

# EMARC - Electric Mobility Applied Research Center - Centrul de Cercetare Aplicată pentru Mobilitate Electrică

## Contact details

Name	Electric Mobility Applied Research Center	
Acronym	EMARC	
Logo		
Site	<a href="http://emarc.utcluj.ro/">http://emarc.utcluj.ro/</a>	
Address	Muncii Bd. 12, S03 and S30	
Faculty Department	<b>Faculty of Automotive Engineering, Mechatronics and Mechanics</b> <b>Automotive Engineering and Transport Department</b>	
Telephone	0246 401 673	
Director	Prof. PhD. Habil. Eng. Bogdan VARGA	
e-mail	<a href="mailto:bogdan.varga@auto.utcluj.ro">bogdan.varga@auto.utcluj.ro</a>	

## Areas of expertise

**Electric vehicles; Hybrid vehicles; Fuel Cell Vehicles; Optimization of high voltage batteries; Thermal management of high voltage batteries; Solutions for the decarbonization of cities; Optimizing urban and extra-urban transport; Optimizing intermodal transport;**

## Team

Prof. PhD. Habil. Eng. Bogdan VARGA, Prof. PhD. Habil. Eng. Florin MARIASIU, Asoc. Prof. PhD. Habil. Eng. Călin ICLODEAN, Asoc. Prof. PhD. Eng. Dan MOLDOVANU, Asoc. Prof. PhD. Eng. Nicolae Vlad BURNETE, Asoc. Prof. PhD. Eng. Nicolae CORDOȘ, PhD. Stud. Eng. Irina DUMA, Lect. PhD. Ec. Ioana SECHEL, Lect. PhD. Eng. Adela BORZAN, Assoc. Researcher PhD. Eng. Nicolae VLAD, Assist. Prof. PhD. Eng. Thomas BUIDIN, Assist. Prof. PhD. Stud. Eng. Horațiu CĂRĂUȘAN, PhD. Stud. Eng. Gabriel PRUNEAN, PhD. Stud. Eng. Tudor OARGĂ, PhD. Stud. Eng. Bogdan GAL, Eng. Alexandru Mihai BARA.

## Representative projects

- ✓ **ZERO-MOVE** (Zero Emission Mobility Initiatives) - partners along Cluj-Napoca, Pecs and Velenje Municipalities - assists cities with mobility improvement by implementing a City Digital Twin that continuously measures traffic flow (2025 – 2026).
- ✓ **Ro-HydroHub (SMIS 351358)** - Hub-ul Român de Hidrogen și Noi Tehnologii Energetice – within the project, the team will be able to test Hydrogen Fuel Cells using the latest technologies from AVL GmbH (2024 - 2029).
- ✓ **Ro-Green Sustainable Electric Mobility Solutions (SMIS 336225)** - the project targets the research, development, and validation of innovative solutions for electric mobility, with a strong emphasis on the integration of green and digital technologies into transport systems.
- ✓ **CoreSpaces** - COdesign urban REalm & dynamic Spaces management for cognitive & socially connected cities, with the purpose to co-create and scale human-centric, climate-neutral urban spaces through flexible tools, citizen partnership, and transferable solutions that make cities resilient and future-ready (2026 – 2029).
- ✓ **NetZeroCities** - partners along Cluj-Napoca Municipality - assists cities to overcome the current structural, institutional and cultural barriers they face in order to achieve climate neutrality by 2030, (2023-2025).
- ✓ **OLGA**, Holistic Green Airport – an opportunity for innovation in smart and sustainable mobility (H2020) – ongoing (2021 - 2026);
- ✓ Elaboration of **opportunity study for the purchase of articulated electric buses** and buses with **fuel cells (Hydrogen)** in the Municipality of Cluj-Napoca;
- ✓ **Consultancy services** in the elaboration of the specifications for the purchase of **buses with fuel cells** and a **hydrogen production and distribution plant** in the Municipality of Cluj-Napoca;
- ✓ Consultancy services in the elaboration of the specifications for **the purchase of 12m electric buses and minibuses** for Alba Iulia and Ciugud Municipality.
- ✓ Consultancy services in the elaboration of the specifications for the **purchase of 12m electric buses** for Bistrița

- ✓ Municipality.
- ✓ The opportunity study for "Modernization of the local public transport system through the purchase of **ecological vehicles** in the Municipality of Bistrița"
- ✓ Consulting and Elaboration of specifications for the purchase of 18m **electric buses** – ongoing with Cluj-Napoca Municipality;
- ✓ **URBIVEL** - Advanced technologies for intelligent urban electric vehicles POC-A1-A1.2.3-G-2-15 Partnerships for knowledge transfer:**together with Porsche Engineering Romania, a battery of accumulators was developed; together with INOVO developed an electric car;**
- ✓ Consulting services in the development of specifications for **electric buses, trams and trolleybuses for 24 cities** in Romania, European Investment Bank – Luxembourg
- ✓ Technical assistance for the purchase of 41 electric buses in the Municipality of Cluj-Napoca;
- ✓ Technical assistance for the purchase of 50 trolleybuses in the Municipality of Cluj-Napoca;
- ✓ Technical assistance for the purchase of 21 trams in the Municipality of Cluj-Napoca;
- ✓ Modernization of the Laboratory for testing, research and certification of internal combustion engines operating with biofuels;
- ✓ Comparative analysis of the performances of 13 fuels from Cluj-Napoca

### Significant results

#### Articles in ISI rated journals, in the past 5 years:

- ✓ Oargă, Ioan-Tudor, et al. "**Modular Autonomous Vehicles' Application in Public Transport Networks: Conceptual Analysis on Airport Connection.**" Sustainability 16.4 (2024): 1512.
- ✓ Cărauşan, Horaţiu, et al. "**Energy efficiency analysis of a Fuel Cell Bus model using real scenarios generated by data collection.**" Sustainability 16.5 (2024): 1863.
- ✓ Oargă, Ioan-Tudor, et al. "**Connected and Autonomous Vehicles in Urban Mobility: Technologies, Challenges and Opportunities.**" International Congress of Automotive and Transport Engineering. Cham: Springer Nature Switzerland, 2024.
- ✓ Cărauşan, Horaţiu, Bogdan Ovidiu Varga, Dan Moldovanu, Florin Mariasiu, Gabriel Prunean, Ioan-Tudor Oargă, and Dan Doru Micu. "**Energy Efficiency Assessment of Sustainable Public Transport Solutions: a Comparative Analysis Fuel Cell vs Battery in Real Life Scenarios.**" In 2023 58th International Universities Power Engineering Conference (UPEC), pp. 1-6. IEEE, 2023.
- ✓ Moldovanu, Dan, Florin Mariaşiu, Bogdan Ovidiu Varga, Adela Ioana Borzan, Horaţiu Cărauşan, and Dan Doru Micu. "**Analysis of the modes of operation of an electric vehicle on energy consumption.**" In 2023 10th International Conference on Modern Power Systems (MPS), pp. 1-5. IEEE, 2023.
- ✓ Mariasiu, Florin, and Edmond A. Kelemen. "**Analysis of the Energy Efficiency of a Hybrid Energy Storage System for an Electric Vehicle.**" Batteries 9, no. 8 (2023): 419.
- ✓ Mariasiu, Florin, Ioan Aurel Chereches, and Horia Raboca. "**Statistical Analysis of the Interdependence between the Technical and Functional Parameters of Electric Vehicles in the European Market.**" Energies 16, no. 7 (2023): 2974.
- ✓ Oarga, Tudor, Bogdan Ovidiu Varga, István Barabás, and Gabriel Prunean. "**Review of Connected Autonomous Vehicles Platooning: Technologies, Challenges, and Future Directions.**" Scientific Books of Abstracts 2 (2023): 83-83.
- ✓ Cărauşan, H., B. O. Varga, D. Moldovanu, and A. A. Sirca. "**Comparative analysis of fuel cell and electric public for transport busses.**" In IOP Conference Series: Materials Science and Engineering, vol. 1256, no. 1, p. 012041. IOP Publishing, 2022.
- ✓ Significant solutions:
- ✓ **Products and technologies: Tender books for electric buses; Tender books for trams; Tender books for trolleybuses; Opportunity studies regarding green transport and decarbonization if cities.**

### The offer addressed to the economic environment

Research & development	The team members also coordinate the ART TU Cluj-Napoca Association representing the Formula Student team of UTCN, currently being the only electric single-seater team in Romania ( <a href="https://arttu-formulastudent.ro/">https://arttu-formulastudent.ro/</a> ). Research on electric buses, hydrogen buses, trams, and trolleybuses (with papers and books to support this activity). Hydrogen Fuel Cell testing.
Consulting	The team members fully support the local Municipality and other Municipalities, and help with consulting on tender books, evaluation and reception of hydrogen production facility, electric buses, hydrogen buses, trams and trolleybuses.
Training	The team members support the Postgraduate Training Program: Specialist in the diagnosis, evaluation and operation of electric and hybrid vehicles, taught in Romanian (Specialist în diagnosticarea, evaluarea și exploatarea autovehiculelor electrice și hibride), within UTCN, the Department for Continuing Education, Distance and Low-Frequency Education.

Last update on January 2026