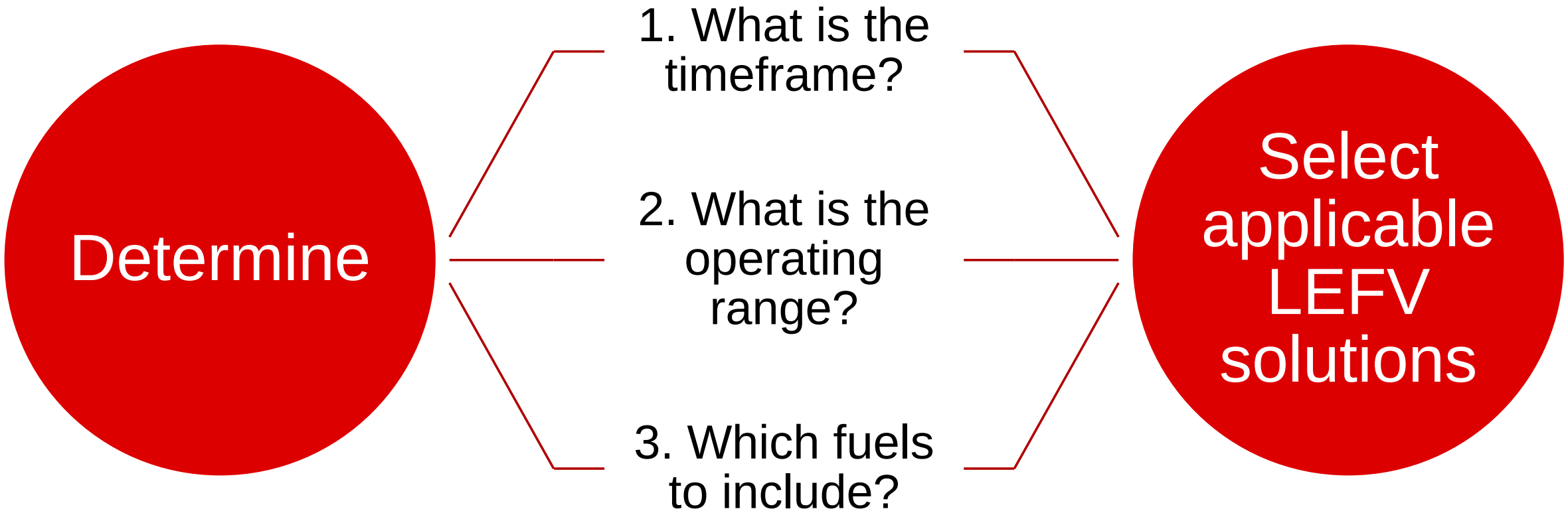
Step 1. Determine Applicability of LEFV solutions to your use case

Step 2. Determine Availability of LEFV solutions in your market

Step 3. Determine Feasibility of the LEFV solutions in cost and emissions

Step 1. Determine applicable LEFV solutions

Questions of step 1



Step 1. Determine applicable LEFV solutions

Scope and definitions

Timeframe:

- Year of introduction
- Duration
- Outlook up to 2030

Fuels/Powertrain:

- Biofuels (2nd & 3rd generation)
  - Biodiesel (B20/B100)
  - HVO
  - LBM / CBM
  - Biomethanol
  - Bioethanol
- Electric
  - BEV
  - E-Highways
- Green Hydrogen
  - FCEV 350 bar / 700 bar
  - FCEV Liquified Hydrogen

Operating Range

- Urban / Short Trip
- Regional ±100-300 km
- Extended-Regional 300-500 km
- Long Distance 500+ km
- International 1000+km

Vehicle category or Payload

- < 1.3 tonnes;
- 1.3 – 3.5;
- 3.5 – 7.5;
- 7.5 – 12;
- 12 – 17.5,
- 17.5 – 26;
- >26

Step 1. Determine applicable LEFV solutions

Output shows the Low emission fuel solutions in a particular year (evolvement of technology); Final categories and chosen solution to be made by each company.

2025 concept (example only)

	Urban	100-300 km	300-500 km	500-1000km	1000km+
1-[0T – 1.3T]	Electric	Electric	Biofuel	Biofuel	Intermodal
2-[1.3T – 3.5T]	Electric	Electric	Biofuel	Biofuel	Intermodal
3-[3.5T – 7.5T]	Electric	Electric	Biofuel	Biofuel	Intermodal
4-[7.5T – 12T]	Electric	Electric	Biofuel	Biofuel	Intermodal
5-[12T – 17.5T]	Biofuel	Biofuel	Biofuel	Biofuel	Intermodal
6-[17.5T – 26T]	Biofuel	Biofuel	Biofuel	Biofuel	Intermodal
7-[26T+]	Biofuel	Biofuel	Biofuel	Biofuel	Intermodal

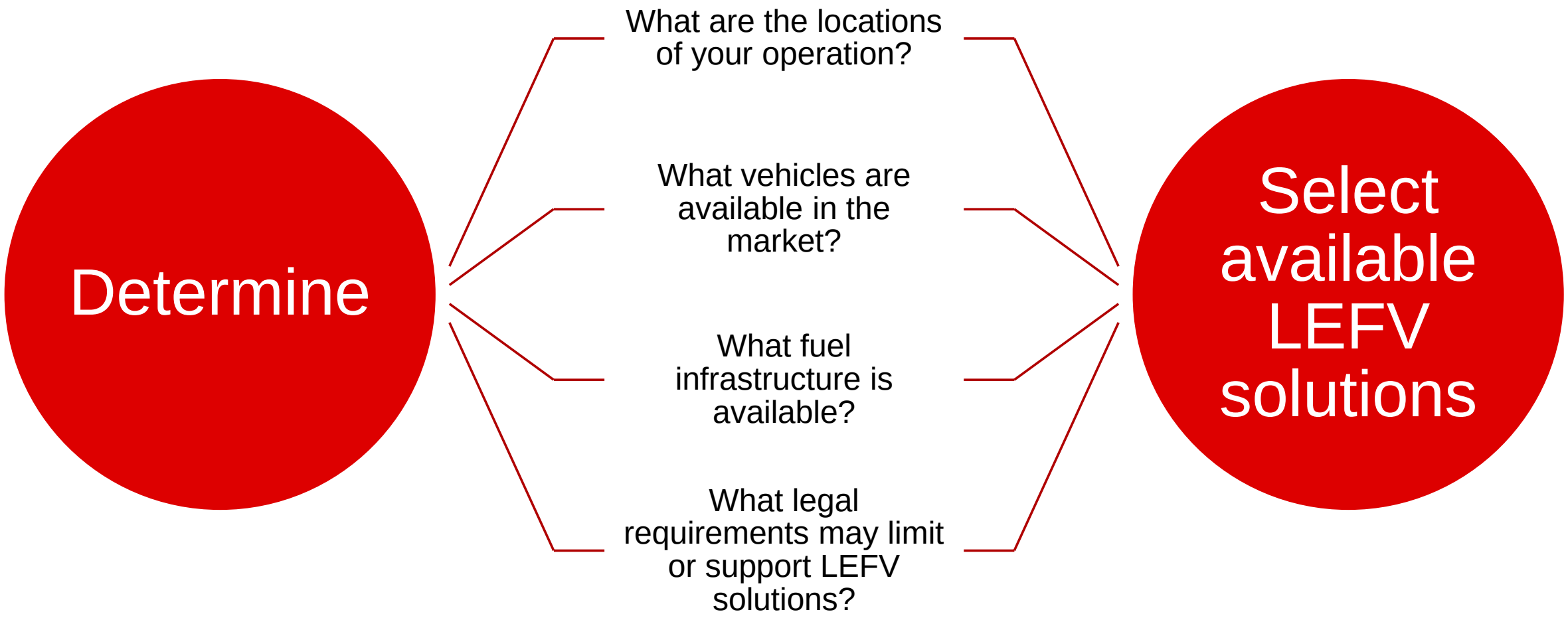
2030 answer (example only)

	Urban	100-300 km	300-500 km	500-1000km	1000km+
1-[0T – 1.3T]	Electric	Electric	Electric	Electric/ Hydrogen	Intermodal
2-[1.3T – 3.5T]	Electric	Electric	Electric	Electric/ Hydrogen	Intermodal
3-[3.5T – 7.5T]	Electric	Electric	Electric	Electric/ Hydrogen	Intermodal
4-[7.5T – 12T]	Electric	Electric	Electric	Electric/ Hydrogen	Intermodal
5-[12T – 17.5T]	Electric	Electric	Electric	Electric/ Hydrogen	Intermodal
6-[17.5T – 26T]	Electric	Electric	Electric/ Hydrogen	Electric/ Hydrogen	Intermodal
7-[26T+]	Electric	Electric	Electric/ Hydrogen	Electric/ Hydrogen	Intermodal

Source: Example derived from Unilever

Step 2. Determine available LEFV solutions

Questions



Step 2. Determine available LEFV solutions

Scope and definitions

Location

- City [Paris, Nice, Lyon, …]
- Province [Bretagne, Riviera, etc.]
- Corridor [Lyon-Paris]

Vehicle supply

- Category (from step 1)
- Manufacturer [Renault, Toyota, Scania, …]
- Model

Fuel supply and Infrastructure

- Type [Recharging/ Refuelling]
- Ownership [Public, Own or subcontracted]
- Fuel quantity [availability of selected fuel]
- Fuel certification

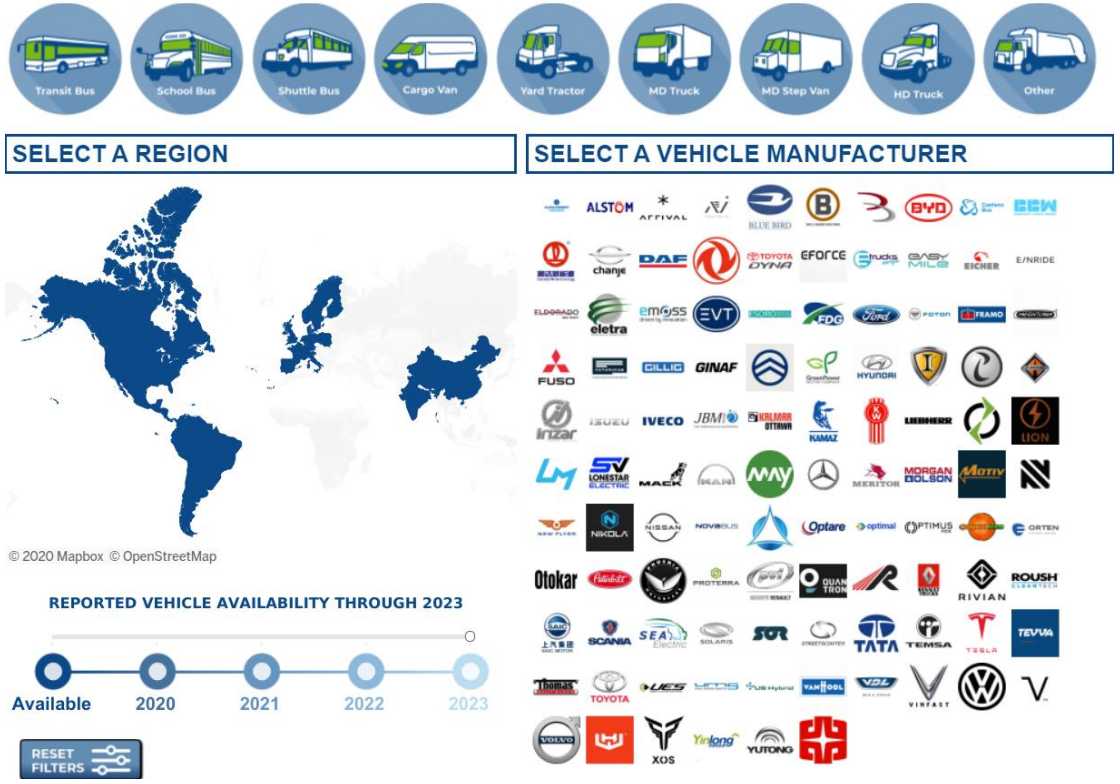
Legal requirements

- Restrictions [zero emission zones vs low emission zones]
- Norms and standards [e.g. fuel emission/ economy standards]

Step 2. Determine available LEFV solutions

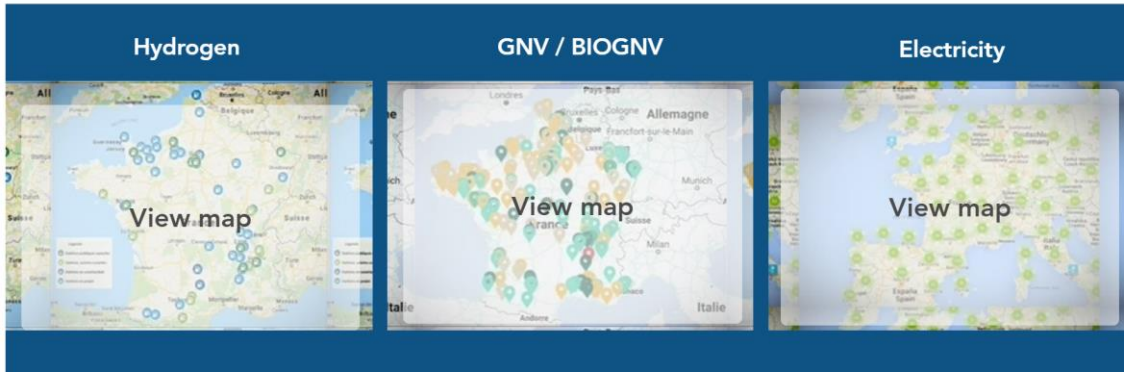
Output: Which vehicles and infrastructure are available
Guidance: Legal considerations, reliability, etc.

Vehicles



Source: Global Commercial Drive To Zero Program (globaldrivetozero.org)

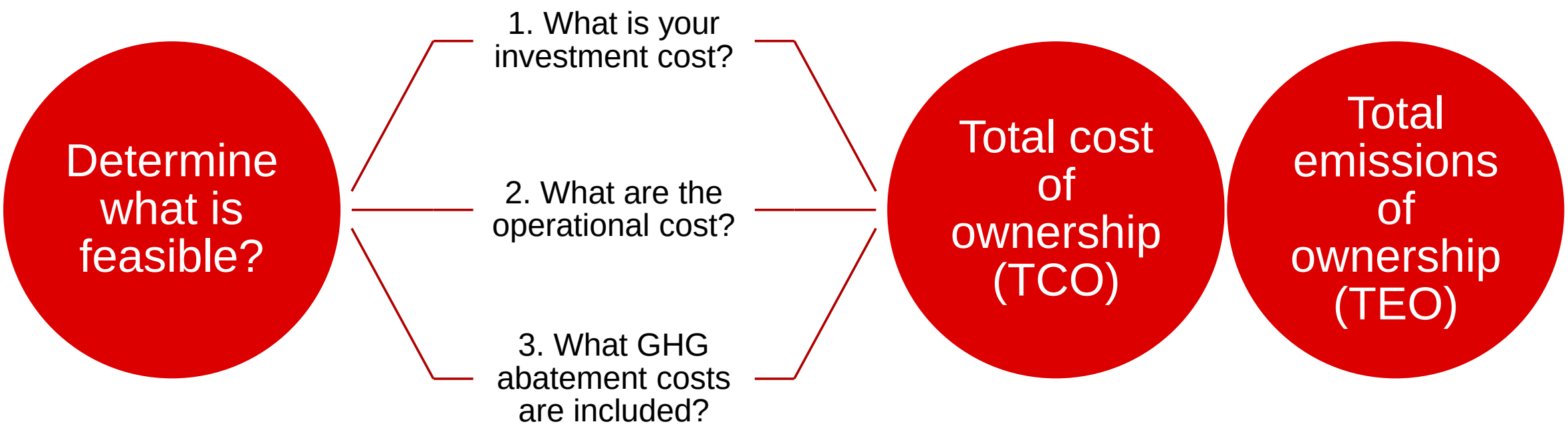
Infrastructure



Source: Véhicules et Avitaillement | Kit Environnement (terre-tlf.fr)

Step 3. Determine feasible LEFV solutions

Questions



Step 3. Determine feasible LEFV solutions

Scope and definitions

Investment

- Vehicle purchase,
- Fuel infrastructure
- Retrofitting
- Other (e.g. training, licensing, etc.)
- Resale price

Incl. available subsidies in each category

Operational cost

- Fuel/energy per unit
- Insurance
- Taxes
- Toll
- Maintenance
- Other

GHG Abatement costs

- CO_2e (shadow) pricing
- Carbon offset
- Social costs of carbon

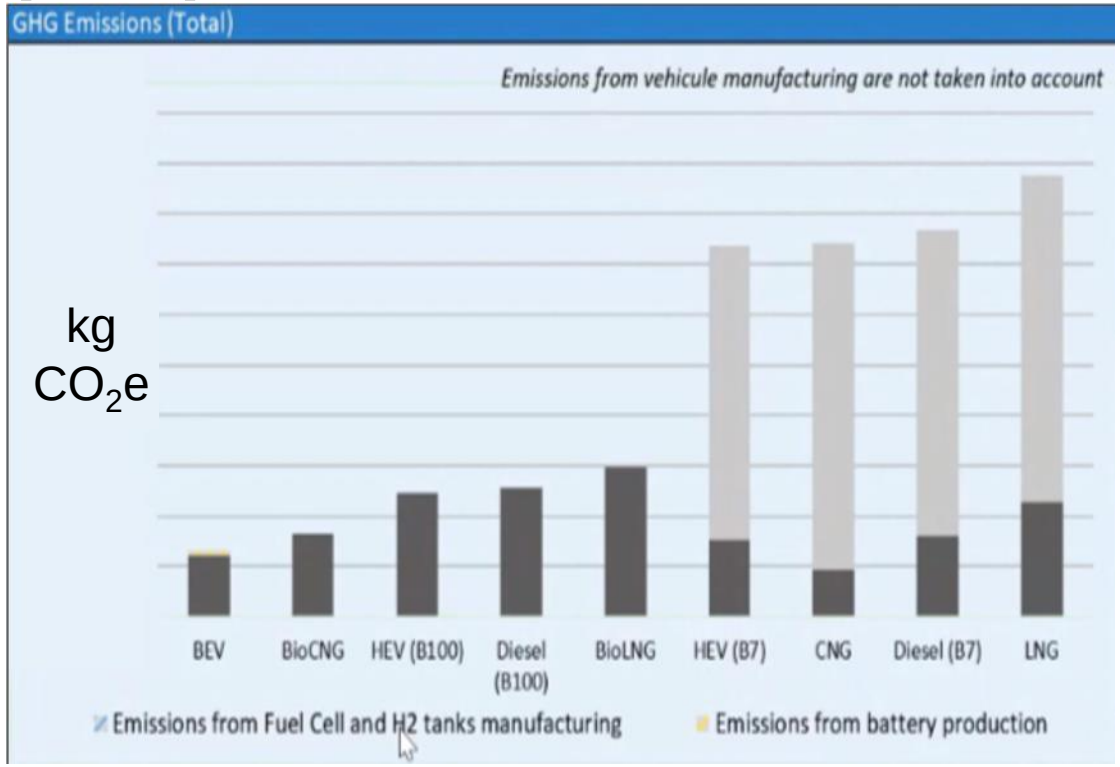
Total Emissions of Ownership

- CO_2e of operating the vehicle
- Well to tank and tank to wheel; (iLUC)
- Emission factors may change over time (e.g. more renewable electricity)

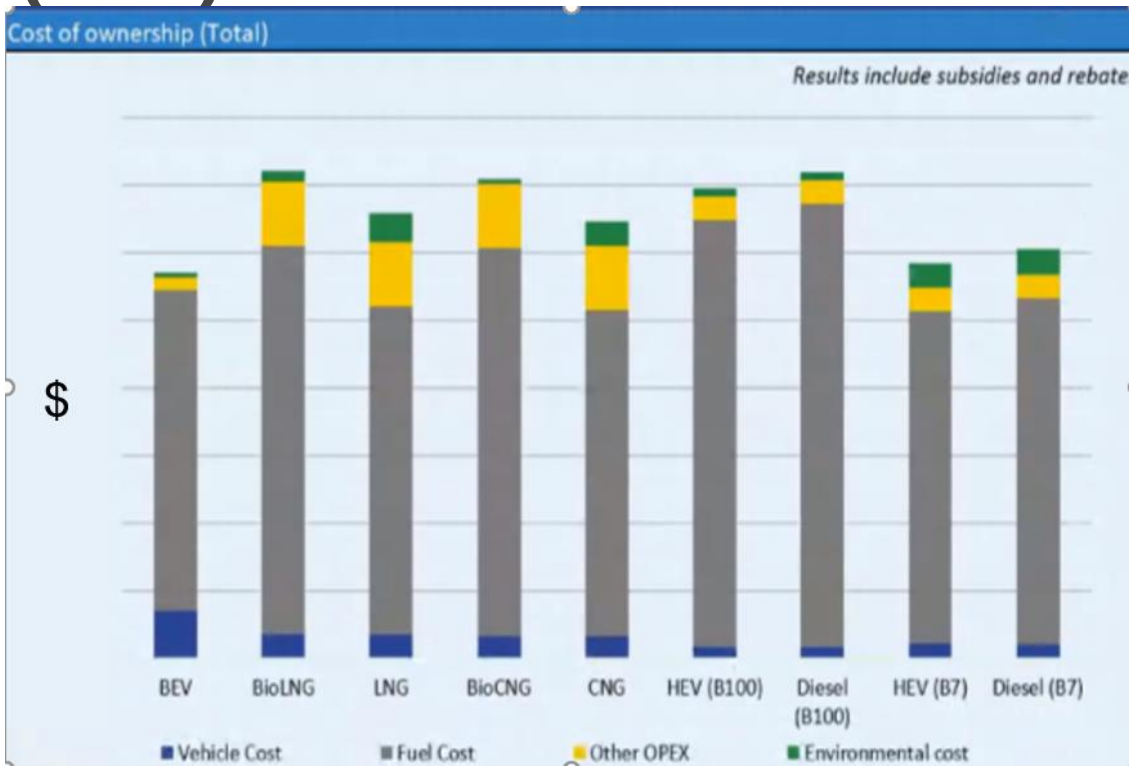
Step 3. Determine feasible LEFV solutions

Output: Calculations based on the anticipated usage of total emissions and cost of ownership

Total Emissions of Ownership (TEO)



Total Cost of Ownership (TCO)



Source: Example of FM Logistic/ENEA, Mobility Comparator

Summary

No straightforward answer on which solution to take

- Consider the feedstock and origin of the fuel and ensure it is certified
- TEO in addition to TCO
- Apply Applicability, Availability, Feasibility

- Overview of technical feasibility
- Indicative answer of preferred solution per use case

- Fuel and infrastructure availability
- Vehicle availability
- Legal/Policy options

- Guidance on TEO calculations
- Reference to TCO guidance
- Template for calculations

Product 1. LEFV Decision Making Template	Product 2. LEFV Decision Making Manual	Product 3. LEFV Decision Matrices for France

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Join our journey towards efficient and zero-emissions global freight and logistics

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