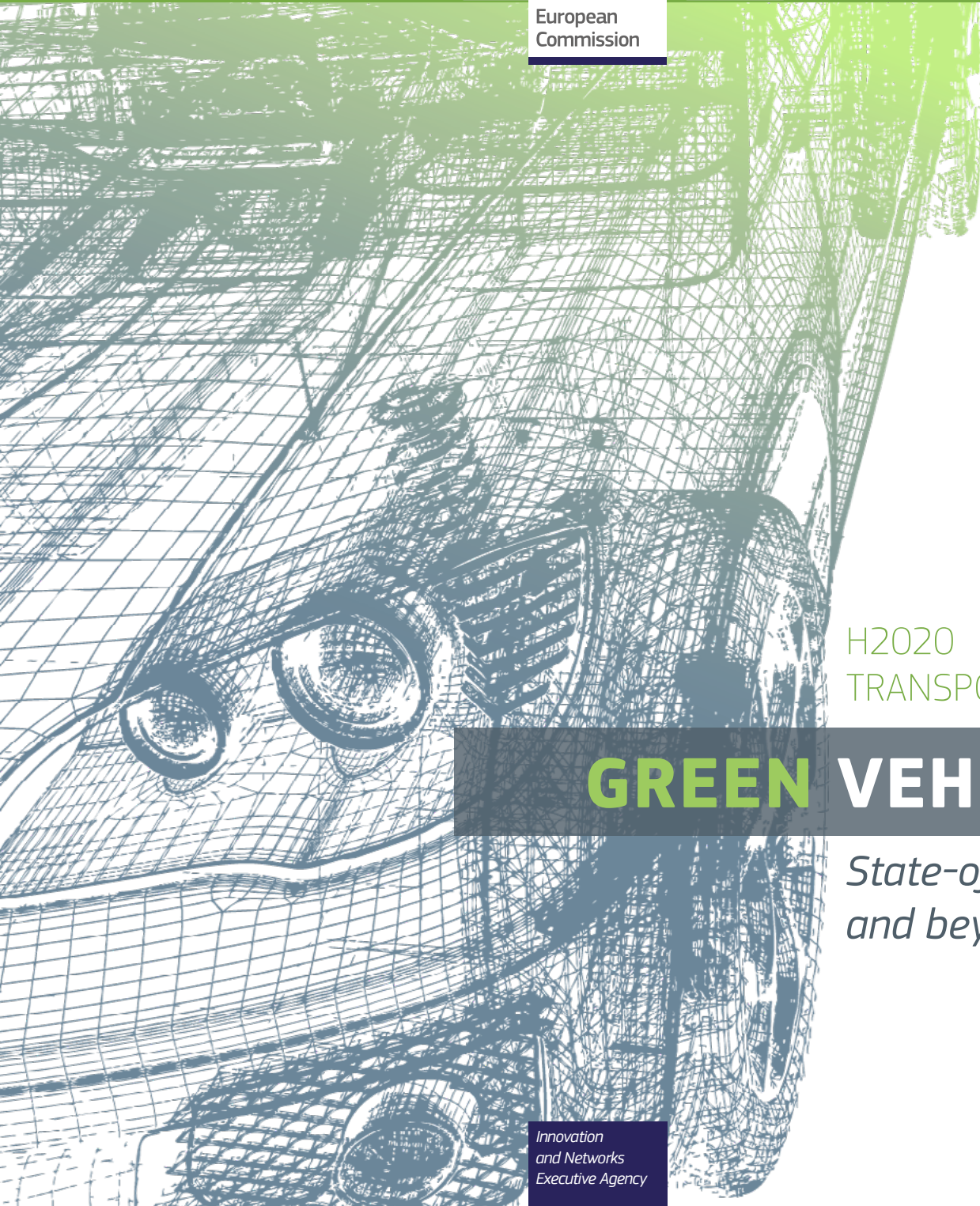




European
Commission



H2020
TRANSPORT

GREEN VEHICLES

*State-of-the-Art
and beyond*

Innovation
and Networks
Executive Agency

Foreword

Foreword



The EU is among the world's biggest producers of motor vehicles and the sector represents the largest private investor in research and development. Currently, around 12 million people work in the EU automotive industry and it accounts for 4% of European GDP. Global sales of passenger cars in 2017 hit 77.7 million vehicles and these numbers are expected to grow. Compared to 2005, freight and passenger transport activity are projected to increase around 80% and 51% respectively by 2050.

However, these numbers come with a cost on air pollution, human health and on energy dependency. Air pollution is a risk to health and to the environment. In the coming decades, road transport is likely to remain a large contributor to air pollution, especially in urban areas. Furthermore, according to the Paris Agreement, there is the need to drastically reduce world greenhouse gas emissions with the goal for the EU to reduce emissions by 80–95% below 1990 levels by 2050. In addition transport has become more energy efficient but still depends on oil for 96% of its energy needs.

The European Commission has more than doubled the funds available for collaborative research and innovation in the road transport sector for the period 2014-2020.

The funding covers areas such as Green Vehicles, automation, safety, and smart mobility. The aim is to decarbonise transport, reduce air pollution, increase efficiency of the transport system and preserve the EU's technological leadership in the automotive sector.

INEA is responsible for the implementation of a wide road transport project portfolio. This portfolio constitutes a showcase at European level, demonstrating the value of collaborative research and innovation.

This brochure provides a comprehensive overview of the Green Vehicle projects that INEA is managing, with a total EU contribution around €370 million. I hope that you will find the brochure informative and interesting.

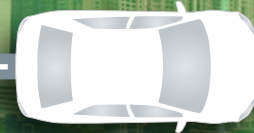
Director
Dirk Beckers

FUELLING H2020 ROAD TRANSPORT RESEARCH

DG RTD DG MOVE

- Transport Work Programme
- Transport White Paper
- Europe on the Move
- Strategic Transport Research & Innovation Agenda (STRIA)

H2020



EGVIA

European Green Vehicle Initiative Association

- Multiannual Roadmap

ERTRAC

European Road Transport Research Advisory Council

- The Strategic Research Agenda (SRA)
- Multi-Annual Implementation Plan (MAP)
- Road Maps

STAKEHOLDERS

- Industry
- SMEs
- Academia
- Research Institutes
- Public Bodies
- Operators

INEA

H2020 IMPLEMENTATION



- Green Vehicles
- Mobility for Growth
- Automated Road Transport

CEF IMPLEMENTATION



- Targeted infrastructure investment at European level

PRIZES



- Cleanest Engine
- Retrofit

SME



- Instrument for transport

TOWARDS THE GOAL OF **GREEN VEHICLES**

The Green Vehicle calls are an integral part of the Transport Work programme in Horizon 2020. Based on research roadmaps defined in cooperation with the contractual public-private partnership European Green Vehicles Initiative (EGVI) as well as other stakeholders, calls focus on decarbonisation, energy efficiency of vehicles and alternative powertrains. Research and Innovation activities address:

- new powertrains and vehicle technology improvements
- electrification and battery developments
- new vehicle architectures, weight reduction, improved aerodynamics and rolling resistance
- component development for alternative fuel vehicles
- interfaces between the vehicle and the recharging infrastructure
- the implementation of tighter emission standards
- demonstration of technologies to promote clean technologies in road transport.

The common characteristics of the projects from the Green Vehicle calls is that they contribute to the EU goals of building a **resilient, resource efficient, climate and environmentally friendly, safe and seamless** European Transport System.

INEA'S ROLE

INEA's role in

Horizon 2020 transport

research is essential, from

evaluating proposals submitted against calls

published in the H2020 workprogramme,

to the signature of the Grants,

the monitoring of the projects,

feedback to the policy makers and

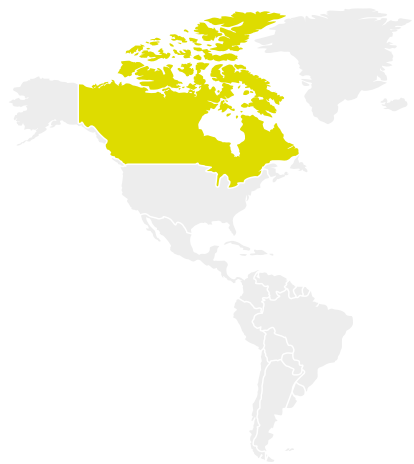
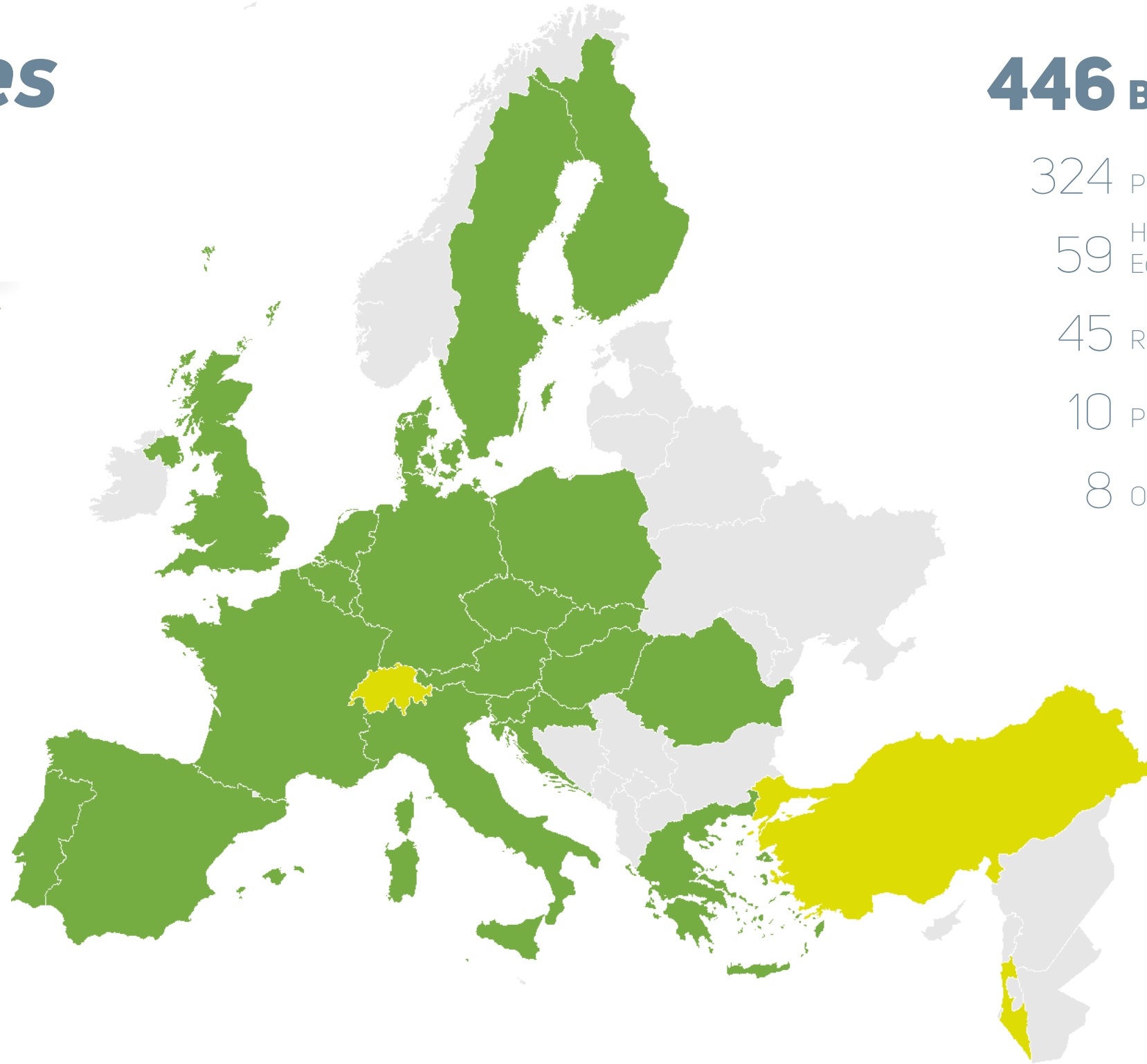
communication on successful

outcomes and results.

The World of *Green Vehicles*

PARTNERS FROM


21 EU MEMBER STATES
4 NON-EU COUNTRIES




446 BENEFICIARIES

- 324 Private for-profit entities
- 59 Higher or Secondary Education Establishments
- 45 Research Organisations
- 10 Public bodies
- 8 Other

Funded projects at a glance


 HEAVY DUTY VEHICLES

 BUSES

 LIGHT ELECTRIC VEHICLES


 PASSENGER CARS AND LIGHT DUTY VEHICLES

AERODYNAMIC AND FLEXIBLE TRUCKS



AEROFLEX 

ICE* BASED POWERTRAINS

Alternative Fuels Powertrains

GasOn 
 HDGAS 
 COLHD 

Low Emission Powertrains

PaREGE 
 DiePeR 
 UPGRADE 
 EAGLE 

Emission Measurement





DownToTen 
 PEMs4Nano 
 SUREAL-23 

Powertrain Control

IMPERIUM 
 optiTruck 







* Internal Combustion Engine

VEHICLE HYBRIDISATION


ECOCHAMPS 
 THOMSON 
 ORCA 
 ADVICE 

BATTERIES

Batteries and Battery Packs




eCAIMAN 
 SPICY 
 FIVEVB 
 GHOST 
 iModBatt 
 IMAGE 

Battery Management System





Everlasting 

ELECTRIC VEHICLES




Modelling and Testing

OBELICS 
 DEMOBASE 
 HiFi-ELEMENTS 








Energy Management

OPTEMUS 
 OSEM-EV 
 XERIC 
 JOSPEL 






Drivetrains

ModuLED 
 DRIVEMODE 
 ReFreeDrive 

Concept and Design

EU-LIVE 
 ESPRIT 
 RESOLVE 
 Silver Stream 
 WEEVIL 
 QUIET 
 DOMUS 

Integration into the Transport System and Grid

Nemo 
 ELECTRIFIC 
 ASSURED 
 ELVITEN 
 STEVE 

AEROFLEX

AERODYNAMIC AND FLEXIBLE TRUCKS FOR THE NEXT GENERATION OF LONG DISTANCE ROAD TRANSPORT






The AEROFLEX project supports vehicle manufacturers and the logistics industry in tackling future challenges for road transport, including an overall 18-33% efficiency improvement in road transport/long haulage by 2025+.



The aim is to develop and demonstrate new technologies, concepts and architectures for complete vehicles that are energy efficient, safe, comfortable, configurable and cost-effective, while adapting to the varying needs of customers in continuously changing operational conditions. These new configurable truck concepts should meet all future logistics and co-modality needs.

AEROFLEX will work on characterising the European freight transport market. It will develop new concepts and technologies for trucks with reduced drag. The project will demonstrate potential truck aerodynamic and energy management improvements - with associated impact assessments of the new vehicle concepts, technologies and features. It will also draft coherent recommendations for revising standards and legislative frameworks to allow the new aerodynamic and flexible vehicle concepts on the road.

1 October 2017

31 March 2021

 Man Truck & Bus AG, Germany
 € 9.5 million
 www.aeroflex-project.eu

 Coordinator  EU contribution  Website

ASSURED

FAST AND SMART CHARGING SOLUTIONS FOR FULL SIZE HEAVY DUTY URBAN APPLICATIONS






The ASSURED project aims to enhance the performance, comfort and safety of the next generation of electrically chargeable heavy-duty, medium and light-duty urban vehicles, creating a competitive and sustainable transport system. It includes analysing the needs of cities, operators and end-users, optimising energy storage systems and charging infrastructure, and improving understanding of fast charging on battery and grid reliability to ultimately improve the Total Cost of Ownership (TCO) and environmental impact. The project will also develop interoperable and scalable high power charging solutions among key European providers. As a result, energy and cost efficient

wireless charging solutions and 6 electrically chargeable vehicles with automatic fast charging will be demonstrated.

The project will enable industrial partners to improve the TCO and operational cost of vehicles, and support all the steps needed by the involved cities, Public Transport Operators and Authorities to implement full sustainable mobility concepts and define the requirements for the next generation fleets of electric vehicles and charging infrastructure. It will also support the take-up of business cases and exploitation of project results across Europe by partner cities and end-users.

1 October 2017

30 September 2021

 Vrije Universiteit Brussel, Belgium
 € 18.7 million
 www.assured-project.eu

 Coordinator  EU contribution  Website

COLHD

COMMERCIAL VEHICLES
USING OPTIMISED LIQUID
BIOFUELS AND HVO
DRIVETRAINS



Acknowledging the importance of reducing greenhouse gas emissions (beyond EURO VI) with affordable developments, a consortium of industrial and academic leading players covering the entire value chain of road transport has joined forces to identify workable and environmental-friendly cases of alternative fuels to fossil diesel for road transport. COLHD has the ambition to enable buying high performance, clean, safe and affordable Heavy Duty Vehicles (HDVs) specifically designed to run on alternative renewable fuels, and which can then easily adapt to EU transport infrastructure.

To do so, COLHD will follow a mixed approach, working on technology, infrastructure and removal of additional barriers. COLHD will optimise and further develop 3 Diesel Dual Fuel powertrains running on biogas and second generation biofuels (Hydrogenated Vegetable Oils), evaluating the many benefits under testing in the Liquefied Natural Gas Blue Corridors infrastructure. That way, COLHD will allow proving oil substitution on the short and medium term, addressing different markets and ranges. Lastly, COLHD will co-develop cross-wise activities involving all key target audiences, aiming to finally establish an EU market for alternative-fuelled HDVs.

1 November 2017

31 October 2020

 Idiada Automotive Technology SA, Spain
 € 9 million
 www.colhdproject.eu

 Coordinator  EU contribution  Website

DIEPER

DIESEL EFFICIENCY
IMPROVEMENT WITH
PARTICULATES AND
EMISSION REDUCTION






The challenge of the DiePeR project is to apply advanced technologies for combustion and exhaust after-treatment to existing non-hybrid diesel engines. It also aims to optimise the improved characteristics of a new generation of engines with regard to emissions, fuel consumption and driveability. Specific technologies will be advanced to technology readiness level (TRL) 6 or 7 and integrated in two demonstration vehicles: one passenger car of the mid/ premium segment, and one light commercial vehicle. A full calibration and assessment of the vehicles and underlying technologies will take place

to demonstrate the project will achieve real driving emissions substantially below Euro 6/ NEDC limits, less than half of emitted particles (number) including particles < 23nm, and a more than 5% improved fuel efficiency based on best-in-class MY2015 vehicles. The project also addresses design features, control and basic research, such as modelling of particles formation and the deterioration of engine components (fuel injection system, exhaust after-treatment system). It also looks at its effect on emissions, in order to assess the robustness of the vehicles over the lifetime of their use.

1 October 2016

30 September 2019

 AVL List GMBH, Austria
 € 7.2 million
 www.dieper-project.eu

 Coordinator  EU contribution  Website

ECOCHAMPS

EUROPEAN
COMPETITIVENESS IN
COMMERCIAL HYBRID
AND AUTOMOTIVE
POWERTRAINS



The ECOCHAMPS project is developing technologies for hybrid electric passenger and commercial vehicles that provide better performance and comfort, improve efficiency, lead to less CO2 emissions, and reduce the price of hybrid vehicles. It will develop a set of electric hybrid components and optimised drivelines that will be demonstrated on 5 hybrid vehicles in total to prove and assess the success of the ECOCHAMPS innovations.




The project aims to:



- Improve fuel efficiency by up to 20%
- Reduce powertrain weight and volume by up to 20%
- Reduce hybrid vehicles costs, targeting a 10% maximum cost premium

Through broad cooperation of manufacturers of commercial vehicles, ECOCHAMPS will also propose a Modular system and Standardisation Framework (MSF). This modularisation enables the use of the same hybrid electric components over different types of vehicles. It will support commercial competition and scalability, resulting in a significant cost reduction for hybrid drivetrain components and vehicles.

To meet air quality targets, the project will also demonstrate, via independently supervised testing, actual driving emissions below Euro VI limits.

1 May 2015    30 April 2018

 DAF Trucks N.V., Netherlands
 € 21 million
 www.ecochamps.eu

 Coordinator  EU contribution  Website

ELECTRIFIC

ENABLING SEAMLESS
ELECTROMOBILITY
THROUGH SMART
VEHICLE-GRID
INTEGRATION






The project's starting point is the possibility to unlock the potential of electromobility by increasing coordination of all the actors in its ecosystem. To this end, the project is developing novel techniques and ICT tools. At the grid level, the project is developing new smart charging stations capable of dynamically controlling charging rate, maximising the use of renewables and making them as grid-friendly as possible. At the level of drivers of electric vehicles, the project is developing advanced driver assistance services that suggest the most convenient travel and charging options taking into account the

charging capacity constraints. At the electric vehicles fleet level, the project is developing management tools that will help optimise fleet operations, maximise battery lifetime, and minimise charging costs. ELECTRIFIC's consortium involves experienced research partners, energy providers and innovative electromobility SMEs. The project results will be shared with the scientific community and prepared for commercial use on different vehicles ranging from e-bikes to e-buses. Both private owners and public services will be considered, with a particular attention on cross-border mobility.

1 September 2016    31 August 2019

 GFI, Belgium
 € 6.2 million
 www.electrific.eu

 Coordinator  EU contribution  Website

ESPRIT

EASILY DISTRIBUTED
PERSONAL RAPID TRANSIT



© ESPRIT

The ESPRIT project aims to develop a purpose-built, light weight L category electric vehicle that can be stacked together to gain space. Thanks to pioneering coupling systems, up to eight ESPRIT vehicles can be nested together in a road train, seven being towed, for an efficient redistribution of fleets and a smartly-balanced and cost efficient transport system. To prove the ESPRIT concept, the project also includes a suite of modelling and simulation tools to predict, once ESPRIT vehicles are deployed, the economic, social and environmental benefits as well as key operating strategies. It is anticipated that this concept will encourage citizens to use conventional

public transport and car sharing solutions rather than their private vehicles. This, in turn, will lead to seamless intermodal transport, reduced congestion and significant reduction of noise and air pollution. As the key to the ESPRIT transport system is the ability to redistribute eight vehicles at a time by a single operator, the project expects to demonstrate through simulation that it is possible to achieve a continuous 90% availability rate of vehicles across all stations, using less manpower compared to current systems - which have 50% of stations empty several times a day.

1 May 2015

31 October 2018

Commissariat à l'Énergie Atomique et aux
Énergies Alternatives, France

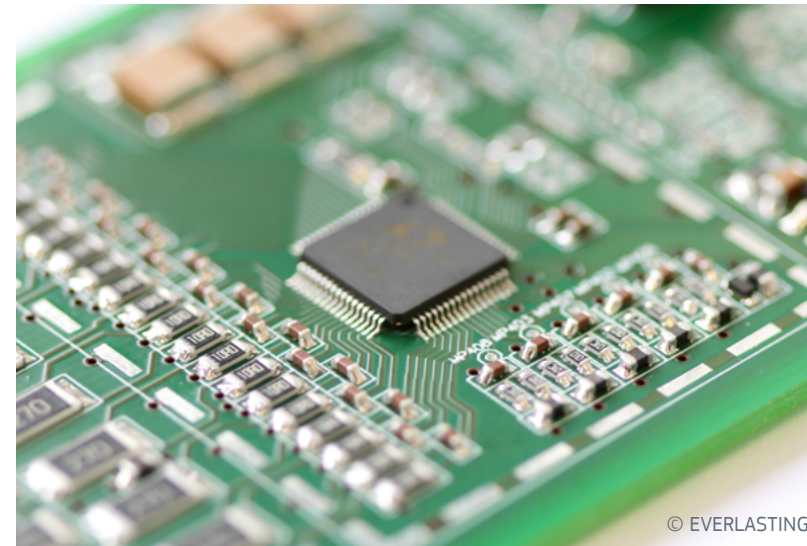
€ € 8 million

www.esprit-transport-system.eu

Coordinator € EU contribution Website

EVERLASTING

ELECTRIC VEHICLE
ENHANCED RANGE,
LIFETIME AND SAFETY
THROUGH INGENUOUS
BATTERY MANAGEMENT



© EVERLASTING

The EVERLASTING project will improve Li-ion batteries by focusing on the following technology areas:

- Predicting the behaviour of battery systems in all circumstances and over their full lifetime. By enabling accurate dimensioning and choice of the correct battery type, this ultimately leads to a lower cost.
- Sensing signals beyond the standard parameters of current, voltage and temperature. This approach provides more varied and in-depth data on the status of the battery. It leads to a pro-active and more effective battery management, and helps prevent issues rather than mitigating them.
- Monitoring the status of the battery by interpreting the rich sensor data. By intelligently combining

this information with road, vehicle and driver data, the project will offer accurate higher-level driver feedback.

- Managing the battery based on a correct assessment of its status. Efficient thermal management and load management results in increased reliability and safety. It also leads to lower overall cost through an increased lifetime.
- Defining a standard Battery Management System (BMS) architecture and interfaces, and gathering the necessary support in the market. This allows an industry of standard BMS components to flourish, resulting in a lower cost.

1 September 2016

31 August 2020

Vlaamse Instelling Voor Technologisch
Onderzoek N.V., Belgium

€ € 8.2 million

www.everlasting-project.eu

Coordinator € EU contribution Website

HDGAS

HEAVY DUTY GAS ENGINES
INTEGRATED INTO VEHICLES



© HDGAS

The HDGAS project is developing, optimising and demonstrating advanced powertrain concepts for dual-fuel and pure Liquefied Natural Gas (LNG). The project is working on the following technical objectives:

- Specification of the requirements and international/European standards for LNG fuelling interfaces and fuelling process for heavy duty vehicles (trucks and buses)
- Development of an advanced LNG fuel tank system
- Development demonstration of new generations of exhaust after-treatment systems and low emission technologies for dual fuel and gas engines
- Development and demonstration of mono-fuel low- and high-pressure direct gas injection

engines and a dual-fuel engine with a substitution rate higher than 90% of the diesel fuel and fuel systems. Integrating these engines into vehicles. The demonstration vehicles will comply with the Euro VI emission regulations, reach at least 10% CO2 reduction compared to state of the art technology, and show a range before fuelling of at least 800 km on natural gas. All developed technologies will be more competitive in terms of performance, engine life, cost of ownership, safety and comfort in comparison to 2013 best in class vehicles. Fuel consumption results and CO2 reduction with the new technologies, as well as compliance with the legally limited exhaust emissions, will be independently assessed at the end of the project.

1 May 2015

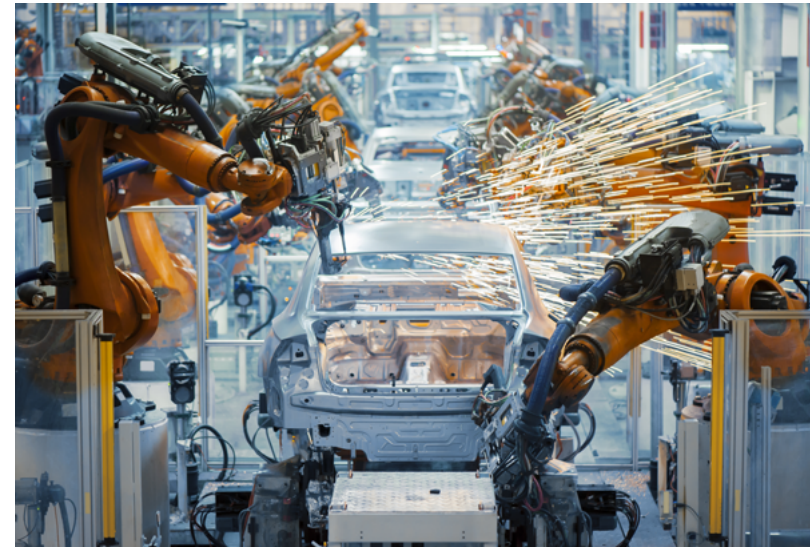
30 April 2018

 AVL List GMBH, Austria
 € 19.9 million
 www.hdgas.eu

 Coordinator  EU contribution  Website

HIFI-ELEMENTS

HIGH FIDELITY ELECTRIC
MODELLING AND TESTING









Within the automotive product development cycle, virtual and heterogeneous testing is becoming increasingly established through component, module and vehicle-level simulation and Hardware-in-the-Loop test-beds. Though a number of standards in this field have been established (FMI, ASAM XiL API), models are still mostly created in a fragmented manner. This fragmentation leads to a lot of redundant effort as models of the same component or system are re-created several times. HIFI-ELEMENTS will develop, validate and publish a recommendation for standardisation of model interfaces for common e-drive components, and will

implement compliant versions of existing models. Secondly, the project will link extended versions of existing tools (a model/data management tool and a co-simulation tool for MiL and HiL environments), augmented with effort-saving automated methods for model parameterisation and test case generation. Validation of standardised models and workflows will be done in four industrially relevant use cases depicting common scenarios in e-drivetrain and Electric Vehicle (EV) development. Once the project ends, the interface recommendations and workflow methods will be disseminated for widespread EV-industry adoption.

1 October 2017

30 September 2020

 FEV Europe GMBH, Germany
 € 7.5 million
 www.hifi-elements.eu

 Coordinator  EU contribution  Website

IMPERIUM

IMPLEMENTATION OF
POWERTRAIN CONTROL
FOR ECONOMIC AND CLEAN
REAL DRIVING EMISSION
AND FUEL CONSUMPTION



The IMPERIUM project is working on fuel consumption reduction (diesel and urea) for heavy duty vehicles, all the while keeping them within the legal limits for pollutant emissions. The approach relies on three stages:




- Direct optimisation of the main component control (engine, exhaust after-treatment, transmission, waste heat recovery, e-drive) to improve their performance
- Global Powertrain energy management and optimisation of the energy source control in various driving situations
- Creating a more comprehensive understanding of

the mission (eHorizon, mission-based learning) for better long-term planning and optimisation of the different energy sources

The results will be demonstrated on three advanced fuel efficient Heavy Duty vehicles, each integrating eHorizon and providing different approaches of Vehicle Control Units and powertrain configurations. The overall expected impact is a reduction of fuel consumption of at least 20% on the reference vehicles with conventional control, which will be demonstrated comparatively, whilst not exceeding Real Driving Emissions limits set by the established Euro VI procedures.

1 September 2016

31 August 2019

 AVL List GMBH, Austria
 € 6.6 million
 www.imperium-project.eu

 Coordinator  EU contribution  Website

OPTEMUS

OPTIMISED ENERGY
MANAGEMENT AND USE









OPTEMUS represents an opportunity for overcoming one of the biggest barriers towards large scale adoption of electric and plug-in hybrid cars: range limitation due to limited storage capacity of electric batteries. The project proposes to tackle this challenge by leveraging low energy consumption and energy harvesting through a holistic vehicle and an occupant-centred approach, considering space, cost and complexity requirements. The project is developing a Battery electric vehicle (BEV) with an innovative thermal and electric management system. It will allow a minimum of 32% of energy consumption reduction for component cooling, and

60% for passenger comfort, as well as an additional 15% for traction. Specifically, OPTEMUS aims to develop a number of innovative core technologies: integrated thermal management system, including the compact refrigeration unit and the compact heating; heating, ventilation and air conditioning (HVAC) unit; battery housing and insulation as thermal and electric energy storage; thermal energy management control unit, and regenerative shock absorbers. It will also develop complementary technologies, such as localised conditioning, or photovoltaic panels with intelligent controls.

1 June 2015

28 February 2019

 Kompetenzzentrum - Das Virtuelle Fahrzeug,
Forschungsgesellschaft MBH, Austria
 € 6.4 million
 www.optemus.eu

 Coordinator  EU contribution  Website

ORCA

OPTIMISED COST-
COMPETITIVE MODULAR
HYBRID ARCHITECTURE FOR
HEAVY DUTY VEHICLES



ORCA aims to improve the efficiency and cut the costs of hybrid trucks and busses through enhanced powertrains, reduced fuel consumption, smaller internal combustion engines, and longer electric autonomy. The project will also look into replacing diesel engine by an advanced compressed natural gas engine, leading to further cuts in fuel consumption and higher efficiency levels. In particular, the project aims to:




- Reduce the total cost of ownership (TCO) to the same as diesel vehicle levels.
- Improve the hybrid powertrain efficiency up to 5% compared to actual IVECO hybrid bus and


conventional truck.

- Reduce the fuel consumption by 40% compared to an equivalent conventional HD vehicle.
- Downsize the Internal Combustion Engine (ICE) by at least 50% compared to actual IVECO hybrid bus and VOLVO conventional truck.
- Improve the electric range from 10km to 30km by adding the plug-in hybrid electric vehicle capabilities and optimising the rechargeable energy system capacity.
- Assess the replacement of diesel engines by Compressed Natural Gas (CNG) engines for future heavy-duty vehicles.

1 October 2016

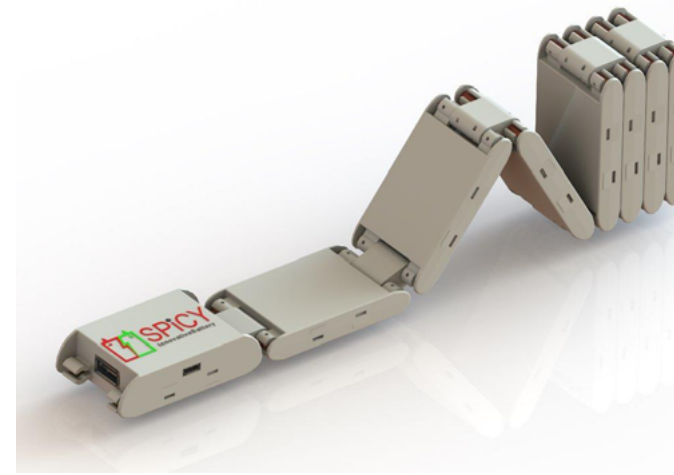
30 September 2020

 Nederlandse Organisatie Voor Toegepast
Natuurwetenschappelijk Onderzoek TNO, Netherlands
 € 8.3 million
 www.h2020-orca.eu

 Coordinator  EU contribution  Website




SPICY




SILICON AND POLYANIONIC
CHEMISTRIES AND
ARCHITECTURES OF
LI-ION CELL FOR HIGH
ENERGY BATTERY



The SPICY project is developing a new generation of Li-ion batteries that meet the expectations of electric vehicle end-users in terms of performance, safety, cost, recyclability and lifetime. Batteries can fulfil the need for a constant, efficient, clean, safe and renewable power supply for vehicles. Battery storage systems have been recognised as a key enabling technology to safely optimise the energy recuperation and the energy management of the whole vehicle – all the while respecting the environment. The most significant technological challenge of electric vehicles is the cost and performance of their components, particularly the

battery. The development of new chemistries and cell architectures for the Li-ion battery is the only way to increase the cell capacity and the possible energy density, leading to greater autonomy. The project is addressing the whole value chain up to manufacturing. The proposed solution of cost optimisation and integrating eco-design is of high interest to industry and could lead to the launch of mass production. Four industrial partners (three large groups and one SME) and eight academic and research centres from Spain, France, Belgium, Luxembourg, Germany and Switzerland collaborate in the project.

 Commissariat à l'Énergie Atomique et aux
Énergies Alternatives, France
 € 6.9 million
 www.spicy-project.eu

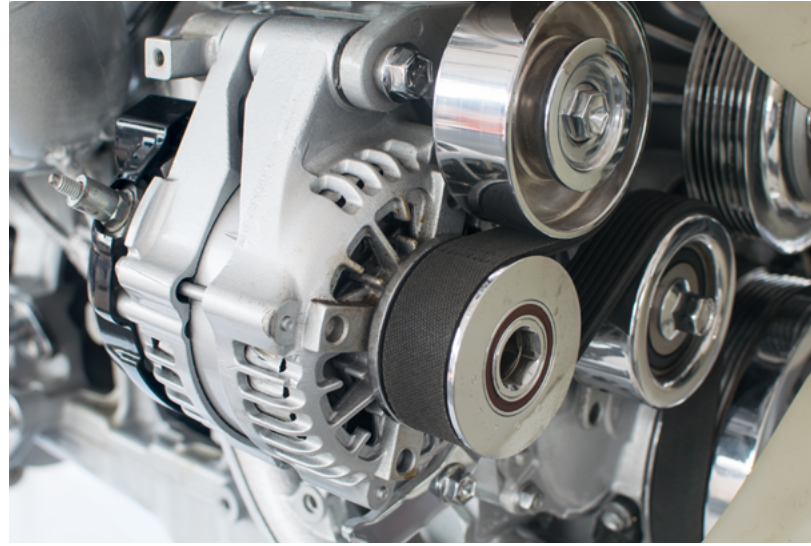
 Coordinator  EU contribution  Website

1 May 2015

31 July 2018

THOMSON

MILD HYBRID COST
EFFECTIVE SOLUTIONS
FOR A FAST MARKET
PENETRATION



The THOMSON project aims at developing cost effective solutions, based on 48V architectures, answering to the need of reducing the environmental impact of the transportation sector through a clever combination of advanced engines technologies, electrification and wider use of alternative/renewable fuels.




Approaches developed in the THOMSON project will demonstrate how the right combination of advanced engine downsizing/turbocharging technologies, coupled with a 48V motor-generator system, can provide the most cost effective solution for a rapid electrification through conventional vehicles.

To support this concept, the project will develop two different 48V architectures (one integrating the e-machine on the front engine belt drive, the other between the engine and the transmission) of two different engine families: a mid-size 1.6 litre Diesel engine and a small downsized Spark Ignited Compressed Natural Gas (CNG) engine equipped with a Direct Injection system. This twin approach will help demonstrate how 48V architecture interacts with Diesel technologies (especially with regard to noxious pollutant reduction), as well as with Spark Ignited CNG ones, ultimately strengthening even further the CO₂ reduction already achieved through the use of low carbon fuel such as CNG.

1 October 2016



30 September 2019

 Centro Ricerche FIAT SCPA, Italy
 € 9.1 million
 www.thomson-project.eu

 Coordinator  EU contribution  Website

UPGRADE

HIGHLY EFFICIENT
PARTICULATE FREE
GASOLINE ENGINES






The UPGRADE project aims to support the transition to highly efficient, cleaner and affordable powertrain technology systems, based on Spark Ignited GDI (Gasoline Direct Injection) approach, suitable for future Light Duty applications. The project also includes a deep analysis of the phenomenon of the nanoparticles in relationship to the engine design and its operating conditions and, with regard to the after-treatment solutions, the study and development of new Gasoline Particulate Filter (GPF) technologies.




The project will see the realisation of two full demonstrator vehicles: one B-segment vehicle, equipped with the small downsized stoichiometric engine, and one D/E vehicle equipped with the medium size lean-burn engine. The vehicles will be fully calibrated and assessed by independent testing, according to on road test procedures and using the best available Portable Emission Measurement System (PEMS) technology, while considering also particle number measurement below 23 nm diameter.

1 October 2016



30 September 2019

 Centro Ricerche FIAT SCPA, Italy
 € 9.6 million
 www.upgrade-project.eu

 Coordinator  EU contribution  Website

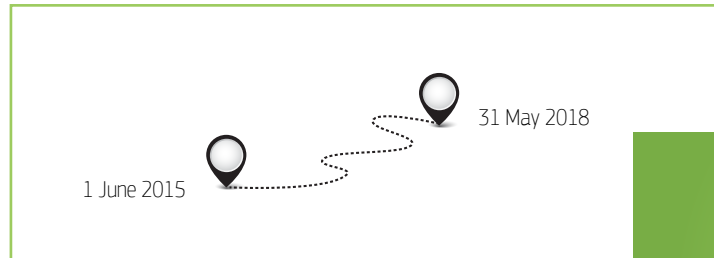
XERIC

INNOVATIVE CLIMATE-CONTROL SYSTEM TO EXTEND RANGE OF ELECTRIC VEHICLES AND IMPROVE COMFORT



XERIC is developing an energy-saving climate control system that will extend the range of electric vehicles and improve passenger comfort in all weather conditions. Current climate control systems are very energy-consuming - they can go up to 40-60% of the energy available on electric vehicles in summer conditions. Such a substantial amount of energy needed to run auxiliary equipment combined with

the limited capacity of electric batteries dramatically affects the range of electric vehicles. XERIC's new climate control system will reduce the energy used for passenger comfort by more than 50% and will that way extend the range of electric vehicles. It will also be easily customised for electric vehicles and easily produced at an industrial scale.



- GVS S.P.A., Italy
- € 4.6 million
- www.xeric.eu

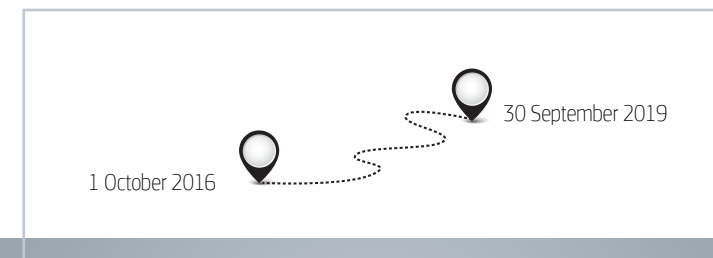
Coordinator EU contribution Website



DOWNTOTEN PEMS4NANO SUREAL-23

A large proportion of the total number of particles emitted from direct injection engines are below 23 nm. Although the EU aims to regulate those emissions and impose limits for new light duty vehicles, this is not yet possible due to the absence of accurate quantification methods, especially under real driving conditions. The main reason for this is the absence of adequate knowledge

regarding the nature of sub-23 nm particles from different engine/fuel combinations under different operating conditions. The three clustered projects DOWNTOTEN, PEMS4NANO and SUREAL-23 aim to overcome such barriers by introducing novel measurement technology for concentration/size/composition measurements. All projects started in October 2016 and are on-going.



- Aristotelio Panepistimio Thessalonikis, Greece € 4.1 million www.downtoten.com
- Horiba Europe GMBH, Germany € 3.6 million www.pems4nano.eu
- Ethniko Kentro Erevnas Kai Technologikis Anaptyxis, Greece € 3.4 million www.sureal-23.cperi.certh.gr

Coordinator EU contribution Website

INEA

Innovation and Networks
Executive Agency

INEA is an Executive Agency established by the European Commission to implement parts of EU funding programmes for transport, energy and telecommunications.

The Agency provides its stakeholders with expertise and high-level programme management, while at the same time promoting **synergies** among programmes, in order to contribute to economic growth and benefit EU citizens.

INEA **supports** Road Transport research together with the European Commission's Directorate-General for Research and Innovation (DG RTD) and Directorate-General for Mobility and Transport (DG MOVE).

The Agency plays a **crucial role** in turning road transport policy set by the Directorates-Generals into successful implementation of research and innovation projects.

HORIZON 2020

Since January 2014, INEA is managing programmes under the Horizon 2020 Societal Challenges 'Smart, Green and Integrated Transport' and 'Secure, Clean and Efficient Energy' with a total budget of €5.3 billion (€2.3 billion for transport and €3.0 billion for energy) to be granted by end 2020. With a €246 million budget that is available under the **Green Vehicle** calls in 2018-2020, INEA's total contribution to the management of EU Green Vehicle projects since 2014 will amount to €616.5 million.

Promotion of a wide-market introduction of highly automated driving systems is the overall objective of the **Automated Road Transport** calls with an overall budget of €217 million since they were launched in 2016. Smart urban mobility, road safety and road infrastructure are also supported in the **Mobility for Growth** calls.

ADDITIONAL ROAD TRANSPORT FUNDING OPPORTUNITIES

INEA implements most of the **Connecting Europe Facility (CEF)** programme budget, in total €28.3 billion out of €30.4 billion for the 2014-2010 period (€23.2 billion for transport, €4.5 billion for energy, and €0.6 billion for telecommunications). CEF Transport programme objectives are to remove bottlenecks, provide missing links, and ensure sustainable and efficient transport systems. The programme also promotes integration and interconnection of transport modes, as well as digital mobility solutions.

The CIVITAS initiative – the network of cities dedicated to cleaner and better transport in Europe, brings together cities developing and deploying innovative transport solutions. Over 800 urban mobility solutions have been tested and implemented as part of demonstration projects in more than 80 Living Lab cities Europe-wide.



FOR MORE INFORMATION

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