



Funded by the European Union  
GA No.101096598

# ESCALATE

Powering European Union Net Zero Future by Escalating Zero Emission HDVs and Logistic Intelligence

## ESCALATE PROJECT

The E-Volution: urban space solutions for passengers and freight - POLIS Office

Zissis SAMARAS, Professor

20/06/2023



- VISION & MISSION
- CHALLENGES
- AIMS
- ESCALATE FACTS
- OBJECTIVES
- REAL WORLD PILOTS
- INFRASTRUCTURE PILOTS
- AEVETO CLUSTER

# VISION & MISSION

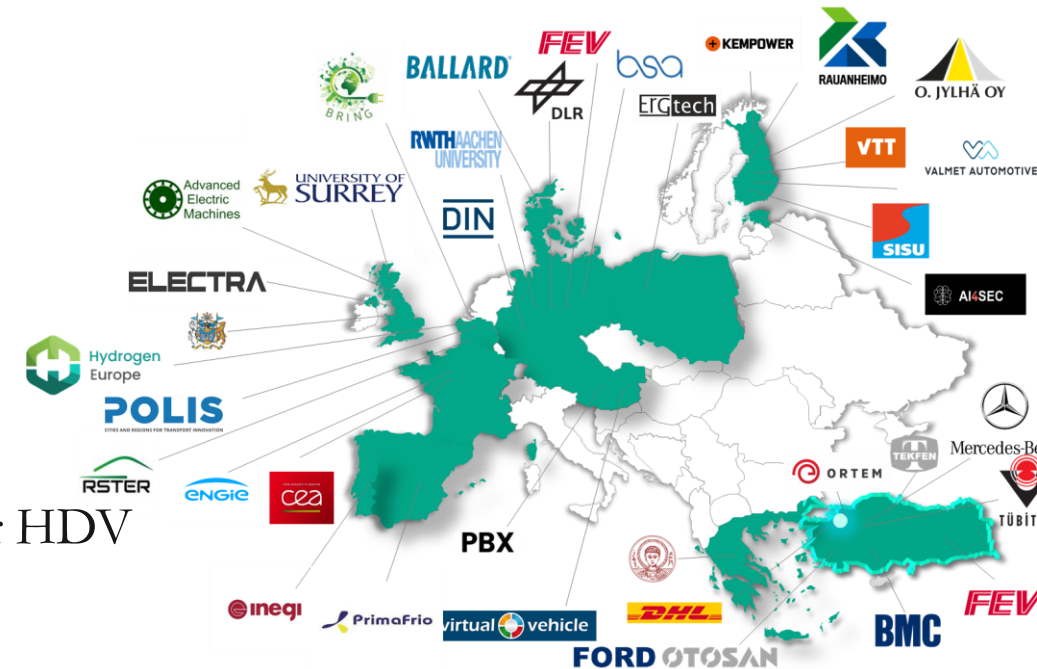
- Transform long haul freight transport to reach 2050 CO<sub>2</sub> targets
- Achieving the envisioned targets necessitates the **development and seamless integration of zHDVs**



ESCALATE will play a pivotal role in propelling Europe to the forefront as a leading pioneer of carbon-neutral freight transport through its innovative:

- Battery Electric HDV
- Fuel-cell Electric HDV
- Range Extender HDV

and *fleet management tools!*



- Diesel-powered HDVs account for about 27% of the total on-road CO<sub>2</sub> emissions in the EU  
→ Despite only representing ~2 % of total fleet vehicles
- The growing trend is incompatible with EU targets aiming for a 55% reduction of GHG emissions by 2030.
- In addition to the well-known problems hindering the commercialization of zHDV such as:
  - Limited range on a single charge/fuel,
  - High upfront costs,
  - Long charging/fueling times,
  - Lower payload,
  - Lack of effective solutions for integrating EVs into fleets, and
  - Power grids without negative impacts

There are **2 major challenges** which are **still outstanding**:

- Uncertainty contrasting the freight and logistics industry's inherently and necessarily conservative nature



- GHG emissions generated during the manufacturing and electricity production phases of EVs

**→ All those challenges are addressed on ESCALATE!**

## Contribute to CL5 aims

...to fight climate change ...by making the **European Union** transport sectors more **climate and environment-friendly, more efficient and competitive, smarter, safer and more resilient.**



# ESCALATE FACTS

ESCALATE consortium has brought together the collaborative efforts of :

→ 37 partners from 13 countries including

- 5 Truck Manufacturers
- 3 Infrastructure Suppliers
- 4 Shippers
- 10 Research Institutes
- 5 NGO

## € Budget

- 22,4 Million € Project Costs
- 16,6 Million € EU Contributions

Duration: 42 Months

01/2023 – 06/2026



..are formulated in such a way that..



**O1.** D&D of ground-breaking high-efficiency long-haul *b*-HDV, *f*-HDV and *r*-HDV at a minimum GVW of 40t with 800km uncharged range under real-world operational conditions



**O2.** D&D of cost-effective standardized modular electric multi-powertrains in RW conditions for a min 500 km daily operation under full load for 6 months



**O3.** D&D of grid-friendly (multi) energy fast charging solutions



**O6.** Global Leadership for EU Automotive, Logistics, and Infrastructure & Powering EU Absolute Zero Future



**O4.** Seamless integration and fluid operation of *z*-HDV fleets



**O5.** Development of 5 Modular DTs for early assessment of “Innovations True Value” (impact assessment+ valuation) in the context of 2Zero targets, continuous optimisation and LCA

...they all bring back to the «challenges»



## Demonstration, Evaluation and Validation of Pilots: P1-P5



- 24 Months of Tests under Real-World Conditions
- 5 Demonstrator Vehicles
- +500.000 km
- Regional and Cross-border Tests

## Demonstration, Evaluation and Validation of Pilots: P1 & P2

- Helsinki, Finland
- Regional Tests

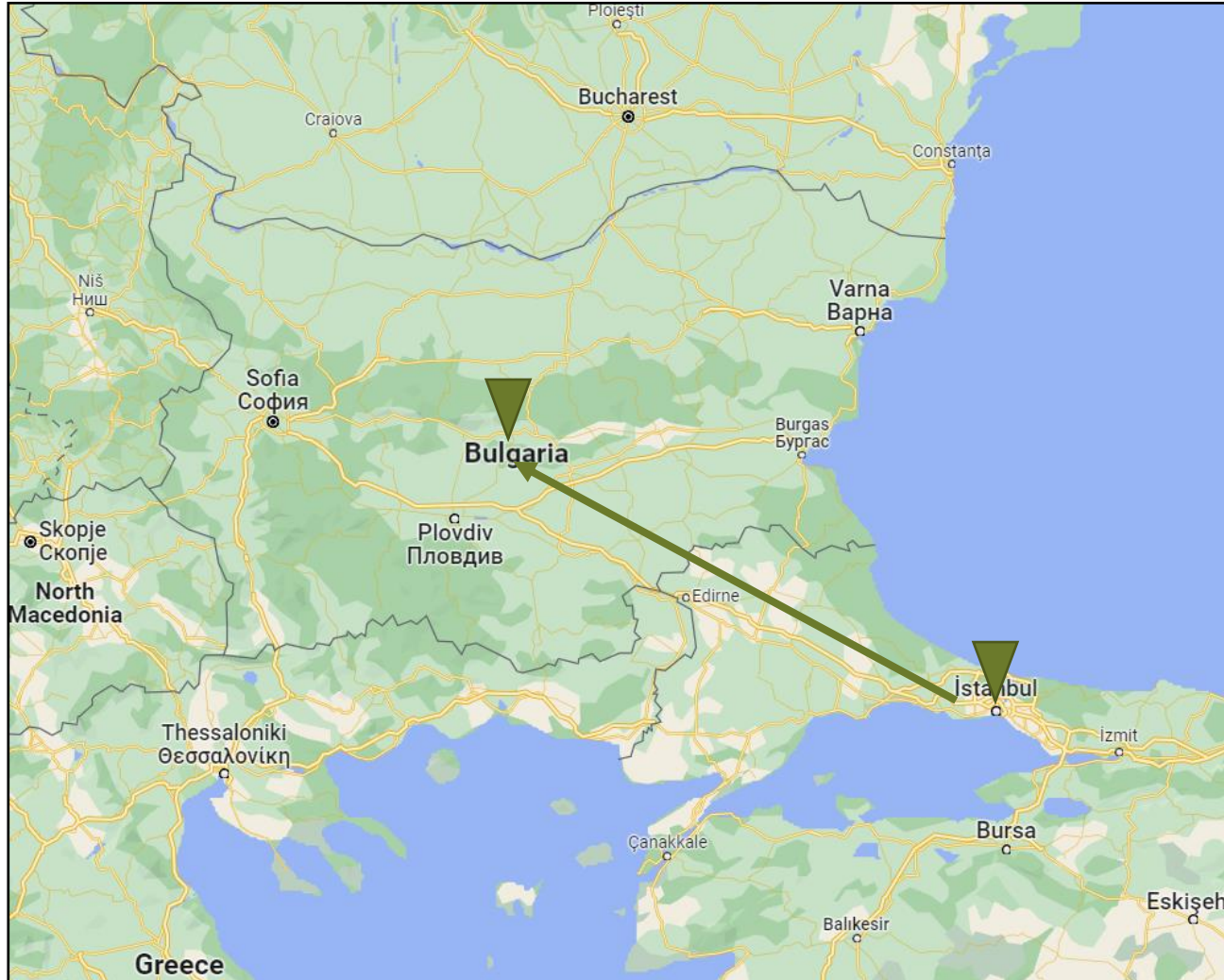
**P1 (SISU): Range Extender Long Haul**  
Vuosaari (Helsinki) → Jyväskylä →  
Vuosaari (Helsinki) : 540 km

- Germany, France and Turkey
- Regional Tests
- Cross-border Tests

**P2 (BMC): Fuel-cell Tractor-Truck with High Operational Flexibility & Short Refueling Time**  
Bolu → İstanbul → Bolu : 510km  
Munich → Paris : 800km



## Demonstration, Evaluation and Validation of Pilots: P3



- Turkey and Bulgaria
- Regional Tests
- Cross-border Tests

Харків  
P3 (MBT): Battery eTruck  
with high efficiency modular  
powertrain  
Istanbul → Sofia: 510km

## Demonstration, Evaluation and Validation of Pilots: P4 & P5



P4: UK and Germany

**P4 (ELCT):** Battery-electric Refrigerator Truck  
-Trailer powered via Rooftop Photovoltaic Solar Panels & Short Charging Time  
Flensburg → Worth (Karlsruhe): 800 km  
Dundee → Southampton: 800 km

P5: France and Spain

**P5 (FORD):** Long Haul Fuel Cell Refrigerator Truck with Optimized e-Powertrain & Hybrid Freight Cooling  
Geneva → Lyon → Barcelona: 800 km

Additionally, ESCALATE will showcase 3 pioneering pilots focused on advancing charging and hydrogen infrastructure...

Mobile-modular  
H2  
Filling station

**TEKFEN**

Green fix  
Multi-fuel  
station

**ENGIE**

1 MW  
Fast Charger

**KEM**

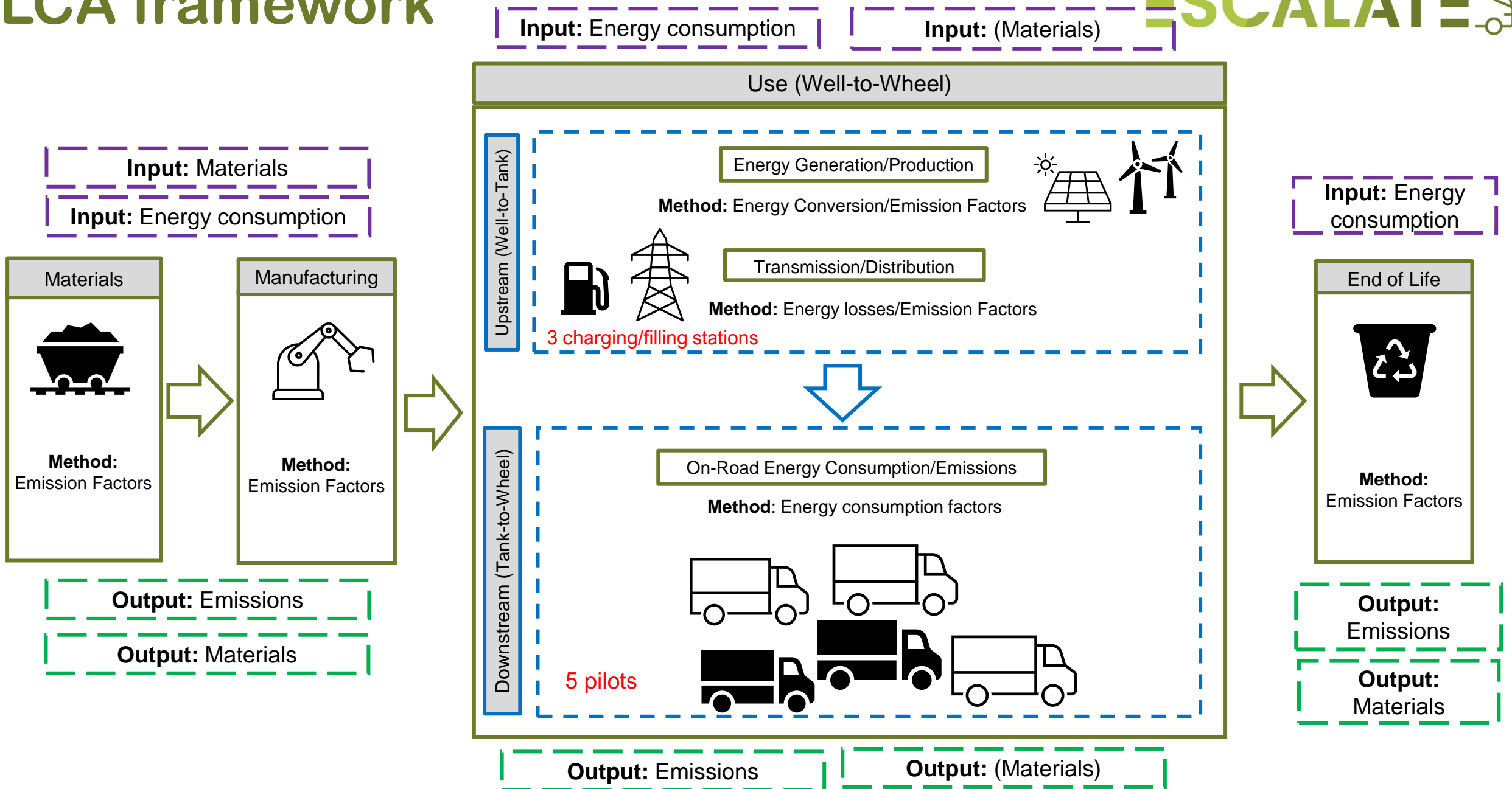
- Advanced Refueling
- Digital Twin establishment
- Cloud Control



- MW-level Charging Management
- System Scalability for Different power levels
- Grid Monitoring + Waste Heat Management



# LCA framework



ESCALATE will play a pivotal role in propelling  
Europe  
to the forefront as a leading pioneer  
of  
a carbon-neutral freight transport.



The partners would like to acknowledge the funding support of the European Union's Horizon Europe research and innovation programme under grant agreement No. 101096598.



## ESCALATE

 ZEFES

 EMPOWER

 H2HAUL

 Next EIRUCK



# Thank you!

# ESCALATE

Twitter: @EscalateHEurope

LinkedIn: ESCALATE – Horizon Europe Project

Website : [www.escalate-eu.com](http://www.escalate-eu.com)



This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101096598.