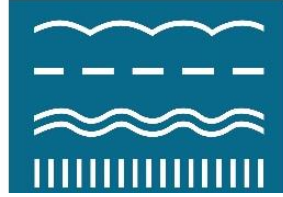




GLEC
GLOBAL
LOGISTICS
EMISSIONS
COUNCIL



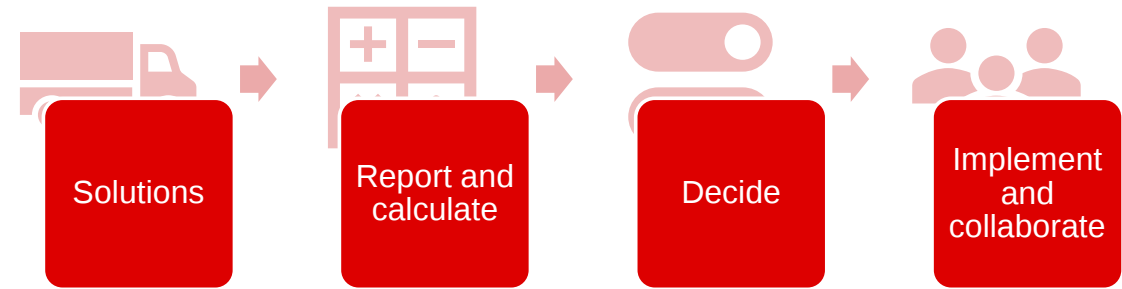
8th International Workshop on
Sustainable Road Freight

A true comparison of the GHG reduction potential of transport energy sources and the concept of Total Emissions of Ownership

Rik Arends
Program Director



Our Low Emissions and Fuels Program



FREIGHT DEMAND GROWTH IS MANAGED



- Supply chain restructuring
- Localization and nearshoring
- Decentralization of production and stockholding
- 3D printing
- Dematerialization
- Consumer behavior

TRANSPORT MODES ARE SMARTLY USED AND COMBINED



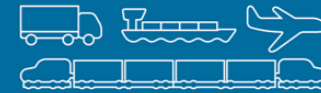
- Increased use of rail
- Increased use of short sea shipping and inland waterways
- Modular road transport
- Cargo bikes
- Multi-modal optimization
- Synchromodality

FLEETS AND ASSETS ARE SHARED AND USED TO THE MAX



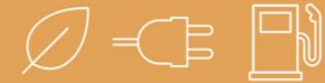
- Load optimization
- Load consolidation and asset sharing
- Reduce empty moves
- Modular packaging and boxes
- Open transport networks and warehouses.
- Increase storage density and energy efficiency

FLEETS AND ASSETS ARE ENERGY EFFICIENT



- Cleaner and efficient technologies
- Efficient vehicles and vessels
- High capacity vehicles and vessels / duo trailers
- Driving behavior
- Fleet operation
- Fleet maintenance

FLEETS AND ASSETS USE LOWEST EMISSIONS ENERGY SOURCE FEASIBLE



- Electric / hybrids
- Solar / Wind
- Biofuels
- Hydrogen
- CNG/bio-LNG
- Cleaner diesel
- Fuel management

© Smart Freight Centre and ALICE-ETP based on A. McKinnon 'Decarbonizing Logistics' (2018)

In partnership with
alice
Alliance for
Logistics Innovation
through Collaboration
in Europe



Smart Freight Centre

What's the problem?



Operators



Shippers



Energy Providers



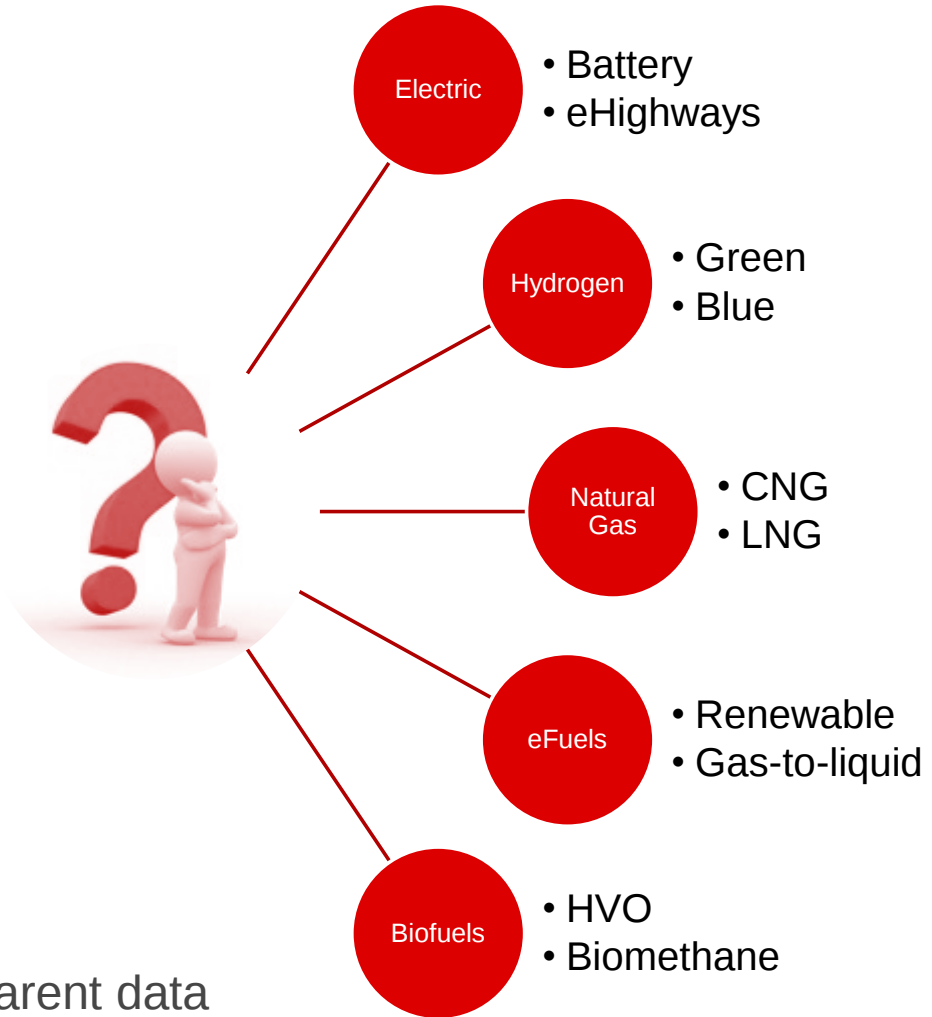
Policymakers



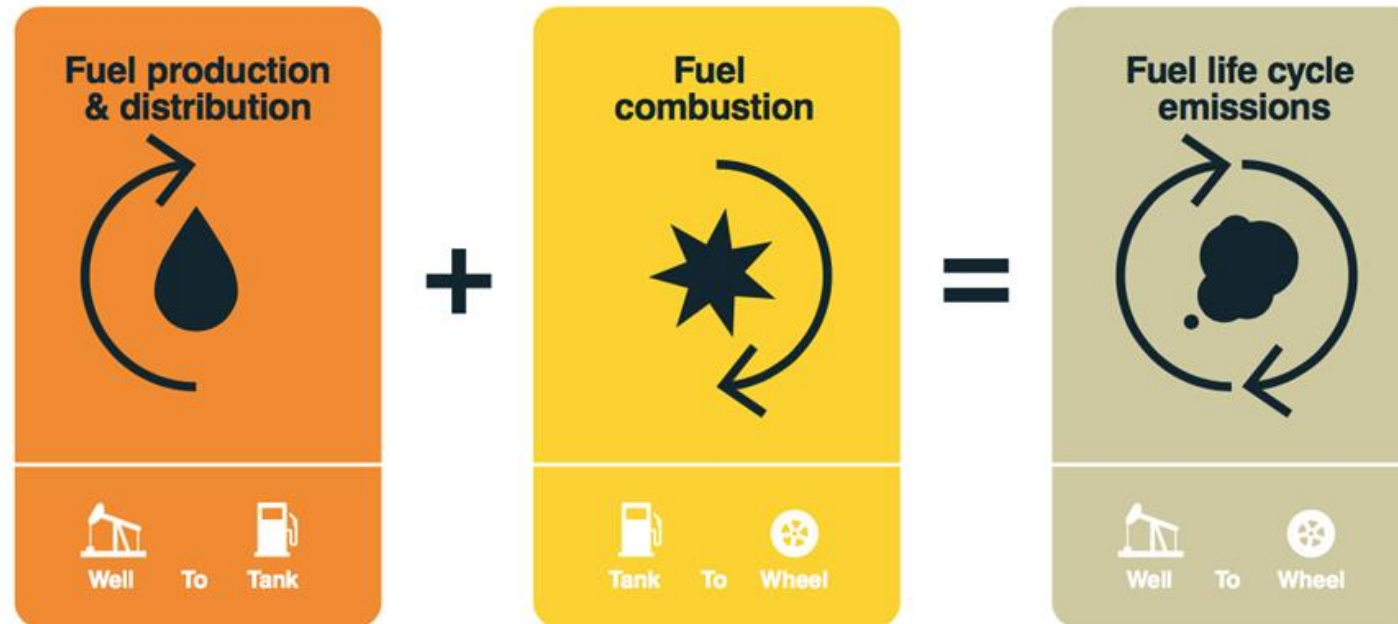
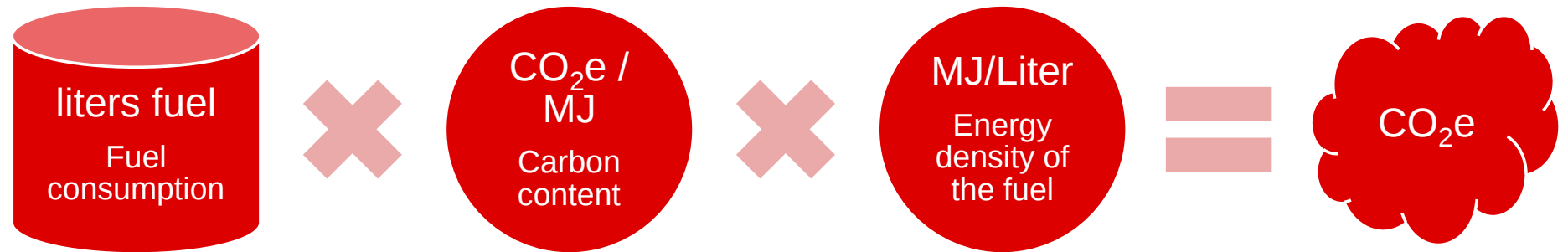
Vehicle Manufacturers

Challenge:
which way
to go?

Reliable transparent data
= Trust in the outcome!



Calculate logistics emissions

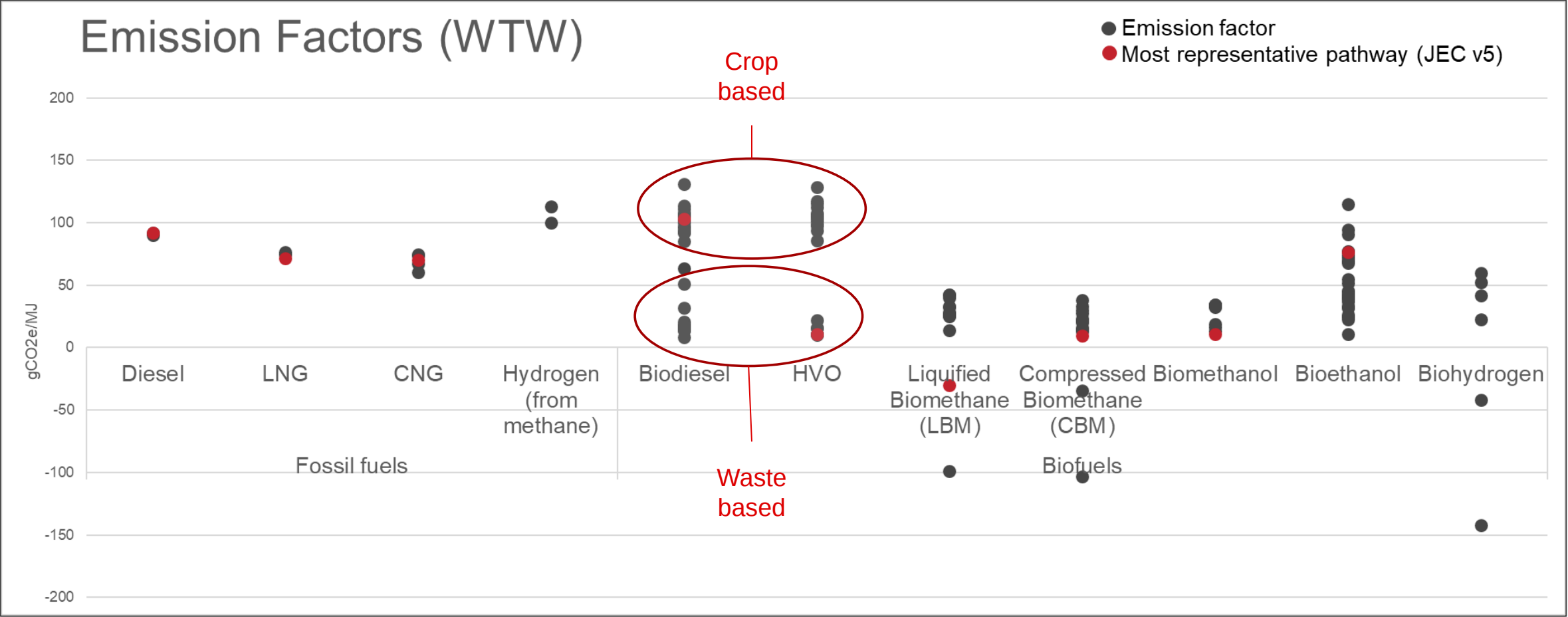


**Variations in carbon content of
different energy carriers**

A review of JEC v5 (EU), RED II, NL Emissiefactoren and UK BEIS

Variability Within Fuel Type

Biofuels and fossil fuels



Biofuels

Well-to-wheel GHGs

Source of the
biofuel



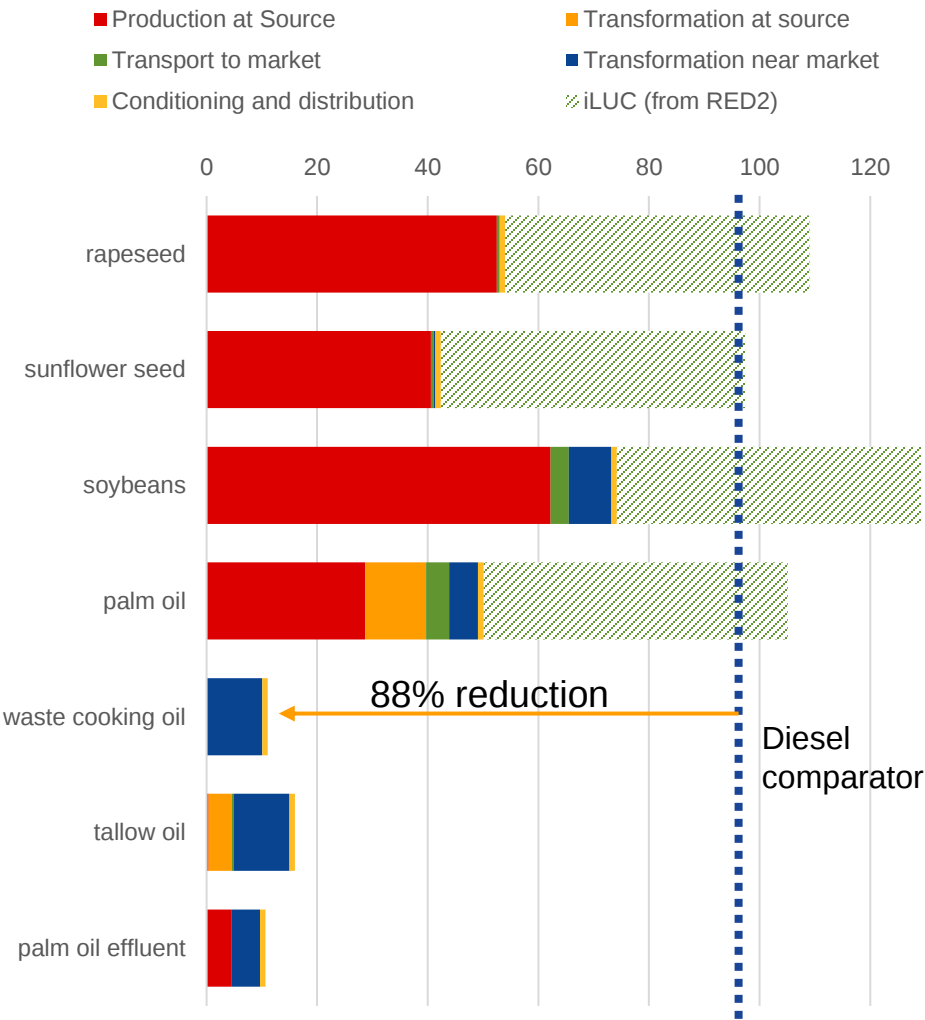
Distance
biofuels
source to use



Efficiency
biofuels plant



Variation in HVO Emission Factors
Source: JEC v5; gCO₂e/MJ; WTW incl iLUC



Electric vehicles and vessels

Well-to-wheel GHGs

Fossil fuels



Renewable energy

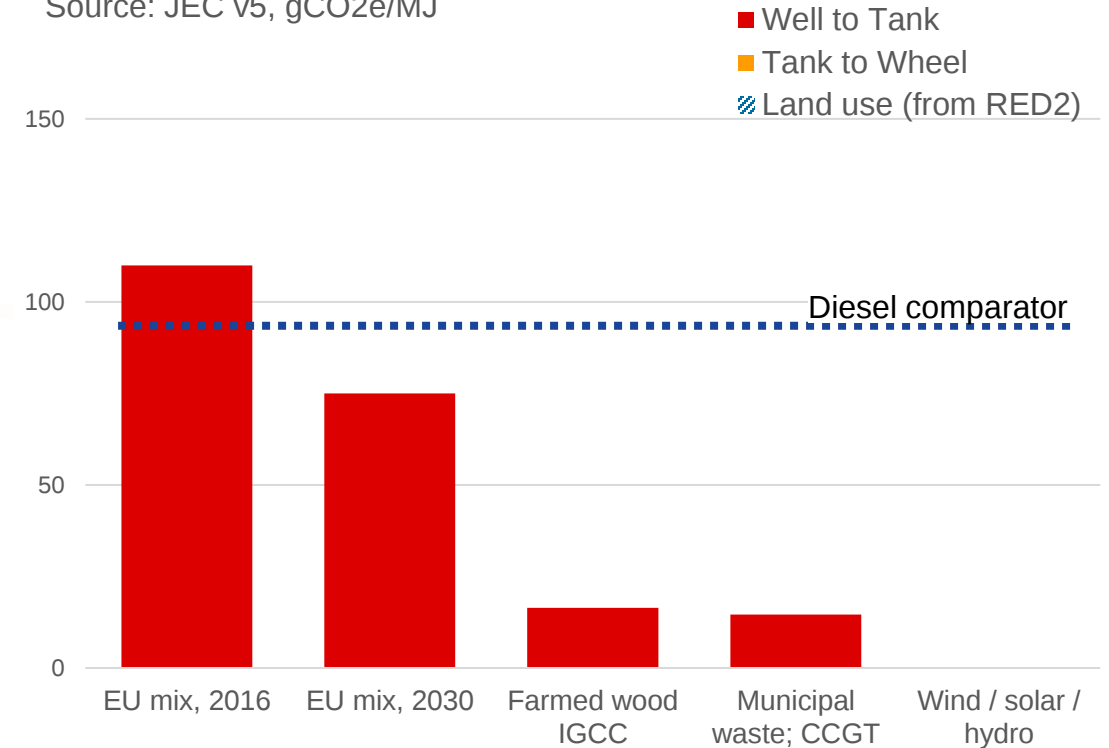


Nuclear



Variation in Emissions

Source: JEC v5, gCO₂e/MJ



Hydrogen

Well-to-wheel GHGs

Losses during production, transport, distribution and use

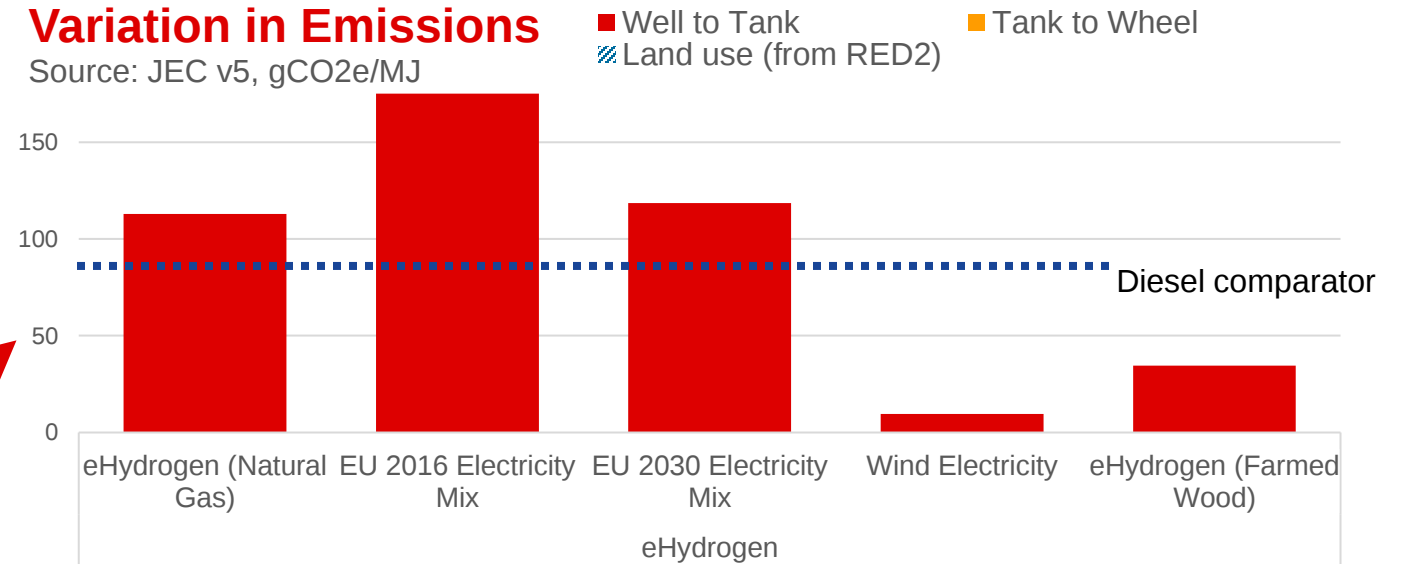
Source of the methane in SMR

Effectiveness of carbon capture and storage (CCS)

Means of electricity generation

Variation in Emissions

Source: JEC v5, gCO₂e/MJ





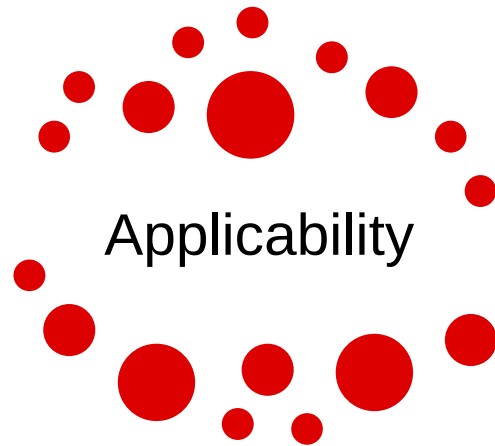
**Smart Freight
Centre**

Decision Making and Total Emissions of Ownership

Our Decision Making

A conversational tool to compare and understand what is possible

Determine in three steps the potential solutions:



Applicability

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



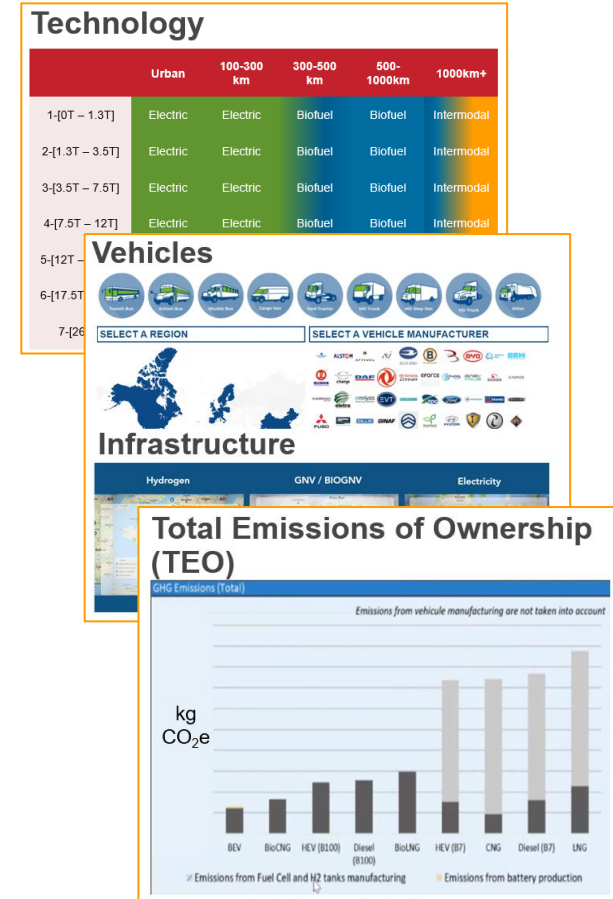
Availability

Step 2. Determine Availability of LEFV solutions in your market



Feasibility

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



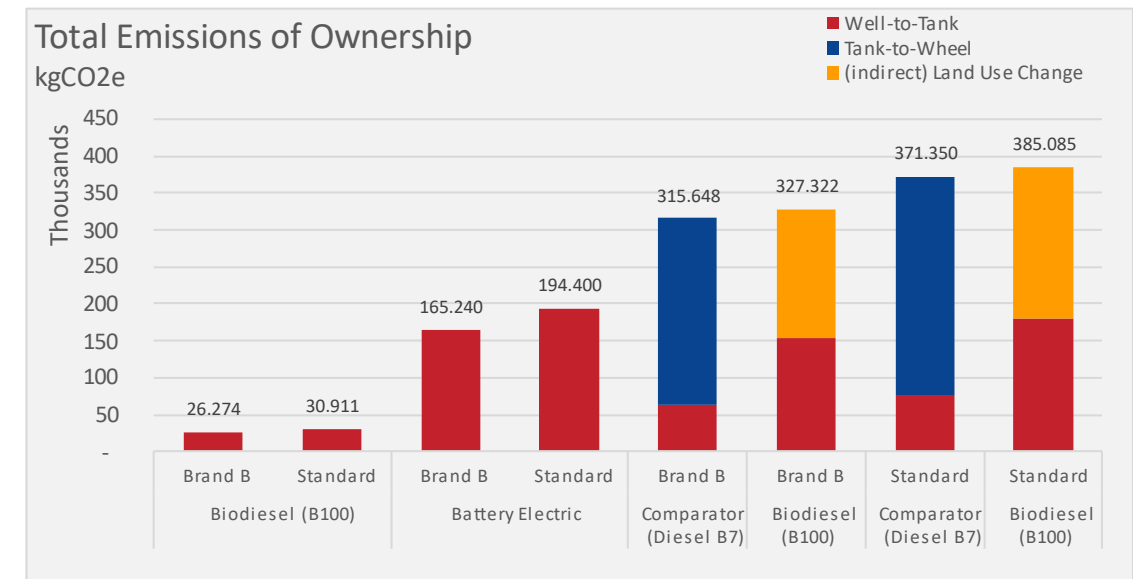
Total Emissions of Ownership

Total Emissions of Ownership is:

- calculation of emissions from the **operating** lifetime of a vehicle,
- allow for changes in electricity emission factors change over time or the use of 'drop in' fuels.
- Explicitly linked to the concept of Total Cost of Ownership, still considered one of the most important factors
- In line with GHG accounting practice: Upstream and Downstream emissions of the fuel, excl. infrastructure and vehicle production/dismantling

Strategic importance to freight buyers and suppliers in understanding emission reduction potential

Total Emissions of Ownership allow enabling comparison of fuels, vehicles, feedstock, etc.





Conclusions

Review of emissions

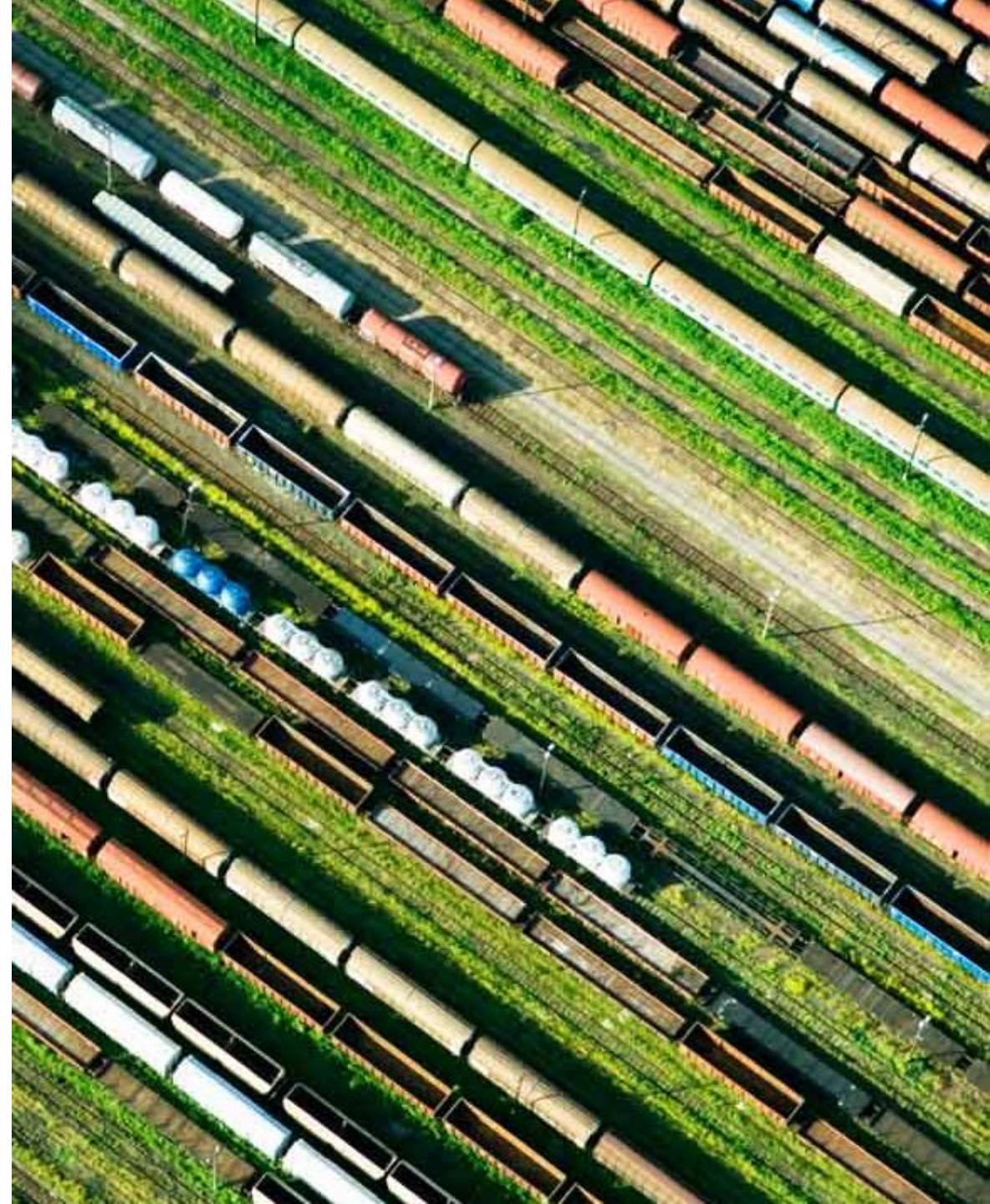
1. The source of production or the feedstock used
2. the direct and indirect contribution to land use change for crop-based fuels can be significant
3. certain fuel development scenarios include Carbon Capture Utilization and Storage (CCU/CCS) in the production pathway as a method to reduce life cycle emissions.
4. Certify the source and the lifecycle GHG emissions of the fuels using neutral, well-established mechanisms

Total Emissions of Ownership can present a simple method to review and compare the emission reduction potential of various fuels

Conclusions (Methodology)

The methodology:

- The reviewed reports did not cover methane slip for the gaseous vehicles which can be a strong greenhouse gas contributor,
- Calculate and attribute the effects of indirect land use change, which can be substantial, change to the emission factor is still under development;
- Once a fuel sees substantial share of the market, there is a need to switch from a consequential approach to an attributional approach





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

Rik Arends
Program Director

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