

# 10th International Workshop on Sustainable Road Freight

4<sup>th</sup> December 2023, Cambridge, UK



*Fernando Liesa*  
*Secretary General*

**alice** | Alliance for  
Logistics Innovation  
through Collaboration  
in Europe

***Robust decarbonisation and resilient logistics:  
Progress in the last decade and a roadmap to 2035***



# Special report 18/2023: EU climate and energy targets – 2020 targets achieved, but little indication that actions to reach the 2030 targets will be sufficient

26/06/2023

Energy, environment and climate action

Ref: <https://www.eca.europa.eu/en/publication?ref=SR-2023-18>

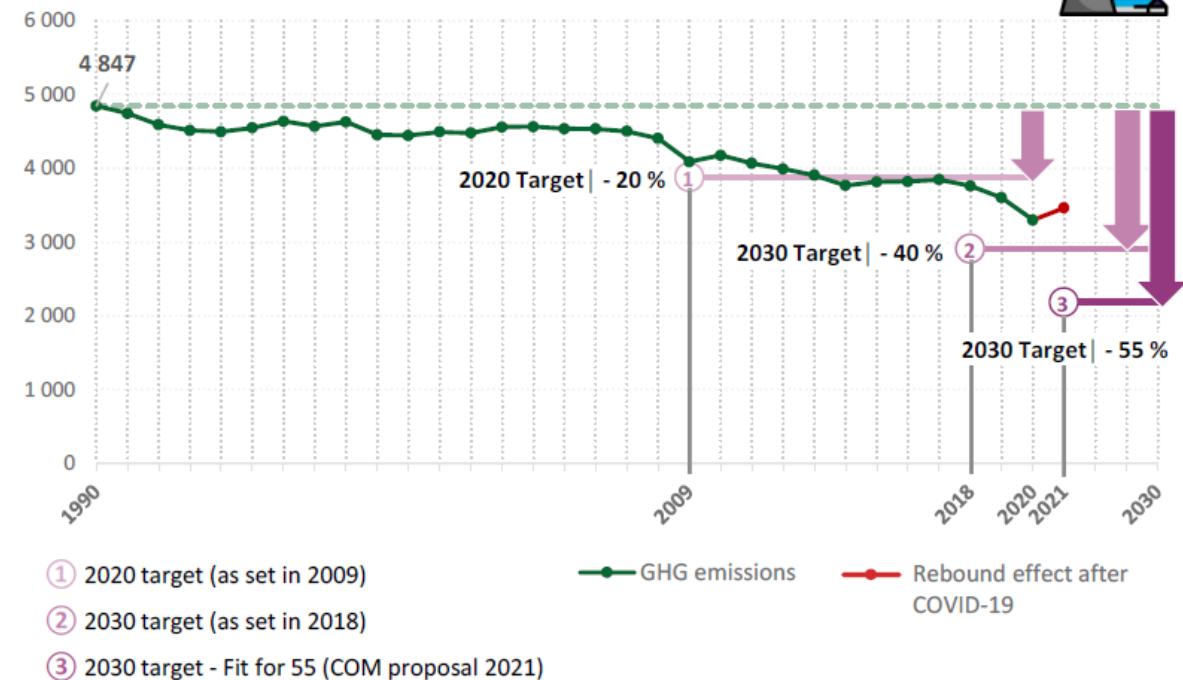


The EU achieved its 2020 climate and energy targets, but some member states did not contribute as expected to the targets. The Commission did not assess whether the EU had reached its targets as a result of its policies rather than as a result of external factors, such as the 2009 financial crisis and the COVID-19 pandemic. The EU's 2020 and 2030 greenhouse gas emissions targets do not include emissions embodied in imported goods or emissions from international aviation and

shipping. Little data is available on the cost to the EU budget, national budgets and private sector at which the EU achieved its targets. The National Energy and Climate Plans lack data on investment needs and funding sources to assess whether such plans are a sound basis to reach the 2030 targets.

Figure 1 – Evolution of the EU greenhouse gas emissions target

In million tonnes of CO<sub>2</sub> equivalent




Source: ECA based on data from European Environment Agency. [Data for 2021 are provisional].



# Parliament backs new rules to reduce air pollution from trucks and buses

Press Releases [PLENARY SESSION](#) [ENVI](#) 21-11-2023 - 14:22

 EU | BRUSSELS



## EU truck and bus CO<sub>2</sub> vote made even worse by absurd mandatory purchase idea

21 NOV 2023 • ENVIRONMENT

The European Parliament's plenary vote on CO<sub>2</sub> emission targets for heavy-duty vehicles today sets unrealistic targets for zero-emission vehicles, feebly tries to factor the role of carbon-neutral fuels in decarbonisation, and attempts to bring the EU transport sector in line with totalitarian regimes by mandating purchase targets for transport operators.

- 45% emissions reduction from 2030 (increased from 30%)
- 65% emissions reduction from 2035
- 90% emissions reduction from 2040

**CO<sub>2</sub> targets for trucks and buses: much more needed than targets on paper, caution manufacturers**

**acea**  
DRIVING MOBILITY FOR EUROPE



Co-funded by  
the European Union

*ZEFES is co-funded by the European Union under grant number 101095856. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.*





# Content

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1. Who is ALICE?
2. ALICE ambition: Support transition to zero emissions Logistics in an affordable way
3. EU programmes and projects to accelerate road transport electrification
4. ZEFES: Zero Emissions flexible vehicle platforms with modular powertrains serving the long-haul Freight Eco System
5. Final thoughts and way forward



ALICE, Alliance for Logistics Innovation through Collaboration in Europe

**not-for-profit association**, registered in Brussels, since 2015

Recognized by the European Commission as a *European Technology Platform*<sup>1</sup>

Who is ALICE

1. European Technology Platforms, ETPs are industry-led stakeholder fora that develop short to long-term research and innovation agendas and roadmaps for action at EU and national level to be supported by both private and public funding. More Info on ETPs [http://www.etp-logistics.eu/wp-content/uploads/2021/03/Logistic-TP-recognition-SWD\\_2013\\_272\\_F1\\_STAFF\\_WORKING\\_PAPER\\_EN\\_V2\\_P1\\_735480.pdf](http://www.etp-logistics.eu/wp-content/uploads/2021/03/Logistic-TP-recognition-SWD_2013_272_F1_STAFF_WORKING_PAPER_EN_V2_P1_735480.pdf)



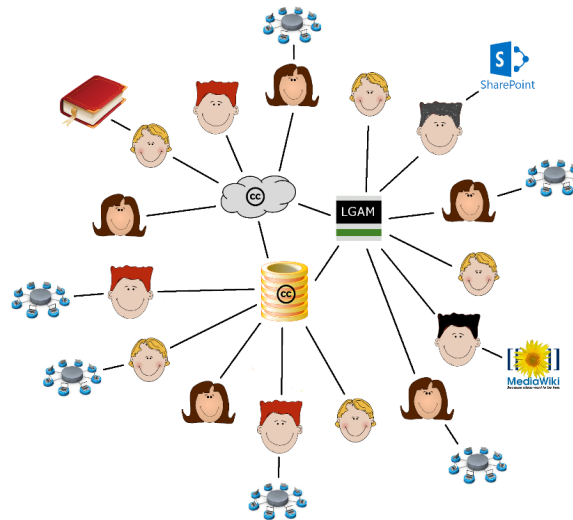
# ALICE membership is bringing an holistic approach → All key logistics stakeholders represented!

Type of Organization	Members	EU/International Associations
Shippers & Retail	       	   
Logistics Service Providers, Courier and Postal operators & Freight Forwarders	                 	   
Ports, Hubs, Real Estate companies, Intermodal terminals & Transport/Energy Infrastructure	             	   
Transport and industry vehicles, packaging & material handling	     	 
Information and Communication Technologies & Consultancy	                                  	
Regional & National Logistics Clusters & Associations	               	
Research and technology Centers	                      	 
European Technology Platforms /PPPs	    	
Member States and innovation Funding*	            	

\*Involved in ALICE Mirror Group

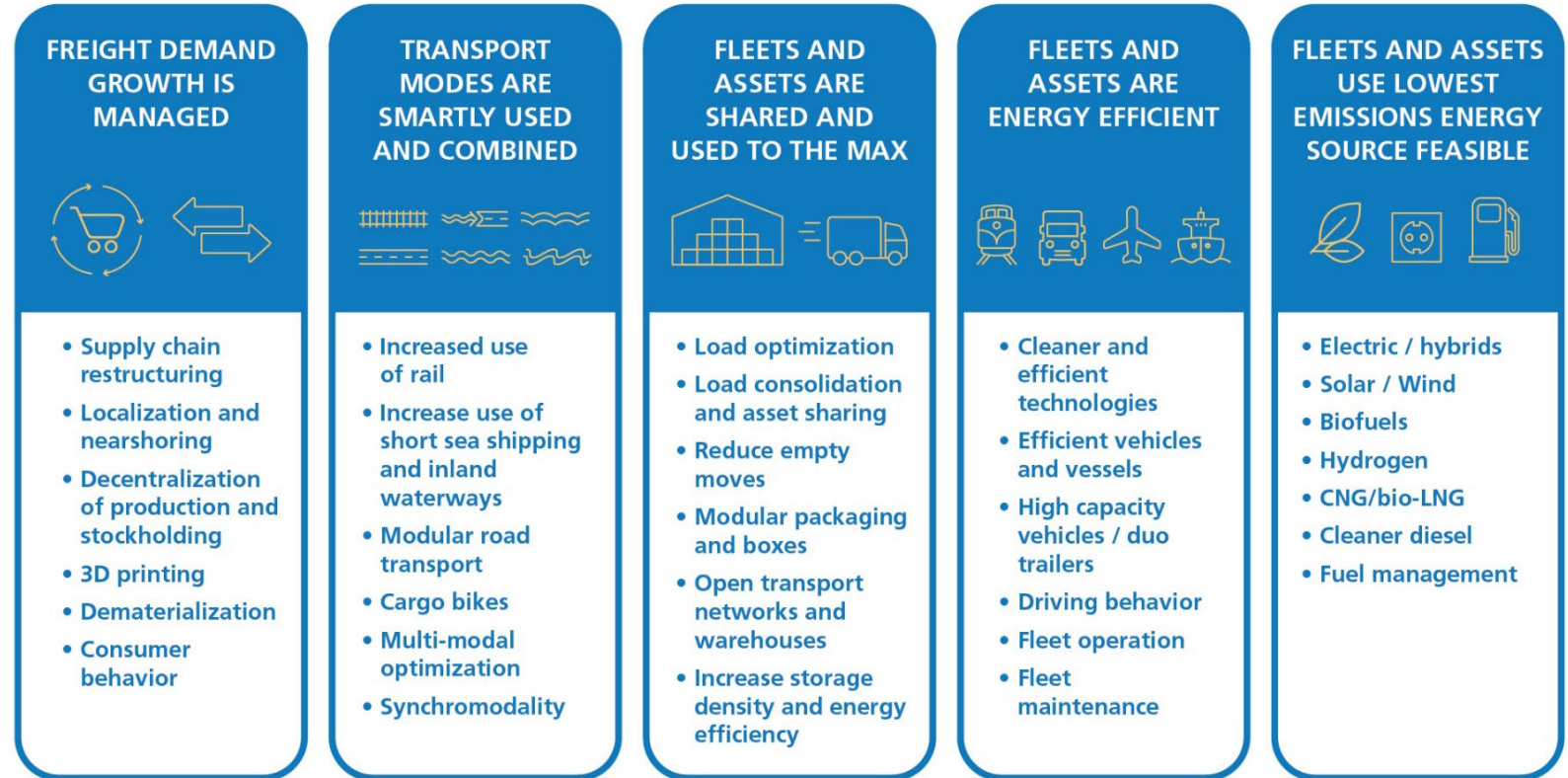
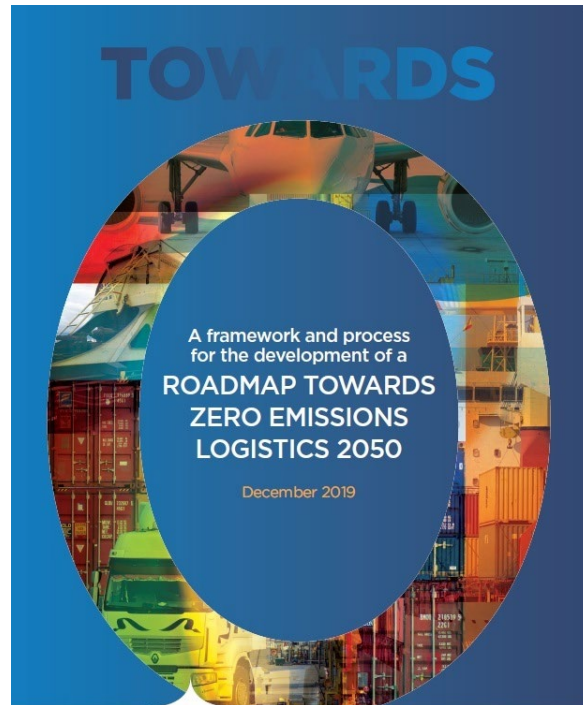
# Mission: acceleration of decarbonization in affordable way

# INNOVATION

A close-up photograph of a right hand holding a thick, horizontal blue line. The hand is positioned on the right side of the frame, with the thumb and index finger gripping the line. The line extends from the hand towards the left edge of the image. The background is a plain, light gray. The word "INNOVATION" is partially visible at the top of the image, with the letters "INNO" and "ATION" clearly legible in a blue, sans-serif font.

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© Smart Freight Centre and ALICE-ETP based on A. McKinnon 'Decarbonizing Logistics' (2018) Roadmap Towards Zero Emissions Logistics 2050. ALICE (2019) [www.etp-alice.eu](http://www.etp-alice.eu)

[Link to the document](#)





Achieving the transition for assets, energy sources, infrastructures, vehicles, and vessels is possible by 2040-2050 but we need short term success for 2030 ambitions

A holistic and integrated innovation approach addressing the vehicles, the energy, the infrastructure and operations is needed



Affordable alternatives to fossil fuel are required and market adoption accelerated by using taxation revenues for market incentives

Carbon measurement and reporting is key

Rail and inland waterways need to truly become part of the solution



HE partnerships



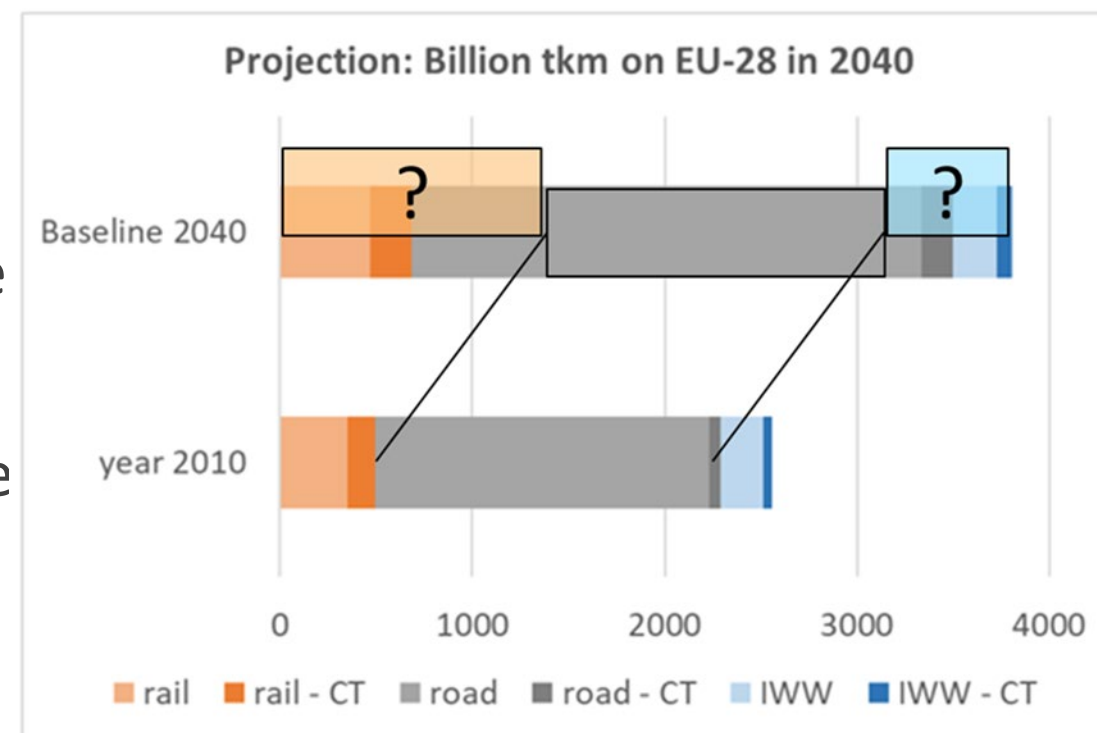
Projects

# Challenges transport and logistics, fit for 55

- 🚚 Growth of freight transport in Europe 2010 – 2040, 49%
- 🚚 Reduction CO2 for HDV 2019 - 2030, 45% and 2019 - 2035, 65%\*

- 🚚 Transport and logistics efficiency, do more with less
- 🚚 Utilisation of existing infrastructure (road, rail, iww)
- 🚚 Diversity within Europe at cross border, national, regional level
  - 🚚 legislative framework,
  - 🚚 topography and available modes

- 🚚 Drivers shortage



source: DLR; results of the model Demo-GV

\*[https://climate.ec.europa.eu/eu-action/transport-emissions/road-transport-reducing-co2-emissions-vehicles/reducing-co2-emissions-heavy-duty-vehicles\\_en](https://climate.ec.europa.eu/eu-action/transport-emissions/road-transport-reducing-co2-emissions-vehicles/reducing-co2-emissions-heavy-duty-vehicles_en)



# ZEFES projects fact sheet



40 Partners



6 OEM's



14 Suppliers



11 Shippers & retail



9 Research



23 Million EU funding

39 Million project costs








Start date 01 January 2023

Duration 42 Months



# Current challenges BEV/FCEV

-  BEVs and FCEVs have a limited range
-  Available payload is affected (e.g. by the weight of the batteries)
-  Lack of available energy infrastructure  
(charging points and hydrogen filling stations)
-  Higher costs due to energy prices and low-scale production

 Incorporation into daily fleet operations  
is affected by all of the above  
and their interdependencies!



# Ambition



2

Create a pathway for long-haul BEVs and FCEVs to become more **affordable** and **reliable**, more **energy efficient**, with a **longer range** per single charge and **reduced charging times** able to meet the user's needs

1

Execute **real-world demonstrations** of **long-haul BEVs** and **FCEVs** across Europe to take zero-emission long-haul goods transport in Europe to the next level.

3

Make the **mapping** of flexible and abundant **charging/refuelling points** and novel charging concepts.

4

Develop technologies which can deliver **promised benefits** (easy handling, similar driving hours & charging/hydrogen refuelling stations, high speeds and ability to operate in complex transport supply chains).

5

Create novel tools for **fleet management** to support the rising number of long-haul BEVs and FCEVs vehicles in the logistics supply chains, in the form of a **Digital Twin**.



# 15 use cases throughout Europe, each focussing a specific logistic operation



Challenging route components	Challenging factors and KPIs
Long-haul: up to 1300 km one-way 	Minimise extra waiting time for charging/refuelling 
Shorter hub-to-hub and factory-to-factory transport 	Availability of technology 
Cross mountains 	Having the right energy carrier and quantity on board 
Multi-modal (including train and ferry) 	Reducing extra costs 
Stretching across Europe using TEN-T corridors 	Remote optimisation and predictions   Permissions to drive (incl. tunnels) 



## D1.2 Defined Use Cases, Target metrics and needs

<https://zefes.eu/defined-use-cases-target-metrics-and-needs/>

# Needs and requirements as part of ZEFES



ZE-HDV: battery and fuel cell electric truck-trailer combinations (GCW +36 tons)  
for the whole **ZE-HDV ecosystem**.

## 59 Needs and requirements in total, over 6 categories

- 14 related to Truck-trailer technology (technical)
- 4 related to Fleet integration (digital twin)
- 6 related to Safety and acceptance
- 25 related to Infrastructure
- 9 related to Viable Business case
- 1 related to Legal barriers



Session I Supply Chain Needs

SHG Symposium 25<sup>th</sup> October 2023  
Validation Needs and requirements

Category I - Truck-trailer technology



	Need and/or requirement	Important	Not relevant	Comments
T1	The <b>truck-trailer combination</b> is seen as <b>one asset</b> to determine whether a mission is feasible, since both assets can <i>consume</i> and <i>store</i> energy. The energy consumption for a mission is depending on the characteristics of both.			
T2	The <b>driving range</b> of the ZE-HDV is sufficient for the logistic operations and can vary from use case to use case.			
T3	The transport <b>capacity</b> is not limited, both in payload and availability of the truck.			
T4	ZE <b>trailers</b> are available. (cooling and tailgate electrified)			
T5	The truck-trailer combination is <b>modular</b> , and the specifications / capabilities can be adjusted to the needs of the end-user.			
T6	The <b>energy stored</b> on the truck-trailer combination is known, especially for the driver.			
T7	<b>Energy consumption</b> of the truck-trailer combination can be predicted given the mission parameters and weather conditions.			
T8	It is clear what the impact of <b>weather</b> would be on the capabilities of the truck trailer combination.			
T9	Trucks and trailers are deployable in <b>different modes</b> . (water and rail) ( <i>Technical point of view</i> )			
T10	<b>Knowledge and resources</b> are available in the logistic company to implement and operate ZE-HDV.			
T11	The truck end-user <b>trusts</b> the new technology.			
T12	<b>Maintenance</b> can be organised.			
T13	The trucks are <b>connected</b> (digitalisation: communication, V2X, is possible)			
T14	A <b>contingency plan</b> for transport with ZE-HDV can be drafted (power blackouts...)			

Remarks/ missing needs and requirements



# Summary of the recommendations



## 59 identified needs and requirement on 6 topics

### 14 related to Truck-trailer technology (technical)

	Technical
T1	The <b>truck-trailer combination</b> is seen as <b>one asset</b> to determine whether a mission is feasible, since both assets can <i>consume</i> and <i>store</i> energy. The energy consumption for a mission is depending on the characteristics of both.
T2	The <b>driving range</b> of the ZE-HDV is sufficient for the logistic operations and can vary from use case to use case.
T3	The transport <b>capacity</b> is not limited, both in payload and technical availability (reliability) of the truck.
T4	ZE <b>trailers</b> are available. (cooling and tailgate electrified)
T5	The truck-trailer combination is <b>modular</b> , and the specifications / capabilities can be adjusted to the needs of the end-user.
T6	The <b>energy stored</b> on the truck-trailer combination is known, especially for the driver.
T7	<b>Energy consumption</b> of the truck-trailer combination can be predicted given the mission parameters and weather conditions.
T8	It is clear what the impact of <b>weather</b> would be on the capabilities of the truck trailer combination.
T9	Trucks and trailers are deployable in <b>different modes</b> . (water and rail) ( <i>Technical point of view</i> )
T10	<b>Knowledge and resources</b> are available in the logistic company to implement and operate ZE-HDV.
T11	The truck end-user <b>trusts</b> the new technology.
T12	<b>Maintenance</b> can be organised.
T13	The trucks are <b>connected</b> (digitalisation: communication, V2X, is possible)
T14	A <b>contingency plan</b> for transport with ZE-HDV can be drafted (power blackouts...)

### 4 related to Fleet integration (digital twin)

	Integration in logistic operation
F1	The ZE-HDV (fleet) can be implemented in an existing fleet by a <b>fleet management system</b> that takes into account the capabilities of ZE-HDV.
F2	It is clear <b>where to</b> charge/fuel and how it will fit in the logistic operation.
F3	It is clear what is <b>the impact</b> of charging/refuelling time will be on the logistics operation.
F4	It is clear what is <b>the impact</b> of less payload and availability (maintenance) will be on the logistics operation.

### 6 related to Safety and acceptance


	Safety and social acceptance
S1	A <b>methodology</b> to determine, if the ZE-HDV <b>run on renewable energy</b> (electricity and hydrogen) is available.
S2	<b>Emissions over the full life cycle</b> of a truck-trailer combination is known.
S3	Vehicle must be <b>safe</b> , both while driving and charging/fuelling.
S4	It is clear how <b>the job</b> of truck driver will change, and how the driver will be <b>trained</b> to use ZE-HDV it in a safely manner.
S5	It is clear what to do in <b>case of emergency</b> , especially for the driver.
S6	<b>Safety regulations</b> and <b>precautions</b> are known, especially for the driver, for first responders it is clear the vehicles are ZE-HDV.

### 1 related to Legal barriers

	Legal barriers
L1	Innovative technologies (trucks and infrastructure) can be implemented since a <b>regulative framework</b> exists.





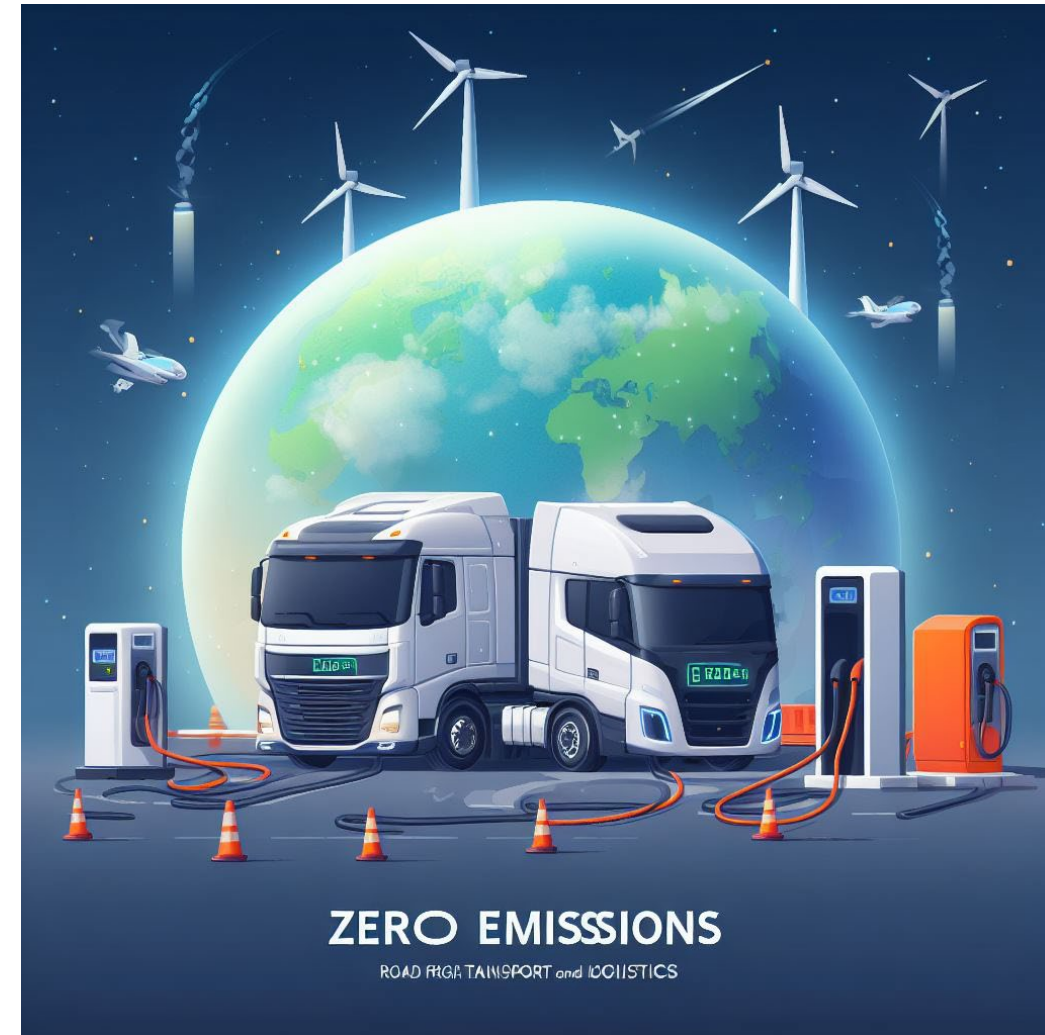


Why do we  
think that the  
future must  
look like the  
past?

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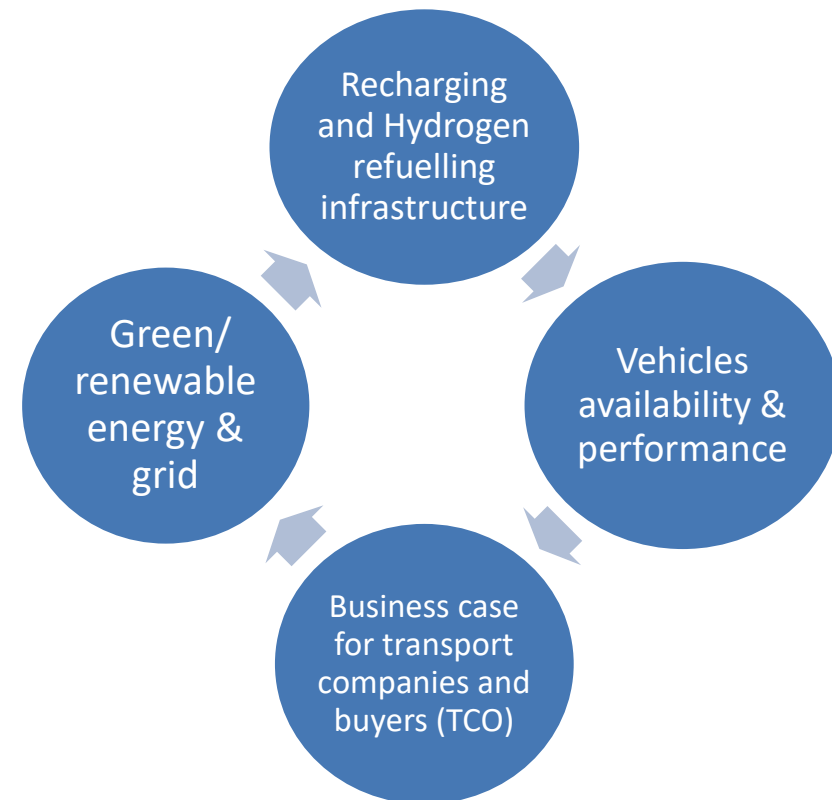
- Market for heavy duty electric trucks is expected to be developed rapidly, however delays in trucks delivery still exists, a lot of uncertainty on charging infrastructure is there and it is unlikely to change in the next 2-3 years.
- Medium, long term, the bottleneck could be on grids when adoption is beyond 10-20% and required grids upgrades projects could need 5-7 years to be realized.
- TCO assessment vs portfolio of mission profiles/use cases assessment for fleets
  - Implication for smaller fleets?
- LCA, energy mix and actual contribution to GHG emissions reduction targets
- Corporate Sustainability Reporting Directive (CSRD) as a lever
  - 2024 financial year for reports published in 2025.
  - Concrete action plans need to be part of the reporting for companies in scope



*Market in the early stages and requires acceleration if we want to start mass adoption by 2030*

### Challenges:

- how to address the interdependencies across the sectors involved?
- how to move from “project” base to reliable and scalable solutions?



**Mission**  
**Accelerate Road Transport (HDVs)  
Decarbonization**  
Collaboration is key to address  
interdependencies  
  
*We need **lighthouse integrated  
projects involving the full value chain**  
(i.e. energy, infrastructure, OEMs and  
transportation companies/logistics)  
and substantial amounts of trucks and  
companies operating in European  
corridors/regions*

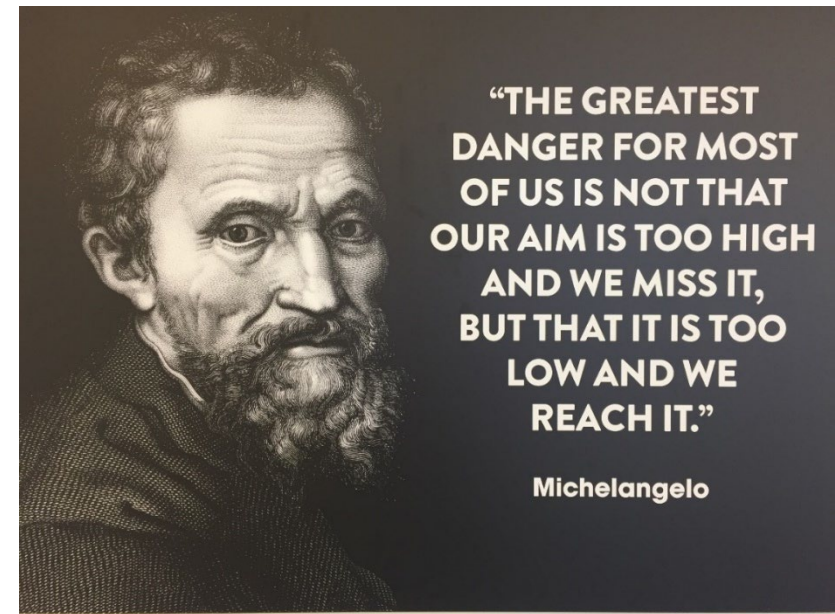




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Alliance for  
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in Europe

*Thank you!*



## The Best Way To Predict The Future Is To Create It!

*Source: President Abraham Lincoln*

*If you want to go fast, go alone If you want to go far, go together*



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