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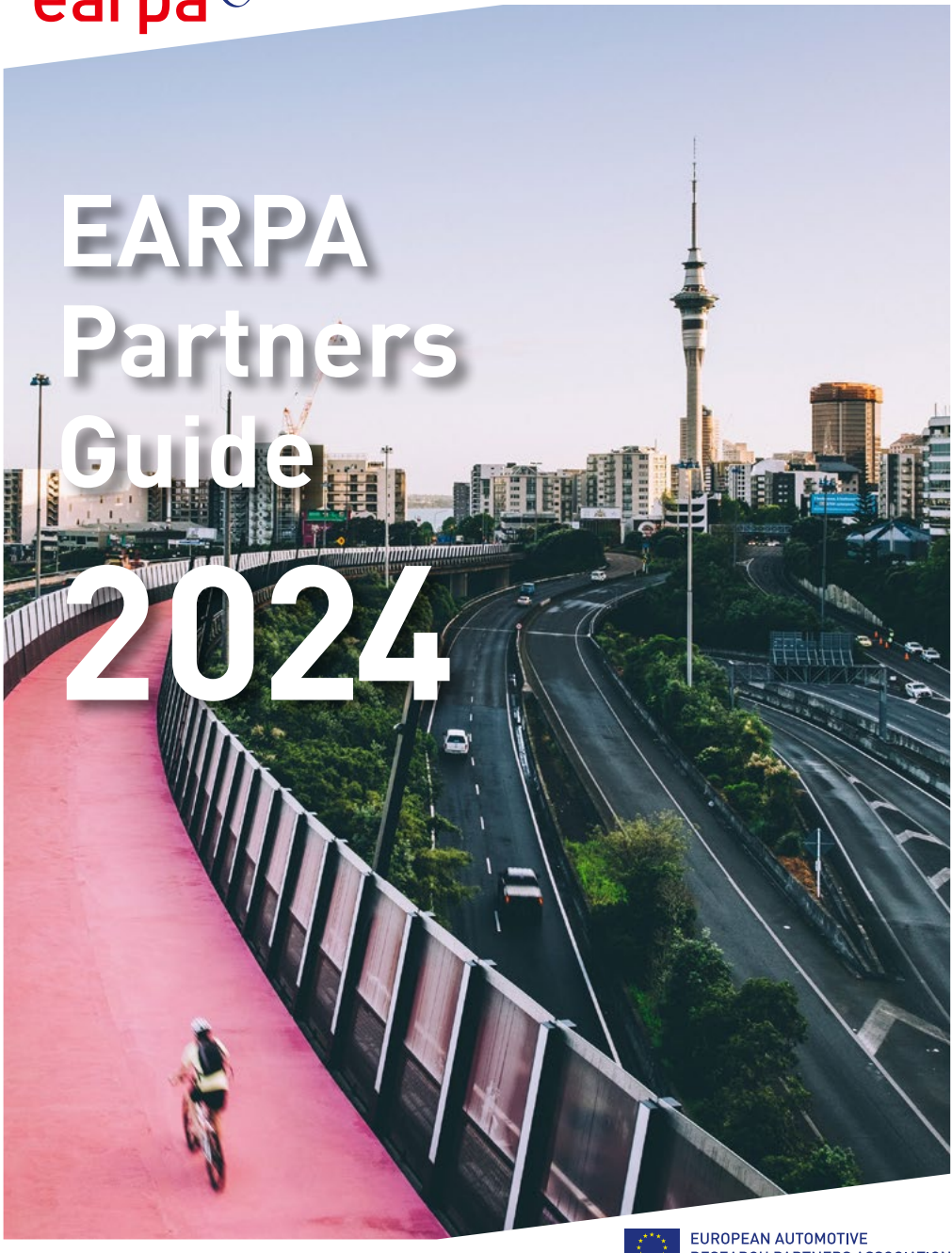
EARPA Partners Guide 2024



EUROPEAN AUTOMOTIVE
RESEARCH PARTNERS ASSOCIATION

Contents

Introduction to the EARPA Partners Guide

Christof Schernus, EARPA President

Dear reader,

EARPA, with its roots in road transport research, understands that road transport as part of a larger system with significant interactions with other (sub)systems. Challenges faced by other transport modes and industries such as the energy sector and their innovations have an impact on the road transport (sub)system and vice versa. Societal aspects must be considered so that technical solutions are accepted by society and users, while at the same time increasing the efficiency of energy and resource utilisation in the sense of a circular economy. And a leading role in the development of the software-defined vehicle, its architectures and software are crucial for Europe's competitiveness.

To meet these challenges, EARPA and its members have further expanded their research activities. EARPA is continuously looking at how research in road mobility can help mitigate risks and improve Europe's future, achieving a positive impact on the world. In this context, EARPA's updated research strategy and priorities identify six major characteristics or values of the future mobility system of people and goods: The transport system must be **S**ustainable, **U**ser-focused, **S**afe, **T**rustworthy, **A**ccessible and **IN**clusive (mnemonic: SUSTAIN), which includes many further important aspects laid out in EARPA's new High-Level Position Paper in more detail.

From its neutral position between industry and government, EARPA, the European Automotive Research Partners Association, can provide independent advice to the European Commission and recommend the research that is most beneficial to society and the environment. As a member of the co-programmed partnerships 2Zero, CCAM and Batt4EU, EARPA works as part of a broad network with the European Commission and industry, with the European Technology Platforms (ETP) and colleagues from other associations

(e.g. ERTRAC, EUCAR, CLEPA, ECTRI, FEHRL, ALICE or POLIS, to name but a few) as well as with other actors in the European research community. This way, EARPA and its members continuously contribute to defining future research needs in EARPA position papers and ETP roadmaps, reviewing and updating them and helping to define the strategic research and innovation agendas of the next Framework Programme and partnerships. EARPA is committed to the green and digital transformation of industry, mobility, energy and the climate system.

Our 57 members work together in five Task Forces we call Foresight Groups reviewing and updating EARPA's strategic positioning in European research. In Collaborative Research Group meetings, EARPA members respond to research programmes, discuss forthcoming and open calls, initiate proposals and review the outcome of closed calls to take lessons learned. With a success rate well above average, EARPA members are involved in numerous projects, quite often as coordinator.

In this guide we present each of the members of EARPA, we give a summary of their expertise and highlight their involvement in European projects. Each EARPA member has an active role to play giving input to help the creation of research programmes, creating proposals, helping perform successful and valuable projects to the benefit of society and environment, and in the widening of the network.

I trust you find this information helpful and would welcome the opportunity to meet you at our events!

What is EARPA?

Founded in 2002, EARPA is the association of automotive R&D organisations. It brings together the most prominent independent R&D providers on road mobility throughout Europe. Its membership is ranging from large and small commercial organisations to national institutes and universities.

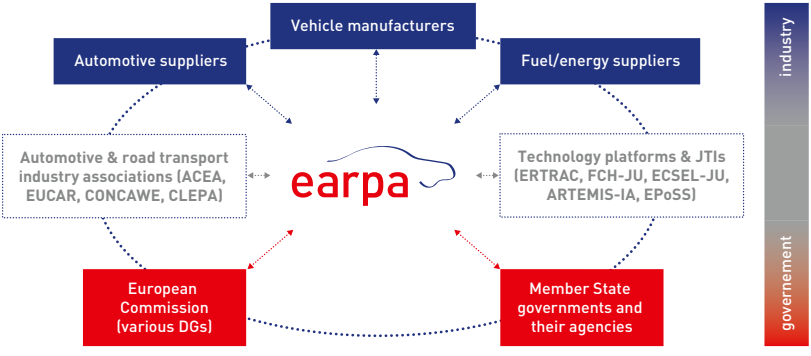
EARPA, as the platform of automotive researchers, aims at actively contributing to the European Research Area and the future EU research programmes. In this task, EARPA seeks a close cooperation with the automotive industry, the automotive suppliers, the oil industry as well as the European Institutions and the EU Member States.

EARPA members are strongly committed to cooperate closely with industrial automotive partners, universities and other research organisations on future R&D. Such a cooperation may vary from an exchange of ideas and knowledge in joint meetings to setting up networks and carrying out joint projects. The EU research programmes are of particular interest to EARPA members by means to achieve such cooperation.

EARPA members are committed to contribute to a common vision on future transport and the creation and implementation of a strategic research agendas. In this, they support the actions of ERTRAC – the European Research Transport Advisory Council – as well as other European Technology Platforms.

EARPA and its members, being well integrated in both national and European research structures, are in a position and willing to support a closer link between and coordination of national and European research programmes. EARPA as an independent platform is prepared to participate at European level in strategic consulting related to public interest and social matters regarding mobility, environment, energy and safety in the automotive domain.

EARPA promotes the awareness and understanding of the specific role and contribution of its members in the automotive sector and reinforce the high-tech character of the automotive industry and its potential for future innovation and new opportunities.



Organisation

EARPA is functioning thanks to its very active members through their annual contributions. The organisation is composed of three main bodies:

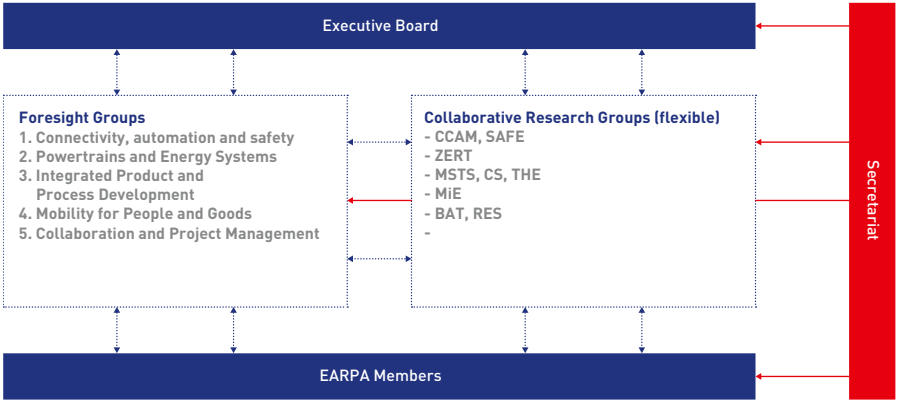
- The General Assembly governs the Association in which all members are participating.
- The Executive Board, elected by the General Assembly, is responsible for the management of the association. The Executive board tasks are to delegate plus initiate activities and carry-out the representative tasks.
- The EARPA Secretariat, managed by EARPA's President, supports the Executive Board, General Assembly, Foresight Groups and Collaborative Research Groups.

Core activities

The Foresight Groups and the Collaborative Research Groups are in the core of the activities within EARPA.

I. In the **Foresight Groups** (FGs), EARPA member experts are actively discussing pertinent research topics and cover the main road transport and automotive R&D areas in which EARPA members are active.

II. The **Collaborative Research Groups** (CRG's) facilitate the discussions among EARPA members for drafting new proposals.



EARPA's Foresight Groups

The Foresight Groups (FGs) are focusing on answering specific needs identified by EARPA members (e.g. technical discussions, RTD needs, outlook, etc.) or the needs identified by the actual effort of EARPA in terms of influence & information (e.g. discussion on EU RTD Policy). Each FG has up to 6 technology experts.

Main objectives of the EARPA Foresight Groups:

1) Identifying and advocating EARPA priorities:

- Technology road mapping with special focus on EARPA needs and working areas
- Compilation and structuring of mid-/long-term RTD needs and outlook
- Creation of EARPA roadmaps and position papers
- Collection of input for European Commission research work programmes
- Exchange of information and views with European Commission and related associations as well as other stakeholders

2) Scouting of future opportunities for EARPA members:

- Sharing information on relevant developments within the group's thematic scope among members (EU events, activities of corresponding working groups in other associations etc.)
- Identification of particular funding programmes/opportunities on EC level (and joint MS-level) as input to the Collaborative Research Groups

Participants in these Foresight Groups are relevant experts coming from within EARPA's members organisations. As an EARPA member you are very welcome to join the FGs. You can join them directly via the EARPA intranet – Foresight Group – Details – [Subscribe for this Foresight Group]

Five thematic focus areas of the Foresight Groups:

1. Connectivity Automation Safety (CAS)
With the ambition of contributing to a European road transport system without victims, FG CAS identifies and promotes R&I needs as well as future opportunities in the areas of automation, connectivity and safety for all road users.

Speaker: Margriet van Schijndel (TU/e)
Secretary: Bastiaan Krosse (TNO)

2. Powertrains and Energy System (PES)
Foresight Group PES is supporting the continuous development and integration of clean and efficient electrified powertrains as well as powertrains working on alternative fuels with a holistic view on the EU energy system.

Speaker: Bernhard Brandstätter (Virtual Vehicle)
Secretary: Marco Mammetti (IDIADA)

3. Integrated Product and Process Development (IPPD)
This Foresight Group focuses on Integrated and Connected Product Development – materials, manufacturing and design tools.

Speaker: Thilo Bein (Fraunhofer LBF / EMI / IWU)
Secretary: Bert Pluymers (KU Leuven)

4. Mobility for People and Goods (MPG)
This group deals with the overall aspects, such as implementation and business models, of the mobility of people and goods in our future society, based on the technological developments in other EARPA groups.

Speaker: Magnus Granstrom (Chalmers)
Secretary: Fanny Breuil (EURECAT)

5. Collaboration and Project Management (CPM)
Expert group for European RTD project management, rules for participation, legal and financial issues.

Speaker: Verena Wagenhofer (AVL)
Secretary: Jean-Marc Zaccardi (IFPEN)

EARPA's Collaborative Research Groups (CRG)

The Collaborative Research Groups are selected by the EARPA Executive Board prior to the Spring / Autumn Meetings according to the current Horizon Europe work programme and other applicable funding programmes.

The CRG Moderators are selected out of the technology experts assigned to the FGs.

The information about the open calls, as per discussed within each CRG, are distributed by the Moderator via the Secretariat.

Main objectives

- Reflection on submitted proposals
- Provide information on on-going proposals
- Discussion on upcoming calls and drafting new proposals, appointing proposal champions, collecting partners' interests

For more information please contact the Secretariat.

User Guide

This guide provides an overview of the EARPA members and can be used within the Association. It is based on the information provided by our members.

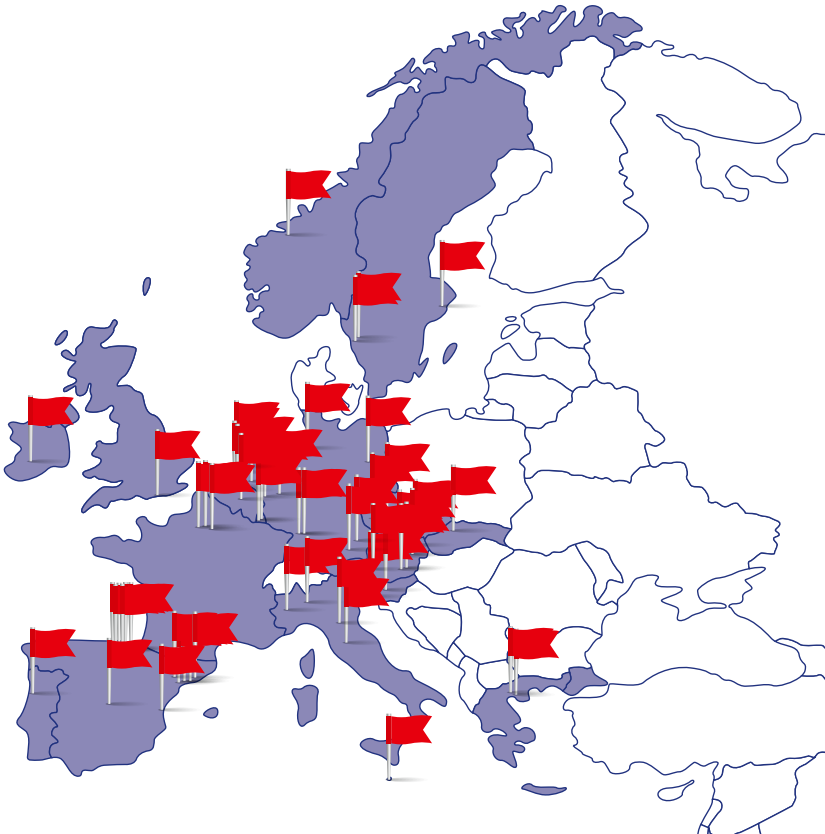
Per member, there is a fact sheet containing the type of organisation, location and a short summary of expertise and activities, including participation in EU projects and participation in Technology Platforms and other major European networks. At the end of this publication, you will find all necessary contact details. Per member, also the contact details are given.

Membership

EARPA today counts 57 members: have a look at the next pages for more information.

EARPA membership is open to R&D providers, commercial and non-profit. Independence of the automotive industry and experience with EU projects is among the criteria for membership. Interested organisations may apply for membership.

Should you be interested to join EARPA, please do not hesitate to contact EARPA Secretariat.



Members & Locations

AIT Austrian Institute of Technology

Organisation type:	R&D institute
Contact person:	Dr. Christian Chimani
Phone number:	+43 50550 6233
Email:	christian.chimani@ait.ac.at
Location head office:	Vienna, Austria
Number of employees:	1465
Turnover before tax:	€182.9 Million
Website:	www.ait.ac.at

Short summary of expertise and activities

The AIT Austrian Institute of Technology is Austria's largest non-university research institute. With its seven Centers, AIT regards itself as a highly specialised research and development partner for industry.
Its researchers focus on the key infrastructure issues of the future: Energy, Health & Bioresources, Digital Safety & Security, Vision, Automation & Control, Transport Technologies, Technology Experience and Innovation Systems & Policy. Throughout the whole of Austria – in particular at the main locations Vienna Giefinggasse, Seibersdorf, Wiener Neustadt, Ranshofen and Leoben – around 1,400 employees carry out research on the development of those tools, technologies and solutions that will keep Austria's economy fit for the future in line with our motto "Tomorrow Today".

Center for Transport Technologies
Mobility is a core pillar of human society and therefore a central factor in our economic system. At the AIT Center for Transport Technologies, around 180 experts are working on solutions for sustainable, safe, intelligent and thus future-proof mobility. The focus of the research and development work is on material-based lightweight design, on the electrification of the propulsion train and the storage of electrical energy, as well as on a resilient and safe transport infrastructure. This also includes environmentally compatible and intelligent production technologies for mobility components. Comprehensive system know-how, scientific excellence, state-of-the-art laboratory infrastructure and many years of international experience enable AIT experts to drive innovations in the field of climate-friendly mobility and thus to serve industry and society already today with the solutions of tomorrow.

Participation in EU projects

AMIGOS – Active mobility innovations for green and safe city solutions, Assets4Rail – Measuring and monitoring devices for railway assets, Augmented CCAM – Augmenting and evaluating the physical and digital infrastructure for Connected, Cooperative and Automated Mobility (CCAM) deployment, BatWoMan – Climate-friendly batteries for the mobility of tomorrow, EMPOWER – Multi-powertrain for heavy-duty vehicles, HELENA – Halide solid state batteries for electric vehicles and aircrafts, HighSpin – High-Voltage Spinel LNMO Silicon-Graphite cells and modules for road and airborne transport applications, IMOTHEP – European aviation research and industry initiative on Hybrid Electric Propulsion, InSPIRe – Innovative systems to prevent ice on regional aircraft, IMPACT – Aircraft advanced rear end and empennage optimisation enhanced by anti-ice coatings and devices, MAST3RBoost – Novel hydrogen tanks as a contribution to decarbonising the transport sector, MATISSE – Multifunctional structures with quasi-solid-state Li-ion battery cells and sensors for the next generation climate neutral aircraft, MULTI-FUN – Enabling MULTI-FUNctional performance through multi-material additive manufacturing, ORCHESTRA – Optimised Electric Network Architectures and Systems for More-Electric Aircraft, PIARC Global Road Safety Knowledge Exchange – AIT supports, PULSELiON – Pulsed laser deposition technology for solid state battery manufacturing supported by digitalization, SELFIE – Self-sustained and smart battery thermal management solution for battery electric vehicles, SOLIFLY – Multifunctional aircraft components with integrated semi-solid state battery, SUSTAINair – Lightweight, multifunctional and intelligent airframe parts, SUBLIME – Solid state sulfide based Li-metal batteries for EV applications, TRIcEPS – Development of integrated engine air intake and protection systems for Tilt Rotor.

Applus+ IDIADA

Organisation type:	R&D company
Contact person:	Adrià Ferrer
Phone number:	+34 911 166 000
Email:	adria.ferrer@idiada.com
Location head office:	Tarragona, Spain
Number of employees:	3100 (as of October 2023)
Turnover before tax:	€272 (as of 31st Dec 2022)
Website:	www.applusidiada.com

Headquarters & Main Technical Centre

Short summary of expertise and activities

Applus+ IDIADA, as a global partner to the automotive industry worldwide, supports its clients in their product development activities by providing design, engineering, testing and homologation services.

With over 30 years of experience, Applus+ IDIADA provides an extensive range of engineering and testing services in the fields of passive and active safety, CAV & ADAS, electronics, powertrain, comfort and reliability. The company's expertise and wide capabilities in both physical and virtual testing result in maximum cost and time efficiency.

Its engineering solutions are driven by the ongoing pursuit of excellence and research in the best technology.

A large team of more than 3.100 professionals as well as an international network of 56 subsidiaries and branch offices in 22 countries ensure clients are given agile customized services.

To keep meeting the challenges of sustainable mobility, the company is continually investing in new capabilities, mainly for the development of connected and automated vehicles and new powertrain technologies.

Participation in EU projects

SUNRISE – Safety assurance framework for connected, automated mobllity systems
PoDIUM – PDI connectivity and cooperation enablers building trust and sustainability for CCAM
SALIENT – Novel concepts for safer, lighter, circular and smarter vehicle structure design for enhanced crashworthiness and higher compatibility
XL-Connect – Large scale system approach for advanced charging solutions
LENS – L-vehicles emissions and noise mitigation solutions
GAP_Noise – Global acoustic interaction and psychoacoustic impact of the autonomous vehicles in interior and exterior noise
FAME – Framework for coordination of automated mobility in Europe
EBRT2030 – European bus rapid transit of 2030: electrified, automated, connected
TANGO – Digital technologies acting as a gatekeeper to information and data flows
Althena – AI-based CCAM: trustworthy, explainable, and accountable
SELFY – Self assessment, protection & healing tools for a trustworthy and resilient CCAM
TRANS-SAFE – Transforming road safety in Africa
TARGET-X – Trial platform for 5G evolution – Cross-industry on large scale
VERA – Vehicle emission retrofit activities
V4SAFETY – Vehicles and VRU virtual evaluation of road safety
ZEFES – Zero emission flexible vehicle platforms with modular powertrains serving the long-haul freight eco system

AVL List GmbH

Organisation type:	R&D company
Contact person:	Mr. Horst Pflügl
Phone number:	+43 316 787 1587
Email:	horst.pfluegl@avl.com
Location head office:	Graz, Austria
Number of employees:	10700
Turnover before tax:	€1.6 Billion
Website:	www.avl.com

Short summary of expertise and activities

AVL is one of the world's leading mobility technology companies for development, simulation and testing in the automotive industry, and beyond. The company provides concepts, solutions and methodologies in fields like vehicle development and integration, e-mobility, automated and connected mobility (ADAS/AD), and software for a greener, safer, better world of mobility.
Powertrain engineering AVL develops and improves all kinds of powertrain systems including hybrids, fuel cell and battery electric powertrains along with all subsystems and automated controls.
Instrumentation and test systems:
The products of this business area comprise all the instruments and systems required for powertrain system and vehicle development & testing.

Advanced simulation technologies:
The simulation software solutions of AVL are supporting all designs and optimizations of powertrain systems and cover all phases of the development process.
To support European automotive research collaborations, AVL is a member of various associations such as ERTRAC SIG, EGVIA, ARTEMISIA, EPOSS, and Hydrogen Europe. On national level, AVL participates in A3PS, ACStyria, AlpLab (Austria), FKG (Sweden), FVV, FVA, FAT, SafeTrans (Germany), AESIN, LCVP, NMI (UK), and Mov'eo (France).

Participation in EU projects

Since 1992 AVL has been active in more than 160 EC-funded RTD projects. In Horizon2020 AVL is coordinator of the following projects such as EVC1000 Electric Vehicle Components for 1000 km daily trips, VISION-xEV Virtual Component and System Integration for Efficient Electrified Vehicle Development, DiePeR Diesel Efficiency Improvement with Emission Reduction, IMPERIUM Powertrain Control for Economic and Clean Real Driving, OBELICS Optimization of Scalable Realtime Models and Functional Testing for E-drive Concepts, IMAGE Innovative MAnufacturing routes for next Generation batteries in Europe, HIPERFORM High Performant Wide Band Gap Power Electronics for optimized, efficient and reliable electric Drivetrains.

Further, AVL participates in projects such as AUTODRIVE Fail-safe/-operational electronics for automated driving, FFL4E Future freight locomotive, INN-BALANCE BoP components for PEMFC systems, INSIGHT SOFC system monitoring and diagnostics, Productive4.0 ICT for digital industry, SCOTT Secure connected trustable things, GHOST InteGrated and PHysically Optimized Battery System for Plug-in Vehicles Technologies, SECREDAS Product Security for Cross Domain Reliable Dependable Automated Systems, ASSURED fASt and Smart charging solutions for full size URban hEavy Duty applications, PRYSTINE Programmable Systems for Intelligence in Automobiles, IDEV40 Integrated Development 4.0, AFarCloud Aggregate Farming in the Cloud, AVENUE Autonomous Vehicles to Evolve to a New Urban Experience, LOWCOST-IC SOEC Design to Cost, 1000kmPlus Scalable European Powertrain Technology Platform for Cost-Efficient Electric Vehicles to Connect Europe, COSMOS COherent Support for MObility.E Strategy, CARAMEL Artificial Intelligence based cybersecurity for connected and automated vehicles, NewControl Integrated Fail-Operational, Adaptive Perception and Control Systems for Highly Automated Vehicles, AI4DI Artificial Intelligence for Digitising Industry, FR8HUB Real time information applications and energy efficient solutions for rail freight.

BRING - Brussels Research and Innovation Center for Green Technologies

Organisation type:	R&D center
Contact person:	Imane Worighi
Phone number:	+32 470 03 33 79
Email:	Imane.worighi@bringvzw.be
Location head office:	Belgium
Website:	www.bringvzw.be

Short summary of expertise and activities

Brussels Research and Innovation Center for Green Technologies (BRING) is a nonprofit organization for the development of green and sustainable technologies and solutions. BRING is involved in research and development of various rechargeable energy storage systems and energy technologies for Lightweight and Heavy-duty vehicles, electric vessels and utility scales. BRING offers the following services:

- R&D center activities: Reliable and fast-growing R&D center with an ecosystem of more than 65 partners.
- Next generation battery for e-mobility and stationary applications: Development of next-generation battery systems supported by multi-scale mathematical modelling and artificial intelligence solutions.
- Next generation battery for maritime/ waterborne sector: Cutting edge center for e-mobility on maritime / waterborne sector.
- Different research areas: Different research areas in the field of green technologies such as fuel cells, lightweight materials, hydrogen storage, automated vehicles, and drones.

Participation in EU projects

At Bring, we are continuously working on multi-companies projects that improve battery technologies and sustainability. BRING offer services to companies and industries and collaborate with universities in the field of green technologies. BRING is also involved in EU projects such as:

Escalate project:
Heavy-duty vehicles account for about 25% of EU road transport CO_2 emissions and about 6% of total EU emissions. In line with the Paris Agreement and Green Deal targets, Regulation (EU) 2019/1242 setting CO_2 emission standards for HDVs (from August 14, 2019) forces the transition to a seamless integration of zero-emission vehicles into fleets. In line with the European 2050 goals, ESCALATE aims to demonstrate high-efficiency zHDV powertrains (up to 10% increase) for long-haul applications that will provide a range of 800km without refueling/recharging and cover at least 500 km average daily operation (6+ months) in real conditions. BRING is leading the powertrain and battery system development WP and is responsible in ECSALATE project for the design, prototyping, testing and simulation tools for two OEMs (heavy-duty vehicles) with the objectives of extending the range and improving battery performance, considering sustainability and safety constraints.

LIBERTY project:
LIBERTY's overall target is upgrading EV battery performance, safety and lifetime from a lifecycle and sustainability point of view. The key objectives of LIBERTY are to achieve a range of at least 500 km on a fully charged battery pack, halved charging times, an ultimate safe battery system, a long battery lifetime of over 300,000 km for first life, the ability to reuse the battery pack for second life applications and sustainability over the battery pack's entire life cycle. BRING is WP leader in LIBERTY project, leading the battery system design. In this regard, BRING has designed a conceptual design of the battery system, performed the test activities, and has developed predictive maintenance coupled with a cloud platform for BMS troubleshooting.

CEA

Organisation type:	RTO
Contact person:	Daniela Joubert Stoica
Phone number:	+33 4 38 78 92 54
Email:	daniela.joubertstoica@cea.fr
Location head office:	Centre de Saclay, 91191 Gif sur Yvette - Francee
Number of employees:	20181
Turnover before tax:	€5 Billion
Website:	www.cea.fr

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Short summary of expertise and activities

CEA, the French Atomic Energy and Alternative Energy Commission, is a key player in research, development and innovation in four main areas:

- Defense and security
- Low carbon energies (nuclear and renewables energies)
- Technological research for industry
- Fundamental research in the physical sciences and life sciences

CEA Tech is the technology research unit of CEA. It develops through its three institutes – Leti, Liten, List – a broad portfolio of technologies for ICTs, energy and healthcare.

The institutes of CEA Tech are conducting R&D to overcome the Transportation and mobility challenges with four major focuses: vehicle design, infrastructure, services and energy supplies.

CEA tech R&D activities, in the field of land transportation, include batteries and battery management systems for electric vehicles as well as software, sensors and other communicating objects that will equip future vehicles, and in particular driverless cars and transportation infrastructure.

Participation in EU projects

CEA Tech is involved in several initiatives at European level:

- Key Digital Technologies JU
- BEPA
- ETP EPoSS specific automotive group,
- ERTICO,
- Hydrogen Europe and JTI-FCH.

CEA Tech is also taking part in CleanSky2, Shift2Rail and the Innovation Communities of the EIT (EIT Digital, EIT Health, EIT Raw Materials, EIT Climate, EIT Inno-Energy, EIT Added Value Manufacturing which all include dimensions related to mobility).

In Horizon 2020 and with regards to challenges of industry and society for transportation and mobility, CEA Tech has been involved in more than 50 projects. Since the beginning of Horizon Europe, CEA Tech is involved in 6 projects.

Projects in the area of infrastructure, Intelligent Traffic System (ITS) and safety: 5G CARMEN (connectivity), HADRIAN (safe mobility), SAFE-UP (safe mobility)

Projects in the area of sustainable mobility: SAFELiMOVE (battery), 3beLiEVe (battery), INSTABAT (battery), SPARTACUS (battery), i-HeCoBatt (battery), echarge4Drivers (e-mobility), DOLPHIN (PEMFC), FurtherFC (PEMFC)

Ceit BRTA

Organisation type:	RTO
Contact person:	Ibon Ocaña
Phone number:	+34 943 212800
Email:	iocana@ceit.es
Location head office:	Donostia-San Sebastián, Spain
Number of employees:	250
Turnover before tax:	€22 Million
Website:	www.ceit.es

ceit
MEMBER OF
BASQUE RESEARCH
& TECHNOLOGY ALLIANCE

Short summary of expertise and activities

Ceit is a private multidisciplinary non-profit RTO, part of the Basque Research and Technology Alliance (BRTA), the School of Engineering of the University of Navarra (Spain), with a staff of more than 250 employees and 40 PhD students, and an annual budget over 22 M€.

Our missions are to provide industry with services through the development of technical research projects and to promote the dissemination of knowledge through the training of young researchers, PhD students and scientific publications.

Regarding our first mission, more than 100 research projects between TRL4 and TRL7 are carried out at Ceit per year. Ceit has been involved in 15 FP6 projects (coordinator in 2), 34 FP7 projects (coordinator in 10), 45 H2020 projects acting as coordinator in 12 of them and it's currently involved in 12 Horizon Europe projects (coordinator in 4 of them).
Moreover, Ceit participates in 3 LIFE projects, one ECHORD++ instrument and is the coordinator of 1 INTERREG SUDOE CircRural 4.0. Finally, Ceit has also coordinated 1 CIP ECOINNOVATION project and has also participated in 18 Research Fund for Coal and Steel (RFCS) projects, having the role of coordinator in 2 of them.
Ceit takes part in EIT manufacturing through Manufacturing Alliance AIE.

In terms of our second mission, in the last 5 years, Ceit has produced more than 150 PhD theses, published 100 papers in scientific journals, and participated in 80 international conferences.

Since 1996 Ceit has created 17 technology-based spin-offs, which currently employ more than 300 people. Five of these have been purchased by companies which are listed on NASDAQ, NYSE, the Madrid Stock Exchange and the Paris Stock Exchange.

The organizational structure of Ceit organizes its expertise and capacities in a way that allows the major challenges in the industry to be addressed from a more advantageous position:

- Materials and Manufacturing Division at Ceit offers solutions to transform industry challenges into value. The assets of the Division rely on an integrated structure based on the Industry 4.0 holistic approach.
- Transport and Energy Division is focused on four main areas; railway transportation, aircraft transportation and road transportation
- Water&Health Division at CEIT is funded in three main pillars (urban and industrial water control and monitoring systems, design, fabrication and testing of biomedical devices and biosensors)
- ICT division focuses its research in the design of monitoring devices and communications systems.

Participation in EU projects

NEOHIRE, LASER4SURF, AIOSAT, SIMFAL, SIA, HUC, DIGESTAIR, ADDIMOT, WATEREYE-, ASSASSIN, MODEL2BIO and HIVOMOT. CHEAPREMAG, REEPRODUCE, SUSAAN, DARROW, SUREWAVE, BILASURF, HyInHeat, SPACE4GREENER, MOMA-FLEX, NDT INSPECTION, SI-SHIFT and WILLOW.

Center for Research and Technology Hellas - CERTH

Organisation type:	R&D Institute
Contact person:	Mrs Eleni Papaioannou
Phone number:	+30 2310 498193
Email:	helen@cperi.certh.gr
Location head office:	Thermi-Thessaloniki, Greece
Number of employees:	500
Turnover before tax:	€20 Million
Website:	www.certh.gr

CERTH
CENTRE FOR RESEARCH & TECHNOLOGY HELLAS

Short summary of expertise and activities

The **Centre for Research and Technology-Hellas (CERTH)** is one of the leading research centres in Greece. CERTH participates in EARPA with one laboratory (**APTL**, Aerosol and Particle Technology Laboratory) and two institutes (**ITI**, Information Technologies Institute, and **HIT**, Hellenic Institute of Transport).

APTL established itself as a laboratory of international calibre, by exploiting the benefits of **nanomaterials and nanotechnologies** for the clean transport systems of the future. Our core R&D activities include (1) Development and assessment of Automotive Emission Control Technologies for Internal Combustion Engines (soot particulates and gaseous emissions) (2) Sensor and Measurement Technologies (3) Cathode and Anode material Development and Characterization for advanced and post Lithium-ion automotive batteries, (4) Renewable Hydrogen Production and Power-to-Fuel Technologies and (5) Numerical Simulation of Thermochemical Processes.

HIT's objective is the conduct and support of applied research activities in the field of **transportation** relating to the organisation, operation, planning and development of infrastructure, standardisation, economic analysis, management, vehicle technology, and impact assessment of transport services. Our expertise lies in the areas of (1) Road Safety (2) Urban Mobility (3) Logistics and (4) Electronic & Communication Systems.

ITI is one of the leading Institutions of Greece in the fields of **Informatics, Telematics and Telecommunications**, with long experience in numerous European and national R&D projects. We have introduced several innovations in areas related to 1) Road Safety 2) Materials, Design & Production 3) Methods and Tools for Virtual Development and Validation 4) Electronic & Communication Systems 5) Urban Mobility and 6) Logistics.

Participation in EU projects

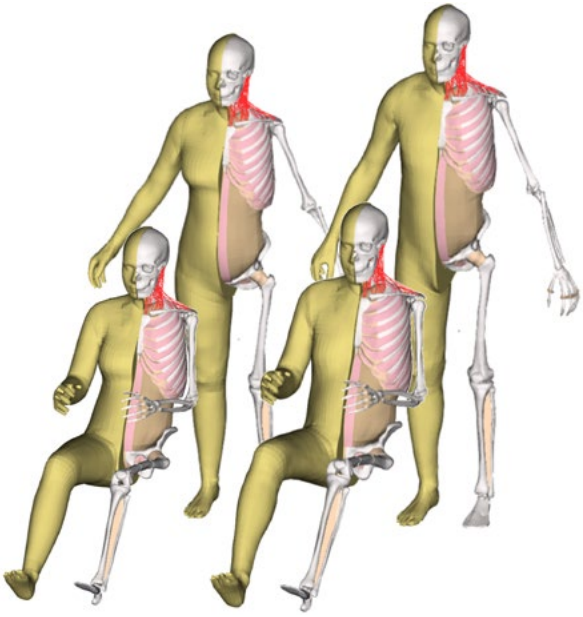
SUREAL-23 – Understanding and measuring sub-23 nm particle emissions from direct injection engines including real driving conditions
eCAIMAN – Electrolyte, cathode and anode improvements for market-near next-generation lithium ion batteries
ARMOS – Advanced multifunctional reactors for green mobility and solar fuels
C-MobILE – Accelerating C-ITS mobility, innovation and deployment in Europe
TransAID – Transition areas for infrastructure-assisted driving
SAFE STRIP – Safe and green sensor technologies for self-explaining and forgiving road interactive applications
MOVESMART – Renewable mobility services in smart cities
SERIOT – Secure and safe internet of things
RESOLUTE – Resilience management guidelines and operationalization applied to urban transport environment
COMPOSITION – Ecosystem for collaborative manufacturing processes – intra- and inter-factory integration and automation
GOODROUTE – Dangerous goods transportation routing and monitoring

Chalmers University of Technology

Organisation type:	University
Contact person:	Magnus Granström
Phone number:	+46 772 0000
Email:	Magnus.granstrom@chalmers.se
Location head office:	Göteborg, Sweden
Number of employees:	3100
Turnover before tax:	€375 Million
Website:	www.chalmers.se

CHALMERS
UNIVERSITY OF TECHNOLOGY

Family of Viva+ digital human body models with both female and male models



Short summary of expertise and activities

Chalmers University of Technology has eight Areas of Advance, which brings together education, research and innovation. They are organised as strong, challenge-driven thematic platforms for strategy and long-term collaboration that hunt down specific challenges, often directly relevant for industry and society. The Areas of Advance also offer common access to cutting-edge research infrastructures as well as to several targeted centres. At the same time, our departments represent a continuous source of expertise.

Among Chalmers eight AoA the most relevant for EARPA are: Transport, Materials Science, Energy, and Information and Communication Technology.

In the transport area, the difficult task we face is to create the potential for sustainable, safe transport systems and, at the same time, increase effectiveness and efficiency.

Future development cannot be conducted by a single industrial, public or academic actor. Mitigating climate impact and reducing risks in the transport sector are serious challenges that require collaboration between various stakeholders, including industry actors and the society as a whole. Addressing these challenges is an important part of reaching the the Sustainable Development Goals set by the United Nations.

To address the problems, we need to simultaneously address several levels in and perspectives on the transport system, taking into consideration the interaction of vehicles and vessels, networks of infrastructures and the demand and supply of transport and logistics services. We do this in the research areas identified within our profiles Sustainable vehicle technologies, Transport and Logistics and Road traffic safety.

Sustainable transport systems require the development of energy-efficient vehicle concepts and propulsion systems using renewable energy sources. We focus on research and innovation in three areas: propulsion systems, vehicle design and sustainability assessment. This is to avoid harmful impacts on climate, health and the environment in all modes of transport.

Efficient, sustainable transport and logistics systems contribute to a sustainable society. Our research is based on societal challenges and the interaction between actors and different subsystems, including individual mobility, business logistics systems and supply chains. The relationship between transport efficiency and the environmental impact of different solutions also guides the research.

Road traffic safety includes preventive measures and measures to mitigate the consequences of accidents, in pursuit of a sustainable society. Our research is based on a better understanding of real traffic environments and behaviour through data collection and analysis. This forms the basis for research into methods and technologies for accident avoidance, injury prevention systems and safety for a multimodal, connected transport system.

Participation in EU projects

HiDRIVE, SUNRISE, FAME, V4SAFETY, FENIX, MINIMAL

CIDETEC

Organisation type:	RTO
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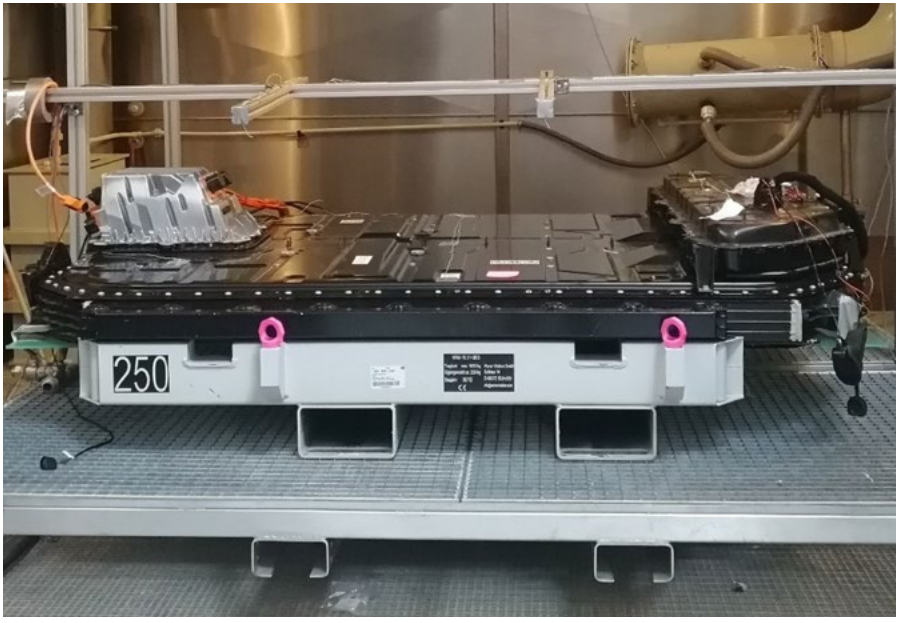
Email:	iosucendoya@cidetec.es
Location head office:	San Sebastián, Spain
Number of employees:	245
Turnover before tax:	€15 Million
Website:	www.cidetec.es

cidetec
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

Contribution of CIDETEC to battery pack heat exchanger in i-HeCoBatt project



Short summary of expertise and activities

CIDETEC is a private organisation for applied research founded in 1997 that seeks to contribute value to companies by harnessing, generating, and transferring technological knowledge. CIDETEC is comprised of three International Technological Reference Institutes in Energy Storage, Surface Engineering and Nanomedicine:

CIDETEC Energy Storage: Specialised in creating new battery technology and facilitating its transfer to industry. Our research activity covers from exploratory, low TRL new battery technologies and concepts up to high TRL product development for direct transference to the industry, near-ready for commercialization. Our Technological Offer comprises: 1) Battery Materials and Technologies, 2) Pilot Plant Battery Manufacturing; 3) Module and Pack Engineering, 4) Energy Storage Solutions, 5) Battery Testing and characterization and 6) Modelling & Simulation.

CIDETEC Surface Engineering: Focused on the development of surfaces and materials and their application methods on different type of substrates (metals, polymers, and composites), mainly for automotive, energy, and aerospace sectors. This is possible through the application of different solutions, such as innovative high-performance and multifunctional coating systems (e.g. omniphobic and REACH compliant coatings) and break-through materials (e.g. reprocessable, recyclable and repairable resins and composites based on proprietary tech).

Both CIDETEC Institutes provide services and develop R&I projects using top-of-the-line equipment, including a pilot plant for integrated battery manufacture; first class equipment and specific installations for testing and characterization, equipment to synthesise, characterise and process polymers and advanced composites and 4.000 m^2 laboratories and pilot plants completely equipped for surface study, characterisation and treatments.

Participation in EU projects

BATSS – Safe efficient BATtery SyStem based on advanced cell technology
BATTERY2LIFE – BATTERY management system and system design for stationary energy storage with 2nd LIFE batteries
InnoBMS – Situationally aware innovative wireless battery management system for next generation vehicles
NextETRUCK – Efficient and affordable Zero Emission logistics through NEXT generation Electric TRUCKs
EMPOWER – Eco-operated, Modular, highly efficient, and flexible multi-POWERtrain for long-haul heavy-duty vehicles
Nickeffect – Ni-based ferromagnetic coatings with enhanced efficiency to replace pt in energy & digital storage applications
MAT3RBoost – Maturing the production standards of ultraporous structures for high density hydrogen storage bank
SPINMATE – Scalable and sustainable pilot line based on innovative manufacturing technologies towards the industrialisation of solid-state batteries for the automotive sector
INN-PRESSME – open INNovation ecosystem for sustainable Plant-based nano-enabled biomateRials deploymEnt for packaging, tranSport and conSuMEr goods
ALBATROSS – Advanced Light-weight BATteRy systems Optimized for fast charging, Safety, and Second-life applications
SPARTACUS – Spatially resolved acoustic, mechanical and ultrasonic sensing for smart batteries
COBRA – CObalt-free Batteries for FutuRe Automotive Applications

CMT – Clean Mobility & Thermofluids

Organisation type:	University
Contact person:	Prof. José M. Desantes
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Email:	xmargot@mot.upv.es
Location head office:	Valencia, Spain
Number of employees:	150
Turnover before tax:	€4.2 Million
Website:	www.cmt.upv.es

Clean Mobility & Thermofluids

Fuel cell test bench, designed for 200 kW FC and with capabilities for hardware-in-the-loop developments

Short summary of expertise and activities

CMT Clean Mobility & Thermofluids is a dynamic and internationally well-known research institute of the Universitat Politècnica de València, that collaborates closely with the international automotive industry. Its main research activities are centred on the theoretical-experimental study of all the thermo-fluid dynamic processes applied to clean propulsion powerplants. Main concerns are dictated by environmental and sustainability issues, such as the reduction of specific fuel consumption and pollutants, the need to improve powerplants efficiency and reliability. Work is carried out to explore following aspects:

- Injection-combustion processes and pollutant formation with new fuels, ammonia and hydrogen
- Noise analysis and control for xEVs and UAV's acoustic issues
- Hydrogen combustion and fuel cells
- Thermal management with specific applications to xEVs
- Powerplant hybridization; control strategies and optimization
- Air management, turbocharging and aftertreatment
- Tribology, predictive and integral maintenance systems for transport fleets.

Over the years, CMT has designed and set-up many experimental facilities to respond to industry demands: 20 fully equipped engine test cells for single cylinder and real engines, 3 climatic chambers, including one with capabilities to simulate below zero temperatures (-30 °C) and altitude conditions (up to 3000 m, 700 mbar) with enough space for a car, 3 turbo-group test benches for the full characterisation of turbochargers.

In addition, CMT has recently invested in state-of-the-art experimental and computational installations to address current and future challenges: a high pressure - high temperature test rig (up to 150 bar and 1100 K) for injection-combustion studies of renewable fuels (ammonia, hydrogen, DME, e-fuels); a fuel cell test bench (200 kW, with capabilities for hardware-in-the-loop developments); specific facilities for batteries characterization: 2 thermal chambers (1.1 m^3 with temperature range -70 °C to 180 °C, and 12 m^3), battery testers, a multi-zone temperature chamber (8 independent chambers), equipment for thermal runaway studies; an electric motors test bench (200 Nm, 10 krpm); a 2WD vehicle test bench (200kW maximum power, 250km/h) for advanced powertrain technology research; CMT's patented MEDAS compact altitude simulator enabling measurements at high altitudes (up to 8000 m) with simulated temperatures from -20 °C to 50 °C and humidity from 1 to 70 hH20/kgDryAir; a cluster with 1536 Xeon Gold 3GHz cores, 7.5TB RAM and Infiniband network.

Participation in EU projects

GIGAGREEN – Next wave of electrode and cell component processing techniques for 3b Li-ion cells. PULSELION – Novel manufacturing process development for Gen 4b solid-state batteries. NEXTCELL – New 3b LIB cell generation for both high capacity and high voltage applications. ALL-IN Zero – Multi-fuel system to generate electrical and mechanical power with zero emissions. REBELION – Development of cutting-edge technologies to promote a circular model for LIBs for electric mobility. EXTENDED – Development of next generation multi-functional, modular and scalable solid state batteries system. MEASURED – Enhancement of performance and lifespan of high-temperature membrane electrode assemblies for heavy duty vehicles.

Czech Technical University in Prague

Organisation type:	University
Contact person:	Mr. Oldřich Vítek
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Email:	oldrich.vitek@fs.cvut.cz
Location head office:	Prague, Czech Republic
Number of employees:	3320
Turnover before tax:	€117 Million
Website:	www.cvut.cz

Short summary of expertise and activities

The Centre of Vehicles for Sustainable Mobility has been established as a part of the Czech Technical University in Prague (CVUT). It links relevant research workers and postgraduate students of Faculties of Mechanical and Electrical Engineering of CVUT; moreover it has employed researchers from other universities and companies. The Centre provides research and development of spark ignition and diesel engines in the field of thermodynamics, aerodynamics, turbocharging, emissions, motor management, engine dynamics and structural strength applied to the design optimisation.

The Centre was successful in some simulation and experimental tasks concerning engine combustion of alternative fuels at limited pollution (especially using natural gas). Another large domain is optimization of turbocharging for large-bore engines, heavy – duty engines and engines for downsized-cars. It includes the recent technologies of variable turbine geometry with predictive algorithms of control and the use of pressure-wave superchargers. The use of combined simulation by computational fluid dynamics (CFD), 3-D (Star CD, Fluent, Fire) and specific 1-D methods of engine modelling (GT Power, GT Suite) and finite element method (FEM – like ABAQUS, EngDyn) together with multibody dynamics (Simpack, Adams, Madymo, PAM Crash) for these tasks is supported by commercial and in-house developed codes and by experiments using laser optical diagnostics. Results were applied, e.g., in Skoda Auto, a.s., and at some West-European and American manufacturers of cars and tractors. The Centre is an official partner of Gamma Technologies, Inc., the leader in specialized engine simulation software.

The Centre applies the results into turbocharger development in co-operation with the Czech manufacturers of turbochargers (PBS Turbo, Ltd., CZ Strakonice, a.s.) and turbo-compounded concepts of future engines (several projects of Czech Ministry of Trade and Industry).

Further it supplies the R&D results for vehicle transmission design and powertrain optimisation (mechanical, hydraulic, electrical ones), vehicle suspension design (including active Mechatronic Elements and their Control), body aerodynamics and passive safety issues. The Centre is active in engine/vehicle integrated control, especially for engine management (the project of Czech Ministry of Trade and Industry) and active/semiactive car or truck suspension (a German project) combined with ABS and other vehicle controls. The specialists of micro-electronics are involved in rapid prototyping of control, hardware development, sensor development and CAN bus management/monitoring (Skoda Auto).
The important part of research is an electric powertrain concept, useful for hybrid and fuel-cell powered vehicles.

Participation in EU projects

New projects: IMPERIUM, FUTURE RADAR, GasOn, REWARD

Finished projects: NICE, GREEN Heavy Duty Engine, InGAS, Roads2HyCOM, VECOM, POWERFUL, LESSCCV

Deutsches Zentrum für Luft- und Raumfahrt

Organisation type:	Research
Contact person:	Anna Schieben
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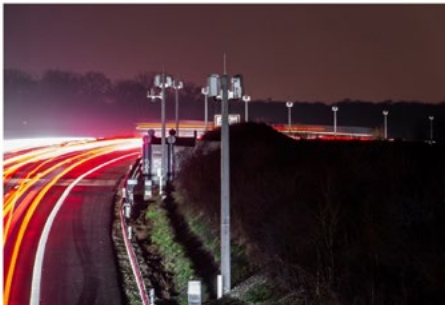
Email:	anna.schieben@dlr.de
Location head office:	Cologne
Number of employees:	10,000
Website:	www.dlr.de/EN/Home/home_node.html



Short summary of expertise and activities

DLR is the Federal Republic of Germany's research centre for aeronautics and space. We conduct research and development activities in the fields of aeronautics, space, energy, transport, security and digitalization.

Climate, mobility and technology are changing globally. DLR uses the expertise of its 55 research institutes and facilities to develop solutions to these challenges. Our 10,000 employees share a mission – to explore Earth and space and develop technologies for a sustainable future. In doing so, DLR contributes to strengthening Germany's position as a prime location for research and industry.

The DLR traffic sector develops and designs consistent innovative solutions for the mobility of people and for the transport of goods. Application-oriented research and development supports many levels of research, from connected and automated driving to data and service platforms supporting innovative mobility technologies up to verification and validation technologies as well as test sites for vehicle- and railway systems.

Participation in EU projects

Hi:Drive – Deployment of higher automation
SHOW – Shared automation operating models for worldwide adoption
TRIPS – A new approach to designing transport systems free of mobility barriers
Interreg ART-Forum – Automated Road Transport
AWARE2ALL – Safety systems and human-machine interfaces oriented to diverse population towards future scenarios with increasing share of highly automated vehicles
VOJEXT – Value Of Joint EXperimentation in digital Technologies for manufacturing and construction
NDC ASPECTS – Assessing Sectoral Perspectives on Climate Transitions to support the Global Stocktake and subsequent
ESCALATE – Powering EU Net Zero Future by Escalating Zero Emission HDVs and Logistic Intelligence
r-LightBioCom – New bio-based and sustainable raw materials enabling circular value chains of high performance lightweight biocomposites
x2Rail-5: Completion of activities for Adaptable Communication, Moving Block, Fail safe Train Localisation (including satellite), Zero on site Testing, Formal Methods and Cyber Security
FR8RAIL IV – Use-centric rail freight innovation for Single European Railway Area ()
FCH2Rail – Fuel Cell Hybrid PowerPack for Rail Applications
SOLUTIONSPlus – Integrated Urban Electric Mobility Solutions in the Context of the Paris Agreement, the Sustainable Development Goals and the New Urban Agenda
TRANS4M-R – Transforming Europe's Rail Freight
FutuRE – Delivering Innovative rail services to revitalise capillary lines and Regional rail services

Eindhoven University of Technology (TU/e)

Organisation type:	University
Contact person:	Mrs Margriet van Schijndel MSc
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Email:	m.v.schijndel@tue.nl
Location head office:	Eindhoven
Number of employees:	3700
Turnover before tax:	n/a
Website:	www.tue.nl/smartmobility

TU/e

EINDHOVEN UNIVERSITY OF TECHNOLOGY

One of our successful student teams: The Ecomotive student team with the vehicle that lasts a lifetime: ETERNA

Short summary of expertise and activities

TU/e is ranked as a top Technical University in Europe, providing higher education to ± 13.000 students, publishing over 5000 articles and 40 patents annually. TU/e is a research driven university where its innovation and application in high tech systems is embedded in the strong industrial region of Brainport.

Mobility is a prerequisite for a healthy economy and sustainable society. However, our current mobility system is far from sustainable. Pollution, noise, congestion, inefficient use of public space and high accidents rates are drastically impacting on the economy and our well-being. At TU/e we believe that a future fully sustainable mobility system is possible and within reach. Our team on mobility research, with students and over 300 researchers, is committed to accelerate the transition to a sustainable mobility system; towards mobility that is safe and clean and that minimizes the use of scarce (urban) space. Mobility that is accessible to all at reasonable cost. Solutions that are being researched are both in-vehicle ones as well as ones outside the vehicle.

With increasing digitalisation, vehicle performance will be greatly improved by innovations in the areas of electronics, software systems and data intelligence. An increasing volume of mobility data will lead to an exponential growth in smart mobility solutions. But smart design of urban areas – empowering slower mobility options such as walking and cycling – will also boost enhanced mobility.

Nine departments cooperate in high tech innovations. Together, they offer a unique multi-disciplinary system-oriented 3-year Bachelor (>250 students) and a 2-year Master of Science program Automotive Technology (>150 students).

Core business in R&D:

- autonomous driving
- battery storage
- combustion technology
- electrical components
- energy management
- high-tech automotive materials
- hydrogen storage
- powertrains
- vehicle dynamics

Participation in EU projects

See also www.tue.nl/aiprojects:
AITHENA – AI-based CCAM: Trustworthy, Explainable, and Accountable
MODI – A leap towards SAE L4 automated driving features
SELFY – SELF assessment, protection & healing tools for a trustworthY and resilient CCAM
EdgeAI – Edge AI Technologies for Optimised Performance Embedded Processing
Safe-Up – proactive SAFEty systems and tools for a constantly UPgrading road environment
LONGRUN – Heavy duty vehicles, environmental friendly fuels and powertrains
AUTODRIVE – Fail-safe electronics for automated driving
HiFi Elements – High Fidelity Electric Modelling and Testing
EIT Urban Mobility

Member of the Partnerships 2Zero, CCAM and ADRA
Leading the national multidisciplinary project NEON (https://neonresearch.nl), on interrelated societal challenges: climate action, renewable energy, and mobility
TU/e is a founding member of the national Battery Competence Cluster (https://batterycompetencecluster.nl/en/)

ESI Group

Organisation type:	R&D company
Contact person:	Philippe de Souza
Phone number:	+33 6 07 34 40 63
Email:	philippe.desouza@esi-group.com
Location head office:	ESI Group Headquarters, France
Number of employees:	1100
Turnover before tax:	€136.6 Million
Website:	www.esi-group.com

esi
get it right

Virtual prototyping makes the difference

Short summary of expertise and activities

The Group's offered solutions, resulting from 50 years of experience, bring technological empowerment for industry innovation efficiently and with confidence.

Paramount of ESI's business model, Virtual Prototyping allows its global customers, in particular in automotive sector, to validate the vehicle design, and behavior of their product in different environment minimizing their risk, their costs and time to market, without sacrificing safety and quality. To reach these objectives.

ESI accompanies its customers in a journey towards Zero Tests, Zero Prototypes and Zero Downtime by providing predictive, real-time, and immersive software solutions.

ESI strived to provide the best answer for the industries' challenges and to keep its promises to boost agility and push innovation. Confining the physics of material in its DNA, ESI supports industries to validate the fabrication, assembly, and behavior of the product in different operational environments – early and throughout the whole product life.

The ability to experiment with real data and real physics at the same time gives engineers just the extra degree of freedom they need to design and to pre-certify the different vehicle variations virtually right the first time.

It is the freedom to displace physical tests and prototypes by virtually replicating product development, testing, and manufacturing with simulations. It's Virtual Prototyping. A Virtual Prototype is based on multi-domain simulation models and captures ESI's unique treasure of material physics. It is the freedom to assess the changes like ageing and behavior of a product at any stage and in any situation during its life. This is what the industry commonly refers to as Digital Twin. At ESI, we went the extra mile in creating a new virtual paradigm. Equipped with smart sensor data collected from real life operations, our Virtual Prototype becomes artificially intelligent to predict maintenance needs based on its current condition. We call this a Hybrid Twin™. Our customers use the Hybrid Twin™ to ensure a predictive assessment of real operational performance of their products in the targeted market environment and to improve next design and to upgrade the engineering knowledge.

2021 – Facts sheet

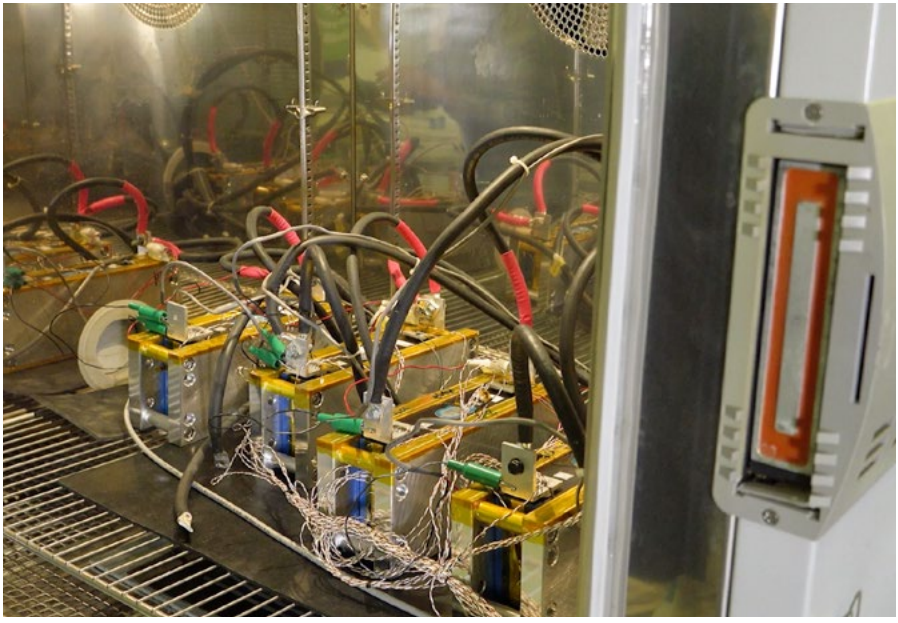
- Revenue 2021: €136.6M
- Number of Employees: 1100
- Operate in: more than 20 countries
- Auto industry: over than 50 %
- R&D investments: over than 33 % of Licenses revenue

Participation in EU projects

AWARE2ALL – CAE Simulation of crash/ pre-crash integrated safety scenarios vehicle occupants with human body modelling, HIPERMAT – Design of new metal alloys, and their manufacturing process, hydrosolidification, LEVEL-UP – Simulation of fatigue of the manufacturing toolset in a hybrid twin approach, applied to predictive maintenance, OSCCAR – Human body modelling for occupant safety in autonomous vehicles, SUaaVE – Immersive driving simulation for Human-Centric development, UPSCALE – Crash performance simulation of electric vehicles' batteries, using model order reduction and multiscale simulation.

Fundació EURECAT

Organisation type:	RTO
Contact person:	Fanny Breuil
Phone number:	+34 93238 1400
Email:	fanny.breuil@eurecat.org
Location head office:	Barcelona, Spain
Number of employees:	700
Turnover before tax:	€55 Million
Website:	www.eurecat.org/en



Short summary of expertise and activities

Eurecat is the leading Technology Centre of Catalonia, providing the industrial and business sector with differential technology and advanced expertise. The center offers solutions to their innovation needs and boosts their competitiveness in a fast-paced environment. Serving two thousand companies, Eurecat is involved in more than 200 projects of R&D national and international with high strategic value and has 181 patents and 10 technology companies.

A key priority area focuses on cutting edge technologies and solutions to support the future mobility:

- Advanced materials and multi-materials aiming at lightweighting, sustainability and circularity
- Advanced, smart, automated, flexible and integrated manufacturing (pilot plants: plastronics, composites, metal, plastics, 3D printing, Continuous Fibre Injection Process...)
- Automated dismantling of components and parts, materials recovery, recycling; substitution of critical raw materials
- Optimized design & simulations
- Ecodesign, design for circularity
- Part performance prediction (experimental, virtual, advanced characterisation, fatigue, crashworthiness etc.)
- Electromobility: batteries and electrification; power electronics & grid integration, smart grids. recharging infrastructure. BATTECH: Joint Batteries research unit with IREC.
- Robotics and automation; unmanned ground/air robots for industrial production, deliveries, predictive maintenance, etc.
- Cybersecurity and resilience of CCAM, infrastructure, services and the entire mobility system
- Mobility data sharing and management
- Technologies for smart and efficient planning and management of network, traffic and physical/digital infrastructure
- Technologies for the mobility services of the future for people and goods (MaaS, sharing economy, 15-minute cities etc.).
- Digital humanities aimed at understanding and anticipating mobility patterns and choices, and ensuring inclusiveness, algorithmic fairness and explainability, health and wellbeing.

Participation in EU projects

SELFY – (HEU. 2022-2025. EURECAT Coordinator). Creating self-assessment, protection & healing tools for a resilient CCAM's ecosystem. FATIGUE4LIGHT – Europe, H2020. 2021-2024). Fatigue modelling and fast testing methodologies to optimize part design and boost lightweight materials deployment in chassis parts. SALEMA – (H2020. 2021-2024. Eurecat Coordinator). Substitution of Critical Raw Materials on Aluminium Alloys for electrical vehicles. MARBEL – (H2020. 2021-2024. Eurecat Coordinator). Manufacturing and assembly of modular and reusable EV batteries for environment-friendly and lightweight mobility.
COBRA – (H2020, 2020-2023) Cobalt-free Batteries for Future Automotive Applications. FLEXCRASH – (HEU, 2022-2026). Flexible and hybrid manufacturing of green aluminium to produce automotive tailored adaptive crash-tolerant structures. FRONTIER – (H2020. 2021-2024. Eurecat Coordinator). Next generation traffic management for empowering CAVs integration, cross-stakeholders collaboration and proactive multi-modal network optimization. BatteReverse (HEU. 2023 – 2026). A next-generation automated, connected, and standardised process for increased safety, efficiency, and sustainability of Li-ion battery reverse logistics.

FACTUAL

Organisation type:	SME
Contact person:	Mr. Marc Figuls
Phone number:	+34 6200 05845
Email:	marc@factual-consulting.com
Location head office:	Barcelona, Spain
Number of employees:	18
Turnover before tax:	€2 Million
Website:	www.factual-consulting.com

FACTUAL's Lane Patrol road safety assessment for cycling infrastructure

Short summary of expertise and activities

FACTUAL is a foresight innovation and strategy firm committed to transforming mobility. The Barcelona-based SME equips their customers, both from the public and private sector, with timely and expert insight to interpret the key challenges and drivers facing (future) mobility. One of FACTUAL's main areas of expertise are research projects at European level, where their seasoned and multidisciplinary team is very active, cooperating hand in hand with cities and organisations paving the way of mobility innovation in international, cross-industry consortia.

FACTUAL keeps a keen eye and interprets global trends (re)shaping future mobility, from the smart combination of autonomous, connected, electric and shared features transforming the automotive industry for the better, to disruptive, new mobility paradigms redefining how mobility is consumed from a brave new user-centric perspective.
A differential asset of FACTUAL is an in-house factory for developing, accelerating and validating new innovative mobility services and products, such as the on-demand transport platform NEMI, currently operating in different countries as a new start-up; RIDEAL, the micro-incentive calculation engine which can be plugged on to any MaaS and/or transport service provider platform; and LANE PATROL, a road safety tool for assessing the cycling network through the CycleRAP methodology aiming at identifying potential risks, proposing improvements to foster a safer and more comfortable environment for the cyclists.

Participation in EU projects

MOLIERE – Mobility services enhanced by Galileo and blockchain, DIGNITY – Digital transport in and for society to tackle mobility poverty, ARIADNA – Awareness raising and capacity building increasing adoption of EGNSS in urban mobility applications and services, NUMIDAS – New tools and methods for mobility data collection, management and exploitation, CommINSAFE – Commuting with shared mobility COVID-free, MultiDEPART – Harmonisation of design and monitoring tools for public funded Demand Responsive Transport (DRT) services, Cleanergy 4 Micromobility – Cable-less and solar renewable docks for e-scooters, S+LOADZ – Multi-sustainable digital loading and delivery zones for city logistics, RideSafe Urban Mobility – Advanced active safety solutions for micromobility vehicles, eBRT2030 – New Generation of advanced full electric, urban and peri-urban European Bus Rapid Transit (BRT), UPPER – Unleashing the potential of public transport in Europe, TACTIC – Tools for Local commerce logistics. Knowledge transfer between Barcelona and Paris, Digital Bus – The inclusive digital revolution for public transport services, REALLOCATE – Rethinking the design of streets and public spaces to leverage the modal shift to climate-friendly active transport everywhere, RAIL4CITIES – Railway stations for green and socially inclusive cities, METACCAZE – Flexibly adapted MetaInnovations, use cases, collaborative business and governance models to accelerate deployment of smart and shared Zero Emission mobility for passengers and freight, TIPS4PED – Turning cIties Planning actionS for Positive Energy Districts into success, JULIA – Joint developments for urban resilience connecting users to public transport through space technology, SCREEN – Smart Cycling Infrastructure Assessment.

FEV Europe GmbH

Organisation type:	R&D company
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Phone number:	+49 241 5689 6753 (d) +49 160 746 3619 (m)
Email:	schernus@fev.com
Location head office:	Aachen, Germany
Number of employees:	Over 7000 (FEV Group)
Turnover before tax:	Over € 700 m (FEV Group)
Website:	www.fev.com

Using renewable energy for mobility is one of FEV's prime focuses

Short summary of expertise and activities

FEV is a leading independent international service provider of vehicle and powertrain development for hardware and software. The range of competencies includes the development and testing of innovative solutions up to series production and all related consulting services. The range of services for vehicle development includes the design of body and chassis, including the fine tuning of overall vehicle attributes such as driving behavior and NVH. FEV also develops innovative lighting systems and solutions for automated driving and connectivity. The electrification activities of powertrains cover powerful battery systems, e-machines and inverters. Additionally, FEV develops highly efficient zero-impact-emission combustion engines, transmissions, EDUs as well as fuel cell systems and facilitates their integration into vehicles suitable for homologation. Renewable fuels are a further area of development. The service portfolio is completed by tailor-made test benches and measurement technology, as well as software solutions that allow efficient transfer of the essential development steps of the above-mentioned developments, from the road to the test bench or simulation. The FEV Group currently employs about 7,500 highly qualified specialists in customer-oriented development centers at more than 40 locations on six continents.

Participation in EU projects

- GasOn
- ECOCHAMPS
- IMPERIUM
- L3PILOT
- PaREGEn
- EAGLE
- ADVICE
- SCOTT
- AutoDrive
- ASSURED
- HIFI-ELEMENTS
- DIAS
- REDIFUEL
- SELFIE
- CEVOLVER
- LONGRUN
- SUBLIME
- SHOW
- ALBATROSS
- StaSSH
- Hi-Drive
- CoacHyfied
- Take-Off
- PHOENICE
- VERA
- HELENA
- ADVAGEN
- SELFY
- NEXTCELL
- XL-CONNECT
- ESCALATE
- VERSAPRINT
- FASTEST
- ZEVUP
- LeMesurier

FEV is also member of:

- ERTRAC
- EGVIAfor2Zero
- CCAM
- Hydrogen Europe
- FVV
- FVA
- P2X4A by VDMA
- AUTOSAR
- 5GAA
- CIMAC
- FISITA
- ASAM e.V.
- VDA

Fraunhofer LBF / EMI / IWU

Organisation type:	R&D institute
Contact person:	Mr. Thilo Bein / Mr. Philipp Dahl / Mrs. Katja Haferburg
Phone number:	+49 6151 705-463 / +49 761 2714-569 +49 371 5397-1566
Email:	thilo.bein@lbf.fraunhofer.de philipp.dahl@emi.fraunhofer.de katja.haferburg@iwu.fraunhofer.de
Location head office:	Munich, Germany
Number of employees:	390 / 372 / 657
Turnover before tax:	€29 Mio. / €30 Mio. / €50 Mio.
Website:	www.lbf.fraunhofer.de www.emi.fraunhofer.de www.iwu.fraunhofer.de

Fraunhofer
LBF
EMI
IWU

Multi-physical testing of fuel cells

Short summary of expertise and activities

Fraunhofer LBF, EMI and IWU constitute competent and reliable research partners for complex questions of lightweight design, manufacturing, safety and reliability in the automotive sector.

The Fraunhofer Institute for Structural Durability and System Reliability LBF looks back on 75 years of experience in the field of structural durability and nowadays has expanded its expertise towards adaptronics, plastics and system reliability. With its overall competences customised solutions for safety relevant products are being developed, evaluated and realised by the LBF considering the full added value chain. The LBF provides versatile test facilities for structural durability, structural dynamics and acoustics including a newly open battery test center. Besides, the LBF performs research and provides engineering services on synthesis, processing, analysis and testing of functional and engineering plastics.

The Fraunhofer Ernst-Mach-Institute EMI analyses the physics of high-speed, transient processes in order to develop new approaches and cutting-edge solutions for applications in the automotive sector. Fraunhofer EMI has recognized expertise in mechanical characterization as well as numerical modelling and simulation of a wide spectrum of materials, components and structures under dynamic loadings. Its laboratories are equipped with full-vehicle and component crash test facilities, tomography lab and a battery test stand for destructive dynamic tests of electrical energy storage units. In addition, EMI conducts safety and reliability analyses, system design and verification for active vehicle safety and battery systems.

The Fraunhofer Institute for Machine Tools and Forming Technology IWU carries out research in the areas of energy and resource-efficient production processes and production systems, digital manufacturing, car bodies, assembly, lightweight design and smart materials. Among others, foams from various metal materials can be produced and used in sandwich lightweight applications. One focus of all research is also on ultra-short process chains incorporating the whole value chain which are optimized in test facilities including an acoustic lab, facilities for sheet and bulk metal forming, mechanical and thermal joining, micro and precision engineering, adaptronics and smart materials and more.

The Fraunhofer LBF is member of the EPoSS, EuMAT as well of ERTRAC SIG, EGVIA and ECTRI. The Fraunhofer IWU is a member of EFFRA/ Manufuture.

Participation in EU projects

ALLIANCE – Affordable lightweight design
SELFIE – Self-sustained and Smart Battery Thermal Management Solution for Battery Electric Vehicles
AccCellBat – Accelerated Cell and Battery Testing
TranSensus LCA – Towards a European-wide harmonised transport-specific LCA Approach
SALIENT – Novel Concepts for Safer, Lighter, Circular and Smarter Vehicle Design
ShareWork – New technology for a Safe and Effective Human-Robot Collaboration in Industry

Ghent University

Organisation type:	University
Contact person:	Jeroen De Maeyer
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Email:	Jeroen.DeMaeyer@ugent.be
Location head office:	Gent, Belgium
Number of employees:	15,000
Website:	www.ugent.be

GHENT UNIVERSITY

Axial flux electric machine with integrated power electronics

Short summary of expertise and activities

Ghent University attracts over 50,000 students. We are a top 100 university founded in 1817. The university is one of the fastest growing European universities in terms of research capacity and productivity. Our research activities in automotive are spread over several departments and business development clusters. In each of the clusters activities range from fundamental to applied research, strongly connected to regional and international stakeholders.

The Machineries & Factories cluster (150FTE) works a.o. on smart motion products incl. drive trains for vehicle applications as well as on factories of the future. Our activities include (i) innovative electrical machines and their power electronics implementing sensorless, fault-tolerant machine level control strategies; (ii) advanced cooling incl. 2-phase; (iii) AI supported control strategies for hybrid & full-electric drive trains; (iv) modelling approaches for digital twins; (v) elasto-hydraulic-lubrication modelling; (vi) operator support systems and factory organisation; (vii) quality monitoring and assurance using e.g. AI. www.ugent.be/m-f/en

The Metals cluster (120FTE) develops solutions aimed at developing durable materials and realizing rational material use and at the development, characterization (metallurgic, mechanic, tribologic, electromagnetic) and design, construction and exploitation of industrial constructions and machines offering optimal functionality and durability. Metals is targeting sectors wherein metals and/or metals in combination with other materials play an important role, including the automotive. https://www.ugent.be/metals/en

The AM & Composites cluster is the industrial gateway to all composite and AM related research at Ghent University. We focus on 4 research lines (1) Simulation and testing of the mechanical behavior through a combined approach of instrumented experimental testing and numerical modelling; (2) Additive Manufacturing; (3) Monitoring and NDT of composite materials; (4) Processing and recycling of thermoplastics. We work very closely with a.o. Siemens Industry Software, Honda, Toyota, Mitsubishi Rayon in the SIM-M3 program (http://www.sim-flanders.be/research-program/m3). http://www.compositesconsortium.ugent.be/en/

Participation in EU projects

We have been working in several large(r) projects both at a regional and European level. Exemplary projects are: HEu CLIMAFLUX – [coordinator, the future axial flux machines], HEu ICONIC – [coordinator, classical control merged with AI for mechatronic systems], HEu MSCA-IDN-EMByAM – [additive manufacturing for electric machines], HEu HIGHSCAPE – [Power Electronics solutions for automotive applications], HEu HARMONY – [use of recycled permanent magnet materials in electric motors], HEu METAFACUTRING – [using AI to link production parameters with quality], HEu ALPHEUS [drivetrain development incl. control for hydropower], H2020-EXTREME, H2020-PolyCE H2020-3DRepair, H2020-EIT RACE-TP – Lightweight recyclable Lightweight Recyclable Automotive thermoplastic CompositE structural parts for large series production (https://eitrawmaterials.eu/project/race-tp/), H2020 Grade2XL – multi-material wire-arc additive manufacturing (WAAM) for large scale structures (https://www.grade2xl.eu/)

IAV GmbH

Organisation type:	R&D company
Contact person:	Marc Sens
Phone number:	+49 30 3997 89739
Email:	marc.sens@iav.de
Location head office:	Berlin, Germany
Number of employees:	8000
Turnover before tax:	€1.0 billion
Website:	www.iav.com

Short summary of expertise and activities

As one of the leading global engineering partners, IAV develops the mobility of the future. Regardless of the specific manufacturer, our engineering proves itself in vehicles and manifold technologies all over the world.

With more than 35 years of experience and an unsurpassed range of expertise, IAV combines the best of many different worlds: automotive and IT, hardware and software, products and services. With our workforce of more than 8,000 employees and first-class technical resources, we are helping our customers to implement their projects, from the concept right through to SOP. Our goal: better and cleaner mobility.

Engineering is our special forte. For many years, we have been ranked with the greatest and best worldwide. In this outstanding position, it goes without saying that our customers always receive comprehensive, excellent consulting because this is the only way to generate solutions, which will make a sustainable value contribution. Our services are rounded off with customized services and complete product solutions that we put to our customers for successful use.

IAV offers engineering, consulting, products and services as a one-stop shop in all automotive areas and even beyond:

- Powertrain System Development
- Powertrain Integration
- Powertrain Validation
- Intelligent driving function
- Connectivity
- E-Mobility
- Vehicle Development
- Vehicle Safety
- AI & Big Data
- Data Analytics
- Product Life Cycle and Remanufacturing
- Security & Privacy
- Smart Industry
- Connected Software & Services
- UX & Infotainment
- Thermal & Energy Management Solution
- Robotics
- Water-Management

Participation in EU projects

Ongoing Projects:
ASSURED – Fast and Smart charging solutions for full size urban heavy duty applications, UP2DATE – Intelligent software-update technologies for safe and secure mixed-criticality and high performance cyber physical systems

Finished Projects:
CORE – CO_2 reduction for long distance transport, HERCULES B – High-efficiency engine with ultra-low emissions for ships, COHLD – Commercial vehicles using optimized liquid biofuels and HVO drivetrains, OPTITRUCK – Optimal fuel consumption with predictive powertrain control and calibration for intelligent truck, SAFE4RAIL – Safe architecture for robust distributed application integration in rolling stock

Other International Activities (Examples):
AUTOSAR – Automotive Open System Architecture Organisation, CAR2CAR – Communication Consortium, CCC – Car Connectivity Consortium, ECH2A – European Clean Hydrogen Alliance, FVV: Forschungs-vereinigung Verbrennungskraftmaschinen, JSAE – Japanese Society of Automotive Engineers, NGVA – Europe Natural & Bio Gas Vehicle Association, SAE – Society of Automotive Engineers, SIA – Société des Ingénieurs de l'Automobile

IESTA (Institute for Advanced Energy Systems & Transport Applications

Organisation type:	SME
Contact person:	Dipl.-Ing. Dr.techn. Michael Nöst, MBA
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Website:	www.iesta.at

IESTA

Holistic Approach in Proposal Writing and Project Management of Cooperative EU Projects

Short summary of expertise and activities

IESTA is a non-university SME-sized research institute with a network of dedicated experts in the fields of Smart Mobility, Automated Driving, Road Safety & Cybersecurity

- Sustainable Propulsion Technologies & Energy Carriers
- Embedded Systems and IoT
- Energy Conversion and Energy Efficiency Analyses
- System Architecture and Requirements Management
- Cost Assessment Analyses
- Communication and Dissemination Management

As such IESTA has participated in numerous cooperative R&D Projects on national and European level, as initiator, supporter and partner. IESTA is not only active in the field of road transport, but is also in the rail and aviation sectors. This allows the introduction of a strong inter-domain view and expertise and the related fruitful transfer of knowhow. IESTA experts have a proven record in basic and applied research, technology and innovation in industry, academia and public bodies, thus providing a comprehensive understanding of different stakeholders.

Participation in EU projects

IESTA has participated in numerous cooperative R&D Projects on national and European level.

EU proposal coordination / support of:
EU FP7 ITN 2011 "GRESIMO"
EU FP7 ITN 2013 "BATWOMAN"
EU ARTEMIS Call 2012 "CRYSTAL"
EU ARTEMIS Call 2013 "DEWI"
EU ECSEL R&I Action 2014 "TEAADS"
H2020 GV03 R&I Action 2016 "ADVICE"
H2020 LC-GV-01-2018 "SYS2WHEEL"
H2020-DT-ART-2019 "HADRIAN"
H2020-DT-ART-2019 "SHOW"
Horizon-CL5-2021-D5-01 "HiPE"
Horizon-CL5-2023-D5-01-03 "GIANTS"

Proposal & project* coordination on national level of:
VECEPT* – All Purpose Cost Efficient Plug-In Electric Vehicle
eMPROVE* – Innovative solutions for the industrialization of EVs
eco2jet* – Evaluation and demonstration of an energy-efficient, cost-efficient and ecofriendly HVAC system using R744 based on the ÖBB railjet
KeyTech4EV – Key Technologies for Low-cost EV Platforms
GreenHVAC4Rail* – Heating ventilation and Air Conditioning
EV-CEA* – Electric Vehicle with Combustion Engine Assist
eWingDelcer* – Energy optimized delcer of an airplane wing
TWID* – Thermal Wing Ice Detector
PF-EC(H)EV – Poly Fuel Energy Conversion for Hybrid EVs
EN4MAX – Energy for maximum range
IRE* – Integrated Range Extender
EV-CEA – Electric Vehicle with Combustion Engine Assist
MAGNISCOPE – Magnificant Diagnosis Digital Scope
NG Mobility – Next Generation Mobility
FC-IMPACT – Increasing market penetration of FC cars by efficient system solutions
EUREKA TestEPS – Testing and verification methods of automated driving functions and EPS

IFP Energies nouvelles (IFPEN)

Organisation type:	Public-sector R&I body (RTO)
Contact person:	Mr. Gaetano de Paola
Phone number:	+33 6 16 53 83 65
Email:	gaetano.de-paola@ifpen.fr
Location head office:	Rueil-Malmaison, France
Number of employees:	1549
Website:	www.ifpenergiesnouvelles.fr

Short summary of expertise and activities

IFP Energies nouvelles (IFPEN) is a major research and training player in the fields of energy, transport and the environment. From scientific concepts within the framework of fundamental research, through to technological solutions in the context of applied research, innovation is central to its activities, hinged around four strategic directions: climate, environment and circular economy – renewable energies – sustainable mobility – responsible oil and gas.

As part of the public-interest mission with which it has been tasked by the public authorities, IFPEN focuses its efforts on bringing solutions to the challenges facing society and industry in terms of energy and the climate, to support the ecological transition. An integral part of IFPEN, IFP School, its graduate engineering school, prepares future generations to take up these challenges.

Sustainable mobility

To meet the triple challenge of energy-ecological-digital transition towards a decarbonized and sustainable mobility, IFPEN works with industrial partners, major groups and SMEs, academic partners, users and public institutions for developing innovative technological and digital solutions to increase energy efficiency and reduce environmental impacts of transport systems.

IFPEN activities on sustainable mobility are parts of the Carnot Institutes network since 2006, under the name of IFPEN Transports Energy Carnot Institute. These activities are based on a wide range of IFPEN's expertise on electric powertrain, electrochemical systems, control and energy management, hydrogen propulsion, low-carbon propulsion, software and tools, environmental analysis of mobility and life cycle assessment.

Participation in EU projects

MODALIS² – MODelling of Advanced LI Storage Systems
LONGRUN – Development of efficient and environmental friendly LONG distance
PHOENICE – PHev towards zerO EmissioNs & ultimate ICE efficiency
MAGPIE – sMArt Green Ports as Integrated Efficient multimodal hubs
OLGA – OLympics & Green Airports
LENS – L-vehicles Emissions and Noise mitigation Solutions
HELENA – Halide solid state batteries for ELectric vEhicles aNd Aircrafts
TRANSENSUS LCA – Towards a European-wide harmonized transport-specific LCA Approach
UPPER – Unleashing the potential of public transport in Europe
XL CONNEXT – Large scale system approach for advanced charging solutions
EMPOWER – Eco-operated, Modular, highly efficient, and flexible multi-POWERtrain for long-haul heavy-duty vehicles
ARCHIMEDES – Trusted lifetime in operation for a circular economy
ELABORATOR – The European Living Lab on Designing Sustainable Urban Mobility Toward Climate Neutral Cities
BATSS – Safe efficient battery system based on advanced cell technology
BATCAT – BATtery Cell Assembly Twin
AEROSOLS – Air Quality and Health Impact of Primary Semi-Volatile and Secondary Particles and their abatement
MAGELLAN – MAGnets in rEsiLient supply chAINs
LeMesurier – Measuring the value of the Key Performance Indicators (KPI) of the 2Zero Partnership

INEGI - Institute of Science and Innovation in Mechanical and Industrial Engineering

Organisation type:	R&D Organization
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Email:	jcs@inegi.up.pt
Location head office:	Porto, Portugal
Number of employees:	272
Turnover before tax:	€12 Million
Website:	www.inegi.pt

Short summary of expertise and activities

INEGI - Institute of Science and Innovation in Mechanical and Industrial Engineering from the University of Porto is an industry-oriented Research and Technology Organization.

INEGI's current activity in the surface transports area, and particularly concerning the automotive sector, explores innovative approaches to enable greener, safer and more competitive solutions tackling knowledge from multidisciplinary R&D areas, namely:

- Materials Processing: Composites processing, metal casting, metal sheet forming, metal-composites hybridization, additive manufacturing, joining technologies (adhesive bonding, FSW, laser welding and hybrid joining), and material properties customization;
- Advanced Monitoring and Structural Integrity: design, validation and inspection of mechanical structures; Instrumentation of systems, structures and components; custom advanced monitoring and inspection solutions; computer vision; design of quality control/assurance systems; numerical simulation of static and dynamic systems' behaviour; failure analysis; custom mechanical validation; ageing tests; ND inspection; materials joining;
- Mechanical Transmissions: High efficiency rolling bearings and lubricants for reduced dissipated heat in electric motors, gearboxes and other applications; high speed and high efficiency mechanical transmissions for EV drivelines, aerospace and other applications. Lubricants (grease, oil, water-based) to improve motor efficiency and reliability;
- Vibrations and Acoustics: Numerical and experimental analysis of the vibration of structural elements with low degrees of freedom, in (non)linear regime; modal analysis;
- Life Cycle Assessment: In-house developed digital data gathering inventory platform and tools and holistic methodologies for performance assessment of vehicle's structural components or systems (such as storage systems, at cell, module and pack levels and the corresponding integration), in the operational, economic, environmental, and social vectors; Eco-Efficiency and Sustainability assessment methods based on primary datasets over the full TRL scale;
- High-Performance Computational Tools: New design methods intertwining mechanical, electronic and computer engineering, under a common framework of cognitive decision-support systems based on algorithms for intelligent data modelling and optimization;
- Ergonomics, Injury Biomechanics and Passive Safety.
- Smart devices and data-driven manufacturing solutions; digitalization pathways, mainly targeted on the manufacturing sector.
- Hydrogen (H2) production, storage, transport and distribution, power to mobility/ industry/ gas/ synfuel/ power/ buildings, including its commissioning, operation and monitoring.

Participation in EU projects

HORIZON EUROPE

ESCALATE, SPINMATE, REINFORCE, FLASH-COMP, EuReComp, EARASHI, NerveRepack, HERO, CONCERTO, DIDEAROT

HORIZON 2020

MAREWIND, LEVEL-UP, EMB3Rs, LAY2FORM, SMARTFAN

i2m Unternehmensentwicklung GmbH

Organisation type:	SME
Contact person:	Aldo Ofenheimer
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Email:	aldo.ofenheimer@i2m.at
Location head office:	Graz, Austria
Number of employees:	8
Website:	www.ait.ac.at

i2m
creating business

Short summary of expertise and activities

i2m Unternehmensentwicklung GmbH is a research-based technology development and innovation consulting company and was founded in 2014.

The company focuses on helping its clients grow through strategy, innovation & technology, be it through i2m's own developed technologies and products or through strategy and innovation consulting provided in cooperation with the world-renowned Cambridge University (UK). The name "i2m" – innovation to market – embodies what the company is all about: developing innovations until they are a market success.

i2m, located in Graz / Austria, is active in two business areas: on the one hand as an engineering company in product and technology development (also own products/ solutions, e.g., "High Performance Latent Heat Storage" for automotive applications, system simulation tool for components sizing in early development stage), on the other hand as a management consultancy focusing on strategy, technology, and innovation management.

With a team of engineers and experts in strategy development, as well as technology and innovation management, i2m offers a holistic approach to its clients, who are active in technology-intensive industries in Europe (mobility, industrial goods, energy, pharmaceuticals & chemicals).

Portfolio of services and offerings
i2m portfolio of engineering services:

- Manufacturing of virtual sensors
- Latent heat storage technology
- Ultra-fast system simulation

- Technology scouting and benchmarking
- Development of mathematical models and numerical simulations
- Concept development and rapid prototyping of innovative products & services
- Support for market introduction
- Research and development

In addition to these engineering services, selected complementary strategy & innovation management services are also offered (e.g., technology strategy development, technology road mapping).

Participation in EU projects

SELFIE – Self-sustained and Smart Battery Thermal Management Solutlon for Battery Electric Vehicles
CEVOLVER – Connected Electric Vehicle Optimized for Life, Value, Efficiency and Range
GIANTS – Green Intelligent Affordable New Transport Solutions

Johannes Kepler University

Organisation type:	Public Educational Institution
Contact person:	Univ. Prof. Dr. Cristina Olaverri-Monreal
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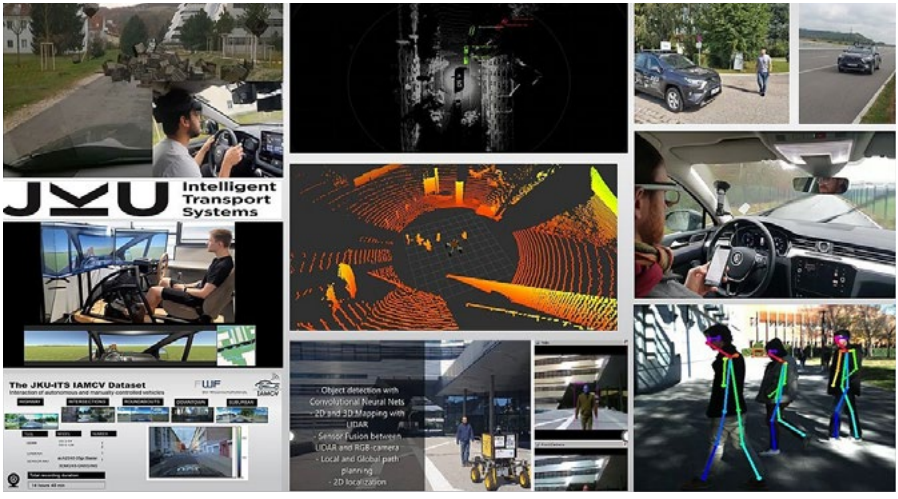
Email:	cristina.olaverri-monreal@jku.at
Location head office:	Linz, Austria
Website:	www.jku.at/its/

JKU Intelligent Transport Systems

JKU ITS Research Overview



Short summary of expertise and activities

Johannes Kepler University researchers lead in cutting-edge developments, actively engaging with the community. Their expertise is shared in dialogue with the public, local business, and cultural institutions. In education, research, and its third mission, JKU addresses global challenges.

JKU-ITS focuses in intelligent vehicular technologies, ICT, data analysis, smart mobility, and mobile sensors for automated, cooperative, and connected transport. The team collaborates in transportation networks, aiming to develop eco-friendly solutions through sensor and communication technologies. Key research areas include Human Factors and Interaction, Automated Connected Transportation, Machine Learning for Automated Driving, Simulation Platforms, Travel Behavior, and Digital Sustainable Transportation.

The head of the department, Prof. Olaverri-Monreal, has dedicated over 8 years to serving as a member of the board of governors at the IEEE Intelligent Transportation Society, assuming the presidency in both 2022 and 2023. Furthermore, she is a European Commission Expert for "Automated Road Transport" and has undertaken the review of numerous research centers, in Ireland, Germany, France, Sweden, etc..

In addition, she has developed projects as the Principal Investigator in collaboration with significant industry stakeholders in logistics, as well as infrastructure providers (e.g., Swarco, IAV GmbH, Post A.G).
Participation

Participation in EU projects

The JKU University has successfully secured funding for more than 62 EU projects, with 11 of them being managed as the coordinator. For instance:
OptiPEx – Optimizing Passenger Experience in Public Transport
AISA – AI Situational Awareness Foundation for Advancing Automation
SILENSE – (Ultra)Sound Interfaces and Low Energy iNtegrated Sensors
SCOTT – Secure COnnected Trustable Things
ENABLE-S3 – European Initiative to Enable Validation for Highly Automated Safe and Secure Systems
RItrainPlus – Research into optimised and future railway infrastructure
AIDOaRt – AI-augmented automation for efficient DevOps, a model-based framework for continuous development At RunTime in cyber-physical systems

Other EU-projects related to smart mobility, robotics and autonomous driving:
CASTSM – Connected and Automated Sustainable Transport Systems and Mobility, EU-funded Erasmus Mundus Design Measures Project
ERGODIC – Combined Passenger and Goods Transportation in Suburb Traffic, within the European partnership "Driving Urban Transitions" (DUT).

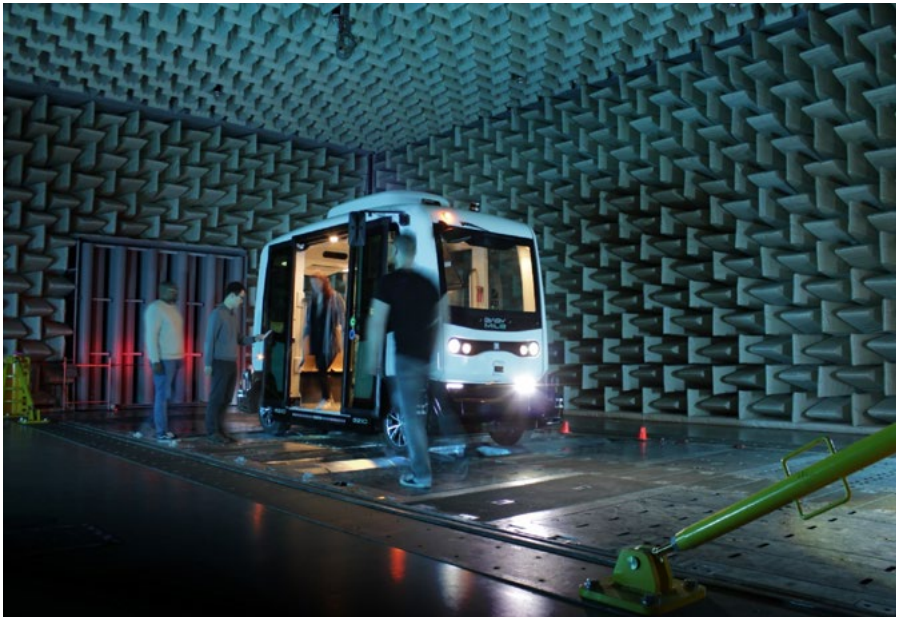
Furthermore, JKU-ITS has actively engaged in various international proposals, securing a total funding of over 2 million EUR since its establishment in 2018 through successful participation in eight national and international projects.

Karlsruhe Institute of Technology (KIT)

Organisation type:	University
Contact person:	Dr. Eckhard Szimba
Phone number:	+49 (0)721 608 47689
Email:	szimba@kit.edu
Location head office:	Karlsruhe, Germany
Number of employees:	9900
Turnover before tax:	€1100 Million
Website:	www.kit.edu

Karlsruhe Institute of Technology

Autonomous shuttle in KIT's acoustic four-wheel roller dynamometer



Short summary of expertise and activities

Karlsruhe Institute of Technology (KIT), a University of Excellence, creates and imparts knowledge for the society and the environment. KIT excels in a broad range of disciplines, i.e. in natural sciences, engineering sciences, economics, as well as the humanities and social sciences. It makes significant contributions to the global challenges of mankind in the fields of energy, mobility, and information. In high interdisciplinary interaction, KIT's research covers the **complete range from fundamental research to close-to-industry applied research** and from small research partnerships to long-term large-scale research projects.

Research at KIT is organized along eight "KIT Centers", which focus on challenges of fundamental importance to our society or on key topics resulting from the striving for knowledge. The **KIT Center Mobility Systems** embraces a **wide range of multidisciplinary competencies** to develop solutions for tomorrow's mobility. The KIT Center brings together about 800 engineers, natural scientists, economists and social scientists from more than 35 institutes, and covers the following research fields: vehicle concepts, vehicle technologies, methods and processes in design and production, infrastructure and traffic, digitization in mobility, as well as mobility and society. The KIT Center Mobility Systems provides both deep expertise in each specific research field, and – through its multidisciplinary concept – a sound basis to **address current and future mobility challenges in a cross-cutting and holistic systems perspective** such as smart and sustainable urban mobility concepts, autonomous driving, seamless mobility, alternative drive systems and energy-efficient transport.

Participation in EU projects

At KIT, several institutes have been involved in EU projects. The following list gives a selection of the more important projects: ARGO, ARRIVAL, ARTIC – Antenna Research and Technology for the Intelligent Car, AUTOSUPERCAP – Development of high energy/high power supercapacitors for automotive applications, BENEFIT – Business Models for Enhancing Funding for Infrastructure in Transport, DBCAR: Decisions and Behaviors for Cognitive Automobiles Research, eCOMPASS, ERANETMED-STORENERGY – Sodium-ion batteries – an advanced solution for mobile and stationary energy storage applications, EIT KIC InnoEnergy – Accelerating sustainable energy innovations, ETISplus, FORTISSIMO – Advanced Simulation, Modelling & Data Analytics for Industry, FUTRE, HERCULES-C – Higher Efficiency, Reduced Emissions, Increased Reliability and Lifetime, Engines for Ships, HIGH-TOOL – High-level strategic transport model, JobVehElec, KITe hyLITE PLUS – Innovative lightweight design for the vehicle industry, LEAFSLIM – Lightweight steel Leaf Springs with improved durability and reliability, Photofuel, PRE-DRIVE C2X – PREparation for DRIVing Implementation and Evaluation of C2X communication technology, SuMo Rhine, SUSANA, TRIP, VI-DAS – Vision Inspired Driver Assistance Systems.

KTH Royal Institute of Technology

Organisation type:	Univsersity
Contact person:	Peter Göransson Mikael Nybacka
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Location head office:	Stockholm, Sweden
Number of employees:	5000
Website:	www.kth.se

Short summary of expertise and activities

KTH Royal Institute of Technology in Stockholm is Sweden's largest technical research and learning institution and home to students, researchers and faculty from around the world dedicated to advancing knowledge. The wide spectrum of research at KTH demands variation in focus, approach and formation. We work to create an open atmosphere and break down traditional barriers between academic disciplines. Basic research is conducted in parallel with applied research, and the same is true of multidisciplinary work and specifically targeted work. Based on strong areas of research at KTH, six Reseach Platforms for multidisciplinary research have been created: Transport, Life Science, Materials, Digitalization, Energy, Industrial transformation.
The KTH Transport Platform is one the focal points in the collaborations with KTH's Strategic Partners with activities related to the transport field. KTH has formed Strategic partnerships with 11 companies, out of these 9 have a link to the Transport research area, see also **KTH Strategic parnering**.

KTH Transport Platform
With the ongoing globalisation, a growing world population and an increasing urbanization, the transport of people and goods sees a tremendous growth worldwide. The challenges associated to the environment, natural resource utilization and space allocation are becoming more and more complex to solve. To reach this, we need to break with the disciplinary/ thematic research paradigm and in joint collaborative efforts; involving industry, society and academia; formulate a new approach among others involving an increasing degree of multi-disciplinarity in research as well as education and training. The KTH Transport Platform is a vehicle for integration of transport related research from all of the Schools of KTH; individual researchers, multi-disciplinary oriented research centres as well as infrastructure in the form of laboratories etc. According to the latest mapping, more than 850 researchers at KTH are actively involved in transport related research. They are members of more than 40 research groups and 14 Centers of Excellence. The activities are managed through 5 thematic areas each contributing with a technology oriented vision: Holistic transport system, Innovative vehicle concepts, Policy and institutions, Transportation infrastructure, Transport in the Information Age. More about the KTH research activities in Transport may be found at **KTH Transport platform**.

Participation in EU projects

KTH has within Transport participated to a large number of EU projects, from FP4 through Horizon 2020. Examples of recent involvement are:
EIT KIC Urban Mobility, LOWBRASYS, ECCENTRIC, METPEX, COMPANION, ENSEMBLE WISE-ACT, EVERSAFE.

KU Leuven

Organisation type:	University
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Email:	bert.pluymers@kuleuven.be wim.desmet@kuleuven.be
Location head office:	Leuven, Belgium
Number of employees:	14000
Website:	www.kuleuven.be

KU Leuven built a hybrid concept car platform to demonstrate its innovative technology developments such as real-time deployment of combined wheel force and sideslip angle estimators performing stable estimation under low excitation while ensuring long-term stability.

Short summary of expertise and activities

KU Leuven boasts a rich tradition of education and research that dates back six centuries. KU Leuven is a charter member of LERU and in the Times Higher Education ranking KU Leuven is ranked as the 14h European university, while in the Reuters Top 100 of the World's most innovative institutions, KU Leuven is listed as the first European university. Its mission is threefold: research, education and service to society. KU Leuven Research & Development (LRD) is the technology transfer office (TTO) of KU Leuven. Since 1972 a multidisciplinary team of experts guides researchers in their interaction with industry and society, and the valorisation of their research results.

The LMSD division (**Mechanic/Mechatronic System Dynamics**) counts 120 researchers and aims to create added value during every phase (design / manufacturing / operations) in the lifetime of mecha(tro)nic systems by understanding, monitoring and controlling their dynamic (motion / vibration / acoustics) behaviour. Targeted systems include machines, vehicles, and manufacturing and assembly processes. The **Digital Twin concept** and **Machine Learning** and **Model Based Systems Engineering** approaches are adopted, thereby involving dynamic behaviour models, validated and enriched with dynamic measurement data.

Addressing both virtual and experimental activities, research is clustered around 5 major research lines: (i) large bandwidth dynamics of lightweight (meta)materials and systems, and their manufacturing, (ii) (flexible) multibody dynamics, (iii) NVH and flow-acoustics, (iv) smart system dynamics and (v) monitoring and prognostics of mecha(tro)nic components and systems. The organisation of the yearly ISMA, ISAAC and ISAMS courses and the biennial ISMA conference on Noise & Vibration Engineering, and the division's presence on dedicated digital media, are key dissemination elements, next to top journal publications and presentations at reference conferences and workshops.

Participation in EU projects

Throughout the years, LMSD has been actively involved in many national and international research projects, relevant to automotive engineering (full list available at www.mech.kuleuven.be/en/mod/Projects/Projects).

These include on-going HEU research projects such as MetaFacturing (coordinator), EU.FFICIENT (coordinator), LENS, VOLTCAR, NEWBORN, REBOOT-SKILLS, ICONIC, PROSPECTS5.0, RecAl, PLIADES and GIANTS, and Marie Curie research and training projects such as APRIORI (coordinator), METAVISION (coordinator), PATRON (coordinator), VAMOR (coordinator), GAP-NOISE, ActaReBuild, IN-NOVA, Gecko and METRAMAT.

Laboratory of Applied Thermodynamics (LAT) - Aristotle University Thessaloniki

Organisation type:	University
Contact person:	Prof. Leonidas Ntziachristos
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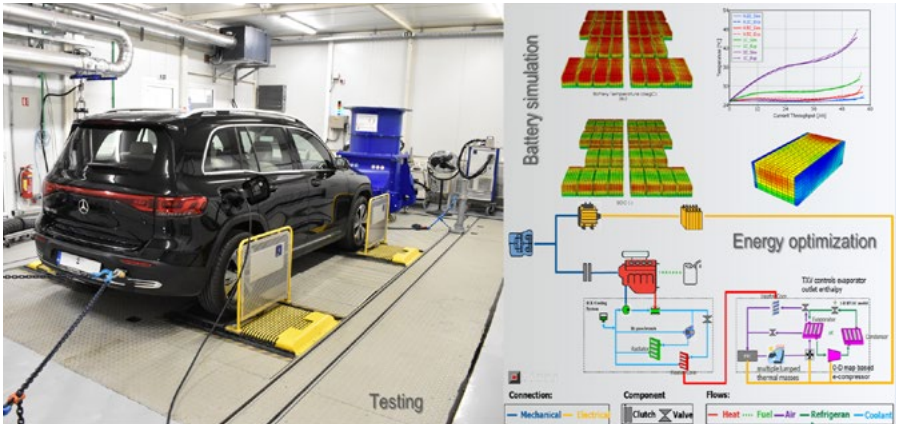
Email:	leon@auth.gr
Location head office:	Thessaloniki, Greece
Number of employees:	60
Website:	lat.eng.auth.gr

LAT LABORATORY OF APPLIED THERMODYNAMICS

Example of electric powertrains testing and simulations at LAT



Short summary of expertise and activities

LAT is a university laboratory established in 1975 with the aim to serve research, development and education in the areas of powertrain systems, combustion and energy conversion. The lab is fully equipped with testing and measurement equipment for light duty engines and vehicles, including power two wheelers and has access to testing facilities for heavy duty vehicles. The main research areas include:

- Combustion and electric powertrain and vehicle testing and evaluation (LD, HD, L-vehicles)
- Battery cell, module testing, thermal management and evaluation
- Non-exhaust (brake, tire) particle emissions sampling, measurement and analysis
- R&D on alternative fuels combustion and use in power systems (engines, fuel cells)
- Multi-physics simulations of power systems including engines, batteries, fuel cells, aftertreatment
- Energy and power optimization algorithms using conventional and machine learning methods
- Life cycle assessment of energy carriers and power systems combinations
- Optoacoustic sensor development for pollutants monitoring, including Black Carbon
- Field and on-board measurement of pollutants (vehicle, vessels, aircraft, machinery, air pollution)
- Pollutants dispersion in the wake of vehicles, vessels and the urban environment
- Policy and regulation impact assessment including energy and GHG projections

LAT has been a long lasting consultant of the European Commission in practically all emission and noise standards developed over the last twenty years with pinnacle achievement being the coordination of the CLOVE consortium in developing the Euro 7 standard.

Finally, LAT is a strategic partner of the automotive and fuel industry around the world in multi-physics modelling of aftertreatment and catalytic systems, fuel and lubricants evaluation for combustion engines, and impact assessments of technologies and policies.

Participation in EU projects

LAT has a long track record of coordination and participation in research projects, including: ICT-Emissions – Development of a methodology and tool to evaluate the impact of ICT measures on road transport emissions (coordination), DownToTen – Measuring automotive exhaust particles down to 10 nanometres (coordination), SCIPPER – Shipping contributions to inland pollution push for the enforcement of regulations (coordination), LENS – L-vehicles Emissions and noise mitigation solutions (coordination) EMERGE – Evaluation, control and mitigation of the environmental impacts of shipping emissions, RSENSE – Revolutionizing disease and environmental detection with portable optoacoustic sensing, ENGIMMONIA – Sustainable technologies for future long distance shipping towards complete decarbonisation, UPTOME – Unmanned-power-to-methanol production, VERA – Vehicle emission retrofit activities, AENEAS – Innovative energy storage systems onboard vessels, POSEIDON – Propulsion of ships with e-Methanol in favour of the decarbonisation of naval transport, ESCALATE – Powering EU net zero future by escalating zero emission HDVs and logistic intelligence.

LEITAT

Organisation type:	Technological Center
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Location head office:	Terrassa, Spain
Number of employees:	+500
Turnover before tax:	€48 Million
Website:	www.leitat.org

Short summary of expertise and activities

Founded in 1906, Leitat is one of the reference entities at state and European level in technology management. It has a team of more than 500 professionals, experts in applied research, technical services and management of technological and innovation initiatives. Leitat provides social, industrial, economic and sustainable value, offering comprehensive solutions in multiple sectors and areas: development of new materials, eco-sustainable production, occupational health prevention systems, revaluation of waste and use of natural resources, interconnectivity and digitization of industry, green energy and maximization of energy efficiency. Leitat is recognized by the Ministry of Economy, Industry and Competitiveness and is one of the main entities participating in the Horizon2020 program of the European Union.

Within the mobility sector, Leitat carries out end-to-end projects encompassing its entire value chain from materials development (post-lithium batteries, fuel cells, textile, self-reinforced fibre composite, fluids, etc.) and connected concept design to their integration within manufacturing processes supported by industrial 3D-enhanced robotic, AI, IoT and cybersecurity approaches. All those aspects are driven by circular economy feature such as safe- and sustainable-by-design tools, innovative technologies and strategies for a sustainable and safe production for efficient management of natural resources (critical raw material, bio-based material, energy and water) and the optimal treatment and recovery of residual flows.

Finally, beyond Integrated Product and Process Development, Leitat has also relevant expertise on treatment and control of air quality including related health exposure, eco-innovation services (LCA, S-LCA, Eco-design), microfluidic systems able for example to monitor use of drugs-of-abuse and multimodal crowd flow management. With all this, we set out to help industries develop their projects from any stage of the mobility value chain, in order to provide knowledge and innovation and create a strong and powerful industrial network based on the new products and processes developed.

Participation in EU projects

ZeroF – Development of verified safe and sustainable PFAS-free coatings for food packaging and upholstery textile applications, NET-Fuels – Increasing biomass conversion efficiency to carbon-negative sustainable biofuels by combination of thermal and bio-electrochemical processes, GH2 – GreenH2 production from water and bioalcohols by full solar spectrum in a flow reactor, AM4BAT – Gen. 4b Solid State Li-ion battery by additive manufacturing, Rhinoceros – Batteries reuse and direct production of high performances cathodic and anodic materials and other raw materials from batteries recycling using low cost and environmentally friendly technologies, BATRAW – Recycling of end-of-life battery packs for domestic raw material supply chains and enhanced circular economy, VIBES – Improving recyclability of thermoset composite materials through a greener recycling technology based on reversible biobased bonding materials, RAWMINA – Raw materials innovation for the circular economy: sustainable processing, reuse, recycling and recovery schemes, Upsurge – City-centered approach to catalyze nature-based solutions through the EU Regenerative Urban Lighthouse for pollution alleviation and regenerative development.PANACEA – PracticAl and Effective tools to moNitor and Assess CommErciAl drivers' fitness to drive.

Ludwig-Maximilians-Universität München

Organisation type:	University
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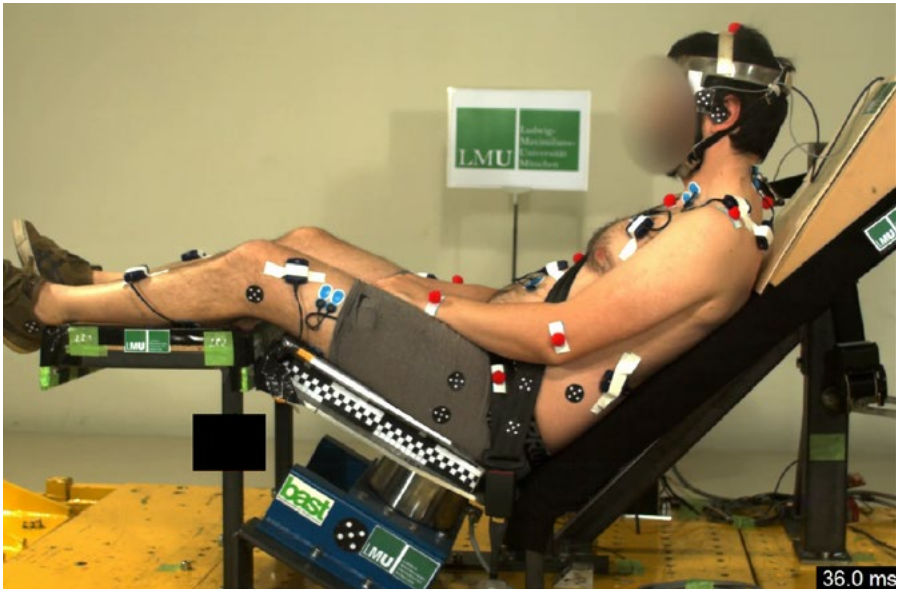
Location head office:	München, Germany
Website:	www.uni-muenchen.de



Short summary of expertise and activities

Founded, as Bavaria's first university with a papal concession in 1472, the LMU has been known for decades for its excellent science. LMU Munich is the leading teaching and research university in Germany, ranking 1st in Germany in the latest Times Higher Education World University Ranking. LMU Munich is a large beneficiary of the German excellence initiative and has hosted more than 85 ERC grants. In FP7 LMU Munich participated in 21 Marie Curie Initial Training Networks and coordinated 4 of them. In Horizon 2020 LMU has already been awarded 21 European Training Networks, of which 3 are coordinated by LMU researchers/scientists. Finally, LMU Munich currently offers more than 35 structured doctoral programs in a broad range of disciplines.

The Institute of Legal Medicine is part of the medical faculty, its Biomechanics and Accident Analysis Group deals with the detailed investigation of traffic accidents, their analysis as well as biomechanical backgrounds and the simulation of injury mechanisms. The primary field of application is the safety of road users, but this is extending to all neighbouring scenarios such as falls and violence. Eleven scientists from Mechanical Engineering, Medicine, Physics, Computer Science, Ergonomics and Biology contribute to in-depth crash studies and injury analysis, data analysis using epidemiology methods and studies examining the impact of anthropometry variations on road user injury risks.
The department has a pronounced expertise in investigation of possible impact scenarios and related injury mechanisms using numerical human body models and is able to analyse and evaluate potential hazards for all kinds of road users.

Participation in EU projects

Running:
OSCCAR (Future occupant safety for crashes in cars) – Development of future advanced occupant protection systems using integrated approach
PIONEERS (Protective innovations of new equipment for enhanced rider safety) –
To improve the performance of safety systems (Personal Protective Equipment and on-board systems), to develop better test and assessment methods for PTW users

Finished:
SENIORS (Safety enhancing innovations for older road users) – To improve the safe mobility of the elderly using an integrated approach
MOTORIST (Motorcycle Rider Integrated safety; Marie-Curie-Actions) – Safety systems
PISa: Development and Implementation of reliable and fail-safe integrated safety systems
MyMOSA – Safety systems
APROSYS – Scientific and technology development of critical technologies improving passive safety for road users in all relevant accident types and accident severities

MCAST Energy Research Group

Organisation type:	University
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Location head office:	Malta
Website:	www.mcast.edu.mt

Short summary of expertise and activities

The Malta College of Arts, Science and Technology (MCAST) is a public vocational applied science-based further and higher education institution with an international reputation for excellence in teaching established in 2001 as the first of its kind in Malta. The award-winning MCAST Energy Research Group (MCAST Energy) (est. 2014) forms part of the Institute for Engineering and Transport (est. 2016).

The Institute supported by this research group provides high-quality professional and academic programmes at technical, undergraduate and graduate levels in engineering and science fields. Even though MCAST is a young institution (est. 2001), it has many accomplishments to show over a very short period of time, while its foundations date back to the 1970s. MCAST manages and awards the diverse qualifications programmes from level 1 to level 8 (Doctorate) under the Malta Qualifications Framework (MQF).

MCAST is the leading public-funded academic institution in Malta, with around 7,000 full-time and 4,500 part-time students and a population of about 700 academic and administrative employees. Furthermore, MCASTEnergy has been top-ranked recently based on several inter/national-based research-funded activities. MCAST also manages a budget for developing a 120 Million Euro new campus and delivering up to about 4 Million Euro funds for vocational education recently, close to 5 Million Euro MCAST budgets on externally funded research projects, including H2020 projects. It also delivers national and regional research programmes funded by the Malta Council for Science and Technology (MCST), the European Structural Funds, the European Regional and Development Funds, INTERREG and ERASMUS+. It has actively participated in more than 12 COST Action programmes and Climate KIC Malta. Two nationally funded projects under ERANETMED initiatives were awarded to the PI, Dr Ing. Eur. Ing. Brian Azzopardi. MCAST, through the PI, is also the coordinator of the H2020 TWINNING JUMP2Excel (Joint Universal activities for Mediterranean PV integration Excellence) project and NEEMO (Networking for Excellence in Electric Mobility Operations) and the chair of ISOS-10 2017 "International Summit on the Stability of Organic and Perovskite Solar Cells", the MEDPOWER2022 "The 13th Mediterranean Conference on Power Generation, Transmission, Distribution and Energy Conversion" and initiated and chaired the first "Energy Day Conference" series.

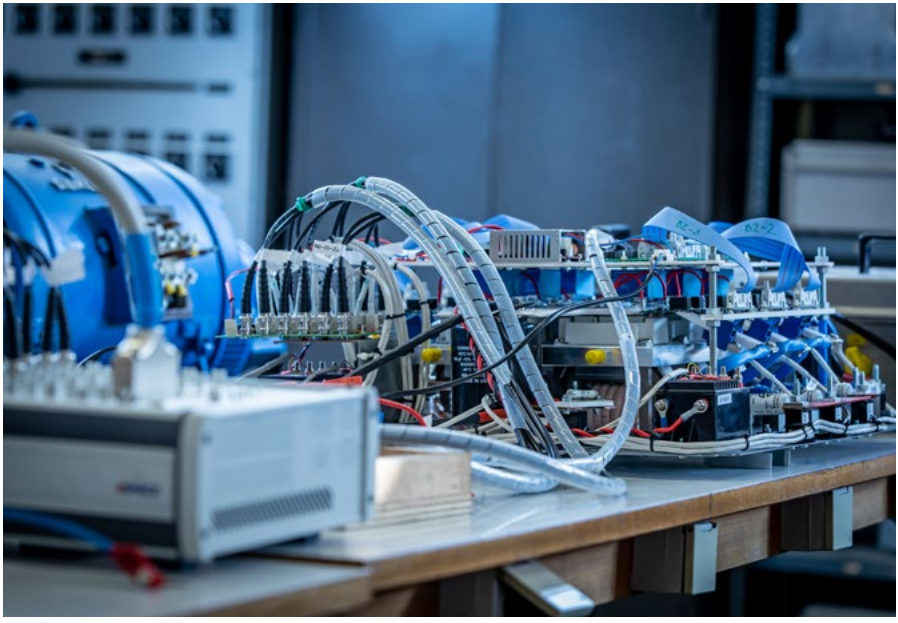
Participation in EU projects

The MCAST Energy team are also on the Management Committees of the COST Action research projects: CA16232 ENGAGER 'European Energy Poverty: Agenda Co-Creation and Knowledge Innovation' (2017 – 2022), CA16114 RESTORE 'REthinking Sustainability TOwards a Regenerative Economy' (2017 – 2022), CA16222 WISE-Act 'Wider impacts and scenario evaluation of autonomous and connected transport', and International Partnership Awards (2016 & 2017) €5k Projects each by Malta Council for Science and Technology (MCST) and several other projects, MCAST Energy Living Laboratory Project.

1. €1M Joint Universal activities for Mediterranean PV integration Excellence (JUMP2Excel). H2020, Coordinator. 2018 – 2022.
2. €0.8M Networking for Excellence in Electric Mobility Operations (NEEMO). H2020. Coordinator. 2019 – 2023.

MOBI Electromobility Research Centre

Organisation type:	Research Centre
Contact person:	Omar Hegazy
Phone number:	+32 2 629 29 92
Email:	omar.hegazy@vub.be
Location head office:	Brussels, Belgium
Number of employees:	120
Website:	mobi.research.vub.be



Short summary of expertise and activities

MOBI is the innovative research hub for electromobility in Europe, and aims to make a strong contribution to a more sustainable society. With more than 120 specialists, we form a multidisciplinary team that supports the transition to a more environmentally friendly and electrified mobility and transport system. A unique mix of technical, environmental and socio-economic skills is the strength of our research group. MOBI is the technological expertise centre in many areas ranging from electric and autonomous driving, to innovative batteries, intelligent drive systems and energy management, power electronics and charging infrastructure. In addition, we provide knowledge regarding business planning and consumer behaviour, and look at the integration of electric vehicles in energy communities and smart grids. This broad approach enables MOBI to develop sustainable and innovative solutions and electrification strategies that are broadly supported by all parties participating in the electric (autonomous) fleet of the future.

MOBI is also a Core Lab within the Flanders Make organization – Driving Innovation and has a long track record in a multitude of research projects.

Participation in EU projects

SELFIE – SELF-sustained and Smart Battery Thermal Management SolutIon for Battery Electric Vehicles, WIMBY – Wind In My Backyard: Using holistic modelling tools to advance social awareness and engagement on large wind power installations in the EU, CoFBAT – Advanced material solutions for safer and long-lasting high capacity Cobalt Free Batteries for stationary storage applications, LONGRUN – Development of efficient and environmental friendly LONG distance powertrain for heavy dUty trucks aNd coaches, BD4OPEM – Big Data for OPen innovation Energy Marketplace, INDIMO – Inclusive digital mobility solutions, SHOW – SHared automation Operating models for Worldwide adoption, eCharge4Drivers, Spartacus – Spatially resolved acoustic, mechanical and ultrasonic sensing for smart batteries, BATTERY 2030+ large-scale research initiative – At the heart of a connected green society, BAT4EVER – Building a Low-Carbon, Climate Resilient Future: Next-Generation Batteries, iSTORMY – Interoperable, modular and Smart hybrid energy STORage systeM for stationarY applications, URBANIZED – modUlaR and flexible solutions for urBAN-sIzed Zero-Emissions last-mile Delivery and services vehicles, HiiEFFICIENT – Highly EFFICIENT and reliable electric drivetrains based on modular, intelligent and highly integrated wide band gap power electronics modules NextETRUCK – Efficient and affordable Zero Emission logistics through NEXT generation Electric TRUCKs, SSH CENTRE – Social Sciences and Humanities for Climate, Energy aNd Transport Research Excellence, AM4BAT – Gen. 4b Solid State Li-ion battery by additive manufacturing, AUGMENTED CCAM – Augmenting and Evaluating the Physical and Digital Infrastructure, Horizon 2020 – InterConnect, SiC4GRID – Next generation modular SiC-based advanced power electronics converters for enhanced renewables integration into the grid, OPEVA – OPtimization of Electric Vehicle Autonomy, NEMOSHIP – New modular Electrical architecture and digital platforM to Optimise large battery systems on SHIPs, ZEFES – Zero Emission flexible vehicle platforms with modular powertrains serving the long-haul Freight Eco System, MAXIMA – Modular AXIal flux Motor for Automotive

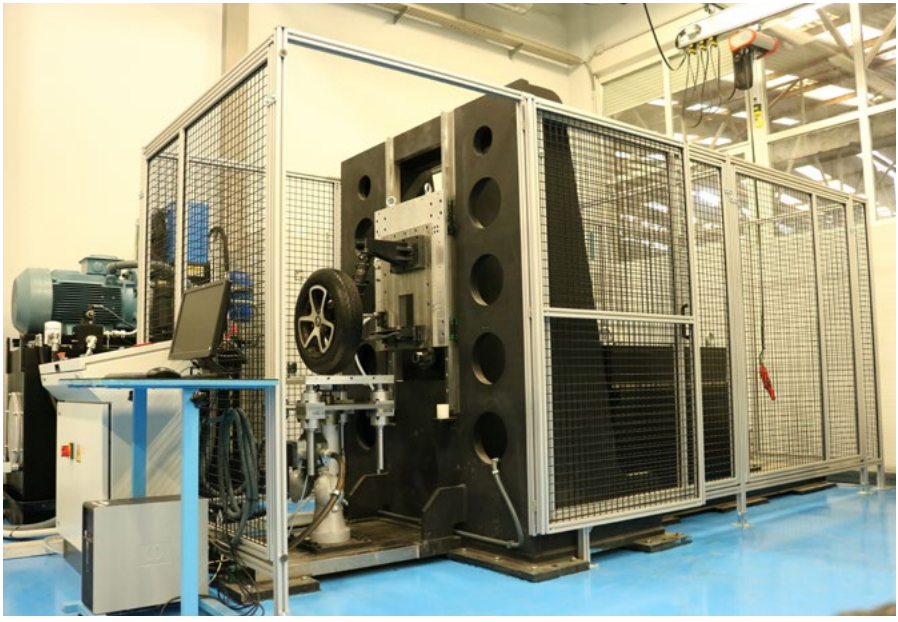
Mondragon Unibertsitatea

Organisation type:	University
Contact person:	Zigor Azpilgain
Phone number:	+34 656 766 881
Email:	zazpilgain@mondragon.edu
Location head office:	Mondragon, Spain
Number of employees:	240
Turnover before tax:	€30 Million
Website:	www.mondragon.edu/en/home

MONDRAGON UNIBERTSITATEA

GOI ESKOLA POLITEKNIKOA

ESCUELA POLITÉCNICA SUPERIOR



Short summary of expertise and activities

The Faculty of Engineering of Mondragon Unibertsitatea is a non-profit integral education cooperative, declared of public utility, whose main activities include education, research and technology transfer to companies and other public or private entities. One of its main characteristics is the close and permanent relationship with industry, enabling to outline the educational offer by adapting it to the needs of companies and organizations.

The participation of the professors at MGEP in research projects is one of the important focal points in its educational innovation process. The Research and Transfer activity of the faculty covers from fundamental applied research (in which are framed up the 130 doctoral theses running nowadays) to experimental development and innovation activities, also covering other industrial research activities. There are 16 research groups, grouped into 5 units: Mechanical behaviour and product design, Science, technology and transformation processes of materials, Design and industrial management processes, Embedded systems and information systems and Electric power.

Participation in EU projects

VENUS – Switched/Synchronous Reluctance Magnet-free Motors for Electric Vehicles
OPTIBODY – Optimized Structural components and add-ons to improve passive safety in new Electric Light Trucks and Vans (ELTVs)
DEWI – Dependable Embedded Wireless Infrastructure
EU-LIVE – Efficient Urban LIght VEhicles
OPTEMUS – Optimised Energy Management and Use
Hi-Fi Elements – High Fidelity Electric Modelling and Testing
WEEVIL – Ultralight and ultrasafe adaptable 3-wheeler

Mosaic Factor SL

Organisation type:	SME
Contact person:	Stefano Persi
Phone number:	+34 677 600 963
Email:	stefano.persi@mosaicfactor.com
Location head office:	Barcelona, Spain
Number of employees:	13
Turnover before tax:	600k
Website:	mosaicfactor.com

Short summary of expertise and activities

MOSAIC FACTOR is a fully independent SME focusing on trustworthy DATATECH and AI for automotive, mobility and logistics. The company has been funded in 2016 and since then has been involved in 15 collaborative R&D projects, mostly belonging to H2020 and HE, some at national/regional level.

The activity on HE focuses mostly on CLUSTER 5, addressing EVs, CCAM, logistics and mobility topics, always with a clear priority on developing and specializing data driven solutions. The leading team has been involved in EU funding since FP7, often coordinating proposals. Stefano Persi, the CEO of Mosaic Factor, previously worked in the automotive field at product level, responsible for the ECU implementing the diesel injection control of different European and Asian OEMs at Delphi Diesel Systems in France. Other members of Mosaic Factor have a previous experience in automotive, one of the key area of development for the coming years.

Technical competences of MOSAIC include: Network and Traffic Management, EVs, Emissions, Intermodal and Sustainable Supply Networks. MOSAIC team brings expertise in cutting edge ICT technologies such as Synthetic data for mobility, Digital Twins, Explainable and Inclusive AI, Generative AI and Data Privacy.

Mosaic Factor engages in local and European associations such as IN-MOVE by Railgrup (intermodal transport), Cluster Digital of Catalonia (ICT), BDVA – Big Data Value Association, ALICE (ETP on multimodal logistics), CCAM, and of course EARPA.

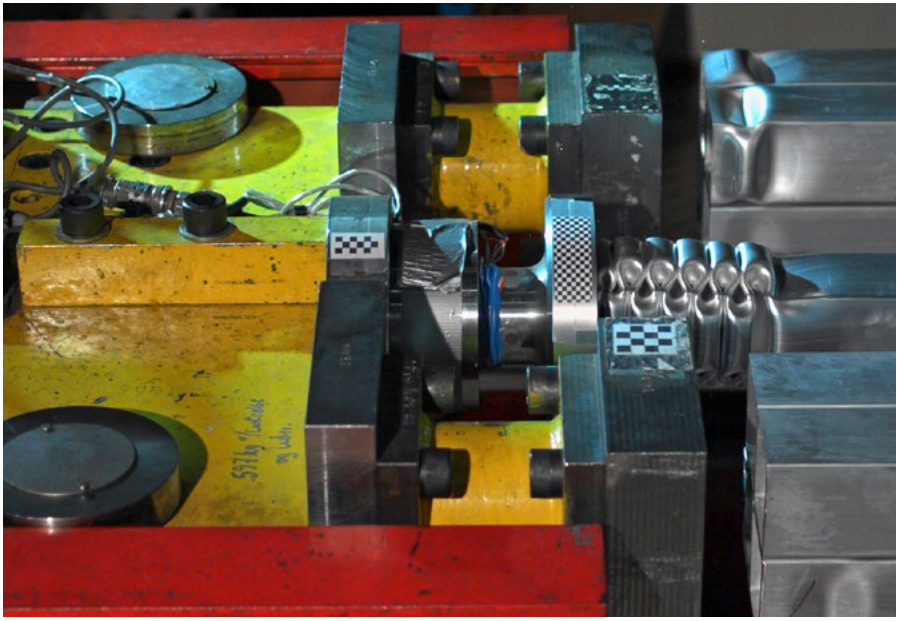
Participation in EU projects

NeMo – Hyper-Network providing seamless interoperability of electromobility services, creating an open, distributed and widely accepted ecosystem for electromobility.
eChargeForDrivers – Improvement of the Electric Vehicle charging experience in urban areas and on interurban corridors, making it more convenient for users to go green.
GreenLog – Green last mile logistics.
PIONEERS – Green Deal Lighthouse project on Port of the future technology.
IMOVE – Paving the way for a "roaming" service for MaaS users at European level.
INCLUSION – Understanding, assessment and evaluation of the accessibility and inclusiveness of transport solutions in European prioritised areas.
COREALIS – Multimodal inland planner and cargo prediction.

Norwegian University of Science and Technology, NTNU

Organisation type:	Public University
Contact person:	Professor Magnus Langseth
Phone number:	+47 930 37 002
Email:	magnus.langseth@ntnu.no
Location head office:	Trondheim, Norway
Number of employees:	6900
Turnover before tax:	NOK €3.6 Billion
Website:	www.ntnu.edu

High speed camera footage from a test in NTNU SIMLabís pendulum accelerator.
An aluminium profile (a generic crash box geometry) is subjected to impact in order to study energy absorption.



Short summary of expertise and activities

NTNU is Norway's largest university with 39 000 students, and has the main responsibility for higher education in technology in Norway. Hence, NTNU is the country's premier institution for the education of engineers. Having a main profile within technology and natural sciences, NTNU still offer a wide range of programmes of professional study. Approximately 350 PhDs are annually obtaining their PhD degree at NTNU, external funding raise above 25% and we participate in more than 100 EU funded research project in the Horizon 2020 programme.

Areas of special interest for the automotive industry:
Structural Impact Laboratory, SIMLab, works with multi-scale testing, modelling, and simulation of materials and structures subjected to dynamic loading. SIMLab is host of the Centre for Advanced Structural Analysis, CASA. CASA is a Centre for research-based innovation and aims at developing validated computational tools for innovation together with and for partners in the oil and gas industry, the transportation industry, materials suppliers and in industry and public enterprises working with physical security. Even though these partners represent different business sectors, they have similar needs in advanced structural analysis because the underlying theories and formulations behind the different computer tools are the same. www.ntnu.edu/casa

Industrial Ecology Programme (IndEcol) has an extensive academic record of accomplishment in developments as well as applications of Life Cycle Assessments and other Circular Economy related frameworks (MFA, SFA, EIO etc.). The programme has significant experience and ongoing activities across multiple drivetrain and fuel technologies. This includes different battery and fuel cell technologies, as well as internal combustion engines, boreal bio-fuels and fossil as well as bio-based hydrogen routes. Our work also bridges aspects such as light weighting with the circular economy aspects of global material cycles. Our objective is to ensure that the environmental and resource characteristics of our options to transform the transport system are well understood. The programme has had multiple contributors to UN initiatives such as the IPCC, UNEP Resource Panel, and the UNEP/SETAC Life Cycle initiative

Dept. of Material Science and Engineering, Batteries (Mg-ion), fuel cell battery testing Materials synthesis and characterisation. See: http://www.mozees.no .The Physical Metallurgy group does research related to aluminium alloys in automotive industry
Manulab – Industry 4.0. Additive manufacturing and joining of dissimilar materials
Dept. of Mechanical and Industrial engineering offer innovation, design and production.
Dept. of Computer Science, Visual Computing, Visual Intelligence, Machine Learning, Deep Learning, AI, HPC and Embedded Computing related to autonomous driving and advanced driver assistance systems, i.e. sensor fusion and perception, mapping and localization.

Participation in EU projects

StaCast, R5-COP, REALISM, HYPACTOR, ALION

Politecnico di Milano

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Location head office:	Milano, Italy
Number of employees:	>3000
Turnover before tax:	>500 M€
Website:	www.polimi.it/en

POLITECNICO
MILANO 1863

DriSMi – Driving Simulator Politecnico di Milano

Short summary of expertise and activities

The Politecnico di Milano, founded in 1863, is the largest technical university in Italy, with about 48,000 students. The university offers undergraduate, graduate and higher education courses in engineering, architecture and design.

According to the QS World University Rankings for the subject area 'Engineering & Technology', Politecnico ranked in 2022 as the 13th best in the world. It ranked 6th worldwide for Design, 9th for Civil and Structural Engineering, 9th for Mechanical, Aerospace Engineering and 7th for Architecture.

Politecnico di Milano participates in prestigious international networks alongside the main European technical universities: IDEA League, Alliance for Tech, Enhance. At the the Politecnico 12 departments are active. The Politecnico hosts 246 research labs, 34 interdepartmental labs and 6 large infrastructures. One of the large infrastructures is the Driving Simulator Lab, which is linked, through the Lombardy Mobility Cluster, to the Four Motors for Europe, an Association of the Governments of four EU Regions. Other large infrastructures are: the Laboratory for the Safety of Transport, the Wind Tunnel, the laboratories of Material Testing, Photonics, Multi-disciplinary Makerspace. The "mOve" Lab deals with automated vehicles.

The Department of Mechanical Engineering is currently the Politecnico's branch for the interaction with EARPA. The mission of the Department is to foster research on transports and sustainable mobility, (motorsport included), power technologies, biomechanics and service robotics,bio-materials, smart materials and hybrid materials, manufacturing and production systems, space and security.
The Politecnico di Milano manages the National Center of Sustainable Mobility (MOST), a Foundation participated by 49 stakeholders, with, among them, 25 Italian top Universities. The MOST has 14 spokes dealing with both vertical topics and horizontal topics. Vertical topics: Air Mobility, Sustainable Road Vehicle, Waterways, Rail Transportation, Light Vehicle and Active Mobility. Horizontal topics: Connected and Automated Vehicle (CAV), CCAM Connected Networks and Smart Infra-structures, MaaS and Innovative Services, Urban Mobility, Freight & Logistics, Innovative Materials and Lightweighting, Innovative Propulsion, Electric Traction Systems and Batteries, Hydrogen & New Fuels. Politecnico has a cooperation with Xi'an Jiaotong University. , a joint Centre has been operational since September 2019. Politecnico has a joint platform with Tsinghua University, the most important Chinese University.

Participation in EU projects

Politecnico is part of 5 KICs: EIT Climate, EIT Digital, EIT Urban Mobility, EIT Raw Materials, EIT Manufacturing.

Main figures - grants that have been obtained:
- Horizon 2020: 189 mln€, 34 ERC
- Horizon Europe: 32 mln € (at 28-Apr-2022), 11 ERC (as at 30-Jul-2022)
- Self financing (2020): 142 mln €

One of the many EU projects: AI@EDGE: A secure and reusable Artificial Intelligence platform for Edge computing in beyond 5G Networks.

Politecnico di Torino

Organisation type:	University
Contact person:	Prof. Federico Millo
Phone number:	+39 3316 796 013
Email:	federico.millo@polito.it
Location head office:	Turin, Italy
Number of employees:	1218 (Teaching staff) + 993 (Admin&Techn staff)
Turnover before tax:	€317 Million
Website:	www.polito.it

Short summary of expertise and activities

Politecnico di Torino was founded 160 years ago and represents a leading public university, in Italy and in Europe, in technical-scientific teaching and research (#33 for Engineering and Technology, according to 2022 QS World University Ranking).

More than 38,700 students (19% of which from foreign countries) are currently enrolled in 25 BSc and 34 MSc programs, with about 1160 PhD students (25% of which from foreign countries) attending 18 different PhD programs.

26 educational paths taught completely in English and more than 300 International Agreements testify to Politecnico di Torino's international vocation. Since 2014 Politecnico has been participating to more than 395 European and International Projects, and to 269 Horizon 2020 Projects, (for 68 of which as Coordinator) and 44 Horizon Europe Projects (for 11 of which as Coordinator).

Politecnico di Torino can boast several decades of experience in research activities on internal combustion engines, and, over the last 20 years, on hybrid and electric powertrains, as testified by its participation to several previous EU funded projects, as well as by a number of research projects in cooperation with primary OEMs, aiming to the development of innovative powertrain and after-treatment systems.

Politecnico di Torino's CARS, Center for Automotive Research and Sustainable mobility, recently constituted, focuses on research and development of the following areas:

- Green Vehicles, with focus on propulsion systems powered by alternative fuels, electric and hybrid systems, zero emission vehicles.
- Feasibility and competitiveness, with focus on production systems and on the implementation of new production technologies.
- Safe and integrated mobility, with a focus on connected vehicles and technological advancements on autonomous vehicles.
- Logistics and urban mobility, with the aim of managing flows of people and goods in an integrated manner to improve the usability of services and the quality of life in metropolitan areas.
- Sharing Mobility, with focus on monitoring and analysis of current and potential trends, integration in traffic monitoring systems, and EVs introduction in the urban systems.

Participation in EU projects

PHOENICE – PHev towards zerO EmissioNs & ultimate ICE efficiency (2021-2024)
BATTERY 2030+ – At the heart of a connected green society (2020-2023)
Solutions for largE bAtteries for waterBorne trAnsporT (2021-2024)
Sensing functionalities for smart battery cell chemistries (2020-2023)
EMPOWER – Eco-operated, Modular, highly efficient, and flexible multi-POWERtrain for long-haul heavy-duty vehicles, (2023-2026)
EM-TECH – Innovative e-motor technologies covering e-axles and e-corners vehicle architectures for high-efficient and sustainable e-mobility, (2023-2025)
HighScape – High efficiency, high power density, cost effective, scalable and modular power electronics and control solutions for electric vehicles, (2023-2025)

RICARDO

Organisation type:	RTO
Contact person:	Mr. Simon Edwards
Phone number:	+49 1761 9821 960
Email:	simon.edwards@ricardo.com
Location head office:	Shoreham-by-Sea, United Kingdom
Number of employees:	2700+
Turnover before tax:	€500 Million
Website:	www.ricardo.com/en

Short summary of expertise and activities

Ricardo is a global, strategic, engineering and environmental consultancy for the energy transition, with a value chain that includes the niche manufacture and assembly of high-performance products.

Our 100+ years of commitment to research and development empowers the Ricardo team of consultants, environmental specialists, economists, professional engineers and scientists to deliver class-leading innovative and sustainable solutions, helping to solve the most complex, dynamic challenges for our public and private sector clients who include: the world's major transport original equipment manufacturers and operators, supply chain company, energy companies, financial institutions and government agencies.

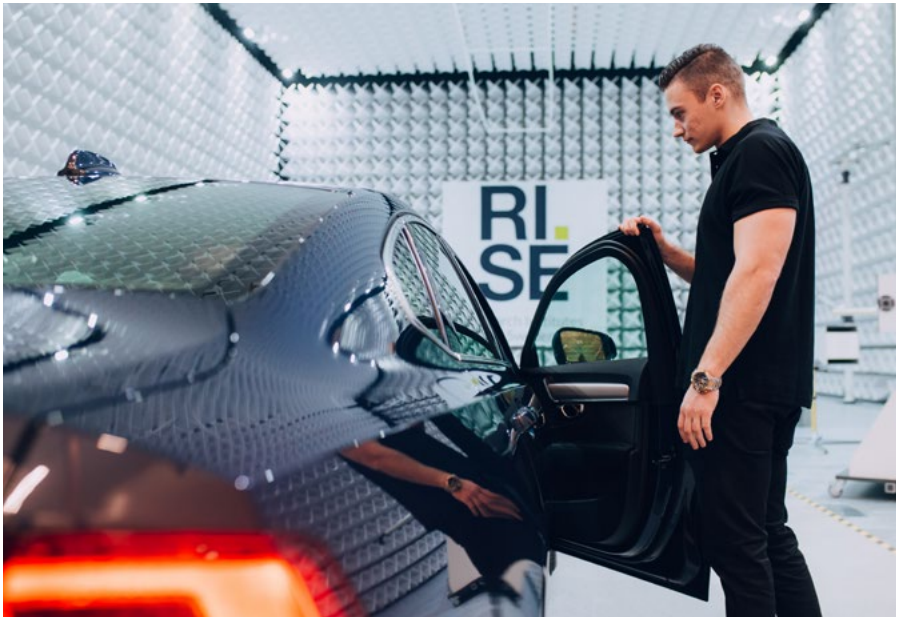
Headquartered in the UK, Ricardo has engineering technical centres in the Netherlands, the Czech Republic, Italy and the UK, and offices across Europe including in Denmark, Germany, Greece and Spain.

Participation in EU projects

Ricardo is and has been involved in many EU projects, those active projects are for example (including some of those from E3-Modelling AE):
*Le*Mesurier – Measuring the value of the KPI of the 2Zeio partnership
ZEFES – Zero Emission flexible vehicle platforms with modular powertrains serving the long-haul Freight Eco System
TranSensusLCA – Towards a European-wide harmonised, transport specific LCA Approach
XL-CONNECT – Large scale system approach for advanced charging solutions
STREnGth_M – Stimulating road Transport Research in Europe and around the Globe for sustainable Mobility
sHYpS – Sustainable HYdrogen powered Shipping
VERA – Vehicle Emission Retrofit Activities
NEMO – Noise and Emissions Monitoring and radical mitigation
NEWTRENDS – New trends in energy demand modelling
TWINRD – Macroeconomic modelling of R&D for the twin transition
ECEMF – European Climate and Energy Modelling Forum
iDesignRES – Integrated Design fo the Components of the Energy System to Plan the Uptake of Renwable Energy Sources: An Open Source Toolbox
CircoMod – Circular Economy Modelling for Climate Change Mitigation
ELEVATE – Enabling and LEVerating climate Action Towards net-zero Emissions
PRISMA – Net zero Pathway Research through Integrated aSsessment Model Advancements

Rise Research Institutes of Sweden AB

Organisation type:	R&D organisation
Contact person:	Dr. Fredrik Harrysson
Phone number:	+46 170 3136963
Email:	fredrik.harrysson@ri.se
Location head office:	Göteborg, Sweden
Number of employees:	3000
Turnover before tax:	€330 Million
Website:	www.ri.se



Short summary of expertise and activities

RISE is Sweden's research institute and innovation partner. Through our international collaboration programmes with industry, academia, and the public sector, we ensure the competitiveness of the Swedish business community on an international level and contribute to a sustainable society. Our 3000 employees engage in and support all types of innovation processes. RISE is an independent, state-owned research institute, which offers unique expertise and about 130 testbeds and demonstration environments for future-proof technologies, products and services.

RISE develop and increase the use of our leading, dynamic environment for testing, demonstration, and pilot production.

RISE support and encourage organizations – particularly small and medium-sized enterprises – to participate in EU research programmes and benefit from international collaborative research.

RISE offer within transport and mobility area:

- Challenge driven solutions
- Research and testing of everything from material technology, production technology and software to complete vehicles and simulation of logistic flows
- Analysis and long-term strategies for building expertise together with and in support of industry
- And a lot more...

Participation in EU projects

RISE participates continuously in about 25-30 EU projects, in cooperation with partners from our extensive international network. As examples of recent European and national mobility and transport related projects we have: **Projects:** SECREDAS – Product security for cross domain reliable dependable automated systems, eCAIMAN – Electrolyte, cathode and anode Improvements for market-near next-generation lithium-ion batteries, PROPART – Precise and robust positioning for automated road transports, MICEV – Metrology for inductive charging, EMPOWER – Empowering a reduction in use of conventionally fuelled vehicles using positive policy measures, RUGGEDISED – Create urban spaces powered by secure, affordable and clean energy, smart electro-mobility, smart tools and services, METROHYVE – Metrology for hydrogen vehicles, IMOVE – Unlocking large-scale access to combined mobility through a European MaaS network, MEGAMARt2 – Model based technologies modernise European manufacturing, HEADSTART – Harmonised European solutions for testing automated road transport, ARCC – Rail freight automation research activities, GOLNG – Development of LNG infrastructure and promote its usage in the transport industry, ROADVIEW – Robust automated driving in extreme weather, POWERIZED – Develop breakthrough technology for digitized and intelligent power electronics, SUNRISE – Safety assurance framework for CCAM technologies, SAFEXPLAIN – Safe and explainable critical embedded systems based on AI, MODI – A leap towards SAE L4 automated driving features, VALU3S – Verification and validation of automated systems safety and security

RWTH Aachen University

Organisation type:	University
Contact person:	Prof. Dr. Peter Urban
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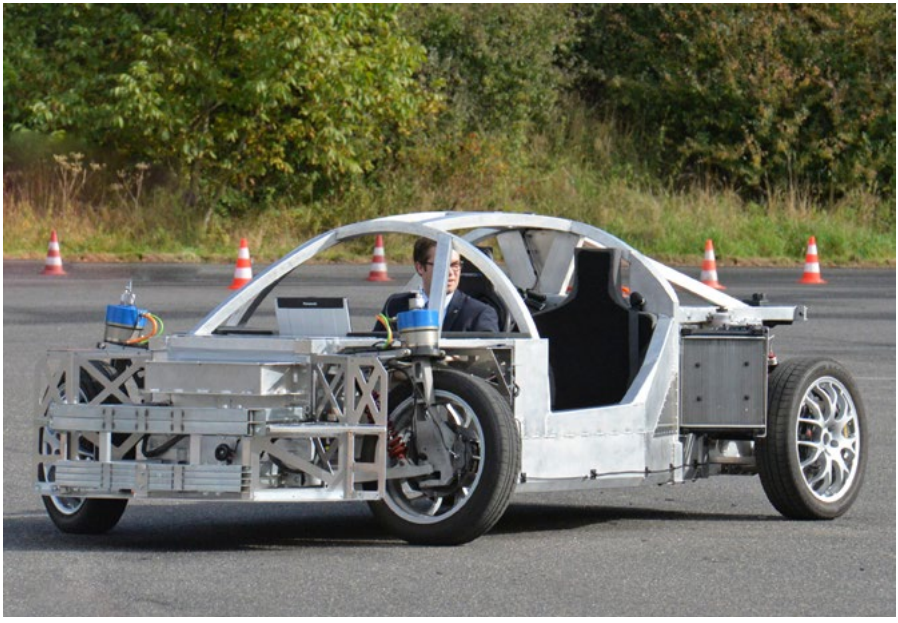
Email:	peter.urban@ika.rwth-aachen.de
Location head office:	Aachen, Germany
Number of employees:	10,000
Website:	www.rwth-aachen.de



Short summary of expertise and activities

RWTH Aachen University is recognised as one of the leading universities worldwide in vehicle technology. Its Profile Area "Mobility and Transport Engineering" coordinates and shapes the integration of future vehicle technologies in human-centred and sustainable mobility for people and goods, while the Profile Area "Energy, Chemical & Process Engineering" pursues the complementary vision of fully sustainable energy and material cycles.

Based on the interdisciplinary competences in these Profile Areas and excellent infrastructure, RWTH Aachen University tackles complex challenges in these research areas and develops solutions, which are rooted in research-oriented teaching and transformed to innovations in partnerships with industry, politics and society. Projects range from the development of new methods of transport planning and organization, intelligent transport infrastructures as well as mobility systems of different automation levels to the development of innovative vehicle concepts, their subsystems and components, the related energy conversion processes as well as energy storage and distribution options. A special focus is on the needs and requirements of individuals and society as well as environmental compatibility. The extensive research infrastructure ranges from powerful simulation tools to a multitude of test benches and driving simulators, various test sites and test tracks including a freely configurable digital communication environment.

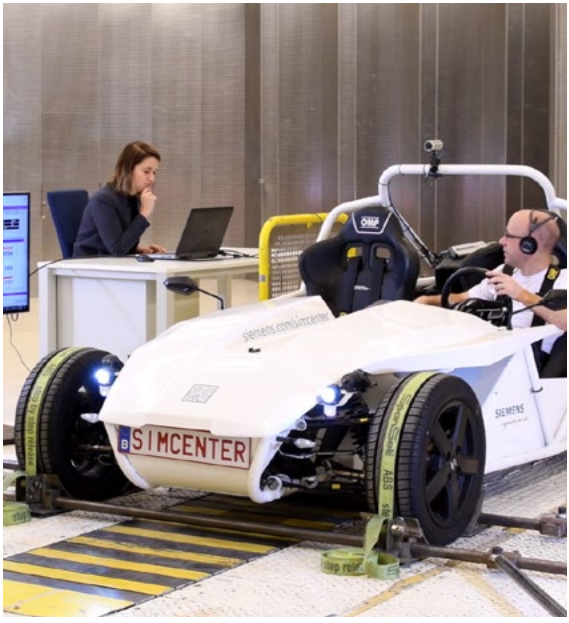
In order to shape future road transport, engineers and scientists with interdisciplinary competences are needed. For this reason, RWTH Aachen University has created the interfaculty degree program in Transportation Engineering and Mobility complementing its programs on Automotive and Energy Engineering. The entities coordinating the latter programs as well as the above-mentioned Profile Areas are also representing RWTH Aachen University in EARPA: the Institute for Automotive Engineering (ika) and the Chair of Thermodynamics of Mobile Energy Conversion Systems (tme).

Participation in EU projects

AIthena – AI-based CCAM: trustworthy, explainable, and accountable
Coachyfied – Coaches with hydrogen fuel cell powertrains for regional and long-distance passenger transport with energy optimized powertrains and cost optimized design
Escalate – Powering EU net zero future by escalating zero emission HDVs and logistic intelligence
FEDERATE – Software defined vehicle support and coordination project
Hi-Drive – Addressing challenges toward the deployment of higher automation
LONGRUN – Development of efficient and environmental friendly long distance powertrain for heavy duty trucks and coaches
STREnGth_M – Stimulating road transport research in Europe and around the globe for sustainable mobility
SUNRISE – Safety assurance framework for connected, automated mobility systems
V4SAFETY – Vehicles and VRU virtual evaluation of road safety
Versaprint – Versatile printed solutions for a safe and high-performance battery system

Siemens Digital Industry Software STS

Organisation type:	Software company, Simulation and Test solutions, R&D
Contact person:	Gijs Kellendonk
Phone number:	+31 6 20595428
Email:	gijs.kellendonk@siemens.com
Location head office:	Leuven, Belgium
Number of employees:	1500+
Website:	www.plm.automation.siemens.com/global/en/products/simcenter/



Short summary of expertise and activities

Siemens Digital Industries Software is driving transformation to enable a digital enterprise where engineering, manufacturing and electronics design meet tomorrow. The Xcelerator™ portfolio, the comprehensive and integrated portfolio of Siemens DI SW, helps companies of all sizes create and leverage a comprehensive digital twin that provides organizations with new insights, opportunities and levels of automation to drive innovation.

Participation in EU projects

There is a strong portfolio of regional and national level projects and collaborative programs for Transport, Aerospace and ICT related research. Since the founding of EARPA, Siemens has been active both as participant as well as coordinator in more than 150 EC-funded projects.

As the automotive industry is our key focus, our product attributes and specific performances focus on noise, vibration, durability, thermal, energy, safety, sensing, control and autonomous.

Recently Siemens joined Horizon projects like PROVEN, SUNRISE and AITHENA. Siemens also participates in Marie-Curie projects like Mirelai and Gap Noise.

SiEVA d.o.o.

Organisation type:	R&D company
Contact person:	Mr. Milos Šturm
Phone number:	+ 386 5 375 6617
Email:	milos.sturm@hidria.com
Location head office:	Šempeter pri Gorici, Slovenia
Number of employees:	43
Website:	www.sieva.si

Short summary of expertise and activities

SiEVA d.o.o. is a research company whose name is an abbreviation in Slovene that stands for "Synergetic ecologic safe vehicle". The research centre has been founded by nine Slovenian companies with an aim of providing research and development service in strategic fields of vehicle electrification and vehicle safety.

Fields of research of the SiEVA d.o.o. include:

- Additive manufacturing (metal 3D printing)
- Energy and environment – Internal combustion engine,
- Energy and environment – Vehicle electrification
- Safety and comfort
- Tools and technology.

SiEVA d.o.o. research centre competences:

- **Competences in the field of products, including:** rapid prototyping, tools with conformal cooling, modification and surface treating of non-ferrous metals, modification of sheet metal, surface steel product protection, sprinkling and stamping of thermosets and thermoplasts with inserts, remodeling of thermoplasts, metal and non-metal material bonding, different welding techniques (resistance welding, ultrasonic welding and laser welding), electro controller units, precise die casting technologies, etc.
- **Competences in the field of development technologies, including:** design for additive manufacturing, topology optimisation, virtual development, virtual assessment systems, process simulation, product and tool construction and modelling, prototype testing in real condition simulation, materials characterization, metrology, structural analysis, process optimization, and process automation, possible error and consequence analysis – FMEA, etc.

Participation in EU projects

EARPA Task Forces that are the most in line with research priorities of the SiEVA d.o.o. research centre are The Hybrid and Electric Systems & Components Task Force and Advanced Combustion Engines & Fuels Task Force.

SiEVA participated in two Horizon 2020 projects: FACTS4WORKERS (www.facts4workers.eu) – Worker-Centric Workplaces in Smart Factories and COMBILASER (www.combilaser.eu) – COMbination of non-contact, high speed monitoring and non-destructive techniques applicable to LASER Based Manufacturing through a self-learning system.

SiEVA's founder companies have been recently involved in many R&D projects from the 7th FP funded from different EU funds. These projects, include among others active participation in ROMEO project, consortium CAPIRE and EUCAR and EUREKA project associations.

Fundación Tecnalia Research & Innovation

Organisation type:	R&D company
Contact person:	Joshué Pérez Rastelli
Phone number:	+34 607 194 924
Email:	joshue.perez@tecnalia.com
Location head office:	Derio, Spain
Number of employees:	1500
Turnover before tax:	€120 Million
Website:	www.tecnalia.com

tecnalia
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

Advanced control system laboratory, shared control simulator and connected and automated Twizy vehicle

Short summary of expertise and activities

TECNALIA is the largest centre of applied research and technological development in Spain, a benchmark in Europe and a member of the Basque Research and Technology Alliance. We collaborate with companies and institutions to improve their competitiveness, people's quality of life and achieve sustainable growth. We do it thanks to a team made up of more than 1,400 people (44% women – 56% men) who are passionate about technology and committed to building a better society.

In Europe, TECNALIA has consolidated its position as the first private organisation in Spain in project contracting, participation and leadership under the European Commission's HORIZON 2020 programme, in partnership with over 600 Spanish companies.

Tecnalia's value proposal for the Mobility Sector in focused on the sustainable mobility, where we design and develop technologies and new business models that contribute to the shift towards a future scenario in which mobility has a low environmental impact and is connected, efficient, safe and inclusive. We also contribute to the positive transformation and development of cities and regions by implementing a set of people-oriented technology innovation solutions to develop smart, low-carbon urban environments. This includes improving transport vehicles, communication systems and energy infrastructures, as well as their interaction and integration into urban and interurban ecosystems.

- Urban air mobility
- Smart mobility management
- Energy for sustainable mobility
- Transport infrastructures
- Automated driving
- Electric and hybrid vehicles

Participation in EU projects

PRYSTINE – Programmable Systems for Intelligence in Automobiles.
3Ccar – Integrated Components for Complexity Control in affordable electrified cars
AUTODRIVE – Advancing fail-aware, fail-safe, and fail-operational electronic components, systems, and architectures for fully automated driving to make future mobility safer, affordable, and end-user acceptable.
ENABLE-S3 – European Initiative to Enable Validation for Highly Automated Safe and Secure Systems
UnCoVerCPS – Unifying Control and Verification of Cyber-Physical Systems
SerioT – Secure and Safe Internet of Things
HIADVICE – HIghway ADVanced CruIse AssistanCE
IoSense – Flexible FE/BE Sensor Pilot Line for the Internet of Everything
STEVE – Smart-Tailored L-category EV demonstration in Heterogeneous urban use cases
CITYMOBIL2 – Cities demonstrating cybernetic mobility
EVENTS – ReliablE in-Vehicle pErception and decisioN-making in complex environmenTal conditions.
SELFY – SELF assessment, protection & healing tools for a trustworthY and resilient CCAM
AWARE2ALL – Safety systems and human-machine interfaces oriented to diverse population towards future scenarios with increasing share of highly automated vehicles.
LONGRUN – Development of efficient and environmental friendly LONG distance powertrain for heavy dUty trucks aNd coaches
FITGEN – Fully Integrated E-axle for the Third GENeration electric vehicles
NEXT-eTRUCK – Efficient and affordable Zero Emission logistics through NEXT generation Electric TRUCKs

Technische Hochschule Ingolstadt

Organisation type:	University
Contact person:	Mr. Prof. Christian Facchi
Phone number:	+49 841 9348 7410
Email:	christian.facchi@thi.de
Location head office:	Ingolstadt, Germany
Number of employees:	550
Website:	www.thi.de

*Outdoor and Indoor CARISSMA Test Facilities under weather conditions (**Rain and Fog** Simulation Tests)*

Short summary of expertise and activities

The **Technische Hochschule Ingolstadt (THI)** is a medium sized University of Applied Sciences training currently about 5.500 students in about 40 technical and business science programs. Core competencies at THI hover around the fields of automotive, aerospace, renewable energies and business management. CARISSMA is the first research center of its kind at a German University of Applied Sciences.

CARISSMA- Automotive Safety Research and Test Center
Based on a 28 million budget has been designed as leading scientific center for vehicle safety in Germany. A unique feature of the **CARISSMA facilities** is the **indoor test laboratory** (crash and robot-controlled vehicle tests) **where environment conditions** such as weather, lightning or driving surface can be simulated. CARISSMA includes **outdoor facilities for integrated safety systems, drop tower**, Vehicle2X-Lab, **safe energy storage lab**, **HiL lab**, **simulation cluster**, **driving simulator with hexapod movement platform** and **a pedestrian protection lab**. To contribute to the social challenge of "Vision Zero", CARISSMA addresses Integrated Safety Systems that not only focus on conventional approaches of Active and Passive Safety but also provide a holistic global safety concept under its 4 main research areas:

1. Passive Safety
- Crash Sensing
- Environment Sensor-Based Detection of VRU and vehicles
- Robust Object Tracking
- Sensor Validation by Reproducible Environmental Influences
- Innovative Safety Actuators and Smart Airbags

2. Integrated Safety
- Collision Avoidance and Mitigation
- Real and Virtual Test Drives
- Machine Learning for Vehicle Safety Applications

3. Testsystems and Methods
- Integrated safety functions
- "Mixed-Reality"
- Vehicle2X-Communication
- Automated Driving
- Sensor Simulation under Weather Conditions
- Hardware-in-the-Loop (HIL)

4. Safe Electromobility
- Battery systems
- Vehicle operation
- Battery Management Systems, testers, simulators and misuse testing

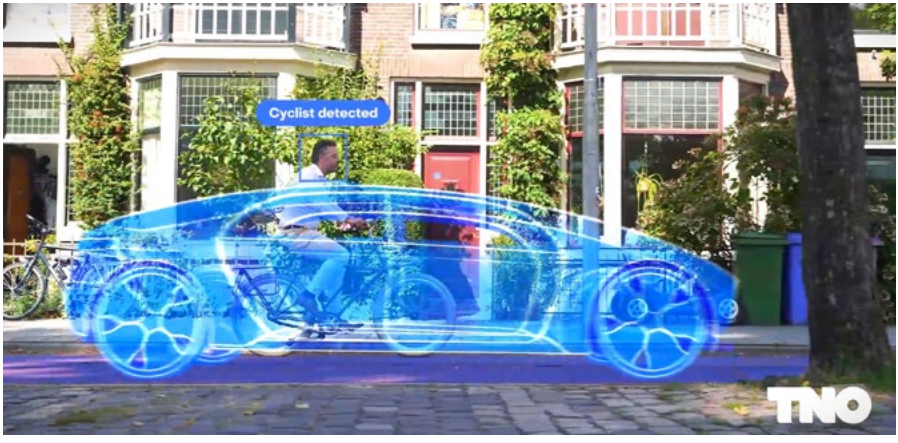
Engine and power train and Power electronics
Research focuses on the assembly of drives, shafts, axle drive, and engine analysis. The research work ranges from component analysis to the functional analysis of the whole aggregate. Power electronics research activities are focused on the development, simulation and optimization of innovative DC-DC and DC-AC converter topologies and multi-converter systems for automotive applications.

Participation in EU projects

LOCOBOT – LOw COst roBOT co-workers
RiFLE – Rail Freight and Logistics Development
AutoUniMo – Automotive Production Engineering Unified Perspective based on Data Mining Methods and Virtual Factory Model
AWARE – Applied NetWork on Automotive Research and Education
COBRA – CObalt-free Batteries for FutuRe Automotive Applications
SAFE-UP – proactive SAFEty systems and tools for a constantly UPgrading road environment

TNO (Netherlands Organisation for Applied Scientific Research)

Organisation type:	R&D Organization
Contact person:	Martijn Stamm
Phone number:	+31 88 866 57 34
Email:	secretaryhelmond@tno.nl
Location head office:	The Hague, The Netherlands
Number of employees:	3897
Turnover before tax:	€590.7 Million
Website:	www.tno.nl



Short summary of expertise and activities

TNO connects people and knowledge to create innovations that boost the competitive strength of industry and the well-being of society in a sustainable way. This drives the over 5,000 professionals at TNO, in their work every day. TNO was founded by law in 1932 and is regulated by public law. We are independent: not part of any government, university or company.

A major challenge lies in creating a liveable future for all. Our approach is based on the conviction that the end users, the modality and the environment interact with each other constantly. In order to innovate in that ecosystem, smart communication solutions are needed. In order to make sustainable and smart traffic and transport possible, intelligence is needed in the logistics and mobility system. For example, in the form of self-organization and intelligent communication.

Safe, sustainable & efficient mobility: We strive towards Zero calamities, Zero emissions and Zero loss.
TNO enables businesses in the mobility sector and the logistic supply chain to introduce safe connected automated vehicles (CAV) and offer technologies and methodologies to maximise safety, sustainability and efficiency of CAV-based (traffic/logistic) system applications.

Our contribution is to provide technological solutions (like algorithms for improving situational awareness, standardisation, quality and trust, and digital infrastructures for functions such as localisation), and tools and methodologies like digital twins, scenario-based safety assessment and methods for policy making to optimize the impact on system level.

TNO enables OEMs to validate real world pollutant and greenhouse gas emission reductions by active in-service monitoring, and governments to develop fact based sustainable mobility policies.
Our contribution is to provide new sustainable propulsion technologies for (heavy duty) vehicles, inland shipping and non-road mobile machinery, monitoring technology and methodology for tailpipe and non-tailpipe emissions as well as independent assessments on policy and technology impact.

Participation in EU projects

NextETRUCK – Efficient and affordable zero emission logistics through next generation electric trucks
LENS – L-vehicles emissions and noise mitigation solutions
VERA – Vehicle Emission Retrofit Activities
SUNRISE – Safety assurance framework for connected, automated mobility systems
FAME – Framework for coordination of Automated Mobility in Europe
MODI – A leap towards SAE L4 automated driving features
AWARE2ALL – Safety systems and human-machine interfaces oriented to diverse population towards future scenarios with increasing share of highly automated vehicles
AITHENA – AI-based CCAM: Trustworthy, Explainable, and Accountable
V4SAFETY – ehicles and VRU virtual evaluation of road safety
ZEFES – Zero-emissions freight ecosystem

Universidad Carlos III de Madrid

Organisation type:	Public Educational Institution
Contact person:	Prof. Fernando Garcia
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Email:	fegarcia@ing.uc3m.es
Location head office:	Madrid, Spain
Website:	www.uc3m.es/

Short summary of expertise and activities

UC3M is a Spanish public university that excels in research, teaching, and innovation. It is among the 35 best universities in the world in the QS Top 50 Under 50 ranking and is among the best universities in the world in 14 academic fields, according to the Shanghai 2021 ranking by subject. UC3M has numerous accreditations and quality distinctions, such as the EUR-ACE seal in the field of engineering and the AACSB accreditation in business and finance programmes, among others. It has exchange agreements with universities in 56 countries on 5 continents. In addition, the University participates in international networks of excellence such as YERUN (Young European Research Universities) or the European alliance YUFE (Young Universities for the Future of Europe).

At European level, the UC3M, throughout the Horizon 2020 Framework Programme, has attracted a total of 66.23 million euros through 147 projects, 24 of them coordinated. According to the IUNE 2021 Observatory report on Research Activity in Spanish Universities (2010-2019 data), UC3M is among the top Spanish universities in terms of the number of projects per professor in both the H2020 Framework Programme and the National Plan. In terms of industrial transfer, the report highlights that UC3M ranks second in Spain in the number of national patents per permanent lecturer in 2019, and is third in income from R&D contracts and consultancies per lecturer.

UC3M has an extensive portfolio of projects in the automotive sector, both at scientific and industrial levels, with experienced researchers in the field. Professor Fernando Garcia, main contact with EARPA, is leader in the development of perception technologies in the automotive sector, developing projects and patents as project leader with Renault France, and BOSH Germany, as well as being one of the active members of the team developing the first certified level 5 automobile in Spain, developed by the UC3M. He is also one of the directors of the IEEE-Intelligent Transportation Systems Society since 2017.

Participation in EU projects

EcoMobility, SHOW, LABYRINTH, R3CAV, DAEMON, NewControl, 5Growth, Cities Timanfaya, Project Tornado, 5G IN Fire.

Other projects related to robotics and autonomous driving:
BADGER. The main objective of the project is the design and development of the autonomous underground robotic system that can drill, maneuver, localize, map and navigate in the underground space.
1 January 2017 - 30 June 2020.

INDIRES. Funded by the European Research Fund for Coal and Steel (RFCS). The project addresses the crucial issue of rapidly acquiring and providing information, which is a key necessity in the effective response to a serious mining incident. 2018-2021.

The Universidad Carlos III de Madrid (UC3M) is among the most successful Spanish organizations in Horizon 2020 (H2020), the EU Framework Programme for Research and Innovation, which came to an end last year. These results were recently published in a report about the participation of Spanish organizations in H2020 by the Center for the Development of Industrial Technology (CDIT, in its Spanish acronym) at the Spanish Ministry of Science, Innovation and Universities. The UC3M ranks among the most prominent Spanish universities for economic return in H2020, regardless of the institutions' size.

University of Firenze

Organisation type:	University
Contact person:	Mr. Niccolò Baldanzini
Phone number:	+39 055 2758749
Email:	niccolo.baldanzini@unifi.it
Location head office:	Firenze, Italy
Number of employees:	3811
Turnover before tax:	€68 Million
Website:	www.unifi.it

Short summary of expertise and activities

The University of Firenze (UNIFI) joins EARPA via its Dept. of Industrial Engineering, which has a technical background spanning several competence areas:

Road Safety
UNIFI has a long lasting research tradition in the field of Powered Two-Wheelers safety, where it is one of the main experts worldwide. More recently it built up competences also in pedestrian and cyclist safety. Road safety research is focused both on vehicle and on personal protective equipment, with a cross cutting approach from primary to tertiary safety.

Life Cycle Sustainability Assessment (LCSA)
UNIFI has expertise on the environmental friendly design and assessment of products and technologies. The main research activities in the automotive field concern the LCSA (=LCA+LCC+Social_LCA) to compare and optimize the environmental, economic and social profile of alternative solutions; the analysis of End-of-Life Vehicles scenarios and the estimation of vehicles recyclability and recoverability according to EU regulations.

Engine Design and Analysis
Numerical and experimental approaches are applied to the thermo-fluid dynamic design of ICEs and turbochargers, and to the development of innovative control strategies, with special emphasis on 2T, turbocharged and small direct injection engines. UNIFI has several experimental facilities, including static and dynamic test benches, flow bench and acoustic test bench for engine characterization, advanced measurements and noise analysis.

Vehicle Design and Dynamics
Core activity is the development of vehicle components and systems, with a special focus on handling, mechatronics systems, and hybrid powertrains. From the vehicle concept to system integration, UNIFI can provide complete CAD models, kinematic and dynamic analyses, FE validation up to full vehicle (with both numerical and experimental approaches). Methods range from virtual modelling to physical testing on ad hoc built test benches.

Electric Mobility
Building on vehicle design and dynamics competencies, specific expertise includes modelling and simulation of key components (battery, power converters, motors) and their integration in full vehicle models, naturalistic driving data acquisition, its statistical analysis and synthesis.

Multidisciplinary Design Analysis and Optimization
UNIFI has experience in the development and application of global sensitivity analysis, uncertainty quantification and multi-disciplinary design optimization methods. Industrial applications cover numerical analysis and optimization of mechanical structures w.r.t. complex multidisciplinary design requirements, such as for example: weight optimization of car body structures considering crashworthiness safety and Noise Vibration and Harshness (NVH) criteria.

Participation in EU projects

(FP7, H2020)
2BESAFE, ABRAM, ALLIANCE, ASTERICS, ENLIGHT, ESUM, GOAL, GRESIMO, IMPROVE, MEBESAFE, MID-MOD, MOTORIST, NEOHIRE, PIONEERS, PV-MOREDE, RASIF, RESOLVE, SAFE2WHEELER, SAFERIDER, SMART RRS, UNPLUGGED, VECOM.

University of Limerick

Organisation type:	Public research university institution
Contact person:	Imelda Doolan
Phone number:	+353 (0)61 234996
Email:	Imelda.Doolan@ul.ie
Location head office:	Limerick, V94 T9PX, Ireland
Number of employees:	2000
Turnover before tax:	€345.1m (2021-22)
Website:	www.ul.ie

Laser-assisted tape placement (LATP) of carbon-fibre based thermoplastic composites using the LATP in the Irish Composites Centre (IComp), University of Limerick.

Short summary of expertise and activities

University of Limerick (UL), is located in the City of Limerick on the west coast of Ireland. UL has over 18000 students, including more than 3,300 internationally mobile students. It is an independent research-led university offering undergraduate and postgraduate programmes across Arts, Humanities and Social Sciences; Education and Health Sciences, Science and Engineering and the Kemmy Business School. UL offers interdisciplinary research and education grounded in the fundamentals of engineering, science, and technology – electronics systems and VLSI, wireless communications, AI, computational modelling, data analysis, robotics, cybersecurity, renewable energy, energy storage, electrical engineering, bio-instrumentation, sensor systems, computer technology, and Internet of Things (IoT), with application in automotive and transportation systems. The Limerick region is an emerging hub for automotive software and systems development and UL has strong links to the automotive technology cluster in the region and nationally. The university excels at translational research, which aims to accelerate the practical application of academic research to benefit society. UL has particular research and development strengths in the areas of Materials, Advanced Manufacturing, Software, Health, and Applied Mathematical Sciences. UL is host to a number of Research Institutes, national externally-funded Research Centres and units. Some of these include the UL Bernal Institute which is focused on materials science and hosts research in advanced battery technology for application in electric vehicles as well as research on production of composite auto-parts from sustainable bio resources; the UL hosted Science Foundation Ireland Lero Research Centre for software which leads a national blended autonomous vehicles (BAV) research programme focused on addressing challenges facing the use of driverless vehicles in blended or mixed environments with pedestrians, animals and human-operated vehicles (e.g. analysis and interpretation of data from cameras, radar and lidar systems).

Participation in EU projects

ICONIC "Improving the crashworthiness of composite transportation structures" - H2020 ID: 721256
LIBRE "Lignin Based Carbon Fibres for Composites" - H2020 ID: 720707
VI-DAS "Vision Inspired Driver Assistance Systems"- H2020 ID: 690772
Si-DRIVE Silicon Alloying Anodes for High Energy Density Batteries comprising Lithium Rich Cathodes and Safe Ionic Liquid based Electrolytes for Enhanced High VoltagE Performance. - H2020 ID: 814464
VIBES "Improving recyclability of thermoset composite materials through a greener recycling technology based on reversable bio-based bonding materials" – H2020 ID: 101023190
GAlBs "Novel porous graphite as cathodes for advanced aluminium-ion batteries" - HEurope ID: 843621
DualFlow "Dual circuit flow battery for hydrogen and value added chemical production" - HEurope ID: 101070788
SiGNE "Composite Silicon/Graphite Anodes with Ni-Rich Cathodes and Safe Ether based Electrolytes for High Capacity Li-ion Batteries" - HEurope ID: 101069738
CUBIC "Improving the cirCUlarity of complex plastic multi-material composites using novel Blobased materials in B2B semi-finished produCts" – HEurope ID: 101111996

University of Ljubljana

Organisation type:	University
Contact person:	Mr. Tomaž Katrašnik Mr. Damijan Miljavec Mr. Janko Slavič
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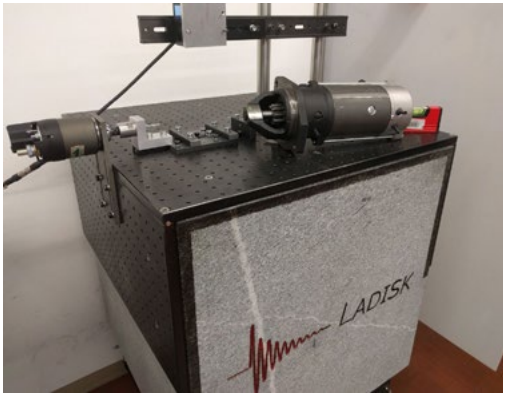
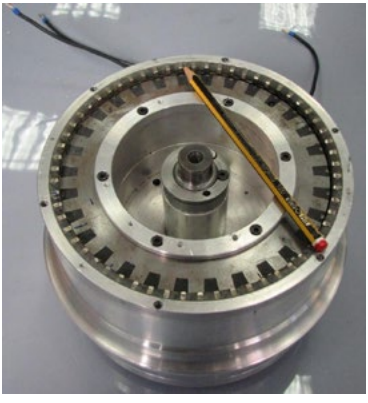
Email:	Tomaz.Katrasnik@fs.uni-lj.si Damijan.Miljavec@fe.uni-lj.si Janko.Slavic@fs.uni-lj.si
Location head office:	Ljubljana, Slovenia
Number of employees:	5700
Website:	www.uni-lj.si

Univerza v Ljubljani

Experimental work on engine starter dynamics.



Transferse flux machine for In-wheel application.



Short summary of expertise and activities

The University of Ljubljana ranks among the biggest universities with more than 56.000 undergraduate and post-graduate students and approximately 6.000 employees.
The Faculty of Electrical Engineering and the Faculty of Mechanical Engineering, being EARPA members, are research driven faculties. Research work at the Faculty of Electrical Engineering, which employs approximately 300 researchers, is divided in 9 major fields: electrical energy, mechatronics, electronics, microelectronics, bio-cybernetics and biomedicine, measuring systems, automation and cybernetics, robotics and telecommunications. Research work at the Faculty of Mechanical Engineering, which employs more than 300 researchers, is divided in 7 major fields: power and process engineering, design, engine mechanics and maintenance, production engineering, mechatronics, micromechanical systems, and automation.

Research activities associated with the EARPA's Task Forces cover:

- **Hybrid Powertrains and Alternative Fuels:** Combustion, Alternative Fuels, Air Management and Supercharging, Thermal Management, Prototyping and Testing including PEMS.
- **EV Systems and Components:** Basic Research on E-machines, Detailed performance and degradation modelling of batteries and fuel cells, Prototyping and Development of Integrated Solutions, Development of Control strategies, Thermal Management of E-components, Testing and Diagnostics, Basic research on vibration&noise&vibration fatigue optimisation.
- **Methods and Tools for Virtual Development and Validation:** Development of predictive system level and detailed simulation models for ICEs, EMs, batteries, fuel cells, VTMS and thus of the complete conventional, hybrid and electric powertrains, virtual vibration fatigue, electromagnetic and magnetostrictive vibration excitation modelling/experiment, multi-domain and multi-physics dynamics (e.g. battery-starter-engine)
- Noise, Vibration & Harshness: acoustic testing, vibration fatigue and lightweight structures, vibroacoustic of electric motors, vibration transmission through bearings

Participation in EU projects

The University of Ljubljana is very active in international research and education programs. It cooperated in 117 FP6 and 110 FP7 projects (in several of them as coordinator), it also cooperates in many H2020 projects and in many other research, development and educational projects financed by European Union (TEMPUS, ERASMUS, ETN Marie Curie, Leonardo da Vinci, DAPHNE, SafeInternet, eLearning, eTEN, Lifelong Learning Program and many more). In the field of transport, the University of Ljubljana is involved in the following projects:
Straightsol
CIVITAS ELAN
2020 INTERFACE
FluMaBack
Asterics
Obelics
Drivemode

University of Luxembourg

Organisation type:	Public university
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Email:	francesco.viti@uni.lu raphael.frank@uni.lu gamal.elghazaly@uni.lu
Location head office:	Belval, Esch-sur-Alzette, Luxembourg
Number of employees:	2400
Turnover before tax:	€60 Million
Website:	www.uni.lu

JUNIOR: autonomous vehicle of University of Luxembourg - SnT

Short summary of expertise and activities

The University of Luxembourg (Uni.lu) was founded in 2003. Among the youngest and fast-growing universities in Europe, the Uni.lu is ranked among the top 250 universities in the Times Higher Education (THE) World University Rankings, 12th worldwide in the THE Young University Rankings and 4th in the THE subcategory of "Millennials" (universities founded since the year 2000). Moreover, in the category Transport and Technology, Uni.lu is ranked within the 100-150 worldwide according to the Shanghai ranking.

Uni.lu is actively participating in European projects. Since the launch of Horizon 2020 and until the end of 2019, more than 90 grants had been obtained, with a total budget of over 500 million euros, including a University of Luxembourg share of approximately 50 million euros since the launch of H2020, and 7.5 million euros for the University of Luxembourg in 2019. The University also obtained 11 ERC grants.

Within the automotive, CCAM and ITS research, the main teams contributing to research include:

- **Mobilab Transport Research Group** is a research group of the Department of Engineering, and performs research ranging from Mobility Modelling and Simulation, Transportation Planning, Traffic and Public Transport Analysis and Control, and regional mobility and sustainability, Smart Mobility and Logistics, Intelligence Transport Systems, Artificial Intelligence for Automated Mobility, Transport Electrification. The mission of Mobilab is to develop computational data-driven models and simulation approaches for planning and managing complex multimodal transport systems.
- **UBIX Research Group** is a research group of the Interdisciplinary Research Centre for Security, Reliability and Trust (SnT) focusing on distributed AI across various fields, including autonomous vehicles, IoT, edge computing, digital twins, and smart cities. UBIX also operates the 360Lab conducting strategic and impact-related related research and innovations in connected and autonomous mobilities. The mission 360Lab is to improve the capabilities of automated vehicles to understand to safely interact with their highly interactive environment at large scale. UBIX expertise is in AI, computer vision, robotics, ITS and vehicular networking come together to reach this goal.
- **Automation & Robotics Group** is a research group of the Interdisciplinary Research Centre for Security and conducts research to enable mobile and industrial robots, autonomous vehicles, space and energy systems to better perceive the world around them and to interact with it in an optimal and intelligent way. Many complex technical systems need to execute their tasks efficiently and with an increasing degree of autonomy, requiring flexible and intelligent automation. ARG conducts research to enable mobile and industrial robots, autonomous vehicles, space and energy systems to better perceive the world around them and to interact with it in an optimal and intelligent way.

Participation in EU projects

FCD4ITS – Floating Car Data Collection for Intelligent Transportation Systems, 5G-MOBIX – 5G technology with advanced Connected and Automated Mobility, 5G-DRIVE – 5G HarmoniseD Research and TrIals for serVice Evolution, TERMINAL – AuToMated ElectRic Bus InterregioNAL, ACUMEN – Ai-aided deCision tool for seamless mUltiModal nEtwork and traffic managemeNt

University of Modena and Reggio Emilia

Organisation type:	University
Contact person:	Prof. Francesco Leali
Phone number:	+39 059 205 6311
Email:	francesco.leali@unimore.it
Location head office:	Modena, Italy
Number of employees:	> 1500
Turnover before tax:	€7 Million
Website:	www.unimore.it

UNIVERSITAS STUDIORUM MUTINENSIS ET REGIENSIS
1175
UNIMORE
UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

Short summary of expertise and activities

Founded in 1176, the University of Modena and Reggio Emilia – UNIMORE is the third oldest University in the World, and has been ranked among the first ten Italian universities for quality of teaching and research since 2007. UNIMORE is a networked campus located in the towns of Modena and Reggio Emilia. It counts about 20000 students, including 3500 postgraduates. It has over 600 international exchange agreements and cooperation programs to encourage students and researcher to actively interact in a globalized world. Currently, UNIMORE project portfolio comprises 50 funded projects under Horizon, plus several projects financed by the National Institute of Health (USA), National institute of research under the PRIM program, ARTEMIS and ENIAC Joint Technology Initiatives, the Life+ Programme.

With respect to activities related to EARPA, the three departments involved are the Department of Engineering "Enzo Ferrari" (DIEF), the Departments of Sciences and Methods for Engineering (DISMI), and the Department of Physics, Informatics and Mathematics (FIM).

Research at DIEF concerns automotive engineering, mechanics, civil and environmental engineering, computer engineering and science, industrial automation, electronics, telecommunications and materials. The areas of expertise can be found include thermal-fluid dynamics of power units and systems, structural design of vehicles and components, noise and vibrations, artificial intelligence and computer vision, advanced driver assistance systems, design by simulation methods, industrial and collaborative robotics, additive manufacturing, electrification of transport and alternative fuels.

DISMI deals with methodological and applied research, technology transfer and university education in various fields of engineering and basic sciences. It mainly covers covers industrial engineering and management, mechanics engineering, energy engineering and basic sciences applied to engineering.

Activities that cover the area of informatics mainly belong to FIM. They are related to autonomous and connected systems and vehicles (CAV), smart cities, and mobility-as-a-service, especially covering the transition of safety-critical and secure system to the next edge devices for the IoT era.

Participation in EU projects

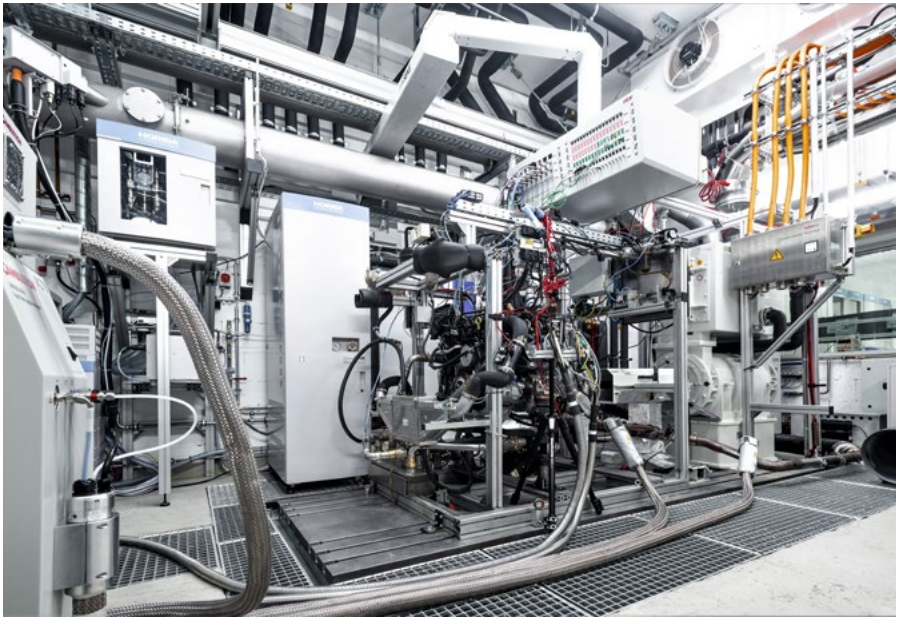
A brief non-exaustive list of UNIMORE involvement in EU project related to the research in the automotive sector: 5GMETA, SINFONICA, 5G-LOGINNOV, AI4CSM, AUTO-MEA, DORNA, DREAM, eCharge4Drivers, FENIX, FORTISSIMO, MobiDataLab, NewControl, OLGA, Prystine, SCAPE, SYMPLEXITY.

University of Stuttgart, Institute of Automotive Engineering Stuttgart (IFS)

Organisation type:	University
Contact person:	Prof. Dr.-Ing. André Casal Kulzer
Phone number:	+49 711 685 66646
Email:	andre.kulzer@ifkfs.de
Location head office:	Stuttgart, Germany
Number of employees:	IFS: about 80
Website:	www.ifs.uni-stuttgart.de

University of Stuttgart
Institute of Automotive Engineering

Hybrid Engine Test Bench



Short summary of expertise and activities

The Institute of Automotive Engineering Stuttgart (IFS) is part of Faculty 7: Engineering Design, Production Engineering and Automotive Engineering at the University of Stuttgart and is involved in research and teaching in the field of automotive and engine technology.

The work at the Chair of Automotive Powertrain Systems is primarily concerned with increasing the efficiency and minimizing the emissions and noise of automotive powertrain systems. Particular focus is placed on the holistic experimental and simulative optimization of battery-electric, hybrid and fuel cell drives
at system level, as well as the application of data science methods.

At least 1/3 of the approximately 60 engineers employed at the Institute of Automotive Engineering Stuttgart conduct research in all the fields of automotive powertrain systems, starting with battery-electric, fuel cell-based and hybridized powertrains, through to thermal converters or combustion engines with renewable fuels.

The main target of the research efforts in the field of automotive powertrain systems is the development of climate- and emission-neutral mobility, including powertrain systems with minimal energy consumption. This also includes the further increase of power density, the interaction with alternative, synthetic fuels (H2, bioFuels, eFuels), the optimization of thermal management, noise minimization and the avoidance of pollutant emissions.

Other chairs at the IFS are Chair of Automotive Engineering and Chair of Automotive Mechatronics.

The Institute of Automotive Engineering Stuttgart is significantly involved in the Bachelor's and Master's degree courses in vehicle and engine technology. Here, the focus is on the motor vehicle in all its variants and technical sub-areas from the very beginning. This makes the programme unique in Germany. Students receive a theory-based basic education in natural science and engineering subjects such as mathematics, technical mechanics, physics, thermodynamics, computer science, electrical engineering, materials science and design. In addition, they specialize in at least two of the three central subject areas: Automotive Engineering, Vehicle Drives and Automotive Mechatronics.

Finally yet importantly, the Institute of Automotive Engineering Stuttgart is home to the Rennteam Uni Stuttgart, the world's most successful formula SAE racing team in the combustion class. And also the Greenteam Uni Stuttgart, which successfully develops electrically powered and autonomous racing vehicles for the Formula Student competition and holds the 2022 world record for the fastest accelerating electric vehicle (from 0 to 100 km/h in 1.461 seconds).

University of West Bohemia

Organisation type:	Public university
Contact person:	Dr. Pavel Žlábek
Phone number:	+420 377 63 8711
Email:	zlabek@rti.zcu.cz
Location head office:	Plzeň, Czech Republic
Number of employees:	2325
Turnover before tax:	€100,5 Million
Website:	www.zcu.cz/en

UNIVERSITY
OF WEST BOHEMIA

Short summary of expertise and activities

University of West Bohemia (UWB) is the only public institution of higher education based in the Pilsen Region. Currently, the University has nine faculties consisting of more than sixty departments and three institutes of higher education. More than 11,000 students studying at the university can choose from a wide of range of undergraduate, postgraduate and doctoral study programs.

University of West Bohemia is also an important centre of research and development, with massive investment to university development and construction activities on the university campus. The university campus is currently undergoing very dynamic changes. The newly constructed research centres definitely strengthened the links between the university and other institutions. This is also one of the reasons why scientists involved in various disciplines, as well as students win prestigious awards for their activities every year.

The research and development activities are focused on obtaining knowledge of basic phenomena and observable facts, applied research directed towards a specific and practical goals and experimental development, which employs existing knowledge obtained through research or based on experience.

Key expertise is in impact biomechanics and passive safety, vehicle design, development of mechanical parts of transport means, machining and forming machines, development and verification of machining and forming technologies, metal 3D printing, power electronics, drives and electrical, electronic and communication systems of vehicles.

The activities go in both experimental and numerical approaches. The research and development activities are based in the departments. There are, however, also interdepartmental and interfaculty teams which do work on projects closely related to the fields offered in the Ph.D. study programmes at the Faculties of Applied Sciences, Electrical Engineering and Mechanical Engineering. The University of West Bohemia has a significant position among universities in both the Czech Republic and Europe.

Participation in EU projects

HIGREEW – Affordable High-Performance Green Redox Flow Batteries
BOWI – Boosting Widening Digital Innovation Hubs
DUET – Digital Urban European Twins for smarter decision making
COMP4DRONES – Framework of key enabling technologies for safe and autonomous drones' applications
CHARM – Challenging environments tolerant Smart systems for IoT and AI
IMOC04.E – Intelligent Motion Control under Industry 4.E
Switch2save – Lightweight switchable smart solutions for energy saving large windows and glass façades
S4AllCities – Smart Spaces Safety and Security for All Cities
TRANS-SAFE – ransforming Road Safety in Africa

University of Žilina

Organisation type:	University
Contact person:	Prof. Tatiana Kovacikova
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Number of employees:	1500
Website:	www.erachair.uniza.sk

UNIVERSITY OF ŽILINA

Eyetracking glasses for capturing driver's glance to monitor driver's behaviour; they are used together with an electroencephalographdevice, which measures brain activity of a driver.

Short summary of expertise and activities

UNIZA was established in 1953 and its particularity originates from the specific scientific branches oriented towards transportation and communications including all transportation modes (road, railway, water, aerial, intermodal), transport services, transport corridors, transport and land civil engineering, mechanical and electrical engineering, security and safety, information and communication technologies, landscape protection and utilisation.
UNIZA has an excellent collaboration with the stakeholders of the Zilina region (municipalities, region, and mobility operators) as well. One of the examples was very successful project FP6 RIS ZIP "Zilina Innovation Policy" or the FP7 "Endurance" project that produced the SUMP for Zilina city.

UNIZA was granted a FP7 Pilot ERAChair in 2014 that named ERAdiate "Enhancing Research and innovation dimension of the UNIZA in Intelligent Transport Systems". ERAdiate, aims at unlocking and strengthening the research potential and promoting the Zilina region in the field of Intelligent Transport Systems (ITS).

As from 1 July 2019, the Department of International Research Projects – ERAdiate+ has been established as a follow up of the successfully finished FP7 ERA Chair project. The main objective of ERAdiate+ is to stimulate UNIZA research potential in UNIZA strategic R&I areas including transport and mobility, elevate international competitiveness and increase participation in EU R&I programs.

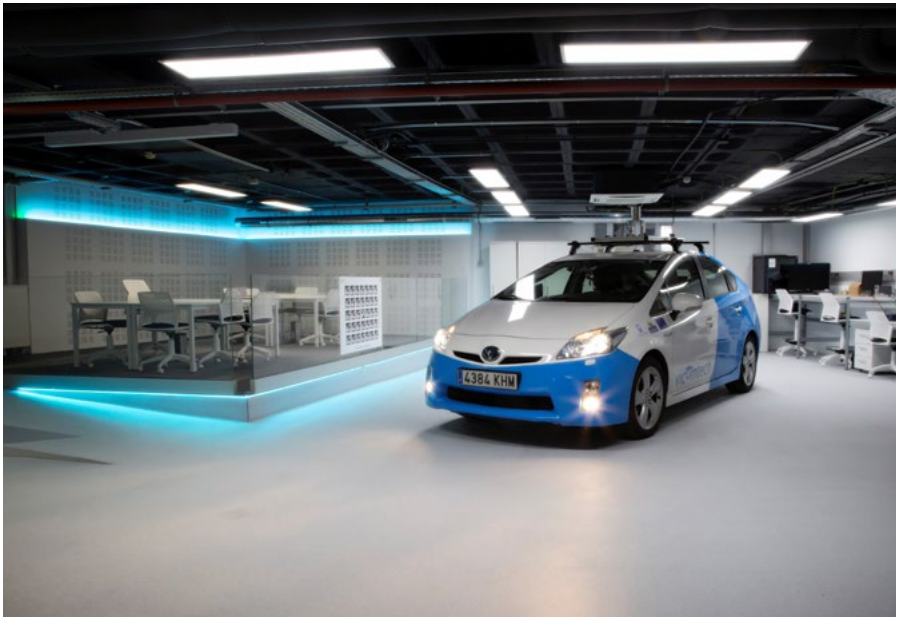
Participation in EU projects

ERAdiate – Enhancing Research and innovAtion dimension of the University of Zilina in intelligent transport systems. www.erachair.uniza.sk
SIMMARC – Safety IMprovement Using Near Miss Analysis on Road Crossings: www2.ffg.at/verkehr/projekte.php?id=1452&lang=en&browse=programm
Alan Turing Institute: Lloyd's Register Foundation programme to support data-centric engineering: Decentralised real-time electric vehicle charging – optimality, fairness and resilience. www.turing.ac.uk/research_projects/electric-vehicle-charging/
MoTiV – Mobility and Time Value - Estimating Travel Time Value by accounting for the Value Proposition of Mobility, H2020 project, RIA, www.motivproject.eu
EC DG MOVE - Call for tenders MOVE/B4/2017-358 – Technical support related to sustainable urban mobility indicators
SENECA – ICT and Smart cars for Efficient emergeNcy responsE and traffiC management, bilateral R&I project Slovakia – Israel
RIDE2RAIL – Travel Companion enhancements and RIDE-sharing services syncronised to RAIL and Public Transport, H2020 S2R project, https://ride2rail.eu/
OJP4Danube – Coordination mechanisms for multimodal cross-border traveller information network based on OJP for Danube Region, Interreg DTP project, www.interreg-danube.eu/approved-projects/ojp4danube
REBALANCE – Future mobility values and culture, H2020 project, RIA, https://rebalancemobility.eu/
UMii – Urban Mobility Innovation Index – 2021 edition, http://umi-index.org/

Vicomtech

Organisation type:	R&D company
Contact person:	Dr. Oihana Otaegui
Phone number:	+34 943 309 230
Email:	ootaegui@vicomtech.org
Location head office:	San Sebastian, Spain
Number of employees:	160
Turnover before tax:	€12.3 Million
Website:	www.vicomtech.org

vicomtech
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE



Short summary of expertise and activities

Vicomtech is an applied research centre for Interactive Computer Graphics and Multimedia located in San Sebastian (Spain). It is a non-profit association, founded in 2001 as a joint venture by the INI-GraphicsNet Foundation and the EiTB Broadcasting Group. VICOM is part of BRTA (Basque Research and Technology Alliance), which has the main function of responding to the technological and industrial challenges in the Basque Country and improving awareness of the centre at international level.
The role of Vicomtech in the market is to supply society with technology by transfer of primary research to industry. This is done through collaborative R&D projects.
Vicomtech's main research lines lay in the fields of computer vision, computer graphics and interaction; technologies which Vicomtech applies in multiple sectors.

ITS and Engineering department applies Cloud Computing, Big Data, AI and Computer to the industrial sector in general and the transport sector in particular, providing the sector's companies with technology solutions. The department's specialization technologies are large scale sensor data management, image processing, visualization and Knowledge Discovery & Data Mining.
ITS and Engineering department activities in the field of land transport includes sensors and functions for enabling CCAM, testing and validation tools and methodologies for highly automated vehicles, communication technologies for enabling connected and cooperative functions including 5G as KET.

Participation in EU projects

Vicomtech actively participates in EU projects and since the beginning of Horizon 2020 Vicomtech has been involve in more than 20 projects.
Projects in the area of CCAM

Coordinated projects:
inLane – Low Cost GNSS and Computer Vision Fusion for Accurate Lane Level Navigation and Enhanced Automatic Map Generation (ADAS/AD)
CloudLSVA – Cloud Large Scale Video Analysis (testing and validation)
VI-DAS – Vision Inspired Driver Assistance Systems (ADAS/AD)
ACCURATE – Towards the development and validation of Enhanced Multi-sensor and EGNSS Multifrequency tight fusion for leveraging high levels of automated driving L4/L5 (ADAS/AD)
5GMETA – 5G Development and validation platform for global industry-specific network services and Apps (ADAS/AD/Testing and validation)

Participants:
TrasSec – Autonomous emergency manoeuvring and movement monitoring for road transport security (ADAS/AD)
Autopilot – AUTOmated driving Progressed by Internet Of Things (ADAS/AD/Communication)
HEADSTART – Harmonised European Solutions for Testing Automated Road Transport (Testing and validation)
5GMOBIX – 5G for cooperative & connected automated MOBIlity on X-border corridors (ADAS/AD/Cooperative)
5GLoginnov – 5G creating opportunities for LOGistics supply chain INNOVation (Mobility)

VIRTUAL VEHICLE Research GmbH

Organisation type:	Research Center
Contact person:	Bernhard Brandstätter
Phone number:	+43 316 873 9001
Email:	Bernhard.brandstätter@v2c2.at
Location head office:	Graz, Austria
Number of employees:	300+
Turnover before tax:	€27 Million
Website:	www.v2c2.at

Short summary of expertise and activities

VIRTUAL VEHICLE is a leading international research and development center for the automotive and rail industries, located in Graz, Austria. The center focuses on the advanced virtualization of development. An essential element is the linking of numerical simulations and hardware testing which leads to a powerful HW-SW system design.

VIRTUAL VEHICLE's international partner network consists of:

- 100+ international industrial partners (OEMs, Tier 1 & Tier 2 suppliers, software vendors)
- 40+ international scientific institutions

Research priority is the linking of numerical simulations, SW-defined functions, and hardware testing, which leads to a powerful HW-SW whole system design and the reduction of development & operations efforts. Following this focus on industry-related research VIRTUAL VEHICLE is an innovation catalyst for future vehicle technologies.

In its 20 years of existence, VIRTUAL VEHICLE has established an excellent reputation as a reliable high-performance partner in the European research landscape (e.g., active in 40+ EU-projects). Its manifold innovative technologies for Green Road and Digital Mobility Systems substantially contribute for achieving the long-term requirements of Green Digital Mobility in Europe and beyond. Furthermore, VIRTUAL VEHICLE offers a broad portfolio of contract research for the vehicle development and provides test systems.

Fields of expertise cover Green Mobility & Transport, Virtual Vehicle and Product Development, Software-Defined Systems, Virtual Validation & Homologation as well as Automated ADAS Systems.

Participation in EU projects

Applied CPS – European Digital Innovation Hub on Applied Cyber Physical Systems for manufacturing, construction, and automotive sector.
DACcelerate – Accelerated DAC (Digital Automatic Coupling) transformation to full digital rail freight operations in Europe
greenSPEED – Green and Sustainable Processes for Electrode Production of electric vehicles batteries
HADRIAN – Holistic Approach for Driver Role Integration and Automation Allocation for European Mobility Needs
HEIDI – Holistic and adaptivE Interface Design for human-technology interactions in vehicles
HiPE – High Performance Power Electronics Integrations for e-vehicles
InSecTT – Intelligent Secure Trustable Things - provides intelligent, secure and trustworthy systems for industrial applications.
UPSIM – Unleash Potentials in Simulation - system simulation credibility via introducing a formal simulation quality management approach

Other useful links

European Bodies

- European Commission – general address http://ec.europa.eu/
- European Commission – DG Research and Innovation (RTD) http://ec.europa.eu/research/
- European Commission – DG Mobility and Transport (MOVE) http://ec.europa.eu/dgs/transport/
- European Commission – DG Climate Action (CLIMA) http://ec.europa.eu/clima/
- European Commission – DG Energy (ENER) http://ec.europa.eu/energy/
- European Commission – Internal Market, Industry, Entrepreneurship and SMEs (GROW) http://ec.europa.eu/growth/
- European Commission – DG Environment (ENV) http://ec.europa.eu/dgs/environment/

Stakeholders

- ACEA - European Automobile Manufacturers' Association www.acea.be
- ALICE - Alliance for Logistics Innovation through Collaboration in Europe www.etp-logistics.eu
- ARTEMISIA - EU Industry Association for Embedded & Cyber-Physical Systems www.artemis.eu
- CLEPA - European Association of Automotive Suppliers www.clepa.eu
- CONCAWE - Oil companies' European organisation www.concawe.eu
- EARTO - European Association representing Research and Technology www.earto.eu
- ECTRI - European Conference of Transport Research Institutes www.ectri.org
- EGVIA - European Green Vehicles Initiative Association, www.egvia.eu
- ERF - European Union Road Federation www.erf.be
- ERTICO European public/private partnership for the implementation of Intelligent Transport Systems and Services www.ertico.com
- ERTRAC - European Road Transport Research Advisory Council www.ertrac.org
- EUCAR - European Council for Automotive R&D www.eucar.be
- ETSC - European Transport Safety Council www.etsc.eu
- FEHRL - Forum of European National Highway Research Laboratories www.fehrl.org
- FIA - Foundation for the Automobile and Society www.fia.com
- FISITA - International Federation of Automotive Engineering Societies www.fisita.com
- POLIS - European Cities and Regions Networking for Innovative Transport Solutions www.polisnetwork.eu
- UITP Europe - International Association of Public Transport www.uitp.org

Any questions?

Please contact us or visit our website at **www.earpa.eu**

EARPA Secretariat
info@earpa.eu

EARPA
Adolphe Lacomblé 59/8
BE-1030 Brussels (Belgium)

January 2024

EUROPEAN AUTOMOTIVE
RESEARCH PARTNERS ASSOCIATION