ENERGETICS

MUR DM 117/Iveco - Environmental and cost assessment of climate-neutral solutions for bus and truck applications

Funded By	MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [P.iva/CF:97429780584] Iveco spa [P.iva/CF:09709770011] Politecnico di TORINO [P.iva/CF:00518460019]

Supervisor	SPESSA EZIO - ezio.spessa@polito.it

Contact	

Context of the research activity	For the transformation of our transport system towards climate-neutrality, the assessment of the environmental footprint of different technologies is essential. The research aims at developing methods and tools for the carbon-footprint and sustainability assessment of commercial vehicles and busses. The effectiveness of the proposed methods and tools will be assessed on selected use cases (electric buses and coaches; battery trucks for regional delivery; fuel-cell and H2-ICE long-haul trucks). Progetto finanziato nell'ambito del PNRR - DM 117/2023 - CUP E14D23001950004

	For the transformation of our transport system towards climate-neutrality, the reliable and comparable assessment of the environmental footprint of different solutions and technologies becomes essential. Although all stakeholders already recognize the importance of life cycle assessment (LCA), the transport sector is still struggling to adopt LCA approaches as a standard. As outlined in the 2Zero SRIA, standardized and comparable results are still lacking due to limitations in accessing and managing real-life data or applying non-harmonized, non-coherent methods, tools and system boundaries, to name some. Within this context, considering upcoming technologies leveraging emission reduction strategies, circular economy targets (as well as social aspects) pose significant challenges for making the best choice in terms of sustainability as an integral part of product development and mobility solutions. The main scientific goals and activities of the project are: a) to review and scrutinize existing published LCA, S-LCA (Social LCA), LCC (Life Cycle Cost) and TCO (Total Cost of Ownership) studies to identify method and data issues specific for transport sector and identify gaps and differences among existing approaches. This will cover scientific literature

Objectives	and other open sources (including relevant studies by/for the EC), as well as current practice along the electromobility value chains. LCA and S-LCA guidance documents, LCC norms and applications, and life cycle sustainability assessment (LCSA) implementation will be identified and reviewed (e.g., eLCAr, ILCD/PEF, RED, ISO 14025, UNEP 2020ISO, 15686-5), along with relevant/prominent models, tools and datasets used in LCA, S-LCA, LCC and TCO. b) Based on identified needs and gaps, the respective building blocks of a single LCA approach will be adapted where needed and harmonized. The following aspects are foreseen as particularly relevant: integration of social and economic aspects – aligning LCA and social LCA (S-LCA) as well as life cycle costing (LCC) approaches; integration of circular economy principles; enabling the consideration of emerging technologies and mobility solutions; definition and harmonization of boundaries for a single LCA approach c) To define impact criteria for representative mobility scenarios d) Define in the LCA a smart template and structure of the results able to simply and speed up the EPD certifications e) To develop methods and tools for the carbon-footprint and sustainability assessment of commercial vehicles and busses. f) To assess the effectiveness of the proposed methods and tools on selected use cases (electric buses and coaches; battery trucks for regional delivery; fuel-cell and H2-ICE long-haul trucks) The goals and activities are in line with Italian PNRR mission M2C2, with specific reference to sustainable transport of goods and improvement of circular economy in hard-to-decarbonize sectors. References [1] 2Zero Partnership – Strategic Research and Innovation Agenda, Draft Version December 9, 2020.

Skills and competencies for the development of the activity	Technical competences about: pollutant and GHG emissions from vehicles, legislative framework for road transport and energy sector. Good knowledge of programming and simulation tools (Matlab, Simulink) and funamental knowledge about Life-Cycle Assessment approaches. Capability to work in a multidisciplinary research team Good knowledge of English