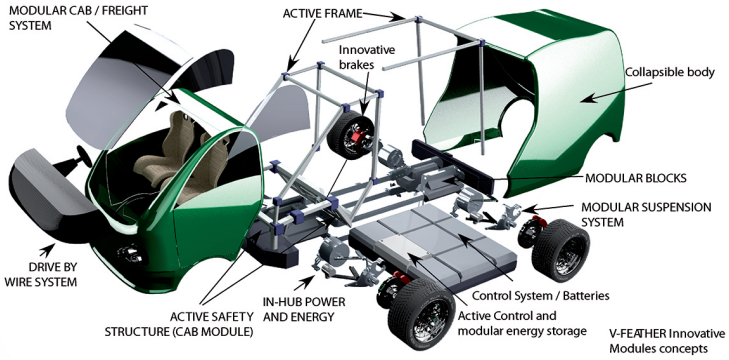
V-Feather

Developing a modular electric vehicle for urban freight delivery.



Even as cities try to reduce their CO2 emissions and become more environmentally-friendly, the demand for urban freight delivery is increasing, further adding to congestion and pollution in city centres. Delivery providers are also facing new urban-specific challenges, such as packet delivery and changing order sizes, and need to become more flexible and efficient. Existing electric delivery vehicles, though better for the environment, do not provide enough flexibility or cost-efficiency to be attractive to delivery providers.

Inspiration

The V-Feather project was initiated by industrial partners interesting in tackling these challenges and presents a complete vision of a new urban electric Light Duty Vehicle (LDV) and how it will be designed, built and run in the near future. Replacing the traditional one-size-fits-all delivery concept, the new vehicle is based on a modular building block concept that uses active, adaptive structural architecture (ADAPTecture). This means that vehicles are made up of connected modules of different sizes and types (cold storage, dangerous good storage, etc.) that can be added or removed to increase capacity or improve agility based on real-time delivery requirements.

Innovation

V-Feather's modular LDV is based on a new system for last mile delivery known as Deposit, Rapid Recharge and Recollect (D3R), which allows vehicles to drop off modules at delivery locations and continue on in smaller form, later returning to pick up the modules. Researchers from Luxembourg Institute of Science and Technology (LIST) are primarily responsible for developing the D3R system, creating algorithms to simulate and optimise modular, electric freight delivery and fleet management in an urban environment. Advanced operational research techniques will make it possible to demonstrate the advantage of using the V-Feather system over traditional delivery systems. Researchers will also be involved in the development of requirements and recommendations for green manufacturing as well as life cycle eco-efficiency design strategies for commercialization validity. The project aims to define the vehicle specifications, develop and simulate the modular vehicle and fleet management concept, manufacture a demonstration vehicle, and finally, test it in a real environment, guided by a focus on energy efficiency, commercial viability, life cycle design and the development of new technologies.

Impact

V-Feather will provide a completely new concept of an adaptive, modular electric vehicle to meet modern urban delivery needs. This new approach will benefit both delivery providers, which will be able to increase their agility and save costs by buying fewer vehicles and adapting them to changing orders, and cities, which will benefit from better traffic flow and decreased CO2 pollution due to fewer and cleaner delivery vehicles on the road.

Partners

Cranfield University (UK) , Ayton Willow Ltd (UK) , Tuk Tuk Factory (NL) , DENSO Automotive (DE) , Cleancarb sarl (LU) , Technical University of Hamburg (DE) , Kings College London (UK) , ECOmove (DK)

Financial Support

Seventh Framework Programme (FP7)

Contact

5, avenue des Hauts-Fourneaux
L-4362 Esch-sur-Alzette
phone: +352 275 888 - 1 | LIST.lu

Dr Wassila MTALAA (wassila.mtalaa@list.lu)
Dr Djamel KHADRAOUI (djamel.khadraoui@list.lu)

LUXEMBOURG INSTITUTE OF SCIENCE AND TECHNOLOGY | LIST