Project "GIANTS": Green Intelligent Affordable New Transport Solutions

Virtual Vehicle Research GmbH is coordinating GIANTS, an EU-funded research project that tackles the urban and suburban passenger challenge by developing a frugal zero-emission L-type vehicle platform. The goal is to construct these vehicles using standardized modules, known as 'Technology Bricks', which are part of the GIANTS platform. The GIANTS platform features swappable batteries, a standardized vehicle control system, and integrated solar panels, enabling the creation of various vehicle models tailored to specific urban traffic needs in both advanced and emerging markets.

Graz/ Austria, March 23, 2026 – The "GIANTS" EU Project aims to close the current gap between existing niche-user L-vehicles, which lack in mission versatility, and versatile but cost-intensive M[(1)]- and N1[(2)]-vehicles, which are overengineered and oversized. This will be achieved by introducing the GIANTS platform as a modular, scalable L-vehicle platform, designed for mission-centric urban cargo- and passenger transport in emerging as well as advanced markets.

Vision: A frugal Zero-emission L-type Vehicle Platform

The GIANTS project tackles the urban and suburban passenger challenge by developing a frugal zero-emission L-type vehicle platform. Such vehicles will be designed to be mission-centric, highly modular, and adaptable for both advanced and emerging markets. The modular design of the GIANTS – platform will simplify refurbishment of used vehicles or vehicle parts and will facilitate recycling at end of use, with the overarching goal of achieving zero emissions throughout the product's entire lifespan. GIANTS will foster stronger collaboration between EU organizations and Asian and African countries, ensuring the applicability and adaptability of the developed systems across diverse global contexts.

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(1) Vehicles having at least four wheels and used for the carriage of passengers (e.g., standard car with 2, 3, 4 doors). Source: https://en.wikipedia.org/wiki/Vehicle_category

(2) Vehicles used for the carriage of goods and having a maximum mass not exceeding 3.5 tons. (Pick-up Truck, Van). Source: https://en.wikipedia.org/wiki/Vehicle_category

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Demo sites in Europe, Africa and Asia

The project will establish living labs at demonstration sites across Europe, Africa, and Asia to showcase the practicality of the GIANTS solutions. These labs will serve as real-life test environments, involving mobility users and providers to co-create and test e-mobility innovations. Locations include Barcelona, Gothenburg, Kisumu, Delhi, Pune, and Manila, with different setups tailored to the local socio-economic contexts. The labs aim to enhance sustainable passenger and freight transport by testing various GIANTS configurations for both people and goods transport in real-world conditions.

Current Project Results:

As reported by the consortium at the GIANTS General Assembly (GA) in October 2025, the GIANTS platform is now fully specified and currently undergoing evaluation. As the project enters its second half, activity now focuses on building and testing demonstration vehicles at Living Labs. The sites will validate performance, affordability, and sustainability across different operating conditions, ensuring that the GIANTS solution can meet both environmental and economic demands worldwide.

Further results of the GIANTS GA:

- A survey with over 300 participants on stakeholders' needs & requirements was conducted, focusing on road safety, infrastructure requirements, integration into mobility ecosystems, fleet management.
- An innovative Mission Suitability & Social Index (MSSI) was developed to synthesize stakeholder needs in relation to mobility systems that integrate frugal EVs
- On top an "E-Motion Advanced Platform" was set up to translate the expectations of personas from the MSSI into quantifiable high-level technical requirements.
- Components and Interfaces of the GIANTS Scalable e-Driveline were specified
- A multi-domain simulation platform was implemented to simulate driving and system behavior of GIANTS vehicles under various operating conditions (vehicle types, location, ambient conditions, battery configuration, etc.)

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GIANTS Road Safety Study:

As part of the GIANTS project and WP4, VIRTUAL VEHICLE conducted a user study to inform the safe and efficient design of in-vehicle touchscreens. As frugal Light Electric Vehicles (LEVs) increasingly rely on small touch interfaces, it becomes essential to understand how interface design choices influence driver distraction and driving performance.

The study addressed two key design challenges:

- Interaction Basics: Investigating how button size, finger choice (stabilized thumb vs. free-hand index), and road complexity affect driver safety and performance.
- Adaptive Concepts: Evaluating a dynamic display concept that manages limited screen space by automatically hiding the gear cluster (PRND) while driving, allowing functional buttons to be displayed in a larger and more accessible format.

Read more about the GIANTS Road Safety Study here: GIANTS Newsletter #2:
https://giants-project.eu/wp-content/uploads/2026/03/GIANTS-Newsletter-2-FINAL-2.pdf

System Validation Tests at VIRTUAL VEHICLE:

At VIRTUAL VEHICLE in Graz, the GIANTS consortium performs system validation activities to ensure that the modular "technology bricks" integrate into a robust and reliable platform before its deployment in the several Living Labs. By building a dedicated lab-car in our powertrain test bench, all key subsystems are integrated and evaluated end-to-end across the full signal chain, from driver input to system response. The testbed vehicle provided by SQUAD will be integrated with the Valeo electric drive unit (EDU) and vehicle control functions (VUC), Cleantron batteries and battery management system (BMS), Solbian solar panel, and HiWiTronics IoT-KiT for data communication.

The validation campaign is performed on the VIRTUAL VEHICLE powertrain test bench. The test programme starts with functionality and calibration checks, as this is the first time that all core components of the GIANTS platform are assembled and operated together as a complete system. Once stable behaviour is confirmed, the campaign continues with performance testing, using automated drive-cycle and scenario testing to validate functionality and performance under a wide range of representative operating conditions. Finally, tests are conducted at different operating temperatures to simulate harsh climates expected in the Living Labs -

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including high-temperature conditions representative for India as well as low-temperature conditions relevant for Sweden.

This structured approach reduces integration risk ahead of field operation and generates high-quality measurement data to support further optimization and model refinement. Finally, the data acquired during this system validation will be used to improve the simulation accuracy of the co-simulation platform developed by VIRTUAL VEHICLE, Czech Technical University (CVUT), and VUB Brussel University within the same project.

GIANTS at a glance:

The GIANTS project is promoting frugal and sustainable urban mobility with a focus on zero-emission, modular L-type vehicles. The goal is to construct these vehicles using standardized modules, known as technology bricks, which are part of the so-called GIANTS platform. This platform features swappable batteries, a standardized vehicle control system, and integrated solar panels, enabling the creation of various vehicle models tailored to specific urban traffic needs in both advanced and emerging markets.

By prioritizing adaptability, refurbishment, and recyclability, GIANTS aims to create vehicles that are cost-effective and environmentally friendly throughout their lifecycle. By fostering collaboration between European organizations and partners in Asia and Africa, GIANTS is paving the way for a global impact in sustainable mobility.

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Project Key Facts

- Project Start/End: Jan. 2024 – Jun. 2027
- Duration: 42 months
- Project Budget: EUR 15 million
- Consortium: 23 Partners, 11 Countries
- Funded under: HORIZON-CL5-2023-D5-01-03
- Coordinator: Virtual Vehicle Research GmbH, Austria
- Project Lead: Dr. Pius Sonnberger, VIRTUAL VEHICLE – Pius.Sonnberger@v2c2.at

Website: https://giants-project.eu

LinkedIn: https://www.linkedin.com/company/giants-eu-project/

Project Video: https://youtu.be/-uEbF6ZBAoM?si=CfsGvN9NH5Kf7Hsn

Project Funding & Disclaimer:

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GIANTS Consortium

The GIANTS Consortium is an international collaboration dedicated to developing and implementing innovative solutions for sustainable, urban mobility. The project brings together a wide range of partners from the automotive industry, research, and networking fields.

Coordinator: The **Virtual Vehicle Research GmbH** leads the consortium, while supporting activities and ensuring effective collaboration between partners.

Supervising OEMs: Leading vehicle manufacturers **Renault** and **Toyota** support the project with their expertise and contribute to its real-world implementation.

Demo Vehicle Manufacturers: Companies such as **SQUAD**, **TUX Mobility**, **Clean Motion** and **TOJO Motors**, provide demonstration vehicles, enabling the realisation of innovative mobility concepts.

Component Suppliers: Key technology providers, including **Valeo**, **Cleantron**, and **Solbian**, supply essential vehicle components and advanced technologies.

Universities: Academic institutions such as **KU Leuven**, the **Vrije Universiteit Brussel** (VUB), and the **Czech Technical University** in Prague contribute valuable scientific expertise and research results.

Network & Know-how Suppliers: Various organisations and experts, including **POLIS**, **CLEAN AIR ASIA**, **Wuppertal Institute**, **CLEPA**, **WeTu**, **i2m**, **HiWi**, **FIR.MT** and **IESTA**, facilitate knowledge exchange, provide data, and support the dissemination of project outcomes.

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- Clean Motion
- SQUAD Mobility
- Cleantron
- IESTA
- POLIS – Cities and Regions for Transport Innovation
- CLEPA European Association of Automotive Suppliers
- VUB Vrije Universiteit Brussel
- KATHOLIEKE UNIVERSITEIT LEUVEN (KUL)
- CTU Czech Technical University in Prague
- Wuppertal Institute for Climate, Environment, Energy GmbH
- Foundation for Innovation and Research – Malta (FiR.mt)
- I2M UNTERNEHMENSENTWICKLUNG GMBH (I2M)
- TUX MOBILITY B.V (TUX)
- WE!HUB VICTORIA LIMITED (WETU)
- TOJO
- Clean Air Asia
- HiWi tronics
- VALEO
- Solbian

VIRTUAL VEHICLE: Let's Shape the Future of Technology – Together

As the largest research center in Europe for virtual vehicle development, VIRTUAL VEHICLE stands for innovation from Austria and strong cooperation with industry partners. Our experts work every day to solve technological challenges – practical, across different industries, and always focused on real-world applications.

VIRTUAL VEHICLE is a recognized partner on both international and national levels in the scientific project landscape. Efficient collaboration between research and industry is the key to innovation. VIRTUAL VEHICLE offers various forms of collaboration tailored to the specific needs of its leading international industry and research partners.

VIRTUAL VEHICLE cooperates nationally and internationally with over 100 industry partners (OEMs, Tier-1 and Tier-2 suppliers, as well as software providers) and with more than 50 scientific institutions.

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Whether it’s automotive, rail, energy, health tech, maritime, or defense: Our goal is to make products smarter, safer, and more sustainable. Using simulation, artificial intelligence, digital twins, and model-based development, we help bring innovations to market faster, safer, and more efficiently.

The emphasis on industry-oriented research makes VIRTUAL VEHICLE an innovation catalyst for the vehicle technologies of the future. Together, we are shaping the mobility and technology of tomorrow.

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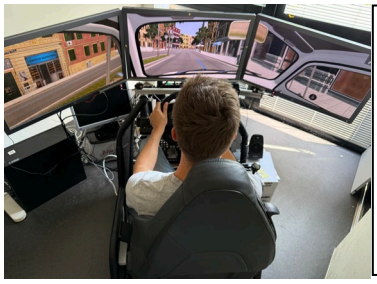
Pictures:



GIANTS user study on "Road Safety" at VIRTUAL VEHICLE in Graz, focusing on the design of a frugal, safe, and efficient user interface.

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VIRTUAL VEHICLE powertrain test bench for system validation of the GIANTS Labcar.

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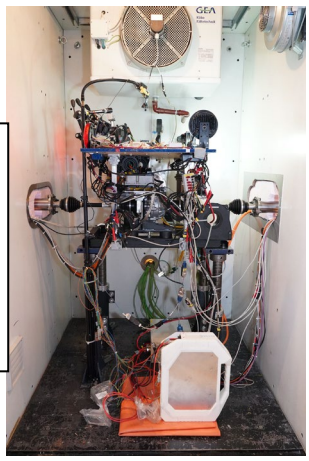

GIANTS Labcar on the VIRTUAL VEHICLE powertrain test bench - here, all key subsystems are integrated and evaluated consistently throughout the entire signal chain

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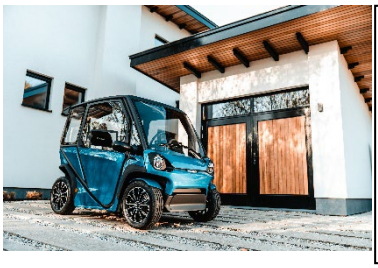

The SQUAD Solar City Car, which was developed in accordance with EU regulations L6 and L7 as well as U.S. LSV regulations.

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GIANTS EU-Project General Assembly Meeting in Malta

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