

# Emission Calculation Practice - Project Trajectory and Pitfalls

ECTA RESPONSIBLE CARE WORKSHOP | 29 SEPTEMBER 2022

THIES GRAGE | HEAD OF INNOVATION & SUSTAINABILITY

- 1** HOYER GROUP IN A NUTSHELL
- 2** CO<sub>2</sub> EMISSION ANALYTICS – PART OF HOYER SMART LOGISTICS
- 3** CALCULATION FRAMEWORK & METHODOLOGY
- 4** PITFALLS
- 5** Q & A | OPEN DISCUSSION

# HOYER Group in a Nutshell

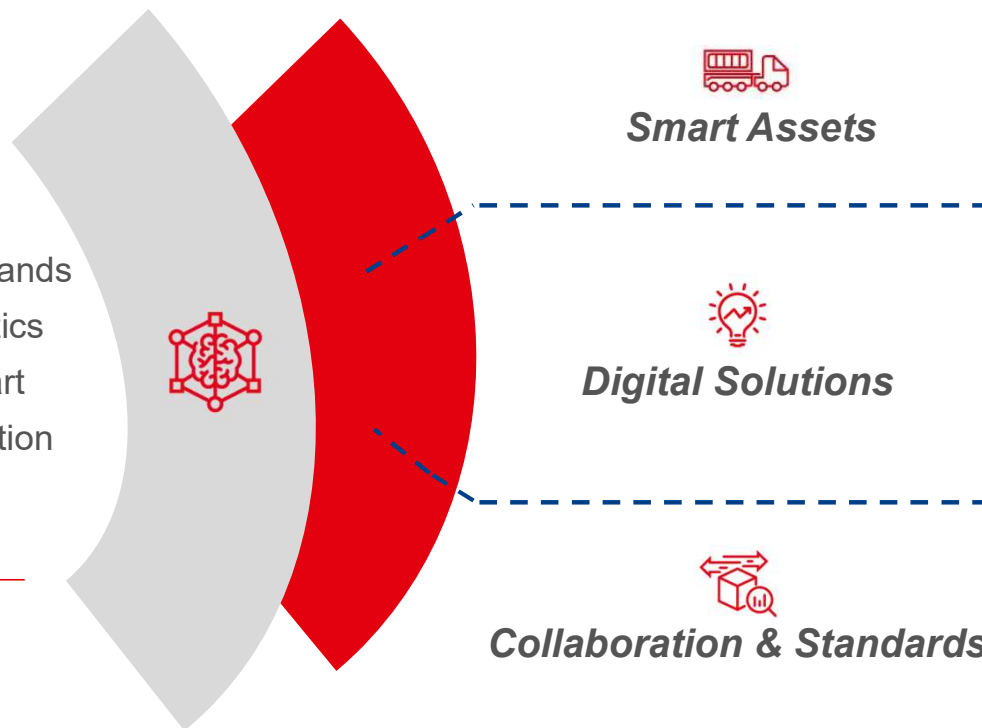
## Our Services



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CO<sub>2</sub> Emission Analytics are an integral part of HOYER Smart Logistics.

HOYER Smart Logistics stands for digital end-to-end logistics solutions enabled by smart assets as well as collaboration and connectivity with business partners.



- ✓ Tank Container
- ✓ Trucks
- ✓ Tank Trailer<sup>1</sup>
- ✓ IBC<sup>1</sup>
- ✓ Transport Visibility
- ✓ Product Condition Monitoring
- ✓ CO<sub>2</sub> Emission Analytics
- ✓ VMI for Storage Tank Containers
- ✓ Customized Temperature Analytics
- ✓ Tank Fleet Management
- ✓ Data Exchange
- ✓ Connectivity to Business Partners
- ✓ Platforms & Ecosystems
- ✓ Digital Transport Documents

# HOYER Smart Logistics

## Digital Solutions: CO<sub>2</sub> Emission Analytics

We calculate CO<sub>2</sub> emissions for our transports as part of our sustainability measures.



Supply Chain &  
Asset Visibility

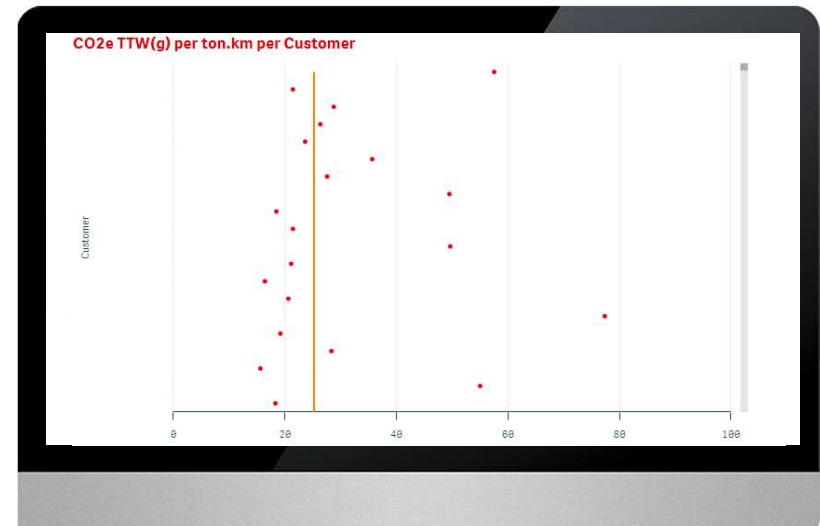


### Solution

- Calculation of CO<sub>2</sub> emissions
  - Transport requests (Offer phase)
  - Retrospective Analysis (Sustainability Report)
- Visualizations
  - Provision on transport offers
  - Reporting with analyses & dashboards

### Benefits

- + Transparency on transport-related emissions
- + Baseline for measures to reduce CO<sub>2</sub> footprint
- + Shipper benchmarking
- + Fulfilment of regulatory requirements



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# CO<sub>2</sub> Emission Calculation

## General Methodology | Transport Activities

We calculate emissions (scope 1/3) for transport-related activities in corporation with a strong partner.

### General Methodology (Shipment & Trip Segment Level)

$$\text{Weight} * \text{Distance} * \text{CO}_2 \text{ Factor} = \text{Emissions (CO}_2, \text{CO}_2\text{e, well-to-wheel, tank-to-wheel)}$$

#### Weight

- Payload provided by HOYER TMS + Equipment tare weight provided by HOYER TMS or estimated by EcoTransIT if no other source is available

#### Distance

- General empty distance allocation for spot/network shipments: Depot → Depot/Cleaning
- Truck
  - Actual traveled distance based on TMS (for own and fully integrated subcontractors)
  - Estimated traveled distance based on transport planning and assumptions by EcoTransIT (non-fully integrated subcontractors)
- Train and Vessel
  - EcoTransIT has access to databases for actual rail network and 85% of the routings for vessels
  - Calculation of distances between rail and sea terminals via comprehensive database instead of as the crow flies ("air distance")

#### CO<sub>2</sub> Factor

- Together with independent experts and scientists (e.g. IML Fraunhofer) EcoTransIT calculates individual CO<sub>2</sub> factors for each modality
- Truck
  - Differentiation based on e.g. emission classes (EURO1 - 6) | Weight classes | Share of biofuel on country level | individual fuel-consumption of HOYER fleet
- Train
  - Differentiation based on e.g. engine type (diesel, electric) | energy source: split for each country | Load capacity & utilization | Time travelled (day vs. night) | Rail track type (freight vs. mixed)
- Vessel
  - Differentiation based on e.g. Load capacity & utilization | Speed | Trade lane | Carrier Name
  - In retrospective real emission for 85% of all ship traffic can be calculated via CCWG<sup>1</sup>

#### Our Partner



Accredited by SFC for being complicit with the GLEC framework ✓

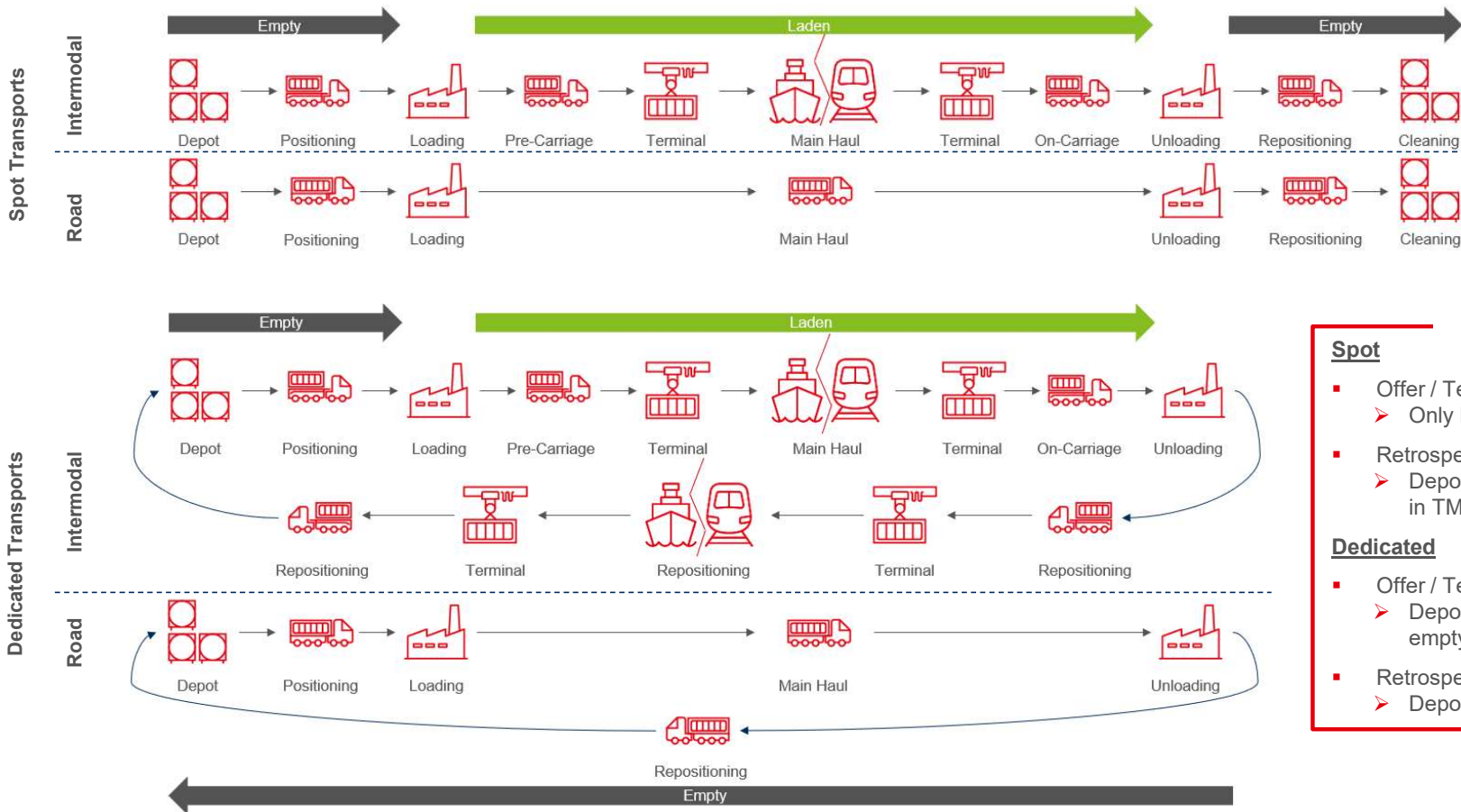
Accredited by a scientific team for being complicit with EN 16258 ✓

<sup>1</sup> <https://www.clean-cargo.org/current-membership>



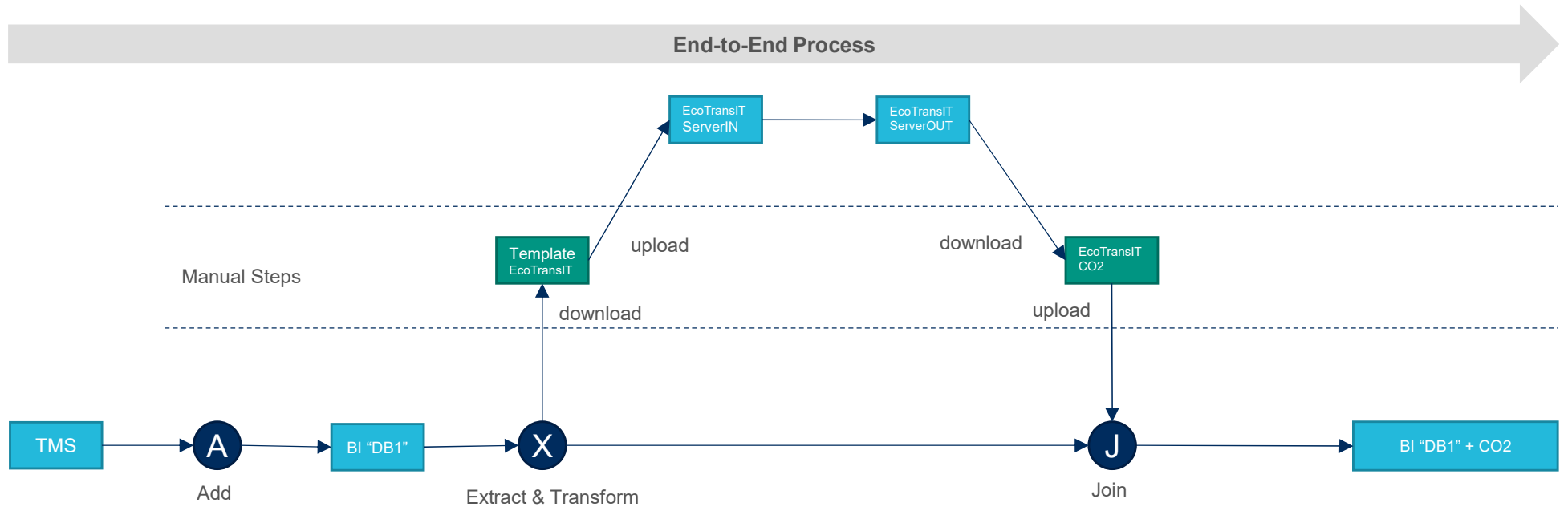
# CO<sub>2</sub> Emission Calculation

## Details: Empty Milage Allocation



- Empty Milage**
- Spot**
- Offer / Tender Phase
    - Only laden distance, no empty milage
  - Retrospective
    - Depot to Terminal / Depot (as booked in TMS)
- Dedicated**
- Offer / Tender Phase
    - Depot to Terminal / Depot incl. all empty milage as planned in routing
  - Retrospective
    - Depot to Depot (as booked in TMS)

# CO<sub>2</sub> Emission Calculation Process & Technical View



# CO<sub>2</sub> Emission Calculation

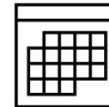
## General Methodology | SCS and Depot Activities

We calculate our scope 2 emissions for SCS and depot activities.



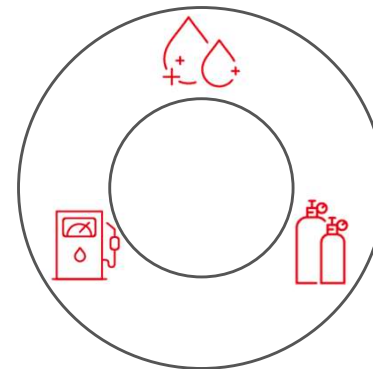
### Energy Consumption

- Primary data according to meter measurements at all operational sites



- Electricity
- Heating Oil
- Diesel
- Steam
- Gas

### Energy Source specific CO<sub>2</sub> Factor



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# CO<sub>2</sub> Emission Calculation

## Pitfalls (1) | Limited Availability & Connectivity of primary Data Sources

Data dependencies from subcontractors and internal data silos currently are an internal challenge for the calculation of transport emissions.



### Limited availability of primary data

- Scattered and unharmonized scope 3 emission values coming from suppliers
  - Rail operators
  - Vessel operators
  - Trucking subcontractors

### Connectivity of primary data between IoT/Telematics technologies and TMS

- Integration of truck telematics data into TMS, e.g. fuel consumption on shipment level
- Allocation of LNG trucks and biofuels on shipment level to measure reduction impact automatically



**Leveraging primary data for CO<sub>2</sub> calculation increases accuracy and generally leads to lower emission values in comparison to applying industry averages.**

# CO<sub>2</sub> Emission Calculation

## Pitfalls (2) | Manual Effort for Data Collection & Consolidation

Data collection and consolidation is the biggest challenge in the process of calculating scope 2 emissions for SCS and depot activities.



### Data collection

- Manual capturing of consumption values from energy consuming assets
- Timeliness of data availability → primarily retrospective analytics

### Data consolidation

- Time-consuming aggregation of consumption values and final calculation of emissions



- How to link depot emission data (for heating and cleaning activities) to transport emission data instead of applying industry averages?
- Availability of software and operational tools to support data collection and consolidation process?
- Which is the major KPI to measure decarbonization improvements for SCS and depot activities?

# CO<sub>2</sub> Emission Calculation

## Pitfalls (3) | Gap in Calculation Baseline between Shippers and LSPs

Comparison of HOYER's and shipper's CO<sub>2</sub> emission calculations show big gaps – Shipper values are up to 20-30 % lower than LSP values on average.



### Gap in number of shipments and transport lanes

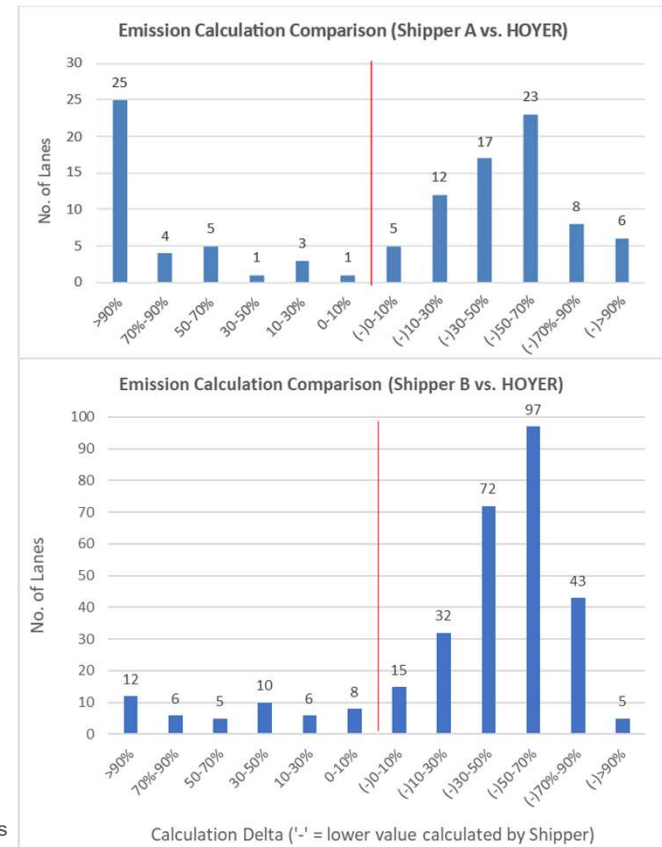
- Data silos between shipper and LSP

### Different amount of transport distances

- Actual driven distances vs. as-the-crow-flies (for all modalities)
- Portion of empty transport mileage

### Variance in CO<sub>2</sub> factors

- Specific CO<sub>2</sub> factors for each ship segment (LSP) vs. average industry factors on shipment level (Shipper)
- Average industry factors tend to include too low empty transport mileages (~30% in spot and >50% in dedicated business within liquid bulk logistics)



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