

Categorie Premio

Accessibilità

Sostenibilità

Qualità della vita

Product Name

MULO System, sistema per la **Mobilità Urbana da Lavoro** (system for working urban mobility)

Designer

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Company Name

Prototype realised by **IPSIA "A. Ferrari di Maranello"** in collaboration with **Politecnico di Milano**

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Description of innovation social values
 - product category
 - formal and functional features
 - problems solved by innovation
 - user
 - field of application

Description of technical features
 - operations
 - technology

Dimensions

Materials

Certifications

Benefits for environment

Benefits for human being

MULO System ambitions at favouring a sustainable mobility in urban contexts, in order to reduce the pollution and traffic problems that effect citizens' quality of life.

MULE System is family of light working vehicles, with zero emissions in use, thought for urban contexts. It is a series of four-wheeled hybrid vehicles, moved by solar, electric and human power. The family of vehicles has been designed in a modular logic, and it foresees a common platform and four different modules that differentiate the vehicle in four variants: freight transportation, people transportation, green areas maintenance and street selling.

These vehicles have been designed to be appropriate and to have access in every kind of urban route: urban roads, pedestrian areas, and limited traffic areas.

Use flexibility, zero emissions in use, soundless, driveability and manoeuvrability, as well as comfort, are the main characteristics of MULO System.

The possibilities of use are multiple: parcel post delivery, shopping home delivery, delivery of meal and medicines for elderly people, city centre people transport, taxi-rickshaw, people transport within fair centres, parks and green areas maintenance, street selling...

When the vehicle is exposed to solar radiations the two solar panels (260 W) convert this energy in electric one. Electric energy is stored in lithium ion batteries, which give energy to an electric motor (1kW). The electric motor operates on the rear axles, determining the vehicle movement. If solar energy is not sufficient to satisfy the vehicle energy demand, batteries can be recharged through the electric grid.

The electric motor is controlled by a throttle placed on the handlebar. The vehicle can move using only the electric energy or, if required, driver can contribute using his own muscular energy.

During deceleration, when driver pushes the brakes a contact sensor inverts the polarity of the electric motor. In this way the motor becomes a dynamo that transforms the kinetic energy of the vehicle in electric energy (recharging the batteries).

Dimensions: 3000 mm lenght X 1100 mm di width X 1800 mm di height
 Max speed: around 40 km/h
 Autonomy: around 60 km

Frame: aluminium. Shell: polypropylene. Windscreen: polycarbonate.
 The other components are standard ones.

Zero emissions during the use phase, since the vehicle is moved by solar and human energy.
Resources minimisation: the vehicle is essential and without not strictly functional components.
Product life span extension: the upgradability of rapid technological obsolescent components has been facilitated, making them easy to be removed and substituted; maintenance and reparability have been facilitated thanks to the easy accessibility of the components that more frequently need maintenance and repair.
Material life span extension: the components designed for the vehicles can be produced using recycled material; reduced number of materials makes easiest the separation at the end of life.
Design for disassembly: thanks to the use of reversible snap-fit and to the reduction of hierarchical dependence.

For the community: increase of quality of life in urban areas, thanks to the reduction of harmful emissions and acoustic pollution.
For the driver: from an ergonomic point of view, the vehicle is designed to provide a correct and comfortable posture.