



URBANIZED

MODULAR AND FLEXIBLE SOLUTIONS FOR URBAN-SIZED
ZERO-EMISSIONS LAST-MILE DELIVERY & SERVICES VEHICLES

ISSUE 3
February 2023

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Welcome to the 3rd URBANIZED newsletter!

As the URBANIZED project moves into its third and final year, we can look back on a highly satisfying 2022 while anticipating a prosperous and exciting 2023 ahead. This newsletter will highlight some key achievements from recent months, while detailing upcoming activities and events to look forward to. As always, we must thank all project partners and contributors for their continued efforts and support.

We hope you enjoy reading. Don't forget to visit the URBANIZED website, [LinkedIn](#) and [Twitter](#) to stay up to date with the project as it progresses through the final year.

Update from Project Partner

Lukas Marthaler of **Bax & Company** provides an update on the URBANIZED project.



Over the past four months, the URBANIZED consortium has been working hard on multiple project innovation prototypes, ranging from the energy management system to our e-power train innovations, the vehicle body, crash test prototypes and our digital urban environment simulation. Our work on dissemination, replication and exploitation continues to ensure the project is ready to make a significant positive impact upon completion.

In February, project partners were able to reflect and plan for the year ahead during our General Assembly - held at the **Alkè** facility in Padova, Italy. This was a special moment in the project, as partners were able to inspect the progress of the vehicle body, which is now really taking shape.

Valuable discussions were held to ensure that 2023 will be a successful final year for the project. A large focus of remaining time will be geared towards testing and validating project results, an exciting aspect of the work performed.



Day 1 provided the opportunity to discuss all ongoing work packages, identify opportunities and solve any potential bottlenecks in the project. Partners were then shown the URBANIZED vehicle and taken on a tour of Alkè's impressive facilities. The evening was spent with trip into the historic city of Padova to enjoy a traditional Italian meal and catch up with each other properly.

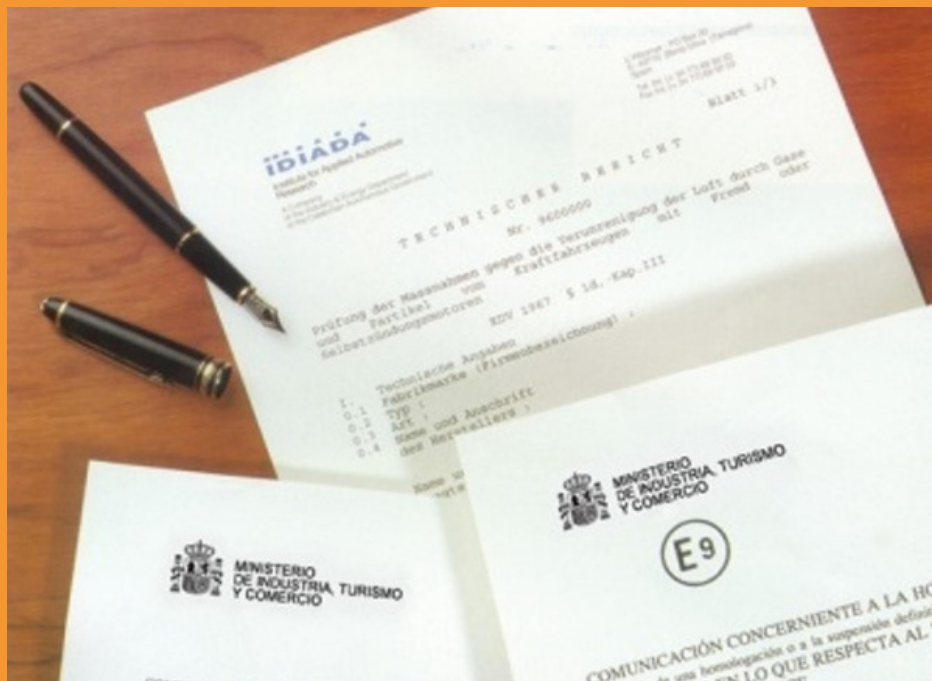
The assembly resumed on day 2 with a workshop hosted by partners from **Bax & Company**, focusing on the replicability of the project results across several urban logistics use cases. Here, several partners are working to make the vehicle fit for purpose in use cases such as mail delivery and HoReCa, whilst also exploring the use of modular and swapable cargo bodies in other urban logistics applications.

A special thanks to Alkè for hosting a great meeting, and to all who traveled and contributed.

Provision for technical standards on URBANIZED vehicle

Pablo Rodriguez & Edoardo Mascaldi

The URBANIZED Project recently initiated Task 7.2 on “Provision for technical standards”, providing technical support to the team which is developing the NI electric vehicles category with a modular approach with respect to the standards and regulations that must be fulfilled by law. The aim is to ensure that the new vehicle concept, as well as its technologies, modules, and features, are validated against the current NI vehicle category legislation, while ultimately providing suggestions for new technical standards for commercial vehicles to be adopted EU-wide.



The first activity, initiated in autumn 2022, was to analyse the current EU regulations, type approval and legislations concerning freight urban transport and flexible and modular vehicles. Political, economic, social, technological, environmental, and legal aspects have all been considered. In addition to the Type approval, the group is also focusing on the new General Safety Regulation and technical requirements for electric powertrains with the scope of covering requirements for both unlimited series and small series. In order to be sold on the EU market, motor vehicles and some components must be type-approved. Type-approval is a process during which the compliance of the vehicle with the legislative framework (EU) 2018/858 is checked by the type-approval authorities. This framework prescribes mandatory rules for vehicles including environmental performance and requirements for vehicle safety. These requirements apply to unlimited vehicle production while manufacturers selling a limited numbers of vehicles (also known as Small Series) benefit from some exemptions.

Provision for technical standards on URBANIZED vehicle

In 2019, the European Commission published the General Safety Regulation (GSR) (EU 2019/2144, the intention being to better protect the vehicle occupants and the vulnerable road users. The new GSR introduces gradually new advanced safety features and focuses on new accident avoidance and driver assist systems, on an improved occupant protection in frontal, side and rear impacts and sets out requirements for pedestrian and cyclist protection around the vehicle. The GSR is in force since 6 July 2022 for most of the new safety measures but some will be implemented later because of technological complexity and development duration.



In addition to the work that is ongoing, the task will define the boundary conditions and technical requirements in terms of safety, as well as modularity of the cargo area. The analysis will be conducted to ultimately enable the definition of novel safety guidelines and protocols for NI vehicles category, particularly for each potential solution or combination of solutions developed in the project. The output of this task will be a list of regulations and standards that will be the starting basis for the Task 7.3 "Policy recommendations and measures for effective urban integration" which will include recommendation for the regulatory framework of the NI vehicles category. Using the outcomes of the Task 7.2, the gaps between the state of the art of regulations and standards and the real needs of this type of vehicles will be determined. Task 7.3 will propose how to close these gaps and pave the way for the development and homologation of these vehicles.

Multi-layer Energy Management algorithm for electric vehicle

Dr. Róbinson Medina, Scientist innovator, TNO

One of the main goals of the URBANIZED project is to achieve an energy efficiency increase of up to 15% in the new generations of NI category electric vehicles.

To contribute to this goal, a multi-layer Energy Management System (EMS) is being developed for the new vehicle generation. An EMS is a software that controls the flow of energy in the vehicle. The multi-layer nature comes from the multiple software layers that constitute the whole EMS: there is a layer running in the cloud, and a layer onboard running on the vehicle. An overview of the multi-layer EMS can be seen in the figure below. The multi-layer EMS is composed of four main eco-functions:

- **Eco-routing:** This algorithm runs in the cloud and corresponds to a fleet-level algorithm. Eco-routing provides the optimal route for a fleet of electric vehicles that minimizes the traveling time of the whole fleet. This in turn results in lower energy consumption. Eco-routing receives information from other cloud components such as logistics information and traffic prediction, which provide the details of the logistics assignment and traffic status, respectively.
- **Eco-charging:** This algorithm runs in the cloud and corresponds to a fleet-level algorithm. Eco-charging provides an optimal charging schedule (i.e., charging moments and power for each vehicle) such that a fleet-level cost is minimised. This cost is a combination of charging costs and battery degradation costs. Eco-charging receives inputs from other cloud components such as Charging Interface, a Vehicle Interface and the Logistics information, which provide information about the status of the chargers, the status of the vehicles and the required departure and arrival times of the fleet.
- **Eco-driving:** This algorithm runs onboard the vehicle. Eco driving provides the driver with speed advice such that the total energy consumption of the vehicle power-train is minimized. Eco-driving receives information directly from the vehicle power-train (e.g., current speed) and from look-ahead information about the traffic conditions (such as speed limits and upcoming stops). This look-ahead information is obtained from the cloud through a Cloud Interface and a local VCU in the vehicle.
- **Eco-comfort:** This algorithm runs on board the vehicle. Eco comfort provides temperature setpoints to the vehicle thermal systems, in order to minimize the energy consumption of the thermal components. Examples of these temperature setpoints are cabin temperature setpoint, refrigerated body temperature setpoint (if available), and battery temperature setpoint. Eco-comfort receives inputs directly from the vehicle powertrain (e.g., current temperatures) and weather forecast. As for eco-driving, the upcoming weather forecast is obtained from the cloud through a Cloud interface and a local VCU in the vehicle.

Notice that these eco-functions are a joined effort of multiple partners: Alke, VUB, TNO and CERTH.

Currently, this multi-layer EMS is being implemented and tested in simulation. During the rest of the year, it is planned to test these eco functions in a prototype vehicle (for the onboard EMS layer) and in a realistic simulation environment (for the cloud EMS layer).

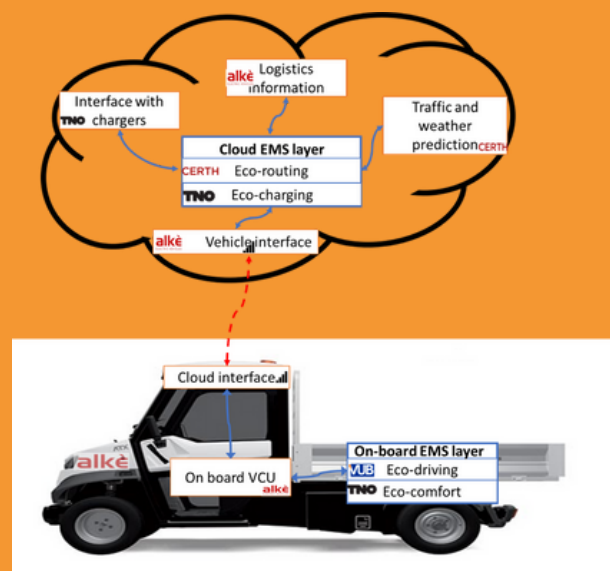


Figure 1: Overview of the envisioned multi-layer EMS

Webinar: Urban Logistics Academy: *Evolution of delivery fleets in changing urban environments*



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**Urban Logistics Academy:
Evolution of delivery fleets in changing
urban environments**

Webinar: 2 March 2023, 11:00-12:30 CET

Register by 28/02/2023 to reserve your spot



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101006943.



We are pleased to invite you to the first webinar of the URBANIZED Urban Logistics Academy series: *Evolution of delivery fleets in changing urban environments*
2 March 2023
11:00 – 12:30 CET

In this webinar, logistics service providers and academics share their perspectives on the applicability of novel delivery vehicles, such as the one developed by URBANIZED.

To address the increase in electro-mobility and urbanisation, and the need for flexible and modular vehicle designs, URBANIZED will develop and demonstrate a multi-purpose, all electric light commercial vehicle well-suited for current and future urban areas.

All attendees will have the opportunity to ask questions and share observations during a panel discussion, in an insightful and interactive 90-minute webinar.

The webinar will be hosted by Lukas Marthaler and Rosa van Gestel from Bax & Company.

Sharing their valuable expertise and experiences, we are delighted to be joined by:

Joris Beckers – Research professor of Economic Geography and Urban Logistics at University of Antwerp

Francesca Miazzo – CEO and co-founder of FOODLOGICA

Ron van Duin – Research professor at Delft University of Technology

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This project has received funding from the European Union's
Horizon 2020 research and innovation programme under
grant agreement No 101006943.