WELCOME

ESA Space4Rail Workshop on Scope 3 emissions

Sept 12, ESA HQ Paris

AGENDA

10:00 – 10:30	ESA Space4Rail
10:30 – 10:45	CEFIC view on SCOPE 3 transport emissions
10:45 – 11:45	SCOPE3 project and consortium
11:45 – 12:00	Coffee break
12:00 – 12:45	Project approach and phases
12:45 – 13:15	Industry participation
13:30 – 14:30	Lunch
14:30 – 15:30	Round table discussion and Wrapping up


ESA Space4Rail programme

CEFIC

View on the importance of SCOPE 3 emissions

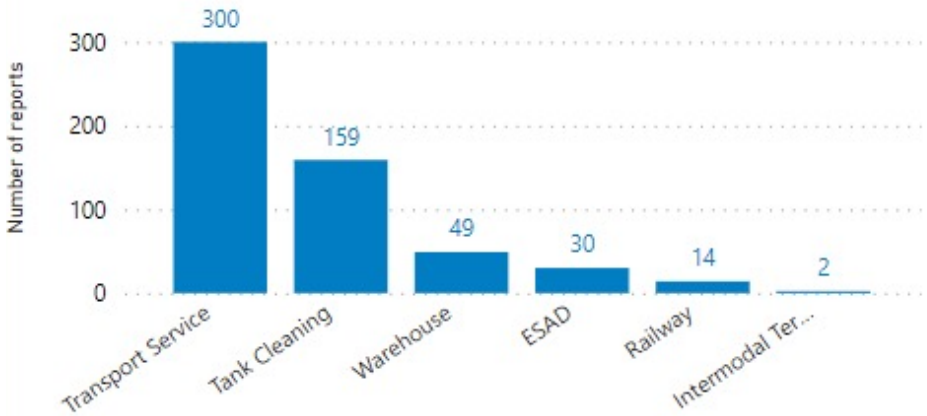
CountEmissions EU
GHG Emissions Calculation

12-09-2023

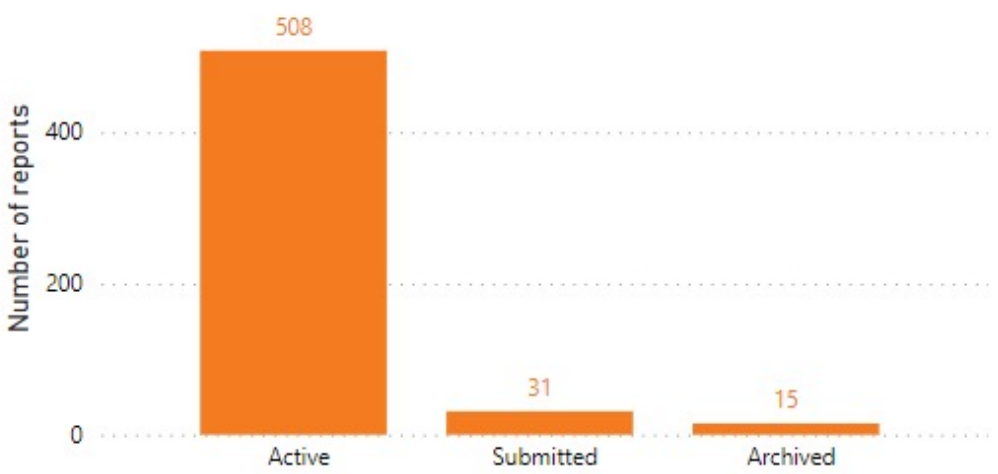
Messina W. C.
Transportation & Logistics Mgr

SQAS and GHG Emissions Calculation

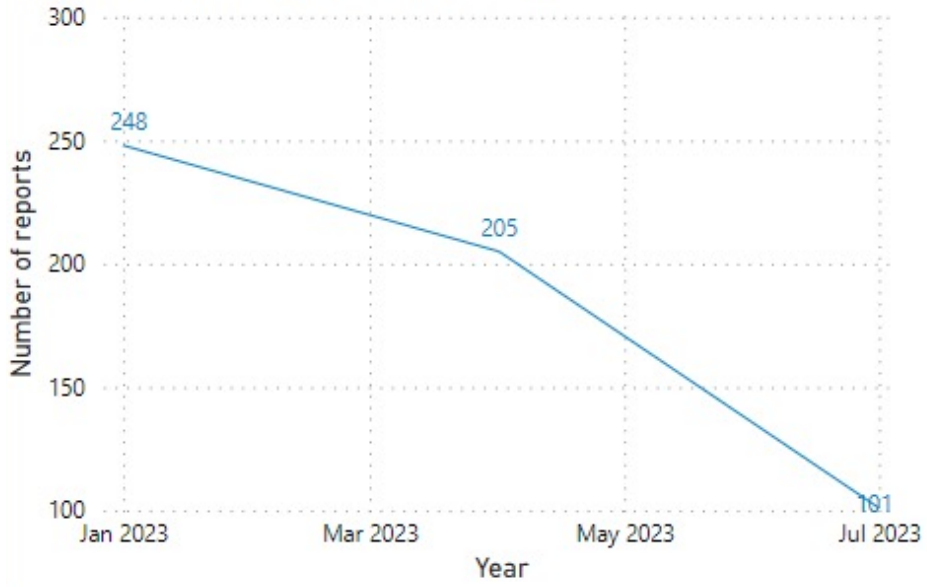
Number of reports by Module



Number of reports by Status



Number of reports by Year and Quarter



Number of reports by Country

SQAS and GHG Emissions Calculation

SQAS version 2022	76%
1. Management System and Responsibility	80%
2. Risk management	76%
3. Human Resources	81%
4. On/Off Site Emergency Preparedness and Response	83%
5. Performance Analysis and Management Review	75%
6. Management of Subcontractors	71%
7. Equipment: Specification, Inspection, Maintenance, and Calibration	83%
8. Behaviour Based Safety (BBS or equivalent programme)	64%
9. Measurement and Management of transport greenhouse gas (GHG) emissions	49%
10. Security	78%
11. Control of operations	82%
12. Specific types of Transport Services and their activities	76%
13. Site Inspection and Site operations	86%
14. Handling practices of Food, Food contact Materials and Feed Products	94%

SQAS and GHG Emissions Calculation

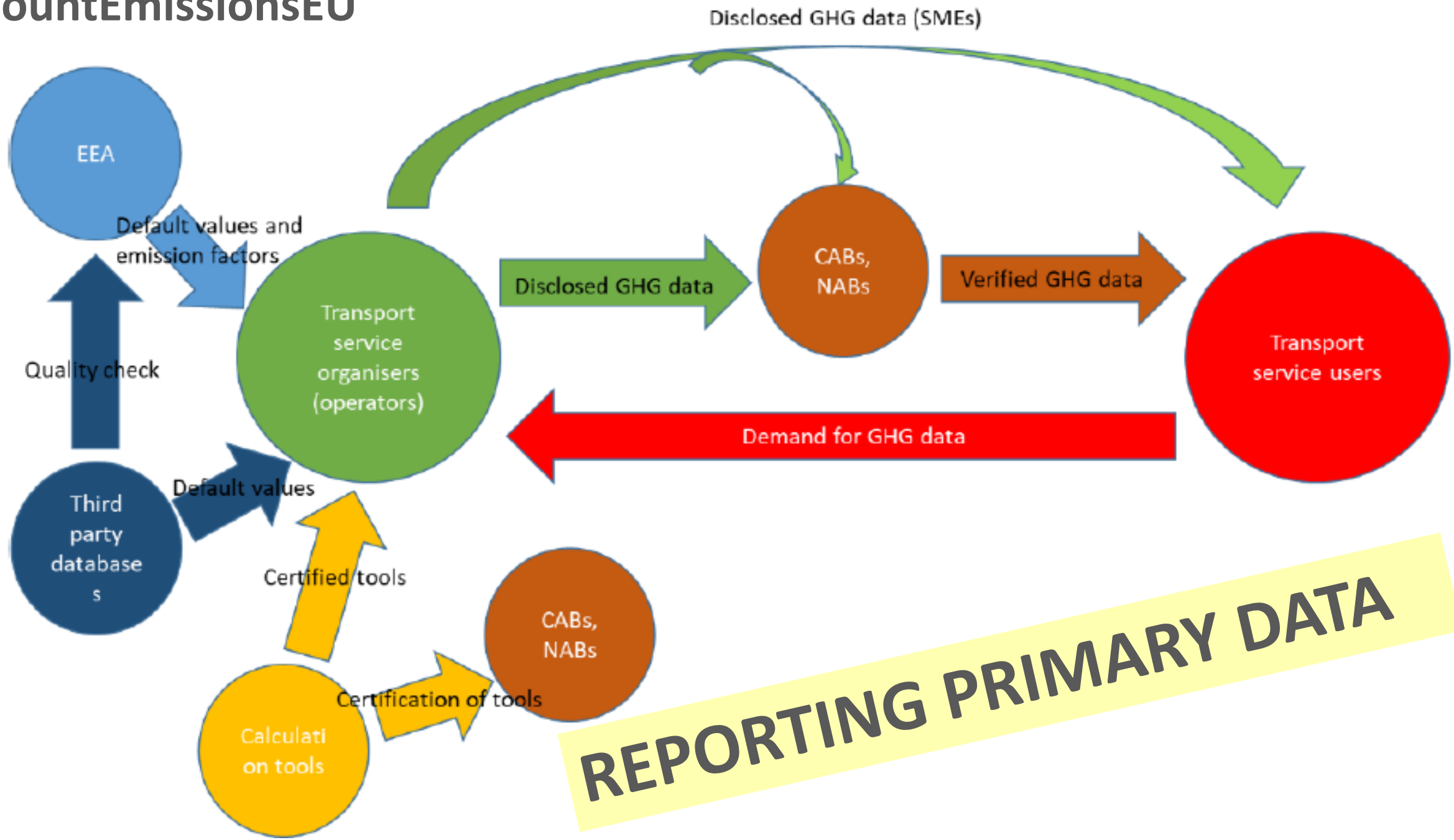
9. Measurement and Management of transport greenhouse gas (GHG) emissions	**55%**
9.1. Scope 1: Emission measurement of vehicles that are owned or controlled by the company.	74%
9.2. Scope 2: Emissions from electricity	78%
9.3. Scope 3	47%
9.4. Calculation of Total emissions (Scope 1, 2 and 3)	41%
9.5. Calculation of Tonnes-km	53%
9.6. Calculation of emission intensity	38%
9.7. Consolidating and reporting emissions	27%
9.8. Training	78%
9.9. Reducing emissions	46%
9.3. Scope 3	**47%**
9.3.1. Fully Integrated subcontractors and Non-Integrated subcontractors	46%
9.3.2. Intermodal/ Multimodal	51%
9.3.3. Tank cleaning stations	40%
9.3.4. Subcontracted storing/handling of goods	9%
9.3.5. Production and Distribution of fuels burned in Scope 1	60%
9.3.6. Calculation of Scope 3 emissions	39%
9.4. Calculation of Total emissions (Scope 1, 2 and 3)	**41%**
9.4.1. Did the company calculate the Total emissions during last year by addition of Scope 1, 2 and 3 emissions?	41%
9.5. Calculation of Tonnes-km	**53%**
9.5.1. Does the company know the tonnes of product transported and Kilometers driven (both laden and empty) associated with each category specified in 9.1.3.?	61%
9.5.2. Did the company calculate the tonnes-Kilometers (tkm) during the last year by transport order and by category with the formula?Σ tkm by transport category = (ton shipment 1 x km shipment 1) + (ton shipment 2 x km shipment 2) +.... + (ton shipment n x km shipment n)	46%

CountEmissionsEU

Standard/methodology	Transport modes/segments	
GHG protocol	All modes	Passengers & freight
EN 16258	All modes	Passengers & freight
ISO 14083	All modes	Passengers & freight
PEF	All modes	Passengers & freight
French transport code (Article L. 1431-3)	All modes	Passengers & freight
Parcel Delivery Environmental Footprint[76]	All modes	Parcel
GLEC	All modes	Freight
SmartWay	All modes	Freight
Topsector	All modes	Freight
Clean Cargo Working Group	Maritime	Freight
EU MRV	Maritime	Freight
IMO DCS	Maritime	Freight
CORSIA	Aviation	Passengers & freight
ICAO/IATA RP1678	Aviation	Freight
IATA	Aviation	Passengers
EU ETS aviation	Aviation	Passengers & freight

Source: Ecorys and CE Delft (2023), Impact assessment support study

CountEmissionsEU



CountEmissionsEU

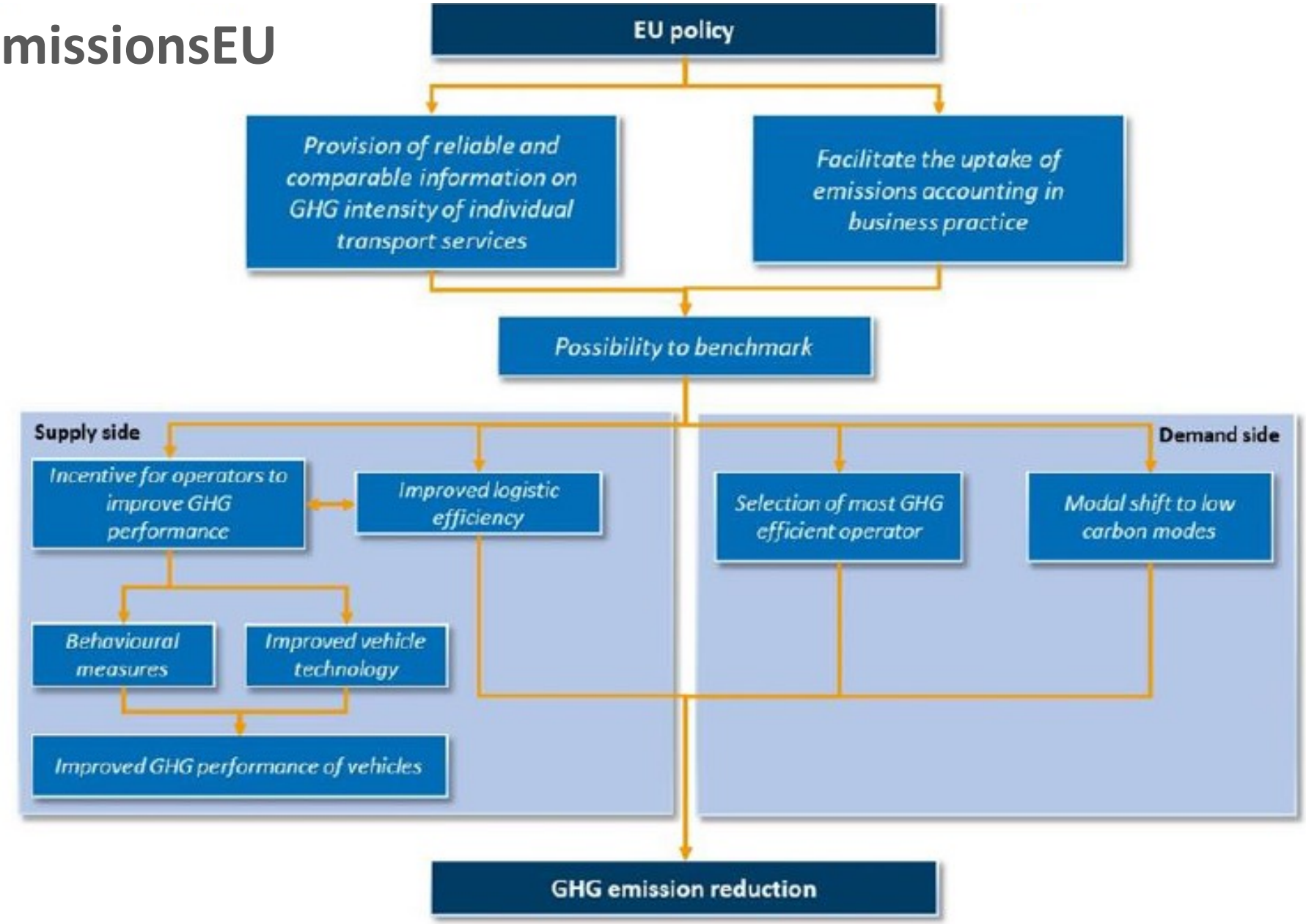
COMMISSIONER KEYWORDS

- CALCULATION OF EMISSIONS
- GREEN CREDENTIALS ONLINE
- METHOD BEHIND THE CALCULATOR
- DATA ACCURACY
- CALCULATION FORMULA

STANDARDIZED METHODOLOGY/FORMULA

ISO/CEN STANDARD

CountEmissionsEU



Source : Ecorys and CE Delft (2023), Impact assessment support study

Revision of the Weight & Dimensions Directive

EXPLANATORY MEMORANDUM

OBJECTIVES

Supporting efforts toward better sustainability and efficiency of the EU

Making more sustainable choices to influence business decisions of transport organisers and operators

Stimulate behavioural change

Disproportionally low uptake GHG emissions accounting is observed particularly among SMEs that represents vast majority of the offer in transport services

LEGAL FRAMEWORK

2011 White paper on transport

2020 Sustainable and Smart Mobility Strategy

Harmonized rules for accounting GHG emissions

APPLICABILITY

Services that start or end on the territory of the Union. This consequently includes services, the origin and destination points of which are situated in third country

Regulation should apply only to those entities that decide or are bound by other legislative and non-legislative regimes to calcualte and disclose GHG info

Regulation should not apply to data intermediaries, such as those offering multimodal digital mobility services. However data intermediaries should be bound by relevant rules related to communication transparency of disclosed data

Regulation should not apply where calculation and disclore of GHG emissions is performed in an aggregated form (i.e CSR directive and EU environmental economic accounts

Revision of the Weight & Dimensions Directive

EXPLANATORY MEMORANDUM

METHODOLOGY

Proper method for calculating GHG emissions is one of the key aspect for the harmonised Union framework

Method provide comparable and accurate GHG emission data, by following a single set of methodological steps

EN ISO standard 14083:2023 was chosen to be the reference methodology fo calculating GHG emissions of transport services

Well-to-wheel basis which includes GHG emissions stemming from energy provision and vehicle use during transport and hub operations

Secondary data by default values and modelled data. Default values and modelled data provided by a reliable source

Different ypes of input including primary and secondary data can be used. Primary data should be prioritised. Secondary data use should be allowed under clear conditions

Core EU database of default values for GHG emission intensity to improve comparability of data. GIven sectorial, national and regional specifities of default values across EU, othe relevant databases and datasets operated by third parties should be allowed but under quality check at EU level

Central EU database of GHG factors of energy carriers as well check on third party (EEA)

Revision of the Weight & Dimensions Directive

EXPLANATORY MEMORANDUM

METRICS AND BENCHMARK

Lay down common metrics to express GHG data that underline the comparability of those data and allow effective benchmarking of transport services

Disaggregated data disclosed to thrid party for commercial or regularoty purpose should be pursuant to the specific rules for GHG emissions calculation

Entity should be able to draw an evidence to substantiate the respective output data. Evidence should be pursuant to the rules on reporting at a transport service level set out by EN ISO 14083

Data intermediary should not be considered liable of breach of the requirements. Data intermediary should make effort to prevent inaccurate/incorrect info to be disclosed

EXEMPTION

Administrative burdain could be disproportionate for smaller companies and so avoided

SMEs should be exempted from the requiremens related to the verification unless these companies wish to obtain a proof of compliance

Large companies should take into account the principle of proportionality when considering requesting the verification of conformity from value chain partners, in particualr SMEs

CALCULATION TOOL

External calculation tools provided on the market for the broader commercial and non-commercial use can facilitate accounting. Use of these tools should be certified

Entities which passed the conformity assessement should be entitled to obtain a proof of compliance to be recognised across the Union

Especially if the tool refer to primary data the proof of compliance should acknowldge it

CountEmissionsEU

Follow up on Legislative process

Legislative Train Schedule
European Parliament

Enter your search (min 3 characters)

Schedule | Packages | In the spotlight | Search | About | Contact

Commission 2019-24 > A European Green Deal > EU framework for harmonised measurement of transport and logistics emissions

EU framework for harmonised measurement of transport and logistics emissions

In "A European Green Deal"

Actions

SUBSCRIBE | CONTACT

Metadata

Status:	Departures
Type:	Legislative
In the spotlight:	JD 23-24
CWP:	2022
CWP indicative date:	Q4 2022
Updated indicative date:	Q2 2023

Rapporteur(s)

Sharing

20/06/2023 | PDF VERSION

As part of European Green Deal, the Commission work programme 2022 contained a legislative initiative on an EU framework for harmonised measurement of transport and logistics emissions, that is now scheduled for second quarter of 2023.

The initiative was first mentioned in December 2020 in the annex to the Commission's Communication on the Sustainable and Smart Mobility Strategy under the heading 'Flagship 5 - pricing carbon and providing better incentives for users'.

The Commission held a 'call for evidence' between 19 November and 17 December 2021. A public consultation was held from 25 July to 17 October 2022.

References:

- European Commission, Commission work programme 2022 - Making Europe stronger together, COM(2021)645
- European Commission, ANNEX to the Communication Sustainable and Smart Mobility Strategy – putting European transport on track for the future, COM(2020) 789 final
- European Commission, *European Green Deal: Commission proposes transformation of EU economy and society to meet climate ambitions*, Press Release, 14 July 2021

The EU Chemical Industry Transition Pathway

#TransitionPathway

Support our transformation journey

https://transition-pathway.cefic.org/

SCOPE3 project

Objectives and consortium presentation

Scope 3 Project

Scope 3 emissions based on ‘real’ consumption vs averages & multiples

Intermodal Scope 3 emissions calculation based on real consumption data

Emission reporting – allocation / alignment with industry standards & ERP feed

Optimization simulator – transport mix selection

OVINTO
Connecting Rail & Intermodal

RAILNOVA.

RHEA GROUP

CMB.TECH

Obligation to report ‘real’ emissions

Real consumption per trajectory

Project ‘Scope 3’ demonstrator

RAILNOVA.

RHEA GROUP

CMB .TECH

Anticipate legislation

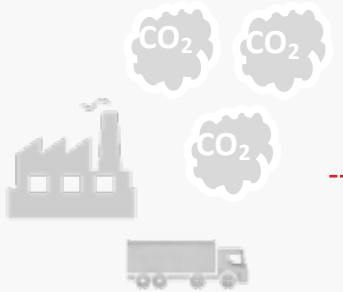
Find a constructive collaboration

Real consumption

?

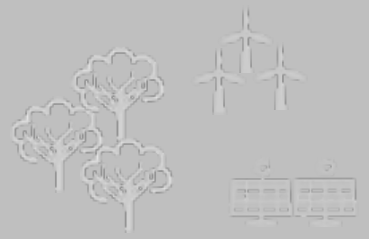
Fear & protectionism

Get the data !



COMPANIES REDUCING THEIR TRANSPORT CARBON FOOTPRINT

INVESTMENTS IN EMISSION REDUCTION PROJECTS



EXTERNAL CARBON OFFSET PROJECTS
FOR EXAMPLE TREE PLANTING

CERTIFICATE FOR CARBON OFFSET ELSEWHERE

OFFSETTING

INSETTING

INTERNAL CARBON OFFSET
FOR EXAMPLE BIOFUEL

VERIFIED EMISSION REDUCTION WITHIN SUPPLY CHAIN

H.ESSERS

HVO BIODIESEL

”HYDROTREATED VEGETABLE OILS”

- Synthetic biodiesel produced in the process of hydrogenation
- Direct replacement for fossil diesel
- Produced out of waste streams, such as vegetable oils or animal fats
- Complies with EN 15940 standard and EU Renewable Energy Directive (RED II)
- 90% reduction WTW CO_2e emissions
  100% reduction TTW CO_2e emissions
- Significant reduction of local emissions (NOx and particulate matter)

SCOPE3 – emis

CONSUMED FOR
YOUR TRANSPORT

00376
LITER FOSSIL DIESEL

00376 x 25 / 50 / 75 / 100%
LITER HVO BIODIESEL

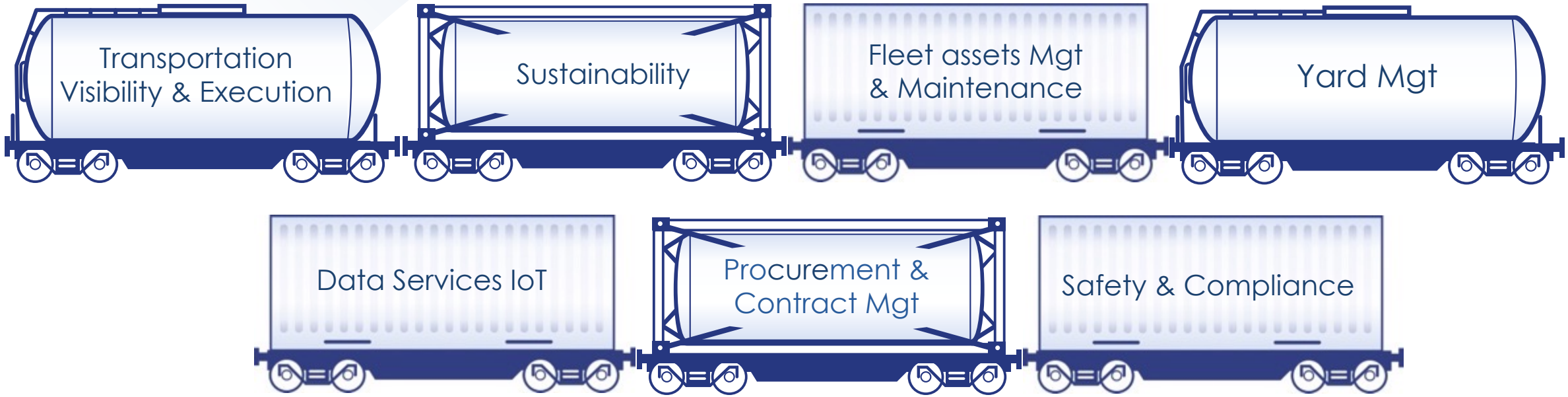
COMPENSATED IN
DESIGNATED
H.ESSERS FLEET

Illustration of the volume-based mass balancing concept as applied by H.Essers

SCOPE3 – emission data capturing, reporting and simulation

We are an ‘Add On’ SaaS platform

Streamlining Supply chain operations



We fill in the gaps

A servant to your software

SCOPE3 – emission data capturing, reporting and simulation

Scope3

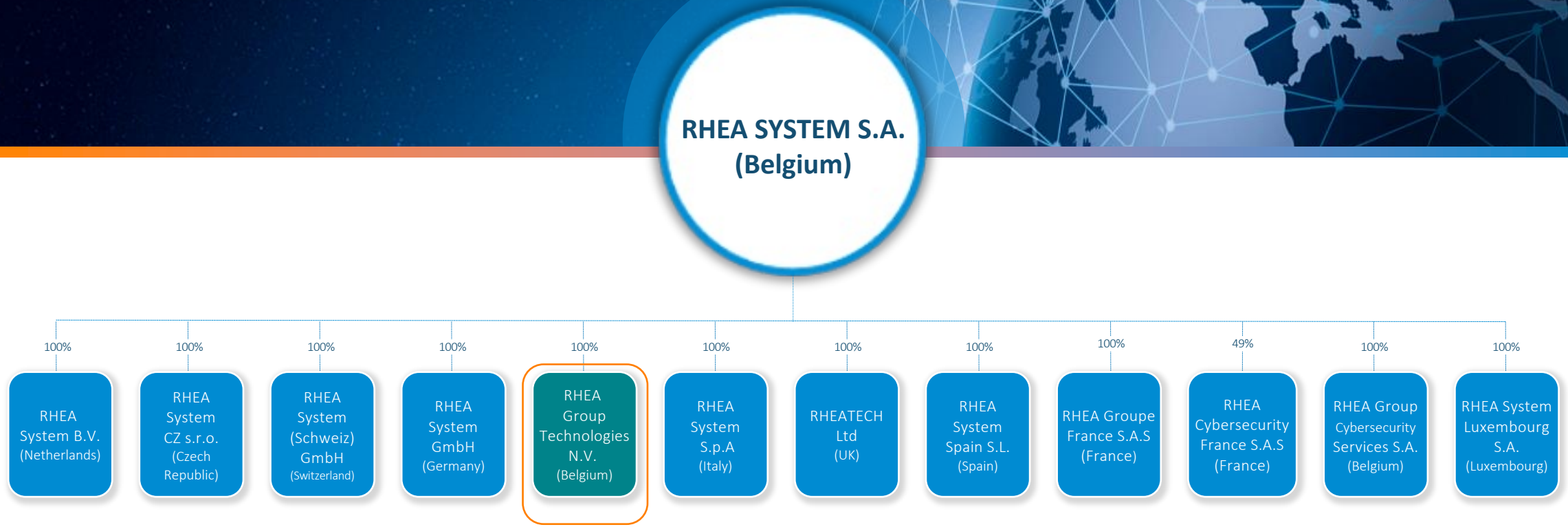
Fabrizio Scaglione

Jeremy Meyer


Trusted
International
Inspirational
Independent
Agile
Space and Security
Engineering services
and customised
technology solutions
2009
89 staff & 10 M€
2014
185 staff & 22 M€
2020
600+ staff & 70 M€
2021
700+ staff & 90 M€
2022
850+ staff & 110 M€
30
Years' Experience
900+
Experts
11
Nations

RHEA Group

Eleven nations with a Belgian and European core



SECURITY

Along the value chain providing engineering services and customised technology solutions for Trusted Secure Space and Critical infrastructure

Security & Cybersecurity Consulting Services

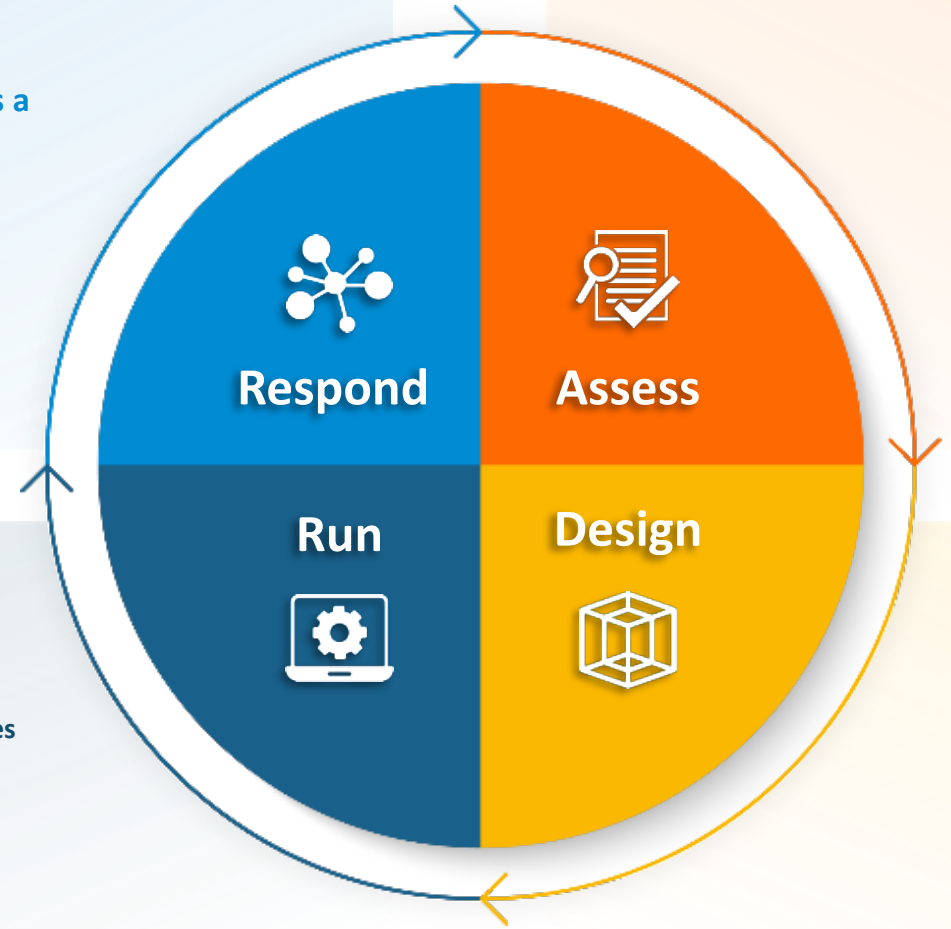
Security & Cybersecurity Engineering Services

Managed SOC Services

Next Generation Cyber Range

SECURITY SERVICES

- Security Operations Centre (SOC) as a Service
- Cyber Threat Intelligence services
- Forensics analysis



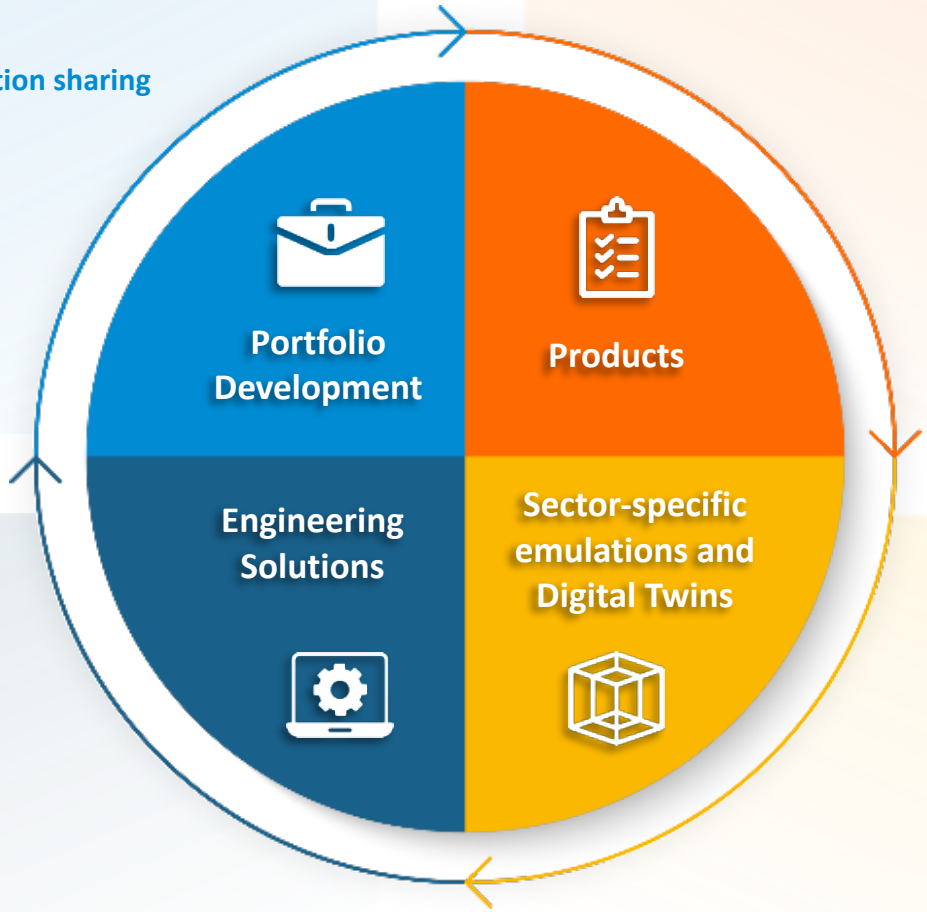
- Risk Assessment (cyber, physical)
- Cybersecurity posture assessment
- Privacy and Safety Impact Assessment
- Incident Response readiness
- Cyber due diligence
- Penetration Testing
- SOC Maturity Assessment and Evaluation
- Crisis Management Analysis
- Compliance Services
- Open Source Intelligence (OSINT)

- Cybersecurity trainings (supported by the Cyber-range) – onsite and remote
- Offensive and defensive scenarios/exercises using the Cyber-range – onsite and remote
- Security controls lifecycle

- Security-by-design support
- Cybersecurity roadmap
- Cybersecurity processes design and optimization
- Cyber risk mgmt. strategy
- Security Awareness programs

SECURITY PRODUCTS & ENGINEERING

- 5G/6G Security
- CTI collection and processing and Information sharing
- Quantum Key Distribution
- R/F Security
- Zero Trust technologies
- AI applied to cybersecurity
- Cyber-ranges technologies
- Products cyber certifications



- **CITEF** cyber-range (on Prem, as a service)
- **Early Warning System - EWS** information sharing/CTI collection and processing

- EM - SAT
- EUSPA EGIPRON Sharing Platform
- NATO CIICS
- ESA SCCoE Synthetic Environment
- ESA C-SOC

- Space
- Energy & Industry
- Transport
- Healthcare
- Defense
- Telecom

RHEA investment in European Cybersecurity Centre of Excellence in Transinne

The long-term commitment to Belgium and Europe

Establish an expertise focused centre of gravity in cybersecurity for **Critical Infrastructure & Operations**

Create the concept of **Cybersecurity Ecosystem & Valley**

Open to partner companies and industries

Collate any type of **demand** in cybersecurity

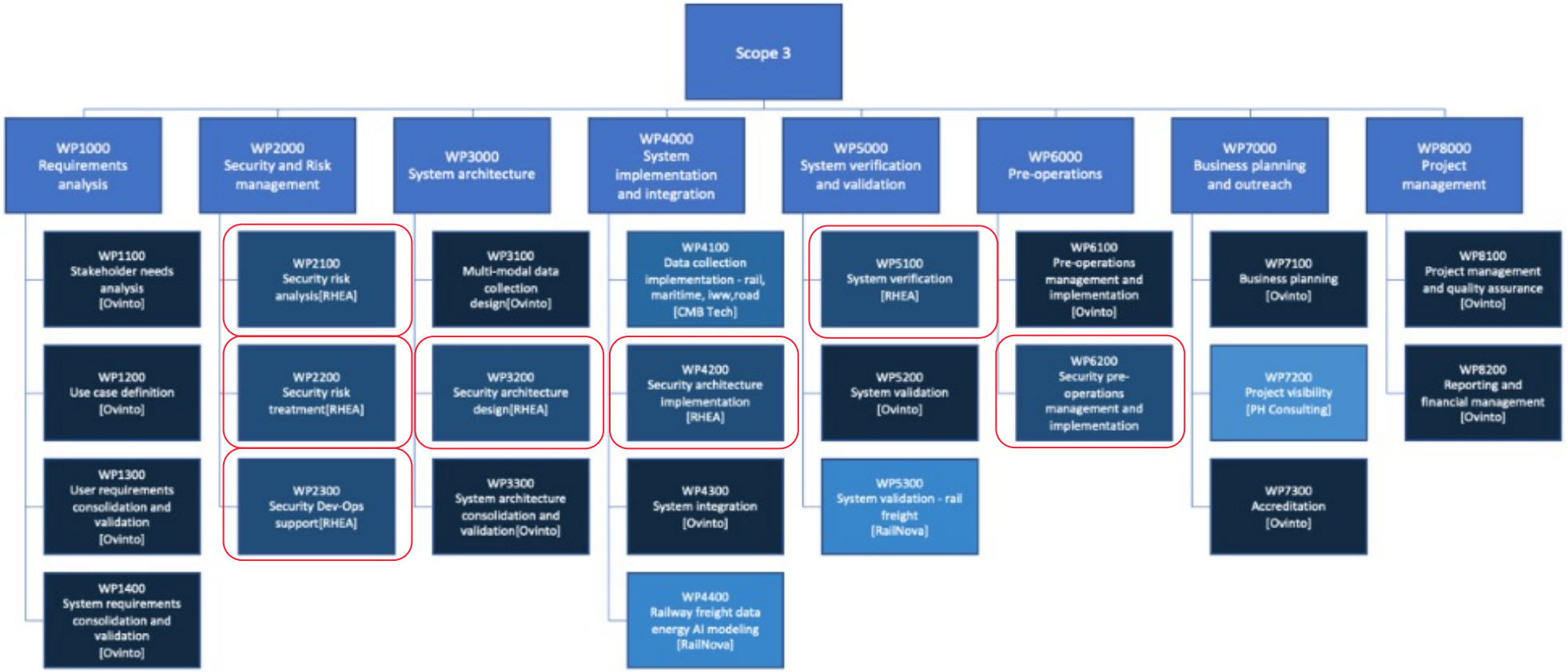
Foster collaborations with universities and academia focusing on **R&D**

Create, attract and retain **STEM talents**

Create high value-added **new jobs**

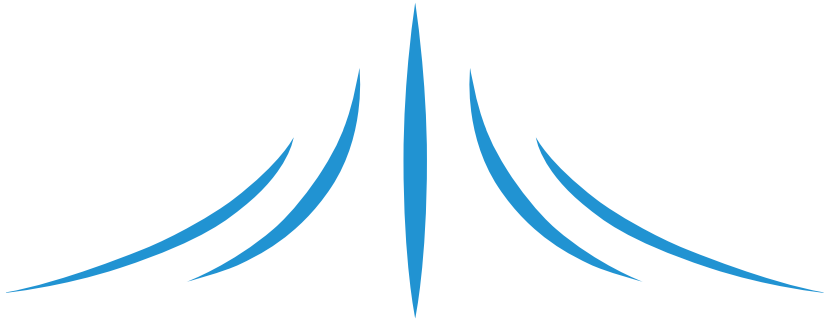
Provide cybersecurity as a service: classified information management, SOC, trainings etc

RHEA contributions in Scope3



RHEA contributions in Scope3

Security and Risk Management	• Iterative Risk Analysis • Risk Treatment and Mitigation • Defining Security requirements and control
Security Architecture Design	• Provide expertise and support from a security standpoint to ensure that security controls and requirements are correctly addressed during the design and implementation phase. • Define the System's security operations centre design and set-up (KPI, Physical Layout, integrations etc)
Security Architecture Implementation	• Integrate the System within RHEA's SOC
System Verification	• Coordinate and perform the test campaign identified in the System Verification Document. • Oversee the System refinements considering the tests' results • Perform penetration testing campaign to verify that security requirements are correctly implemented
Security pre-operation management and implementation	• Establishing a process for continuous improvement and maintenance of the SOC, including regular review and updates to procedures, tools, and staff training. • Implementing and refining the Standard Operating Procedures. • Initiating the pre-operational service delivery within the context of the identified pilot



www.rheagroup.com

RAILNOVA.

WWW.RAILNOVA.EU

Presentation of Railnova

SCOPE3 – emission data capturing, reporting and simulation

Railnova is all about accelerating the digitalisation of railway companies

3000+

Trains connected with 1 multi-OEM device

850+

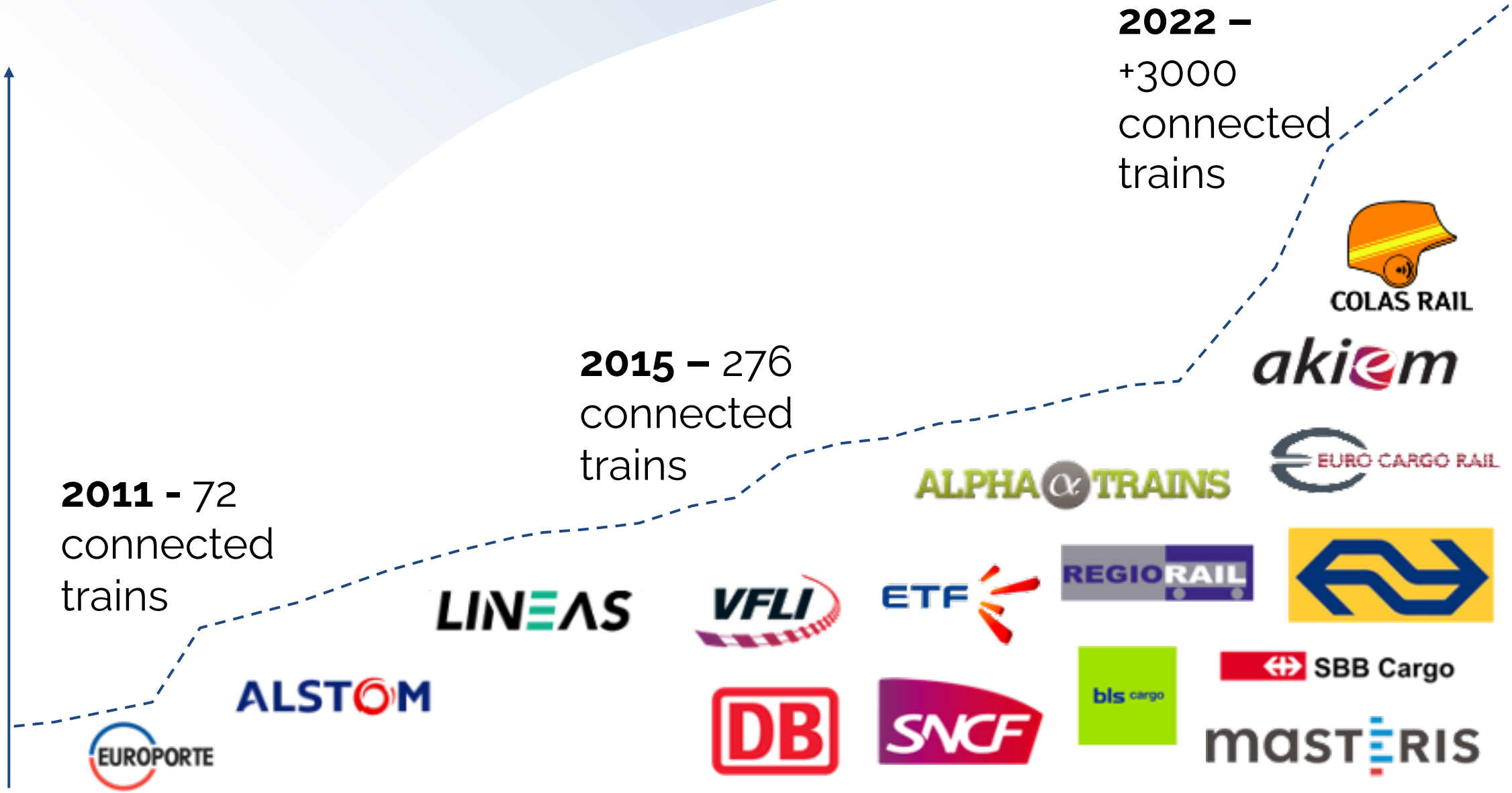
CBM & Predictive algorithms

7000+

Users collaborate digitally and create value

SCOPE3 – emission data capturing, reporting and simulation

Since 2010, Railnova has connected 3000 trains across 100 rail companies in Europe



Rainova offers a custom digitisation approach to each Client, based on proven building blocks

RAILSTER
Asset Connectivity

HARDWARE TELEMETRY

PATENTED, UNIVERSAL DIGITAL AND ANALOG CONNECTIVITY

IOT SECURITY

DEVICE MANAGEMENT

DATA QUALITY

RAILGENIUS
Streaming Insights

CRYSTALISE EXPERT KNOWLEDGE IN RULES

EASY ANALYTICS FOR END USERS

FROM BIG DATA TO INSIGHTS

THIRD PARTY DATA SOURCE

INTERFACE TO DATA LAKES

REAL TIME WORKFLOWS

RAILFLEET
ECM & CBM Workflow

FLEET MAINTENANCE MANAGEMENT

DIGITAL WORKFLOWS

FLEET AVAILABILITY DELIVERY

DRIVER DIAGNOSTICS APP

COMPLIANCE TO REGULATION

INTERFACE TO ERP AND CMMS

SERVICES
Professional Services

CORE TECHNOLOGY IMPLEMENTATION

TRAINING AND CUSTOMISATION

SUPPORT CUSTOMER INTERNAL TEAMS AND CONSULTING PARTNERS

SCOPE3 – emission data capturing, reporting and simulation

Data science at Railnova

Transforming our customer data into actionable insights:

- **Alerts on malfunction of locomotive componants** (battery, transmission, …)
- **Analysis of client data** to help them extract insight from them. Examples:
  - Analysis of fleet utilisation
  - Anomaly detection in train data (engine, door, …)
  - Finding failures with most operational impact locomotive drivers reports using languages models
- **KPI computation and visualization** for enabling data driven decision making and performance improvement

Expertise on Locomotive Energy:

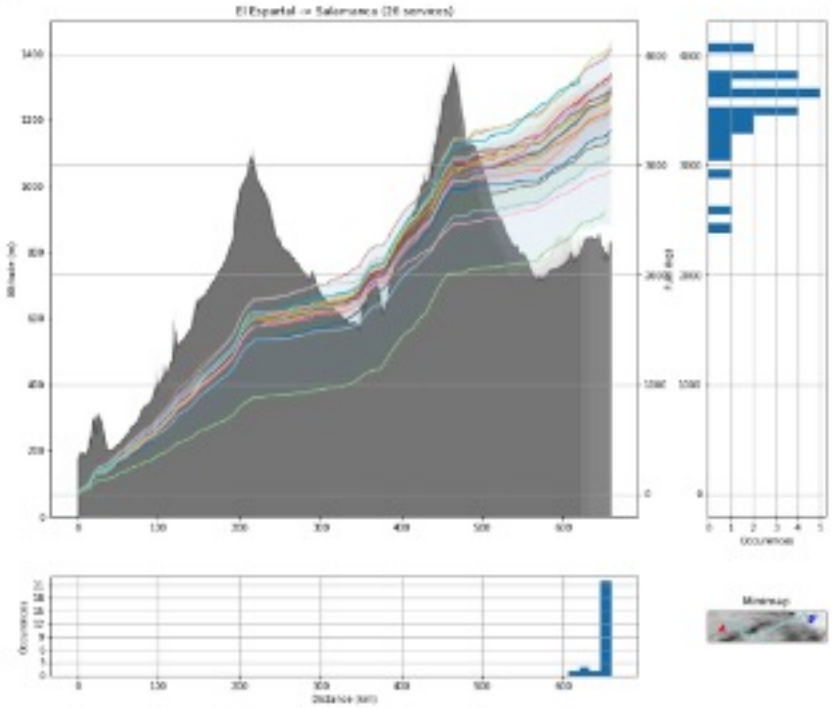
- **Collecting energy data directly from engine controllers**
- **Computation of the energy consumption when needed (old engines)**

Engine Rpm 10x/sec
Engine Power 10x/sec
Boost Pressure 10x/sec
Actuator 10x/sec
No fuel consumption info !

XGBoost

Railster Edge
ML

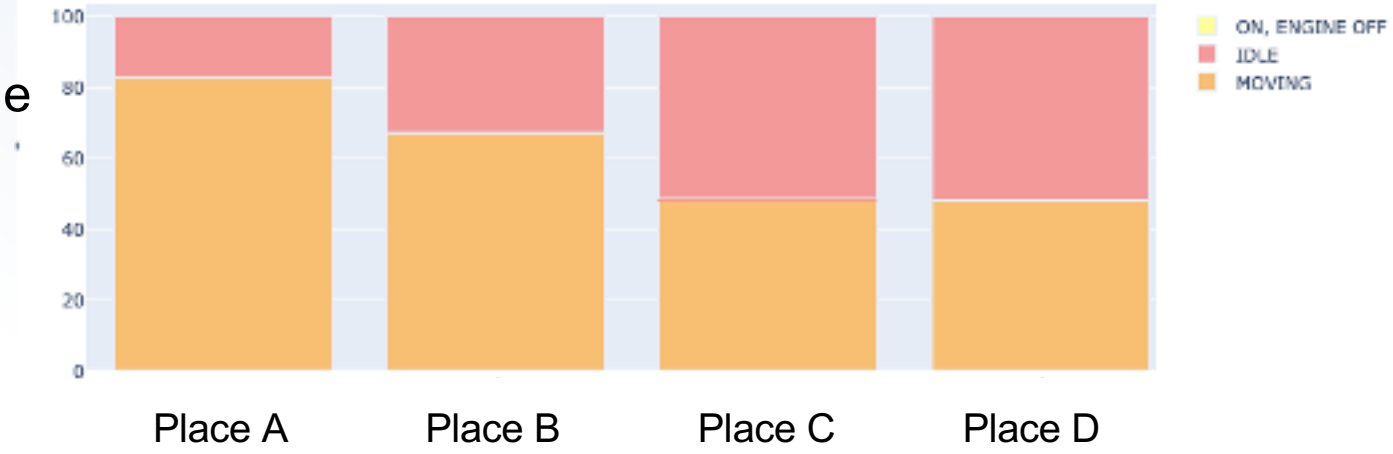
Fuel Consumption: 67 litre/hour
Average 40 litre/hour
Error 0.3 litre/hour

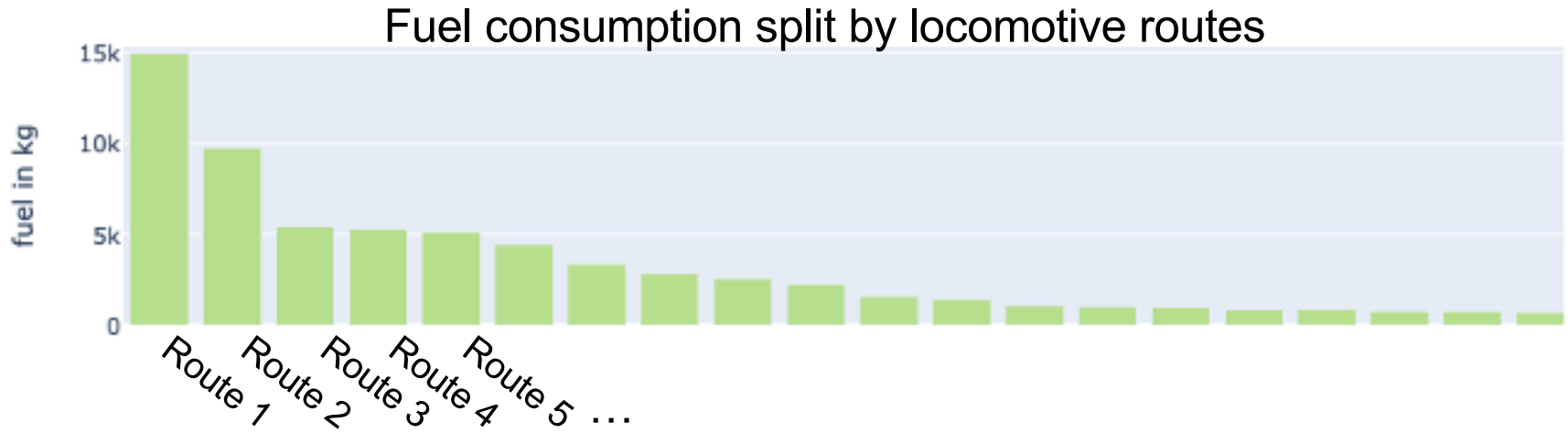


Expertise on Locomotive Energy:

- **Overall fleet analysis of energy data:**

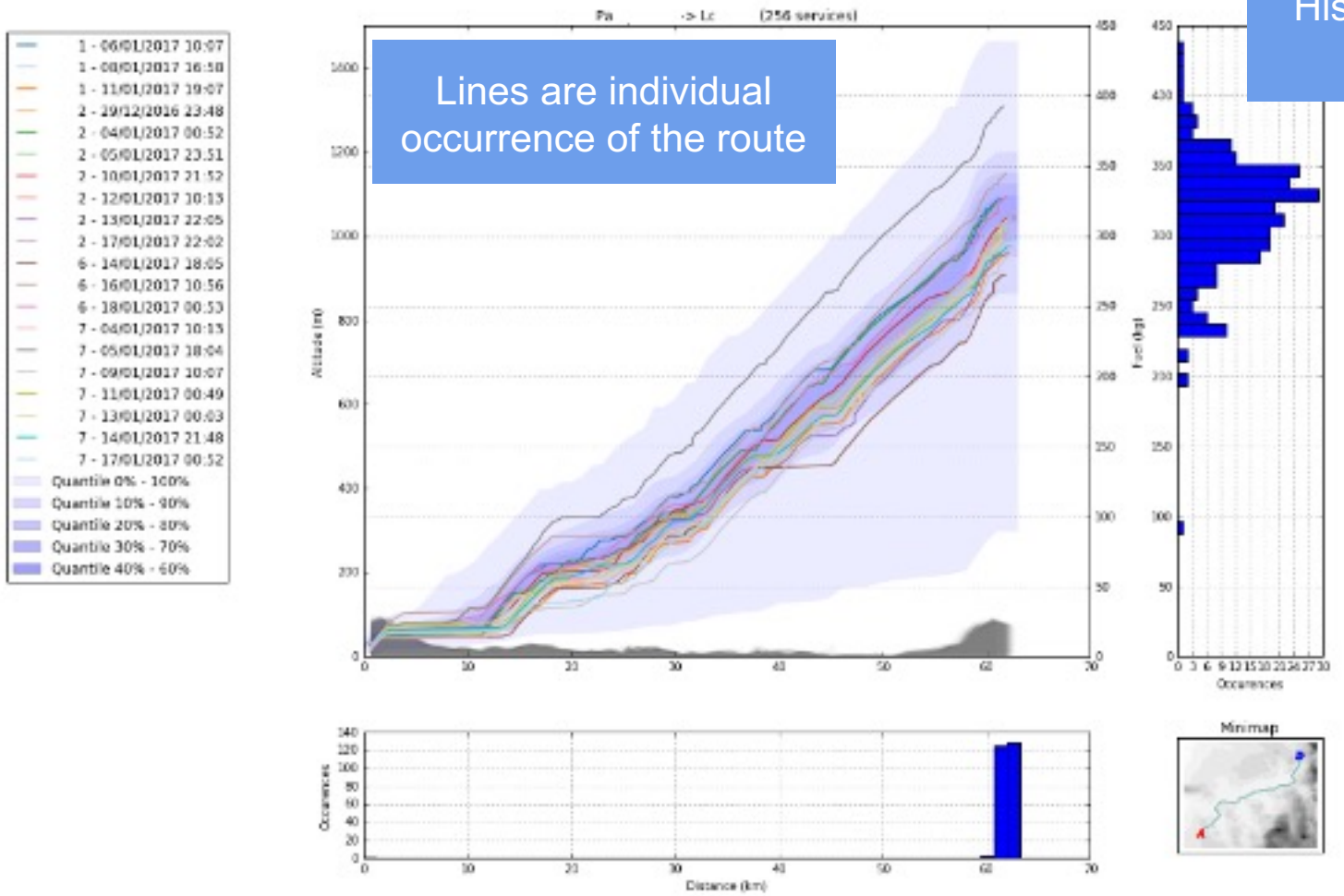
% of fuel idle per place





Expertise on Locomotive Energy:

- **High granularity monitoring:**



Mass of train:

- Main predictor of the energy consumption
- Estimation from paper work is tedious and imprecise

Development of an AI algorithm that allows mass estimation from train kinematic is key:

- By knowing the mass and the energy consumption: direct access to the energy per tonne per km
- Allow estimation of the expected energy consumption of a given mass and exploitation conditions

⇒crucial for a simulator of emissions

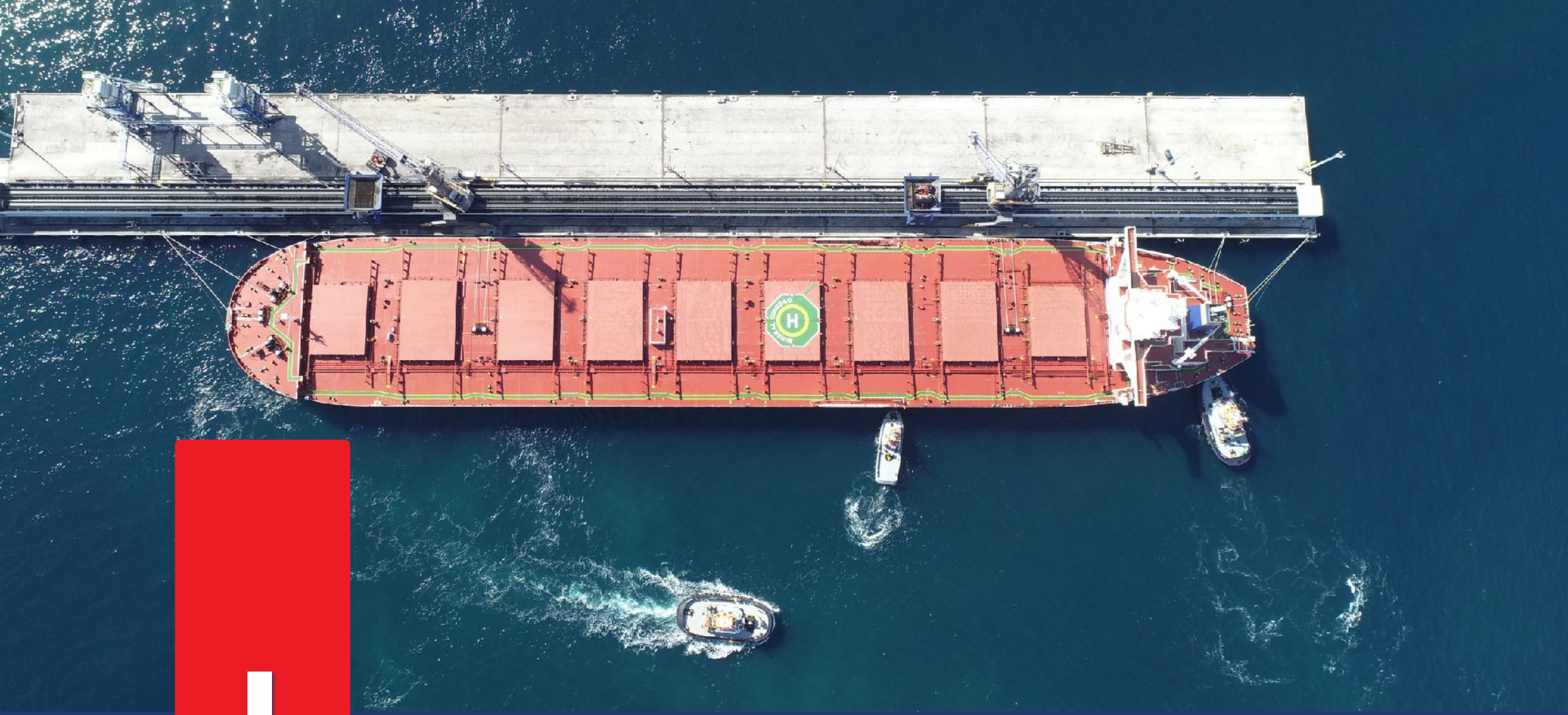
ESA Space4Rail Workshop on SCOPE3 Emissions

Roy Campe, CTO CMB.TECH

Paris, 12 September 2023

Presentation topics

I. CMB and its cleantech division CMB.TECH
II. Four business units of CMB.TECH
III. Activities within the project
IV. Q&A



I CMB and its cleantech division

CMB is a leading global shipping and cleantech group operating 150 ships

- CMB was founded in 1895
- Headquartered in Antwerp, Belgium
- 100% privately owned by Saverys family
- 320 shore-based staff and
- about 3200 seafarers

The group consists of 5 divisions:

Bocimar : Dry cargo
Delphis : Container vessels
Bochem : Chemical tankers
CMB.TECH : Cleantech & offshore support vessels via Windcat
MCA : Maritime Campus Antwerp

– emission data capturing, reporting and simulation

CMB.TECH

II

Business Units of CMB.TECH

The cleantech division of CMB has 4 business units

1. MARINE

Design, building and operation of a future proof fleet powered by hydrogen and ammonia.

2. INDUSTRY

Design and retrofit of port and industrial applications to run on the clean fuel of hydrogen.

3. H2 INFRA

Technology and infrastructure to produce and distribute green H_2 and NH_3, the fuel of the future.

4. TECHNOLOGY & DEVELOPMENT CENTRE

A well equipped technology centre powered by highly skilled engineers specialized in H_2 systems.

CMB.TECH's business model is to own/lease out or sell assets to customers looking for low/zero carbon solutions. CMB.TECH solves the chicken and egg discussion by offering H_2 and NH_3 molecules, either through own production or by sourcing it from third party producers.

1. CMB.TECH: MARINE

Hydrogen powered

- Hydroville
- Hydrobingo
- Hydrocat
- Hydrotug
- Coaster
- CSOV

Ammonia Powered

- 210k DWT bulk carrier
- 25k DWT chemical tanker
- 6000TEU container vessel

H_2 Powered

Hydroville: Launched 2017
The world's first passenger ferry with H_2 combustion engines.

Hydrobingo: Launched 2021
Ferry shuttle for the Japanese coastal waters, equipped with a H_2 trailer for easy refueling.

Hydrocat: Launched 2022
Hydrocat is a dual fuel hydrogen powered Crew Transfer Vessel (CTV).

Hydrotug: final commissioning phase
Hydrotug is dual fuel 65t BP tractor tug built for the port of Antwerp-Bruges.

H_2 Powered Multi Purpose Coaster
4x 5000dwt coaster vessels are being designed which are equipped with a hybrid driveline comprising of 2x H_2 mono fuel ICEs, 2x MGO engines and a battery.

CSOV with onboard H_2 powered genset
3x Construction Service Operations Vessels equipped with H_2 technology are ordered and will be delivered to Windcat Offshore in 2025.

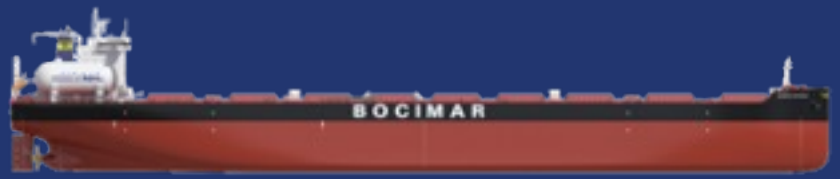
NH_3 Powered

NH_3 25.000 DWT Chemical Tanker

CMB.TECH has ordered 6x 25.000dwt chemical tankers. The vessel has been designed considering future retrofitting for using NH_3 as a fuel.

NH_3 205.000 DWT Dry Bulk Carrier

CMB.TECH has 24x 210.000 dwt Newcastlemax bulkers on order. The vessels have a unique design as they will be able to use the zero-emission fuel of Ammonia.



NH_3 6.000 TEU Container Vessel

6x 6.000 TEU ice class 1A high reefer container ships with a class notation to use NH_3 as fuel.

2. CMB.TECH: INDUSTRY

- H_2 Truck
- Port equipment
- Power generation
- Construction & mining equipment

Industrial and scalable applications

Dual fuel truck

Dual fuel workshop

Dual fuel port equipment

H_2 Gensets

MAN

BEH2YDRO
hydrogen combustion engines

Ford FORD OTOSAN

VOLVO PENTA

Key Partnerships

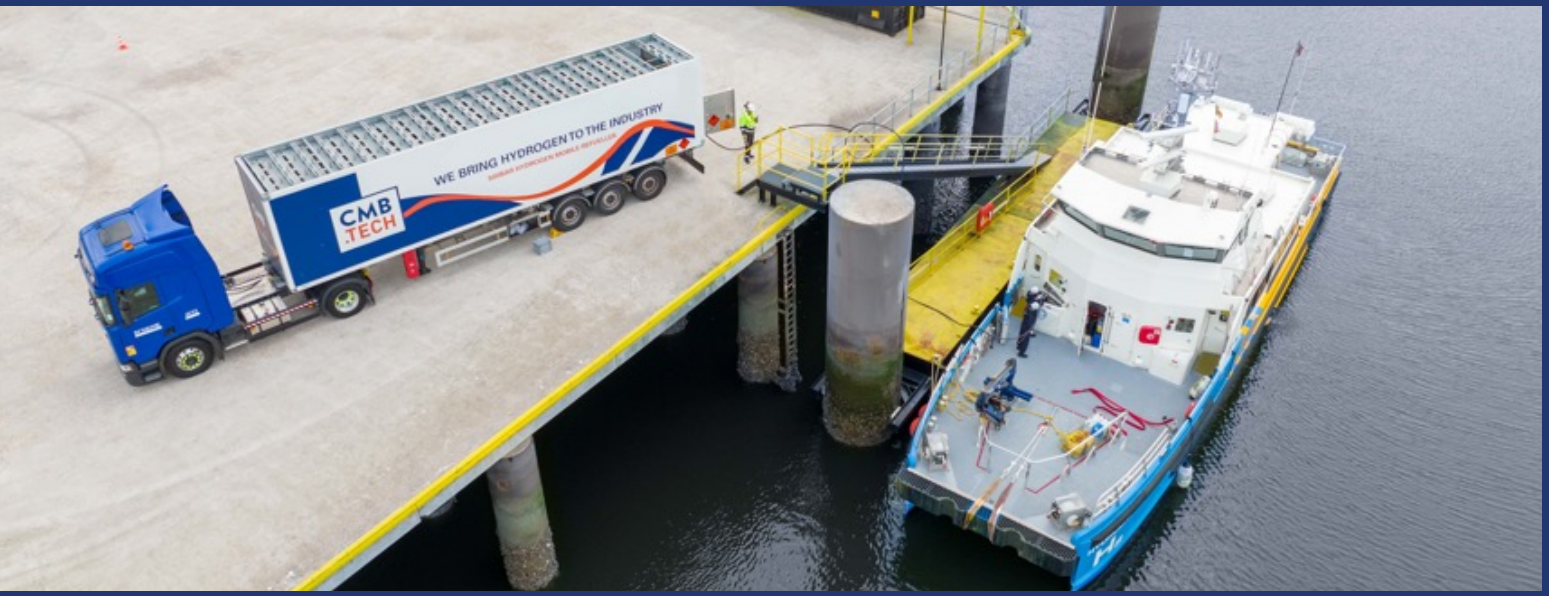
Heavy-duty offroad equipment

3. CMB.TECH: H2 INFRA

- Multi-model Hydrogen refuelling station Antwerp
- Mobile refuelling
- Cleanergy project in Namibia

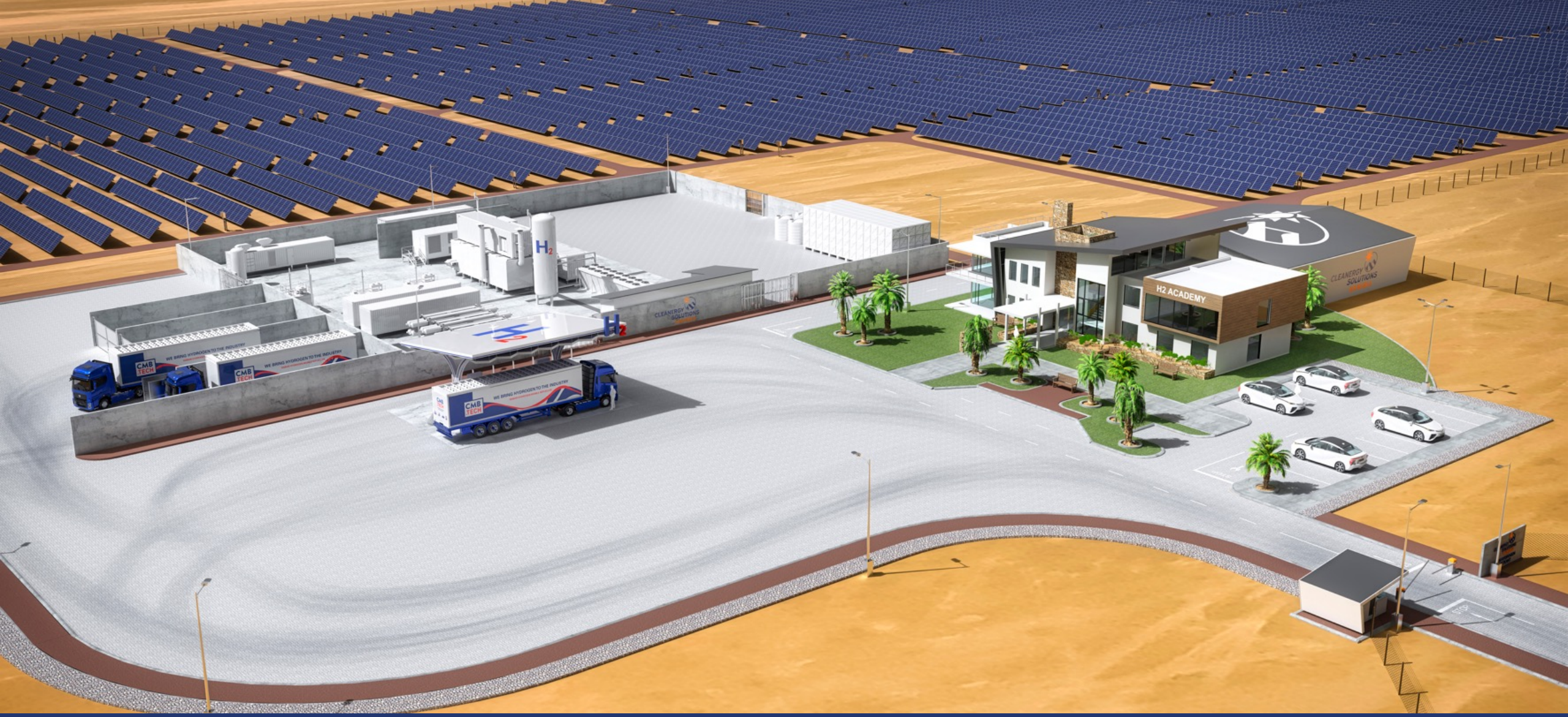
Multi-modal hydrogen refuelling station in Antwerp, Belgium

World's first hydrogen refuelling station with onsite green H_2 production which can be dispensed to trucks, cars, trailers and ships.



Mobile hydrogen refueller

500 bar tube trailer containing 950 kg of useable H_2 for mobile refuelling of marine and land-based applications. With a cascade system 600kg can be delivered at 350bar.



H_2 production plant with Cleanergy Solutions Namibia

Construction of Africa's first public green H_2 refuelling station.

CMB.TECH: ENGINEERING

- Team skills of CMB.TECH's Technology and Development Centre
- Facilities

CMB.TECH has 15 years of experience in engineering of low carbon solutions

- 25 years of experience as engineering and design team with a proven track record in the automotive industry.
- A team of 70 skilled engineers

- Dyno test facilities (3x H_2 equipped)
- Engine build workshops
- Prototyping
- Electrical & electronics build lab
- Fabrication & model studio

– emission data capturing, reporting and simulation

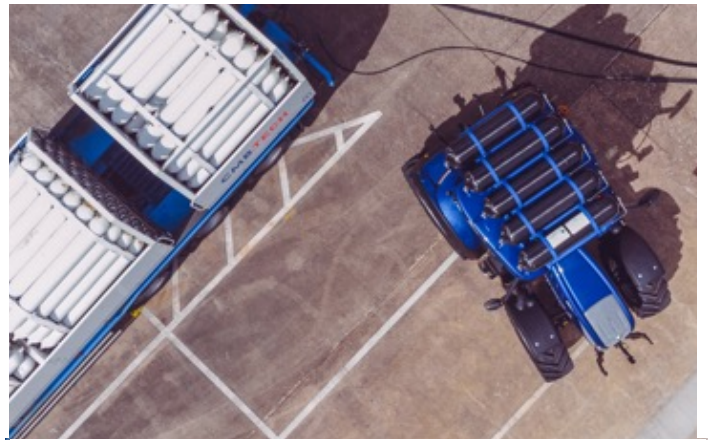
Facilities of CMB.TECH's T&D Centre

Dual fuel technology

H_2 equipped dyno test cells

Skilled calibration team experienced with H_2 combustion

Acceptance testing



Onsite H_2 supply

Emissions testing for EU Stage V

CMB
.TECH

III

Activities within the project

Activities

- CMB.TECH is committed to deliver fuel consumption figures for a wide variety of ships (container vessels, dry bulk carriers and chemical tankers).
- Besides the CO_2 figures, NOx emission figures can generated based on basic modelling.
- Besides the marine emission figures we will also deliver emission figures for trucks, which will be gathered in the framework of our dual fuel truck development.

As part of our dual fuel truck development we have initiated an extensive emission logging project

Two routes

Belgium East-West – 400km, flat topography

Belgium North-South – 400km, hilly topography

Three configurations will be tested

Base diesel vehicle, as a reference

Dual fuel vehicle, diesel-only mode

To assess impact of extra weight of the dual fuel system

Dual fuel vehicle, dual fuel mode

To assess diesel- thus CO_2- savings

Correlate real world driving performance to the WHTC homologation cycle

Testing to be done with a fully laden vehicle and with a half-laden vehicle

To assess impact of load

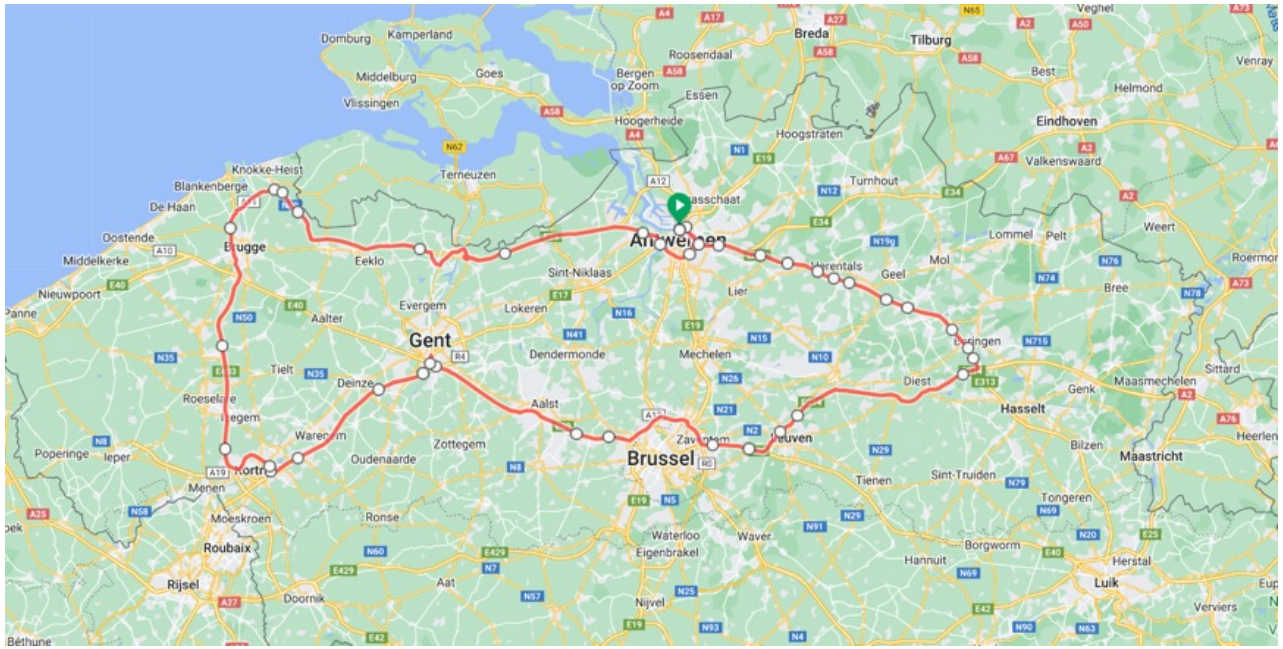
Real world fuel economy testing

East – West : 400km, 2000 altitude meters

Max altitude 85m

North – South : 430km, 4200 altitude meters

Max altitude 650m



World Harmonized Cycles (WHSC & WHTC) tests have been executed at a research laboratory

Two representative test cycles, (WHTC and WHSC), have been created covering typical driving conditions in the EU, USA, Japan and Australia.
WHSC – World Harmonized Stationary Cycle
WHTC – World Harmonized Transient Cycle
These are fixed test cycles to which every engine/vehicle is tested when doing the mandatory emissions testing

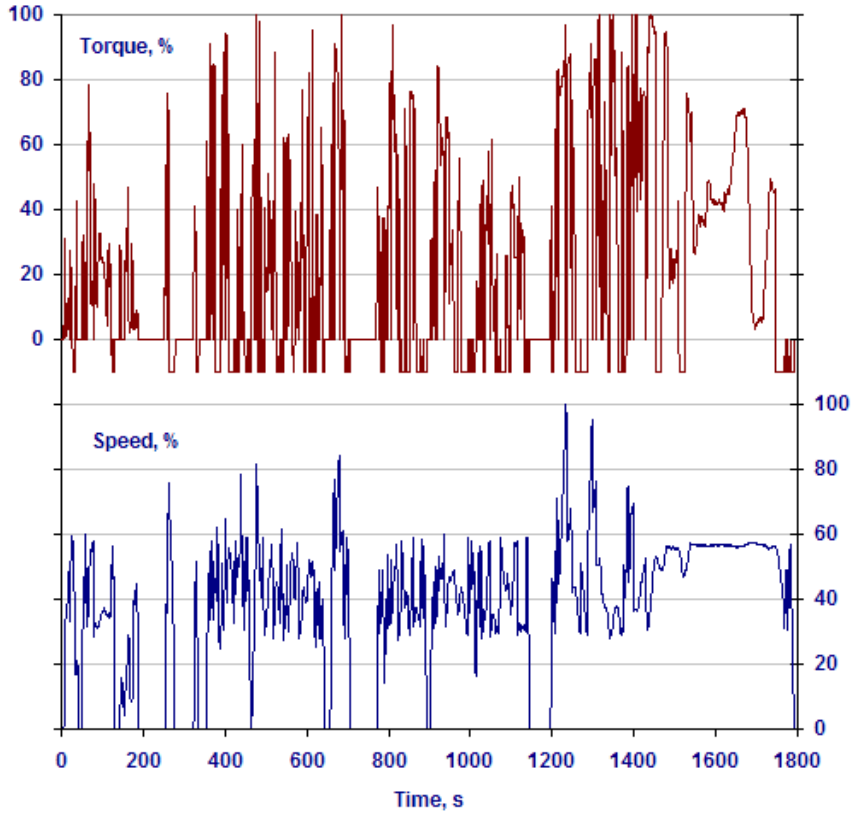


Figure 1. World Harmonized Transient Cycle (WHTC)
Negative torque values are arbitrary representation of closed rack motoring

Besides CO_2 emissions, also other gases can be measured trought PEMs testing.

From experience it is known that teal-life fuel consumption can vary from the official WHTC testing.
With PEMs (Portable Emissions Measurement Systems) testing, we will be able to determine the real life emissions of trucks.

Weighted Specific Emissions - Dataset AP1
WHTC

		Diesel	Dual fuel	Degradation factor	Diesel x DF	Dual Fuel x DF	Limit value	Weighting CO2eq 20 YRS g/kWh	Weighting CO2eq 100 YRS g/kWh	GWP 20y Diesel CO2eq g/kWh	GWP 20y Dual fuel CO2eq g/kWh
CO2	g/kWh	632.07	518.87	1.00	632.07	518.87	- g/kWh	1	1	632.07	518.87
CO	mg/kWh	499.71	422.26	1.30	649.62	548.94	4000 mg/kWh	10	3	6.50	5.49
HC	mg/kWh	7.31	1.37	1.30	9.50	1.78	160 mg/kWh				
NOx	mg/kWh	145.98	217.57	1.15	167.88	250.21	460 mg/kWh	31.5	8.5	5.29	7.88
CH4	mg/kWh	5.63	6.88	1.40	7.89	9.63	500 mg/kWh	86	32	0.68	0.83
PM	mg/kWh	1.48	1	1.05	1.55	1.47	10 mg/kWh				
PN	N/kWh	2.15E+10	2.39E+10	1.00	2.15E+10	2.39E+10	6.0E+11 N/kWh				
FC	g/kWh	204.56	177.95	-	204.56	177.95					
NH3	ppm	0.24	0.32	-	0.24	0.32	10 ppm				
									Total (CO2eq g/kWh):	**644.53**	**533.07**
											17.29%
											CO2eq saving

IV

Q&A

Roy Campe
CTO CMB.TECH
roy.campe@cmb.be
+32 471 80 1959

www.cmb.tech

SCOPE3 project

Phases and approach

Obligation to report ‘real’ emissions

Real consumption per trajectory

Scope 3 Project

Scope 3 emissions based on ‘real’ consumption vs averages & multiples

Intermodal Scope 3 emissions calculation based on real consumption data

Emission reporting – allocation / alignment with industry standards & ERP feed

Optimization simulator – transport mix selection

OVINTO
Connecting Rail & Intermodal

RAILNOVA.

RHEA GROUP

CMB.TECH

Project ‘Scope 3’ demonstrator

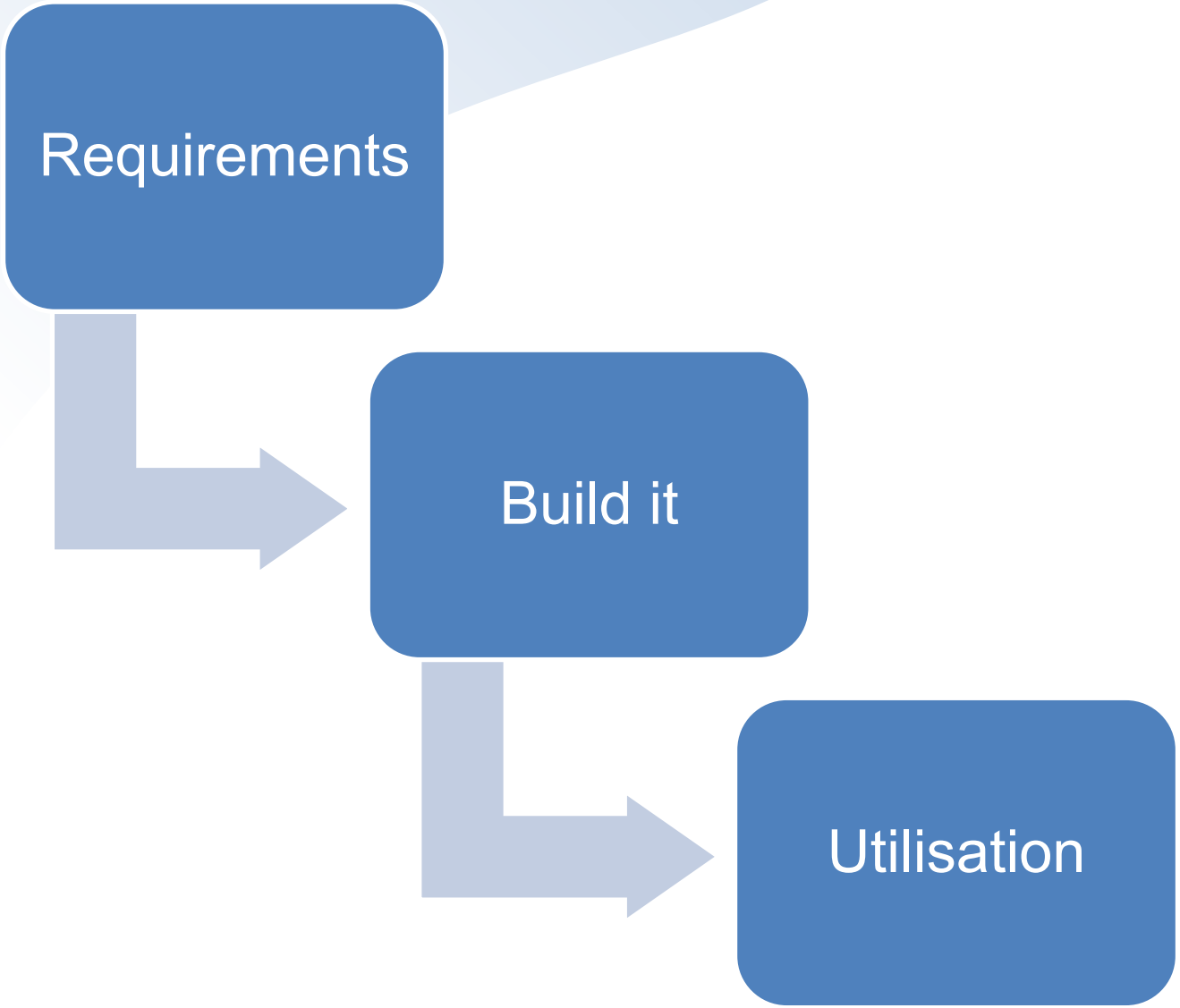
RAILNOVA.

RHEA GROUP

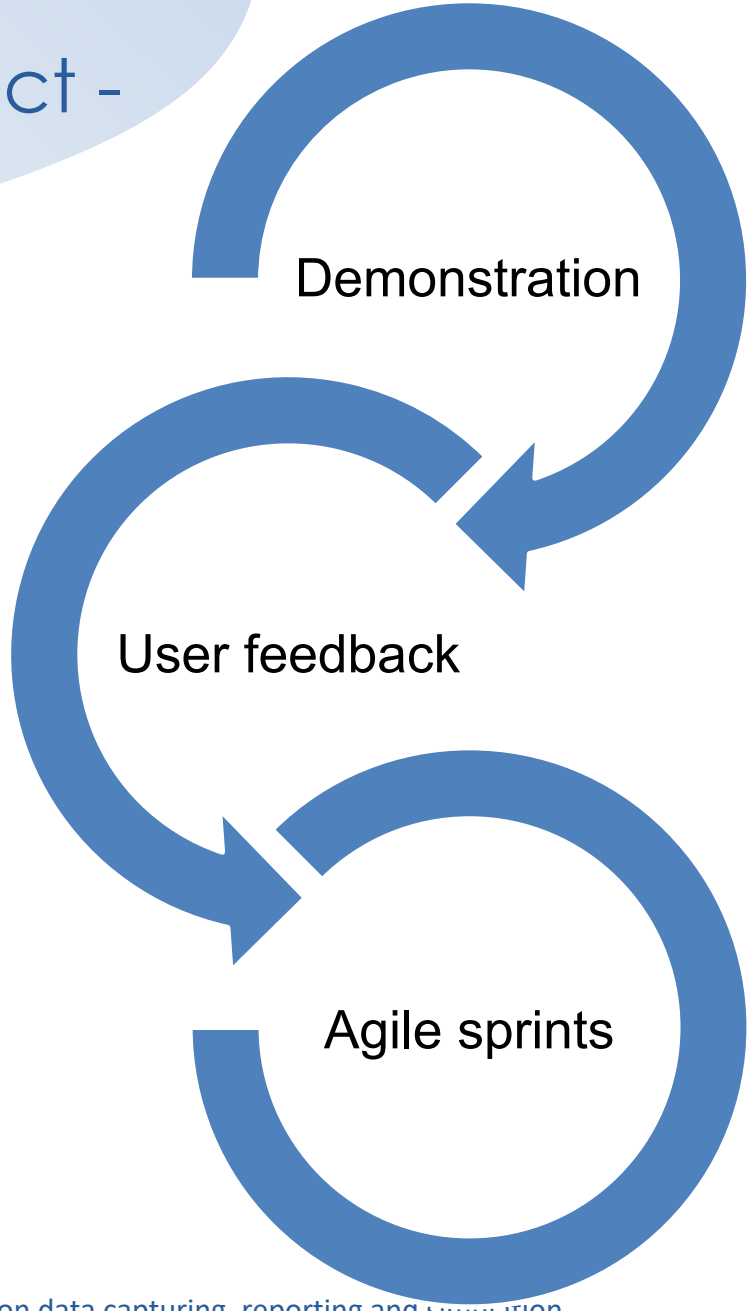
CMB .TECH

Anticipate legislation

Phases of a demonstration project - preparation



Phases of a demonstration project - utilisation

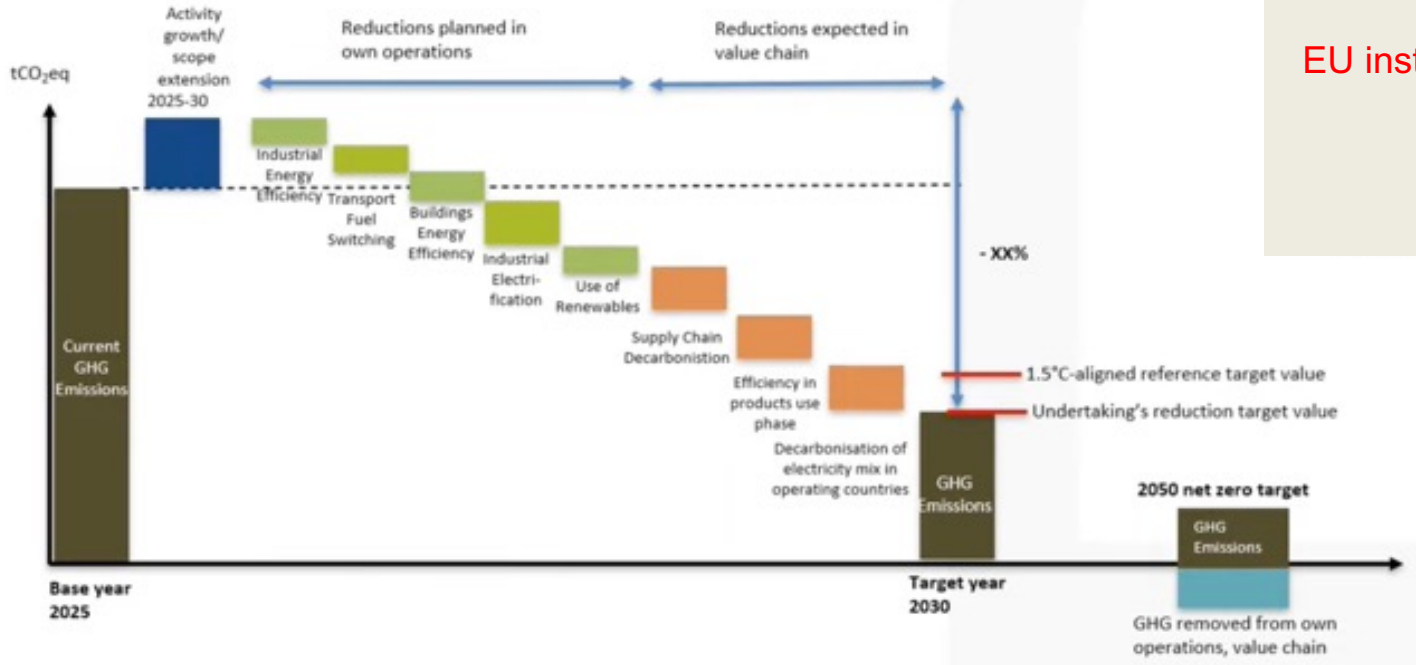


To report GHG emissions from logistics/transports…

Metrics and targets

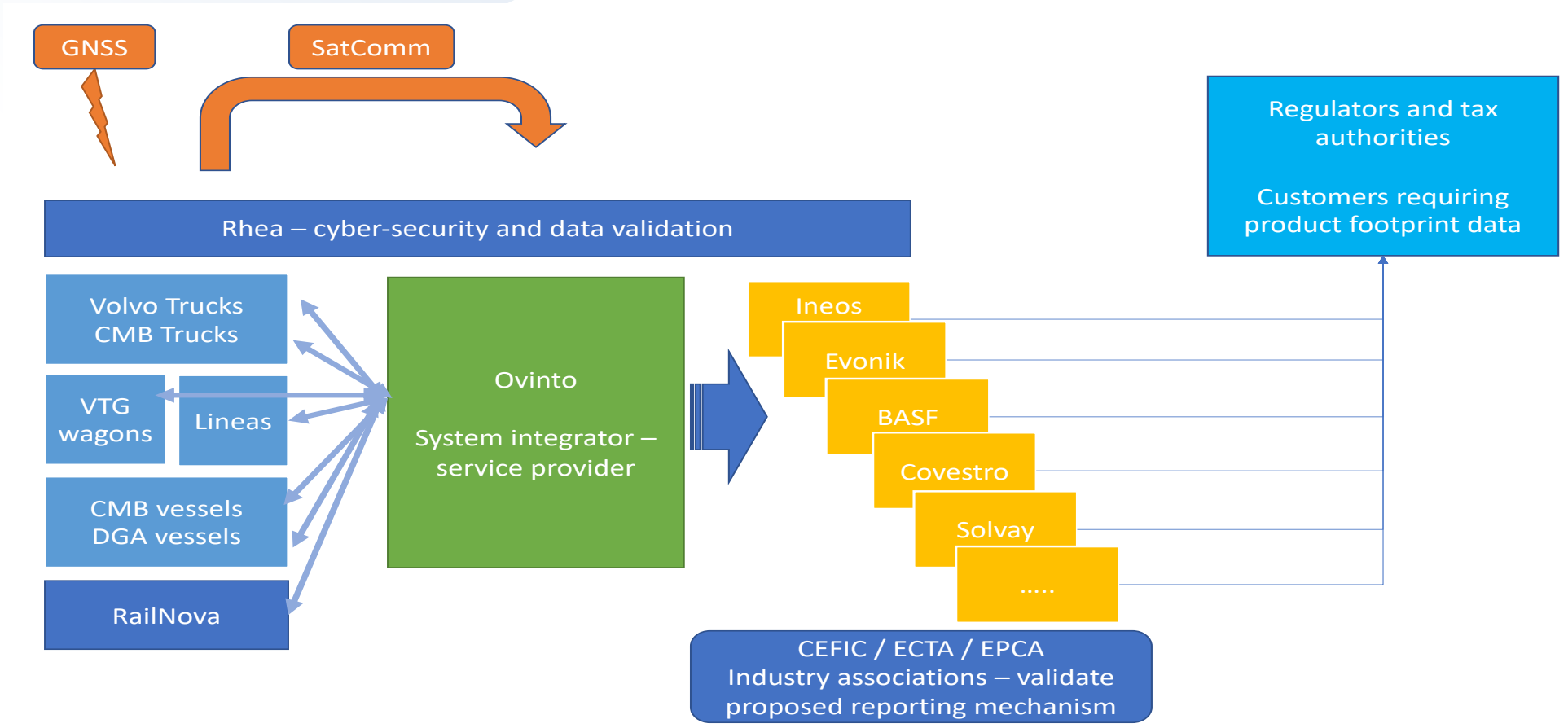
EFRAG

DR E1-4 – TARGETS RELATED TO CLIMATE CHANGE MITIGATION AND ADAPTATION



EU instruction video on sustainability reporting
December 2022

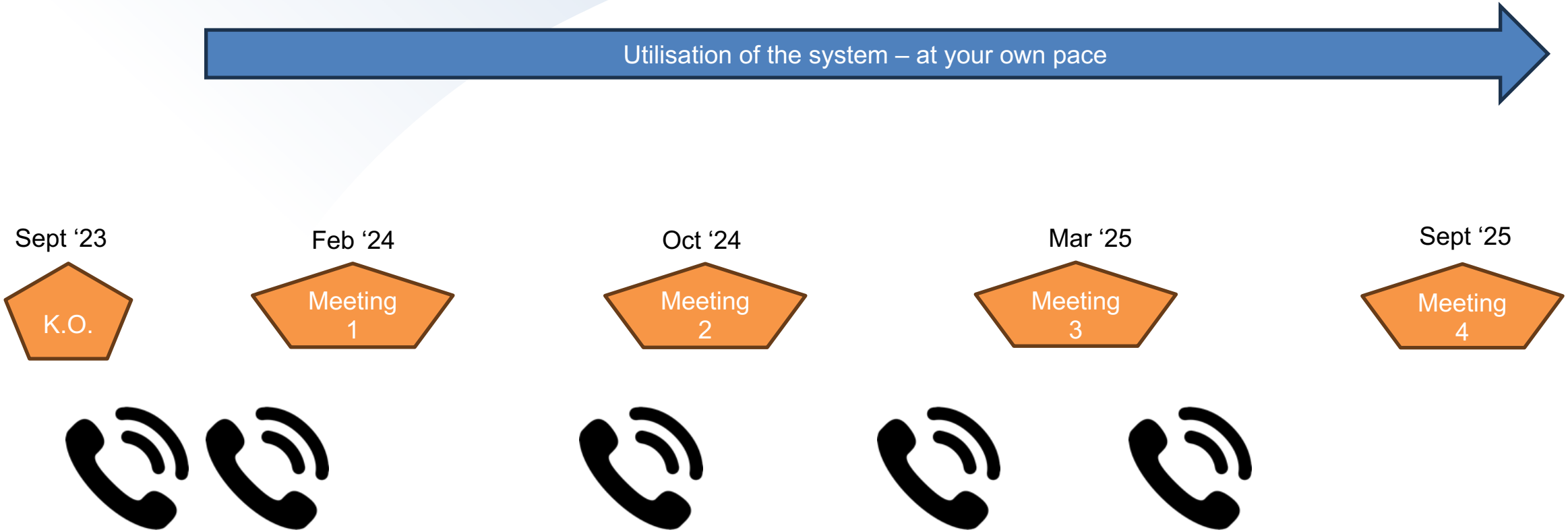
…. we need to collect the data first



Project proposal
simulator

Figure 2 - The smart emission simulator – routes suggested

Participation involvement….



SCOPE3 demonstrator project approach

1. We'll build on your specific stakeholder knowledge and experience, the result should be larger than the sum of the parts.

- You determine what you want to measure, and what is sensitive/what you do not want to measure
- We protect all data - it remains yours at any point - and propose a common ground for reporting in a demonstration

2. The more companies participate, the more accurate the results and the more automated the reports.

Your data remains your data at all times!

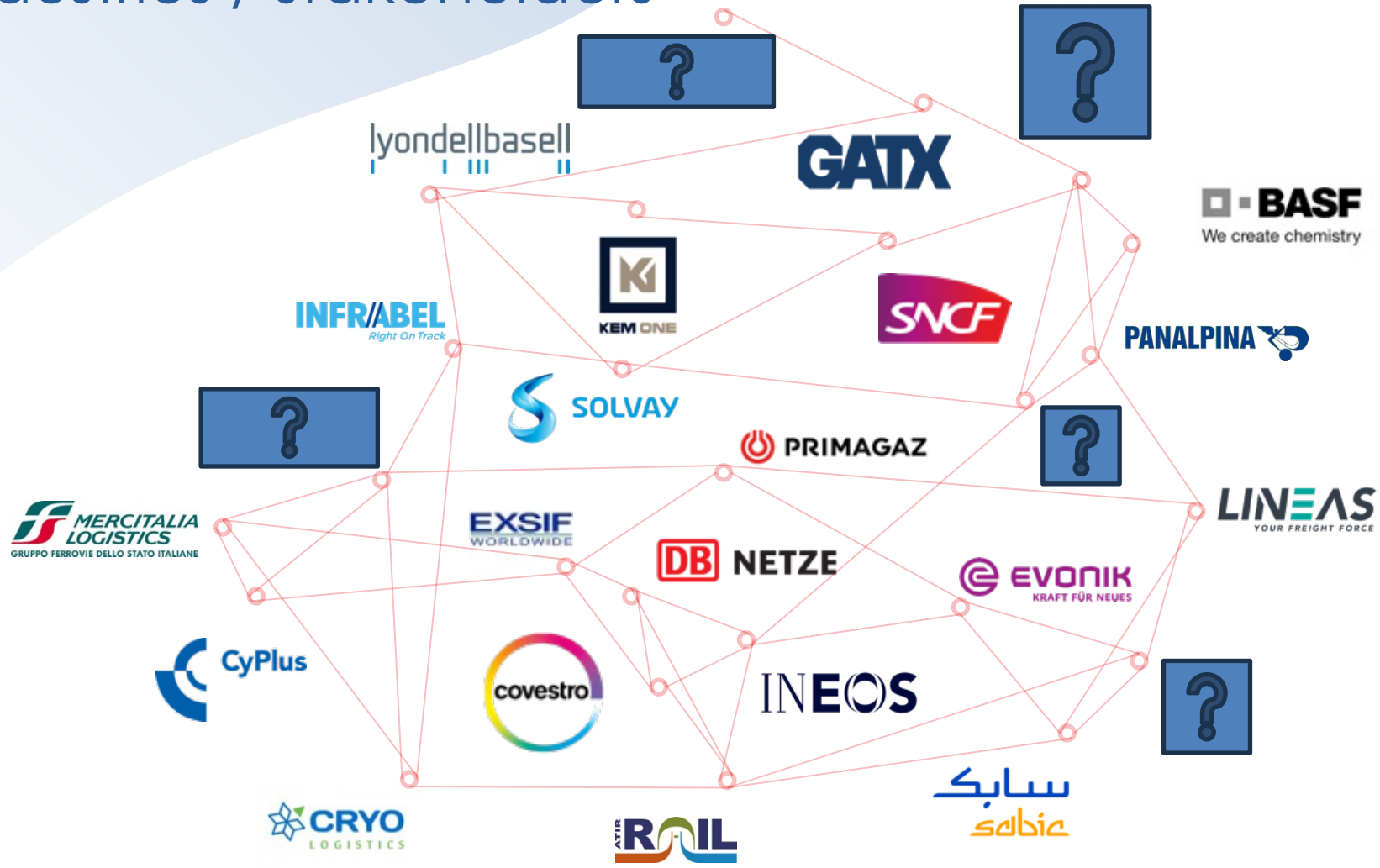
You set the boundaries

- Data that should not be shared
  - decide what information is sensitive/should be kept out of scope
- Data that is essential for the reporting and how to use it safely
  - finding the common ground
- How should we provide the results
  - direct link to your ERP
  - direct link to a trusted reporting mechanism
  - other options

Open to other industries / stakeholders

more **connections**,
more **value**.

Permission based.



Getting involved

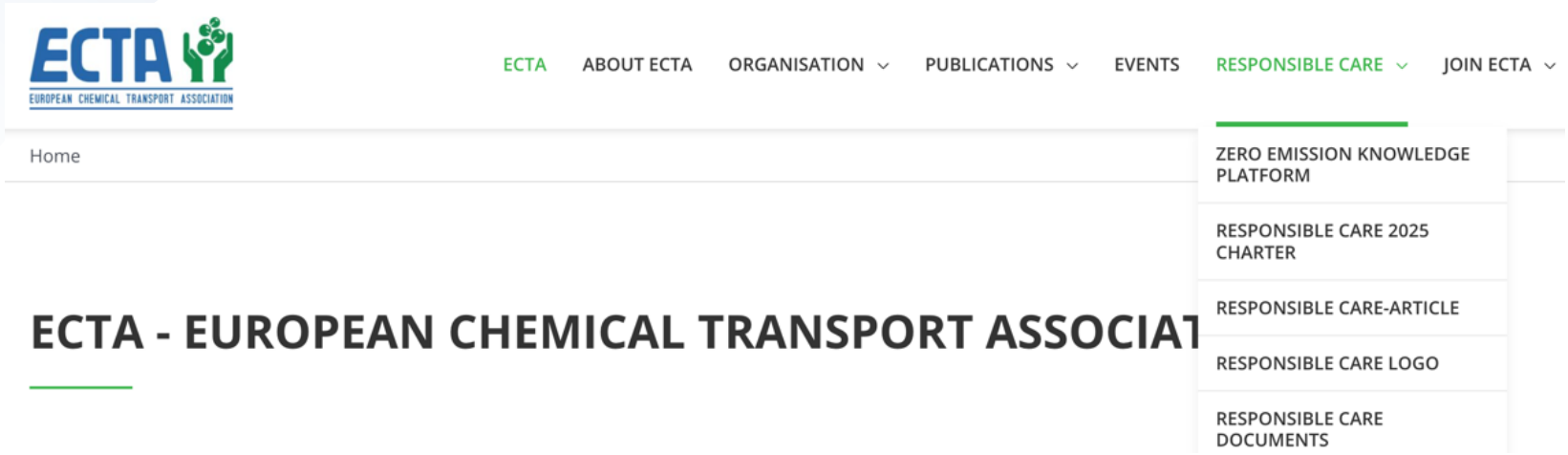
What is expected from you ?

- Full understanding of the goals of the project
- Are these goals suitable for your internal/corporate needs? Something more?
- Open feedback at any moment, active participation on a consultation basis,
- Generation of new ideas, request scope changes if deemed valuable,
- Feedback, feedback, feedback

Partnerships: CEFIC and SQAS

9. Measurement and Management of transport greenhouse gas (GHG) emissions	**55%**
9.1. Scope 1: Emission measurement of vehicles that are owned or controlled by the company.	74%
9.2. Scope 2: Emissions from electricity	78%
9.3. Scope 3	47%
9.4. Calculation of Total emissions (Scope 1, 2 and 3)	41%
9.5. Calculation of Tonnes-km	53%
9.6. Calculation of emission intensity	38%
9.7. Consolidating and reporting emissions	27%
9.8. Training	78%
9.9. Reducing emissions	46%
9.3. Scope 3	**47%**
9.3.1. Fully Integrated subcontractors and Non-Integrated subcontractors	46%
9.3.2. Intermodal/ Multimodal	51%
9.3.3. Tank cleaning stations	40%
9.3.4. Subcontracted storing/handling of goods	9%
9.3.5. Production and Distribution of fuels burned in Scope 1	60%
9.3.6. Calculation of Scope 3 emissions	39%
9.4. Calculation of Total emissions (Scope 1, 2 and 3)	**41%**
9.4.1. Did the company calculate the Total emissions during last year by addition of Scope 1, 2 and 3 emissions?	41%
9.5. Calculation of Tonnes-km	**53%**
9.5.1. Does the company know the tonnes of product transported and Kilometers driven (both laden and empty) associated with each category specified in 9.1.3.?	61%
9.5.2. Did the company calculate the tonnes-Kilometers (tkm) during the last year by transport order and by category with the formula?Σ tkm by transport category = (ton shipment 1 x km shipment 1) + (ton shipment 2 x km shipment 2) +.... + (ton shipment n x km shipment n)	46%

Partnerships: ECTA guidelines and tools



Partnerships: EPCA and supply chain programme committee

Figure 2 - The smart emission simulator – routes suggested

SCOPE3 project

Industry participation

How can we maximise the participation beyond these…

How can we maximise the participation – your ideas?

Your chance to share

- Experience – what worked, what not
- Elements to consider
- Essential parties to participate

Discussion !

Boundaries?

- Data that should not be shared - sensitive data?
- Data that is impossible to get?
- Internal restrictions - e.g. timing?
- External restrictions – legislation etc

Wrap up

- Letter of Participation
- Any other business – remarks, thoughts

Thank you

info@ovinto.com