AEVETO

Zero-Emission Road Freight Transport

Advanced Electric Vehicles for Efficient & Economic Transport Operations



AEVETO Cluster Projects

BELOGIC

FLEXMCS

ESCALATE

ZEFES

RealHyFC

EMPOWER

NexT ETRUCK

MACBETH

H2HAUL

AEVETO
Zero-Emission Road Freight Transport

Contents

AEVETO Vision..... 3

NextETRUCK..... 4

ZEFES..... 6

ESCALATE..... 8

EMPOWER..... 10

RealHyFC..... 11

H2HAUL..... 12

MACBETH..... 14

FLEXMCS..... 16

BELOGIC..... 18



AEVETO
Zero-Emission Road Freight Transport

Accelerating Europe's Zero-Emission Heavy-Duty Future

AEVETO (Advanced Electric Vehicles for Efficient and Economic Transport Operations) brings together European R&D projects working towards the electrification of heavy-duty transport. By creating a common platform for collaboration, the cluster connects projects, expertise and innovations to help accelerate the transition to Zero-Emission Heavy-Duty Vehicles (ZEHDVs).

Connecting Innovation. Driving Change.

AEVETO creates synergies between EU-funded projects developing solutions for Battery Electric Vehicles (BEVs) and Fuel Cell Electric Vehicles (FCEVs). Through knowledge exchange, joint activities and collaboration, the cluster helps turn individual project results into shared knowledge and solutions with wider impact.

Focusing on What Matters

The transition to zero-emission heavy-duty transport still faces important challenges. AEVETO focuses on key enablers for market uptake, including vehicle affordability, driving range and operational efficiency. By bringing together complementary research and demonstration activities, the cluster contributes to identifying solutions that can support the large-scale deployment of electric heavy-duty vehicles.

A Shared Vision for Europe

Aligned with the ambitions of the 2ZERO Partnership, ERTRAC and ALICE roadmaps, AEVETO contributes to Europe's journey towards zero-emission logistics and climate-neutral transport.
Together, AEVETO projects are helping shape a cleaner, more efficient and economically viable future for European heavy-duty transport.

NextETRUCK

Efficient and affordable zero emission logistics through the next generation of electric trucks

Powering the Future of Zero-Emission Freight

A pan-European consortium of 19 partners across 8 countries, developing next-generation electric truck concepts for regional medium freight haulage

- **10%+ increase** in energy efficiency vs. top benchmark electric vehicles
- Concept and infrastructure demonstrators for **fast charging**
- **New business models** to boost end-user acceptance and market uptake
- Six-month live demonstrations with **industry partners** Ford Otosan, IRIZAR, and DAF

NextETRUCK on the road: three pilots, three real-world tests



Distribution logistics

Türkiye



Waste collection

United Kingdom



Back-to-base logistics

Barcelona, Spain



Visit Our Website

https://nextetruck.eu/

Facts and Figures

Coordinator	TNO
Start date	01-07-2022
End date	30-09-2026
Duration	51 months
Funding Call	HORIZON-CL5-2021-D5-01
Total budget	€11.3M

Taking Zero-Emission Long-Haul Freight Transport in Europe to the next level

ZEFES (Zero Emissions flexible vehicle platforms with modular powertrains serving the long-haul Freight Eco System) is a 4-year flagship European project dedicated to taking zero-emission long-haul freight transport to the next level. By integrating cutting-edge vehicle technology with real-world logistics operations, the project demonstrates that a sustainable, decarbonized future for heavy-duty transport is not only possible but operationally viable.

The Project at a Glance

Mission: Demonstrate battery-electric and fuel cell long-haul trucks on major European TEN-T corridors.
Consortium: 40 partners from 14 countries.
EU Funding: €23.2 million (Horizon Europe).
Duration: January 2023 – December 2026 (48 months).

Innovative Technology & Operations

- Modular vehicle platforms for battery electric (BEV) and fuel cell electric (FCEV) trucks.
- High-power charging and hydrogen refuelling solutions to support long-haul operations.
- Smart e-trailers that enhance energy efficiency and extend driving range.
- Digital twins to simulate, optimize, and validate vehicle performance in real logistics operations.

The Strategy for 2026 and Beyond

To transition from "fragmented pilots" to "competitive corridors," ZEFES proposes a Collaborative Governance model:

- EU-Level Leadership: 51% of stakeholders call for the European Commission to lead the harmonization of rules to ensure investment predictability.
- Corridor Execution Taskforces: Establishing public-private "taskforces" for specific trade routes to resolve "small" operational blockers like local permits and grid access in real-time.
- Standardized Evidence: Creating a "convergence pipeline" where data from projects like ZEFES is used to directly inform new EU standards and regulations.

The goal is clear: turning promising technology into a scalable, cross-border zero-emission freight ecosystem that secures Europe's industrial competitiveness.

ZEFES FINAL EVENT

24–25 November 2026
CFL Multimodal | Luxembourg (LU)

Live demonstrations. Expert presentations.
Interactive discussions. Valuable networking.



Register Now!

For more information:

www.ZEFES.eu

a.middelbos@uniresearch.com

ESCALATE

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

Performance Targets

In support of the EU's 2050 climate neutrality goal, ESCALATE is testing high-efficiency zHDV powertrains for long-haul applications, targeting:

- Up to **10% efficiency gain**
- A **range of 800 km** without refuelling or recharging
- An average **daily operation of at least 500 km**, sustained over several months of long-term vehicle testing

Technological Challenges Addressed

1. Efficient use of hydrogen fuel cells
2. Battery-electric modular powertrains for long-haul trucks
3. Energy-efficient cooling systems for refrigerated trucks
4. Hybrid solutions combining hydrogen and battery-electric power



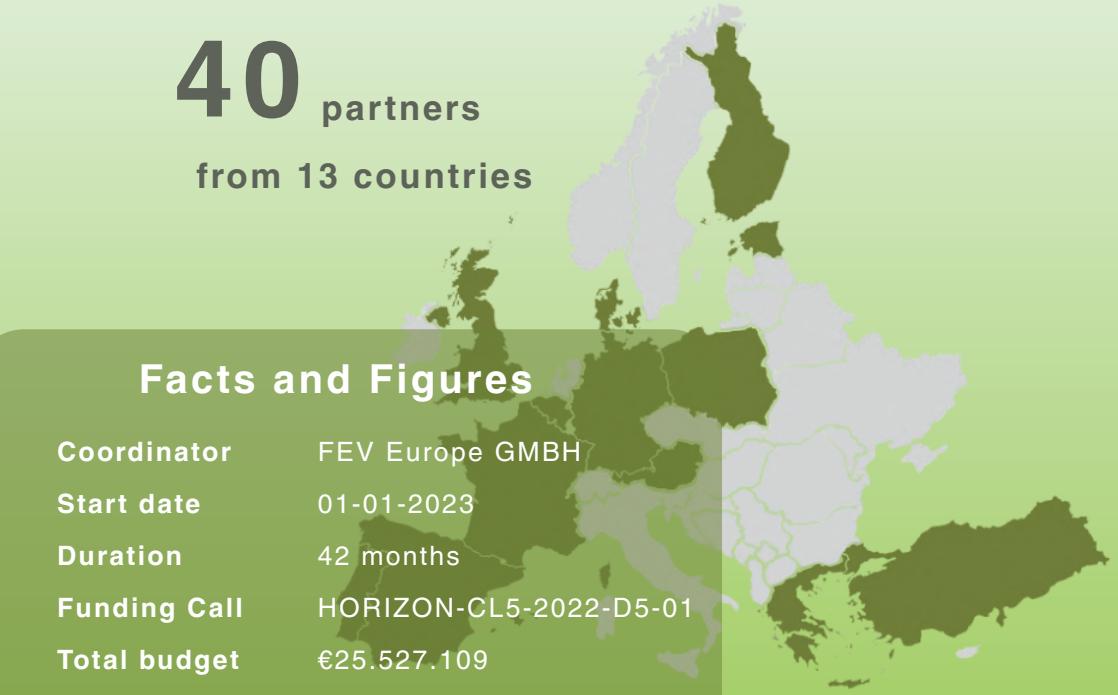
Real-World Testing Conditions



- **Harsh winter conditions** of northern Finland
- Alpine terrain with **significant elevation gain**
- Electric truck pilots operating **at the edge of the European TEN-T corridor**

40 partners

from 13 countries



Facts and Figures

Coordinator	FEV Europe GMBH
Start date	01-01-2023
Duration	42 months
Funding Call	HORIZON-CL5-2022-D5-01
Total budget	€25.527.109
EU Funding	€16.594.389

EMPOWER

Eco-operated, Modular, highly efficient, and flexible multi-POWERtrain for long-haul heavy-duty vehicles.

About The Project

The EMPOWER project aims to develop two flexible, modular, and scalable zero-emission heavy-duty vehicles (ZE HDV). One vehicle will be 100% electric for regional deliveries (400 km range), while the other will be a hybrid fuel cell and battery-powered for long-haul distances (750 km range). Both vehicles will undergo a 6-month demonstration at TRL8 on European roads and International corridors, with development led by an experienced consortium of academic and industrial partners from Europe.

Learn More Here

Coordinator: AIT Austrian Institute of Technology

Start date: 01/01/2023

Duration: 48 months

Total budget: €26,9M

EU Funding: €18M

RealHyFC

Advancing the PEMFC Value Chain for Heavy-Duty Applications

AN INNOVATIVE EUROPEAN PROJECT TO A WIDE ADOPTION OF PEMFC ON HD APPLICATIONS

New Insights

RealHyFC will bring new insights on the operation of carbon versus metallic hardware by testing sensitivity and durability of open-design stacks.

New Solutions

New solutions based on improved physical degradation models, allowing the development of virtual sensor algorithms and optimized fuel cell management.

Two Key Focus Areas

- **Stack Design**
- **Stack Operation**

Facts and Figures

Coordinator Commissariat à l'énergie atomique et aux énergies alternatives (CEA)

Start date 01-06-2023

Duration 36 months

EU Funding €3.487.158

Hydrogen Fuel Cell Trucks for Heavy Duty Zero Emissions Logistics

A total of 16 vehicles will be tested in real-world operations at sites in Belgium, France, Germany, and Switzerland. The innovative hydrogen refuelling stations to be deployed will offer **rapid, high-capacity fuelling** and thus support the demonstration of how fuel cell trucks can operate as **direct replacements for diesel vehicles**, with the same driving range and load capacity but with zero emissions. For more information, visit **www.h2haul.eu**. The project will run for **seven years** from 2019, with a minimum of 2 years in operation for the 16 trucks. H2Haul has received funding from the Clean Hydrogen Partnership under grant agreement No 826236. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme, Hydrogen Europe, and Hydrogen Europe Research. For more information, please visit **www.clean-hydrogen.europa.eu**.

https://www.h2haul.eu

https://www.linkedin.com/company/h2haul-project

Facts and Figures

Coordinator	ERM
Start date	01/02/2019
Duration	83 months
Funding Call	Horizon 2020-JTI-FCH-2018-1
Total budget	€21,4 Million
EU Funding	€12 Million







H2Haul Final Event

H2Haul final event will take place on Thursday, 26 November 2026. The event will showcase the achievements, lessons learned, and key outcomes of the H2Haul project. Hosted by Colruyt Group, at their facilities in Halle, Belgium, this event will bring together decisionmakers, industry leaders, and prominent representatives from across the transport and climate sector, creating a platform for experience sharing, collaboration, and best practices exchanges.

Make sure to mark your calendar!

H2Haul project at the EUH2Week 2026 edition!

Experience the future of hydrogen mobility firsthand at the European Hydrogen Week 2026! Our H2Haul project will be featured in the **EU Project Pavilion** from **26-28 October**, where we'll highlight innovations in hydrogen-powered transport.
This is a unique chance to learn about the latest advancements in hydrogen truck deployment and experience hydrogen vehicles up close.
For those keen on learning more about the progress and challenges in hydrogen truck deployment, we're hosting a dedicated session.

European Hydrogen Week

More details will soon be available at: https://www.h2haul.eu.

MACBETH

Powering the future of resilient passenger and freight electric transport

The transition to electric long-haul trucking with **Megawatt Charging Systems (MCS)** is critical for decarbonising logistics. Addressing adoption challenges through focused research is essential to achieving environmental targets, including a 90 % emissions reduction by 2040. The EU-funded MACBETH project will pilot **user-centric MCS charging hubs** and develop tools for **large-scale implementation** across Europe. Two demonstration sites will be established in the Nordics and Benelux regions, addressing diverse geographic contexts and user needs while providing valuable insights for stakeholders in industry, research, and policy. The project will also showcase charging infrastructure for **regional and long-haul electric trucks** along TEN-T corridors and at logistics terminals, paving the way for widespread adoption.

Learn more



Coordinator: VTT

Start date: 01-02-2025

Duration: 48 months

Total budget: €10 238 095,25

EU Funding: €8 390 483,76

The **MACBETH project** has made significant progress towards the deployment and scale-up of **Megawatt Charging Systems (MCS)** for heavy-duty electric vehicles in Europe. By month 18, the project has advanced the technical development and assessment of MCS solutions, while gathering stakeholder insights on the key requirements and barriers to wider deployment. The **two real-world pilot sites** are central to this work: Construction has started at Pilot 2 in Temse, Belgium, where Milence is developing a hybrid MCS/CCS hub along the **TEN-T network.**

The pilots will also explore **robotic MCS connection technology** and user needs, providing practical evidence for future deployment. MACBETH has further strengthened its visibility and collaboration across the sector through multiple European events and joint activities with the **AEVETO cluster**, bringing together projects, industry and stakeholders working on zero-emission heavy-duty transport. Together, these activities are generating practical knowledge to support the **replication and scale-up** of reliable, interoperable, and efficient **MCS infrastructure across Europe**.







MACBETH

FLEXMCS



flexmcseu@gmail.com
FLEXMCS Project
www.flexmcs.eu

Flexible and Interoperable Multipoint Megawatt Charging Systems for Heavy-Duty Vehicles

Advancing megawatt charging for zero-emission trucks across Europe

Coordinator	Project Duration	Total Budget
VUB	01 January 2025	€9.69M
Vrije Universiteit Brussel	30 June 2028	HORIZON-CL5-2024-D5-01-04

The project develops **flexible, energy-efficient megawatt-charging hubs** integrating **renewable energy, smart charging and optimised hub design**. By addressing infrastructure, grid and business challenges, FLEXMCS will demonstrate **scalable solutions for zero-emission freight across Europe.**

Overall, the **FLEXMCS project** has established a strong evidence base and a set of practical tools and technologies to support the future scale-up of Megawatt Charging Systems (MCS) for heavy-duty vehicles in Europe. The **multi-stakeholder survey** provides a comprehensive, cross-sector view of the main barriers, requirements and needs across the MCS value chain, while the hardware and protocol assessment identifies **key gaps and requirements**, particularly regarding ISO 15118-20, V2X readiness and ongoing standardisation. Complementing this, the **site layout and geographic planning tools** support more cost-effective MCS hub design and deployment by integrating factors such as traffic demand, grid connection costs and infrastructure requirements. The **iEMS modular architecture** further demonstrates the potential to integrate MCS/CCS charging with battery storage, renewable energy and grid flexibility through open protocols, while new tools for SoC estimation, reliability and lifetime assessment can support more efficient and predictive MCS operation. The **demonstration site** also provides a valuable blueprint for replication at industrial sites along the TEN-T network, showing how practical planning and permitting challenges can be addressed to facilitate charging network expansion. The multi-outlet megawatt chargers developed on the project will be integrated to the hub for a real-world demonstration.

Visit the website

FLEXMCS

BELOGIC



BELOGIC accelerates the electrification of long-distance freight transport by deploying **HD-BEVs across 11 missions and key TEN-T corridors** in Europe.

The project addresses key barriers such as **charging, parking and Total Cost of Ownership**, while developing digital tools for smart planning, charging, relay operations and cross-border transport.

Real-world demonstrations and data-driven insights will support the l**arge-scale uptake** of electric trucks across Europe.

Check out our website!

Coordinator: Vrije Universiteit Brussel

Start date: 01-05-2026

Duration: 36 months

Total budget: € 6.226.910,81

EU Funding: €4.999.849,61

Join the BELOGIC Stakeholder Group

Be part of the conversation shaping the future of electric long-haul logistics. By joining the BELOGIC Stakeholder Group, organisations and companies can provide valuable input and feedback on the project's developments, technologies and results. Stakeholders will have opportunities to contribute to the definition of needs and requirements, share their experiences and challenges, and provide feedback on emerging solutions and digital tools. Membership also offers **valuable networking opportunities** with key industry leaders and the chance to **build partnerships for future innovation projects.**

Throughout the project, stakeholders will be invited to participate in meetings, workshops, surveys, interviews and demonstrations, ensuring that BELOGIC's solutions respond to real-world industry needs. **Join the BELOGIC Stakeholder Group and help shape the transition towards efficient, zero-emission long-haul freight transport.**

Sign Up Here!

AEVET

Zero-Emission Road Freight Transport



Funded by
the European Union

Funded by the European Union. 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.