Green Cars

and Leadership Opportunities in Spain

Document elaborated by the Institute of Small and Medium Industry, Generalitat Valenciana IMPIVA, (www.impiva.es), the Centre for the Development of Industrial Technology CDTI (www.cdti.es), the Technological Institute of Energy ITE (www.ite.es) and SERNAUTO (International Innovation Unit; www.sernauto.es)

With the collaboration and support of ANFAC (www.anfac.es), CMT-Motores Térmicos (www.cmt.upv.es), IBERDROLA (www.iberdrola.es), REDITA (www.redita.es), and Tecnalia (www.tecnalia.es).

Funded by IMPIVA and ITE.

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The aim of this publication is to disseminate the Spanish contribution to the European Green Cars Initiative and to update the information included in the document elaborated by TecnoEbro and the Aragon Automotive Cluster on the occasion of the "Spanish Capabilities in the Eco-electro Road Mobility Sector and FP7 Green Cars Initiative" event held in Zaragoza on the 24 th of March 2009.

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FP7 Green Cars and Leadership Opportunities in Spain

15APRIL2010/VALENCIA

The Valencian Community's contribution to Spanish presence in the European "Green Car" initiative.

Recent environmental policies have had a direct effect on the development of a new industry based on promoting R&D and efficient energy sources, thereby creating a wide array of new business opportunities. The development of the electric car is a major challenge for European industry in the short and long term.

The agreement reached by European governments to reduce greenhouse gas emissions by 20% and increase renewable energy use by 20% in 2020 will serve to foster the development of the electric car and draw upon its results in order to reach both goals.

The European Commission has launched a public private partnership, the "PPP European Green Cars Initiative" as part of the European Union's Economic Recovery Programme. They also hope to find the necessary response and support in each of the Member States.

Governments across the EU have drawn up individual national plans based on the European initiative. These plans foster the use of the electric car and prepare European industries to assume a leadership role in this sector.

The Valencia Community encompasses a well-prepared group of companies in the sector. One of the main Valencia Regional Government's priorities is to play a leadership in the development and implementation of the car of the future.

The Regional Ministry of Industry, Commerce and Innovation is financing the project "EPV" (Electric Powered Vehicles). This cooperation project will be carried out by nine companies in the Valencian Community representing different sectors. The goal is to develop the protocol and infrastructure necessary to deploy a network of electrical charge and control stations based on the Community's recognised leadership in electricity generation using renewable energies.

The project will contribute to reach the 20/20/20 objectives by decreasing greenhouse gas emissions, increasing renewable energy production and improving its integration into the electric grid system. This will increase the overall energy efficiency and make possible the use of clean energy to power electric transport system. The potential economic impact of these measures is very significant: it is estimated that when fully electric and hybrid vehicles reach approximately about 5% of the market more than 800,000 charging stations (public and private) would be deployed in Spain.

In conclusion, we would like to recommend this publication which identifies current trends and projects the future growth of the industry from Spanish and European perspective. You will find that it contains useful information and will serve as an important guide for the sector.

Bruno Broseta
Regional Secretary for Industry, Commerce and Innovation
Ministry of Industry, Commerce and Innovation
Generalitat Valenciana

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A unique opportunity for the road mobility sector.

Dear FP7 participant

Some say that in ten years from now a large majority of new cars and vans will be electric. Whatever the future might offer us, the trend is clear, as new technologies open-up new and promising prospects for the emergence of a new industry that will materialise in some degree or another, probably sooner that we believe.

Few recent initiatives have raised so much interest in such a short time as the recently launched European Green Cars Initiative (EGCI), both within Europe and beyond. The initiative reflects one of the main driving forces of the technological leaps in the area of sustainable road mobility. And Europe is not alone, since other world competing areas are also doing their homework, leading their own way, in this matter.

Also Spain is eager and ready to stand up and face challenges and opportunities. It could not be otherwise, given our tradition as vehicle and component designer and manufacturer (Spain is the 8th producer in the world, the EU 3rd passenger car manufacturer and the 1st in the area of light commercial vehicles in the EU). But integration of vehicles and value adding elements being important assets, Spain can contribute a lot also in the provision of infrastructures and network intelligence.

Our strengths should be heard clear and loud in this R&D European endeavour as Spain can and should contribute a lot to European initiatives: efficient vehicle manufacturing plants, innovative world-class vehicle component developers and producers, globally known research and technological centres, excellent university groups and institutes, highly experienced and skilled technological and ICT companies of all sizes… Not to mention the active role of the electricity sector in the international arena and leadership of our country in the renewable energies, a fact that could "close the loop".

For all these reasons, we strive to play a forerunner role in Green Cars, and not just a follower. Followers might cross the finish line too late. Coordination , both at private and public levels, is probably one of the cornerstones of a successful Spanish strategy. And yes we can, there is no doubt. Another cornerstone is surely taking advantage of networks such as the national and European Technology Platforms to come closer to key EU actors and to contribute to the definition of the European research priorities and the implementation of the Green Cars public-private partnership.

As Chairman of the Innovation Agency of the Spanish Government, CDTI, the key entity charged to promote Spanish participation in the FP7, you know that you can count on Spain and CDTI to accompany you in your participations in the FP7 Green Cars initiative.

Please stop by and tell us about your interests and plans in this area.

Juan Tomás Hernani
Secretary General of Innovation and Chairman of CDTI.
Ministry of Science and Innovation.

Welcome by the European Commission

Dear member of the "Spanish Green Cars Community":

As you know, the current global crisis has hit very hard the car industry, although some positive signals are starting to surface. During 2008, and reacting in support to this vital sector of the European economy, the EU's Economic Recovery Package included a specific action for road transport research: the "European Green Cars Initiative", with an overall financial envelope of 5 billion Euros including loans from the European Investment Bank (EIB) and grants for FP7 projects. The first round of calls for research projects was launched already in 2009, with a very positive and encouraging response from European researchers. An advisory group was also created to assist in the definition of FP7 those research themes that are more relevant for Europe. The EIB is also receiving during these past two years a remarkable amount of loan requests in connection with clean, safe and electric mobility.

The European Green Cars Initiative will help accelerate developments in technologies potentially leading to breakthroughs in CO2 reductions. As you all know by now, Green Cars is not just electric and hybrid vehicles: it includes also research and investments on trucks based on ICE and on the use of bio-methane as second generation bio-fuel for buses and waste trucks, as well as on logistics, transport system optimisation and human health impact.

Green Cars should be seen as a concrete example of the role and importance that European Technology Platforms (mainly ERTRAC, EPoSS and SmartGrids), under the leadership of industry, are playing in developing and implementing the European Research Area. More specifically, the participation of all stakeholders involved in electrification of road transport -the automotive industry, the energy harvesters, the IT community and infrastructure and mobility managers- is crucial for the success of the Green Cars initiative.

Through the European Green Cars Initiative, the European Commission (in particular three of its services, namely DG INFSO, DG RTD and DG TREN) is working alongside the automotive sector to make it possible to reconcile research and investments needs by providing short term incentives, short to medium term loans and medium term R&D funding for the breakthroughs that can make the future European automotive industry stronger and cleaner. As we progress in solving our environmental problems, we will also be securing and reinforcing the competitiveness of our industries. Our global competitors are doing it too, so we must act quicker and smarter. China's objective, for instance, is simply to become the world leaders of the new sector of electric vehicles.

The good news is that current efforts of a number of EU countries are comparable to those some of our global competitors. However, duplicated or uncoordinated efforts can diminish the effectiveness of the European investment. In fact, some issues like education, standardisation and regulation, user studies and infrastructure development beg for a Community approach. Both basic research and applied R&D benefit from accessing the best competencies from all over Europe rather than only national ones. In this regard, Member States moving towards joint programming is the best way ahead and several countries are already preparing the response to an ERANET+ call on electromobility foreseen for the near future.

Within this framework, the European Commission welcomes the re-edition of this document summarizing the most recent activities and the scientific and technological capabilities of the Spanish sector of the eco-electro

road mobility. As I did in the welcome letter to the first edition published in 2009, I would like to keep encouraging all the Spanish actors - both public and private, and particularly the industry including SMEs - to take advantage of the new opportunities that the European Green Cars Initiative is opening and to actively contribute to more sustainable, greener and safer road mobility in Europe and worldwide.

The first edition of this review was coordinated in 2009 by the Aragon's regional actors and supported by their regional government. This new 2010 edition is being launched in the frame of the conference "The European Framework Programmes: From Economic Recovery to Sustainability" organized in Valencia by the European Commission, CDTI and the Government of Valencia. This conference includes Green Cars as one of the main themes. I would also like to very much welcome the active role of the regions in support of national and European efforts in this endeavour: this publication is in this sense just another example to follow.

Let me finish by emphasizing the fact that the new economic strategy EU2020 proposed by President Barroso earlier this year makes explicit reference to all modes of clean transport and puts a particular emphasis on electric vehicles. In parallel, the February 2010 Competitiveness Council held in San Sebastian considered electric cars as a clear showcase for the implementation of EU2020. This informal council clearly gave a big impetus to green high-technologies in the car manufacturing industry as a means to create high value-added new jobs in manufacturing and services, to boost competitiveness of the European car industry, to decouple economic recovery and growth from environmental footprint, to expand the use of alternative and renewable energy sources and to increase the quality of life in urban and suburban neighbourhoods where most of the European population lives. The Spanish EU Presidency, playing a protagonist role, fully supports and promotes this approach.

I am sincerely looking forward to seeing you in participating in the FP7 Green Cars calls for proposals,

András Siegler
Director Transport Research
DG Research - Europen Commission

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EUROPEAN GREEN CARS INITIATIVE (EGCI): WEBPAGES & REFERENCES

European Green Cars Initiative

· DG Research webpage:
http://ec.europa.eu/research/transport/info/green_cars_initiative_en.html
· Flyer:
http://ec.europa.eu/research/transport/pdf/2010_greencar_flyer_en.pdf
· Green Cars webpage:
www.green-cars-initiative.eu.
· Website with some key documents:
http://www.green-cars-initiative.eu/documents

European Technology Platforms

ERTRAC - European Road Transport Research Advisory Council:
www.ertrac.org
EPoSS - European Technology Platform on Smart Systems Integration:
www.smart-systems-integration.org
SmartGrids - European Technology Platform for the Electricity Networks of the Future:
www.smartgrids.eu
EIRAC - European Intermodal Research Advisory Council: www.eirac.eu
eSafety Forum - www.esafetysupport.org

European Associations

EUCAR - European Council for Automotive R&D:
www.eucar.be
CLEPA - European Association of Automotive Suppliers:
www.clepa.be
EARPA - European Automotive Research Partners Association:
www.earpa.eu
EURELECTRIC - European Electricity Industry Association:
www.EURELECTRIC.org
ERTICO - European Road Transport Telematics Implementation Co-ordination Organisation:
www.ertico.com

Intergovernmental Organization

IEA - International Energy Agency: www.iea.org

References of key documents

· ERTRAC-EPoSS: "The electrification Approach to Urban Mobility and Transport - Strategy Paper", version 5.0, January 24, 2009
(available at www.smart-systems-integration.org)

· EUCAR-CLEPA: "R&D Priorities for the Greening of Vehicles and Road Transport - A contribution by CLEPA and EUCAR to the European Green Car Initiative", May 2009
(available at www.eucar.be and at www.clepa.be)

· EUCAR: "The Electrification of the Vehicle and the Urban Transport System - Recommendations by the European Automotive Manufacturers", July 2009
(available at www.eucar.be)

· Report on the Joint EC/EPoSS/ERTRAC Expert Workshop 2009 Batteries and Storage Systems for the Fully Electric Vehicle", Version 6, 25 September 2009
(available at www.smart-systems-integration.org)

· ERTRAC-EPoSS-SMARTGRIDS: European Roadmap Electrification of Road Transport Version 3.5, 30 October 2009
(available at www.ertrac.org)

· EUCAR: The Automotive Industry Focus on future R&D Challenges, November 2009
(available at www.eucar.be)

· EARPA Position Paper: Hybrid Electric Vehicles Components & Systems - Importance for European Road Transport Research and FP7, January 2010
(available at www.earpa.eu).

FP7 Green Cars and Leadership Opportunities

SPANISH CONTRIBUTIONS AND PRIORITIES TO THE EUROPEAN GREEN CARS INITIATIVE (EGCI)

0. Preamble

The purpose of this document is to summarize the Spanish initial contributions and priorities to the European Green Cars Initiative (EGCI)[1] . Its aim is to translate the interests and needs in research and development of Spanish entities involved in this field, to help medium and long term development of sustainable transport and eco-efficient mobility solutions. It also sets out the strengths of the "value chain" of the Spanish system, in order to achieve a clear positioning within the European Green Cars Initiative framework.

The document is structured according to the three major R&D avenues proposed by the European Commission for the RTD stream of action of the EGCI:

1. **Research for heavy duty vehicles,** aimed at improving energy efficiency and primarily concentrated on advanced **internal combustion engines (ICE),** with emphasis on new combustion, the use of alter-native fuels, intelligent control systems, 'mild' hybridisation (use of recuperated electricity to power the auxiliary systems) and focused also on special tyres for low rolling resistance.

2. **Electrification of urban and road transport, i.e. research on electric and hybrid vehicles** linked to smart electricity grids with intelligent vehicle charging systems tailored to customers' needs, including the development of components for the vehicles (energy storage systems and drivetrain), vehicle integration, grid integration and integration of the vehicles in the transport system.

(1) ***IMPORTANT NOTE: THE TERM "GREEN CARS" SHOULD BE UNDERSTOOD AS "GREEN VEHICLES" INCLUDING TWO-WHEEL VEHICLES AND OTHER TYPES OF VEHICLES LIKE HEAVY DUTE VEHICLES.*** *In particular powered two-wheel vehicles have an important role to play in the following areas: Integrated safety; Advanced electric vehicle concepts; Smart storage integration; Auxiliaries systems; Validation; and Demonstration*

3. **Logistics and co-modality** combined with **intelligent transport system** technologies to optimize the overall system efficiency and sustainability.

For each research avenue, different priorities may be identified and linked to the already defined R&D areas for electrification of road and urban transport.

The core of the road transport electrification is the electric vehicle, with electric powertrain and their modules and components. Different car, truck and bus concepts are the main subject of current research and homologation activities, both for urban and road use. Key issues in the development of pure electric vehicles and hybrid vehicles include challenges for the mass production and feasibility of energy storage systems (such as the increase in energy density, capacity, safety, duration, charge-discharge cycles, a higher mechanical and electric standardization and a better communication interface, linked to a cost reduction), cell packaging (especially when dealing with safety, cost, manufacturing, diagnosis, maintenance, repair and recyclability) and the development of architectures for energy management systems and elements exchange and the definition of testing standards. Exploitation of the road and railway network as renewable energies generators can also play a primary contributor to an effective switch to electric mobility.

Full deployment of electric vehicles will also demand the availability of the charging infrastructure and its integration in the large scale mobility system. In this context, the concept V2G combines fast charge with smart payment system, ICT for data exchange between the infrastructure and the storage system using standard procedures, physical and logical security of charging points and seamless integration of the charging infrastructure with other Smart Grid developments.

For the long term, road transport will reduce its dependency on, and finally abandon fossil and other

non-renewable sources of primary energy. At the same time, the protection of the environment is calling for further reductions of exhaust gas emission (particulates, CO_2, …).

Urban mobility, as specific segment of transport demand calls for specific solutions both for the development, testing and integration of new technologies in electric and hybrid vehicles and their adaptation to the mobility demand of different users, and also for fleet management with new tools for communication vehicle- infrastructure - control centre, that require real time management of large amounts of information and its processing and distribution using optimized communication channels. Other user-oriented aspects are also key, such as improvement of public transport or car pooling among others.

There are some technical complementary aspects between Green Cars and Factories of the Future PPPs. In fact, manufacturing and supply chain of the green cars sector could take advantage of the new concepts and technologies developed within FoF: Sustainable manufacturing, ICT enabling intelligent manufacturing, high performance manufacturing and exploiting new materials through manufacturing. All this transversal manufacturing topics could also be developed for the green cars industry. On the other hand, FoF initiative could take advantage of the optimization of the overall transport system through logistics, co-modality and ITS implementation, improving Supply Chain performance.

The EGCI, focusing as it does on electrification of road transport, is complementary to the Hydrogen and Fuel Cell Technology Initiative launched last year. This initiative will implement the EU target-oriented research and development to support the broad market introduction of these technologies. In fact, extensive use of hydrogen as energy driver and catalyst will represent another major contributor to an effective switch to electric mobility. At national level, the short/medium/long-term strategy is coordinated by the Spanish Hydrogen & Fuel Cell Technology Platform (www.ptehpc.org).

This document is the result of several meetings held along the summer/autumn 2009 with the participation of the main Spanish stakeholders including representatives from industry, research centres and academia in the fields of automotive and road mobility (both light and heavy duty vehicles), energy, logistics, ICT… Apart from the meetings, the document has undergone a broader online consultation with other actors. The annexes at the end of this document detail the entities participating in the meetings and those who provided comments and input in the broadened on-line consultation.

The reading of the current document will also stimulate the identification of market opportunities out from specific R&D areas (processes, scenarios, technical, industrial…) and this will be of the interest of clusters dealing with transportation and logistics (road and urban).

1. Introduction: Spanish strengths

Fulfilment of the ambitious goals set in the Green Cars initiative demands collaboration among all the sectors and technology agents involved: Vehicle manufacturers and their suppliers, utilities, infrastructures and logistics operators and public and private technological centres and research teams.

All those stakeholders contribute to strengthen the Spanish position in the general goal of achieving greener road mobility as follows:

· The size of the Automotive sector: Spain is the 3rd largest European manufacturer of cars and light vehicles and the first in heavy duty and commercial

vehicles in Europe, linked to a strong component suppliers sector, that includes around 1000 companies from large international groups to SMEs and manufactures all types of components and systems.
· One of the Spanish OEM's has the biggest facilities for automotive R+D (with a headcount of about 1000 engineers), leading research in technologies for the future development and manufacturing of PHEV's and PEV's.
· The production of a pure electric vehicle has already been assigned to a Spanish OEM plant for 2011.
· Spain, as first EU heavy duty vehicle manufacturer, presents strong HDV power-train R&D capabilities, especially concerning natural gas engines. Moreover the 2nd largest biomethane plant worldwide is in Madrid.
· R&D capabilities of vehicle and component manufacturers is complemented by a network of technological centres and specialized research groups, with broad technical capabilities and experience in national and international RTD projects, customers' support, testing and homologation. The same applies for the ICT sector.
· The existence of a Spanish battery manufacturer developing lithium ion battery technology for electric vehicles.
· Existence of battery recycling capabilities in Spain, currently for lead acid batteries, with lithium ion battery recycling programs under way.
· The Spanish Utilities hold a leading position in the European energy market, whereas renewable energies represent a significant ratio in the generation mix in Spain (390 gCO_2/kWh). Therefore integration of renewable energy sources by means of road transport electrification is a logical strategic energy policy at national level.
· Existence of an ITS and intelligent infrastructures sector capable of combining smart recharging infrastructures with global, integrated, greener mobility schemas.
· Transport activities and the logistics network represent also a key pillar of Spanish economy, which is reflected in the high Spanish participation level in the European Association Europlatforms.
· The National Technology Platforms are meeting points for technological agents within each sector and have already defined their own industrial oriented vision and strategic research agendas. Those directly linked to the EGCI are M2F-SERtec for the automotive sector (www.plataformasertec.es), Futured for smart grids (www.futured.es) and Logistop for logistics (www.logistop.org). The national platforms have already established links with the related or mirror European TPs.
· The Ingenio 2010 Plan launched in June 2005 has provided a significant increase of public funding for RTD projects, specially of large integrated projects, and the set up of strategic public-private consortia, with a impact on the resources devoted to R&D (47% increase of public investment in R&D between 1999 and 2006, reaching 1.27% GDP in 2007).

The **Automotive Sector** is one of the keystones of the Spanish economy, generating, in 2008, nearly 9% of both the direct and indirect employment of the active workforce and contributing 6% to the GDP. Spanish vehicle production has dropped in 2008 by 12%, positioning itself as third largest European vehicle producer and 8th worldwide, with a volume level of a little more than 2.5 million units, accounting for 32,090 M€. By the other hand, Spain represents the 5th largest car market in Europe (1.2-1.5 Mill cars/year).

MAIN MANUFACTURING COUNTRIES 2008

País / Country	Turismos Cars	%08/07	Veh. Indus. Trucks	%08/07	TOTAL	%08/07
UE-15/EU-15	13.027.118	-9,7	2.349.210	-6,8	15.376.328	-9,1
JAPÓN/JAPAN	9.916.149	-0,3	1.647.480	-0,3	11.563.629	-0,3
CHINA	6.766.609	7,3	2.567.978	-0,9	9.323.587	5,1
USA	3.776.641	-3,8	4.896.450	-28,3	8.673.091	-19,3
ALEMANIA/GERMANY	5.532.030	-3,1	513.700	1,9	6.045.730	-2,7
COREA DEL SUR/SOUTH KOREA	3.450.478	-7,3	376.204	3,7	3.826.682	-6,4
BRASIL/BRAZIL	2.561.896	7,1	658.979	12,5	3.220.475	8,2
FRANCIA/FRANCE	2.145.935	-15,9	423.043	-9,0	2.568.978	-14,8
ESPAÑA/SPAIN	1.943.049	-11,5	598.595	-13,7	2.541.644	-12,0
INDIA	1.829.677	6,8	484.985	+10,2	2.314.662	2,7
MEJICO/MEXICO	1.241.288	2,7	949.942	7,2	2.191.230	4,6
CANADÁ	1.195.436	-10,9	882.153	-28,7	2.077.589	-19,4
REINO UNIDO/UNITED KINGDOM	1.446.619	-8,7	202.896	-5,9	1.649.515	-8,8
ITALIA/ITALY	659.221	-27,6	364.553	-2,4	1.023.774	-20,3

Sauce: Prepared by ANFAC from appropiate association in each country

The automotive sector is one of the main exporters in the Spanish economy, since it represents nearly a quarter of the total goods exports. The value of the vehicle exports in terms of the total value of goods exported by the automotive sector accounts for 67%, the rest is related to motors, parts and components. Nearly 83% of the vehicle production is for exportation, mainly to the European Union. It should be highlighted, however, that the exports to the countries that have recently joined the EU is gradually increasing.

It is also remarkable that the investment levels have managed in 2008 to recover to over 1,600 million Euros, which demonstrates the high confidence that the "parent companies" have in Spanish factories. According to the information provided by the official statistic sources, the R&D investment of the Automobile Manufacturers and Trucks during 2007, was 280 M€, which represents a sharp drop from the average of the years 2003-2005, which was the order of 560 M€.

Spain, as 1st EU LCV+HDV producer, has major production facilities of HDV and presents strong HDV power-train R&D capabilities especially concerning Natural Gas (NG) engines. Regarding passenger transport vehicles, Spain holds a leading position in the multi-stage vehicle production and has significant examples of R&D projects on alternative power-train technologies (including hybrid and hydrogen) in this sector. Moreover, the advantageous position of Spanish LNG infrastructure and national operators and the biomethane national production provides increasing opportunities in this technology related R&D projects.

Finally, in regards to urban transport and services, Spain has cities (i.e. Madrid and Barcelona) which must be considered as "EU Champions" in incorporating alternative powertrain vehicles into their public transport and services systems.

The Spanish **component manufacturers' sector** holds the 6th position in the world in turnover: 29,970 M€ in 2008 after a peak of 32,873 M€ in 2007, 58% of which were exported. The component manufacturers' sector includes 1000 companies from SMEs to large international groups. They show a strong innovation capability, with an average R&D investment of 3% related to turnover. In general, 75% of the value of the car and 50% of the R&D spending comes from suppliers.

Spanish automotive suppliers are well aware of the threats and challenges that the highly demanding automotive industry requests through the whole value chain, from TIER 1 to TIER 4. Besides production plants of the main global foreign component manufacturers, there are a few large Spanish companies and a broad network of smaller suppliers, most of them SMEs, who are showing, year by year, their capability to comply with the stringent quality and technical requirements demanded by OEMs and transferred through all the value chain. As requested by OEMs, companies are not only providers to the former level, but real development suppliers.

Competitiveness of the European automotive industry at the upper level of the pyramid will be assured when all the lower levels (TIER 1 to TIER 4) can become development suppliers of the former one. To reach the goals set for a sustainable mobility, meeting the challenges of cleaner, safer and smarter vehicles and transport systems, TIER 1 suppliers must develop new products and systems. However, they cannot do it alone, they need the following levels of the chain to provide them with new components and sub-systems, materials, etc. and work of all of them must be aligned. The sector's priorities must be known and encompassed through all the value chain. For this reason it is important to establish mechanisms for an effective flow of information on both directions, upstream and downstream in the suppliers pyramid, and to support

technological collaboration of suppliers from different levels.

There is a need for the development of technologies for the vehicles, but, upon that, there is also a strong need of establishing collaboration models to develop communication systems that lead to a higher efficiency in energy and resources use. Sustainable mobility must be based not only on cleaner and smarter vehicles, but on connected vehicle (V2X) strategies and energy efficiency paradigms in the whole system as well. New development opportunities and technological collaboration agreements are therefore needed, especially with those sectors that are becoming more and more linked to the vehicle in the future: the utilities, infrastructures and ITS suppliers.

The **smart integration of green cars into the electricity grid** requires the development of new coordination and standardisation schemes along all the electricity supply value chain: cars, distribution companies, resellers, and transmission system operators (TSOs), in order to assure that the infrastructure that fuels these mobility schemes is available not only nation but European-wide, with the same quality, standards and services.

Spain has the suitable electricity sector structure for contributing to meet the green car initiative. In fact, from the electricity infrastructure point of view, one single company is acting as TSO over the whole national territory while two distribution companies cover almost 80% of the area. This would assure that coordination and agreements for nationwide standards can be achieved in shorter terms than other European countries where the number of stakeholders in the sector is greater. Common projects are already ongoing for that purpose. Also, Spanish utilities are leading companies at the European level in contributing to achieve common standards for connection and management of distributed demand resources. It is also worth mentioning the Spanish TSO is the only European TSO having a special unit entirely devoted to demand-side management (DSM).

The **macrosector of ICT** now provides 8% of GDP in the EU-27. In the Spanish case, the sector exceeds 77,430 M€, adds 7.07% to GDP. This is clearly a strategic sector for Spanish economy. The ICT companies and their technologies are key to sustainable economic growth, a growth that should maintain respect for the environment. ICT technologies contribute to energy savings and their contribution is essential to mitigate greenhouse emissions through a range of technology solutions that improve the efficiency of other sectors, such as e-services, virtualization solutions or ICT for energy-intensive sectors such as electricity and transportation. The application of ICT, in its broadest sense, enables the development of tools that facilitate mobility management and also help increase efficiency throughout the system.

Logistics and Freight Transport represents in Spain between 9.5 and 11.5% of the GDP and employs nearly 865,000 people in 223,328 enterprises. Logistics is a transversal sector and it has been estimated that logistics costs represent 12% of the final cost in manufacturing sectors and over 20% in retail.

The development of logistics activities in Spain is high, as shown by the fact that there are more than 60 Logistics Platforms and Areas in Spain. 21 of them participate in the European Association of Logistics Platforms and Freight Villages Europlatforms, which means the highest representation of a Member State at the European level. Thus the national transport and logistics network gives Spain a key position as platform for international transit.

Regarding R&D, it is worthwhile highlighting the active role of the Spanish Logistics, Intermodality and Mobility Technology Platform, Logistop.

The rest of this document is structured around the following sections:

1. INTRODUCTION: SPANISH STRENGTHS

2. RESEARCH PRIORITIES

2.1. HEAVY DUTY VEHICLES
2.1.1. Heavy duty vehicles: focus on electrification and alternative technologies
2.1.2. ICEs for heavy vehicles

2.2. ELECTRIFICATION OF ROAD AND URBAN TRANSPORT
2.2.1. Materials, manufacturing and processes
2.2.2. Systems and components for electric vehicles
2.2.3. ICEs for light vehicles (range extenders)
2.2.4. Smart infrastructure and services for Green Vehicles
2.2.5. Grid integration
2.2.6. Sustainable urban mobility: vehicles and concepts
2.2.7. Demonstration and field operational tests
2.2.8. Regulation and standards, homologations, tests, validation, safety and type approval of the hybrid and electric vehicles

2.3. LOGISTICS, COMODALITY AND ITS
2.3.1. Logistics and comodality
2.3.2. Sustainable urban mobility: connected vehicle and fleets
2.3.3. ICT technologies for the improvement of the whole transport system

2. Research Priorities

2.1. Heavy Duty Vehicles

The 'European Green Cars Initiative' includes Heavy Duty Vehicles as one of the three major research and development priority pillars, addressing the key role of "traditional" medium and long distance Heavy Duty vehicles for road transportation in Europe both for passengers and goods.

Spain as the 3rd largest European manufacturer of cars and light vehicles and the first in heavy duty and commercial vehicles in Europe, presents strong HDV power-train R&D capabilities, especially concerning natural gas engines.

This fact combined with a leading position in the multi-stage vehicle R&D and national production and the advantageous position of Spanish LNG and bio-methane infrastructure and national operators, provides increasing opportunities in this technology related R&D projects.

In the other hand, some promising opportunities are seen in the evolution of traditional ICE for HDV, as well as in partial electrification of new vehicle concepts designed for specific purposes such as urban services and transportation.

In summary, RTD specific priorities in this area can be divided in two different lines:

2.1.1. Heavy Duty Vehicles: focus on electrification and alternative technologies
2.1.2. ICEs for heavy vehicles

2.1.1. Heavy Duty Vehicles: focus on electrification and alternative technologies

Objectives and scope

The shrinking availability of fossil energy sources requires, in the short to medium term, strongly increasing the energy efficiency of vehicles and of the traffic and transport system as a whole, including Medium and Heavy Duty Vehicles (MDV & HDV).

Maintaining Spanish leading industrial position and leveraging our R&D capabilities in the Medium and Heavy Duty Vehicle industry appear then as major

objectives in the framework of the Green Cars initiative at national level.

Major R&D areas

1. **Renewable/alternative fuels and related drivetrains** for HDV. Further research related to the energy and environment topic is aiming at the diversification of energy sources and at finding the optimum combination of drive train and energy carrier. R&D needs include:

· Development of CO_2-neutral fuels from renewable materials, particularly biogas/biomethane, first and second generation bioethanol, hydrogen and electricity.

· Development of on-board storage systems for alternative fuels

· Optimisation of powertrains for alternative fuels: diesel for 2nd generation and CNG/biomethane.

· Development of HDV for medium and long distance transport based on LNG (Spain receives 70% of NG in liquid form and saving in running cost accounts for 50%)

· Development of hybrid thermo-hydraulic powertrains for urban service vehicles applications.

· Assessment of climate and energy impact:

  · Well-to-wheel analysis for various fuel options and drive trains,

  · Simulation packages for CO_2 indicators of various types of commercial vehicles and for air quality indicators in urban areas taking into account climate conditions.

2. **Technological innovations of the internal combustion** engine and exhaust systems are important short-term paths towards fuel savings. This topic is fully developed under 2.1.2. below.

3. **Electrification of the vehicle.** Due to their zero local and potentially minor greenhouse gas emissions, electric propulsion and drive trains combining alternative technologies (hybrid, plug-in, electric drive, hydrogen and fuel cell) will play a certain role in reducing the impact of transport on energy consumption, climate and environment also for HDV (although less important than in passenger car). Some R&D possibilities are seen in:

  · Development of hybrid thermo-hydraulic powertrains for urban service vehicles applications.

  · Extending hybrid thermo-electric (including plug-in) developments from passenger cars to M & HDV used in urban distribution and passenger transportation. This leads to extend to M & HDV research initiatives in the following fields: Energy storage systems, new vehicle concepts required for electric propulsion technologies, e.g. using in-wheel motors; solutions for electric vehicle integration issues, key components for hybrid, electrical drive and fuel cell systems, etc.

Expected impact

· Maintaining Spanish leading industrial position and leveraging R&D capabilities in the Medium and Heavy Duty Vehicle industry. This will help to keep actual labour force and possibly enhance technical/specialist human resources in Spain.

· Identify Spain as a UE reference in R&D projects and initiatives based on NG (particularly LNG) in the powertrain systems for M & HDV (medium and long distance transport).

· Realizing real applications of hybrid thermo-electric (including plug-in) developments from passenger cars in M & HDV used in urban distribution and passenger transportation.

· Consolidate Spanish municipalities in a leading position in Europe in incorporating alternative powertrain vehicles into their public transport and services systems. Sustainable urban transport in Spain to be a mature reality in the short term.

· Renewable/alternative fuels and related drivetrains for HDV in the multi-stage busses and trucks industry to be recognize as "European champions"

· Development of the Spanish industry of buses and

trucks by specialising the existing industry which has experience in the adaptation to natural gas and GLP use.

2.1.2. ICEs for heavy vehicles

Objectives and scope

To promote Research and Development in the propulsion systems for Heavy Duty automotive vehicles in the areas in which the Spanish industry has industrial production capabilities:
· Development / adaptation of thermal - electric engines for auxiliary power units and range extenders of electric / hybrid vehicles.
· Alternative fuels: biofuels, biogas (bio-methane), natural gas, including LNG.

As a means to fulfil this objective it is necessary to establish working groups and installations specialised in Research and Development for the adaptation of the thermal and electric engine and of the additional systems required (electric energy converters, regulation and control systems, energy recovery and optimisation), as well as for performance optimisation for use with alternative fuels and Spanish manufactured biofuels.

Major R&D areas

Technological innovations of the internal combustion engine and exhaust systems are important short-term paths towards fuel savings. R&D needs are seen in:

1.**Further improvement of conventional powertrains:** High-efficient combustion engine technologies allowing significant reduction of CO_2,

2. **Optimisation of the vehicle** regarding energy management, energy recuperation, light weight structures (high-strength steel, aluminium, plastics, compound materials);

Expected impact

· Maintaining Spanish leading industrial position and leveraging R&D capabilities in ICEs for Medium and Heavy Duty Vehicles. This will help to keep actual labour force and possibly enhance technical/specialist human resources in Spain.

2.2. Electrification of road and urban transport

Transport electrification can be considered the main pillar of the GCI, due to the technology breakthroughs required and also due to its high impact on the reduction of oil dependency and urban and road transport emissions. Moreover, it involves the development of new vehicle and mobility concepts and of new business models, as well as step changes on materials and technologies for the new components in the vehicle.

The development of electric transport systems demand R&D efforts on the whole value chain from the development of components and new high performing materials (energy storage systems, their management and smart integration in the vehicles, drivetrains, energy efficient auxiliaries, energy recovery systems and ICEs for range extenders) and the development and/or adaptation of manufacturing processes to produce them; new vehicle concepts and architectures; the interaction of the vehicle with smart electrical grids and also the integration of electric vehicles in the whole transport system. Full deployment of electric vehicles will also demand taking into account the specific issues related to urban mobility, the validation of vehicles and users' acceptance studies provided by demonstration programmes and field operational tests and, finally, the definition of standards and homologation procedures and tests.

Summarising, RTD specific priorities in this area have been split into eight lines:
2.2.1. Materials, manufacturing and processes

2.2.2. Systems and components for electric vehicles
2.2.3. ICEs for light vehicles (range extenders)
2.2.4. Smart infrastructure and services for Green Vehicles
2.2.5. Grid integration
2.2.6. Sustainable urban mobility: vehicles and concepts
2.2.7. Demonstration and field operational tests
2.2.8. Regulation and standards, homologations, tests, validation, safety and type approval of the hybrid and electric vehicles

2.2.1. Materials, manufacturing and processes

Objectives and scope

Hybrid and electric vehicle components from the first generation are mostly derived from industrial equipments, such as industrial drives, static energy storage systems and so forth. These components need to be re-engineered in order to meet the stringent requirements of the road transportation sector in terms of cost, reliability, weight, volume and safety. This means that new materials and processes must come into play, particularly when it comes to mass production of electric components under automotive sector requirements.

Technological solutions from other fields such as power electronics, renewable energies and nanotechnologies (Spanish research strong fields) may offer significant improvements to the new generation of hybrid and electric vehicle components.

Major R&D areas

1. **Development and manufacturing of lighter high performance materials** for new definitions of:
· Design and modelling of vehicle modular architecture.
· Life cycle analysis and environmental sustainability. Recycling, reusing and revalorization of materials at the end of product's useful life cycle (batteries, electric motors, ...). Develop renewable and alternative materials (i.e. biomaterials; photovoltaic pavement for road, tram and railway) to replace non-renewable ones (fossil origin materials).
· High energy absorption properties to improve vehicle safety without penalizing weight.
· Lightening and optimization of batteries and electric motors. Reduction of costs increasing motor specific power. Improvement of mechanical performance.
· New (multi)functional performance materials and components for new vehicles (e.g. sensors, actuators, EM shielding).
· Progress in the implementation of nanotechnologies (nanocomposites, polymeric matrixes, ...).

2. Development and implementation of e**lectronic systems embedded in materials** to allow informing about their behaviour in real time.

3. Development of **multifunctional materials** to allow their implementation in the vehicle surface and in key vehicle elements.

4. Development of **new joining technologies** with lower environmental costs, paying special attention to dissimilar joining and enabling easier dismantling and recycling processes.

5. **Metrology applied to manufacturing:** development of measuring and calibration methods for the quality control and manufacturing system verification. Calibration and traceability test.

6. **Mechatronics and microtechnology:** design, manufacturing and calibration systems and prototypes for manufacturing and contact - no contact high precision measurements.

7. Incorporation of **customization and vehicle adaptation concepts to** finished products, decoration and differentiating elements.

8. **Improvement of the collaboration between different agents of the suppliers' chain. Optimization from a global point of view. This means:**
- · Security and privacy of Know-how
- · Protection of sensible information
- · Design of platforms for information exchange
- · Collaborative learning
- · Business process

9. **Optimization of transport from a supply chain perspective.** Optimization of the entries management and the supply chain planning. Analyzing products from the design taking into account logistic requirements for favouring materials inverse flow, recycling, reusing, remanufacturing and other business process.
- · Processes of recycled materials reincorporation in production processes
- · Reverse logistics for waste (including packaging waste)
- · Packaging logistics optimization

10. **Optimization of current networks of material feed-back.**

Expected impact

· **Improvement of Spanish position in materials and processes own technologies** for future green cars.
- · New quality instruments for new cars (sensors, inspection systems, digital 3D)
- · Development of own technology, technology transfer

· **Continuous improvement of productivity and innovation:** development, optimization and automation of techniques and new inspection systems to allow competing in a global market.
· **Reduction of consumption of processing auxiliary systems** (process integration, reduction of intermediate sequences)
· **Reduction of necessary packaging** for ICE and new electric motors.
· **Favourable impact for environment regarding:**
- · Materials reuse (use of biopolymers, plastics recycling and new materials from waste)
- · Consumption reduction
- · Emissions reduction
- · Efficient use of energy

· **Reduction of the "time to market"** with expert support for the decision taking about OEM suppliers and Tier 1 related to innovative materials performing and related processing technologies.
· Translation and use of virtual modelling instruments related to materials and processes behaviour.

2.2.2. Systems and components for electric vehicles

Objective and scope

Most of the priorities set for the development of individual components for the electrification of vehicles have been already included in the GCI 2010 calls, which were launched on July 30th 2009. However, some priorities for their further development and integration in the vehicle and dealing with specific developments of vehicle components and systems for the other areas included in the GCI have been identified.

Major R&D areas

1. Development of advanced energy storage systems to comply with the targeted requirements of safety, high energy density and life, linked to low cost and raw material availability and recyclability. R&D efforts are needed at all technology levels: from fundamental electrochemistry research on new materials for batteries and supercapacitors, to the design and set up of lithium ion battery production lines, and development of cell technologies and smart integration of battery cells into packs or modules and the final integration into the vehicle (hybrid energy/power storage systems) and the grid (fast charge, monitoring for peak and load levelling when required).

2. Development of Drivetrain components and systems, optimization of in-vehicle energy efficiency and energy management:
· Standard modularization of powertrain components and flexible assembly.
· Components for achieving higher specific power and less weight-packaging.
· Increasing plastic content in underhood components and working in higher temperature environments.
· Vehicle technologies for energy efficiency optimisation: brakes, suspension and recuperation technologies, mechanical and thermal energy recovery systems. (Note: this R&D area is also included in section "2.2.3. ICEs for light vehicles, range extenders").
· Development of electric generators for hybrid propulsion systems (Note: this R&D area is detailed in section "2.2.3. ICEs for light vehicles, range extenders").
· Integration of ICE range extenders: Energy management strategies aiming at minimizing energy consumption, including information about energy routing capabilities, availability and limitations of power, trip optimization, predicted or real time traffic situation and specific road attributes.
· Development of new concepts of auxiliary systems, such as air conditioning/heating, specially designed for electric vehicles.
· Further development of technologies and concepts related with electric in-wheel engines.

3. Safety aspects of electric vehicles:
· Adaptation of passive and active safety systems to the future transport concepts and low-weight vehicles. New ADAS systems for electric vehicles: vulnerable road users, collision avoidance, intelligent vehicle dynamics and crash mitigation (Note: this R&D area is also included in section "2.3.3. ICT for the improvement of the whole transport system").
· Functional safety and reliability of components and systems.
· Safety issues related to new electric components and high voltage

4. In-vehicle system integration:
· Development of components and systems for the new vehicle types and topologies. Microprocessors, FPGAs devices and HW/SW designs for multi-system architectures.
· Integration of nanoelectronic technologies, devices, circuits and power electronics modules.
· Functional architecture: position and standardization of interfaces for power and data, distributed x-by-wire systems.
· Development of a distributed real time embedded system platform and embedded systems architectures (hardware, software, operating systems, algorithms, etc.), considering safety critical issues and designed with standardised and interoperable components.
· Control methods and strategies related to different architectures.
· Standardisation, interoperability, and interoperability analysis and verification.

5. Integration with the electrical network: Vehicle-to-Grid connection
· In-vehicle components for advanced vehicle to grid (V2G) interface. Vehicle charging systems with on-line information and interoperability and bidirectional capabilities.

6. Integration of EVs with the transport system:
· Cooperative systems vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I), connected cars to improve safety and efficiency, road and traffic information, car-in traffic control systems, communications and infotainment.

Expected impact

· Work on the priorities detailed above will support the medium-long term introduction of Spanish technologies related with green cars.
· Full deployment of electric vehicles demands availability in due time and at affordable prices of technologies and components for the vehicle itself

as well as for its integration with the electrical grid and with the transport system. This can be accomplished by joint work of all the levels of component suppliers, together with vehicle manufacturers, utilities and infrastructure operators.

2.2.3. ICEs for light vehicles (range extenders)

Objectives and scope

To promote Research and Development in the propulsion systems for light automotive vehicles in the areas in which the Spanish industry has industrial production capabilities:
· Development / adaptation of thermal - electric engines for auxiliary power units and range extenders of electric / hybrid vehicles.
· Alternative fuels: biofuels, biogas (bio-methane), natural gas

As a means to fulfil this objective it is necessary to establish working groups and installations specialised in Research and Development for the adaptation of the thermal and electric engine and of the additional systems required (electric energy converters, regulation and control systems, energy recovery and optimisation), as well as for performance optimisation for use with alternative fuels and Spanish manufactured biofuels.

Major R&D areas

1.Development of small internal combustion engines of high specific power, ecologic, efficient and quiet, specifically designed as range extenders to increase the autonomy and feed the auxiliary systems of electric vehicles. R&D needs include:
· Engine Downsizing, Downspeeding, Turbocharging
· Reduction of energy losses in the various engine systems (heat losses, mechanical losses, …).
· Recovery of waste energy (exhaust, cooling, braking, …).
· Development of new more efficient transmissions, optimized lubrication systems, and integral cooling system for thermal-electric engine.
· Efficient management and integral control of the internal combustion engine and of its auxiliary systems and transmission.

2. Development of electric generators for hybrid propulsion systems:
· Optimisation of the mechanical and thermal design
· Control of the thermal engine - electric generator system
· Common energy flow management

3. Strategies for engine management and use of different fuels:
· Development of management strategies for engine and range extenders
· Adaptation of thermal engines for the use of fuels with different properties
· Development of lubricants suitable for alternative fuels

4. Development of alternative fuels
· 2nd generation biofuels
· On-board storage systems for alternative fuels

Expected impact

Development of the Spanish industry by specialising the existing industry which is nowadays manufacturing stationary and small motorcycle engines. As the range extenders require medium range mechanical and electrical power, they are within reach of the Spanish industry. This development could be extended to hybrid vehicles with higher requirements.
· Development of the Spanish industry of electrical systems and components: generator, electric energy converters, control systems, etc…
· Development of the Spanish biofuel and lubricant manufacturing industry.
· Reduction of the impact on the environment by use of renewable fuels.

2.2.4. Smart infrastructure and services for Green Vehicles

Objectives and scope

Smart grids is a network of networks whose overall objective shall be the integration of all the stakeholders in the electricity networks and communications fields with the transport system, so that the overall use of energy is reduced considering these different stakeholders (vehicles, heavy duty, buses and motorbikes).

Spain has a great potential in the area of integrating vehicle with road infrastructure, based on the main issues:
· Infrastructure (road and electricity), improving its value creating a road network able to integrate and develop new business and adding value to the road infrastructure itself. Construction companies, with a great projection and potential at the European level, shall take a special leadership in this objective, together with generation and distribution companies, which are key issues in this new scenario in which infrastructure can take a leader role, even ahead of vehicles.
· Communication and Services, sector with great capabilities at the national level, linked to services related to electric vehicles and users. Integrating these capabilities with infrastructure developers, specific solutions could be obtained by improving services offered to final users and optimising the distribution, charging and safety and security of infrastructure linked to electric vehicles.
· Transport, with R&D solutions for the OEM using different technologies permitting the communication with infrastructures and the network, guaranteeing a real time bidirectional information exchange and secure transactions. Technologies able to integrate public and freight transportation.

Major R&D areas

1. "Smart charging": control architectures, balancing, standardisation of operation modes, hardware and software for settlement and payment, algorithms and SW operation (network – vehicle) and integration with existing DMS, physical and logical security.

2. Forecast and Adaptive algorithms (PHEV/EV)

3. Communication services with protocols BUS / PLC, RF and their associate technologies: SDRC, Wimax, Zigbee, Tetra or other.

4. Urban infrastructure management:
· Urban policy for electrical vehicle management such as environmental areas definition, pricing, charging stations localization. Technologies and ICT solutions for sustainable urban management.
· Standardisation of traffic prioritisation and "electric" transportation (specific lanes, dedicated lanes, freight – last mile-, public transportation, etc.)
· ICT solutions for vehicles identification and access control for "green" areas. Sensor networks for incidents management.

5. Fast charging and charging system integrated in the infrastructure.

6. Integration of alternative energy sources and green vehicles (storage, distribution).

7. User services: driving using dedicated lanes, quick lane or exclusive lane, payment of parking fees in blue or green zones, covered parking places, and ICT solutions for the management of these services.

8. Safety improvement (compatibility, crashing in junctions, etc, …), warnings of emergency vehicles approaching, emergency or support calls, driver support services, etc..).

9. Value added services for the EV: management of carsharing (sharing of EV) solutions (localization, metering etc.), telematics services for the EV (Loca-

tion Based Services, ICT-based Insurance, use of EV as traffic probes, ICT-based parking management etc.), specific navigation solutions (showing recharge points), information regarding CFP of different transport modes.

10. Launching of pilot projects able to evaluate technologies developed in **different real life scenarios**.

11. Bidirectionality of EV. Technologies V2G. Study of new actors, roles, relationships, business models and cost-benefit analysis of the electricity sector integrated with EV. Management of bidirectionality of charging - discharging of EV and integration with existing DSM.

Launching of pilot projects able to evaluate technologies developed with simulation of **different network scenarios**.

Expected impact

· The impact is undoubtful in environmental terms if pollutant primary energy sources are substituted by cleaner and efficient ones. It is of special interest to fulfil the described objectives, in order to have an efficient intelligent network integrated with the sufficient capability to distribute and supply the necessary energy for charging.
· The position of Spanish companies with greater potential (construction companies, generation and distribution companies, communication and services) as main players in the transport of people and goods, such as the development of physical connections between vehicle, infrastructure (charging points) and electricity network, and the deployment and exploitation of new services based on specific technologies (V2X) and convergent technologies (advanced driver assistance systems - ADAS).

2.2.5. Grid integration

Objectives and scope

Electrical vehicles represent a new type of demand in the value chain of the electricity sector, which, in accordance with the development previsions, will constitute a considerable percentage of energy and power demands on the electrical system in the coming decades. In addition, the impact on the electricity sector is not well known as the patterns of use of electric vehicles are dependent on the technological options available and their social acceptance. It is worth mentioning that electric vehicles are mobile units which in the future will create different electrical demand scenarios from a geographical point of view.

Strategies for fostering electrical mobility lie in the search of an efficient overall energy system. Because of this, it is not only important to pay attention to the efficiency of the design of the vehicles, but also to the operability of these loads according to the needs of the electrical systems. Therefore, it is fundamental that the latter is considered in the strategic development of the infrastructures.

In this area, the objective to be covered is the search for the standardization of the physical connection of the vehicles to the grid, aiming at defining European standards for the interoperability of the vehicles in the different distribution networks. In addition, with the objective of achieving an efficient integration into the energy system, infrastructures need to allow for intelligent management of the electric vehicles (identification, charging, payment, operation services, V2G).

Major R&D Areas

Among relevant aspects to cover for an efficient integration of electric vehicles into the grid, the following can be outlined:

1. Development of European standards for charging electric vehicles,

2. Implementation of new models for planning and operating the electricity networks, taking into account the new energy demands.

3. Development of a regulatory and rating framework which permits future users of electric vehicles to receive adequate quotes for an efficient use of vehicles, promoting charging during off-peak hours.

4. Development of new forecast models for predicting future electricity demand.

5. Harmonious design of monitoring and real time control and management systems, which allow the use of the charging stations irrespectively to the distribution networks in which the electric vehicles are connected.

6. Optimal use of the existing infrastructure for an intelligent management of electric vehicles. Profiting from telematic netwoks for metering and customer tele-management.

7. Identification of new services which electric vehicles could offer to the electrical system: new operation services, support against black-outs, V2G.

8. Identification of business models.

9. Integration of renewable energy into the grid.

Expected impact

· The anticipated results are the achievement of European standards for connection, payment, monitoring and management of the charging of electrical vehicles, so that energy benefits may be achieved.

2.2.6. Sustainable urban mobility: vehicles and concepts

Objectives and scope

Urban mobility is a segment of transport demand that shows significant differences with the interur-ban and that calls for specific solutions in the field of the European initiative "Green Cars". Specific issues include:

· Greater significance of local emissions,

· The possibility of using private vehicles with very low emissions as a result of less demanding specific performance,

· The offer of public transport, structured in vehicle fleets of different sizes, can implement strategies and technologies of exploitation and optimization that are not applicable or more difficult to apply in other domains,

· The possibility to deploy ICT supported integrated multimodal mobility schemas which provide greener, seamless transport solutions to citizens,

· The development and field test in early stages of implementation of new concepts and technologies can be facilitated under a more professional management of fleets and companies involved

· The existing huge frame for the incorporation of new innovative solutions.

Among the principal technological objectives to achieve sustainable and accessible urban mobility of people and goods is the development, testing and integration, in electric and hybrid vehicles platforms, of a set of technologies associated with these vehicles, new fuels generation, electricity supply, energy storage systems, more efficient.

Currently, the interest of companies and public authorities, both national and international, focuses on electric and hybrid vehicles, both sharing a large number of technologies, including those relating to electrical energy storage with batteries that combine the best possible high energy density, short recharge times, reduced weight and number of charge cycles without suffering damage. These requirements are difficult to fulfil all together with existing technologies, hence the interest to tackle projects that would achieve significant progress in several of the identified areas.

The vehicles must enable greater adaptation to the demand for mobility of different users, including reduced mobility persons and goods, especially, urban logistics distribution and collection of urban solid waste.

Major R&D Areas

1. New concepts and technologies for urban vehicles, electric and hybrid, both for private individuals and public transportation, freight logistics distribution, solid waste and others.

2. Advanced systems of electrical energy storage in the urban area, refuelling points, design of the distribution network in urban areas, rapid recharging, vehicle sharing.

3. New services for sustainable urban mobility:
· Environmental indicators evaluation (CO_2 emission) and policy impact analysis.
· Transport management (demand management systems for urban transport, interoperability for public transport, dynamic charge for services and infrastructure utilization.

4. Advanced ICT supported integrated multimodal mobility schemas which provide greener, seamless transport solutions to citizens.

5. Appropriate ICT systems to manage and exploit all the information generated, and to integrate it in a non-disruptive way with existing IT infrastructure and applications.

Expected impact

The additions of new operating systems and vehicles for urban transport offer have different effects:
· Significant reduction of local emissions, with the reduction at the same time of greenhouse gases emissions and the positive effects that such a reduction involves the health and quality of life of citizens.
· Increased use of private vehicles with ultra-low emissions.
· Increased user accessibility to transportation.
· Contribution to strengthening the leadership position of European industry in addressing future demands for sustainable urban transport and accessible.
· Smooth, consistent integration of the green cars within the overall mobility system of European cities.

2.2.7. Demonstration and field operational tests

Objectives and scope

The development of technologies linked to the electric vehicles requires the existence of large scale demonstrations, aimed at validating said technologies. These demonstration projects need to have a global scope so that not only are individual technologies validated in the areas of vehicles, infrastructure, communications and energy supply, but also to validate how these different technologies are integrated in order to obtain synergies that lead to better efficiencies, lower costs, CO_2 emissions…

The scenario for these demonstrations should be urban and periurban areas. The implementation of these demonstrations will be done using commercial vehicles, public transportation, delivery vehicles, etc. Also, all systems implemented should be analyzed (communications, electricity, etc.) as well as the degree of users' acceptance, with the aim of identifying appropriate policies for a better future use.

Major R&D Areas

R&D needs are related to the integration of existing technologies and new developments permitting the efficient, secure and reliable connection among the different elements integrating the system.

1. Vehicles (private cars and freight transport)
· Study of different vehicle concepts, according to their use (urban, periurban, goods transport, etc…).

· Analysis of the systems implemented in the vehicles and users' review and analysis.
· Analysis of charging systems in vehicles (fixed battery, battery change, etc…).
· Impact of great number of information in the economy of the vehicle.

2. Infrastructure: road, electric (generation and charging), **communications** (vehicle to infrastructure and infrastructure to vehicle)
· Way the information is presented: location of charging points, traffic situation, road situation, etc…
· Adequate technologies for information exchange: system-vehicle, vehicle-vehicle.
· Influence of infrastructure on information saturation.
· Integration of the green vehicles into the overall mobility schemas of the road network. Synergic management of the energy related aspects and the traffic/ travellers related aspects.

3. Study of new energy generation systems implemented in vehicles as well as distributed along road infrastructures.

4. Establishment of regulations for the use of infrastructure.

Expected impact

· Use of Spanish technology is the demonstrations, permitting Spanish companies to validate their technology and developments, both at the individual level as well as their integration in the overall system. Also, to increase the services offered by these technologies and developments.
· Analysis of the impact of introducing the different systems in terms of safety, comfort, etc… permitting establishing the regulations that shall be observed by the next generation of electric vehicles, as well as for the new infrastructures.
· Accelerate the use of transport means more environmentally friendly, as well as the rational use of energy with lower carbon emissions.
· Analysis and validation of possible business models in Spain.

2.2.8. Regulation and standards, homologations, tests, validation, safety and type approval of hybrid and electric vehicles

Objective and scope

The core of the electrification of road transport is new vehicles (EV) based on electric traction and the modules and components being part of them. Different concepts of cars, trucks and buses are in the main focus of current research activities and type approval processes to operate in both urban and interurban roads. The pure electric vehicles due to their zero local and potentially minor greenhouse gas emissions (if energy from renewable sources is used) are considered the cleanest option are the mile stones towards sustainable road transport. Hybrid vehicles (HEVs) such as micro, mild and full hybrid are a favourable entry point in this process. The increased energy density, capacity, safety, lifetime, cycle life, and greater standardization of mechanical and electrical interface and better communication, with cost reduction are the major challenges for production mass of energy storage systems and their viability in the EV and HEV. The integration of cells in the packaging of the batteries is an important issue particularly with regard to safety, cost, manufacturing, diagnostics, maintenance, repair and recyclability. It is considered necessary therefore to develop system architectures and energy management of change elements of rapid activation and the establishment of evaluation standards and testing.

The deployment of EV in the market will require the provision of support infrastructure and its integration into a complete system of large-scale mobility. The purchase of power for EV should be as easy as today's refilling at service stations. There

should be no barriers to the use of different facilities, suppliers, rates or types of charging stations. For this purpose, the concept vehicle-to-grid combines a fast power charging with a smart payment system. In this regard will require new technologies of information and communication technologies make use of standard protocols for exchanging data falls infrastructure and storage system. It will be necessary to design the technology of charging stations, the standardization of connections, the rapid charging process, the security requirements and the collection process according to different rates, depending on the origin of electricity charged.

There is now a notable lack of enforceable laws and regulations in the systems involved and in the electric and hybrid vehicles, which ensure the required safety levels and conditions of standardization to facilitate its use, international level, with zero or reduced technical barriers.

The objective is to stimulate and support pre-standardization research for both new systems and for vehicles as a whole.

Major R&D areas

1. Identification of safety standards of components, systems and hybrid and electric vehicles related to storage, use and supply of energy on board, as well as pollutant emissions level produced.

2. Identification of safety standards of the facilities of electricity supply to vehicles.

In both cases, technical requirements must be defined in international regulations and the tests necessary to verify compliance.

Expected impact

· Contribute to tests standardization both at components and vehicle-infrastructure levels.
· Contribute to safety of electric and hybrid vehicles on the road.
· Raise the level of trust of future users of such vehicles.
· Reduce the costs related with engineering and production processes of hybrid and electric vehicles.

2.3. Logistics, co-modality and ITS

The 'European Green Cars Initiative' includes Logistics and co-modality combined with Intelligent Transport System technologies as one of the three major research and development priority pillars.

The optimization of the overall system efficiency and sustainability avoiding sub-optimal logistics can improve performance regarding energy consumption and environmental impact. In this respect, smooth and co-operative interactions between the different transport modes will be essential by defining new operational relationships or by establishing new business models. Also new and innovative concepts to improve collaboration between stakeholders aiming at CO_2 emissions reduction will be required.

Furthermore, ITS has a very strong potential to bring user friendly, seamless co-modality solutions not only to freight, but also to passengers transport.

Spain has a strong potential to contribute and could be an "EU Champion" in terms of Logistics, Co-modality and ITS. The Spanish Technology Platform on Logistics, Intermodality and Mobility, Logistop, could play a key role to the deployment of innovative processes and services.

RTD specific priorities in this area can be divided in three different lines:
2.3.1. Logistics and comodality
2.3.2. Sustainable urban mobility: connected vehicle and fleets
2.3.3. ICT technologies for the improvement of the whole transport system

2.3.1. Logistics and comodality

Objectives and Scope

The main objective of this stream is the optimization of the efficiency of the transport system as a whole, taking into account both, goods and people. All transportation modes should work in a collaborative way improving sustainability. In this regard, road transport interaction with other modes is essential to avoid sub-optimal logistics and promoting the deployment of co-modality concepts.

Major R&D areas

1. Optimization of the average load percentage in freight transportation avoiding that empty trucks circulate on highways.
· Pooling centres and Platforms and shared services between companies and 3PLs.
· Improving transportation forecast to optimize planning.
· Development of efficient technologies aiming intermodal routing optimization and co-modality.
· Empty container management.

2. Increasing the maximum load weight and/or length in trucks including gigaliners, road trucks, etc.
· Infrastructural constrains.
· Impact assessment.

3. Improve last mile process and development of city logistics and freight urban distribution for the benefit of cities and citizens (See section 2.3.2) and take into account possible implications in the logistic chain and their social impact.

4. Development and support of new logistic business models related to the implementation of the Green Car initiative.
· Optimal design of supply chain networks.
· Strategic design of the "green cars" initiative from a logistics perspective (charging points, fleets sizes, routing, etc.).
· Identification and implementation of the use of electric freight vehicles in industrial and logistic areas.
· Storage, handling, transportation and disposal of special materials such as lithium and magnesium salts.
· Handling of new products (i.e. batteries) in distribution, use and end of life taking into account recycling implications and reduction of environmental impact.
· Business processes involved.

5. Environmental analysis (CO_2 emissions) of **the logistics chains** from a supply chain holistic point of view including aspects beyond transportation.
· Development of new strategies to increase sustainability of supply chains.
· Environmental optimization of the different steps of the supply chain.
· Increasing of sustainability by establishing new cooperation modes between agents of the chains.

6. Promotion of co-modality/intermodality
· Increasing visibility of the movement of freight along the logistic chain and strategic transportation planning.
· Integration of different stakeholders involved in intermodal chain; Information systems simplification, interoperability and reduction of bureaucracy.
· Improvement of intermodal exchange processes and physical issues among transportation modes, freight units, freight modules, intermodal containers, etc.
· Optimization of logistics operations in logistics platforms.

Expected Impact

· Improving efficiency of the overall transportation system in relation to energy consumption and CO_2 emissions.
· Improvement of the services for customers and citizens.

2.3.2. Sustainable urban mobility: connected vehicle and fleets

Objectives and Scope

In point 2.2.6. general objectives and scope of sustainable urban mobility are included. Here, we can find specific items regarding services in future urban mobility, i.e. fleet management and information and communication systems needed to achieve urban transport of people and goods more efficient, environmentally friendly and accessible to all users. On top of the R&D here included it is worthwhile pointing the relationships of this line with "2.2.4. Smart infrastructure and services for Green Vehicles". Interesting R&D areas mentioned there such as traffic prioritisation, dedicated lanes management, carsharing solutions, ICT-based parking management including parking slots and information for users are pretty relevant in the field of Sustainable Urban Mobility.

Fleet management, with new demands arising from the type of vehicle and type of energy, requires new tools for communication vehicle - infrastructure - control centre. All this requires real-time management of large amounts of information from different actors in the system: clients, infrastructure, vehicles and operators as well as its processing and distribution using optimized communication channels.

Major R&D areas

1. Advanced communication systems and fleet management, enabling efficient use of vehicles from the energetic point of view, while providing a quality service to users, with maximum accessibility.

2. Implementation of new concepts in mobility resulting from the introduction of electric vehicles.
· Most trips in the not so distant future will be multimodal, with one or more segments of the trip being on electric vehicles. Advance ITS will be required in order to make this option technically possible and user-friendly.
· Inclusion in the mobility patterns of new factors or modification of conditions implied by the introduction of the electric vehicle: routes, range, changes, loading and unloading of goods, vehicle sharing, parking slots, etc.
· New concepts of urban freight distribution: distribution systems, last mile, dedicated lines for freight and their management.

3.Improving mobility in the current scenario:
· Defining strategic network, transport network design considering transfers, access and waiting times.
· Creation of industrial clusters with origins and / or destinations matching to optimize the mode of transport used.
· Design of distribution infrastructure associated with the capillary (city-logistics) with focus on Urban Platforms at the neighbourhood level, designing urban freight distribution in cities. Infrastructure design (see line 2.2.4.).
· Modelling of distribution networks to optimize the overall cost of operations. Optimization of delivery routes based on efficiency and sustainability criteria.
· Solutions to the operation of the distribution and delivery logistics in support of electronic commerce (B2V and B2B), especially on specialized platforms and problems of the last mile.
· ITS Applications to convert the cities in collaborative environments with integrated management of mobility (people and goods) as developed in line 2.3.3.
· Allocation and network optimization and dynamic urban routes from real-time information.
· Definition of business process associated to the previous bullet points.

4. Promoting the use of public transportation:
· Perceptions, motivations, attitudes and expectations and other factors that may tip the users to use public transport.
· Actions to improve service reliability, to increase

travel comfort, to select routes faster, and in general driving public transport measures.

5. **Urban reverse logistics (materials inbound instead of people outbound):**
· Promotion of public transport and other ways of sustainable transport will demand for an increasing flow of materials where goods get closer to people downtown in larger amounts, instead of people driving away.
· Operations in a Free of Noise environment will permit working hours during the night for replenishment operations by reaching city hub centres taking advantage of existing railway and underground infrastructure in the way of reducing truck transit during day and night.

Expected impact

Besides expected impact included in point 2.2.6., a new generation of services is expected as well as the optimization of current performances by increasing the use of public transport.

2.3.3. ICT technologies for the improvement of the whole transport system

Objectives and Scope

ICT technologies will play a major role in the research and development of future generations of clean vehicles. The new developments based on ICT will broaden the range of applications and key systems for a safer, cleaner and smarter sustainable mobility. In this sense, complementarity of vehicle-to-vehicle and vehicle-to-infrastructure communication systems, along with new models of flexible traffic management are part of a global perspective that will facilitate mobility of people and goods, where comodality plays a key role. Similarly, new electric vehicles require new business process and the development and integration of systems and advanced components based on ICT technologies applied to both the vehicle and the network, in order to ensure the required levels of safety and energy efficiency.

Major R&D areas

Following areas are considered of special interest by the Spanish entities:

1. New Intelligent Transportation Systems (ITS) based on ICT technologies to provide advanced solutions for sustainable mobility in urban and interurban areas, introducing the use of EV as a new element in the transportation network.

2. Advanced HMI concepts (Human Machine Interface) which optimize the interaction between the end-user and the eco-efficient multi-modal transport models.

3. V2X communication technologies (vehicle-to-vehicle, vehicle-to-infrastructure, vehicle-to-grid) and cooperative systems/services applied to efficient mobility. Vehicle and infrastructure as sources of information.

4. New ADAS (Advanced Driver Assistance Systems) and active safety systems for the electric vehicle.

5. New concepts of autonomous driving applied to public transport vehicles, or adapted to fleets with special characteristics.

6. Development of data communication interfaces between the green car and the infrastructure, including transmission of information (protocol definitions) to feed the models of demand management.

7. Development of advanced concepts of mobility of people and goods (Co-modality).

8. Services providing information to goods sharing, traffic situation, intelligent cargo, CFP, security and safety, SLA compliance.

9. ICT for advanced and eco-efficient logistic applications. Transportation solutions for goods multimodality, adjustment of demand and offer on power grids, pricing of energy, park reservation for freight transport.

10. New control and traffic management models oriented to energy efficiency (reliable real time traffic information accessible from anywhere, eco-routing/eco-navigation, etc.), infrastructure management, toll collection systems (e.g. based on discrimination between GC and other vehicles), behaviour motivation (e.g. by fines or allowing access to special zones), systems to make decisions about future infrastructures.

11. Impact assessment: emissions and consumption reductions, energy efficiency, transport efficiency, road safety improvement, etc.

12. Implementation of Galileo. Enhancement of navigation and positioning performance which can allow going a step beyond in current applications based on the use of GNSS, be an alternative to other technologies currently used for different mobility applications or facilitate the introduction of applications not possible with current GNSS technology.

Expected impact

· Introduction of new products and services based on ICT that will actively contribute to the deployment of electric cars and the implementation of new models for sustainable mobility.
· Contribution of the ICT technologies to the optimization of the logistic chains and urban mobility.
· Improving information sharing reducing bureaucracy.
· Implementation of real time decision systems in mobility.
· Introduction of new navigation facilities will be required in order to validate the drivers itinerary, driving speed, power consumption due to new constrains in the mobility of people introduced by Electric vehicles (the sparse availability of electric power station in the early stages of EV shift together with the limited energy storage capability of vehicles).
· From a power efficiency standpoint, vehicles itinerary can be improved if onboard navigation systems are able to integrate real time traffic information and parking areas availability. One way to accomplish this without heavy and costly investments in infrastructures equipments is to add sensing capabilities to the vehicle itself and use the captured information to build and share a real-time snapshot of traffic conditions.

Annex 1: Technology domains & entities participating in the original WGs

Area	Contributors *
1. INTRODUCTION: Spanish strengths	**SERNAUTO, ANFAC**, REE, IBERDROLA, ENDESA, IDAE, LOGISTOP
2. RESEARCH PRIORITIES	
2.1. Heavy duty vehicles	
2.1.1. Heavy duty vehicles: focus on electrification and alternative technologies 2.1.2. ICEs for heavy vehicles	**ANFAC**, IVECO, NISSAN, CMT-UPV **CMT-UPV**, IVECO, CIE Automotive, CIDAUT, MONDRAGÓN
2.2. Electrification of road and urban transport	
2.2.1. Materials, manufacturing and processes	**TECNALIA**, ANFAC, CIE, GESTAMP, SERNAUTO, ANTOLIN, UPC, CTAG, MONDRAGÓN, LOGISTOP, TecnoEbro, CIDAUT, MONDRAGÓN
2.2.2. Systems and components for electric vehicles	**SERNAUTO**, GESTAMP, UPC, TECNALIA, CTAG, Lear, MONDRAGÓN, CIE, FICOSA
2.2.3. ICEs for light vehicles (range extenders)	**CMT-UPV**, IVECO, CIE Automotive, CIDAUT, MONDRAGÓN
2.2.4. Smart infrastructure and services for Green Vehicles	**CIDAUT**, CTAG, UPC, ENDESA, IBERDROLA, REE, FICOSA, ACCIONA, LOGISTOP
2.2.5. Grid integration	**REE**, Iberdrola, ENDESA, IDAE, UPC, TECNALIA, ACCIONA
2.2.6. Sustainable urban mobility: vehicles and concepts	**INSIA-UPM**, UPC, TECNALIA, CTAG, MONDRAGÓN, LOGISTOP, CIDAUT, ACCIONA
2.2.7. Demonstration and field operational tests	**CIDAUT**, SEAT, IVECO, HISPANO, TecnoEbro, CTAG, REE, IDAE, IBERDROLA, ENDESA, ANFAC, INSIA-UPM, ACCIONA, MONDRAGÓN, LOGISTOP
2.2.8. Regulation and standards, homologations, tests, validation, safety and type approval of hybrid and electric vehicles	**INSIA-UPM**, CIDAUT, CMT-UPV, CTAG, MONDRAGÓN
2.3. Logistics, comodality and ITS	
2.3.1. Logistics and comodality	**LOGISTOP**, UPC, TECNALIA, ANFAC
2.3.2. Sustainable urban mobility: connected vehicle and fleets	**CTAG**, CIDAUT, UPC, TECNALIA, MONDRAGÓN, FICOSA, LOGISTOP, ANFAC
2.3.3. ICT technologies for the improvement of the whole transport system	**CTAG**, INSIA-UPM, UPC, TECNALIA, MONDRAGÓN, LOGISTOP, CIDAUT, ACCIONA

**Note: bold characters indicate the contributing leader/s of each area*

Annex 2: Additional entities involved in subsequent reviews of the doc.

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Urban mobility and ICT applications	ATOS Origin
Batteries and electric vehicles	CEGASA
Batteries and electric vehicles	CIDETEC
Logistics and comodality	CIGIP - Centro de Investigación en Gestión e Ingeniería de Producción
Urban mobility and ITS	ETRA I+D
Vehicle systems	Faurecia
ITS applications	GMV
Solar energy in electric vehicles	INSOLATIO
Wind energy and electric vehicles	ITE
Logistics and comodality	ITENE - Packaging Transport and Logistics Research Center
H2 and electric vehicles	Spanish Hydrogen & Fuel Cell Technology Platform
Communications	Telefónica I+D

Annex 3: List of contact emails of those taking part in the working group

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FP7 Green Cars and Leadership Opportunities

FP7 GREEN CARS AND LEADERSHIP OPPORTUNITIES: CONFERENCE PROGRAMME AND SUMMARIES OF THE PRESENTATIONS

15**APRIL**2010/**VALENCIA**

On 15 April 2010, in the context of the Spanish Presidency's activities, the **FP7 Green Cars and Leadership Opportunities** workshop was held in Valencia. Its main purpose was to showcase Spain's national capabilities and identify the country's opportunities for industrial and institutional leadership within the European "Green Cars" initiative for sustainable mobility.

The event was attended by experts from every part of the value chain, including those from government bodies which must promote and regulate the initiative and experts from affected areas such as the electrical, telecommunications, infrastructures and automotive sectors, logistics companies, and the institutions, universities and technological research centres that develop projects in those sectors. This book contains summaries of the presentations offered during this day.

Our country is at the head of important projects in this field. These include: Plan MOVELE led by the Spanish Ministry of Industry, Tourism and Commerce; the integrated project VERDE financed by the CDTI (Centre for the Development of Industrial Technology); the strategic projects TECMUSA and CITYELEC, implemented on a national scale by the Ministry of Science and Innovation; and the Valencian Government's EPV project, intended to introduce the electric vehicle as a means of urban transport in that region.

Introducing the electric vehicle will be both a challenge and a great opportunity for public administrations and private companies alike. In this way, both the electric companies and the automotive sector are facing a promising future filled with opportunities.

The forum analysed the need for R&D in such areas as vehicle electrification, the regulatory legislation, modifications to the electrical distribution grid and the creation of charging locations where electric vehicles will recharge. All of the above will certainly make way for major business opportunities in the industry. This is another reason why this forum to discuss Spanish capabilities directed toward the European initiative Green Cars came at a good moment.

In summary, the forum "FP7 Green Cars and Leadership Opportunities" addressed the challenges, opportunities and commitments involved, at the Adeit head office in Valencia. All the information about the workshop is available on the website greencars.ite.es.

Contributors to organising the workshop include the Spanish Ministry of Science and Innovation through the Centre for the Development of Industrial Technology (CDTI), the Valencian Regional Government represented by the local Industry Council and Impiva, the ITE (Institute of Educational Technology), Redita, SERNAUTO, IBERDROLA, ANFAC, the Heat Engine Centre at Polytechnic University of Valencia, Seimed and Tecnalia.

The event offered an ideal setting for an exchange of information between the main figures involved in Green Cars projects, openly extended to other interested actors.

Organizing Comittee:

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Consellería Industria, Comercio e Innovación

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Mr. Sixto Santonja
ITE

Mr. Carlos Moliner
REDITA

Ms. María Luisa Soria
SERNAUTO

08:15-08:50h **Registration**

09:00h **Opening ceremony**
Mr. Bruno Broseta. Regional Secretary of Industry Commerce and Innovation Region of Valencia, Spain

Welcome
Mr. Emilio Orta. CEO of AVIA
Ms. Yolanda Benito. Area Head of Sustainability, Sub-directorate General of Public-Private Cooperation Strategies Ministry of Science and Innovation
Mr. Juan Antonio Tébar. Departament of Framework Programmes of R&D, CDTI

09:30h **Public Administration Perspective and Innovation Networks**
Chair: D. Alfredo Quijano, Director ITE

Valencian Energy Agency - Directorate General of Energy. Mr. Antonio Cejalvo. Director General of Energy
SERNAUTO. Ms. Mª Luisa Soria, Secretary General
REDITA. Mr. Carlos Moliner, Manager

10:30h **Coffee Break**

11:00h **International Perspective**
Chair: Mr. Fernando Acebrón, Technical Director ANFAC

Technological Road Map of the International Energy Agency for Electric and Hybrid Vehicles. Mr. Juan Luis Plá, IDAE
Electric Vehicle: the technological challenge at RENAULT. Mr. Gonzalo Hennequet, RENAULT
FORD and automobile sustainability. Mr. Manuel Luna, FORD

12:30h **Strategy for European Leadership (1)**
Chair: Mr. Javier Zabaleta, Director ITENE

European participation strategy
Mr. Juan Antonio Tébar, Departament of Framework Programmes of R&D, CDTI
Heavy Vehicles Session: priorities, projects and opportunities
Mr. Manuel Lage, NGVA Europe

Logistics, Comodality and ITS session
Logistics and Comodality: priorities, projects and opportunities
Mr. Fernando Liesa, LOGISTOP

ITS: priorities, projects and opportunities
Ms. Ana Paúl, CTAG
Mr. Antonio Marqués, ETRA R&D

14:00h **Lunch**

15:30h **Strategy for European Leadership (2)**
Session on the Electrification of urban and road transport
Chair: Ms. Mª Luisa Soria, Secretary General SERNAUTO

Vehicle electrification
Priorities: Mr. Iñaki Inzunza, TECNALIA-M2F
Projects: Mr. Frank Bekemeier, SEAT
Mr. Alberto Peña, TECNALIA
Mr. Jose María López, INSIA-UPM
Opportunities: Mr. Francisco Payri, CMT-Motores Térmicos

Electrical infrastructure
Priorities: Ms. Susana Bañares, Red Eléctrica de España
Projects: Mr. Sixto Santonja, ITE
Mr. Jorge Sánchez, ENDESA
Opportunities: Mr. José Corera, IBERDROLA

17:45h **Conclusions and leadership opportunities**
Chair: Mr. Jesús Monclús, Departament of Framework Programmes of R&D, CDTI

Mr. Manuel Lage, NGVA Europe
Mr. Fernando Liesa, LOGISTOP
Ms. Ana Paúl, CTAG
Mr. Iñaki Inzunza, TECNALIA-M2F
Mr. Igor Cantero, CEGASA
Mr. José Corera, IBERDROLA
Mr. Sixto Santonja, ITE

Plan of Action

18:45h **Closing and Cocktail**

REGIONAL PERSPECTIVE ON THE ELECTRIC CAR

Antonio Cejalvo Lapeña / **Director General of Energy. Conselleria d'Infraestructures i Transport**

The Valencian Energy Agency (AVEN) is a body of the Generalitat Valenciana Conselleria d'Infraestructures i Transport. The Agency's main objective is the management and implementation of Valencian Region energy policy.

Regional Government is working on getting an own energy model based on quality and it should be friendly with our environment. This model has to guarantee the energy supply and provide us a sustainable development.

The model not only acts on the side of increased supply, infrastructure planning and promoting the generation, transmission and distribution of both electricity and gas, to ensure the energy demand coverage of the Valencian society. The model has to be in the demand side also, the consumers, stimulating then to follow the most efficient way to energy consume. Therefore it is developing active policies on energy savings and efficiency, along with promoting the use of renewable energies, both of them are priorities in the Region energy policy.

Transport sector is one of the most important energy intensive in Valencia, so the Generalitat Valenciana, through the Conselleria d'Infraestructures i Transport, is doing a great effort for implementing a number of savings measures and energy efficiency is this sector. If we look at the distribution energy's final consumption between different economic sectors we can see that the transport sector is the biggest energy's consumer in the Community, with 40% of the total, so these measurements are necessary for increasing the efficiency in this sector. In addition, we know that almost all the energy consumption in Transport is coming from oil, so our energy dependence is too high from outside sources. Therefore it is necessary to apply active policies regarding energy saving and efficiency to reduce the oil consumption. At the same time this kind of politics can help to promote new technologies for introducing alternative fuels, always with sustainability criteria.

To achieve these objectives within the Transport sector, we are working on 3 major blocks:
1. Promoting Sustainable Mobility
2. Development Management Systems Transport efficient fleets and alternative fuels promotion
3. Training Courses

In Electric Mobility one of the priority objectives of the Valencian Energy Agency is to lead the introduction of electric vehicles and the implementation of the electric charging points infrastructure in the Valencia Region municipalities.

To promote electric vehicles, hybrids and even electric motorcycles, since two years ago is running the "CO2TXE Program, a program pioneered in granting aid to buy these vehicles types with a maximum of 7,000€. These grants for car buyers are applied by dealers attached to the programme with discounts to the customers when purchasing cars.

For the electric charging stations implementation there are economic incentives negotiated through a public support up to 40% of investment in such facilities.

Furthermore, in parallel with the aid open to all citizens, AVEN together with the main municipalities of the Region and major utilities, is developing a

project for the creation of networks of power points in major cities around the Valencian Region.

In this first phase of the project, furthermore to create a network of charge and boost the purchase of electric vehicles, policy measures should be established to promote the use of such vehicles.

AVEN collaborates with other European R & D such as the development of a "car sharing electric vehicles" in a municipality of the Region, or the proposed "efficient urban transport based on the use of electric vehicles built in the grid and powered by renewable energy (EPV). In the latter project, we are studying the possibilities of using the electric car as a system to get energy from the network at peak hours where there is a surplus of energy and we see its impact at peak times to ensure supply. In addition, among other things, the system design specification Vehicle to Grid (V2G) will be established.

From the results of these projects, we must define the specifications of electrical mobility systems to implement depending on the municipality and the various charge parameters: when to recharge (valley, peak or flat), for how long and under what conditions (simultaneous and with intelligent management). In a first step, it seems desirable that the bulk of consumption associated with electric vehicles is carried out at times through the valley hours and a intelligent systems is managing this. We are seeking to take the existing electrical system to increase its use, avoid sudden jumps in demand that cause instabilities and facilitate the integration of renewable energies into the system.

Once this first phase, the objectives of the Conselleria d'Infraestructures i Transport, for the promotion of electric mobility in the Comunitat and to be launched by AVEN, are:
· Extend the points of charge to the Region to more municipalities and other different types of locations such as public roads, private garages, malls, etc.
· Adapt and introduce the necessary legislation to facilitate the development of electric mobility.
· Introduce electric mobility criteria in the procurement of public concessions involving vehicle fleets.
· Extend the study of the creation of vehicle refueling infrastructure at the local level, in the Sustainable Urban Mobility Plans (PMUS).

ECO AND ELECTRO-MOBILITY: A TECHNOLOGICAL AND BUSINESS OPPORTUNITY FOR THE SPANISH COMPONENT SUPPLIERS

Mª Luisa Soria García-Ramos
SERNAUTO (Spanish Association of Automotive Equipment and Component Manufacturers)

The expected deployment of electric vehicles and eco-mobility concepts based on electricity as energy vector will provide new business opportunities and possibilities for collaboration between the vehicle and its environment: the infrastructure and the electricity network. Moreover, the development and a broader use of 2nd generation of biofuels and bio-methane demands further work on adaptation of current engines and powertrain systems.

Spain holds a significant position in the world in vehicle (8th) and component manufacturing (6th). Moreover in Europe it is the second producer of vehicles and the first of light commercial and heavy duty vehicles. Over 82% of the vehicle production is exported to more than 90 countries worldwide. Main component manufacturers have also production plants in Spain, and the sector holds the 6th position in the world in turnover: 29.970 Mio €uro in 2008 after a peak of 32.873 Mio €uro in 2007, 58% of which were exported. The Spanish component manufacturers' sector includes one thousand companies from SMEs to large international groups. They show a strong innovation capability, with an average R&D investment of 3% related to turnover. According to CLEPA, the European Association of Automotive Suppliers, 75% of the value of the car and 50% of the R&D spending comes from suppliers.

Spanish automotive suppliers are well aware of the threats and challenges that the highly demanding automotive industry requests through the whole value chain, from TIER 1 to TIER 4. Besides production plants of the main global foreign component manufacturers, there are also some large Spanish companies and a broad network of smaller suppliers, most of them SMEs, who have demonstrated, year by year, their capability to comply with the stringent quality and technical requirements demanded by OEMs and transferred through all the value chain. As requested by OEMs, companies are not only providers to the former level, but real development suppliers.

Automotive component manufacturers as key players in the development of green cars technologies

Main technological challenges and opportunities currently faced by the Spanish automotive industry are related to the European Green Cars Initiative:

· Environmental regulations, including the reduction of CO_2, noxious gases and particulate emissions, fuel consumption, bio-fuel use and vehicle recycling.
· Technological evolution of vehicle propulsion and transmission systems.
· Safety regulations.

Spanish suppliers have demonstrated in the past 10-15 years that they can grow and modify their business models from national to European, and then to global schemes, showing high flexibility and open mind levels. They have also managed the technological challenges as opportunities for new business areas and it is their aim in the future to continue exploring new development opportunities and technological agreements, especially with other sectors that will become more and more linked to the vehicle in the future: the utilities, infrastructures and ITS suppliers.

SERNAUTO, as Spanish Association of Automotive Equipment and Component Manufacturers, represents since 1967 the sector, both at national and international level, and before the Administrations and other public and private institutions. One of the aims of the Association is to support the sector with activities that may reinforce its competitiveness through research and technological development projects. Moreover, SERNAUTO is the coordinator of the Spanish Automotive Technology Platform SERtec, created in 2005, and established in 2008 a Unit of International Innovation to promote the participation of enterprises in the European RTD programmes under an Agreement with the Spanish Agency for the Industrial Technological Development (CDTI).

With industrial leadership and the aim of enhancing R&D cooperation, the technology platform SERtec is a meeting point for all the technological stakeholders related to the vehicle and its environment and a forum to discuss the national RTD priorities for the Strategic Research Agenda, which were included as reference topics in the R&D National Plan. The Research Agenda has been recently reviewed and updated to take into account new technologies and sectors that interact with the vehicles: ICTs inside the vehicle and communication of the vehicle with other vehicles, the infrastructure and, in the new electric vehicles, with the electricity networks. For this reason the technology platform broadened its scope in 2009 to include new actors from the mobility sector and evolved towards **M2F: Move to Future.**

The technology platform is structured in 5 Working Groups: Vehicle electrification, Energy & Resources; Safety; Materials, Design & Production Systems; Sustainable Urban (and interurban) Mobility and R&D Fostering. M2F is also coordinated with other Spanish TPs related to transport, holds the secretariat of the Spanish ERTRAC Forum and represents national activities before the European Technology Platform ERTRAC.

Competitiveness of the European automotive industry at the upper level of the pyramid will be assured when all the lower levels (TIER 1 to TIER 4) can become development suppliers of the former one. To reach the goals set for a sustainable mobility, meeting the challenges of cleaner, safer and smarter vehicles and transport systems, TIER 1 suppliers must develop new products and systems. However, they cannot do it alone, they need the following levels of the chain to provide them with new components and sub-systems, materials, etc. and work of all of them must be aligned. The sector's priorities must be known and encompassed through all the value chain. For this reason it is important to establish mechanisms for an effective flow of information on both directions, upstream and downstream in the suppliers pyramid, and to support technological collaboration of suppliers from different levels.

There is a need for the development of technologies for the vehicles, but, upon that, there is also a strong need of establishing collaboration models to develop communication systems that lead to a higher efficiency in energy and resources use. Sustainable mobility must be based not only on cleaner and smarter vehicles, but on V2X strategies and energy efficiency paradigms in the whole system as well. New development opportunities and technological collaboration agreements are therefore needed, especially with those sectors that are becoming more and more linker to the vehicle: the utilities, infrastructures and ITS suppliers.

REDITA: EFFICIENTLY FULFILLING THE GREEN CAR REQUIREMENTS THROUGH THE MANAGEMENT OF A TECHNOLOGY NETWORK

Carlos Moliner Fernández / **Manager REDITA**

1. REDITA: Managing the innovative capabilities of Technological Institutes through a network structure

REDITA is the Automotive Technology Network of the Valencia region, formed by 8 Technological Institutes (AIDIMA, AIDO, AIMME, AIMPLAS, IBV, ITE, ITENE, ITI). REDITA is the main synergy and catalysis element for innovation in the automotive regional sector, aiming at boosting the Technological Institutes and Local Enterprises position in the national and international level.

REDITA's network management strategy is key to successfully combine exclusive approach to the automotive sector and the specialized technology and research capabilities of each Center.

2. Strategy to adapt REDITA to the new Green Car requirements

The innovation strategy towards Green Car should consist of keeping a tight collaboration with the main actors of the new panorama. The goal is to identify and co-define the new requirements for Electromobility. This approach guarantees the matching between the innovation efforts and the specific needs of the automotive sector. As far as the EV landscape is currently being developed and, at the same time, the expectations for a quick mass implementation keep growing, the aforementioned collaboration is needed to achieve the technological transition.

On the other hand, a strong focus must be kept on the end-user requirements. The automotive industry has a longtime experience on including end-user in design decisions. Nevertheless, there may currently be a certain perception of loss of customer focus as far as current efforts are mainly technology driven. A reminder should be made to keep in mind that Green Car success is first of all the success of a new mobility solution for the end-user.

The following points describe a walkthrough guide to achieve a successful Green Car development and implementation:
Evaluating the situation:
· Automotive knowledge through tight relationship with the main actors,
· Knowing the Electromobility leaders,
· Analyzing the non-solved issues of Electromobility,
· Redefining and evaluating the final customer's expectations.

Analyzing the Technology Network capabilities:
· Collaborative and internal workshops.

Defining the development opportunities:
· Strategic and coordinated decision to fulfill the new requirements.

3. Some success cases in meeting the Green Car requirements

URBAN CAR Project: Definition of the future Green Car taking as a starting point the end user wants and needs. This project is mainly focused on electromobility in the city and in short distances. Project coordinated by REDITA (IBV, AIMPLAS).

EPV (Electrical Powered Vehicle) Project: Definition of the Electromobility business and development

model, from the energy delivery system to the vehicle usage scenarii. The main goal is to define a clear implementation model for the EV. Project coordinated by REDITA (ITE).

Eco-efficient Solutions for the Automotive Industry Project: Research of new materials and process efficiency improvement to reduce carbon footprint. Energy consumption has been reduced up to 30% after close diagnoses of processes and facilities audit. Project coordinated by REDITA (AIMME, AIMPLAS, IBV, ITE).

REDITA: www.redita.es
AIDIMA: www.aidima.es
AIDO: www.aido.es
AIMME: www.aimme.es
AIMPLAS: www.aimplas.es
IBV: www.ibv.org
ITE: www.ite.es
ITENE: www.itene.es
ITI: www.iti.es

KEY FINDINGS: INTERNATIONAL ENERGY AGENCY TECHNOLOGY ROADMAP FOR ELECTRIC & PLUG-IN HYBRID ELECTRIC VEHICLES

Juan Luis Plá de la Rosa / **Head of Transport Department & Spanish Delegate on Implementing Agreement for EV-HEV**

The mass deployment of electric and plug-in hybrid electric vehicles (EVs and PHEVs) that rely on low greenhouse gas (GHG) emission electricity generation has great potential to significantly reduce the consumption of petroleum and other high CO2-emitting transportation fuels. The vision of the Electric and Plug-in Hybrid (EV/PHEV) Vehicles Roadmap is **to achieve by 2050 the widespread adoption and use of EVs and PHEVs, which together represent more than 50% of annual LDV (light duty vehicle) sales worldwide**. In addition to establishing a vision, this roadmap sets strategic goals to achieve it, and identifies the steps that need to be taken to accomplish these goals. This roadmap also outlines the roles and collaboration opportunities for different stakeholders and shows how government policy can support the overall achievement of the vision.

The strategic goals for attaining the widespread adoption and use of EVs and PHEVs worldwide by 2050 cover the development of the EV/PHEV market worldwide through 2030 and involve targets that align with global targets to stabilise GHG concentrations. These technology-specific goals include the following:

· **Set targets for electric-drive vehicle sales.** To achieve the roadmap's vision, industry and government must work together to attain a combined EV/PHEV sales share of at least 50% of LDV sales worldwide by 2050. By 2020, global sales should achieve at least 5 million EVs and PHEVs (combined) per year. Achieving these milestones will require that national governments lead strategic planning efforts by working with "early adopter" metropolitan areas, targeting fleet markets, and supporting education programmes and demonstration projects via government-industry partnerships. Additionally, EV/PHEV sales and the development of supporting infrastructure should first occur in selected urban areas of regions with available, low GHG emission electricity generation.

· **Develop coordinated strategies to support the market introduction of electric-drive vehicles.** Electric-drive vehicles are unlikely to succeed in the next five to ten years without strong policy support, especially in two areas: making vehicles cost competitive with today's internal combustion engine (ICE) vehicles, and ensuring adequate recharging infrastructure is in place. Governments need to coordinate the expansion of EV and PHEV sales, help provide recharging infrastructure, and, along with electric utilities, ensure adequate electricity supply.

· **Improve industry understanding of consumer needs and behaviours.** Wider use of EVs and PHEVs will require an improved understanding of consumer needs and desires, as well as consumer willingness to change vehicle purchase and travel behaviour. Currently, the profile of car buyers in most countries is not well known; the industry needs to gain a better understanding of "early adopters" and mainstream consumers in order to determine sales potential for vehicles with different characteristics (such as driving range) and at different price levels. This information will also inform the development of appropriate policies to overcome market barriers and increase the demand for electric-drive vehicles. Auto manufacturers regularly collect such information and a willingness to share this can assist policy makers.

· **Develop performance metrics for characterising vehicles**. Industry should develop consistent performance metrics to ensure that EVs and PHEVs are achieving their potential. These include metrics related to vehicle performance (e.g., driving range) and technical characteristics (e.g., battery requirements). EVs and PHEVs are different in important respects; thus, the set of performance metrics for each must be tailored to each technology separately. Additionally, governments should set appropriate metrics for energy use, emissions and safety standards, to address specific issues related to EVs, PHEVs and recharging infrastructure.

· **Foster energy storage RD&D initiatives to reduce costs and address resource-related issues.** Research, development and demonstration (RD&D) to reduce battery costs is critical for market entry and acceptance of EVs. In order to achieve a break-even cost with internal combustion engines (ICEs), battery costs must be reduced from the current estimated range of USD 500 to USD 800 per kilowatt-hour (kWh) of storage at high volume down to USD 300 to USD 400 per kWh by 2020, or sooner. RD&D to improve battery durability and life spans that approach vehicle life spans is also imperative. Over the medium term, strong RD&D programmes for advanced energy storage concepts should continue, to help bring the next generation of energy storage to market, beyond today's various lithium-ion concepts. Additionally, industry needs to focus RD&D efforts on addressing resource requirement issues and establishing secure supply chains. In particular, lithium and rare earth metals supply and cost are areas of concern that should be monitored over the near-to mid-term to ensure that supply bottlenecks are avoided. Governments should help offset initial costs for battery manufacturing plant start-up efforts to help establish and grow this important part of the supply chain.

· **Develop and implement recharging infrastructure.** Reliable electricity supply must be available for EV/PHEV recharging and recharging stations must be convenient to access. It is therefore critical to understand the likely impact of a given number of EVs and PHEVs on daily electricity demand, generation and capacity, and to provide a sufficient planning horizon for utilities. While it will be necessary to standardise the vehicle-to grid interface, it is important to avoid over-regulating in order to allow for innovation. Policies should foster low-cost infrastructure to facilitate PHEV and EV introduction. Other valuable areas to explore include innovative electricity recharging systems (e.g., battery swapping centres), grid powering from batteries, smart metering, and implications for drivers and utilities. To make these efforts most effective, the role of utilities and governments (including policymaking and regulatory agencies) in developing the recharging infrastructure should be clearly established.

The roadmap outlines additional recommendations that must be considered in order to successfully meet the technology milestones and strategic goals. These recommendations include the following:

· **Use a comprehensive mix of policies that provide a clear framework and balance stakeholder interests.** Governments should establish a clear policy framework out to at least 2015 in order to give stakeholders a clear view. To the extent that it is possible, policies should not favour particular technologies, but rather promote good performance. Policy goals should be grounded in societal goals (e.g., energy security, low CO_2 emissions).

· **Engage in international collaboration efforts.** Industry and government can work together on an international level to help lower costs and accelerate EV/PHEV technology diffusion. Key areas for information sharing and collaboration include: research programs; codes and standards; vehicle testing facilities; setting of vehicle sales targets; alignment of infrastructure, charging and vehicle systems as

appropriate; and policy development and experience in implementing different approaches. It will be important to track progress (e.g., regional EV/PHEV production, infrastructure investments, etc.) and keep all stakeholders in all regions up to date.

· **Address policy and industry needs at a national level.** Successful implementation of this roadmap requires that governments around the world enact the policies supportive of the necessary technology development and dissemination, possibly via the policy recommendations for governments put forth in this document. Like this roadmap, national roadmaps can be developed that set national targets and help stakeholders better set their own appropriate targets, guide market introduction, understand consumer behaviour, advance vehicle systems, develop energy, expand infrastructure, craft supportive policy and collaborate, where possible. By formulating common goals, targets and plans, countries and the global community can work toward an electric-drive transport future.

The IEA will work in an ongoing fashion with governments and stakeholder organisations to coordinate activities identified in this roadmap and monitor and report on progress toward identified goals and milestones.

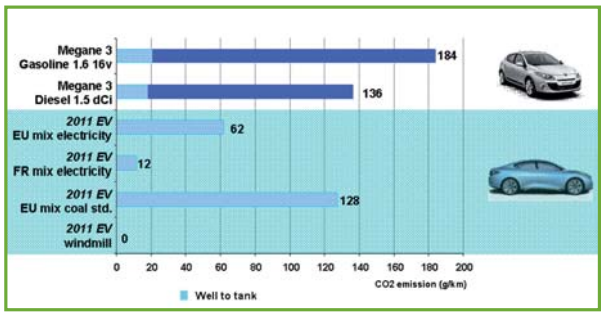
ELECTRICAL VEHICLES: THE TECHNOLOGICAL CHALLENGE OF RENAULT

Gonzalo Hennequet / **Research & Advanced Engineering Division - RENAULT**

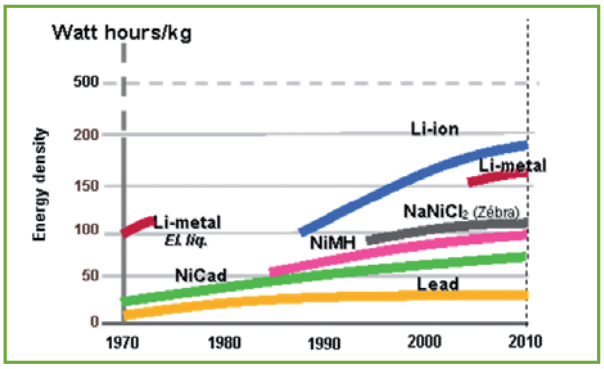
1. Why the Electric Vehicle today?

Renault is launching the "EV Breakthrough": 100% electric vehicles, accessible to all at medium term. This strategy will start with the introduction of four EV models between 2011 and 2012: EV versions Fluence (Fluence Z.E. Concept) and Kangoo (Kangoo Z.E. Concept) as well as two specific EV models, ZOE Z.E. Concept and TWIZY Z.E Concept.

The full or pure EV vehicles are the real answer to curbing well-to-wheel CO_2 emissions. So, in the B segment, we will pass from 184 gCO_2/km for a Megane 1,6 mpi gasoline engine to 12 gCO_2/km for a Fluence Z.E Concept corresponding to the Electricity mix production in France.



The most significant technical breakthrough, which makes it possible, is "Lithium-ion Batteries". Relatively recent Li-ion batteries technical develop-ment allows EV to reach its launch window because the attempted improvements in terms of Autonomy, Performances, charging availability and safety.



Other elements will progressively swing the market from conventional vehicles to pure electric ones: the growing urbanization (EV will fit a large share of mobility needs), the energy independence (face to the growing oil price and oil import dependency) as well as a global economical benefit for the customer due to new dedicated business models.

2. R&D Innovation Prospect for Electric Vehicles

Four key factors must accompany Electrical Vehicles massive development:

· The Electrical Powertrains: new developments on EM concepts as well as Mechatronics integration,

· Batteries evolution in terms of energy and power density, security and recycling end reliability,

· Energy management, by improving auxiliary consumers reduction and energy recovery devices,

· Connection to Energy Infrastructure: battery exchange/quick charging, data exchange, charging availability and performance.

FORD AND AUTOMOBILE SUSTAINABILITY

Mr. Manuel Luna / **Ford**

Ford Motor Company is committed to offering customers affordable environmental technologies in the vehicles they want and value.

To do this, Ford is introducing a range of global environmental technologies, including electrified vehicles that provide customers with more fuel-efficient models emitting fewer greenhouse gases without compromising safety, interior room or performance.

Ford is focused on solutions that reach not just hundreds or thousands of cars, but millions of vehicles - because that is how Ford can truly make a difference.

Near- and longer-term advancements include the new Ford EcoBoost global engine family featuring turbocharging and direct injection technology, Ford's ECOnetic range of low- CO_2 technologies in Europe, and multi-speed transmissions such as Ford PowerShift.

Also, Ford is developing a range of other environmentally focused features, including advanced electric power steering, weight reduction and aerodynamic improvements, plus biofuel-capable vehicles, hybrids and plug-in hybrids.

Electrification is a key element in the effective use of Ford's global resources and talents to provide a portfolio of affordable and fuel-efficient technologies for customers.

Our electrification strategy and plans include hybrids, plug-in hybrids and battery electric vehicles to best meet our global customers' needs.

Ford will launch two zero-emission full battery-electric vehicles including the Transit Connect Electric light commercial vehicle in 2011 followed by the Ford Focus Electric in 2012. Three other vehicles - two next-generation petrol hybrid-electric vehicles and a plug-in hybrid - will be introduced in 2013.

FP7-TRANSPORT EUROPEAN PARTICIPATION STRATEGY

Juan Antonio Tébar / **Department R&D Framework Programmes, CDTI**

1. Transport in the 7th Framework Programme

The Framework Programmes are the European Union's main means for funding research in Europe. The Seventh Framework Programme (FP7) began on 1 January 2007 and runs from 2007-2013. FP7 has a massive budget of EUR 50 billion. Transport research receives EUR 4.16 billion of this money. Nearly EUR 4.16 billion will be injected into transport research during FP7 to create safer, greener and smarter European transport systems and develop European competitiveness in the global market.

Research covers all modes of transport of people and goods, divided into two categories:

· Aeronautics and Air Transport;
· Sustainable Surface Transport (encompassing rail, road and waterborne forms of transport);

The transport research budget under FP7 will be used to support all types of research cooperation between universities, industry, research centres and public authorities throughout the EU and beyond, to gain or consolidate leadership in key scientific and technology areas. FP7 notably introduces some new elements compared to previous framework programmes which are used in transport research funding such as:

· Joint Technology Initiatives (JTIs) which are intended to facilitate ambitious pan-European public-private partnerships (see box);
· Strengthened coordination of national research programmes, notably through the ERA-NET scheme;
· Enhancing complementarity and synergies of research programmes across Europe through 'Article 169 initiatives' whereby the European Community participates in jointly implemented national research programmes;
· International cooperation within each theme and across themes;
· More flexible means to react to emerging needs and unforeseen policy needs;
· Optimal participation of SME across all themes.

For more information on FP7 and funding schemes available, log onto:
www.cordis.europa.eu/fp7/home_en.html

2. The added value of the participation in FP7-Transport

The following lines stresses some of the added values of the participation in FP7-Transport activities, as mentioned by active participants in calls and projects:

· High subvention rates that are more or less stable along several years
· To network and get in touch with other European groups / partners
· Because it is a must in today's globalized world (because my sector is international)
· To face common challenges
· In the pursue of excellence and enrichmen
· To support my organization's international strategy
· To help open new markets
· To join international consortia, as well as large projects
· Just for the sake of "Europeism"
· To avoid duplicating R&D investment in different countries

· To close the circle: local-regional-national and, finally, international
· To be abroad
· To ensure competitiveness in the medium and long term

3. Key elements of a successful European participation in FP7-Transport

The following list includes some of the key factors for a successful participation in FP7-Transport activities:
· Do I keep myself informed? (I am registered in key e-mail lists?)
· Do I know the structure of the transport theme and previous work programmes?
· Have I reviewed the guide for applicants?
· Am I active in the national technology platforms?
· Am I active in the European technology platforms (or do I follow them)?
· Do I promote my participant profile (for instance via CORDIS, via networks…)?
· Do I participate in European networks, association related to my "business"?
· Do I take part in Info-Days? In brokerage events?
· Am I in close contact with my National Contact Point?

BIO-NATURAL-GAS FOR CLEANER TRANSPORT

Manuel Lage / **Dr. Eng. General Manager NGVA Europe**

Natural gas, the alternative fuel to oil

With the available data today, we know that the reserves of natural gas in the world mean at least 30 to 50 years more of fuel availability than those related to oil, measured at the present rate of consumption. This fact makes necessary to develop new cars and commercial vehicles able to run on natural gas, in order to diversify and reduce the strong oil dependence of the modern world.

Natural gas is the cleanest available fuel for vehicles today

Natural gas has a very high energy content and the lowest carbon to hydrogen ratio of all the hydro-carbons (75% for natural gas; 86,5% for petrol and diesel; 82,6% for LPG), being the reason why its emission of CO_2 per kg of fuel is by far the best of all current fuels.

From the point of view of the regulated exhaust emission the very low levels of NOx, particulate matter and noise, in comparison with the diesel options, position the CNG commercial vehicles as the cleanest engine option for the urban heavy transport vehicles, in particular for buses and garbage collection trucks. In the case of the stoichiometric mixture combustion process, the exhaust emissions are even much lower than the EEV (Environmental Enhanced Vehicle) standard limit.

Another significant aspect of the CNG option is the wide experience accumulated by a number of big fleets operating in different European cities. One of the best examples is the Madrid garbage collection fleet, with a total of 650 CNG trucks. The calculation made in 2008, when the fleet was only 450 trucks, compared with what it should emit as Diesel Euro 3, this fleet alone was responsible for a yearly reduction of the emissions to the air in the city of Madrid of 132 tons of NOx, 703 tons of CO+HC+PM, and still 2.069 tons of CO_2.

Development of NGV in Europe

The development of NGVs in the different countries in Europe has been quite heterogeneous. We have the cases of Italy and Germany, with a widespread public distribution network (more than 800 stations each) where the development has been mainly oriented to private cars: 600.000 in Italy, 80.000 in Germany. In other cases like France and Spain the push in NGV's has been oriented to heavy urban vehicles; buses and garbage collection trucks, and the final numbers are of course much reduced; 10.000 in France and 2.000 in Spain, but these figures have to be explained for a better understanding; a heavy urban vehicle has an engine of about three times the power of a car and what is more important, it works 2 or 3 shifts per day, totalising up to 20 hours of operation. If we consider a private car running about 2 hours a day, we will obtain that the urban heavy vehicle represents the consumption of up to 30 private cars! Applying this equivalence to the trucks and buses running in these two countries, the final numbers would show 109.000 and 54.000 equivalent cars, that are much more significant figures.

The growing of the CNG vehicle volume in the whole world has progressed at a 16% rate from 1991 to

2001, but in the last 6 years the growth rate was 26%, reaching now a total of 7 million vehicles in the world. Assuming a very conservative rate of 18% in the next years it would mean more than 60 million CNG vehicles by 2020.

Medium term development of natural gas vehicles and technology

Other than the present advantages of the Natural Gas vehicles, we have to consider the important technology variants that would promote and gear up the development of NGV in the years to come: Biogas (biomethane), coming from fermentation processes of biomass as organic waste, landfills, vegetable and animal feedstock. Once depurated biogas can be used directly or mixed with the grid natural gas in the CNG vehicles. Biogas, in opposition with bioethanol and biodiesel, has exactly the same composition than natural gas -CH4- and it is CO_2 neutral. Thanks to the biogas contribution, natural gas becomes a renewable source of energy. Another aspect of great interest is the efficiency of the energy production when the biomethane comes from crops, because the ratio of kW per hectare is clearly higher than in the cases of bioethanol or biodiesel.

LNG stands for Liquid Natural Gas, the way it is transported long distances by ship. The big advantage of LNG is its high energy density: 1 litre of diesel = 1,6 litre of LNG = 5 litres of CNG. This energy density allows the use of LNG for medium and long distance high power transport.

Methane-hydrogen mixtures, known as Hythane or Hidrometano allow the use of hydrogen as a fuel in road transport, through a well known and mature technology as it is the CNG engine. The amount of hydrogen mixed in with CNG (in weight) is the amount of CO_2 saved.

As a conclusion, it is clear that natural gas is a renewable source of energy, being the only real alternative to the oil derived fuels. CNG vehicles offer a real alternative, available, economic, reliable and immediate in front of the diesel and petrol vehicles, in order to improve simultaneously both gaseous and acoustic emissions.

LOGISTICS AND CO-MODALITY: PRIORITIES, PROJECTS AND OPPORTUNITIES

Fernando Liesa / **Technology Platform on Logisitics, Intermodality and Mobility (Logistop)**

1. Introduction and strengths

Logistics and Freight Transport represents between 9.5 and 11.5% of the Spanish GDP and employs nearly 865,000 people in 223,328 enterprises. Logistics is a transversal sector and it has been estimated that logistics costs represent 12% of the final cost in manufacturing sectors and over 20% in retail. The development of logistics activities in Spain is high, as shown by the fact that there are more than 60 Logistics Platforms and Areas in Spain. 21 of them participate in the European Association of Logistics Platforms and Freight Villages Euro-platforms, which means the highest representation of a Member State at the European level. Thus the national transport and logistics network gives Spain a key position as platform for international transit.

One of the main strengths of the sector regarding R&D is the Technology Platform on Integral Logistics, Intermodality and Mobility, Logistop. Logistop constitutes an effective mean for the definition of research and development priorities, (Strategic Research Agenda) roadmaps and action plans in the scientific-technological field for the management of supply chains, logistics and transportation. It was launched in 2006 and it is supported by the Spanish Ministry of Science and Innovation. More than 280 organizations are engaged in Logistop including industry (46% of the members): 3PLs, carriers, retailers, logistic areas, transportation companies, technology providers, consultancy, manufacturing companies, associations, etc. and also universities, public research organizations and other RTD performers.

2. Priorities

The optimization of the overall system efficiency and sustainability avoiding sub-optimal logistics can improve performance regarding energy con-sumption and environmental impact. In this respect, smooth and co-operative interactions between the different transport modes will be essential and new operational relationships and business models will be established. Also new and innovative concepts to improve collaboration between stakeholders aiming at CO_2 emissions reduction will be required. As a summary, the main priorities established for the sector are the following:

· Optimization of the average load percentage in freight transportation.
· Effective implementation of new concepts in road transport i.e. increasing the maximum load weight and/or length in trucks.
· Improve last mile process and development of city logistics and freight urban distribution for the benefit of cities and citizens.
· Development and support of new logistic business models associated to the implementation of the Green Car initiative.
· Environmental analysis (CO_2 emissions) of the logistics chains from a supply chain holistic point of view including aspects beyond transportation.
· Promotion of co-modality/intermodality.

A detailed description of these priorities can be found in the document: "Spanish Contributions and Priorities to the European Green Cars Initiative".

3. Projects

Over the last years, several high impact RTD projects have been developed or are currently being developed with national funding in the field of logistics and co-modality. Most outstanding ones according to their budgets are:

· Smart Intermodal Transport of Goods, TIMI. (2007-2010). Budget: 23.8 Million € (www.proyecto-timi.es).
· Boosting Spanish business competitiveness through logistics as main strategic factor in a global environment, GLOBALOG (2006-2010). Budget: 8.3 Million € (www.pse-globalog.com).
· Freight traffic forecasting and modeling and possibilities for intermodal transport to and from Europe: analysis of capacity, efficiency, quality, service levels, regulation and financing, PREVITRANS. (2008-2011). Budget: 1.9 Million €
· Spanish Network of Intermodal Logistics Platforms improving competitiveness and Environmental Sustainability of Freight Transport. (2008-2011). Budget: 1.67 Million €
· Definition of a Spanish Network of Logistics Platforms, RELOG. (2001-2011). Budget: 1.59 Million €
· Analysis of the accessibility and efficiency improvements for intermodal operations and logistics platforms, INTERNODAL. (2007-2009). Public funding: 0.56 Million € (www.inter-nodal.com).

4. Opportunities

Above mentioned projects are important tools to increase RTD capacity in Spain in the field of logistics and co-modality. All of them will allow their participants to increase their know-how and potential to lead projects at European level.

In this regard, the application of ICTs, the logistic platforms network design and associated services are areas of growing interest in Spain aiming to increase the overall efficiency of the transport system. Moreover, last mile and city logistics is an important topic which has to be developed and improved in the next future including electric vehicles delivery solutions.

Spanish Technology Platform on Logistics Intermodality and Mobility, Logistop (www.logistop.org).

Spanish Contributions and Priorities to the European Green Cars Initiative
(http://greencars.ite.es/contributions.pdf).

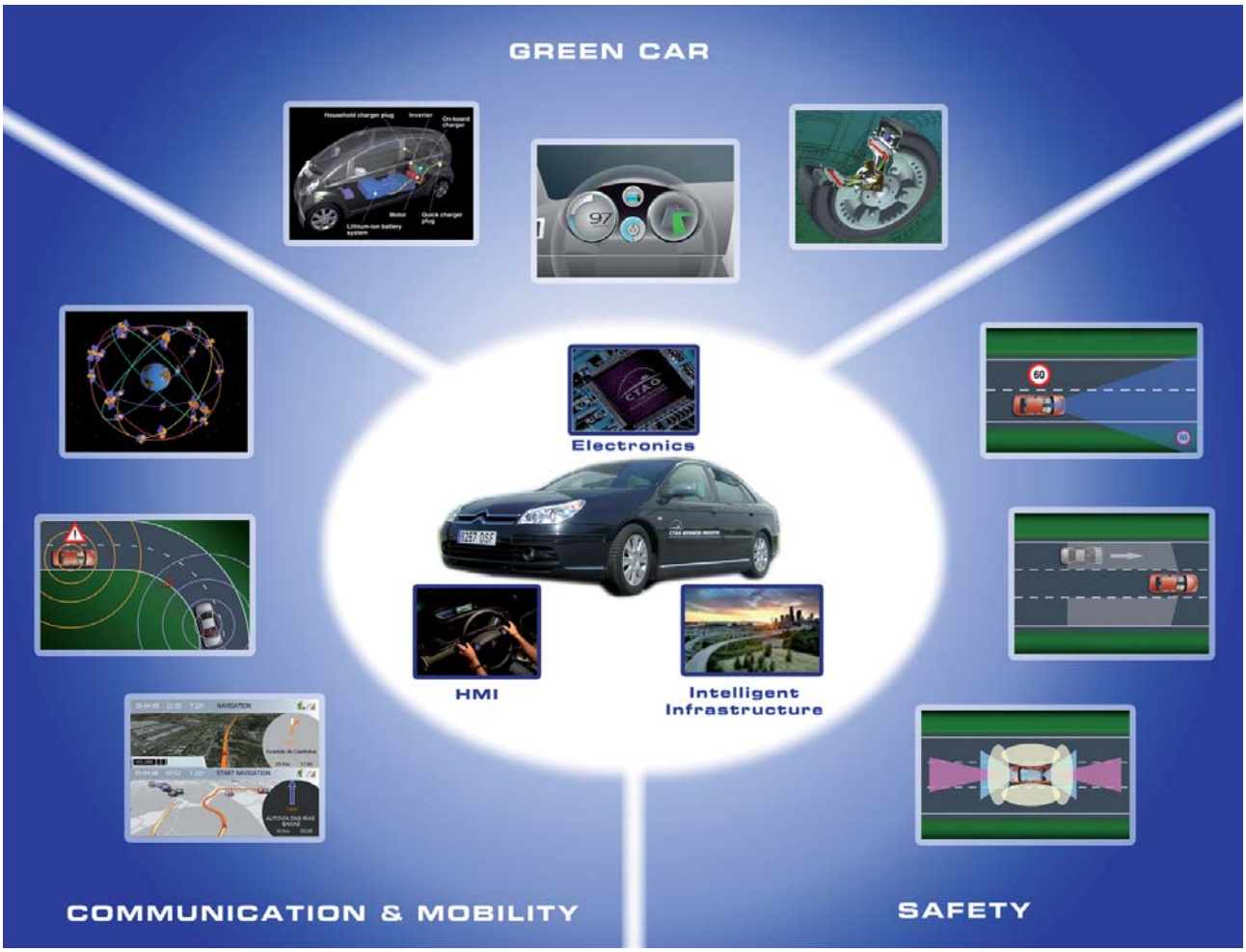
ITS CHALLENGES FOR NEXT GENERATION GREEN DRIVING

Ana Paul / **Fundación CTAG**

1. The role of ITS in Green Cars

The Intelligent Transport Systems (ITS) will play a major role in the future development and deployment of green cars, since they will contribute significantly to a safer, cleaner and smarter sustainable mobility. New electric vehicles will require the development and integration of systems and advanced components based on ICT technologies applied to both the vehicle and the network, in order to ensure the required levels of safety and energy efficiency.

In this sense, main challenges of next generation vehicles include new vehicle-to-vehicle and vehicle-to-infrastructure communication technologies, advanced safety systems adapted or extended to the electric or hybrid vehicles, new eco-navigation functionalities, novel systems for autonomous driving,



applications for the integration with the electrical network, real-time monitoring systems or innovative HMI solutions, among others.

Furthermore, ITS have also a strong potential in the fields of logistics, co-modality, traffic management and urban mobility. Green transport related aspects such as traffic prioritisation (specific lanes, dedicated lanes, etc.), user-friendly trip planners based on multi-modality, real-time data management, ICT-based parking control, vehicle identification and access control for green areas, etc., will find in ITS technologies the adequate basis for the development of complex and successful transport architectures which will definitely contribute to the ambitious goal of the Green Cars Initiative.

2. Spanish priorities

With regard to ITS, Spanish needs have been analysed under the perspective of the European Green Cars Initiative. As a result, the following set of priorities and R&D areas of interest have been established:

· New systems and services based on ICT technologies to provide advanced solutions for sustainable mobility in urban and interurban areas, introducing the use of EV as a new element in the transportation network.
· Advanced HMI concepts, which optimize the interaction between the end-user and the eco-efficient multi-modal transport models.
· V2X communication technologies (vehicle-to-vehicle, vehicle-to-infrastructure, vehicle-to-grid) and cooperative systems/services applied to efficient mobility.
· New ADAS and active safety systems for the electric vehicle.
· New concepts of autonomous driving applied to public transport vehicles or adapted to fleets with special characteristics.
· Development of data communication interfaces between the green car and the infrastructure, including transmission of information (protocol definitions) to feed the models of demand management.
· Development of advanced concepts of mobility and transport of people and goods. Services providing information to goods sharing, traffic situation, intelligent cargo, etc.
· ICT for advanced and eco-efficient logistic applications. Transportation solutions for goods multimodality, adjustment of demand and offer on power grids, pricing of energy, park reservation for freight transport.
· New control and traffic management models oriented to energy efficiency, infrastructure management, advanced toll collection systems (e.g. based on discrimination between green cars and other vehicles), behaviour motivation (e.g. by fines or allowing access to special zones), etc.
· Impact assessment: emissions and consumption reductions, energy efficiency, transport efficiency, road safety improvement, etc.
· Implementation of Galileo.

3. Opportunities

The Green Cars Initiative requires the strong implication of new actors beyond the traditional ones within the transport sector. As far as ITS is concerned, the development of this vision opens a lot of opportunities, since Spain presents a high potential in terms of important and relevant stakeholders in the different domains of in-vehicle systems and components, communications, intelligent infrastructures, energy supply and logistics.

The successful collaboration between automotive, communication and infrastructure companies together with research centres and universities in some ongoing R&D projects supported by the national and regional governments put the Spanish ITS sector in a privileged position to approach the leading of future European Projects.

ITS AND GREEN CARS CANNOT DO WITHOUT EACH OTHER

Antonio Marqués / **ETRA**

1. Why now?

Environmental issues have always been in the agenda of Intelligent Transportation Systems. However, in the not so distant past, the mitigation of the negative impact of mobility in the environment has received relatively little attention compared to other higher -at the time- priority topics, such as efficiency, comfort …

Environmental and other related aspects, such as energy, may have remained as second or third level priorities for the ITS community, the automotive community and society at large if things hadn't changed.

But things have changed: the need to address global warming, increases in fuel costs as a result of supply constraints and, more recently, the worldwide financial crisis are leading to major long term changes in our individual travel decisions. People, whether they are making travel decisions for themselves, or for their companies, will be much more conscious of environmental implications, energy use and costs.

2. Now what?

The challenges posed by the current energy, climate and socioeconomic crises can not be faced from a unidimensional perspective.

On the one hand, green cars alone can not be the solution -nobody wants current traffic jams of petrol cars replaced by jams of electric cars …

On the other hand, ITS systems must radically embrace the multidimensional nature of the challenges society is facing, considering the environmental and energy dimensions as fundamental decision criteria and incorporating the green car as one of the cornerstones of the future mobility solutions in Europe.

At a high level, we can consider the solution we are looking for as a 2x2 matrix where the key dimensions are, on the one hand, the vehicle and the infrastructure and, on the other, the energy-related issues and the mobility-related issues- see fig 1.

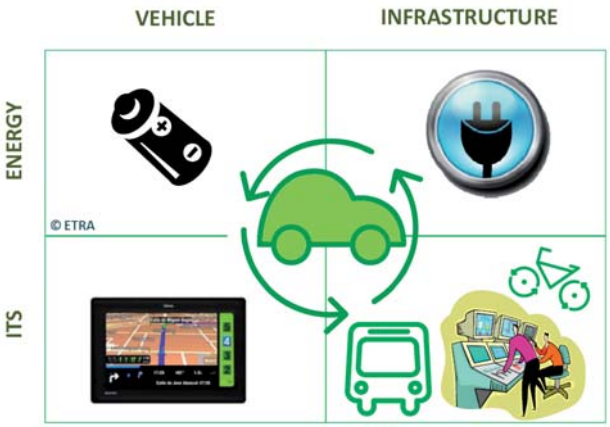


Fig. 1: The Green Car: a 2x2 challenge.

The main challenge lies in the much needed coordination between the recharging infrastructure, the electric vehicles and the overall mobility schemas of a city or interurban road network.

The key questions are:
· How can we integrate green cars smoothly and consistently in the overall mobility system?
· How can we optimize the energy used per passenger transported?

· How can we make operational new business models which will be required for the successful deployment of electric cars?
· How can ITS contribute to the long term sustainable success of green cars?

3. Why not?

We could map on fig 1 the multiple initiatives taking place both at EU and national levels. The result of this exercise would be a disconnected, heterogeneous level of coverage of the four cells in the matrix.

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VEHICLE ELECTRIFICATION: RTD PRIORITIES

Iñaki Inzunza / TECNALIA M2F

Transport electrification can be considered the main pillar of the GCI, due to the technology breakthroughs required and also due to its high impact on the reduction of oil dependency and urban and road transport emissions. Moreover, it involves the development of new vehicle and mobility concepts and of new business models, as well as step changes on materials and technologies for the new components in the vehicle.

The development of electric transport systems demand R&D efforts on the whole value chain from the development of components and new high performing materials (energy storage systems, their management and smart integration in the vehicles, drivetrains, energy efficient auxiliaries, energy recovery systems and ICEs for range extenders) and the development and/or adaptation of manufacturing processes to produce them; new vehicle concepts and architectures; the interaction of the vehicle with smart electrical grids and also the integration of electric vehicles in the whole transport system.

Full deployment of electric vehicles will also demand taking into account the specific issues related to urban mobility, the validation of vehicles and users' acceptance studies provided by demonstration programmes and field operational tests and, finally, the definition of standards and homologation procedures and tests.

1. Materials, manufacturing and processes

The major R&D areas are: development and manufacturing of lighter high performance materials; development and implementation of electronic systems embedded in materials to allow informing about their behaviour in real time; development of multifunctional materials to allow their implementation in the vehicle surface and in key vehicle elements; development of new joining technologies with lower environmental costs, paying special attention to dissimilar joining and enabling easier dismantling and recycling processes; metrology applied to manufacturing; mechatronics and micro-technology; incorporation of customization and vehicle adaptation concepts; improvement of the collaboration between different agents of the suppliers' chain; optimization of transport from a supply chain perspective; optimization of current networks of material feed-back.

2. Systems and components for electric vehicles

The major R&D areas are: development of advanced energy storage systems; development of Drivetrain components and systems, optimization of in-vehicle energy efficiency and energy management; safety aspects of electric vehicles; in-vehicle system integration.

3. ICEs for light vehicles (range extenders)

The major R&D areas are: development of small internal combustion engines; development of electric generators for hybrid propulsion systems; strategies for engine management and use of different fuels; development of alternative fuels.

4. Sustainable urban mobility: vehicles and concepts

The major R&D areas are: new concepts and technologies for urban vehicles, electric and hybrid, both for private individuals and public transportation, freight logistics distribution, solid waste and others; advanced systems of electrical energy storage in the urban area.

5. Demonstration and field operational tests (FOTs)

The major R&D areas are: vehicles (private cars and freight transport); infrastructure: road, electric and Communications; study of new energy generation Systems; establishment of regulations for the use of infrastructure.

6. Regulation and standards, homologations, tests, validation, safety and type approval of the hybrid and electric vehicles

The major R&D area related to the vehicle is the identification of safety standards of components, systems and hybrid and electric vehicles.

http://www.cdti.es/index.asp?MP=7&MS=225&MN=4&TR=A&IDR=1&iddocumento=2103&r=1344*840
"Spanish Contributions and Priorities to the European Green Cars Initiative (EGCI)".

VERDE: R&D IN TECHNOLOGIES APPLIED FOR ELECTRIC VEHICLES IN SPAIN

Frank Bekemeier / **SEAT R&D executive vice-president**

1. Project aim and objectives

The aim of the project VERDE is to research and develop technologies which allow the production and commercialisation of electric vehicles in Spain.

VERDE is an applied research project to develop new technologies, organised with a solid leadership, but also cooperative and based on the mutual trust between partners, which are convinced of being part of a common project.

VERDE must be the driving force of future individual and cooperative projects to introduce the new developed technologies in the next generations of vehicles.

The accomplishment of these objectives would allow Spain to reduce its energy dependency from the oil, to reduce the CO_2 emissions in the transport sector and to favor the penetration of renewable energy as established in the UE energy policy for 2020, and, last but not least, to guarantee the future of the industrial sector and the automotive R&D in the country.

2. Work packages and technical goals of the project

Introducing electric vehicles in our societies is a complex task which involves many agents beyond the automotive sector. Therefore, project VERDE was divided in seven different work packages, and each of them focuses on concrete aspects that must be achieved, in order to convert the electric vehicle in a reality on our roads.

First work package studies different electromechanical architectures for plug-in-hybrid (PHEV) and electric vehicles (EV), in order to achieve the most energy efficient solutions for each type of vehicle and driving use. PHEV are meant to be the inevitable transition to the complete electrified vehicle, allowing an electric daily driving for the common uses of mostly drivers, but offering also the flexibility and autonomy of the conventional vehicles.

Second work package concentrates on the batteries for electric vehicles, which nowadays are the most critical component, being necessary to increase considerably their energy density and reduce their costs.

Third work package develops complete electric systems for the vehicle traction, including motors, generators, inverters, electronic control and cooling systems for their components.

Forth work package designs integrated bidirectional converters for the charging of the batteries, but also for the discharging of them, in order to allow V2G services which would be an important tool for an intelligent management of the electrical power demand.

Fifth work package studies local charging infrastructure systems and the new needs in communication between vehicles and the electric network.

Sixth work package analyses the integration of the electrical vehicle to the electric network through the management of smartgrids.

Finally, seventh work package integrates and validates the developed technologies in a physical demonstrator.

3. Leadership and Partnership

An ambitious project as VERDE in only possible with a strong leadership of leader enterprises in their fields. SEAT, as the only vehicle manufacturer with a R&D centre in Spain, leads the project and the first and seventh work packages, but counts as well on the partnership of leader companies for each of the rest work packages.

Therefore, CEGASA, the Spanish most important battery manufacturer, leads the activities related to automotive batteries for electric vehicles. SIEMENS, one of the major industrial groups worldwide and with an important presence in Spain, assumes its leadership for the electric traction systems. LEAR, a worldwide leader supplier for electronic automotive components, takes the responsibility on the charger's design. COBRA, part of ACS Group, one of the most important Spanish companies in the management of civil engineering and private construction, assumes the activities related to the necessary charging infrastructure. Last but not least, ENDESA and IBERDROLA, the two major Spanish energy suppliers, work together on the activities of the sixth work package. CTM, a technological centre with experience in industrial project management, is in charge of the technical and economical coordination of this complex project.

Since the investigation field of VERDE is wide and requires research in many concrete areas, each leader partner counts on the collaboration of other important companies and high specialised technological centres and universities to develop its activities. Among all partners of the project should be mentioned enterprises like FICO TRIAD (part of Ficosa Group and responsible in VERDE for the developing of the battery pack), CIRCUTOR (in charge of energy measurement electronic systems) and RED ELÉCTRICA (Spanish acting manager of the electricity transport network and electrical power demand).

Altogether the project counts on the participation of sixteen big companies, four small and medium enterprises, and fifteen technological centres and universities, all distributed in Spanish territory.

4. Main terms

VERDE was selected on 2009 for the CENIT Program, destined for R&D projects in strategic technological areas of international interest, and it is partial financially subsidized by CDTI, dependent on the Spanish Science and Innovation Ministry.
Duration: 2009-2012
Budget: 34,15 Million €

CITYELEC: NEW CONCEPTS OF ELECTRIFIED URBAN MOBILITY

Alberto Peña Rodríguez / **Tecnalia**

1. Cityelec Project objectives

The Cityelec Project is focused on the key components that will allow the electrification. This project is focused on the research of key elements both in vehicle and infrastructure for new concepts (sometimes radical) of electrified mobility on urban environment. The main objective is to define the CITYELEC system, that will allow personal mobility with minimal carbon print by means of the following:

1.- Fleet of light electric vehicles (Scooters, city cars and small buses).

2.- Infrastructure elements: Urban transformer station with energy storage capability, local urban energy generators (photovoltaic, windmill, others...).

3.- New concepts for management of electrical power from renewable sources on the grid, focused on maximum storage of renewable energy for mobility.

The project will perform physical test with vehicles and infrastructure, obtaining measurements from the total carbon print of the proposed Cityelec concept. The project is aiming at a total CO_2 emissions from 0 to 40 g/km, considering well to wheel analysis.

2. Project consortium

The project is led by TECNALIA. The partners are Tier 1/Tier 2 automotive suppliers, electrical equipment manufacturers, technology platforms, energy companies, government energy institutions, national vehicle manufacturers, Universities, research organizations and national laboratories and councils. There are 32 partners involved and the total budget is 19 million euros.

The project is funded by the Spanish Ministry of Science and innovation (MICINN) .The vehicle/ infrastructure validation and tests will be carried out in three sites: Concept demonstration on controlled environment:

The INTA test track in Madrid will be used for scale scenario simulation and certification of the developed vehicles. This test facility will replicate certain urban scenarios in a controlled manner ("Dummy" urban environment). This stage will ensure safe operation of prototype vehicles and infrastructure before merging with real traffic conditions. Attached is the test track top view, and a portion of the dynamic platform that will be used for 6-8 months for testing of vehicles in an urban dummy environment. Once the elements are considered safe, the INTA will provide test plates for certification of vehicles in order to allow circulation on traffic conditions.

It should be highlighted that the CITYELEC project is focused on the development of new in vehicle electric drives, energy storage systems & advanced networked (C2X) energy management strategies, as well as the infrastructure elements. That is why it is so important to carry out test in a controlled environment, previous to urban testing on open traffic.

Testing and system evaluation in two Urban areas: The infrastructure elements will be installed in the cities of San Sebastian (population 190.000) and Zaragoza (population 660.000). These cities are considered representative of most of urban areas

in Spain, and their Councils are very active in EU projects and very concerned with urban efficient and clean mobility. Local public transport company of San Sebastian (CTSS http://www.dbus.es/en) is also involved in CITYELEC, which makes this site specially recommended for a "Focused Demonstration" scheme.

Currently, a fleet of electrical scooters are being instrumented to be used by council services in order to obtain accurate driving cycle data that will be used on the CITYELEC system design. This will define also required use schemes for different users, as well as usability & acceptability aspects related to electric vehicles.

Once the vehicles and the infrastructure concepts are certified for urban use, a series of elements will be installed in both cities, together with an estimated fleet of more than 20 vehicles, that will carry out validation activities focused mainly on obtaining data both from vehicle and power grid in order to identify the carbon print of the CITYELEC system for about 6 months. The recommendations on the optimum size for the different components, optimum use modes (personal transport, car sharing, public, …) will be validated with the measured data.

3.Status of the project: Current achievements up to date.

In order to define the requirements of the Cityelec system, an extensive analysis of urban mobility needs. New simulation tools have been created in order to assess the effects in terms of well to wheel emissions so that the most convenient vehicle fleets can be defined. These tools take into account large combination of vehicles, tailored to the needs of measured data from vehicles in San Sebastian and Zaragoza.

Concerning the key elements in the vehicle, significant effort has been carried out in order to agree the electric drive requirements of both the "stand alone" and the "motor in wheel" configurations for urban light vehicles. At this point, a parallel effort is being carried out in the development of highly efficient axial flow "motor in wheel" concept with Infranor and a inboard radial flow machine with Reivaj, as well as the advanced power electronics.

As a summary, the Cityelec project is being very successful, mainly due to the combined technology push from the research agents involved and the market pull from the industrial partners, that will be putting in the street their developments in the next months. It has to be highlighted that the Cityelec consortium has been actively involved in many proposals related to electro mobility in the last Green Cars transport call, with activities related to the research lines of the Cityelec project.

TECHNOLOGIES FOR SUSTAINABLE AND ACCESSIBLE URBAN MOBILITY (TECMUSA)

Jose María López / **INSIA (University Institute of Automobile Research) Polythecnic University of Madrid**

1. Introduction

Among the principal technological objectives to achieve sustainable and accessible urban mobility of people and goods are the development, testing and integration, in electric and hybrid vehicles platforms, of a set of technologies associated with these vehicles, new fuels generation, electricity supply, energy storage systems, more efficient. However, it will be a step change of technologies, business models and user practice that requires strong efforts in terms of research and development. Under this topic, the project TECMUSA presents the research priorities in all related fields and derived a common strategy for joint actions of the involved stakeholders.

The partners of the consortium involve in the project TECMUSA, 15 private companies and 10 research group from the University, are dedicated to research and develop new knowledge to meet the demand of an increasingly demanding society, not stay out of the market by the high competition among firms in the sector, through research, in partnership, in the field of electric and hybrid vehicles, aimed at developing new technologies associated with these vehicles, next-generation fuels, electricity supply, fleet management and information and communication systems to achieve urban transport of people and goods efficiently , energy efficient, environmentally friendly and accessible to all users, promoting the integration of activities belonging to the same value chain, ranging from the analysis and creation of components of complex systems needed for applied research to prototype testing unmarketable and hybrid electric vehicles for testing by a pilot demonstration to allow generic technology validation.

The consortium provides for the obtaining of significant results arising from activities that take place during project implementation will mean an increase in the competitiveness of companies in the consortium and promote its position in the sector nationally and internationally, improving the industrial and revalorization of partnerships along the value chain.

2. Hybrid and Electric Vehicle Developments in the Urban Areas

Have been identified four types of needs detected by urban transport operators and many other types of vehicles designed to meet:

· Pure electric buses of large dimensions and high energy range.
· Hybrid buses with reduced consumption and emissions by using biofuels and other alternative fuels.
· Hybrid vehicles for the collection of solid urban waste by using biofuels and other alternative fuels.
· Hybrid light commercial vehicles for logistics applications in urban and interurban areas.

The main working areas in which action is being taken and could be supported by Spanish industry are the following:

· Vehicle structures, bodies and mechanical groups optimized to reduce the drag resistance of the vehicles, with extensive use of lightweight materials, including composites, and optimized designs.
· Energy storage systems using high-density batteries capable of withstanding high driving periods in purely electric mode, in the case of hybrid vehicles,

and achieving high range in the case of pure electric buses.
· Fast charging and charging systems integrated in the infrastructure.
· Modelling and optimization, with the criteria of zero or minimum consumption and pollutant emissions, of the hybrid configuration, storage and energy management on board, according to urban traffic, characterized by driving cycles representative of applications each type of vehicle.
· Advanced systems for fleet management real-time dynamic control, energy management and coordination with the energy supply system in the case of electric vehicles, among other features.
· Comprehensive system of communication with customers so as to achieve two important goals: improving efficiency of services and high accessibility of all types of users, and advanced information services to passengers on board, in the case of urban transport passengers.
· Integration of these technologies in the three types of vehicles to develop, adapt to technical requirements, and the whole set-up and experimentation through pilot tests.

OPPORTUNITIES IN THE VEHICLE ELECTRIFICATION

F. Payri y B. Pla / **CMT-Motores Térmicos. Universidad Politécnica de Valencia**

Light duty vehicles have been powered almost exclusively by Internal Combustion Engines (ICEs) since they were concerned more than 100 years ago. Its high power density, acceptable efficiency and the petrol availability have allowed the ICE to monopolize the road transport sector, pushing the rest of competing technologies to minor applications. Since virtually all the transport energy comes from petrol-based fuels, carbon dioxide emissions from transport grow almost linearly with the fuel consumption. In fact, road transport was responsible in 2006 for 17,7 % of all EU-27 green-house gases (GHG) emissions, apart from providing 40 % of NOx emissions, 36 % of CO emissions and 18 % of the emission of non-methane volatile organic compounds [1]. Therefore, any effort to reduce the global GHG emissions should tackle the efficiency of vehicle powertrains. Important efforts are being carried out in order to increase the ICEs efficiency, but also, other powertrains than ICE-based are currently under evaluation.

Electric Vehicles (EV) will introduce important benefits in terms of local emissions. Regarding energy efficiency and global GHG emissions, electric powertrains have higher efficiencies than ICEs (electrical machines typically reach the 90%, while ICEs roughly reach the 40% in the case of high efficiency Diesel engines). Nevertheless, as far as global GHG emissions are concerned the potential of EVs is strictly associated with the electricity production technologies. In this sense, Spain holds a leading position in electricity production from renewable sources, and then, the road transport electrification is the next logical step towards the eco-friendly vehicle. In table 1 the well-to-tank emissions from different fuels and electricity are shown. It can be observed that the high use of renewable energy sources in Spain allows the CO_2 emissions attached to electricity production to be lower than those from other developed countries. Nevertheless, electricity production involves higher well to tank CO_2 emissions than fossil fuels. Biofuels have important emission benefits due to their negative CO_2 well-to-tank emissions. Although it is unlikely that enough biofuels could be produced to be universally used as a transportation fuel, it could be used by some production countries to reduce fossil fuels imports. In this sense, Spain has important production capabilities in the area of alternative fuels.

Table 1. Well to tank CO_2 emissions from different energy sources.

	Gasoline[2]	Diesel[2]	BD[3]	Electricity [USA][2]	Electricity [Spain][4]
well to tank emissions [gCO_2/kWh]	66,6	50,76	-65.88	702	390

In any case, the EVs success has been limited by added weight of batteries, reduced load capacity, limited range, lack of recharging infrastructure and higher costs. The Spanish automotive industry is able to achieve these challenging technology breakthroughs. Specifically, the Spanish R&D strong fields include:

1. Development and manufacturing of new lightweight materials that will lead to a consumption reduction and a more efficient energy use.
2. Development of components and systems for electric vehicles: electric machines, batteries and supercapacitors, including their integration, thermal and energy management systems, energy efficient

auxiliary systems (heating) and in-vehicle V2G technologies.

3. Development of a smart grid integrating vehicle with road infrastructure: "smart and fast charging", communications services, traffic management to improve safety…

4. One challenge for EVs and then an important business opportunity is the **integration of the EVs demands in the electrical grid.**

5. Currently, there is a lack of enforceable regulations in the systems involved in EVs. Thus, the identification of safety **standards** of components, systems and overall vehicles is a new sector where Spanish companies have good opportunities.

As previous steps towards the zero emissions vehicle, other architectures besides EV should be considered. Current Diesel engines show high efficiency, but in urban driving, they suffer significant energy losses due to idling. Hybrid Vehicles (HV) combine a fuel-driven power source with an electric drivetrain allowing the engine to stop at idling and low load conditions where the engine efficiency is low. In addition, HVs allow regenerative braking which is also a significant advantage in terms of energy efficiency. Then, HVs have aroused the interest of car manufacturers, at least as a temporary solution on the way to zero emission road vehicles. To conclude, the development of high specific power, ecologic, efficient and quiet ICEs adapted for HVs is a fundamental task where the Spanish industry which is nowadays manufacturing stationary and small motorcycle engines can adopt an important role. In figure 1 the engine power versus the weight of the best seller vehicles in Spain during 2009 is shown, and also the maximum power required during the homologation NEDC cycle. It can be noticed that the engine power is considerably higher than strictly necessary; especially in J and F segment cars (this trend is even clearer for the US light vehicle fleet). Since engines operate at partial load (with low efficiency) for most usual driving situations downsizing is justified. Accordingly, the US Environmental Protection Agency [5] concludes that the fuel economy of the 2004 car and light truck fleet would have been a 22% higher if it had remained at the same average weight and acceleration performance of the 1987 fleet.

[1] "Panorama of Transport". Eurostat Statistical Books. (2009): ISSN 1831-3280.
[2] "A Well-to-Wheel Comparison of Several Powertrain Technologies" SAE Paper 2003-01-0081 (2003).
[3] "Comparison of GHG emissions from diesel, biodiesel and natural gas refuse trucks of the City of Madrid". Applied Energy 86 (2009) 610–615.
[4] "Spanish Contributions and Priorities to the European Green Cars Initiative (EDGI)" (2009).
[5] "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2007". US Environmental Protection Agency (2008).

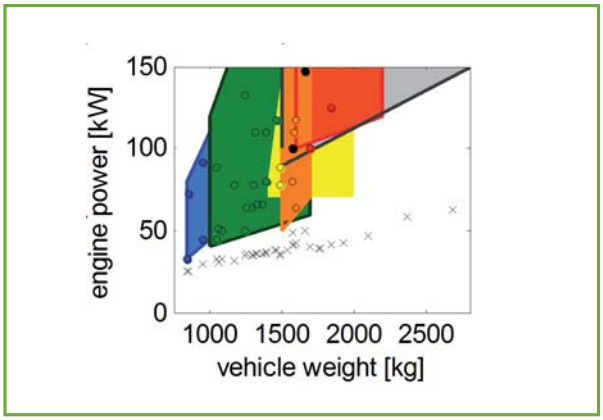


figure 1. Engine power vs vehicle weight for the Spanish light duty vehicle fleet [2009].

- city car (A segment).
- compact car (C segment).
- family car (D segment).
- MPV (M segment).
- luxury car (F segment).
- SUV (J segment).

x maximum power required to carry out the NEDC.

ELECTRIC INFRASTRUCTURES

Susana Bañares Hernández / **Red Eléctrica de España**

1. The need of the electrical infrastructures

Electrical vehicles represent a new type of demand in the value chain of the electricity sector, which, in accordance with the development previsions, will constitute a considerable percentage of energy and power demands on the electrical system in the coming decades. In addition, the impact on the electricity sector is not well known as the patterns of use of electric vehicles are dependent on the technological options available and their social acceptance. It is worth mentioning that electric vehicles are mobile units which in the future will create different electrical demand scenarios from a geographical point of view.

The smart integration of green cars into the electricity grid requires the development of new coordination and standardization schemes along all the electricity supply value chain: cars, distribution companies, resellers, and transmission system operators (TSOs), in order to assure that the infrastructure that fuels these mobility schemes is available not only nation but European-wide, with the same quality, standards and services.

2. Research and development areas identified

In the framework of the Spanish support group for the European Green Cars Initiative, four research priorities have been identified in the area of electrical infrastructure and energy management.

2.1. Grid integration

Strategies for fostering electrical mobility lie in the search of an efficient overall energy system. Because of this, it is not only important to pay attention to the efficiency of the design of the vehicles, but also to the management of these loads according to the needs of the electrical systems. Therefore, it is fundamental that the latter is considered in the strategic development of the infrastructures.

· Identification of new business models for developing the electricity mobility,
· Better integration of renewable energy into the grid,
· Optimal use of existing infrastructures for an intelligent management of electric vehicles,
· Development of V2G services.

2.2. Smart infrastructures

Smart grids is a network of networks whose overall objective shall be the integration of this new demand in the electricity grid, the telecommunication network and transport network, with the overall objective to allow the development of this new mobility, optimizing the energy use.

The major R&D areas identified are the following:
· Definition of new functionalities (smart charging, vehicle identification, electricity prices information, metering, invoicing and payment, bidirectional communications, etc…).
· Development of new mobility services and ICT solutions for the management of these services.
· Development of demand side management services.

2.3. Standardization

The deployment of EV in the market will require the provision of support infrastructure and its integration into a complete system of large-scale mobility. There should be no barriers to the use of different facilities, suppliers, rates or types of charging stations. For this

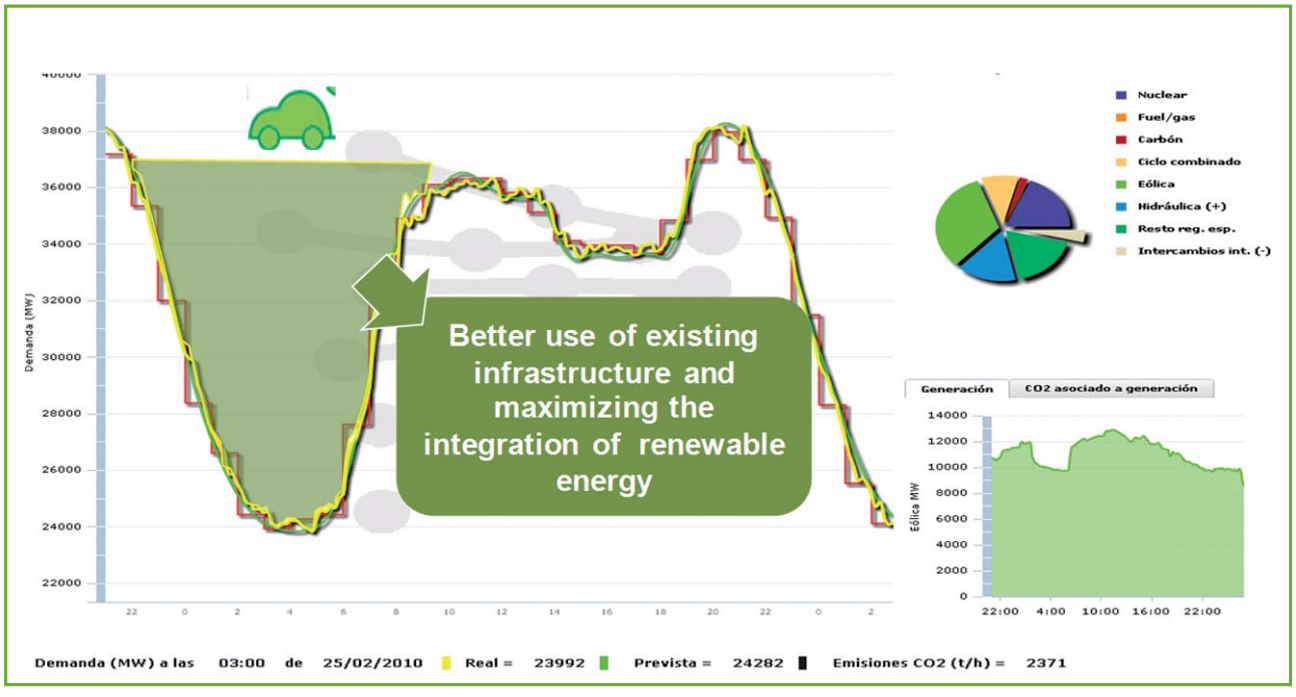
purpose, the concept vehicle-to-grid combines a fast power charging with a smart payment system. In this regard will require new technologies of information and communication technologies make use of standard protocols for exchanging data falls inrastructure and storage system. It will be necessary to design the technology of charging stations, the standardization of connections, the rapid charging process, the security requirements and the collection process according to different rates, depending on the origin of electricity charged.

2.4. Demonstration and field operational test

The development of technologies linked to the electric vehicles requires the existence of large scale demonstrations, aimed at validating said technologies. These demonstration projects need to have a global scope so that not only are individual technologies validated in the areas of vehicles, infrastructure, communications and energy supply, but also to validate how these different technologies are integrated in order to obtain synergies that lead to better efficiencies, lower costs, CO_2 emissions…

3. Spanish strengths

Spain has the suitable electricity sector structure for contributing to meet the Green Car Initiative goals. In fact, from the electricity infrastructure point of view, one single company is acting as TSO over the whole national territory while two distribution companies cover almost 80% of the area. This would assure that coordination and agreements for nationwide standards can be achieved in shorter terms than other European countries where the number of stakeholders in the sector is greater. Common projects are already ongoing for that purpose. Also, Spanish utilities are leading companies at the European level in contributing to achieve common standards for connection and management of distributed demand resources. It is also worth mentioning the Spanish TSO is the only European TSO having a special unit entirely devoted to demand-side management (DSM), promoting that efficiency and sustainability criteria are observed.



EPV PROJECT, ELECTRICAL VEHICLES, SMART GRIDS AND RENEWABLE ENERGIES

Sixto Santonja Hernández / **Instituto Tecnológico de la Energía**

1. Introduction

For the electrical industry a new revolution is coming, the private and public electric transport, that means a great concept change in urban, suburban and long distances transport.

With all of these changes in front of us, the EPV project was launched, financed by Valencian Government and the European Funds for Development. The goal is the development of a new efficient transport system based on electric vehicles and hybrid vehicles, integrated on the grid and with high renewable energies integration.

2. The electrical vehicle and the grid

With the advice of the Valencian Energy Agency (which Spanish acronym is AVEN), the Technological Institute of Energy coordinates the project with a consortium of nine leading enterprises in different sectors (Iberdrola Distribución Eléctrica S.A., Movilidad Urbana Sostenible, Power Electronics, Nutai, GND, Tecnibat, CPD, IDOM and Montesol), to identify consumption patterns, new regulatory model and charging infrastructure for the electrical batteries. Also, Iberdrola and the other partners, analyzed the used of wind power to charge the car, adapting the energy demand associated with this type of vehicle to the periods of maximum generation. This project is co-financed by the Valencian Government, through the strategic actions for industrial diversification inside the year 2009 of the Department of Industry and the European Funds for Development.

In order to maximize the comfort user level, adapting the technology to their needs and with similar performance of the transport systems used today. One of the projects goals is the research in the Li-ion batteries field for automotive uses. This will provide to the vehicles a great autonomy and lightness. Electric cars reach Europe for the next year, but people are concerned because missing a whole network of outlets and electrical poles providing autonomy to vehicles, in houses, and companies and the streets.

There are two possibilities for charging in the street, the first one is in a charging station pod. The second one is replacing the depleted battery by another one with full charge. In this project we have considered the first solution at this time. The new charge infrastructure needs to be studied, analyzed and optimized.

So one of the main concerns of the EPV project is the standardization of the charging stations pods, their characteristics and communications with the user, also we need to implement a management and billing system.

EPV project is working on with the introduction of technical and methodological advances achieved during months of research, regarding the development of the new Vehicle-to-Grid System Design and, at the same time, the development of a V2G prototype and studies in communication patterns.

Between the results obtained, we will discuss about the design infrastructure network for charging stations pods:

· Energy management software: demand monitoring, the associated generation and the system users control.
· V2G communications standard specifications: HW and SW.
· External design according to the studied user profile.

Design and development of the "intelligent" charging station pod.

3. Renewable Energies Integration

The transport electrification will have a considerable impact, beyond the increase in the electricity demand and the need to modernize grid infrastructures. The EV introduction in large-scale could have positive effects for the renewable energy integration and in the grid management and quality too.

The transition process must carried a new regulation model of the sector, including the implementation of dynamic billing that reflect the real cost of energy and enabling the renewable energy management as source for this new demand for the EV batteries.

We have too many doubts about this innovative technology. A massive electric vehicle introduction will bring an increase in the electricity consumption so we will need more generation capacity (including the renewable energy). But experts are agree that, at the moment, it is possible to hand with a relative big number of EV without big structural changes on the network.

Smart grids have been proposed. These smart grids have a management system which interacts with the customer and a two-way relationship between the network and the smart devices, EV includes.

Despite the fact that the utilities indicate vehicles will have to charge mainly at night, during low demand periods, the project also discusses the consequences of massive connections at other times of the day in order to determine if energy would come from renewable sources, something possible in Spain, since we are leaders in wind energy. On the other hand, taking into account that electric vehicles are more efficient that gasoline ones, making headway 60 % more, neural networks for modeling and obtaining optimal charging stations pods location are used.

The EPV project is analyzing the electric vehicles penetration and the vehicle usage profiles scenario. The metropolitan area of Alicante have been selected for a strong study, based on the diversity of profiles (workers, tourists, vehicle rental, messaging and carriers, Town Council fleets and public services), different areas (urban and industrial) will be considered.

Among the conclusions, we have to mention the development of an analytical model of the distribution network, presenting the interdependence between renewable energy and electric vehicle. In this task, studies have focused on a wind farm. This is far away from the urban area. Our analysis has to show the capacity of the farm to supply the energy that the EV demands.

At the end the EV is an active element inside the "smart grid" how we can manage this intelligent device is a big goal for the EPV project. Because in an open point of view the vehicle will be a load for the power network but it could be a generator too in certain conditions. This is not an easy situation but our project will get an applicable model.

VISION AND OPPORTUNITIES IN ELECTRIC VEHICLES

Jorge Sánchez / **ENDESA**

The introduction of the Electric Vehicles has opportunities and challenges to be solved for all the actors involved, utilities will play a relevant role. The new smart grid that is being developed over the world and also the increase of the renewable energies has to take advantages of these new resources in order to manage the grid with reliability, quality and safety. At the same time we have to be ready in the long term to support the connection of millions EV and try to minimise their impact on the grid. Endesa has a clear road map, supported by different projects, with different scopes and oriented to the short, medium and long term, that help us to be ready for the introduction of the EVs in terms of, infrastructure, normalization, impact, services and new business models.

1. Projects

The EV introduction represents a challenges and opportunities for Endesa. Aligned with our strategy Endesa has lunched several collaborative projects under the 7th FP and other national funding programs.

G4V: Under the work programme topics: ENERGY.2009.7.3.3: Strategic impact of the roll-out of electric and plugin hybrid vehicles on grid infrastructure.

The objective of G4V (Grid for vehicles) is to develop an analytical method to evaluate the impact of a large scale introduction of EV and PHEV on the grid infrastructure and a visionary "road map" for the year 2020 and beyond, taking into account all stakeholders and generating fast and openly available results.

The project will take into account of these effects and derive single recommendations on the different topics as well as a recommendation on a common system solution. Focus will be laid on favouring customer convenience and making use of the EV and PHEV as enablers for smart grid ideas. It also examines the widespread use of EV, the impact on society, and communication services needed and the challenges and opportunities that may arise. The consortium also involves major European utilities like Enel, RWE, EdF, EdP and Vatenfall.

Also universities such as Universitat Politècnica de Valencia (UPVLC) that leads WP7 ('System analysis and definition of the road map') and contribute to all working packages throughout the project, especially with regard to their core expertise in the area demand responsiveness and energy efficiency. This is a clear example of collaboration between Spanish institutions.

ELVIRE: Approved by the EC under the 'ICT for Safety and Energy Efficiency in Mobility' Work Program Topic. The project's purpose is to develop an effective system, which is able to neutralize the driver's "range anxiety" and encourage the customers to embark the fully electric road transport:

· An on-board electricity-status IC-unit (E-ICT), combined with its enhanced in-vehicle service layer.
· A customer oriented, open external service platform required for the optimum interaction between the user/vehicle, the data processing & service provision layer and an intelligent electricity infrastructure.
· An investigation of the most relevant scenarios and business cases.

This is a good opportunity for OEMs to develop new products aimed to news systems of propulsion for vehicles, cleaner and environmentally friendly, adapted to the user.

The main partners of this consortium are: Endesa, Continental, Better Place, Renault, Volkswagen, SAP.

CENIT VERDE: CDTI Research and development project focused in EVs. VERDE will study the reduction of the petrol dependency, CO_2 emissions reductions and promote the automotive industry and R&D in Spain.

This consortium is composed by companies that work in the all value chain of the EVs: car manufacturers (SEAT), Batteries (CEGASA), Electric motors (SIEMENS), recharging systems for the car, Infrastructure (ACS), and the generation and distribution of the energy (Endesa and Iberdrola).

SmartCity: The goals of the Project "Smart City", lead by Endesa in Malaga, are to develop a living and real demonstrator for the next generation smart grid. Within this new Grid, customers and Distribution companies cooperate for the achievement of the energy challenge. This is achieved by Increasing the usage of renewal energy sources, and by connecting the generators more near the final customers, just betting for a more rational and efficient consumption.

The WP12 is dedicated to V2G and its objectives are to deploy a small fleet of electric vehicles, convert it to V2G and manage their consumption and in generation. Then, vehicles are considered like special loads that can be controlled or like small generators with a specific capacity and availability. Also Smart charge will be developed.

2. Opportunities

Electric vehicles (BEV, PHEV) have the potential to contribute significantly to solving contemporary and future environmental and economic challenges of mobility. In addition, they constitute new driver for deployment smart grid technologies, new management algorithms and procedures and the all of methods for integration of low voltage Renewable Energy Sources (RES) into electricity networks.

Future mobility faces a number of serious challenges of environmental and economic nature which influence the development of alternatives to the conventional combustion engine and the mix of technologies for mobility.

On one hand, the concepts and technologies are driven by forces such as the security of energy supply, environmental effects and efforts to reduce CO_2 emissions as well as economic parameters, which in the case of Europe principally includes the dependency on oil imports and volatile oil prices.

On the other hand, the enforcement of alternative mobility concepts requires consumer acceptance, meaning that they have to deliver the same kind of ease-of-use, safety and reliability to the car owners at reasonable prices, and an acceptable level of investment in infrastructure and equipment.

We believe that real pilots and share critical information at the beginning will be necessary in the near future. So Endesa will take part in future pilots and demonstrators such the Green eMotion proposal, presented inside Greencars PPP, with the most relevant partners in Europe.

ELECTRICAL INFRASTRUCTURE: OPPORTUNITIES

José Corera / **Iberdrola**

1. Introduction

Electric Vehicles constitute a new electric load that will have a very little penetration in the beginning, but will increase in the following years. Although the total energy consumed will not be that high (and that is the beauty of EVs!), in the order of 2.000 Kwh/year/EV, the EVs will accept significantly high power charge levels, in the order of 40 kW each EV if we are considering 3-phase charge, 64 Amps: luckily, their flexibility as a load can make this affordable, as slow, night charge load will be the quite common (as it is in line with their user's habits).

The charge should be as simple as possible, so it is an enabler of EV and not a barrier. Over-specification of charge (the charge poles and the government of them) can make it more expensive, or more complex to the user.

In order to materialise the opportunities EVs offer, and advance with sound progress to their massive penetration (and avoid quick successes based on wrong models, which perhaps are possible thanks to incentives, but cannot be maintained in the future), some principles must be kept in mind:

· The electric system of today is perfectly capable to handle EVs, independently of the charge model they follow: the electric system has been continuously growing since it was created more than 100 years ago, always serving the new loads, with a very high reliability (better than 99,98%, as a illustrative value). The system is designed to grow and EV fast charge is not a problem
· The EV is flexible as a load: it does not demand electricity when it drives, but before it drives (which is obvious): the actual cost of that load has to be transferred transparently to the user, so he can decide when he charges the EV. The cost is the sum of the energy (referenced by pool prices, which reflect mainly central generation costs) and the network cost (Distribution and Transmission). These costs can guide users to perform the charge when it is more suitable for them.
· EV should not be discriminated, positively or negatively, in respect to other loads. And EVs should not be considered as an "incremental load": if the system peak increased due to penetration of EV, the EV should not be penalized for that alone, as the peak is composed of many different loads. The additional cost must be shared by all.
· EV (and other flexible loads) can take part of the SmartGrids mechanisms, and can even give a definite push to some of them, as we are talking of thousands, or millions, of similar loads with inherent intelligence (the EV as a whole, and more specifically the subset charger and battery) in compare with others (such as heat accumulators).
· Finally, provided that EV will have a gradual penetration, the activity should be focused where it is more effective, in these first years: EVs for urban/suburban use, considering as priority charge the one in private garages (particular or fleets).

2. Opportunities

The massive deployment of charging infrastructure in the following years will require a substantial industrial effort, and will allow the put in place advance mechanisms.

· Manufacturing, deployment and further O&M of

the infrastructure itself. This includes the manufacturing of sets and components (it will initially use standard components, but possibly due to the large number of units to be installed, ad-hoc equipment will be developed), and the development of the corresponding ICTs for its management, payment systems, etc. The effort will be significant, as we are talking of millions of units in the medium to long term.

· Developing advanced charging systems: conducting, AC systems (in board charger) will be the common way to charge, but fast DC (external charger) and inductive charging could at some time take a role.

· The integration of the charging infrastructure with the existing LV network and smart metering, that will be deployed in parallel. LV operation have been traditionally passive, but advanced functions can be incorporated, such as the introduction of dynamic power limits at the points of supply (which would depend on the remaining capacity of the network and the VE charge level and urgency to charge).

· The overall management of EVs as a stability mechanism of the Electric System: for instance, instead of the load shedding available today (performed through MV line shedding using frequency relays), EVs could be shed in an orderly manner and in different time scales: with little disturbance for the user, it could present a significant advantage to the system.

· Advance ICT (now reserved to high-end vehicles) could be introduced more easily in the EV, as it will have the label of "intelligent Vehicle": as examples, remote management of some functions (such as pre-heating), fast access to internet services, etc. could be deployed.

· All the above should be performed using standards at least at European level, so the economies of scale are achieved.

FP7 Green Cars and Leadership Opportunities

ECO-ELECTRO ROAD MOBILITY NATIONAL PROJECTS

The Ministry of Science and Innovation (www.micinn.es) is the Spanish public department responsible for the "National RTD Plan", the instrument which establishes the objectives and priorities for mid-term research, development and innovation policy, as defined in the Spanish Science Act. The aims of the National RTD Plan can be summarised as follows:

· To encourage the cooperation between scientific and technological agents
· To promote the industry technological capacity
· To favour research on targets of interest
· To optimise resources and investment in RTD
· To respond to strategic needs
· To promote the development of the national technology

The main funding subprograms for cooperative research foreseen by the National RTD Plan are the Unique Strategic Projects (PSE projects) and the Strategic National Technical Research Consortiums (CENIT projects).

From the perspective of this national framework, the new FP7 European Green Cars Initiative (EGCI) must be regarded as extremely relevant for Spain, in particular because the EGCI concentrates on a sector vital to the Spanish economy (the automotive sector) and because large capabilities in this field of R&D exist in Spain.

Spanish Technology Platforms, which also receive support through the National RTD Plan, as well as the above mentioned types of cooperative projects (PSE and CENIT projects), can play an important role in support of the European Green Cars Initiative, as they bring together public and private interests and resources in pursuit of joint initiatives and common goals.

In the following pages, a short description of the most relevant projects carried out during the last years in the field of eco-electro road transport and mobility with the support of the Ministry of Science and Innovation, including those financed by the Centre for the Development of Industrial Technology (CDTI, www.cdti.es), is presented.

In order to complete this landscape of national activities, a brief outline of the Spanish demonstration project on road electro-mobility financed by the Ministry of Industry, Tourism and Trade though the Spanish Institute for the Diversification and Savings of Energy (www.idae.es), the MOVELE Project, and other regional initiatives, are also included at the end of this section.

Note:
This section has been collated by the Subdirectorate General for Public-Private Collaboration Strategies (www.micinn.es) and the Centre for Development if Industrial Technology (CDTI, www.cdti.es) under the Ministry of Science and Innovation.

UNIQUE STRATEGIC PROJECTS

Singular and Strategic Projects - PSE, Ministry of Science And Innovation

ENHANCING COMPETITIVENESS OF THE BUSINESS THROUGH LOGISTICS AS A STRATEGIC FACTOR IN A GLOBAL ENVIRONMENT

Duration

2006 - 2010

Background

Today, in the highly competitive and global environment, Spanish industry finds difficulties to compete with other countries in production costs. A well managed and optimised logistic, became a relevant and differential value to our companies.

The increase of competitiveness of Spanish companies through logistics and integration of supply chain is the main goal of GLOBALOG.

Objectives

The project aim is the creation of new knowledge, methodologies and practices in the logistic area by using information and communication technologies to get more efficiency in the supply chains in a global marketplace. The first step of the project is to analyze the strengths and weaknesses of Spanish logistic and future trends.

Main challenges of GLOBALOG:
· To build a national map of future logistic opportunities and needs in the companies depending on their strategies.
· Definition of parameters of logistic competitiveness in Spain and investment priorities.
· Modernisation of supply chains by using efficiently the Information and Communication technologies.
· Implement new radiofrequency technologies (RFID) in the identification and monitoring processes of associated conditions of goods.
· Creation of a communication network among Atlantic and Mediterranean Spanish regions to favour the integration to main global logistics networks, especially with those with relevant economic activity in EU.
· Set-up of Integral Platform of technological services to provide solutions to specific problems.
· To favour the cooperation and technologic transfer between companies, Universities and Innovation Centres.
· To promote R&D initiatives to companies.
· Application of knowledge generated in the project to distribution and retailing scenarios, manufacturing scenario and intermodal scenario.

Programme organisation and transport policy context

It is an integrated project, as far as it considers research on basic techniques and methods to improve the efficiency of the supply chains and the transportation networks. It also includes the coordinated development of various sub-projects to address global optimization of all the mechanisms involved in the management of logistics processes of different types of supply chain:

SP1. - Technological development strategies for logistic competitiveness.
SP2. - Analysis and configuration of the supply chain in a strategic framework.
SP3. - Operative integration of the supply chain

SP4 - Identification, monitoring and traceability of the supply chain
SP5 - Logistic Infrastructures: Assessment of the Atlantic-Mediterranean networks
SP6 - Logistics and environmental sustainability
SP7 - Integrated Pilot
SP8 - Dissemination and technology transfer

Programme stakeholders

All sectors where logistic is present, specially, Manufacturers, Distributors, Logistic operators, Transport companies, etc.

Map of Participants

Thirty nine entities being part of this public-private cooperation:
· Technology Centres: CIEMAT, CIGIP-UPV, CTL, ECOLEC, EUVE, FEPORTS, VALENCIAPORT, ICIL, ROBOTIKER, ZLC, IE, IET, ITA, ITENE.
· Companies: ICE CREAM FACTORY COMAKER, S.A., KERABER, S.A., NEXPOINT SOLUTIONS, S.L., TRANSFRIGO CANARIAS, S.A., ULMA MANUTENCIÓN, S.COOP.
· Public R&D Centres: Cantabria Univ., Oviedo Univ., Zaragoza, Univ., La Coruña Univ.
· Collaborators: AR SISTEMAS, S.A., CONSUM Coop., CHINA SHIPPING SPAIN AGENCY, S.L., DOCKS COMERCIALES DE VALENCIA, S.A., EBHI, S.A. ECHEVARRIA CONSTRUCCIONES MECANICAS, S.A., GEFCO ESPAÑA, S.A. HAPAG-LLOYD SPAIN, S.L., ITESAL, S.L., LEROY MERLIN ESPAÑA, S.L.U., MARS ESPAÑA INC Y CIA FOOD SRC, NORBERT DENTRESSANGLE GERPOSA, S.A., RAMINATRANS, S.L., ZONA DE ACTIVIDADES LOGISTICAS DE AUSTURIAS ZALIA, AUTORIDAD PORTUARIA DE GIJON, PLATAFORMA LOGISTICA PLAZA.

Leading institution

ITENE

Type of funding

Project promoted and financed by the Science and Innovation Ministry in the National R&D&I Plan (2008-2011) framework; Shared cost funding between public and private cooperation agreements. Support Subprogram for Singular and Strategic Projects (PSE).

Programme funding arrangements and funding conditions

General funding conditions for Singular and Strategic Projects (PSE): Funding is provided for Universities, Agencies and Public Research and Development Centres (OPIs), Institutes, Industry clusters and associations. Different financing rates are applied depending on of the annual resources available, type of institution considered and type of financing subject.

Yearly calls allow the renewal of the Project both financial and participants involved, which it allows the Project to adjust partial budgets of participants in the different sub-projects according to evolution of the PSE. Several years of financing are also considered.

Project Total Budget

8.3 M€

Contact / Additional Information

http://www.pse-globalog.com/

INTELLIGENT CABIN

Duration

2007 - 2011

Background

All innovations technologies and systems able to improve transport safety are of main interest to the PEIT. This project intends to use smart technologies advantages to enhance the interactions between vehicle cabin and driver addressing safety.

Objectives

The purpose of this project is two-fold: to design a vehicle cabin fitted with intelligent technologies, enabling us to study the driver's behaviour (by revealing good habits as opposed to hazardous behaviour in the context of safe driving), and to analyse the parameters characterizing both the vehicle and the driver during the moments prior to an accident.

Programme organisation and transport policy context

The project is organised in the following subprojects:

SP1 -HITO- Development of a Technological System Simulated which will be used to optimise the reliability and ergonomics of the equipments on board providing information to the driver. This project aims to guarantee safe driving by implementing current and future information technologies, making sure they are valid and can be used simultaneously and compatibly.
SP2 -ALERTA: Driver's Intelligent Supervisor System. This project develops a system which warns the driver when his alertness level drops. Its aim is to detect the driver's potential state of drowsiness or his inadequate behaviour during driving.
SP3 -eSEÑAL: Signal and Traffic Information Intelligent Systems. This intelligent signalling system tells the driver about traffic signs, making it unnecessary for him to see them or interpret them. It also provides information on the condition of the roads, such as accidents, road works or traffic congestion.
SP4 -ESTABLE: System to Monitor the Stability of INDUSTRIAL vehicles. This project will analyze the dynamic stability of heavy vehicles carrying various loads, alerting the driver about potential overturns during driving. It is especially useful for the transportation of hazardous goods.
SP5 -REGISTRA: Accident Reconstruction System Based on the stored data about vehicle, driver and driving environment. This project contemplates the design of a recording device which will enable us to recreate accidents by storing data related to the vehicle, the driver's condition and the driving environment.
SP7 -ASISTE. Platform for the Integration of Intelligent Transport Systems. This platform will integrate the information regarding the condition of the vehicle with all on-board information devices and driver assistance devices.
SP8 -CONECTA CABINTEC. Horizontal action aimed at disseminating and following-up the global project, regarding both its technical and financial aspects.

Map of Participants

Promote by the Ministry of Science and Innovation, the entities involved are the following:
· Technologie Centres: CEIT, CTAG, ESM.
· Companies: IDIADA, LEAR, Lander, Signaletics, ADT(ALSA).
· Public R&D Centres: Alcalá de Henares Univ., Juan Carlos I Univ., Valencia Univ., TECNUN (University of Navarra), UPM-INSIA.
· Associations: Sernauto.

Leading institution

CEIT

Type of funding

Shared cost funding between public and private cooperation agreements. Framework of the National R&D&I Plan (2008-2011); Support Subprogram for Unique Strategic Projects (PSE).

Programme funding arrangements and funding conditions

General funding conditions for Unique Strategic Projects (PSE): Funding is provides for Universities, Agencies and Public Research and Development Centres (OPIs), Institutes, Industry clusters and associations. Different financing rates are applied as a function of the annual resources available, kind of institution considered and kind of financing subject.

Yearly calls allow the renewal of the Project both financial and participants involved, which allows the Project to adjust partial budgets of participants in the different sub-projects according to stage and evolution of the PSE. Several years of financing are also considered.

Project Total Budget

8.9 M€

Contact / Additional Information

http://www.cabintec.net/

LIGHTCARBONCARS

Duration

2007 - 2011

Background

Automotive industry is one of the most innovative manufacturing sectors. One of the objectives of this industry is weight reduction in order to reduce energy consummation and CO_2 production. The use of carbon composite materials would help designers to solve those problems. In 2004, Spain produced near 3 million vehicles and their industry suppliers produced components for national and exportation. Spanish automotive industry suppose more than 25% of the Spanish exportations and more than two million people works in this industry. Then, competitiveness enhancement between components enterprises it is clearly of the interest for this sector and they must to be ready for composite material components production. Also, carbon fibre production by national industry will be strategic not only for automotive but also for railways, naval, wind power and civil engineering.

Objectives

The Project aims to reduce the environmental impact of cars by structural lighten based on low cost carbon fibber without compromising safety and comfort.

Programme organisation and transport policy context

Programme organisation and transport policy context
This PSE is organised in the following Subprojects:

SP1.- CARBONCHEAP: Development of low cost carbon fibre composites.
SP2.- AUTOPROCESS: Development of new manufacturing composite technologies to produce structural automotive components.
SP3.- LIGHTDESIGN: Development of numerical calculations for light weighting, security and comfort multi objective optimisation.
SP4.- REFIC: Life-Cycle Assessment.
SP5.- TEST: Design, manufacture and testing of prototypes.
SP6.- VIGIA, Project Management, surveillance technology and Diffusion.

Programme stakeholders

The automotive sector in general and the components and supplies in particular. Also, railways, naval, wind power and civil engineering industries.

Map of Participants

Promote by the Ministry of Science and Innovation, the entities involved are the following:
· Technology Centres: GAIKER, CTAG, FIDAMC,TEAMS
· Companies: PEUGEOT CITROËN AUTOMÓVILES ESPAÑA, S.A.,FPK. S.A., CONDEPOLS, REPSOL YPF, EASY Industrial Solutions, S.A., SERNAUTO, CEI-MONDRAGON, VFUS Armonia Galicia S.L.
· Public R&D Centres: UPM-ETSIA, UPC-CCP, JAUME I Univ., CORUÑA Univ., INCAR-CSIC, OVIEDO Univ., AICIA (SEVILLA Univ.).

Leading institution

Polytechnic School of Mondragón University

Type of funding

Shared cost funding between public and private cooperation agreements. Framework of the National R&D&I Plan (2008-2011); Support Subprogram for Unique Strategic Projects (PSE).

Programme funding arrangements and funding conditions

General funding conditions for Unique Strategic Projects (PSE): Funding is provides for Universities,

Agencies and Public Research and Development Centres (OPIs), Institutes, Industry clusters and associations. Different financing rates are applied as a function of the annual resources available, kind of institution considered and kind of financing subject. Yearly calls allow the renewal of the Project both financial and participants involved, which allows the Project to adjust partial budgets of participants in the different sub-projects according to stage and evolution of the PSE. Several years of financing are also considered.

Project Total Budget

13.7 M€

Contact / Additional Information

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INTEGRAUTO

Duration

2008 - 2011

Background

The automotive sector is moving forward incorporating new lighter materials in the novel car models, more safe and with new capacities and advanced properties. These new materials need of innovative processing routes tailored to the function.

Objectives

The objective of the project is to integrate new technologies being developed in universities and technological centres of the consortium to create products with a higher added value together with automotive market companies.

Programme organisation and transport policy context

For the definition of the specific objectives of the project, it has been chosen as a demonstrator or Cockpit (or supported Module), manufactured by a company which is part of the project, integrating different functional parts. At present, manufacture of this module requires many tasks with a lot of hand work associated: on a metal bracket obtained by deformation and many welds are subjected, usually by screws, modules (mostly plastic), such as the vents, the covers of air bags, etc. Thus, there is much room for improvement in design and weight reduction using new materials and technologies.

The PSE is organised in the following Subprojects:

SP1 - METROPOL Innovation of the injection process for hybrid metal/polymer automotive components.
SP2 - LIGHTFORM. Analysis and Development of Near Net Shape technologies for the manufacture of light alloy structural components.
SP3 - T-FORM. Development and application of innovative forming and union techniques in the manufacture of tubular structural components for the automotive sector.
SP4 - INFASOL. Integration, manufacturing and union of new high elastic limit materials with surface properties optimized.
SP5 - MANAGEMENT. Technical coordination, project management and dissemination.

Programme stakeholders

The components and supplies of the automotive sector in general.

Map of Participants

Promoted by the Ministry of Science and Innovation, the entities involved are the following:
· Technology Centres: LORTEC, TECNALIA-Labein Foundation, CTM, Azterlan, Centre Catalá del Plástic.
· Companies: Alfa Microfusion, Cie Automotive, Industria Puigjaner, Loire Safe, TTCarreras, Volkswagen (EPO).
· Public R&D centres, universities and associations: CENIM-CSIC, UPC, MU, SERNAUTO, CIC marGUNE.

Leading institution

Mondragon Goi Eskola Politeknikoa - University of Mondragon

Type of funding

Shared cost funding making use of public-private cooperation agreements. Framework of the National R&D&I Plan (2008-2011); Support Subprogram for Unique Strategic Projects (PSE).

Programme funding arrangements and funding conditions

General funding conditions for Unique Strategic Projects (PSE): Funding is provides for Universities,

Agencies and Public Research and Development Centres (OPIs), Institutes, Industry clusters and associations. Different financing rates are applied as a function of the annual resources available, kind of institution considered and kind of financing subject.

Yearly calls allow the renewal of the Project both related to financial support and participants involved, which allows the Project to adjust partial budgets of participants in the different sub-projects according to stage and evolution of the PSE. Several years of financing are also considered.

Project Total Budget

7.7 M€

Contact / Additional Information

http://www.mondragon.edu/integrAuto

CITYELEC

Duration

2009 - 2012

Background

Over half of greenhouse gas emissions are created in and by cities, and 80% of the population lives and works in cities. Therefore a large portion of the population limits their daily travel to short/medium distances of less than 80 kilometres, often within urban agglomerations. In order to achieve the goal of a future sustainable urban transport system, new concepts and technologies need to be developed to increase the efficiency of the vehicles for both individual and public mobility. The electrification of the urban transport taking into account the infrastructure and the vehicle, offers a great opportunity to reduce pollution, green house gas emissions and traffic congestion, leading to a sustainable transport system.

Objectives

Cityelec project is focused on the key elements both in vehicle and infrastructure for new concepts of electrified mobility in urban environment, and the objectives are the following:

· Search solutions for the introduction of new mobility systems in urban environment.
· Research on electric powertrain systems and the dedicated infrastructure associated with the electric vehicles.
· Demonstrate the impact of the research with a field test in two Spanish cities (involving electric vehicles and the related infrastructure).
· Generate knowledge and industrial property in the field of the vehicle electrification.

Main challenges of CITYELEC

The main challenges are related to the definition of the CITYELEC system, suited to fulfil actual and future urban transport needing, that will allow personal mobility with minimal carbon print in the near future, by means of:
· Development of a fleet of light electric vehicles (scooters, city cars and small buses).
· Development of infrastructure elements: Urban transformer station with energy storage capability, local urban energy generators (photovoltaic, windmill, others, …).
· New concepts for management of electrical power from renewable sources on the grid, focused on maximum storage of renewable energy for mobility.

Cityelec project will end performing physical test in two cities (San Sebastian and Zaragoza) with vehicles and infrastructure, validating the research and development.

Programme organisation and transport policy context

This PSE is organised in the following subprojects:
SP1: Cityelec system architecture specification
SP2: Infrastructure integration in the urban environment
SP3: Distributed recharge point system
SP4: Electric grid new models
SP5: Battery pack energy management and distribution
SP6: Vehicle electric powertrain new concepts
SP7: Powertrain power and energy optimum management
SP8: Cityelec field test and dissemination

Map of Participants

Promoted by the Ministry of Science and Innovation, the entities involved are the following:
· Technology Centres: AITIIP, CIDAUT, INASMET, LABEIN, ROBOTIKER.
· Companies: CTSS, EXIDE, INFRANOR, IPS, LABEIN, LEAR, LUMA, MASER, ORMAZABAL, REIVAJ, RÜCKER, SAFT, SERNAUTO, HC ENERGÍA, TEMPER,

UNIÓN FENOSA, UGO, USYSCOM, VALEO, ZIV I+D, ZIV MEDIDA, ZYTEL.
· Public R&D Centres: IAI-CSIC, INTA, UEX (UNIVERSITY), UPC (UNIVERSITY), UPV/EHU (UNIVERSITY).
· Public Enterprises: EVE, ITC, SAN SEBASTIAN (CITY COUNCIL), ZARAGOZA (CITY COUNCIL).

Leading institution

ROBOTIKER TECNALIA

Type of funding

Shared cost funding between public and private cooperation agreements. Framework of the National R&D&I Plan (2009-2012); Support Subprogram for Unique Strategic Projects (PSE).

Programme funding arrangements and funding conditions

General funding conditions for Unique Strategic Projects (PSE): Funding is provides for Universities, Agencies and Public Research and Development Centres (OPIs), Institutes, Industry clusters and associations. Different financing rates are applied as a function of the annual resources available, kind of institution considered and kind of financing subject. Yearly calls allow the renewal of the Project both financial and participants involved, which allows the Project to adjust partial budgets of participants in the different sub-projects according to stage and evolution of the PSE. Several years of financing are also considered.

Project Total Budget

19.0 M€.

Contact / Additional Information

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TECMUSA	TECHNOLOGIES FOR SUSTAINABLE AND ACCESSIBLE URBAN MOBILITY

Duration

2009 - 2012

Background

Creating a new urban mobility culture.

The challenge facing urban areas in the context of sustainable development is immense: that of reconciling the economic development of towns and cities and accessibility with improving the quality of life and with environmental protection, on the other.

In order to address these issues, which have many and varied implications, a joint effort will make it possible to encourage the search for innovative and ambitious urban transport solutions with a view to arriving at a situation where towns and cities are less polluted and more accessible and where traffic within them flows more freely.

Working together, we must seek ways of achieving better urban and suburban mobility, sustainable mo-bility, and mobility for all the inhabitants of Europe, while allowing economic operators to play their role in our towns and cities. COM(2007) 551 final.

Objectives

Develop, test and integrate into platforms of electric and hybrid vehicles
· A set of technologies associated with these vehicles,
· Next-generation fuels,
· Electricity,
· Fleet management and information and communication systems,

To achieve urban transport of people and goods effective, energy efficiently, environmentally friendly and accessible to all users.

Main challenges

Among the principal technological challenges to achieve sustainable and accessible urban mobility of people and goods are the development, testing and integration, in electric and hybrid vehicles platforms (bus, truck and light commercial vehicle), of a set of technologies associated with these vehicles, new fuels generation, electricity supply, energy storage systems, more efficient.

Programme organisation and transport policy context

Programme organisation and transport policy context
TECMUSA development involves: 10 Subprojects

SP01: Analysis of requirements and general specifications
SP02: Structures and bodies
SP03: Storage electric power load
SP04: Electric power train
SP05: Advanced SAE
SP06: Customer information
SP07: Sustainable logistics
SP08: Technology integration. Prototypes
SP09: Testing and evaluation
SP10: Coordination and preparation for "Green Cars"

Map of Participants

Promoted by the Ministry of Science and Innovation, the entities involved are the following:
· Companies: ALSA, AVIA INGENIERÍA, EMT MADRID, AZKAR, CASTROSUA, BOYACA, CEMUSA, FCC, SEUR, CITET, SAFT-BATERIAS, ENDESA, GRUPO ETRA, IVECO, SIEMENS.

· Public R&D Centres:
CEI UPM - Centro de Electrónica Industrial and GME UPM - Grupo de máquinas eléctricas belonging to "Escuela Tecnica Superior de Ingenieros Industriales de la UPM".

Six groups belonging to "Escuela Tecnica Superior de Ingenieros de Telecomunicaciones de la UPM":

· GPDS UPM - Grupo de Procesado de Datos y Simulación
· GATV UPM - Grupo de Aplicación de Telecomunicaciones Visuales
· GTI UPM - Grupo de Tratamiento de Imágenes
· GTH UPM - Grupo de Tecnología del habla
· RSC UPM - Redes y Servicios de Comunicaciones
· RSTI UPM - Redes y Servicios de Telecomunicación e Internet
SIMCA UPM - Grupo de Sistemas Inteligentes para la Movilidad y Comunicación Accesible, belonging to "Escuela de Informática de la UPM".
· Public Enterprise: Empresa Municipal de Transportes de Madrid (EMT)

Leading institution

University Institute for Automobile Research. INSIA-UPM. UNIVERSIDAD POLITECNICA DE MADRID (UPM)

Type of funding

Shared cost funding between public and private cooperation agreements. Framework of the National R&D&I Plan (2009-2012); Support Subprogram for Unique Strategic Projects (PSE).

Programme funding arrangements and funding conditions

General funding conditions for Unique Strategic Projects (PSE): Funding is provides for Universities, Agencies and Public Research and Development Centres (OPIs), Institutes, Industry clusters and associations. Different financing rates are applied as a function of the annual resources available, kind of institution considered and kind of financing subject.

Yearly calls allow the renewal of the Project both financial and participants involved, which allows the Project to adjust partial budgets of participants in the different sub-projects according to stage and evolution of the PSE. Several years of financing are also considered.

Project Total Budget

10,5 M€.

Contact / Additional Information

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www.tecmusa.es

STRATEGIC NATIONAL TECHNICAL RESEARCH CONSORTIUMS

Consorcios Estratégicos Nacionales en Investigación Técnica - CENIT, Centre for the Development of Industrial Technology, CDTI. Ministry of Science and Innovation

REVELACION	R&D OF TECHNOLOGY FOR A NEW GENERATION OF COATINGS FOR AUTOMOTIVE

Duration

2006 - 2009

Summary

This project intends to get a new generation of coatings and trimmed for interior of vehicles, different that the existing at present. The joint work of two industrial sectors: textile and automotive components, is required. With this aim, the project is focused on materials technology, technology manufacturing processes and the quality perceived by the senses, safety, ergonomics and comfort.

Project Total Budget

26,5 Million €

Leading Institution

GRUPO ANTOLIN-INGENIERIA, S.A.

Participants

Companies
SONATEX 2000 SL
PABLO FARRAS FAUS SA
TROCELLEN IBERICA SA
ANGLES TEXTIL, S.A.
INDUSTRIAS MURTRA, S.A.
COMPAÑIA ESPAÑOLA DEL LAMINADO RECYTEX SA
ANTECUIR SL 2,951,552
FIELTROS Y TEJIDOS INDUSTRIALES, S.L.
GRUPO ANTOLIN-INGENIERIA, S.A.

Public and Private Research Centres
CENTRO TECNOLÓGICO LEITAT
INSTITUTO TECNOLÓGICO TEXTIL (AITEX)
UNIVERSIDAD DE BURGOS
FUNDACION CIDAUT

TIMI	SMART INTERMODAL TRANSPORTATION OF GOODS

Duration

2006 - 2009

Project Total Budget

23,8 Million €

Summary

During the last years a considerable increase in the transport of goods, mostly performed by road in Europe, has been observed. In this context and for a sustainable development, the European Commission and various national and regional governments have imposed as a necessity and priority to encourage the use of intermodal transport.

The biggest problem of intermodality is the need for a more effective organization among the different modes of transport. Besides the standardization and unification in legislation in the different states, technological innovation can help and benefit the intermodal transport offering tools to facilitate and promote their use.

Aspects such as the integration of means of transport, monitoring and tracking of vehicles and goods, the potential of services that the new satellite navigation system Galileo will offer, the identification and tracking system of vessels LRIT great distance, or the European system of traffic management ERTMS rail, emerge as relevant topics for this sector. This proposal brings together the major players in the Spanish transport (including rail and sea) with technology service providers, associations and other relevant logistics and transport with the aim of developing methodologies, technologies and knowledge for building new specific generation of intelligent systems for intermodal transport of goods that meet the needs and medium term scenarios, taking into account the needs of sustainable development. The project aligns well with the thematic priority "Sustainable Mobility" in the CENIT Program, with the objectives set out in the Seventh Framework Program, and the different R&D national and regional plans aiming to enhance research in the areas of CIT, Transport and Intermodality.

Leading Institution

ATOS ORIGIN SOCIEDAD ANONIMA ESPAÑOLA

Participants

Companies
FAGOR ELECTRONICA, S.COOP.
COMPAÑIA TRASMEDITERRANEA, S.A.
TB-SOLUTIONS ADVANCED TECHNOLOGIES, S.L.
ATOS ORIGIN SOCIEDAD ANONIMA ESPAÑOLA
INFOPORT VALENCIA, S.A. 1,615,445
INSTITUTO IBERMATICA DE INNOVACION S.L
IBERMATICA, S.A.
ETRA INVESTIGACION Y DESARROLLO, S.A.
INGETEAM INDUSTRY SOCIEDAD ANONIMA
SERVIMAPS SIG SL

Public and Private Research Centres
UNIVERSIDAD DE CANTABRIA
UNIVERSIDAD PUBLICA DE NAVARRA
FUNDACION ROBOTIKER
UNIVERSIDAD DE MURCIA
FUNDACIÓN DE LA COMUNIDAD VALENCIANA PARA LA INVESTIGACIÓN
UNIVERSIDAD CARLOS III DE MADRID
MONDRAGON GOI ESKOLA POLITEKNIKOA S. COOP.
FUNDACIÓN CENTRO TECNOLÓGICO EN LOGÍSTICA INTEGRAL CANTABRIA
FUNDACION GENERAL DE LA UNIVERSIDAD DE VALLADOLID
FUNDACIÓN UNIVERSIDADE DA CORUÑA
UNIVERSIDAD PABLO DE OLAVIDE
INSTITUTO TECNOLÓGICO DEL EMBALAJE, TRANSPORTE Y LOGISTICA
UNIVERSIDAD DEL PAÍS VASCO
CENTRE TECNOLOGIC DE TELECOMUNICACIONS DE CATALUNYA

MARTA	MOBILITY AND AUTOMOTIVE WITH ADVANCED TRANSPORT NETWORKS

Duration

2007 - 2010

Summary

The main aim of this project is to establish the scientific and technological basis for the future mobility, letting Spanish ITS sector to answer challenges of safety, efficiency and sustainability.

Project Total Budget

35 Million €

Leading Institution

FICOSA INTERNATIONAL, S.A.

Participants

Companies
AGNITIO SL
AT4 WIRELESS, SA
GMV SOLUCIONES GLOBALES INTERNET S.A.
GRUPO MECANICA DEL VUELO SISTEMAS SOCIEDAD AN
TSS TRANSPORT SIMULATION SYSTEMS SL
FICOSA INTERNATIONAL- GRUPO MECANICA DEL VUEL
ANALISI TECNOLOGICA INNOVADORA PER A PROCESSO
IDOM INGENIERIA Y ARQUITECTURA SA
CENTRO TECNICO DE SEAT SA
SOUTHWING, S.L.
ADVANCED AUTOMOTIVE ANTENNAS, S.L.
FICOMIRRORS, S.A.
ETRA INVESTIGACION Y DESARROLLO, S.A.
APIF MOVIQUITY, S.A.
TELEFONICA INVESTIGACION Y DESARROLLO, S.A.
OBRAS PUBLICAS Y TELECOMUNICACIONES DE NAVARRA
FICOSA INTERNATIONAL, S.A.
FICO TRIAD, S.A.

Public and Private Research Centres
UNIVERSIDAD DE VALLADOLID
CENTRO MULTIDISCIPLINAR DE INNOVACIÓN Y TECNOLOGÍA DE NAVARR
FUNDACIÓ BOSCH I GIMPERA
UNIVERSIDAD AUTONOMA DE MADRID-AREA DE TRATAMIENTO DE VOZ
UNIVERSIDAD POLITECNICA DE CATALUÑA-TECNOLOGIA DEL HABLA
UNIVERSIDAD POLITECNICA DE VALENCIA-INSTITUTO DE TPTE Y TERR
INSTITUTO DE BIOMECÁNICA DE VALENCIA
UNIVERSIDAD POLITÉCNICA DE VALENCIA-INSTITUTO DE TELECOMUNICACIONES
CENTRO PARA EL DESARROLLO DE LAS TELECOMUNICACIONES DE CASTILLA LEON
UNIVERSIDAD POLITECNICA DE MADRID
CENTRO DE ESTUDIOS E INVESTIGACIONES TECNICAS DE GUIPUZCOA
UNIVERSIDAD POLITECNICA DE CATALUÑA-GRUPO PROCESADO Y SISTEMAS
INSTITUTO DE AUTOMATICA INDUSTRIAL-CSIC
UNIVERSIDAD POLITÉCNICA DE VALENCIA- INSTITUTO DE LAS APLICA
UNIVERSIDAD POLITECNICA DE CATALUÑA-GRUPO DE INV. PDTO ESTADO
CENTRO ANDALUZ DE INNOVACIÓN Y TECNOLOGÍAS DE LA INFORMACIÓN
UNIVERSIDAD DE MURCIA. FUNDACION ROBOTIKER
UNIVERSIDAD POLITECNICA DE MADRID-DPTO ICS GRUPO DE TRABAJO.
FUNDACION CIDAUT
UNIVERSIDAD ALCALA DE HENARES-DPTO. ELECTRONICA

ECOTRANS	ENVIRONMENTAL TECHNLOGIES FOR URBAN TRANSPORT

Duration

2008 - 20011

Summary

The Project's overall objective address the challenges of urban public transport through the R&D of technologies needed for making public transport more attractive for passengers as well as energy more efficient. These new technologies will allow public transport emits less CO_2 and also improve the market share respect private vehicles, through an upper comfort and reliability of service guaranteed.

Project Total Budget

23,8 Million €

Leading Institution

CONSTRUCCIONES Y AUXILIARES DE FERROCARRILES, S.A.

Participants

Companies
CONSTRUCCIONES ELECTROMECANICAS LETAG SA
ELYTT ENERGY SL
GREEN POWER TECHNOLOGIES SL
TRANSPORTES DE BARCELONA, S.A.
NEUREUS TECHNOLOGIES SL
CARROCERA CASTROSUA SA
ADMINISTRADOR DE INFRAESTRUCTURAS FERROVIARIA
INTERNACIONAL HISPACOLD SA.
TRAINELEC, S.L.
METRO DE MADRID, S.A.
NUEVAS ESTRATEGIAS DE MANTENIMIENTO, S.L.
TRAINTIC SL
ACUMENER INVESTIGACION Y DESARROLLO S.L.
HYNERGREEN TECHNOLOGIES, S.A.
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, S
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES IN
IDOM ZARAGOZA SA
ARIÑO DUGLASS, S.A.

Public and Private Research Centres
CENTRO DE ESTUDIOS E INVESTIGACIONES TÉCNICAS DE GIPUZKOA
UNIVERSIDAD DEL PAIS VASCO
INSTITUTO DE TECNOLOGÍA QUÍMICA DE LA UNIVERSIDAD POLITÉCNICA
UNIVERSIDAD POLITÉCNICA DE VALENCIA
IKERLAN
UNIVERSIDAD DE JAEN
FUNDACIÓN TEKNIKER
FUNDACIÓN FATRONIK
UNIVERSIDAD DE SANTIAGO DE COMPOSTELA
INVESTIGACIÓN ASOCIACIÓN DE INVESTIGACIÓN Y COOPERACIÓN INDU
UNIVERSIDAD DE OVIEDO
CENTRE D'INNOVACIÓ DEL TRANSPORT
INVESTIGACIÓN INSTITUTO TECNOLÓGICO DE ARAGÓN
UNIVERSIDAD DE ZARAGOZA
CENTRO DE ESTUDIOS E INVESTIGACIONES TÉCNICAS DE GIPUZKOA
MONDRAGON GOI ESKOLA POLITEKNIKOA
INVESTIGACIÓN FUNDACIÓN ROBOTIKER
FUNDACIÓN PARA LA PROMOCIÓN DE LA INNOVACIÓN, INVESTIGACIÓN
FUNDACIÓN CIDAUT
CENTRO DE ESTUDIOS E INVESTIGACIONES TÉCNICAS DE GIPUZKOA
IKERLAN, S. COOP.
AGENCIA DE ECOLOGIA URBANA
UNIVERSIDAD DE ZARAGOZA
FUNDACIÓN PARA EL FOMENTO DE LA INNOVACIÓN INDUSTRIAL-UNIV
UNIVERSIDAD CARLOS III DE MADRID

OASIS	SAFE, INTELLIGENT AND SUSTAINABLE HIGHWAYS OPERATION

Duration

2008 - 2011

Summary

The main target of OASIS project (Safe, Intelligent and Sustainable highways operation) is the definition of the highway of the future, that is, the one able to operate at clearly improved levels of security, service for the user and sustainability.

This project will tackle the highway conception from a global perspective, in such a way that all the stages of its lifecycle are taken into account, paying special attention to the exploitation phase due to its greater relevance.

Project Total Budget

30,5 Million €

Leading Institution

PROYECTO CENIT-OASIS, A.I.E.

Participants

Companies

SOCIEDAD IBERICA DE CONSTRUCCIONES ELECTRICAS
OBRASCON HUARTE LAIN, S.A.
CPS INGENIEROS OBRA CIVIL Y MEDIO AMBIENTE SL
PROYECTO CENIT-OASIS, A.I.E
GRUPO MECANICA DEL VUELO SISTEMAS SOCIEDAD AN
DRAGADOS SOCIEDAD ANONIMA
GEOTECNIA Y CIMIENTOS, S.A.
ASFALTOS AUGUSTA, SL
IRIDIUM CONCESIONES DE INFRAESTRUCTURAS SA
ASOCIACION ESPAÑOLA DE LA CARRETERA
INDRA SISTEMAS, S.A.
P Y G ESTRUCTURAS AMBIENTALES SL
ABERTIS AUTOPISTAS ESPAÑA, S.A.
OHL CONCESIONES SL
SIEGRIST Y MORENO SL
TORRE DE COMARES ARQUITECTOS SL
HIDROFERSA FABRICA DE CHAVIN SL

Public and Private Research Centres

FUNDACIÓN CARTIF
UNIVERSIDAD POLITÉCNICA DE MADRID.
INSTITUTO TECNOLÓGICO DE ROCAS ORNAMENTALES Y MATERIALES
FUNDACIÓN PARA EL PROGRESO DEL SOFT COMPUTING
UNIVERSITAT DE VALENCIA
CENTRE D'INNOVACIÓ DEL TRANSPORT
UNIVERSIDAD AUTÓNOMA DE MADRID
FUNDACIÓN CIDAUT
UNIVERSIDAD DE MURCIA
UPM TRANSYT
UNIVERSIDAD POLITÉCNICA DE CATALUNYA
UNIVERSIDAD DE CANTABRIA
UNIVERSIDAD POLITÉCNICA DE MADRID. ETSI AGRÓNOMOS
CENTRO DE ESTUDIOS Y EXPERIMENTACIÓN DE OBRAS PÚBLICA
UNIVERSIDAD DE VALLADOLID

MAGNO	MAGNESIUM NEW TECHNOLOGICAL OPPORTUNITIES

Duration

2008 - 2011

Summary

The processing industry of Magnesium in Spain it is not too important, although the demand and its potential applications are very high. The reasons of this situation lie in the handling difficulties with this kind of material in its different states and the inadequacy of the technologies based on current knowledge and experience with other lightweight alloys. An analysis of the state of the art in Europe concludes that the situation is not so different. Therefore, there are important opportunities around the field of Magnesium, demanding important changes to the industry and a major innovation effort in order to lead the sector in Europe.

The MAGNO project will be implemented by an industry consortium, supported by research groups and Technological Centres in the field of light alloy and magnesium, and seeks to give impetus to the sector of Magnesium in Spain through a program of high-technology investments, seeking to place Spain at the top of a future market trend upward, and additionally to consolidate the Spanish consortium through competitiveness based on technology and knowledge in accordance with the European R&D FP VII.

Project Total Budget

30,7 Million €

Leading Institution

GRUPO ANTOLIN-INGENIERIA, S.A.

Participants

Companies
GRUPO ANTOLIN-INGENIERIA, S.A.
AKABA SOCIEDAD ANONIMA
BOSTLAN, S.A.
COMERCIAL NICEM EXINTE, S.A.
ECOFOND S.A.
FAGOR ELECTRONICA, S.COOP.
GIESSEREI INSTANDSETZUNG SERVICE 2003
INDUSTRIAS LEBARIO, S.L.
INGENIERIA Y SERVICIOS TECNICOS, S.A.
MUGAPE, S.A.
PRENSAS Y TRANSFORMACIONES, S.A
REYDESA RECYCLING, S.A.
TRATAMIENTOS TERMICOS CARRERAS, S.A.
TRATAMIENTOS TERMICOS TTT, S.A.

Public and Private Research Centres
FUNDACION INASMET
FUNDACIÓN FATRONIK
IKERLAN, S. COOP.
UNIVERSIDAD POLITÉCNICA DE MADRID
FUNDACIÓN IMDEA MATERIALES
UNIVERSIDAD DE ALICANTE
UNIVERSIDAD DE BURGOS
UNIVERSIDAD POLITÉCNICA DE CATALUÑA
UNIVERSIDAD COMPLUTENSE MADRID
FUNDACIÓN FATRONIK
FUNDACIÓN PARA LA INVESTIGACIÓN Y DESARROLLO EN TRANSPORTE Y ENERGÍA
CENTRO INTERNACIONAL DE MÉTODOS NUMÉRICOS EN LA INGENIERÍA
FUNDACIÓN CENTRO TECNOLÓGICO DE MIRANDA DE EBRO
UNIVERSIDAD ANTONIO DE NEBRIJA
CENTRO NACIONAL DE INVESTIGACIONES METALÚRGICAS DEL CSIC
FUNDACIÓN CENTRO TECNOLÓGICO DE COMPONENTES
FUNDACIÓN CIDETEC
FUNDACION INATEC (INNOVACION AMBIENTAL Y TECNOLOGICA)

ADAPTA	INTELLIGENT AND ADAPTIVE AUTOMOTIVE SIDE PROTECTION FUNCTIONS TECHNOLOGIES

Duration

2008 - 2011

Summary

The overall objective of the project is to meet challenges outstanding research technology field of the lateral advanced safety vehicle.

Project Total Budget

26,7 Million €

Leading Institution

DALPHI METAL ESPAÑA, S.A

Participants

Companies
DALPHI METAL ESPAÑA, S.A
AUTOTECH ENGINEERING AGRUPACION DE INTERES ECONOMICO
CENTRO TECNICO DE SEAT
DEIMOS APLICACIONES TECNOLOGICAS SL
GRUPO ANTOLIN-INGENIERIA, S.A.
INNOVACIONES MICROELECTRONICAS, S.L.
MANUFACTURAS GOMA, S.L.
PARAFLY SA

Public and Private Research Centres
FUNDACIÓN PARA LA INVESTIGACIÓN Y DESARROLLO EN EL TRANSPORTE Y ENERGÍA
FUNDACIÓN ROBOTIKER
UNIVERSIDAD DE VALLADOLID
UNIVERSIDAD DE NAVARRA
UNIVERSIDAD DE BURGOS
CENTRO PARA EL DESARROLLO DE TELECOMUNICACIONES EN CASTILLA Y LEÓN
FATRONIK
GAIKER
INSTITUTO DE MICROELECTRÓNICA DE SEVILLA
UNIVERSIDAD SANTIAGO DE COMPOSTELA
INSTITUTO NACIONAL DE TÉCNICA AEROESPACIAL ESTEBAN TERRADAS

FENIX	RESEARCH FOR NEW CONCEPTS TO BE APPLIED IN MORE SAFIER AND SUSTAINABLE ROADS

Duration

2007 - 2010

Summary

Roads are the main means of transport in Spain and therefore road is the most important transport infrastructure in Spain. FENIX project members are on the road an active platform for the development of communications, cultural and social changes for present and future. The road as a platform for modern guidance systems for vehicles communication to the road as an active element in reducing accidents by developing early warning systems from the pavement situations or extreme weather risk. The road as a recycling system of their own products or even more, products from other industrial sectors, employed in the development of materials and the structure of the firm, all with a strong commitment to sustainability, developing technologies friendly to the environment.

The FENIX project brings together companies in the consortium that represents 45% of the national road sector that carry out 85% of the R&D being conducted in this field, thus ensuring scientific and technical excellence of the project and the probability of technical success of the tasks undertaken.

Project Total Budget

31,1 Million €

Leading Institution

AGRUPACION DE INVESTIGACION ESTRATEGICA PROYECTO FENIX

Participants

Companies

AGRUPACION DE INVESTIGACION ESTRATEGICA PROYECTO FENIX
CENTRO DE INVESTIGACION ELPIDIO SANCHEZ MARCOS, S.A. CI ESM SO MA
CONSTRUCCIONES Y OBRAS LLORENTE, S.A.
DITECPESA, S.A.
ELSAN PACSA
INDUSTRIAL DE TRANSFORMADOS METALICOS, S.A.
PAVASAL EMPRESA CONSTRUCTORA, SA
REPSOL YPF, S.A.
SACYR, S.A.
SERVIÀ CANTÓ, S.A.
SORIGUE, S.A.

Public and Private Research Centres

GESTIÓN DE INFRAESTRUCTURAS DE ANDALUCÍA, S.A.(GIASA)
CSIC-INSTITUTO DE INVESTIGACIONES QUÍMICAS Y AMBIENTALES DE BARCELONA
CENTRO DE ESTUDIOS Y EXPERIMENTACIÓN DE OBRAS PÚBLICAS (CEDEX)
CIDAUT
CARTIF
UNIVERSIDAD DE HUELVA
UNIVERSIDAD POLITÉCNICA DE CATALUÑA - LABORATORIO DE CAMINOS
UNIVERSIDAD POLITÉCNICA DE MADRID
UNIVERSIDAD CARLOS III DE MADRID
UNIVERSIDAD DE ALCALÁ DE HENARES
UNIVERSIDAD DE CASTILLA LA MANCHA
UNIVERSIDAD DE CANTABRIA - GRUPO DE INVESTIGACIÓN DE TECNOLOGÍA DE LA CONSTRUCCIÓN
INSTITUTO TECNOLÓGICO DE ROCAS ORNAMENTALES INTROMAC
FUNDACIÓN LABEIN - TECNALIA

FORMA 0	NEW CONFORMING PROCESSES AND DEVELOPMENT OF ADVANCED MATERIALS FOR THE TRANSFORMATION OF HIGH STRENGTH STEELS

Duration

2006 - 2009

Summary

Forma0 aims to explore new processes and new materials that allow the fabrication of industrial components with high resistance steels. The automotive and transport sectors are the potential market. Applicability of these steels is very broad, and could be spread to other sectors. For that, the scope of the project is focused on research of new processes for AHSS steels and advanced manufacturing research matrices, and on research of new materials.

Project Total Budget

24,9 Million €

Leading Institution

SEAT, S.A

Participants

Companies
SEAT, S.A.
AUTOTECH ENGINEERING AGRUPACION DE INTERES ECONOMICO
BATZ, S.COOP.LTDA.
CANTABRA DE MATRICERIA
CENTRE TECNOLOGIC EDUARD SOLER
COMERCIAL DE TRATAMIENTOS TERMICOS, S.A.
GRUPO ANTOLÍN PGA, S.A.
INDUSTRIAS LANEKO, S.A.L.
INDUSTRIAS PUIGJANER, S.A.
LA FORMA INDUSTRIAL XXI, S.L.
MANUFACTURA MODERNA DE METALES, S.A.
MIKALOR, S.A.
ROVALMA, S.A.
SANDVIK ESPAÑOLA S.A.
VIZA AUTOMOCION, S.A.

Public and Private Research Centres
ASOCIACIÓN DE INVESTIGACIÓN METALÚRGICA DEL NOROESTE (AIMEN)
ASOCIACION DE LA INDUSTRIA NAVARRA (AIN)
FUNDACIÓN ASCAMM ASCAMM
CTM CENTRE TECNOLÒGIC
UNIVERSITAT POLITÈCNICA DE CATALUNYA (UPC)
UNIVERSITAT POLITÈCNICA DE CATALUNYA (UPC)

VERDE	R&D IN TECHNOLOGIES APPLIED FOR ELECTRIC VEHICLES IN SPAIN

Duration

2009 - 2012

Project Total Budget

34,15 Million €

Summary

The aim of the project VERDE is to research and develop technologies which allow the production and commercialisation of electric vehicles in Spain.

VERDE is an applied research project to develop new technologies, organised with a solid leadership, but also cooperative and based on the mutual trust between partners, which are convinced of being part of a common project.

VERDE must be the driving force of future individual and cooperative projects to introduce the new developed technologies in the next generations of vehicles.

The accomplishment of these objectives would allow Spain to reduce its energy dependency from the oil, to reduce the CO2 emissions in the transport sector and to favor the penetration of renewable energy as established in the UE energy policy for 2020, and, last but not least, to guarantee the future of the industrial sector and the automotive R&D in the country.

Leading Institution

CTS: Centro Técnico de SEAT S.A.

Participants

Companies
Up to 20 Companies
SEAT
CEGASA
SIEMENS
LEAR
COBRA
IBERDROLA
ENDESA
Other key Partners:
REE
CIRCUTOR
FICOSA

Public and Private Research Centres
Up to 16 Private R&D Centers and Universtities.
Main Partners:
CTM
UPC
TECNALIA

THE MOVELE PROJECT

Institute for the Diversification and Savings of Energy, IDAE
Ministry of Industry, Tourism and Trade

The Spanish Plan for the Activation of Energy Savings and Efficiency 2008-2011 (Plan de Activación del Ahorro y la Eficiencia Energética 2008-2011), which was approved by the Spanish Council of Ministers on 1/8/2008, includes as fourth action a pilot project to introduce electric vehicles in Spanish cities. The objective of this project is to demonstrate the technical, energetical and economical viability of this mobility alternative.

The MOVELE project, managed and coordinated by the Institute for the Diversification and Savings of Energy under the Spanish Ministry of Industry, Tourism and Trade (Instituto para la Diversificación y el Ahorro de la Energía, IDAE, del Ministerio de Industria, Turismo y Comercio), proposes the introduction in a two years time (2009 and 2010) and within urban areas of 2,000 electric vehicles of different categories, features and technologies. The vehicles would be operated by a broad range of enterprises, institutions and private drivers. The project also foresees the installation of 500 charging points for these types of vehicles.

The specific objectives of the MOVELE project are:

· To demonstrate the technical and energetical feasibility of electric mobility in urban areas, consolidating Spain among the very few real-life demonstration experiences in the field of electric energy technologies for mobility.
· To activate inside the local administrations involved in this initiative measures to promote this type of vehicles: public recharge infrastructure, prioritized parking spaces, permission to share dedicated lanes with buses, taxis...
· To involve companies from the private sector in the introduction of the electric vehicle: utility companies, insurance enterprises, renting companies, et.
· To serve as basis for the identification and promotion of regulatory measures that could facility the uptake of this technology: fiscal measures to the acquisition and use of electric vehicles, electricity price, changes in the regulations that could curtail its evolution (access to charging points in housings, homologation and so on).

MOVELE project website:
www.idae.es/index.php/mod.pags/mem.detalle/id.407

REGIONAL DEMOSTRATION PROJECTS

THE LIVINGCAR PROJECT

LivingCAR is an open initiative for promotion of the use of electrical vehicles (EVs) by applying the living lab research methodology for innovation. It was constituted in July 2009 by a public-private partnership involving private companies, public entities, technology center and users.

Its main objective is that Asturias becomes a real-life laboratory for the implementation of electromobility and their related infrastructure. The experiments have already started in the city of Gijón.

The LivingCAR is understood as a real demonstration platform for extracting crucial information about:
· Technical issues: To identify the advantages and disadvantages from the technical point of view when using EVs and the related infrastructure in existent life operating conditions, and to measure their real impact.
· Social issues: To name the social barriers when using electrical vehicles by extracting data from a set of live experiments with real users and to evaluate citizens' perception.

In summary, this initiative is devoted to evidencing the potential of electromobility for certain usage scenarios, able to stimulating the society and the market and aligned to regional, national and international mobility plans. It is not only an open scenario for demonstration, but an example of collaboration between the stakeholders from different sectors. LivingCAR brings together a strong consortium form by Fundación PRODINTEC (coordinator), Ayuntamiento de Gijón, Grupo Temper, Grupo Isastur, HC Energía (EDP Group), Banco Herrero (Sabadell Group), GAM and Autoridad Portuaria de Gijón.

In March 2010 this living lab become a member of ENoLL, the European Network of Living Labs.

Contact information: Paula Queipo Rodríguez, Project Manager. Technology Transfer Group. Fundación PRODINTEC. E-mail: pqr@prodintec.com

EPV	ELECTRICAL POWERED VEHICLES

Duration

2009 - 2010

Summary

A new transport system is necessary for achieving the goal 20-20-20 in tear 2020 as the European Commission defined.

One of the solutions is, with no doubt the, electrical vehicle for private use and public fleets. These keep our cities clean and environmentally friendly. But if want the EVs in the streets we need to provide them with a charging infrastructure, a new element should be integrated into the grid. If we want that EVs as a solution we have to solve some important issues regarding this integration, if not them could be a problem for the network.

The main objective of this project is to integrate the charging stations infrastructure into the grid. Also, an efficient use of renewable energies for the battery charge is essential. Spain is a power in wind farms with a great amount of energy coming from them, one of the goal of this projects is to use this energy for EV charge. We know that during early morning hours the wind is blowing, these hours are low load ones for the grid, so we have developing a model for a best integration of this energy source using as load the car batteries.

The development of an Intelligent Charging Station, a management system for them is another important project goal.

At the end the companies working in this project will get the necessary technology for the development of the charging stations, the optimal implementations around the city, the monitoring and management of the entire network and a better integration of the renewable energy sources into the grid.

Project Total Budget

2,3 Million €

Leading Institution

ITE: Instituto Tecnológico de la Energía - Energy Technological Institute

Participants

Companies
IBERDROLA
MOVUS
IDOM
POWER ELECTRONICS
GND
TECNIBAT
CPD
NUTAI
MONTESOL

Public and Private Research Centres
ITE: Instituto Tecnológico de la Energía - Energy Technological Institute

FP7 Green Cars and Leadership Opportunities

DIRECTORY OF SPANISH GREEN CARS RESOURCES 2010

This second edition of the Directory of Green Car Resources is an improved attempt to show the capabilities and interests of Spanish Organizations currently involved in activities related to the European Green Cars Initiative. The organizations listed, large and small private and public entities show that Spain has a strong base from which to pursue opportunities in meeting the growing needs for eco and electric mobility, both at national and international levels. Electric and ecomobility is a relatively new industry segment that includes vehicle manufacturers and assemblers, manufacturers of automotive parts and electrical equipment, engineering and consulting companies, utilities, technological centres, universities and public research centres.

The main objective of this Directory is to disseminate at a European level the contact details and relevant information of the activities of enterprises and RTD performers with expertise in eco and electric mobility. This Directory has been prepared by the Unit of International Innovation of SERNAUTO compiling information sent by the organizations. Based on the first edition released in 2009, a large number of new entities have been included and contact data updated when needed.

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CIDAUT Foundation 185
CIDETEC Foundation 186
CIRCE - Centre of Research for Energy Resources and Consumption 187
CITEAN 188
CITET - Centro de Innovación Tecnológica para la Logística y el Transporte de Mercancías por Carretera 189
CMT Motores Térmicos - Universidad Politécnica de Valencia 190
CRIA - Network Centre for Automotive Engineering of the Universidad Politécnica de Valencia 191
CSIC - Spanish National Research Council (ICMM. ICMAB, CNM, IAI, CIN2) 192
CTAG (Centro Tecnológico de Automoción de Galicia) 194
CTC - Centro Tecnológico de Componentes 195
CTM - Centre Tecnològic 196
EDERTEK 197
EUVE - European Virtual Engineering 198
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IDF Automoción - Design and Manufacturing Institute for Automotive Industry. 201
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ENTERPRISES		Road Transport Electrification						Logistics, co-modality and ITS technologies			Others		
	Code	Energy storage systems	Drive train	Vehicle integration	Infraestructure integration	Transport system integration	Heavy duty vehicles	Logistics	Co-modality	ITS	Alternative fuels (Biofuels, Hydrogen)	Materials	Production technologies
AIA	C			X	X	X							
AJUSA	S				X	X	X				X		
ANTOLIN IRAUSA	S											X	X
APIF Moviquity	I				X	X		X	X	X			
ATOS ORIGIN	I					X		X	X	X			
AVIA INGENIERIA	V	X		X			X					X	X
BESEL	E, V	X	X	X	X	X	X			X			X
Carrocera CASTROSUA	V			X								X	X
CEGASA	S	X										X	
CIE Automotive	S	X	X	X	X	X	X				X	X	X
COPO	S											X	X
ELLOC	S				X								
ENDESA	U	X			X	X							
ENTECNIA	E		X	X								X	X
ETRA I+D	L, I				X	X		X	X	X			
EXIDE	S	X											
FAGOR EDERLAN	S		X	X		X	X	X				X	X
FAURECIA	S			X								X	X
FICOSA	S	X		X	X	X				X		X	X
FORD España	V			X				X			X		X
GAM	L, O	X	X	X	X	X	X	X					
GESTAMP	S			X								X	X
GMV	I				X	X	X	X	X	X			
GUILERA	S		X	X									
HC Energía	U				X								
HELIOS	E		X	X									
HISPANO	V			X							X	X	X
IBERDROLA	U				X	X							
IDOM	E					X				X			
INGEINNOVA	E			X		X							X
INGETEAM	S	X			X	X	X						

Code: V= Vehicle manufacturer; S= Supplier; I= ITS; U= Utility, energy supplier; E= Engineering; L= Logistics; O= Other

ENTERPRISES		Road Transport Electrification					Heavy duty vehicles	Logistics, co-modality and ITS technologies			Others		
	Code	Energy storage systems	Drive train	Vehicle integration	Infraestructure integration	Transport system integration		Logistics	Co-modality	ITS	Alternative fuels (Biofuels, Hydrogen)	Materials	Production technologies
IPS	O					X						X	X
IRIZAR	V	X	X	X		X	X					X	X
ISDEFE	E							X	X				
KYBSE	S		X	X		X							X
LEAR	S	X	X	X	X	X							
MONDRAGON	S	X	X	X	X	X						X	X
MONTESOL	U				X	X							X
MOVUS	O					X							
NAGARES	S	X	X	X									
NECT NMISA	V	X	X	X	X	X	X	X	X	X	X	X	X
NIT	S			X		X							
PIHER-NACESA	S			X			X					X	X
POWER ELECTRONICS	S	X	X		X								
PUIGJANER	S			X			X					X	X
Red Eléctrica de España	U				X								
REIJAV	S		X										X
RENAULT España	V												X
SAFT	S	X											
SAINT GOBAIN	S			X								X	X
SEAT	V			X								X	X
SICE	L, I				X	X		X	X	X	X		
SIEMENS	S, I		X	X	X	X	X						
TECNIBAT	S	X											
TEKNIA	S			X								X	X
TELEFONICA I+D	I			X	X					X			
TEMPER	S, I	X	X	X	X	X				X			X
VELMUS Idi	V			X	X	X		X		X			X
VICUSdt	E	X	X	X									X
ZIV	S		X		X								
ZYTEL	V	X	X	X		X					X	X	X

Code: V= Vehicle manufacturer; S= Supplier; I= ITS; U= Utility, energy supplier; E= Engineering; L= Logistics; O= Other

RTD PERFORMERS		Road Transport Electrification					Heavy duty vehicles	Logistics, co-modality and ITS technologies			Others		
	Code	Energy storage systems	Drive train	Vehicle integration	Infraestructure integration	Transport system integration		Logistics	Co-modality	ITS	Alternative fuels (Biofuels, Hydrogen)	Materials	Production technologies
AICIA U. SEVILLA	U			X			X	X	X	X			
AIMEN	T											X	X
AIMPLAS	T											X	X
AIN	T, A				X	X							X
AITIIP	T											X	X
APERT	U		X	X	X	X				X			
ASCAMM	T	X	X	X	X	X	X	X		X		X	X
CARTIF	T			X	X						X	X	X
CEIT	T	X	X	X		X	X		X	X		X	X
CENIT - UPB	U				X	X		X	X	X			
CENTRO ZARAGOZA	T			X		X							
CIDAUT	T	X	X	X	X	X	X			X	X	X	
CIDETEC	T	X		X							X	X	
CIRCE	T	X	X	X	X	X	X				X		X
CITEAN	T		X	X	X	X	X			X		X	X
CITET	T, A							X	X				
CMT	U			X			X				X		
CRIA - UPV	U	X	X	X	X	X		X		X		X	X
CSIC	R	X		X	X							X	
CTAG	T	X	X	X	X	X	X	X	X	X	X	X	X
CTC	T					X						X	X
CTM	T	X	X	X	X	X						X	X
EDERTEK	T		X	X								X	X
EUVE	T	X			X	X		X	X	X			X
GID	U										X	X	X
IBV	T			X		X				X		X	X
IDF	R		X	X		X				X		X	X
IDIADA	T	X	X	X	X	X	X		X	X	X		
IKERLAN	T	X	X	X								X	X

Code: U= University; T= Technology Center; R= Research Center; A= Association; O= Others

RTD PERFORMERS		Road Transport Electrification					Heavy duty vehicles	Logistics, co-modality and ITS technologies			Others		
	Code	Energy storage systems	Drive train	Vehicle integration	Infraestructure integration	Transport system integration		Logistics	Co-modality	ITS	Alternative fuels (Biofuels, Hydrogen)	Materials	Production technologies
IKERLAN	T	X	X	X								X	X
INSIA - UPM	U			X			X						
INTA	R	X		X	X	X	X			X	X	X	X
ITA	T	X		X		X		X				X	X
ITCL	T	X		X	X	X				X	X		
ITE	T	X	X	X	X	X	X					X	X
ITENE	T					X		X	X	X		X	X
LAUPV	U		X	X		X		X	X	X			X
LUREDERRA	T	X	X	X			X				X	X	X
Mondragón GEP	U	X	X	X	X	X		X		X		X	X
PRODINTEC	T				X	X							X
REDITA	T,A	X	X	X	X	X	X	X	X	X	X	X	X
TECNALIA	T	X	X	X	X	X	X	X	X	X		X	X
TECNOEBRO	T, A	X	X	X	X	X	X	X		X	X	X	X
TEKNIKER	T	X	X	X	X	X				X		X	X
UNEX	U	X	X	X	X	X							
U Valladolid	U							X	X	X			
ZLC	T							X	X				
OTHERS													
AENOR	O					X							
Port Auth. Gijón	O			X	X								

Code: V= Vehicle manufacturer; S= Supplier; I= ITS; U= Utility, energy supplier; E= Engineering; L= Logistics; O= Other

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Organisation profile

Aplicaciones en Informatica Avanzada, S.A. (AIA), founded in 1988, is one of the few Spanish companies working in the Consulting and Engineering of Software and IT Systems that strongly emphasises innovation. Its headquarters are located in the Parque Tecnologico del Valles (Barcelona, Spain), an industrial area specially dedicated to high technology companies. It has also delegations in USA (San Francisco), Mexico DF and Zaragoza (also in Spain).
AIA research and development activities are centred on: forecasting, optimisation, classification and Artificial Intelligence techniques and advanced software. Since its creation, AIA has satisfied the needs and expectations present in a demanding high-tech market: solving complex problems in the industry and in the business world, through the use of the techniques mentioned above, rapidly adapting state-of-the-art advances coming from the academic world.

The AIA Group has developed various powerful tools for grouping, modelling, and analysing, forecasting and distributing information and supplied unique solutions tailored to the highly specific needs for some of the most important companies in Spain, from the energy sector; the banking business; the transport sector and the Telecomm business.
Areas of Technological Specialization: Artificial Intelligence, data analysis and complex modeling. AIA has a vast experience in the Energy and Financial Services sectors.
Main Services in National & European Project Management: AIA is currently participating in one EU funded project. EMILI (Emergency Management in Large Infrastructures). AIA is responsible of modelling the electricity network and develop alarms interpretation algorithms to support real-time decision making.

Main Green Cars activities: Products and Projects

AIA main involvement in "Green Cars" R&D projects:
· In the Spanish "CENIT Framework":
1. Project **"VERDE"** is aimed to the development of new electric-based vehicles, including all their main components, and to their impact in the electric infrastructure (V2G).
2. Project **"ENERGOS"**, focused in Smart Grids, also takes into account the future influence of electric vehicles scenarios
· In the Catalan regional "Nuclis Framework":
Project **"BattMAN"** is oriented to provide a Spanish alternative to Battery Manufacturing oriented to electric vehicles.

AIA's CAPABILITIES aligned with the "GREEN CARS INITIATIVE": AIA can develop specific intelligent models oriented to: battery management, electric distribution in the vehicle, interaction between vehicle and grid, impact of the massive introduction of electric vehicles in the distribution and transport networks.
AIA can effectively contribute to "Green Cars" with R&D in the following areas: Control system of the electric distribution network within the car. Energy optimization. V2G intelligent interaction.

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Organisation profile

AJUSA is a family company founded in 1972 in premises of 250 sqm, producing automotive gaskets as the only product. Nowadays, in addition to gaskets, AJUSA manufactures cylinder head bolts, camshafts and hydraulic lifters.

AJUSA has over 15 years researching and developing PEM fuel cells, their components and applications.

Main Green Cars activities: Products and Projects

Our products for internal combustion engines are gaskets, cylinder head bolts, camshafts and hydraulic lifters.

Our products and projects in Hydrogen Technologies are:
· Components: AJUSA develops components, according to the characteristics and needs of the client (MEAs, Bipolar plates).
· Fuel Cells: Develop PEM fuel cells, from 100 W to 10 kW.
· Unit Power from 1 kW to 10 kW, including all systems to achieve an independent operation (cooling system, power electronics and control, food and air humidification). Need only supply of hydrogen.
· The Scooter Project is the first vehicle with a PEM fuel cell of Spanish manufacture.
· Don Qhyxote® Car Project: light vehicle (four passengers) powered with a PEM fuel cell, fueled with hydrogen gas at 350 bar.
· Don Qhyxote® Home Project demonstrates that the use of PEM fuel cells for energy supply in housing is now a reality.
· Don Qhyxote® H2 Station Project will supply hydrogen to all types of vehicles.
· Hydrogen City Project, by all Don Qhyxote® Projects. It is an example of sustainable development and respects the environment.

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Organisation profile

Grupo Antolin is a Spanish multinational leader in the design, development and manufacturing of automotive interior components. The company focuses its strategy on the following three main functions: overhead, door and seat.

Grupo Antolin operates in 22 countries with 85 plants and 20 technical-commercial offices.

Countries: Argentina, Brazil, China, Czech Republic, France, Germany, India, Iran, Japan, Mexico, Poland, Portugal, Russia, Slovakia, South Africa, Spain, Thailand, Turkey, UK, USA, Canada and Morocco.

The research and development capacity is the identity axle of Grupo Antolin. This strategy allows the Group to offer multi-technological products, thanks to the knowledge of different areas: materials, advanced simulation techniques, electronics, industrial processes, safety, acoustics and vibrations, industrial design....

Main Green Cars activities: Products and Projects

Weight reduction:
· Development of applications in Magnesium for a great range of functions, either for Grupo Antolin or for third parties.
· New technologies for acoustic functions and safety functions.

New Materials:
· Materials from renewable feedstock. Composites from vegetal sources. The origin is from cultivation (not devoted to human food): natural fibers, bioplastics, bioresins…
· Parts made from recyclable materials

Industrial scraps recovery:
· Several applications of the new material already developed

APIF MOVIQUITY

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Organisation profile

APIF MOVIQUITY SA (commercially named MOVIQUITY) is a mobile applications developer and IT solutions engineering company located in Spain (Madrid).

MOVIQUITY was founded with the objective of providing high added value technological and engineering services in the area of advanced information and communications technologies (ICT), with particular emphasis in mobile and wireless technologies and its applications, providing the company a strong potential for growth. This is further enhanced through an established agreement with several universities to provide expertise in mobile, IP, wireless and broadband technologies, having continuous access to the latest R&D done at the University, as well as the best technical staff. At present, MOVIQUITY is a medium size company formed by 140 engineers, researchers, and technical staff.

MOVIQUITY is member of several European and National Technological Platforms (eMobility, NESSI, NEM, etc.), and leads a working group within the eMOV platform.

Main Green Cars activities: Products and Projects

FP6- 2006 - TRACKSS. Technologies for Road Advanced Cooperative Knowledge Sharing Sensors. The objective is developing new systems for cooperative sensing and predicting flow, infrastructure and environmental conditions surrounding traffic, with a view to improve road transport operations safety and efficiency (www.trackss.net).

CELTIC - 2006 - CARLINK. Wireless Traffic Service Platform for Linking Cars. The aim of this project is to develop an intelligent wireless traffic service platform between cars supported by wireless transceivers beside the road. The primary applications are real-time local weather data, urban transport traffic management, and urban information broadcasting (http://carlink.lcc.uma.es).

CENIT - 2006 - MARTA. Mobility & Automotion through Advanced Transport Networks. The objective is to foster research and development in communication between vehicles and to the infrastructure to develop technological solutions that will improve transportation. These intelligent systems of the future will contribute to reduce traffic congestion, reduce accidents, and in the event of an accident automatically contact the Emergency Services. Applied correctly the technology also exists to provide a more efficient and sustainable forms of transportation that reduce its environmental impact (www.cenitmarta.org).

AVANZA - 2007 - mVia. This project tries to apply communications technologies and models of services to the transport by road, improving the application of the mobile communications and wireless networks technologies in road transportation, adding value in terms of information and entertainment to the driver and passengers, support to professional vehicles, comfort and optimization of the traffic (www.mvia.es)

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Organisation profile

Atos Origin is an international information technology services company. The company's annual revenue is EUR 5.5 billion and it employs 50,000 professionals in 40 countries. Atos Origin is the worldwide information technology partner of the Olympic Games. http://www.atosorigin.com/

Atos Research & Innovation (ARI), node of R&D at Atos Origin in Spain, is a point of reference for innovation for the whole Atos Origin group. Atos Origin has developed more than 200 R&D&I projects over the last 15 years (70 R&D&I ongoing projects in 2008).

The transport and logistics unit within ARI is addressing major challenges on transport, logistics and manufacturing. Relevant technological issues tackled are context aware systems, data extraction, transformation and analysis, payment collection, demand forecasting, software for embedded systems, location and navigation technologies, systems interoperability and semantic technologies.

Main Green Cars activities: Products and Projects

Atos Research & Innovation (ARI) is involved in some research projects concerning:

· **Intermodal transport:** interconnection of freight transport for different modes of transport, multimodal infrastructures and technologies, interoperability for public transport, supply chain collaboration, …
· **Smart Urban Systems:** logistic platforms, real time information for dynamic routes planning, localization, freight urban distribution technologies and solutions.
· **Communication technologies (V2X):** vehicle-vehicle and vehicle-infrastructure communication systems. Embedded systems. Sensoring for interaction and communications.
· **New Advanced Driver Assistance Systems:** eCall, HMI, in-vehicle navigation systems, traffic reporting.
· **Smart Grids**

Atos has participated in large projects, some of them being large demonstrators, such as: TIMI (Smart Intermodal Transportation of Goods), mVIA (Communication technologies and models for services to the transport by road) and OPENNODE, BEinGRID, STORK, ORCHESTRA, OpenGrid, MASTER, SENSATION, or DAPHNET, among others. Furthermore, Atos Origin participate in EVA Consortium.

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Organisation profile

Avia, Ingeniería y Diseño, S.L., begins its activities in 1990 as an association of professionals in design engineering, providing a huge experience at aeronautics, automation, agriculture equipments and civil works as responsible for the technical departments of AISA, Motor Ibérica, Nissan and Kubota. In 1994, it is consolidated as an independent society related to engineering services, specialized in design and manufacturing of prototypes and small series of special vehicles, enlarging its activities to the aeronautical and industrial fields.

Offers answers to our clients from the simplest in execution such as manufacturing drawings, to the most advanced integral projects, providing with its acknowledges, technologies and computer media, the most innovating and economic solutions.

In Avia, innovation is our "Leif-Motif". Therefore, in the year 2000, we established a New Technologies Division: `Electric Vehicles and Alternative Tractions´ (VE&TRA) and nowadays it has the status of independent company within the Avia group.

Main Green Cars activities: Products and Projects

Automotive Design Engineering: Conceptual design and mocks-up; Assemblies and pieces design; Complete vehicle design.

Stress Analysis and Testing: Stress analysis/ Finite elements; Dynamic Tests: Testing on testing ground and Functional tests; Laboratory test: Data acquisition and Fatigue test.

Prototypes: Elementary Pieces and "Rapid Prototyping"; Complete Vehicles.

Manufacturing: Preseries and small series.

Projects dealing with Electric and Hybrid vehicles:
· TEMPUS: Urban Hybrid bus chassis for Castrosua with multi mode operational capabilities and pure electric operation. Mainly focused for city centres and historical district, were the emissions engines will be banned, the design philosophy of the traction and electric energy storage systems allows the vehicle to be used as a complete transport solution, with different operational strategies depending on the course could optimise the fuel economy or be a cero emissions vehicle.
· 15 tone Refuse collection truck: A heavy industrial Hybrid vehicle design specially for FCC S.A. is able to complete the whole refuse collection in pure electric mode, removing completely the emission and noise associated to this vehicles from the urban areas.
· 14 tone street watering truck: A heavy industrial Hybrid vehicle design specially for FCC S.A. to clear the city centre streets and park watering in pure electric mode, to make this task consistent with the urban city life.
· Development and manufacture of CNG vehicles, from the bare initial idea to build complete vehicles, to transform actual vehicles to CNG operation.

BESEL

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Organisation profile

BESEL is a medium-sized technology-based company offering clean, efficient and sustainable turn-key solutions for a wide range of sectors, including energy, industry, building and transport.

BESEL was founded in 1984 and today counts with three Divisions: Research and Development, Engineering and Consultancy, each providing solutions to different customer needs individually or jointly, based on the specialised knowledge and experience of highly qualified staff.

BESEL has its head-office in Madrid and a site in Valladolid, both with state-of-the-art laboratories for the development of systems and equipment. In particular, BESEL has a cutting-edge hydrogen and fuel cell laboratory to assist in the development of these technologies. BESEL has successfully developed and deployed hybrid electric vehicles to operators of public transport, logistics and airport vehicle fleets.

Main Green Cars activities: Products and Projects

Vehicles:
· Development hybrid electric vehicle drive-trains (including fuel cell and ICE hybrids).
· Development of power conversion devices, electronic control units and human-machine-interfaces.
· Integration of electro-chemical energy storage devices.
· Development of test rigs and equipment for electric motors, batteries, supercapacitors and power converters.
· Efficient vehicle power and thermal management
· Modelling and simulation of electric drive trains and components.
· Support to vehicle testing and homologation.

Infrastructure
· Smart electric vehicle charging infrastructure, including charging stations, electricity distribution and metering, web-based charging infrastructure management.
· Renewable energy generation, including photovoltaic and wind.

Intelligent Transport Systems (ITS)
· Fleet monitoring systems, with a focus on vehicle efficiency and emissions.

Project management
· Management of large scale vehicle demonstration projects, such as HyChain (deployment of fuel cell vehicle fleets across four European countries, funded by the 6th FP).
· Business model development for public and private institutions and partnerships.

CARROCERA CASTROSUA

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Organisation profile

Carrocera Castrosúa S.A is a family business founded in 1948. It is devoted to manufacture complete vehicles, especially buses in urban, interurban and long distance versions.

One of the Castrosua basic lines is the environmental improvement of its products, being a pioneer in the adaptation of buses to alternative propulsion systems, liquefied gas, compressed gas and ethanol, here in Spain. The actions to care the environment taken by Castrosua are:

· Encourage the use of public transport.
· Implantation of green fuels, through the use of buses powered by gas, Fuel Cell buses and ethanol vehicles.
· Manufacturing of hybrid buses - with electrical traction system.

Main Green Cars activities: Products and Projects

Tempus hybrid bus range, from 9 to 12 metres long, with an electrical traction system, battery accumulation, energy recovery from deceleration processes and rechargeable through electrical grid connection; this vehicle is currently being marketed .
CASTROSUA is developing several R&D projects with the following main goals:
· Improvement of the current products, especially those from the Hybrid range increasing the added value concerning safety, efficiency, comfort and ergonomics: alternative propulsion system, monitoring system of the vehicle surrounding through image processing, early warning system in case of risk in the doors opening/closing, Improvement of the driver's ergonomics, improvement of hybrid buses acclimatisation using climate electrical compressors, reduction of noise and vibration.
· New features implemented to the products: automatic guidance system at zones of passengers loading and unloading, early warning system of unintentional road abandonment, new communication systems and Internet connections for the user.
· Improvement of the manufacturing process as well as the subsequent bus recycling.
· It is highlighted the collaboration between Castrosua and the Department of Hydrogen and Fuel Cells from the Industrial Engineering School of the University of Vigo, where they were made several tests of traction systems for buses with an hydrogen fuel cell of 32kW. Thiscell was bought by Castrosua for its monitoring and subsequent implantation and testing in buses with electrical traction system.
Green Technologies for the Urban Transport (ECO-TRANS) (2008-2011) Project Manager CAF company (Railways Subsidiary Company); CENIT Program - National Strategic Partnership for Technological Research.
TECMUSA - Tecnologies for sustainable and accessible urban mobility (2009-2011) Project Manager: Universidad Politécnica of Madrid (UPM); Singular and Strategic Projects of the National program for Public and Private Cooperation within the National Plan of Science, Development, Research and technological Innovation.

CEGASA

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Organisation profile

CEGASA is an important business group which started as a battery manufacturer in 1934. The CEGASA group is currently one of the world's leading manufacturers of private label batteries and has experienced spectacular growth over the past 5 years, now commanding a strong market presence, both at home and abroad. In 2007 the group's consolidated turnover stood at 230 M€, with a work force of close to 1000 people. CEGASA has an extensive sales and logistics network, operating in 8 different countries and exporting to 50 countries on the 5 continents. Most of this production is exported to Europe, particularly to Germany. Throughout the last 8 decades, CEGASA has demonstrated its ability to develop and bring innovative solutions to market, putting the company at the forefront of technological development in the manufacture of portable batteries.

In the 1990's, CEGASA launched their "Environmentally Friendly" Green Technology battery range, including 2 new lines of Alkaline and Zinc air batteries with enhanced performances. In order to adapt to the fast growing demands of recent times, wide ranging research into new battery technologies, such as primary lithium, lithium ion and lithium-polymer batteries, is in progress within the R&D Department of the company.

Main Green Cars activities: Products and Projects

Products and Materials:

· **Lithium-ion battery** development for the EV: new active materials, new concepts for solid polymer electrolytes, electrode formulation and optimization, assembly and testing of cells, modules and battery packs, electrochemical and safety characterization, pilot plant production of electrodes, cells and modules.

· **PEM fuel cells:** new components development, new concepts for solid polymer membranes, MEA formulation and optimization, bipolar plates design and manufacturing, assembly and testing of MEAs, stacks and BOP, electrochemical and safety characterization, pilot plant production of MEAs, stacks and complete fuel cells.

Relevant projects:

· DEIMOS: Desarrollo e innovación en pilas de combustible de membrana polimérica y oxido sólido (2007-2010, CENIT project, coordinated by CEGASA)
· EPICO: Desarrollo en España de Pilas de Combustible (2005-2008, coordinated by HYNERGREEN)
· ILLIBAT: Ionic Liquid based Lithium Batteries (2006-2008, FP6 STREP project, coordinated by Technical University of Graz).
· ORION: Organic-Inorganic Hybrids based on Ionic Liquids for lithium batteries (2009-2013, FP7 LARGE project, coordinated by CIDETEC).

CIE Automotive

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Organisation profile

CIE Automotive is a global operator with a differentiated business model based on multi-technology. This successful model has enabled it to consolidate its position as a specialist group in the management of industrial processes of high value added, being present on the main emerging markets worldwide.

CIE Automotive is focusing its resources on two strategic business areas: automotive components (with 6 basic technologies - Aluminium, Forging, Stamping and Tube Welding, Machining, Plastic and Casting- and it's present in 9 countries) and Biofuels, (with biodiesel plants operating in Spain and Italy, presence in Brazil and Guatemala, and its own sales network).

CIE has 6 technical centres in Spain, Portugal, Romania, China, Mexico and Brazil, focused in adding value to our customer in product, oriented to optimisation of efforts in strategic products of both CIE Automotive and its divisions and processes to achieve excellence in the development of processes.

Main Green Cars activities: Products and Projects

CIE's main research lines are focused on:

· Downsizing
· New materials and processes for Turbochargers and EGRS
· Variable compression ratio
· Lightweight concepts and materials
· Efficiency of auxiliary systems
· Thermal management (integration)
· Closed loop control
· Multi-fuel 2nd generation of biofuels
· Electric motors
· Safety in EV
· Integration car to grid

COPO Group

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Organisation profile

Grupo Copo is a holding implanted in Spain, Portugal, Brazil and Cuba, that started its activities in 1969. Today Grupo Copo has 4 main fields of activities:

· Production of seat foam pads for the automotive industry, as well as headrests and armrests and energy absorption parts for door panel, pillar, etc.
· Production of carpets and other acoustic absorbers and insulators for the automotive industry.
· Production of fabrics and flame laminated textiles for the automotive sector (seat covers, headliners, door panel, etc.).
· Production of mattresses, pillows and slabstock for furniture; as well as technical foams for the automotive sector.

It counts with an R&D Centre in Vigo-Spain, where they develop all the Research, Development and Innovation projects of the Group. They have all the resources, technical and humans, to deal with these activities.

Main Green Cars activities: Products and Projects

Grupo Copo has presented to CDTI (that belongs to the Spanish Government) a new project to develop car components produced with bio-materials. The target of this project is to develop new polymeric materials including bio-components more environmentally friendly. This will allow Copo to introduce in the future new cars some components with better properties for recycling and to reduce the current reliance on petrol.

e.lloc , ELECTRIC LLOC

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Organisation profile

e.lloc mission is to support mobility companies with the right recharge infrastructure for the implementation of electrical vehicles. Through its different modular and flexible products e.lloc is capable to offer mobility companies and final users with the right solutions.

e.lloc, Electric Lloc S.L. is a private company, owned by two Tier 1 automotive engineering companies, Nutai and CPD. It has also commercial offices established in Germany (Cologne and Munich) and UK (London).

Nutai core business is industrial automation; supervision and process control. In the area of engineering services, Nutai is also able to provide industrial software solutions. Nutai has over 15 years experience providing to its customers turnkey solutions. Nutai has also developed a energy management system (ENERGYS) which can be integrated inside e.lloc.

CPD core business is the complete CAD/CAE development of automotive components and systems. CPD has proved experience in manufacturing process such us metal stamping and plastic injection and has over 20 years experience providing to its customers with design and development turnkey solutions.

e.lloc R&D&I experience includes regional projects and international collaborations.

Main Green Cars activities: Products and Projects

Product: e.lloc **SMART SOLUTIONS for the electrical mobility.**
e.lloc is an electrical vehicle recharge station. Its main characteristic is the modularity and the easy adaptation to the needs of sponsors/developers, end-users and final locations. e.lloc offers a set of solutions to solve the identification and the payment, the bidirectional communication: end user-Control Room/Data Base, the management of the energy and the interface to the final users.

MODULAR: Thanks to the modular development and manufacturing process its easy to adapt the different solutions, configurations and needs of the sponsors/developers, end users and final locations.
FLEXIBLE and OPEN: Allows the continual integration of additional modules and future actualizations of the system, following market trends and **future regulation.**
SMART RECHARGE STATION: Maximizes the **bidirectional communication** between final user and Control Room/Data Base. Easy to adapt to future intelligent communications with the vehicle. V2G.
SMART RECHARGE STATION: Capable of managing the energy efficiency of the charge process and **managing the individual energy supplied per point.**- Modulo ENERGYS.
e.lloc main projects related to Green Cars include:
Regional Project EPV: New System of Efficient Urban Transport Power based on the use of electrical vehicles integrated in the grid and powered by renewable energies. Methodology for optimal location of the charge stations and the vehicle charge process. Within this project e.lloc partners NUTAI and CPD have developed together the intelligent recharge station.

ENDESA

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Organisation profile

ENDESA is the leading utility in the Spanish electricity system and the number one private electricity company in Latin America. It is a significant player in the energy sector of the European Mediterranean region, has a growing presence in the Spanish natural gas market and is advancing rapidly in the area of renewable energy. ENDESA has over 25 million customers.

Endesa has several projects related with Smart Grids, like Denise, to develop the new Spanish intelligent Grid, develops new sensors, new algorithms and new systems and studies the behaviour of the massive integration of DG in the networks and new maintenance techniques based on reliability. Endesa is founder of the IUA (Innovation Utilities Alliance), whose aim is to share experiences, knowledge and initiatives between utilities, and develop consortium projects.

Main Green Cars activities: Products and Projects

Member and co-founder of the de-facto EV standardization group, which is formed by the big utilities in Europe (Endesa, Enel, EDF, RWE, E-on, etc.) and the main OEMs. This group has done recommendations dealing with the plug and the communications between the car and the charging station, which have been moved to the standardisation committees as IEC and ISO. Endesa has already installed several recharging stations, including its headquarters parking area.

Smart City Project: Demonstration national project to create the first smart city in the south of Europe applying all the knowledge and outcomes resulting from Denise. It includes EVs, V2G capabilities, design and installation of bidirectional Smart Charging Stations, and integration in the Smart City Grid.

Grid For Vehicle: FP7 project with the objective to develop an analytical method for the planning of necessary technological developments in the electricity grid infrastructure and the definition of related ICT and policy requirements in order to support, cope with and clearly understand the effects of a mass introduction of EV and PHEV until 2020.

MOVELE: EVs demonstration project launched by the national Government. One of its main goals is to promote actions among the local administrations involved to generate a network of charge spots in public roads and car parks as a stepping stone to the deployment of 2,000 electric vehicles over a maximum period of two years. ENDESA works with the Councils defining the requirements and the specifications of these recharging points.

EPRE: Internal project that defines the characteristics of a Endesa Recharging Point. It includes slow, smart, and fast charge. One activity is focused in convert, design, and install a solution that allows converting Public Telephone Boxes on the street to charging stations.

ELVIRE: FP7 project. The main goal is to develop tools, solutions and services to support energy efficiency within e-mobility.

VERDE: National Cenit Project with SEAT, Spanish car manufacturer, and the two big utilities from Spain, Endesa and Iberdrola. The main goals are to deal with an efficient use of energy transport, design control and safety strategies to recharge EVs, and do research about batteries intelligent infrastructures, electric motors, and connect it with the Smart Electrical Grids.

ENTECNIA Consulting

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Organisation profile

ENTECNIA is a SME dedicated to engineering and development, mainly automotive safety components.

This new company, born in April 2009 in Spain, with presence also in US, is the results of merging the knowledge of a group of very skilled people, having an average of more than 20 years expertise in developing braking systems for the most European and American automotive manufacturing an OEM suppliers (BMW, DAIMLER, FIAT, TRW…).

Besides the very close contact with automotive customer, ENTECNIA is working with the most qualified, at full worldwide level, research institutions and technology suppliers, being able to cover the whole process from the concept to the prototypes and pre-industrial manufacturing validation, being the virtual and physical simulation the ENTECNIA core activity.

The ENTECNIA staff is experienced in coordination of EUROPEAN FRAMEWORK projects and other international, projects.

Main Green Cars activities: Products and Projects

· Braking systems combining energy recovery, electrical and mechanical (pressure, kinetic…).
· Vacuum pumps systems, for electric/hybrid vehicle braking systems.
· Integration / programation of electric - mechanical braking.
· ESP systems for electric / hybrid car.

ETRA Investigación y Desarrollo

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Organisation profile

ETRA is a high tech industrial group part of ACS, one of the biggest Construction and Services Corporations in the World.

ETRA is a market leader in the fields of technology, mobility, energy and public services. The company combines a powerful research centre with a 24/7 on site customer service. This is how it successfully delivers high added value turnkey solutions to its customers around the World.

The main fields of activity of ETRA include:
· Intelligent Transport Systems: Fleet Management, Traffic Management, Electronic ticketing, Access Control, Tolling, Personalized Information services to travelers etc.
· Energy Management Systems in the field of mobility, public lighting, smart buildings, etc.
· In general, real time control and information management systems aimed at improving the efficiency of organizations, increasing the safety and quality of life of people and minimizing the environmental impact of socioeconomic activities.

ETRA covers all the life cycle of a product or service, carrying out pre-competitive research (with a large success record of more than 50 EU research projects), engineering, product and service development, integration with third parties, turnkey system delivery and, if required, exploitation of the system for its customers.

Main Green Cars activities: Products and Projects

ETRA addresses the Green Car initiative and related issues from two main perspectives:
· On the one hand, ETRA provides solutions in the field of recharging infrastructure, from the recharging points to the smart grid and the intelligent management and exploitation of the overall system. ETRA's solutions support different business models as well as the packaging/combination of the recharging services with other related services which add value to both the driver/user and the infrastructure operator.
· On the other hand, ETRA is a market leader in the field of energy-efficient transport solutions. ETRA's integrated mobility solutions allow the consistent incorporation of the green car in the context of the overall mobility schemas of a network -urban or interurban-, so that (i) the user is incentivised to choose the greener transport alternative available and (ii) the road network authorities effectively implement an energy efficient, environmentally friendly, sustainable mobility solution.

ETRA's recent projects in the field of greener transport include: MARTA, TIMI, TECMUSA, WISETRIP, SMARTFREIGHT, ECOSPACE, CITYMOBIL, TELEFOT, CARLINK, TRACKSS, EMMA, PECES, MODETRA, TURTLE, IVISCAT, etc.

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Organisation profile

The company is mainly involved in the development and manufacture of lead-batteries for transportation and industrial business. The R&D department is developing improved batteries for the new micro- and mild-hybrid applications.

Main Green Cars activities: Products and Projects

Various projects in which our company is involved are related to the improvement of lead-acid batteries (flooded and VRLA) for micro (stop/start) - mild-hybrid applications. Promising results have been obtained up to date in terms of extending cycling life according to Power Assist profile (>220,000 cycles at 2.5% DoD) on 6 V modules manufactured with advanced lead-acid technologies.

FAGOR EDERLAN Group

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Organisation profile

FAGOR EDERLAN Group is an automotive group and part of the Mondragon Group, leaded by Fagor Ederlan S. Coop., with two business units: Chassis and Powertrain, based on the knowledge of Brake-Suspension Engine-Transmission function in vehicle. Fagor Ederlan offers global solution in all its products lines, closely working with their customer from design and development activities and wide added value options.

We understand the requirements from OEMs related to global production in automotive projects, so we operate from our all manufacturing plants in Spain, Slovakia and Brazil and our production alliances developed with our partners.

With more than 40 years in automotive marketplace Fagor Ederlan has the reference of main OEMs and Tier 1 as Renault, Ford, GM, BMW, PSA, Honda, Jaguar, Land Rover, VW, Mercedes, Fiat, Suzuki, Contiteves, Bosch, TRW.

Our main highlights define our consolidated level at marketplace: 15 manufacturing plants in Spain, Slovakia, Brazil and production alliances at Korea, China; 1 technology center Edertek; 3.448 professionals; 668 Mio Euro sales 2008; 28.8 Mio Euro investment 2008 (231 Mio Euro in whole strategic plan 2004-2008).

Main Green Cars activities: Products and Projects

Fagor Ederlan group understands the technological advances as a key factor for new activities and business challenges. With Edertek Technology Center, Fagor Ederlan group supports its customers with collaborative product design, offering different solutions in terms of weight reduction, product and process improvements and quality. Main activities are focused on:

· Development and research on light materials (aluminium, magnesium, plastic) to replace current iron products.
· Development of engine blocks in different materials like aluminium and CGI with the weight reduction as the main objective. This goal is also worked through new technological advances such as reduction of the wall thickness.
· Improvement in production through flexible processes to obtain the maximum energy efficiency.
· Development of aluminium structural parts to substitute current steel parts.

FAURECIA Interior System SALC España

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Organisation profile

FAURECIA Interior System SALC España S.L. is part of the FAURECIA Group, a multinational company of the automotive sector which develops interior trims for light vehicles.

Because the ergonomics, comfort and style of its interior influence the decision to purchase a vehicle, Faurecia designs and produces instrument panels, central consoles and door panels that meet both the expectations of final customers and the requirements of automakers. We are able to offer the most advanced solutions in terms of passenger safety, interior fittings or weight reduction.

Main Green Cars activities: Products and Projects

Our main research activities are related to:
· Safety: increase safety level of our products and process.
· Weight reduction: lightweight concepts.
· Recycled materials and environmental process: develop environmentally-friendly materials, increase use of renewable resource, rather than plastics.

FICOSA International

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Organisation profile

Research, Development, Production & Commercialization of systems and components for vehicles. Eight Business units: Rear-view systems; Command & Control systems; Under hood systems; Door & Seat systems; Advanced communications; Commercial vehicle; Security & Locks Systems (JV) and ADAS SENS.

2008 Sales: 897 Mio Euro; 2008 Team: 7000 people worldwide. R&D investment represents 4% of our total Group's sales. Intellectual Property of Ficosa Group: 500 active patents.

Main Green Cars activities: Products and Projects

· Battery Packaging and Management Systems: Battery pack, Cells (chemistry partner), Sensors, Relays, Cooling system, BMS: charge/discharge configuration, electrical safety in case of accident, high temperature, fire, …
· In Vehicle Telematic Unit: V2X communications (vehicle/infrastructure/grid) as a key topic to deploy electrification through the terrain, new RF architecture locating antennae and receptors in the same device, antennae with adaptable bandwidth and multiband systems, specific immune and real time V2G SW.
· iVTU (onboard communication module): reliable information exchange, smart controls and information sharing.
· Shift by wire, configured to any drivetrain, reduced packaging and weight.
· Artemis (EU) & CENIT (national) programs in competition.
· Weight reduction projects on current business products (Shifters, Mirrors, …).
· New materials applications in Magnesium and Plastics with Natural Fibers reinforcements.

FORD España

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Organisation profile

Ford Motor Company is committed to offering customers affordable environmental technologies in the vehicles they want and value.

To do this, Ford is introducing a range of global environmental technologies, including electrified vehicles that provide customers with more fuel-efficient models emitting fewer greenhouse gases without compromising safety, interior room or performance.

Ford is focused on solutions that reach not just hundreds or thousands of cars, but millions of vehicles - because that is how Ford can truly make a difference.

Main Green Cars activities: Products and Projects

Near- and longer-term advancements include the new Ford EcoBoost global engine family featuring turbocharging and direct injection technology, Ford's ECOnetic range of low- CO_2 technologies in Europe, and multi-speed transmissions such as Ford PowerShift.

Also, Ford is developing a range of other environmentally focused features, including advanced electric power steering, weight reduction and aerodynamic improvements, plus biofuel-capable vehicles, hybrids and plug-in hybrids.

Electrification is a key element in the effective use of Ford's global resources and talents to provide a portfolio of affordable and fuel-efficient technologies for customers.

Our electrification strategy and plans include hybrids, plug-in hybrids and battery electric vehicles to best meet our global customers' needs.

Ford will launch two zero-emission full battery-electric vehicles including the Transit Connect Electric light commercial vehicle in 2011 followed by the Ford Focus Electric in 2012. Three other vehicles - two next-generation petrol hybrid-electric vehicles and a plug-in hybrid - will be introduced in 2013.

GAM - General de Alquiler de Maquinaria

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Organisation profile

GAM is the leading rental company in Spain and Portugal focused on providing rental and fleet services for various sectors such as civil works and construction industries in general, industrial operations and maintenance, renewable energies, railway construction and maintenance, material handling, energy supply, events, E-Mobility and many more. GAM is servicing around 5.000 machines with Electric-Drives and batteries worldwide.

Main Green Cars activities: Products and Projects

· Living Car: First "Living" Laboratory in Spain dedicated to E-Mobility.
· mov-e: Company dedicated to provide turn-key solutions for E-Mobility, like: feasibility studies, sales and installation of infrastructure around E-Mobility like reloading stations and signalling, fleet management, maintenance, CARclub, etc. www.mov-e.es

GESTAMP Automoción Group

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Organisation profile

"Gestamp Automoción" is an international group dedicated to the development and manufacturing of metal components and structural systems for the automotive industry. Today, "Gestamp Automoción" has locations in 18 countries (Europe, America and Asia) with 55 production centres and 15 R&D Centres, which together total over 13,100 employees.

In 2008 "Gestamp Automoción" sales were 2.4 billion Euros, to global automotive manufacturers, such as Volkswagen, Renault-Nissan, Peugeot-Citroen, Mercedes, GM, Ford, and Chrysler.

Gestamp Automoción's rapid growth is sustained by the quality work of its employees who are dedicated to providing clients with products and technologies aimed at the reduction of weight and GHG emissions, while at the same time providing improvements in passenger safety.

Main Green Cars activities: Products and Projects

The Strategic Plan 2012 of GESTAMP Automoción is aligned with the following competitiveness lines: Reinforcement of R&D resources; Product Weight reduction; Recyclability; Safety, Security and Comfort improvements; High Added Value product orientation.

The company has long experience in Large Collaborative Projects with global OEMs at National (CENIT Program) and European scale (ECSC and Framework Programme).

Main Green Cars activities:
· **Products:** Full chassis subframes - Mobile parts (doors…) - Axles.
· **Lightening Materials:** UHSS Steels - Aluminium - Magnesium.
· **Advanced Technologies:** Patchwork - Hydroforming · Hot Stamping - Roll forming - Laser Welding.
· **European Projects (Framework Programme, ECSC, Eureka):** New materials (UHSS Steel, Aluminium, Magnesium) for Low Weight Vehicles; New technologies (Hydroforming, Remote Laser Welding, Local Heat Treatments) to reduce the weight of components.

GMV

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Organisation profile

GMV is a privately owned technological business group with an international presence which offers its solutions, services and products in very diverse sectors: Aeronautics, Banking and Finances, Space, Defence, Health, Security, Transportation, Telecommunications, and Information Technology for Public Administration and large corporations.
GMV is involved in the design, development, manufacturing and commercialization of on-board telematic applications, most noticeably GPS-based fleet localization and management systems. GMV provides Intelligent Transportation Systems (ITS), offering turnkey solutions and getting involved in complete project development, from analysis, design, installation and completion, including the development of proprietary hardware and software. The solutions provided by GMV include from GNSS alone applications up to hybridization with other sensors, integrating satellite navigation, mobile communications, tracking and control centers and user information for different modes of transportation (road, maritime, rail).
Additionally, GMV has participated in different R&D Projects in the national and international context, including FP5, FP6 and FP7 programmes and Profit, Avanza I+D, CENIT and other national and regional programmes. Some reference R&D projects are directly related with the development of solutions for ITS, cooperative systems (including V2V and V2I solutions) and the application of ICT to the road sector applications in general.
GMV is member of different associations and groups (AEC - Asociación Española de la Carretera-ITS España) or international (ERF - European Union, Road Federation-, IALA AISM - International Association of Marine Aids to Navigation and Lighthouse Authorities-).

Main Green Cars activities: Products and Projects

GMV works on different research activities related with Green Cars (and with green driving in general):
· Development of telematics services supporting green cars and green driving: Fleet management, Pay-As-You-Drive schemes, Road User Charging, eCall, bCall and breakdown assistance, Stolen Vehicle Tracking and recovery, traffic information provisio ning, eco-driving etc.). Some reference projects include GIROADS, MENTORE, GINA, MORYNE and solutions developed for customers in the private sector (management of electric cars service available in Madrid and Barcelona airports and others).
· Development of Onboard Equipment for different purposes (telematics ECUs), including the different telematics services, mentioned above.
· Co-operative Systems (V2V, V2I): provisioning of in-vehicle solutions and Service Centers for applications involving the interaction between vehicles and between the vehicle and the infrastructure in order to achieve a safer, more efficient, secure, sustainable and cleaner road transportation (as in projects such as MARTA, OASIS, REPOSIT or others). Participation in trials related with congestion (and pollution) control, eco-taxes, eurovignette and road charging (e.g. CLoCCS (Central London Congestion Charging Scheme), ABvM in the Netherlands ARENA in Sweden).

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Organisation profile

Our vision is to be a full service electronics company, specializing in customized solutions for customers, involving product design, prototyping, testing and manufacturing to our target segments.

Our mission is to develop and produce high-quality, cost-effective systems that deliver a real high value solution to our customers.

We are working, day by day, to improve our slogan: "Electronic Smart Solutions".

Main Green Cars activities: Products and Projects

HC Energia-Temper-GAM agreement: In order to meet the objectives laid down by the Ministry of Industry and bearing in mind the international commitment to tackle climate change, HC Energía, the Temper Group and GAM, have signed in 2010 an business agreement which sets out the working guidelines needed to offer a complete infrastructure in Asturias to enable the common, everyday use of electric cars in the medium and long term. The agreement establishes several lines of action, being the most relevant the definition and implementation of a plan to install public access charging points, with the support of Local Administrations.

LivingCAR project: A living lab for studying the effect of using electrical vehicles and their related infrastructure in a real life environment. The main objective of this initiative is to run a "living lab" based on the utilization of electrical vehicles in a real city such as Gijón (Asturias) and involving the users in the research, development and innovation processes.

Here, the living lab is understood as a real scenario for extracting crucial information about:

· Technical issues: To identify bottle-necks from the technical point of view when using electrical vehicles in real-life settings, measuring the real impact.
· Social issues: To identify the social barriers of using electrical vehicles by "current people" by extracting data from a set of live experiments with users, evaluating their perception.

CITYELEC project: EVs R&D national project with 30 partners involved in different industries and stakeholders concerned with EVs (utilities, car component manufacturers, parking facility managers, electrical equipment manufacturers, research institutions and local authorities). Among its main goals are the development of new urban mobility systems, the integration of these systems with energy infrastructures and the deployment of a large scale test of electrical vehicles.

HC Energía

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Organisation profile

HC Energía, a Spanish company within the Edp Group, is an integrated company leader in generation, distribution and commercialisation of electricity and gas in Asturias. In Spain, the Group has a portfolio of 1.4 million electricity and gas customers and over 270,000 maintenance services, with generation activity in Asturias, Navarre and Castile-La Mancha, as well as its own electricity and/or gas distribution networks in Aragon, Asturias, Cantabria, Castile-Leon, Catalonia, the Community of Valencia, Extremadura, Madrid, Murcia, Navarre and the Basque Country.

Across its presence in other companies, like Naturgas Energía and Edp Renováveis, HC Energía also takes part in the development of other areas of the energy field, such as gas and renewable energies, putting a clear emphasis on diversification, growth and sustainable development.

HC Energía has several projects in the Smart Grids area, like Denise, a Research consortium to develop the new Spanish intelligent Grid. The company also leads one of the five subprojects of REDES 2025, the biggest Smart Grid project in Spain fostered by the Spanish Technological Platform Futured.

Main Green Cars activities: Products and Projects

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Organisation profile

Helios Engineering is a small company fully dedicated to R&D in Power Electronics, mainly for advanced vehicles (electric, hybrid, Fuel-cell).

Our staff has up to 9 years of experience in projects with some of the main world-wide carmakers with a wide knowledge in suitable technologies and solutions and international regulations.

Main Green Cars activities: Products and Projects

Some of our activities have been:
· 4 kW DC/DC Converter for Fuel-Cell Vehicle
· 2.5 kW Bidirectional DC/DC Converter for Hybrid Vehicle
· 4 kW Li-ion Battery Charger for Electrical vehicle
· 200W DC/AC Inverter for vehicle accessory
· 12 kW machine driver for SSG in a hybrid vehicle

HISPANO CARROCERA

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Organisation profile

With headquarters in Zaragoza, Spain, Hispano is one of the largest manufacturers of bus and coach bodies in Europe and North Africa. With production facilities in Spain and Morocco, we design, develop, produce and commercialize passenger transport solutions in collaboration with the most important chassis manufacturers. The solid alliances achieved with them are the central formula to guarantee the maximum value possible for our customers, the Transport Operators and hence, their passengers.

Our broad product portfolio includes urban and suburban buses, intercity and touring coaches, and a comprehensive range of bodywork services. Hispano's vehicles are moving people in more than 60 countries all over the world. Inspired by the changing nature and diversity of every individual market's needs, Hispano pioneers two distinct routes: solutions that provide superior economic results for transport companies and OEMs as well as open and long-term relationships supported by a personal basis operation at all levels of the company.

Hispano Zaragoza facilities cover more than 112,000 sqm. (40.000 sqm. built-up), and have a production capacity of more than 2,000 units a year. Both the office and assembly buildings are amongst the most modern in Europe. Hispano Casablanca has moved its activities to a new 10.000 spm plant located in the outskirts of the economic capital of Morocco. The most complete equipment will place this plant as one of the most competitive facility in North Africa. This reflects the expansion project and the continuous improvement of the company.

Main Green Cars activities: Products and Projects

ACE EV MODEL: Electric Mini pick up. Conversion into the electric version at Hispano´s manufacturing plants of the diesel version from TATA Motors. Political and social environment is placing increasing pressure on vehicle manufacturers to lower their emissions. Consumer pressure to shop green is also at an all time high. The ACE EV electric vehicle is an effort from TATA motors and Hispano to accomplish the most demanding requirements for environmental care, offering an extremely functional vehicle aimed to different kinds of businesses. The ACE is a small vehicle that opens up big opportunities. Ideal for short, narrow roads as well as long highway hauls, for small bulky loads and large heavy ones, the ACE is an innovative 4-wheeler model which assures zero emissions, zero noise pollution, low maintenance and easy to recharge. Big on technology, small in size.

GULLIVER MODEL electric version: Distribution in the Spanish market and aftersales service in Spain. The production of this model is produced in Italy by the company Tecnobus, and nowadays, you can find more than 450 units worldwide as part as the urban transport sector. This model has sold in Spain around 40 units and is also present in Italy, UK, Portugal, France, Canada and Norway. Also in European cities such as Rome, Naples, Bordeaux and also Liverpool.

Other projects: Hybrid Urban Bus and a Hydrogen version of the mini pick up ACE.

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Organisation profile

Iberdrola Distribution is a DSO covering approximately 40% of the Distribution Networks in Spain. It is wholly owned by Iberdrola S.A., who is Spain's number one energy group, one of the five largest electricity companies in the world and a world leader in wind power. It employs 33,000 people in more than 40 countries. Some of the major companies owned are Scottish Power (UK) and Energy East (USA).

Main Green Cars activities: Products and Projects

The first activity of Iberdrola in the EV field took place in the 90's with the development of a BEV named ZEUS, together with charging systems. The world decline of EV activity at the time made Iberdrola freeze those initiatives. Iberdrola is now strongly interested in EV, considering them a new paradigm in transportation that will bring significant benefits to society.

Iberdrola is preparing for the massive advent of EVs, for what it has initiated activities such as participation in standardization groups (Berlin de facto group, IEC, EPRI in USA); member of the Eurelectric EV task force and a number of pilot projects for EV testing, mostly in the territories where it holds Distribution. Some of the most significant projects are:

VERDE: National Cenit Project with SEAT, Spanish car manufacturer. The main goals are to deal with an efficient use of energy transport, design control and safety strategies to recharge EVs, and do research about batteries intelligent infrastructures, electric motors, and connect it with the Smart Electrical Grids.
MERGE: EU FP7 project, 20 partners: Development of a methodology consisting of a management and evaluation suite that consists of methods and programs of modelling, analysis, and optimization of electric networks into which electric vehicles and their charging infrastructure is integrated.
EPV: Regional Project, financed by Valencian Government and the European Regional Development Fund. The objective of the project is the development of a new efficient transport system based on electric and hybrid vehicles, integrated on the grid and with high renewable energies integration.
MOVELE: EVs demonstration project launched by the national Government. IBERDROLA works hand by hand with the Councils defining the requirements and the specifications of these recharging points.

The main interest of Iberdrola Distribution is the integration of EV in the current networks, by applying SmartGrids concepts to the control of the charge of EVs, in order to maximize the number of EVs to be hosted in their networks (minimizing the costs incurred by EV), and also to help the penetration of renewable energy, mostly wind energy.

Iberdrola is member of the Advisory Committee of the EU SmartGrids initiative, and also a member of European SmartGrids Industrial initiatives, and carries out big projects in the area such as the FP6 and FP7 projects FENIX, ADDRESS and OPENMETER.

IDOM, Ingeniería y Arquitectura

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Organisation profile

IDOM is one of the leading companies in the Spanish market for professional services in Engineering, Architecture and Consulting.

For almost half a century, with more than 5,000 satisfied clients, participation in 13,000 projects on four continents, IDOM has been able to maintain its independence from any economic or vested interests.

IDOM has distinctive strengths for undertaking multidisciplinary and complex projects, though this does not prevent the company from undertaking small projects. For IDOM, all projects are equally important, as the raison d'être of the Company is the Client and his requirements, regardless of the size of these requirements.

Technological innovation, understood as the conversion of knowledge into the improvement or creation of new services, products or processes, is aimed towards the improvement of internal processes and the application of new technologies to the clients' products and processes.

IDOM provides its national and international customers with specialised technical counseling for the planning, design, installation, start-up, development and maintenance of installations, transport services and operations designed for the transport of passengers and goods. In its projects, IDOM uses the latest technologies in Geographical Information Systems, modeling (software VISUM) and simulation (software AIMSUN NG) of transport.

Main Green Cars activities: Products and Projects

Project EPV: New Efficient Urban Transport Power System based on the use of Electrical Vehicles integrated in the grid and powered by renewable energies. We take care to analyze the mobility patterns of users profiles and their electrical needs recharged.

Urban Mobility Plans: Strategic planning of urban transport to improve transport efficiency and the quality of life of citizens. The diversification of the energy transport plays an important role in planning for urban mobility. In this scenario green cars have a major role.

INGE-INNOVA

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Organisation profile

One of Europe's leading engineering firms, INGEINNOVA works principally in and for cutting edge sectors like the automotive industry and renewable energy sources. The firm specializes in the design and development of production processes, lay-out, work stations and line start-ups. Clients include the leading players linked to these industries (car and vehicle makers, providers, institutions, etc.).

INGEINNOVA has three lines of services. Strategic: Design and development of production systems and processes; and Implantation, monitoring and/or control. Tactical: Process Planning; and Lay-out design and development; Operational: OFF-LINE station design and development; and Line installation and start-up.

INGEINNOVA´s specific activities in Automotive industry: Pre-industrialization reports. Draft projects / Preparation of measure control books and specifications / Design of production processes / Planning report on demand-related production / Design and development of the means of production / Implementation and turnkey delivery.

INGEINNOVA's policy of going where its clients go enables it to work in various markets: Europe, Latin America and Asia (China, India). Main clients are car makers like: Daimler (Vitoria), Volkswagen Corporation (Shanghai, Barcelona), PSA Group (Vigo), Renault (Valladolid)?, Iveco (Valladolid)?. Plus first and second tier providers: Michelin (Lasarte), CIE Automotive (GALFOR, NORMA, PLASTY-CHEQUIA), GESTAMP (Automocion I, Potsdam), SINTEX (Engineering), ThyssenKrupp (Bilstein, Sofedit).

Main Green Cars activities: Products and Projects

INGEINNOVA combines product and production development with on-site construction in a valueadded process. The company adapts its developments permanently to the restrictions and requirements of production. INGEINNOVA also offers all the services parallel to development found throughout the valueadded chain, from planning and design to the "digital factory", from control and steering technologies and robotics to technical documentation and safety services.

Also, INGEINNOVA is developing these new capabilities related to Green Cars Technology:

· Control methods and strategies related to different architectures
· Advanced electric vehicle concepts.
· Business models.
· Smart & flexible manufacturing for cost efficiency, performance and robustness (automation, decentralised controls).
· Modelling and virtual engineering.
· Flexible production processes for customised products and small series.
· Efficiency and energy use in manufacturing processes.

INGETEAM ENERGY

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Organisation profile

Ingeteam Energy is the company dedicated to the supply and development of equipment for the Renewable Energies sector inside the group Ingeteam, more specifically focused on the wind, photovoltaic, thermo-solar, hydropower, biomass and biofuels fields. Its main activity is the design and manufacturing of power converters, electric generators and control equipment, including the supply of integral solutions for electric generation plants of renewable nature.

Ingeteam Energy head office is based in Sarriguren Technology Park, in Navarre, a leading region in the use of clean energies. The company is integrated also by several foreign offices in Mexico (Ingeteam Monterrey), Italia (Ingeteam Srl.), USA (Ingeteam Inc.), China (Ingeteam Shanghai), Germany (Ingeteam GmbH) and Brasil (Ingeteam Ltda).

The workforce of the Ingeteam group comprises more than 3500 professionals, 9% of which are dedicated to R&D, a key asset to Ingeteam. In the case of the Renewable Energies division, 37% of personnel is engaged in R&D activities.

The sales revenues of the whole group reached 715 Mio Euro in 2008 (444 Mio Euro coming from the renewable energies division), a significant increase of 38% compared with the sales revenues achieved in 2007, continuing the steady growth of the last years.

Main Green Cars activities: Products and Projects

Ingeteam Energy is positioning itself as a charging infrastructure provider for electric vehicles. Its products comprehends both "slow" charging stations, based on a.c. 220/380 Volts (1 phase or 3 phase) but also "fast" charging stations (d.c. systems up to 100 kW) for all kind of electric vehicles (passenger cars, trucks, buses…).

The technology available in the group Ingeteam, specifically the power and control electronics, can also be adapted to specific applications for the use of clean energies and the save of fossil fuels in heavy duty vehicles.

INTEGRAL PARK SYSTEMS (IPS)

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Organisation profile

IPS is a company within the manufacturing, supply, assembly and maintenance, of the mechanical parking systems industry. Since its establishment IPS has open up this market in Spain working on several fronts: diffusion actions to make the product known to public administrations, private real-state developers, technicians and prescribers; collaboration actions with the public administrations regarding town-planning regulations for this specific parking technology; and very intense commercial actions that have made and are making possible many mechanical parking systems installations in Spain.
IPS was founded with the goal of contributing with technological solutions to the quality improvement of our cities and therefore its inhabitants. With expertise in: architectural and urban planning, especially in the rehabilitation of the historical areas of central districts, in advanced engineering and in real-state consultancy, IPS helps to solve a serious and wide spread problem in our cities: the lack of parking space and the consequently problem of public space low quality and defective mobility in our cities.
IPS is the only company operating in Spain that includes a multidisciplinary team, capable of developing "turn-key" projects and products by carrying out: real state consultancy engineering services, management of urban development, legal services, economic and financial viability project studies, director plan developments and maintenance of the parking systems installed. All of these activities guarantee the success of our installations.

Main Green Cars activities: Products and Projects

IPS makes studies and projects, manufactures, supplies, assembles, and carries out the maintenance of mechanic parking systems. Mechanical parking technologies are solutions based on space compacting and partial or total parking process automation. We offer two different kinds of systems: automated and semi-automated. The automated parking systems are mechanic storage systems for vehicles, managed by a programmable logic controller unit. This means that the car will be parked automatically into a car rack, car tower, or parking tower. The driver leaves the car in the transfer parking area, and the system carries out the parking procedure without the user's intervention. The semi-automated systems are equipped with partially mechanic systems. The access to the parking is done by conventional means, and the user parks his car always in his own parking place. Inside, the system is capable to store the car in two or more parking rows, by shifting and arranging the parking platforms. Besides the space compaction, these mechanic parking solutions also allow the great reduction on: energy consumption, emissions and waste along de life-cycle of the parking systems (manufacture, transport, assembly, operation and maintenance).
IPS does not install any single system without having a locally established maintenance structure capable of guaranteeing the proper functioning of every mechanical parking system. IPS counts with a strong R&D and innovation department which makes research on solutions to improve mobility thus reducing parking space problems in the cities.

IRIZAR S. Coop.

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Organisation profile

Irizar S. Coop. is the largest Spanish bus and coach body builder and among the 4 biggest in Europe. It has production plants in Spain (HQ), China, Brazil, Mexico, Marocco, India and Southafrica. In 2008 turnover was 485 Mio Euro, 4.250 units were produced with 3.200 employees.

Hispacold is the climate system company belonging to IRIZAR Group.

Masats is a pneumatic and electrical door and wheelchair lift company belonging to IRIZAR Group.

Main Green Cars activities: Products and Projects

· Development of completely integrated buses and coaches with own designed powertrain using the most innovative technologies.

· Next step: Monocoque city buses with hybrid technologies. Development project.

ISDEFE - Ingeniería de Sistemas para la Defensa de España

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Organisation profile

Isdefe (Ingeniería de Sistemas para la Defensa de España- Systems Engineering for the Defence of Spain) is a state owned company founded in 1985, through an agreement by the Council of Ministers, with the objective of providing technical engineering support and consulting services for advanced technologies in the Defence and Civil sectors.
Since its inception, Isdefe has proved to be the perfect supporter and ally in national and multinational programmes for Government agencies and organisations, especially for the Defence Ministry and the Spanish Armed Forces, as well as for other civil and military organisations of the European Community, NATO, and other pan-European and international public agencies.
Isdefe has wide experience in European Projects and its team proving it through their participation in over 30 funded projects from FP6 and FP7 programmes.

Main Green Cars activities: Products and Projects

· **Simulation.** Modelling of logistic networks and capacity studies in transport nodes, for instance **MICA** project **(Integrated Capacity Model)**.
· **Economy Business** (Cost Benefit Analysis). For instance, within the E-OCVM (European Concept Validation Methodology).
· **Safety Assessment Processes and Safety Assessment Methods.**
Projects:
COUNTERACT. COUNTERACT is a European research project funded under the 6FP by the Directorate-General for Transport and Energy of the European Commission. The main objective is to improve security against terrorist attacks aimed at public passenger transport, intermodal freight transport and energy production and transmission infrastructure.
EUMASS: The EUMASS Project aims at developing an innovative solution for risk assessment and management in Mass-transit System security applications, as part of the EPCIP.
MIP-MaDe: This project focuses in protecting critical infrastructure buildings by developing: an evaluation vital areas, an effective modelling tool for structure design able to increase the building resistance to blasts (predictive): including as a solution both, active and passive systems.
PERSEO (Platform for the performances assessment in the Spanish ATM System): The objective of this project is to provide a tool to support the effective decision making in the Spanish Air Traffic Management System. The tool will forecast the evolution of key ATM Performance Indicators by integrating data from a wide range of sources (CFMU, Slot allocation, meteorological data, Spanish ATM system SACTA...).
SAM CBA: This project provides the SMD of EUROCONTROL with a systematic approach to integrate the information derived from the Safety Assessment steps (as defined in Safety Assessment Methodology or SAM) in the EUROCONTROL Cost.
Benefit Analysis Model. The study refers to the costs and benefits obtained by performing a Safety Assessment of an Operational Concept (OC) or an Operational Improvement (OI).

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Organisation profile

KYB Steering Spain S.A. is a Company of KYB Corporation, which is located in Japan. KYB is a major supplier of Steering System for vehicle in the world, and 5 plants, including Spanish Plant, are producing steering system for car manufacturers. 1.8 million pumps/year are produced in Spain.

Currently, KYB group has products of Power Steering Pump, Power Steering Gear and Electric Power Steering System, and KYB Steering Spain S.A. is supplying power steering pumps for VW, Porsche, Bentley, Porsche, AUDI, SEAT, Daimler, Saab, OPEL, GM and Ford.

Main Green Cars activities: Products and Projects

EPS (Electric Power Steering)
Advantage of EPS: Suitable Steering System for Electric Vehicle, Low Energy Consumption.
Current Production: Pinion Type EPS for Electric Vehicle (Mitsubishi i-MiEV) and Pinion Type EPS for Passenger Vehicle, for Lower Energy Consumption.

Current Projects:
· Pinion Type EPS for Electric Vehicle with Steer-by-Wire System: Active Steering System.
· Belt Drive Type EPS with Higher Performance: Lower Energy Consumption with Larger Vehicle and Active Steering Control with ITS and Automatic Parking System.

LEAR Corporation

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Organisation profile

Lear Corporation is one of the world's leading suppliers of automotive seating systems, electrical distribution systems and electronic products. The Company's world-class products are designed, engineered and manufactured by a diverse team of 80,000 employees at 210 facilities in 36 countries. Lear's headquarters are in Southfield, Michigan, and Lear is traded on the New York Stock Exchange under the symbol [LEA].

The Electrical and Electronic Division (EED), employs more than 29,000 people with 29 facilities located in 17 countries worldwide. In Europe as full-service Tier 1 supplier has complete design, engineering, testing and manufacturing capabilities. The division is certified with the following Quality Standards: QS 9000, ISO 9001, ISO 14001 and TS 16949.

The Spanish Technological Centre located in Valls (Tarragona, Spain), takes responsibilities in advanced engineering and research and new product development, especially in the new Power Electronics Components for EV/HEV (Green Car activities).

Main Green Cars activities: Products and Projects

Power Electronics: DC/DC Converters, DC/AC Inverters, Battery chargers, Voltage Quality modules, Battery Electronics & Battery monitoring, Electrical Vehicle Supply equipments.

Control Systems: Energy Management Systems, Gateways and Body control systems, Vehicle communications and also communications with the smart grid.

Power Distribution: Power high Voltages Junction boxes with fuses, relays and disconnect systems, Power Wire Harnesses, High power Terminals and Connectors.

Electrical & Electronic Distribution Systems (EEDS) Low Voltage Systems: Passive and smart Junction Boxes, body electronics with communications, Wire harnesses, Terminal and Connectors, Wireless Systems, Lighting Electronics, Infotainment Systems.

MONDRAGÓN Automoción

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www.mondragoncorporation.com/ing/estructura/automocion.html

Contact

Mikel Uribe-Altuna
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Organisation profile

Mondragón Automoción is a group of companies supplying the world's main automotive manufacturers and Tier 1 companies. We collaborate with clients at the design and development, manufacturing and supply stages in these two main activities:

Modules and Components: Development of products ranging from components to automotive modules using iron and aluminium casting and plastic injection technologies. Companies: FAGOR Ederlan Group, Mapsa, Ecenarro, MAIER Group, Cikautxo, FPK, Batz Sistemas.
Machinery and Tools: Design, production and start-up of automation solutions such as stamping, tool and die manufacturing systems including Turnkey projects. Companies: Matrici, Batz Troquelería, MB Sistemas, Aurrenak, Loramendi and Fagor Arrasate.

We have financial backing from Mondragón (MCC) to undertake new investment projects and activities to support our customers. MCC is a business group made of 264 companies and entities organised in three sectorial areas: Financial, Industrial and Distribution, together with the Research and Training sectors. Together we have been able to transform ourselves into the leading Industrial Area in the Basque Country and 7th in the ranking in Spain, with sales of 13,266 Mio Euros in its Industrial and Distribution activities, 12,332 Mio Euros of administered assets in its Financial activity and a total workforce of 92,773 in 2008 (www.mcc.es/ing/index.asp).

Main Green Cars activities: Products and Projects

Mondragón Automoción is developing one relevant plurianual project in the electric car area, developing strategies for the electric car and for their new electrical components.

Mondragón Automoción successfully transforms technological advances into new products and processes. It owns 3 Technology Centres with the know-how to identify the clients' requirements and the capacity to offer solutions. All our staff has continuous education keeping them abreast of any new emerging technologies.
· EDERTEK Chassis/Powertrain Technology Centre specialised in engineering and research and industrial testing and prototyping using different technologies (IMA).
· MTC Technology Centre specialised in plastic technologies for the automotive sector, and developing decorative finishes associated with these technologies.
· KONIKER Technology Centre specialised in Forming and Assembly technologies.
Mondragón Automoción collaborates with clients at the design and development stages, producing and supplying a full range of components, modules, machinery and tools. It has a growing world presence and its main level of activities is innovation and development.
· Internal cooperation between the companies' engineering departments and our own technology centres: Edertek, MTC and Koniker.
· External cooperation between our own technology centres and other technology centres, universities, clients and suppliers.

MONTESOL Energías Renovables

Address

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www.montesolenergia.es

Contact

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Monitoring systems manager
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Organisation profile

Montesol Energías Renovables, is a fast growing solar company specialized in solar photovoltaic installations with four main action areas: legalization, promotion, installation and maintenance.

We are a multidisciplinary team of highly qualified professionals including engineers, lawyers, economists and installers. We provide solutions adapted to the particular needs of each client.

Through the Energy Technological Institute of Valencia all the processes of assembly and maintenance of Photovoltaic installations are certified.

Montesol has developed **Sonnesoft** system, an award winning product at Egética Energy Fair in 2008, for the monitoring of photovoltaic plants, which ensures the availability of the facilities and maximizes energy generation. Sonnesoft monitoring engine also can be applied in other scopes like Efficiency in energy use and management of public lightning systems.

Main Green Cars activities: Products and Projects

Project EPV: New Efficient Urban Transport Power System based on the use of Electrical Vehicles integrated in the grid and powered by renewable energies.

MOVUS - MOVILIDAD URBANA SOSTENIBLE

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www.movus.es

Contact

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Organisation profile

Movilidad Urbana Sostenible S.L. (Movus) is a new company founded with the goal of bringing new solutions to the urban mobility in order to help to achieve more sustainable mobility ratios.

The company's budgets are new approaches to mobility that can generate real alternatives to the private car, looking forward a more environmental, social and economic sustainable mobility.

Movus is focused on the research and development of new mobility solutions. In fact, the present market offers few solutions, usually with insufficient information and appropriate applications. This is the case of some modern systems like bike-sharing, car-pooling, car-sharing, electric vehicles, public transportation with services based on demand, etc.

Movus attempt to cover the complete process, from the idea, study and experimentation to the implementation on the street.

Since Movus was founded in 2008, it has been working on innovative projects for urban mobility, attempting to integrate electric vehicles as a real alternative of transport in our in cities. Movus is working also in other projects related with sustainable mobility as public bicycle systems, a carpooling for an industrial zone and an initiative transport on demand.

Movus offers a prepared work team, mainly civil engineering. The whole integration between personal and professional ways of acting is the key of Movus' success.

Main Green Cars activities: Products and Projects

Since 2008, Movus is working on the project entitled "Pilot experience with electric car-sharing in the city of Sagunto (e-sharing)" whose purpose is the definition and implementation of an innovative mode of transport, alternative vehicle, car sharing by using completely electric vehicles with the ability to recharge in fixed bases in the urban environment.

The e-Sharing project will develop a final product to move things and people in urban areas of small and medium size. The project raises two basic ideas: car-sharing and electric vehicles. The revolutionary system way is the location of fixed stations on the street used to park vehicles and to recharge them.

The car-sharing contribute to sustainable mobility being more sensitive with the limited resources such as fuel, air and space. Electric vehicles save energy, can use new forms of renewable energy and reduce pollution and noise in the city.

e- Sharing provides the technical analysis to combine the advantages of both systems, offering a new mobility system open, accessible, convenient, economical and ecological. It will be demonstrated the use of electric vehicles in urban travel by combining the rules established in recharge and discharge in real time, through the telemonitoring, with special emphasis on autonomy and availability of vehicles.

NAGARES

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Contact

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Organisation profile

Medium size company with 40 years of experience within the automotive market. We have our own R&D center with 25 engineers, researching for electronic solutions to be applied in the power management electronics. We are able to research, design and validate all the products (SW - CAN, LIN, PWM, FM, etc…), HW, mechatronics and connections elements for standard or tailored products demanded by our customers. Additionally, we can manufacture it all as we have SMT lines, clean room for thick film hybrid circuit production, metal stamping, plastic injection and over moulding and final assembling lines. All that is made under a only-250-employees-company, so we can be very flexible and fast in any development phase.

Main Green Cars activities: Products and Projects

· High voltage PTC electrical heater regulator (for HVAC systems).
· On board battery chargers for pure electric car plus plug-in hybrid cars.
· Battery management electronic and electro mechanical systems.
· Fuel cell voltage monitoring electronic systems for Hydrogen cars.

Today we are specialized in power electronics within the current car technology. We are investing lots of resources to increase our capabilities to become also specialist in power electronics within the new car generation: green cars using high voltage.

NETC-NMISA (Nissan Technical Centre Europe-Spain)

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Contact

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Organisation profile

Nissan is one of the world's leading cars manufacturing sensitive and oriented not only to clean vehicles. See NISSAN Green Program web for details. NTCE-NMISA as R&D Centre is involved on several Global Programs with global responsibility for Power Train development for Diesel.

Main activities are Project management, Design and Development of vehicle parts and systems, Prototypes manufacturing and Test.
http://www.nissan-global.com/EN/ENVIRONMENT/GREENPROGRAM_2010/

Main Green Cars activities: Products and Projects

· Several Programs to improve CO_2 and emissions reduction are leading from NTCE-NMISA.
· NTCE-NMISA as member of R&D NISSAN Global Development Centres is involved in several Programs regarding EV development cars.

· As sample Leaf vehicle as first zero emission vehicle, will be launch in Europe on FY10 is tested in NTCE-NMISA Barcelona.

NEW INFRARED Technologies (NIT)

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Contact

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Organisation profile

NIT is a 100% private capital. NIT was founded in September of 2005 with the aim of manufacturing and commercializing IR detectors with a high degree of innovation. On July of 2008, NIT was granted the licenses to commercially exploit the manufacture of VPD PbSe IR detectors. The owner of the patents is the Spanish Ministry of Defense.

The objective of NIT is to bring to the market IR detectors whit high performance features and low cost. The technological process to manufacture our detectors is unique and allows manufacturing 2D PbSe FPA sensors.

Added value of our products is based on:
· Real FPA detectors: 2D arrays capable of acquiring and showing images in MWIR.
· Uncooled detectors: Low-end systems oriented.
· Manufacturing process compatible with the manufacturing processes of CMOS semiconductor devices: Monolithic devices with ROIC integrated.
· IR photodetector devices: Very high speed of response, unparalleled in applications which require ultrafast detection.
· Low cost packaging technology: No need for vacuum packaging.
· Compatible with on-wafer fabrication of optically spectral selection filters: capable of spectral discrimination.

Main Green Cars activities: Products and Projects

Uncooled Infrared Imaging Detectors (FPAs) and cameras for low-power operation aimed to:

· Obstacle detection
· Collision avoidance Systems

PIHER - NACESA

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www.piher.net

Contact

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Organisation profile

Piher is a specialist manufacturer of high precision sensors and controls for use in industrial applications and Land Vehicle motion control and Appliance markets. Our products are typically employed for Powertrain control, Pedal position sensing, Height & suspension feedback, HVAC (Climate Control), AFL (Adaptive Front Lighting), Infotainment and Seat Memory & Heating in the Automotive industry and for Human Interface applications in the Consumer Electronics, Major Appliances, Power Tools and Industrial/Instrumentation markets.

Main Green Cars activities: Products and Projects

· Non-Contacting long life angle/position sensor
· Absolute Rotary Position Sensor
· Turn counter
· Throttle/EGR Valve and Gear Position Sensor
· Height & suspension Sensor
· Non-Contacting Potentiometer
· Float-Level Sensor
· Motor-shaft Position Sensor
· HVAC monitoring & control...o Lighting
· Switch panels
· Transmission
· Electronic pedals position sensors
· Power windows, roof

POWER ELECTRONICS

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Organisation profile

Power Electronics is the main Spanish manufacturer of Softstarters, Variable Speed Drives, Solar Inverters and custom power electronics devices.

The present and the strategic plan for the future, has converted to our company into the first alternative in power electronics in our market.

In Power Electronics we know that the time is an appreciated worth for those companies who have opted for the latest trends, for that reason, we support quality and new technologies investigation. But not only this, additionally we put at customer disposal our technical department, where expert engineers will advice you with a full pre and post - sale service.

Power Electronics has facilities with full capabilities for the design, manufacturing and testing of complete power electronic devices mainly including:
· Motor Soft-starters
· Variable speed drives
· Photo-voltaic solar inverters

These capabilities include the whole cycle:
· R&D and innovation
· Electric, electronic and mechanical design and manufacturing
· Software development
· Technical support

Main Green Cars activities: Products and Projects

· Project EPV: New Efficient Urban Transport Power System based on the use of Electrical Vehicles integrated in the grid and powered by renewable energies.

· Design and manufacturing of fast battery chargers for electric vehicle charging infrastructure.

PUIGJANER INDUSTRIES (DENN)

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Organisation profile

INDUSTRIAS PUIGJANER S.A. was established in BARCELONA in 1885, and holds the oldest machine tool manufacturing license in Spain. Currently the number of employees is 50 and the turnover 10 M €. Its sales area is worldwide and its main markets: Asia, USA and Europe.

INDUSTRIAS PUIGJANER S.A. supplies Metalforming machines by rotation process (Spinning, Flowforming ,Necking-in machines and forging). They also design and manufacture customized processes for cost optimization and weight reduction.

INDUSTRIAS PUIGJANER S.A supply to the automotive industry metal forming machines and complete processes for manufacturing:
· Alloy wheels
· Structure frames
· Pulleys
· Gear parts

Main Green Cars activities: Products and Projects

INDUSTRIAS PUIGJANER S.A develops manufacturing processes based on their incremental technologies Spinning, Flowforming ,Necking-in machines and forging for: alloy wheels, structure frames, pulleys and gear parts, with results of weight reduction and cost optimization (investment of the equipment and electrical consumption).

Relevant cooperation projects:
· Flexform 6th FP EU Project "Development of a flexible manufacturing process for the low series production of metal parts for custom and special vehicles".
· CENIT FORMA0 "New Metalforming processes and development of advanced materials for the transformation of high Mechanical Resistance Steels".
· CENIT eEe" Advanced Technologies for the Equipment and Manufacturing processes in 2015".
· Integrauto "Increase of the added value in automotive components though the integration of innovated processes".

RED ELÉCTRICA DE ESPAÑA

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Organisation profile

Red Eléctrica was the first company in the world dedicated exclusively to power transmission and the operation of electrical systems. A pioneer in its field, the company occupies a position of leadership today in these activities.

When it was created in 1985, it took over the transmission grid and the operation of the Spanish power system, well before the recent world-wide trend towards the segregation of activities, establishing transmission as a separate activity from generation and distribution. This marked a radical change in how the Spanish power sector operated and served as a model for other countries when liberalising their power sectors.

Act 17/2007 of 4 July amended the previous law to adapt it to European Directive 2003/54/CE which established the common guidelines for the internal power market. This law has resulted in the definitive consolidation of the **Red Eléctrica's TSO Model (Transmission System Operator)**. In this regard, Red Eléctrica, as the system operator, guarantees the continuity and security of the power supply and the proper coordination of the production and transmission system, performing its functions based on the principles of transparency, objectiveness and Independence. In addition, Red Eléctrica is the **manager of the transmission grid** and acts as the sole transmissioner on an exclusive basis.

Red Eléctrica is recognized world-wide as an efficient company that renders its services to the power sector and to society in a safe and reliable manner.

Main Green Cars activities: Products and Projects

The main activities of REE in the field of electrical vehicles are:
· Participation in R&D projects- Analysis in of the risks and opportunities for the System Operation.
· Development of a new regulatory framework adapted for a electrical system with high share of renewal energy sources.
· Time of use tariff design to discourage the connection of the EV to the grid during the peaks periods.
· Development of an intelligent recharge system adapted to the system operation needs.

REIVAJ Automotive Motors

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Organisation profile

REIVAJ automotive motors is a division inside REIVAJ devoted to the design and manufacture of electric drives for vehicles. Belonging to the Unites Technologies Corporation (UTC), REIVAJ is a leader in the traction electric motor technology and mass-volume manufacture.

· Leader in production: More than 45.000 traction motors manufactured per year
· Leader in technology: Top-end capabilities to design and develop application oriented motors to optimize critical performance aspects such as braking energy regeneration efficiency and battery size reduction.

Main Green Cars activities: Products and Projects

Products:
Electric traction motors
· Brushless Permanent Magnet motors.
· Induction motors.
· Multi-speed induction motors.

Projects:
Currently Reivaj is involved in two high level research and development projects.
· City-Elec: Advanced electric systems for the urban mobility.
· e-Car drive: Development of a new concept of integral electric drive for high efficiency electric car.

RENAULT España

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Organisation profile

Renault España is a branch of the Renault Group with two assembly plants (Valladolid & Palencia), one engines plant (Valladolid) and one gear-boxes plant (Seville) in Spain. Renault Spain counts for over 10% of the vehicle production of the Renault Group, 40% of the engines ant 30% of the gear-boxes. The company has also with engineering capacities (800 engineers and professionals) mainly in process engineering but also in product development with a special focus on engine. Renault Spain counts on all the back-up of the Renault Group engineering and R+D resources. Renault sells in Spain the brands Renault and Dacia. The total headcount is over 10.000 people.

As a branch of the Renault Group, Renault Spain is fully committed with the deployment of the Zero Emission Vehicles and works in narrow cooperation with the Spanish Government and other Authorities and organisations in the introduction of green mobility in Spain.

Main Green Cars activities: Products and Projects

Renault España will build in its plant of Valladolid the electric vehicle shown as Twizzy prototype at the Frankfurt Show 2009: a tandem two seats vehicle, 2,3 meters long, equipped with a Ion-Lithium battery that delivers a range of 100 km. Its fully electric engine delivers a 70 Nm torque. Production will start by mid 2011, the output foreseen is 20.000 units per year. The process enginee-ring will be fully developed by our local teams which also cooperate with the central teams in the final definition and suppliers' selection of the vehicle. The assembly of the battery will be made in Valladolid from modules coming from another plant.

SAFT Baterías

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www.safbatteries.com

Contact

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Organisation profile

SAFT Baterias SL, as subsidiary of the multinational SAFT, has as main activity the design, manufacturing and distribution of energy storage systems for different industrial sectors, including the automotive sector.

Main Green Cars activities: Products and Projects

Nowadays, SAFT is involved in several projects on hybrid vehicles, both with internal combustion engines and with fuel cells. It is worth to mention a hybrid vehicle for garbage collection (15 tons, with FCC) and a hybrid fuel cell wheel chair (Besel).

SAINT GOBAIN Cristalería

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Contact

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Organisation profile

Laminated and tempered Glass (windshields, backlights, rear quarter window, doors, roofs, etc).

Modular Glazing solutions on glass (preassembly of components, extrusion, injection plastic "encapsulation", soldering solutions….).

Logistic integration (JIT).
Full service supplier to car manufacturers.

Main Green Cars activities: Products and Projects

· To increase the value added of the products orientating them towards "clean transport", so that the vehicles which they join are more sustainable and need a minor energetic consumption simultaneously that reduce their emission of CO_2 and other gases.

· Some examples the Thermal, acoustic and modular portfolio: THERMOCONTROL® Absorbing, THERMOCONTROL® Venus, THERMOCONTROL® Reflecting, dBCONTROL®, TENNAFIT®, TPE Extrusion directly on glass.

SEAT

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Organisation profile

SEAT is a Spanish OEM that is integrated in the Volkswagen Group. Our core business is to develop, produce and sell cars in our markets, mainly in West Europe. Other markets are East Europe, Latin America, and some Mediterranean countries in Africa.

The products of our brand are design-oriented, sporty and lively and we are proud to have the youngest costumers in our branch. Our product range goes from small cars (A-class) like the SEAT Ibiza to large MPV's like the SEAT Alhambra. The most popular models are the SEAT Ibiza and the SEAT Leon (B-class) that are reference for design an sportiness in these classes.

Since many years we're very sensitive and oriented to clean cars. Additionally to the most efficient Diesel engines in the market, we added a new product line to our portfolio which is called "ecomotive" and which products perform the lowest CO_2 emissions within their classes. An example already on sale is the SEAT Ibiza ecomotive with an emission of 97g CO_2/km and a consumption of 3.8 l / 100km.

SEAT as a referent brand in Spain leads the change of the Spanish automotive branch to the clean cars technologies. This concerns not only the suppliers but also other fields like Engineering Services, Insurances, Recycling, after market technical services, and many others.

Main Green Cars activities: Products and Projects

SEAT is involved in some research projects concerning Plug-in Hybrid cars and Electrical cars. The main project is the so called "Twin Drive" project which is developed together with the Volkswagen Group. It's about the needed technologies to develop a Plug-in Hybrid car in the future. Additionally SEAT has also developed a prototype of a pure e-car to find out the Synergies between the both concepts (PHEV and EV).

Another ambitious project is the project "VERDE" developed in collaboration with companies like battery suppliers, e-machine suppliers, electronics and power electronics suppliers, but also energy and infrastructure companies. The main objective of this project is to find and research the issues needed to make Spain a friendly country for clean cars and a reliable production country for such cars.

SICE - Sociedad Ibérica de Construcciones Eléctricas

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Contact

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Organisation profile

SICE is a company founded in 1921, 100% belonging to the ACS-Dragados Group (the second largest construction group in Europe). SICE is a reference system integrator (one of the top three in Spain and a major actor worldwide) providing, technical consulting and auditing, basic and detail engineering; installation, operation and management of turn key solutions for the transport and environmental sector. It currently has about 2000 employees and 215 m€ turnover of which 30% from abroad. SICE, as Intelligent Transport Systems provider, is involved in more than 30 projects and 2,500 km of highway monitored and controlled by SICE in 15 years of activity in this market, including projects executed in Spain, Portugal, Chile, Australia, and Argentina. Representatives in PIARC Association and in Spanish Tunnel Committee.

SICE is a Spanish pioneering company that has developed and deployed numerous systems - more than 5,000 intersections and projects in 1,000 towns- that are intended to improve the control, management, and overall safety of urban traffic.

SICE has developed projects for public and private organizations, both at national and international level. SICE has deployed environmental control systems conceived to the centralization of management and monitoring of urban air quality through the air pollution measurement network of cities, at a national and an international level, thus knowing, forecasting and broadcasting at short periods of time the pollution levels in the city.

Main Green Cars activities: Products and Projects

SICE has a proven record of technical competence and managerial experience in international environments, including EU R&D projects including the coordination of e-PARKING, ADA and OPTIPARK as well as the former e-TEN project, TECAPSY, a car-pooling initiative that was awarded the "World Submit Business Award for Sustainable Development Partnerships" in the Johannesburg conference (2002) organised by UN and International Chamber of Commerce.
CATCH (www.carbonaware.eu/index.php?id=12): Development of a virtual information platform for choosing climate-friendly travel in the city, region and World of tomorrow (FP7, TPT 2009-2012).
OASIS (www.cenitoasis.es): Definition of the motorway of the future with significantly higher levels of safety, user service and sustainability of operation than currently. (CENIT 2008-2011).
GUIADE (www.sice.com/contenidos/referencias/ide/idi_001a13.html?sector=13): Automatic guidance for public transport vehicles through multimodal perception in order to improve efficiency (National R&D Plan and FEDER, Public-Private Transport and Infras-tructure Cooperation Projects Programme; 2009-2011).
DANTE(www.sice.com/contenidos/referencias/idi/idi_001a10.html?sector=13): Development and Applicationof New Technologies for integrated improvement of road safety and intersection design (National R&D Plan and FEDER, Public-Private Transport and Infrastructure Cooperation Projects Programme; 2009-2011.
OPTIPARK is a transactional web services platform that offers integral management of parking spaces, booking and payment (e-TEN 2005-207).

SIEMENS

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Organisation profile

Siemens AG (Berlin and Munich) is a global powerhouse in electronics and electrical engineering, operating in the industry, energy and healthcare sectors. The company has around 405,000 employees (in continuing operations) working to develop and manufacture products, design and install complex systems and projects, and tailor a wide range of solutions for individual requirements. For over 160 years, Siemens has stood for technical achievements, innovation, quality, reliability and internationality.

Siemens' operations are divided into three sectors: Industry, Energy and Healthcare.

Our further activities are handled by Siemens IT Solutions and Services and Siemens Financial Services GmbH. Equity Investments include BSH Bosch und Siemens Hausgeräte GmbH and Nokia Siemens Networks.

Main Green Cars activities: Products and Projects

The main interest of SIEMENS in e-cars activities are focused in the global strategy, inside e-car and outside e-car. Nowadays several projects are being developed in the company, with special interest in Smart-Grids, Electric Drive Traction (motor & inverter), Inductive Recharge Spot… as an example the VERDE project lead by SEAT.

Products: ELFA. ELFA combines mobile energy generators - such as diesel generator sets and fuel cells - with high-performance energy storage devices. These allow the energy that is released when braking to be harnessed and stored. Just the diesel-electric hybrid concept alone provides enormous advantages. With this concept, the diesel engine drives a generator. This supplies an electric traction motor with energy using state-of-the-art power electronics (drive converter).

TECNIBAT

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Contact

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Organisation profile

The company was founded with the clear objective of offering its clients a high quality service not only selecting and installing the most appropriate product but also in its after-sales service. In order to achieve this, TECNIBAT has local collaborators at the first level of assistance and its own technicians for further assistance.

Our independence from manufacturers gives us total freedom to choose the products with the best quality-price relationship in order to provide the most suitable technical solution for the client's requirements.

TECNIBAT focusses on industries that generate and supply electricity (nuclear, thermal, hydro-electric power, renewable energy); on petrochemical, ceramic, medical, marine, rail, airport, automobile and agrifood industries; on telecommunications companies; on engineering offices and electrical contractors and installers, and so on.

This interest in being at the forefront resulted in TECNIBAT receiving as early as 1997 the ISO 9000 quality certification granted by TÜV Management, that today guarantees not only its professional know-how but also its compromise with the environment, both socially and ecologically.

Main Green Cars activities: Products and Projects

· Project EPV: New Efficient Urban Transport Power System based on the use of Electrical Vehicles integrated in the grid and powered by renewable energies.
· Project IMPIVA 2010-2011: Power Electronics and Battery Management Systems (control and charge).
· Project: Enhancement of energy efficiency due to the use of HF chargers in motive power applications.
· Analysis of maintenance process management in battery charge stations for electrical vehicles, with resouce optimization and environmental friendly waste management.
· Technological modification of vehicles with internal-combustion engine to convert them in electrical vehicles.

TEKNIA Manufacturing Group

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Organisation profile

Teknia Manufacturing Group is a Spanish Family Owned Group, and we are manufacturers for automotive sector since 1992. We have some factories around the world (6 in Spain, 4 in Brazil, 3 in Poland, 1 in Czech Republic and Morocco, 1 Comercial Office in German and 1 Technological Center in Spain).

Teknia Manufacturing Group is organised in four branches:
· Plastic Division that includes six plastic injection factories located in Martos (Spain), Guadalajara (Spain), Rzeszow (Poland), Uhersky Brod (Czech Republic), Tangier Free Zone (Morocco) and Sao Paulo (Brazil).
· Machining Division, with 3 machining plants located in Barcelona (Spain), Vizcaya (Spain) and Sao Paulo (Brazil)
· Metallic Division, with 5 stamping and tube factories located in Sao Paulo (Brazil), Vizcaya (Spain), Kalisz (Poland), Zaragoza (Spain) and Guipuzcoa (Spain).
· R&D Division with a Technology Centre located in Martos (Spain).

Teknia R&D Division was created in 2010 and is located in Martos (Jaén), with 12 people, 8 of them in Martos, 2 in Germany and other 2 in the North of Spain. We want to improve our Know-How about technologies, Research and Development for new projects applied to automotive sector.

Main Green Cars activities: Products and Projects

· Some investigations about greencar and lightcar
· Investigation about fuel cells, and contact a specialist company like Röckerlipsa.
· Battery Charger Project with Lear for an electrical car.

TELEFÓNICA Investigación y Desarrollo

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Organisation profile

Telefónica Investigación y Desarrollo (TID) is the company of the Telefónica Group devoted to research, development and innovation. Established in 1988, nowadays it is the most important private company in Spain in terms of resources and staff devoted to R&D activities. Moreover, it is one of the major R&D players among European telcos in terms of participation in European-funded R&D projects.

Created in 2007 from in-house experience in Intelligent Transportation Systems (ITS), the Net-worked Vehicles Division is TID's R&D group devoted to designing and developing value-added services for connected vehicles. Our activities are grouped into Services, Communications and Demonstration. The Networked Vehicles Division has participated or is participating in over 10 public-funded projects in the European (FP6, FP7 and EUREKA) and Spanish arenas (PROFIT, CENIT and PSE) as well as industrial contracts with companies of the Telefónica Group. Moreover, we lead the Vehicular Networks (VENS) group of the Spanish eMOV technology platform (mobile communications) and are participating in several Spanish for a in the ITS field: the SERtec technology platform (automotive components), ITS España Association and eSafety Español. Finally, we have a number of publications in conferences and magazines, invited speeches and public demonstrations in ITS events.

Main Green Cars activities: Products and Projects

Telefónica I+D has four main researching lines in Green Cars' world (Green Telematics):

· **Communications supported EcoDriving:** Data Fusion of traffic information with ADAs information (with NavTeq, M. Marelli). M2M systems for Pay As You Drive/Pollute solutions. On board EcoIndicator (CVIS Project).
· **Communications support for Traffic Efficiency:** variable signalling (on board, COOPERS Project), Traffic & Parking information, optimal speed information.
· **Cooperative Systems (V2X):** vehicles, roadside units and telecommunication networks, cooperate for obtain and broadcast traffic information, in order to improve the safety and efficiency on the road.
· **Telematic support for electrical vehicles recharging:** in contact with electric companies, automotive industry platforms, and public-points telco operators, for developing an on board fast point-of-charge geolocation, and a overall managing system.

TEMPER Group

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Organisation profile

The Temper Group is formed by 13 companies specialized in design, manufacture, advisory services and distribution of product and services in the electrical, electronic and automation sectors for industrial and domestic facilities.

Our product offering covers a wide range of solutions, from home DIY to more complex industrial processes.

Our R&D and innovation was the first Spanish centre in the electrical sector to be awarded the AENOR R&D&i Management System Certificate, based on the UNE 166.002:2002 EX standard, under the ISO guidelines.

All our activities are guided by the Environmental Management System that was implemented based on the **ISO 14001** standard.

GETLAB, our laboratory of Electrical Calibration and R&D&i Core, is recognized in October 2007 as laboratory accreditation from the National Accreditation Subscribers (ENAC), to issue certificates of calibration in the field of electricity for DC and low frequency.

Main Green Cars activities: Products and Projects

CARdylet is the set of solutions proposed by the Grupo Temper to recharge electric vehicles comfortably and safely, both for the user, for the vehicle and the wiring. Cardylet was born after two years of research at the headquarters of R&D&i a tour from July 2009 to deploy facilities for recharging electric vehicles available on the market.

The range includes solutions for both external recharging (Urban) and individual or collective interior parkings (HOME), which are designed for easy installation, grid connection and maintenance. This large family provides, in addition to the recharge, protection of integrated battery systems in hybrid and electric vehicles and electrical connection to the rest, creating a bidirectional protection to ensure the integrity of both.

Also, the range is prepared and intended for the sharing of resources supported by a network of intelligent management of both users and infrastructure. This network, called "CARdynet" promotes the right of each individual control of the vehicles making up the fleet and global infrastructure.

LivingCAR project: A living lab for studying the effect of using electrical vehicles and their related infrastructure in a real life environment.

VELMUS IDI

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Organisation profile

VELMUS I+D+i, means: light electric vehicles for multiple uses, R & D. Velmus IDI, SL, works in research, development and innovation of mobility with light electric vehicles. Vehicles are used for personal or commercial urban transportation as well as leisure tourism. Its motto "innovation at the service of mobility" integrates industrial and commercial concepts. The newborn company capitalizes the legacy of more than 25 years of experience in working with the R&D, Industrial Design and Automotive Engineering; for multinational or SME, private or public sector, education and government organizations.

Velmus IDI, SL headquarters are at ESADECREAPOLIS Innovation Park. The company is known and has acquired reliability, after winning 2 prizes, exhibitions and media.

Velmus IDI presents a platform for intelligent and sustainable mobility of people, based upon 20 years invested in its research. This is easing the access to a growing market, and to unveil a new way of communication, for which the message contents consists in goods or people. Following years of experience in the vehicle industry and bodywork; his manager is inclined to growing together on an open collaboration basis by all actors in the electric vehicle sector.

The working concept prototype was exhibited at the following Auto Shows:
· 35th Barcelona International Motor Show held from 05/09/2009 to 05/17/2009 at the innovation exhibition stand supported by STA (Spanish Automotive Engineers Society).
· 1st Alternative Vehicle and Fuel Show held in Valladolid from 11/05/2009 to 11/07/2009.

Main Green Cars activities: Products and Projects

Three Wheeler Electric Scooter: eMoTria's ™: unique body styling and vehicle configuration flexibility, it is based on a new mobility concept. This electric vehicle, offers a quick battery pack change allowing 24/7 service. It got a Special Mention in the 7th Barcelona International Motor Show Awards for the Best Technological Developments in the Automotive Industry, Category: Complete vehicle, given its quick change system for its body configuration change and of its batteries. Easy driving, ergonomics and accessibility allow young people from 15 to 95 years old, ride it with ease, even for people using wheelchairs.

In 2008 he obtained a Genesis grant-ACC1Ó CIDEM (Government of Catalonia), based on the profile of technology-based company and its innovative project, to help bear the costs of the first prototype.

In early 2010 VELMUS IDI is engaged in the design and development of production level.

It also has under development a car share system for use by groups of people who need it in a specific district, some time in the day but not all day long (summer 2010).

VICUS Desarrollos Tecnológicos

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Organisation profile

VICUS DESARROLLOS TECNOLOGICOS S.L. (VICUSdt) is a technological, dynamic and innovating company, committed to research and technological development in the shipping, industrial and energy sectors.

The company was founded with the aim of creating our research team of personnel enabled to develop or to give support in all types of R+D+i projects.

Our research team is specialized in the analysis and design using the most up-to-date CAD-CAE tools.

The company has three main research lines at the moment:

· **Aerodynamic and Hydrodynamic Research:** Fluid dynamic design and analysis carried out with the most advanced simulation tools (CFD). We search for new and innovative systems with better energy efficiency.
· **Mechanical design, structural and thermal analysis:** Conceptual design, detail and manufacturing engineering. Finite element method simulation. Our research team guarantees optimised mechanical solutions.
· **Research on innovative electrical machines:** Developing new electrical machine concepts tailored to be used as motors or generators for special applications such as propulsion, wave energy devices and turbines. Several patents pending.

Main Green Cars activities: Products and Projects

· Special drive systems based on direct drive with permanent magnet motors. Designs suited to hard environments, water applications, etc…
· Fluid dynamics analysis with CFD tools.
· Hybrid propulsion systems.

ZIV Group

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Organisation profile

ZIV consists of a group of companies of Spanish ownership dedicated to the design, manufacture and market of "Digital Protection, Control, Metering and Communications Equipment/Systems" for electric power substations, HV and MV distribution networks and industrial applications".

Product and services catalog

· Digital Protection and Control equipment for Transmission, Distribution, Industrial Applications and Electric Power Machines.
· Digital Busbar and Circuit Breaker Protection equipment.
· Automatic Control.
· Multi-function and Multi-energy Digital Meters (classes 0.2S, 0.5S, 1 and 2).
· Meter Data Reading, Acquisition and Billing Software (ZIV-TPL, ZIVERLEC and ZIVERPAY).
· Automatic Meter Management (AMM).
· Wireless Networking for Industrial environment.
· Communication Modems for electrical and industrial environments (PSTN, GSM, GPRS, PLC and LAN).
· Substation Central Units.
· Communication and Configuration programs and Software tools (ZIVERCOM; ZIVERLOG, ZIVERTOOLS and some others).
· Protection, Control, Metering, Communication and Automation turn-key engineering projects.
· Equipment and engineering for data transmission through medium and high voltage power networks.
· Inductive and capacitive coupling devices (carrier injection).

Main Green Cars activities: Products and Projects

· EV energy re-charging infrastructure and management: metering, communications and recording.
· Automatic EV re-charging point monitoring.
· Power electronics associated to the energy charging management.

ZIV offers its participation in EV related projects providing our expertise in digital protection, control, measuring and communication equipment for power distribution networks.

ZIV has a broad experience in the management of energy distribution grids. From our experience, one of the main challenges of the advent of the Electric Vehicle is the impact on existing distribution grids. It must be minimized. It is also a huge opportunity in order to increase the efficiency of the grid, flatten the load profile, and increase the use of renewable energy.

Another important point is the utilization of local generation in order to cover local consumption originated by the EVs. Our participation in Fenix and Microgrids European projects gives us the vision that local managing entities should optimize the ratio of local generation/consumption. Also co-generation plants might be efficiently managed with this goal.

ZYTEL AUTOMOCIÓN

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Organisation profile

Zytel Automoción S.L. is a company based in Zaragoza (Spain) for the manufacture of motor vehicles (CNAE 34) in early 2008. It is specialized in the design and production of electric vehicles for multiple purposes and formed through the collaboration of three companies Zytech Solar SL, Aditral SL and Francecol Technology that comprise the group.

The objectives as brand are the design and research on electric vehicles using the development of advanced propulsion technologies and ultimately the production of vehicles with cleaner propulsion systems. It is developing three lines of action that could be: a first application of electric vehicles for logistics and industrial application in captive fleets, electric vehicles from the second transformation and renewal of vehicle fleets and to complete electrical special applications.

Our key differentiators are research design and architecture of electric vehicles with energy storage that optimize energy consumption. In addition to developing advanced traction technologies based on high efficiency motors, built especially for use in vehicles and automobiles and the development and manufacture of electronic control systems of power and energy management, high-performance multipurpose.

Our staff of engineers design vehicles for the customer, inform the customer if production is viable, and report alternative materials or designs that improve the vehicle and production. Our knowledge of the Chinese market tooling guarantees vehicle prices among the lowest in the world. Our service offers flexible options for vehicles, quick response and competitive prices always on time.

Main Green Cars activities: Products and Projects

Zytel Gorilla Zytel line begins with its original launch vehicle and avant-garde with the Gorilla, a car completely modular, capable of turning on in a three-door, a cabriolet, a spider or 2 seats, and even a pick-up.
Zytel City (ZYTY) the ZYTY is the model designed and prepared for daily urban use, economical and manageable. With its versatility and performance becomes ideal for everyday use of small displacements in urban environments.
Zytel Log (ZYLOG) the ZYLOG born with the desire to find a vehicle capable of providing solutions to the characteristics of the vehicles for captive fleets.
Depending on the needs of use, modularity allows to vary its performance. For example light goods transport, maintenance, security, tourism, assistance from other.
Zytel Park, our popular light electric vehicles, it is a vehicle that will install photovoltaic panels designed by the group Zytech they can be recharged even inplaces outside the grid. Hotels, resorts, Natural parks, entertainment centers, Zoo's are ideal environments where the Zytel Park can evolve.
Zytel Works, the most ambitious of our projects due to the required performance and conditions of use. The Zytel Works is a vehicle ready for jobs like cleaning, waste collection, transportation of goods among others.

AICIA

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Organisation profile

The Association for Research and Industrial Cooperation of Andalusia (AICIA) is a non-profit Research Center created in 1980. It is a member of the European Association of Research and Technology Organizations, FEDIT; founding member of the Andalusian Network of Technological Areas and of the Foundation for Aerospace Development of Andalusia. In 2006, AICIA was recognized as Center of Innovation and Technology (CIT) on both national and regional scale, and obtained the Management System Credential for R&D&Innovation according to the UNE 166002 EX standard.

In 2008 AICIA participated in 31 international projects and 110 engineering works, as well as carrying out numerous tests, analysis, studies and consultancies, courses and workshops. Amongst the international projects, various corresponding to the V, VI and VII Framework Program and others to the European Space Agency, stand out, basically in the areas of Information Technologies, Energy and Environment, Transport and Aeronautical Engineering.

AICIA is divided into several work Units. One of them is the Unit of Transportation Engineering which is integrated in the Faculty of Engineering, University of Seville. The activities of the Group are diversified in several fronts: educational, basic investigation, investigation in R&D project and support to companies. The major Research and Development Lines in which the Unit is working encompass i) Design and Simulation of Vehicles and Components (dynamics of industrial vehicles and variable continuous gearboxes); ii) ITS - Extraction of information from the CAN bus in conjunction with GNSS technologies iii) Transport and Traffic Modelling (traffic flow models, mobility models, Origin-Destination matrices and Discrete choice models). The Unit is formed by 12 proficient engineers who are poised to excel in the field. They participate in several inter-national projects and have published numerous papers in international journals.

Main Green Cars activities: Products and Projects

Research activities:
· Modelling, design, prototyping and testing of continuous variable transmissions (CVT).
· Design of driveline architecture for hybrid propulsion systems.
· Designing of power-split driveline transmission systems.
· Exploitation of CAN bus data.

Main results:
· 2 International Patents registered in EU, USA-Canada.
· Projects with several Car-manufacturing companies.

AIMEN

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Organisation profile

AIMEN is a research centre specialized in materials, joining technologies and processing of materials by laser. Its mission is to contribute to the development and strengthening the competitive capacities of the companies. Promotion and management of R&D&I activities, technology services of high added value and training actions are part of AIMEN's activity. The centre is located in Galicia, the Northwest of Spain. Currently, AIMEN has 235 employees out of which 15 hold a PhD, 20 are enrolled in PhD studies, and around 100 hold a Master degree. As a Technology Centre with a constant working relationship with SMEs, AIMEN is in a privileged position to detect technology shortcomings of the Spanish industry. This is specially the case in materials and joining technology, where AIMEN has more than 40 years of experience in providing services to the industry.

In order to fill the gap of the detected deficiencies, AIMEN has developed a work programme focused on the following knowledge areas:
· Joining Technology
· Materials Processing through Laser technologies
· Development of New Materials
· Characterisation Techniques

Within each of these areas of expertise, various working fields are currently being developed by means of R&D&i projects and technology services. Their objective is to acquire and transfer the scientific-technological know-how, necessary to improve the competitiveness of our industrial sphere and promote regional development and employment growth.

Main Green Cars activities: Products and Projects

AIMEN is working on the development of new manufacturing paths that enable new concepts of high resistance/light weight panels and profiles for the automotive sectors. These products will be based on full biomass composite materials, ultrahigh strength steels or aluminium metallic matrix composites. The desirable characteristics are moderate production cost, recyclability, sustainable production and biodegradability. Areas of particular interest are the processing of the materials (fillers treatments and mixing process), joining and even biodegradability of products.

Another research field is based on the development on engineered surfaces, e.g. laser modified. The objective is to provide a functional service: wear resistance, low friction, while improving their resistance to corrosion and low machinability requirements (near net shape). Functionally graded surfaces or materials are sought to contribute to weight reduction and low friction of moving parts.

AIMPLAS, Technological Institute of Plastics

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Organisation profile

AIMPLAS, Technological Institute of Plastics, is a Centre of Innovation and Technology (CIT), recognised by the Ministry of Science and Innovation, located in Paterna, Valencia (Spain).Its mission is to increase the competitiveness of businesses within the plastics sector by means of Research, Development and Innovation, in transformation processes as well as in products and integral technological services.

Integral Research, Development and Innovation projects. Research Lines:
· Development and improvement of polymer materials.
· Biodegradable materials and materials from renewable resources: biodegradables, biopolymers, sustainable composites with fibres and natural charges.
· Research in nanocomposites to improve plastic materials properties as: electrical and thermal properties, fire resistivity, superficial appearance, tribology.
· Development of thermoplastic mould composites with continuous fibres. Thermoplastic infusion, continuous extrusion and over-extrusion of mats.
· Plastic waste processing and optimisation. Increasing the valorisation of the product and ecodesign.
· Multi-layer structures with improved properties. Co-extrusion, Co-injection, Sheets.
· Advanced curing systems for composites.

Main Green Cars activities: Products and Projects

Main projects in the automotive sector and their objectives are:

PEGASUS: 1. To develop a new Integrated Design and Engineering Environment (IDEE) based on KBE (Knowledge Based Engineering) for SMEs supplying the automotive sector. 2. To develop reliable and processable highly advanced materials. 3. To develop plastic processing adapted to new materials as well as the process integration 4. To develop a new supply chain concept.

EXTRUCO2: 1. To develop a pre-competitive industrial process to produce solid, natural fibre filled thermoplastic sheet. 2. To produce a pre-competitive solid, natural fibre filled thermoplastic sheet. 3. To reduced environmental impact of the process developed and the sheet materials produced. 4. Reduced production costs. 5. Increase SME competitiveness.

CODE: Development of a new curing technology for polyester resins; acceleration of the curing, shortening of the curing time; increase of degree of cross-linking, reduction of waste and environmental pollution; lower viscosity of the resin is possible leading to higher fibre content. Social benefits are less VOC (volatile organic components) emission and drastically decreasing of the content of hazardous peroxides.

AIN

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Organisation profile

AIN is non-profit organization that provides advance consulting, training and engineering services and research developments to private companies and government. Founded in 1963 by a set of industrial companies, today it belongs to 140 members that represent the most important industrial sectors of Navarra. AIN became a R+D Center in 2004 but combines its research activity with a wide range of services oriented to companies development and delivering innovation.

Based on more than 120 experienced people devoted to research and serving clients, AIN generated revenues of more than10m€ in 2009. AIN has spread out its research activities, covering fields other than Metal Mechanics as well as its geographical market area, participating in research projects at European scale and providing technological services to the whole Spanish market.

AIN is also committed to regional development leadership and help companies indentify business and technology trends and develop strategic and innovative positioning in order to explode new opportunities.

Main Green Cars activities: Products and Projects

Based on the knowledge developed in the Green Energy and Environmental fields, both from consulting and engineering experience and technology capabilities, and its leadership among industrial companies, AIN is developing innovative business models to integrate different players of the green car value chain (from green energy production to infrastructure development).

Capabilities and knowledge developed in the Green Sector:

· Design and installation of renewable generation plants (wind, solar, hydroelectric, biomass…).
· Global management and engineering of power generation plants (generation, cogeneration, energy process…).
· Power line and large energy facilities air monitoring and inspection.
· Monitoring, control and automatization of energy equipment (wind-generators).
· Efficiency and energy use in industrial and business processes.

AIN is also helping automotive supplies companies with technological and production development to evolve and position as new supplier of the green car producers.

AITIIP Foundation

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Organisation profile

AITIIP Foundation Technological Centre is a private non profit institution focussed to research, development and innovation projects in design and manufacturing processes with a high degree of specialisation in plastics industry and mould making technologies.

The main ACTIVITIES and TECHNOLOGIES are:
· R&D application
· Design and development products in plastic and composite materials
· Simulation of plastics converting technologies
· Plastics processing by injection moulding, extrusion-blow-moulding
· Microcellular foaming
· Mould making technologies and rapid prototyping
· Additive Manufacturing
· Double barrel polymer extruder for nanocompounding
· Product industralization
· National & European R&D Project Management
· ICT for industry
· Training and technological consulting

AITIIP chairmen are the most relevant industries in Spain converting plastics for automotive industry.

Main Green Cars activities: Products and Projects

· Light-weight parts for interior trims in plastics.
· Plastics recycling.
· Nanoadditivated materials.
· Using simulation to reduce loops in product development.
· Freeblowmoulding for more complex hollow parts in plastics.

CITYELEC: PSE - Singular and Strategic Project - Systems for the mobility electrification in the urban environmental context.
· CITYELEC system specification and architecture.
· Electrical Energy storage, adaptation and distribution in the vehicle.

APERT (Applied Electronics Research Team) - University of the Basque Country

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Organisation profile

APERT (Applied Electronics Research Team) is a research group of the University of the Basque Country. This group is specialized in the design of electronic reconfigurable SoC circuits and energy management circuits.
The group uses last generation and high capacity FPGAs to integrate digital systems on a single integrated circuit and use of the reconfiguration capabilities of these devices. Also, APERT designs and studies power converters for renewable generation, conversion, storage and transmission of electrical power.
Recent group activities are related to fault tolerance systems using high density reconfigurable circuits and redundant architectures. The experience in this area is being applied to high reliability automotive communication systems and fail-proof energy management systems.

Main Green Cars activities: Products and Projects

Main research projects that APERT was involved in the automotive sector are:
TEReTRANS: Intelligent systems for the new generation of ground transport. Strategic research project with the main objective to promote the participant agents in the European innovation map in its broad sense, deepening and advancing in the development of the strategic research in intelligent transport over convergence of traditional scientific and technical areas in order to obtain an advanced technology to contribute to competitiveness and innovation in the transport sector of the Basque Autonomous Community, and therefore in its economy and society.
Design Methodology and simulation environment based on the hardware description language VHDL of circuits for the train communication standard IEC. The development of communication networks has spread to a wide range of applications. Particularly, a vast amount of projects have taken place in Europe in the transport sector within the Telematics Application Program of the European Commission (DG XIII). To be more precise, the need for a communication system on board, capable of interconnecting all electronic subsystems has been detected. This would make the interoperability between devices and distributed control architectures easier, as well as improve the interconnection with other extern networks. This system is based in the standard IEC 61375-1 also known as Train Communication Network.
There are a need for new circuits that conform to the standard and allow a full development of its possibilities, establishing a design methodology for the verification and construction of the circuits, using the VHDL language. The main goal is, thus, the development of a simulation environment and to establish the above mentioned methodology for the TCN network.
CITY-ELEC: Systems for the electrification of urban mobility. This project is a Singular Strategic Project divided into 7 subprojects. The APERT group participates in the subproject "Integration of infrastructure in the urban environment" in which, among others, it participates in evaluation of renewable sources and selection of the most appropriate selection, as the design of architecture and system calculations for battery charge of electric vehicles.

ASCAMM Foundation - Technology Centre

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Organisation profile

ASCAMM Technology Centre is a leading multi-sector research, technical assistance and knowledge transfer organisation specialised in design, materials and manufacturing technologies.

Areas of Technological Specialization: Integral development of Innovative products / Materials: polymers, ferrous metals, light alloys / Advanced process & manufacturing Technologies / knowledge engineering: ICT for Industrial + R&D application. Activities & Services: Contract and collaborative R&D, Innovation management, Training and consulting, Feasibility studies, Integral product/process design and development, Technical assistance in product industrialization, Process monitoring and automation, Testing.

Main TECHNOLOGIES of our Advanced Manufacturing and Process Labs: Plastic Injection Moulding (Lab with 10 presses from 15T to 2700T) / Double barrel polymer extruder for micro and nanocompounding (enhanced properties: mechanical, thermal, electric, biomaterials,…) / Composite materials and processes / Thermoforming / Blow moulding / Materials test lab for plastics and metals / Rapid Prototyping, Tooling & Manufacturing (laser sintering, incremental metal forming,…) / Microtechnologies: laser micromilling, microinjection moulding / Light alloy pressure die casting / Sheet metal forming / Mechatronics, process sensoring, monitoring and automation, robotics / Artificial intelli-gence applications / Embedded systems / …+ soft-ware for all major design, simulation and manufactu-ring applications.

Main Green Cars activities: Products and Projects

R&D projects: Spanish CENIT projects: **"VERDE"** for the development of new electric-based vehicles, including all their main components, and to their impact in the electric infrastructure (V2G) and **"ENERGOS"**, focused on Smart Grids and the future influence of electric vehicles scenarios. Catalan re-gional "Nuclis Framework" project **"BattMAN"**, aimed at providing a Spanish alternative to Battery Manufacturing oriented to electric vehicles.

ASCAMM's CAPABILITIES aligned with the "GREEN CARS INITIATIVE":

· Weight reduction, lightweight vehicle construction: light alloys; metal-plastic substitution; advanced, high-performance composites; function integration in vehicle components; optimised vehicle architectures / Improving Battery efficiency and management: Materials and design solutions for improved heat dissipation, thermal conductivity and crash-worthiness in battery housings.

· Nanoadditivated materials for battery elements to improve their charge capacity, energetic availability etc. / Design and manufacturing solutions for the industrialization of new components and systems - especially mechanical ones - derived from new generation green vehicles / Smart Grids and vehicle charging systems: Artificial Intelligence algorithms: electric system monitoring, energy and route optimization, C2G integration for battery charging optimization and energy trading, C2C integration for collaborative efficiency and energy trading / Logistics & transport system optimization: controller hardware platform selection and operating system configuration, communications set-up, controller implementation.

CARTIF Technology Centre

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Organisation profile

CARTIF is a leading Spanish Applied Research Centre created in 1994. Its main goals are to identify technology needs and develop R&D-based know-ledge, to support technological innovation in Industry, including SMEs, and to disseminate R&D and innovation results.

Every year CARTIF carries out more than 100 R&D and innovation projects with similar number of customers. Nowadays CARTIF is formed up by 187 people (19% PhD), mainly engineers, scientists and senior researchers, distributed in 9 technical divisions supported by 7 departments that ensure the Centre projects' quality. Its main research areas are: Environment, Food and Chemicals, Energy, Automation and Process Control, Robotics and Computer Vision and Biomedicals. The Centre is currently involved in 21 international projects, with partners in almost all the EU countries, non-EU Mediterranean ones and Latin America, in the following programmes: FP7 (coordinating 2 projects and participating in other 6), CIP, EUREKA, LIFE+, Interreg and IBEROEKA.
CARTIF is part of 20 research and professional networks -including 13 international- and several Technology Platforms (ERTRAC, ECTP, ETPIS, Manufuture) and PPP (E2B, FoF). The Centre is integrated as well in the Spanish Federation of Technology Centres. Equipment and pilot plants to perform and evaluate different chemical processes at different scale (lab. to pre-industrial) towards bio-fuels R&D.

Main Green Cars activities: Products and Projects

CARTIF has capacities and experience in several areas related with Green Cars, Electric Vehicles and those powered by Biofuels:
Charging stations for electric vehicles, through the use of smart meters, load management, communications with the smart grid and provision of information to the electric retailer company for the billing to the consumer. Studies on the impact caused on the **electric grid** by the recharging stations, taking into account the different possible scenarios.

Life Cycle Assessment (LCA) and Eco-design (certified UNE150301) of the vehicle. Modelling and optimisation of the production process, in order to achieve the required high response time for a 5-days-car customized for the end user (FP7 ACDC IP project). Laser welding advanced control (FP7 CLET project; coordinators). FP7 FORBIOPLAST project: development of bio-based products for use in the automotive sector.
Fuel Cells and hydrogen systems: Integration of systems fostering interchange and interoperation of subsystems from different vendors. Joint operations of heterogeneous systems (renewable energy sources, electrolysers, hydrogen stocking, batteries, etc.), improving the efficiency and functioning of global systems and their components. Improving safety while operating the systems. Standardisation of the monitoring and control systems.
Synthesis of **biofuels:** Different strategies have been developed for the production of bioethanol and biodiesel, such as immobilisation of micro-organism in fermentation of sugars to obtain ethanol and synthesis of methyl esters in supercritical medium.

CEIT

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Organisation profile

CEIT is a private multidisciplinary non-profit research centre closely connected to TECNUN, the Faculty of Engineering of the University of Navarra (Spain). Its mission is to provide the industry with services through the development of technical research projects and to form young researchers and PhD students. CEIT has a staff of 296 employees and an annual budget over 14 M€. CEIT consists of three departments (Materials, Applied Mechanics, and Electronics and Communications) and two R&D Units (Unit on Microelectronics and Microsystems, and Environmental Engineering Unit).

Facilities:
· Full Immersive bus and truck combined simulator.
· Development Environments for CAN and Flex ray.
· Scanning/Transmission electron microscopy.
· Simulation tools to describe the microstructural properties of new materials.
· Laboratory for rapid prototyping.

Main Green Cars activities: Products and Projects

Electronics and Power Electronics: Techniques for the safety critical software and programmable logic development. Electronic design of new on board devices. / Advanced electrical drive systems. Electrical energy management and storage. Design and development of traction systems for sustainable transport. Advanced electromagnetic design. / Development of power electronic systems. Advanced drive control: Vector control, sensorless control, DTC.

Materials and Processes : Mechanical properties, structural integrity and forming processes. / Materials for micro-nanotechnologies. / Processing of metallic and ceramic powders.

Communication: I2V communication systems for on board signalling and Traffic Information. / Experience with on board communication buses: CAN and Flex Ray.

HMI: Design of Human Machine Interfaces (HMI) for new on board devices. / The design cycle can be partially closed validating the new systems in our full immersive bus and truck combined simulator.

Projects:
· Environmentally friendly Technologies oriented to the urban transport.
· New generation, High Energy and power density SuperCAPapcitor based energy storage system.
· TESTMOV Automatic testing system for embedded systems for transport applications.
· TERETRANS (Intelligent systems for the new generation of terrestrial transportation).
· High performance on new processes and components for the automotive sector by nanotechnology applications.
· CABINTEC (Intelligent Cabin for Road Transport) (2007-2011).
· Ambience Intelligent - Electronics for Intelligent Transport (2007-2008).
· EBSF European Bus System of the Future.

CENIT - Center for Innovation in Transport

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Organisation profile

CENIT (Center for Innovation in Transport) is a center for research, development and innovation created in 2001 aiming at becoming the reference center in R&D&I on transport in Catalonia, and also at becoming a reference center at an international level. CENIT was the first research center on transport to be created in Spain and its team is made up of 25 researchers and 5 staff persons (2008; 1/3 were women) and it keeps continuously growing).

Since its creation in 2001 CENIT has developed an intense research activity. CENIT has obtained 92 research contracts. 26 courses and specific seminars related to research on transportation have been organized. CENIT has published 233 publications: 17 books, 28 articles in journals (15 SCI) and 184 congress papers and has recently joined ECTRI - European Conference of Transport Research Institutes.

Excellence and knowledge and, therefore, R&D&I must form the basis upon which to construct the transport system that society demands. That is why CENIT keeps exchange relationships and collaborations with the best North American and European universities. CENIT strongly believes in R&D&I to grow and to achieve a more efficient, equitable, sustainable and safe transport system.

Our research lines and activities cover the operation analysis, pricing, appraisal, demand's behaviour, network design and route optimization, location and layout, etc: mobility and urban transport; railway; traffic management; logistics and terminals; ports and maritime transport; airports and air transport; safety, security and reliability; ITS; demand; financing; transport system management; PPP, concessions and regulation; territory and city-planning; environment and energy.

Main Green Cars activities: Products and Projects

CENIT carries and has carried out many R&D&I projects related to sustainability:
· GESTA - Road network management by means of a toll system to maximize the social benefit for a sustainable mobility (2008-2009).
· Cenit- OASIS - Safe, intelligent and sustainable highway operations (2008-2010).
· Cenit - ECOTRANS - Ecological technologies for urban transportation.
· Improvement of the bus network service and promotion of inter-modality.
· MOBITRANS - Information technologies for the user to enhance sustainable urban mobility (2009-2010).

CENTRO ZARAGOZA - Instituto de Investigación sobre Reparación de Vehículos

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Organisation profile

Research Centre founded in 1987 as a public limited company, by the initiative of a group of Spanish Insurance Companies, which represent more than 80% of the automobile insurance premiums in Spain. Road Safety and the management and control of material damages in the automobile insurance sector are the main aims of CENTRO ZARAGOZA. It researches, tests and studies the features, methods and systems to repair vehicles as well as the performance of the vehicles and traffic safety, moreover it also gives training courses for professionals whose jobs are connected with the reparation and evaluation of damaged vehicles.

European Research projects:

· INVIEW -Interactive and Immersive Video from Multiple Images- (IST-2000-28459).
· SARAC II -Quality Criteria for the Safety Assessment of Cars based on Real-World Crashes- carried out by the Safety Rating Advisory Committee for the European Commission.
· SAFETY TECHNOPRO, coordinator of the SSA: -Training System on New Safety Technologies for Road Transport Addressed to Professional Bodies of the Automotive Sector- (IST-2004-027373).
· SMART RRS - Innovative concepts for smart road restraint systems to provide greater safety for vulnerable road users-, funded by the EC under the Seventh Framework Programme (FP7-SST-2007-RTD-1, Project nº 218741).

National research projects:

· PEATON -Análisis Coste/Beneficio de Sistemas de Seguridad Activa y Pasiva para la protección de Peatones-, funded by the Ministry of Industry -MICYT-, under the -PROFIT:2006- Program for Promotion of Technical Research.
· FENIX -Strategic Research on more Sustainable and Safer Roads- Investigación Estratégica en Carreteras más Seguras y Sostenibles-, funded by the Centre for Technological & Industrial Development -CDTI- under the -CENIT 2006 Program for promotion of stable public-private cooperation.
· DENDRA - Investigación para el desarrollo de nuevos sistemas de seguridad pasiva para motoristas (Research for the developement of new passive safety systems addressed to motorcyclists). IAP-560410-2008-20.
· PRELACE - Investigación para el desarrollo de tecnologías más eficaces en la prevención del latigazo cervical (Research for the developement of more efficient technologies for whiplash prevention). IAP-560410-2008-61.

Main Green Cars activities: Products and Projects

· Safety conditions of maintenance, repairing works and emergency intervention on electric vehicles.
· The opportunities of great improvement in pedestrian, and other vulnerable road users protection, that arises with new car concepts due to the absolutely new requirements that affect to electric vehicles (regarding distribution of mass and components).
· Also the opportunities of great improvement in whiplash prevention (the most frequent occupant injury), that arises with new vehicle structural concepts for electric vehicles.

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Organisation profile

CIDAUT Foundation (Centre for Research and Development in Transport and Energy) is a non-profit making organisation intended to foster the competitiveness and the industrial development of the companies involved in the fields of Transport and Energy. The key element in order to reach this goal is the wide range of technical skills, knowledge, equipments, and human resources available in the Centre, which permit the tackling of complete R&D projects that include the whole value chain of a product from its conception and design to pre-industrialization, passing through material research, behaviour simulation, processing, design of prototypes and, finally, its validation.

Today the research, development and innovation programs take up approximately 85% of the Centre's total activities and are focused on: Transport Safety, Product-Process-Materials and Energy & Environment.

Research staff: 315 people: 23.305 m^2 in 7 buildings. More than 200 Industrial clients. RTD associations: EARPA, North American institution TRB, ESIS, SPE, ASTM, ASM, AFS, SAE, SEM, ASA, IIAV, ISN. European Technology Platforms: EUMAT, ERTRAC, BIOFRAC, HFP and JTI on Fuel Cells and Hydrogen.

Main Green Cars activities: Products and Projects

Vehicle Design & Integration: Vehicle ecodesign (low cost/low weight) considering Vehicle Dynamics, NVH & Safety requirements (including preventive safety). HMI and comfort. ADAS. New advanced materials for structures (green materials). New joining technologies. Light alloys materials & technologies. New manufacturing processes. New development methodologies (virtual testing & manufacturing). Energy management & control of vehicle systems. Prototyping. Industrialization. Recycling. Homologation support.
Vehicle - Infrastructure Interaction: Vehicle-vehicle (V2V) and vehicle-infrastructure (V2I) communication systems. Sensoring for interaction & communication. Traffic monitoring. Adaptive systems to advise optimal routes. Real time information for planning intelligent routes. Systems for logistics distribution in urban areas. Systems for connection to networks.
Energy: Internal combustion engines. Calculation and simulation tools for fluids, thermal, noise, vibration, etc. aspects related with power components, in combination with specific experimental tests. Renewable energies production and utilisation (Biomass, Biofuels and non conventional fuels, Photovoltaics, Wind), Hydrogen (production from renewable fuels and electricity). Energy management and residues valorisation. Electronics: Design of electronic systems.
Field Operational Tests (FOTS). Vehicles prototypes prepared as systems evaluators. Predictive maintenance and on-line (real time) monitorisation of vehicle on-board systems.

R&D projects related to Green Cars: E-LIGHT (Advanced Structural Light Weight Integral Chassis for Electric/Hybrid Urban Vehicles), PV2VEHICLE (photovoltaic solar panel implementations TO save energy in commercial/passenger VEHICLE), NCV 2105 (Networked Clean Vehicle Project), PREVER (PRototype of Electric VEhicle based on Renewable energies) and VICLU (Technology watch project about intelligent networked clean and urban vehicles)

CIDETEC Foundation

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Organisation profile

CIDETEC, Centre for Electrochemical Technologies, was created in 1997 as a non-profit Foundation whose mission is to serve the industry to enhance its competitiveness through the implementation of innovative procedures and products. CIDETEC had an annual turnover of 6,5M€ in 2008 and at the present time employs a highly qualified staff of 103 people.

CIDETEC addresses all electrochemical technologies mainly from an applied research point of view. Its experience and "know-how" covers three main areas of activity: Energy (Batteries, Fuel Cells and other electrochemical storage systems), Surface Finishing (Coatings and Processes) and New Materials (Nanotechnologies, Biomaterials, Sensors and Photonics).

Main Green Cars activities: Products and Projects

Products and Materials:

· Lithium-ion battery development for the EV: new active materials, electrode formulation and optimization, prototype assembly and testing, new concepts for solid polymer electrolytes.
· Ultracapacitors development: new active materials, electrode formulation and optimization, prototype assembly and testing.
· Power management: hybridisation of batteries and ultracapacitors, regenerative braking.
· Electrochromic materials based devices.
· New materials for Innovative solar cells.
· Environmentally friendly (Cr and Cd free) corrosion protection coatings for metals and alloys: ZnNi, NiW, nanostructured metallic coatings,…
· Metallization and anodizing processes of Al, Mg and Ti for weight reduction.
· Multifunctional coatings: metal matrix composites (MMCs), functional graded materials (FGMs), electrophoretically deposited ceramic coatings,...

Relevant projects:

· E3CAR: Nanoelectronics for an Energy Efficient Electrical Car (2009-2011, ENIAC JU Project, coordinated by Infineon Technologies AG).
· ILLIBAT: Ionic Liquid based Lithium Batteries (2006-2008, FP6 STREP Project, coordinated by Technical University of Graz).
· ORION: Organic-Inorganic Hybrids based on Ionic Liquids for lithium batteries (2009-2013, FP7 LARGE Project, coordinated by CIDETEC).
· INNOSHADE: Innovative Switchable Shading Appliances based on Nanomaterials and Hybrid Electrochromic Device Configurations (2008-2012, FP7 LARGE Project, coordinated by Fraunhofer ISC).
· Nanotechnologies for development of new formulations of reduced viscosity rubber for injection of pieces for automotive industry (2007-2008, Industrial Project, coordinated by Trelleborg Navex, S.A.U.).
· MAGNO: Magnesium New Technological Opportunities (2008-2011, National CENIT Project, coordinated by Grupo Antolín).

CIRCE - Centre of Research for Energy Resources and Consumption

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Organisation profile

CIRCE -Centre of Research for Energy Resources and Consumption- was established in 1993 as an independent research centre by the University of Zaragoza, the Regional Government of Aragón and Endesa Group. In 2010, SAMCA and Turol Trading became the fourth and fifth Foundation members. Currently, CIRCE has a staff of over 130 full time people. Since 2001, CIRCE is recognised as National Centre of Innovation and Technology. CIRCE's research and development activities cover four main areas in the energy sector: assessment of resources and processes, electricity generation, transportation and distribution, and the efficient use of resources.

Main CIRCE facilities are:
· Laboratory for the Integration of Renewable Energy allows testing power electronics configurations for improving the quality in the grid, the security of supply and different control strategies to manage energy in complex systems (i.e. electric vehicles).
· Electrical metrology laboratory. Accredited by ENAC. It allows testing and calibration.
· Electrical protections systems laboratory. Development of new algorithms and systems for distance protections, differential protection, protection of intensity and voltage.

Main Green Cars activities: Products and Projects

CIRCE is envolved in many R&D&I pro-jects related to sustainability:
· Energy transfer, by inductive coupling, from the grid to the electric vehicle. Optimization of the coils and EMI screens design. Design of resonant configurations and development of control strategies to assure the maximum efficiency of the power transfer. In this field, CIRCE owns two patents.
· Optimum design of the energy management system for electric vehicles, considering the different subsystems: internal combustion engine, storage system and electric engine. The optimum size of each subsystem is determined depending on the user profile and the control policy that optimize the efficiency of complete vehicle. The vehicle energy system is considered as a nanogrid of generation and consumption of electrical energy and the techniques associated to nanogrids are applied.
· Grid integration. Impact assessment of the electric vehicles on the grid. Development of power electronic systems for the grid connection. Joint management of different units. Electrical protections design and development.

Representative projects:
· CENIT VERDE - National Strategic Consortium in Technical Research for studying Green Cars technologies. (30/09/2009 - 31/12/2012). Centre for the Development of Industrial Technology.
· Smartcity New Urban Energy Management (1/01/2009-31/12/2012) Centre for the Development of Industrial Technology.
· Energy supply systems with no contact for electric vehicles (1/01/2009 - 01/01/2010) Spanish Ministry for Science and Innovation.
· Wind power regulation for electric vehicles (1/02/2009 - 31/01/2010). Spanish Wind Energy Association.

CITEAN

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Organisation profile

The Automotive Technological Innovation Centre of Navarra (CITEAN) is a technological centre specialised in applied research aimed at the automotive sector from vehicles to heavy trucks and special vehicles (agricultural machinery, public works) and railways.

The technological offer of CITEAN is divided in the following areas: Experimental Mechanics, Computational Mechanics and Manufacturing processes.

Developments are focused on the following lines of activity: Mechanical and Environmental tests (multiaxle, rotary, environmental); Noise, Vibrations and Harshness; Kinematics and Dynamics; Structural design and analysis.

Main Green Cars activities: Products and Projects

Products:
Drive Train: Active Control units for electric motors and wheels
Vehicle integration:
· Energy efficient auxiliaries
· Smart controls to manage requirements to keep driving performance and comfort
· Safety (active)
· Safety and robustness of communication, actuators
· Advanced electric vehicle concepts
Infrastructure integration:
· Advanced V2G interface
· Deployment of charging infrastructure
Electric car, integrated with the transport system:
· Intermodality / interoperability
· Connected car to improve safety and efficiency
· Deployment of public infrastructure in parkings

Heavy Duty vehicles: Vehicle technologies for energy optimisation
Intelligent Transport Systems technologies (ITS)

Materials
Weight reduction
Use of recyclable and bio- materials
Production technologies
· Smart & flexible manufacturing
· Modelling and virtual engineering
· Flexible production processes
· New joining, assembly and surface protecting technologies

Projects
Domocell Household system to recharge Electric Vehicle Batteries.

CITET - Centro de Innovación Tecnológica para la Logística y el Transporte de Mercancías por Carretera

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Organisation profile

CITET is an association which acts as an innovation center for the logistics and transportation sectors.

Our members are both public entities (city halls, departments of the regional government) and private companies (Logistics Services Providers, technology companies) which work together to impulse R&D, and innovation projects which may improve the impact of the companies' activities on the environment and increase their productivity and efficiency.

Our research capabilities are limited, but we have as members of our association technology companies with extended research capacities and logistics companies which help determine the functional specifications to be included in a project and act also as testers of the solutions

Main Green Cars activities: Products and Projects

We haven't done any activity directly focused on the Green Car projects, however, several of our projects aim to the same targets as the Green Cars initiatives. Citet's activity and projects have the goal of improving the environmental impact of the logistics and transportation activities by improving processes (like better route planning), introducing technologies (incorporating on line information for the drivers so they can take informed decisions to respond to unforeseen circumstances in a more efficient way), or analyzing the introduction of different greener vehicles.

Last year we organized the 1st National Congress on Urban Sustainable Mobility and Goods Distribution, to share best practices implemented by several cities and companies regarding the topics of the Congress.

We also participate in the consortium of the TECMUSA project which plans to develop several technologies for Urban Sustainable Mobility, including a prototype of an electrical rechargeable vehicle for goods distribution.

CMT-Motores Térmicos. Universidad Politécnica de Valencia

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Organisation profile

CMT - Motores Térmicos of the Universidad Politécnica de Valencia, with 30 years experience of advanced research in the automotive sector, is an internationally well-known Research Institute 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 in reciprocating internal combustion engines, with the aim of responding to specific demands of the automotive industry. Main concerns are nowadays dictated by environmental issues such as the reduction of specific fuel consumption, pollutants and noise as well as by the need to improve engine efficiency and reliability. Current work is carried out to assist development of modern automotive engines with advance technology such as flexible injection systems, advances turbocharging and supercharging, variable valve actuation, integral electronic control and vehicle thermal management.

In any case, research work performed combines experimental measurement with state-of-the-art equipment in dedicated facilities and advanced simulation and modelling tasks with own-developed or commercial codes. In addition, CMT also does research work for the maintenance of reciprocating internal combustion engines aimed at developing non-intrusive diagnosis techniques for predictive maintenance, such as performance measurements, analysis of lubricants and engine vibration, and at implementing integral maintenance systems for transport fleets.

CMT-Motores Térmicos, with around 100 members including professors, researchers, laboratory technicians and research assistants, has carried out in the last 5 years more than 50 RTD projects with public funding and around 150 projects with private funding form 25 companies from the automotive sector. It has participated in more than 20 EC funded projects since FP3, in four of them as the coordinator, and is a recognised Marie Curie Training Site. It is also a member of EARPA (European Automotive Research Partners Association), with active participation is several of its Tasks Force groups.

Main Green Cars activities: Products and Projects

Currently CMT participates in three FP7 EC projects:
· POWERtrain of Future Light-duty vehicles (POWERFUL) 2010-2013.
· Clean European Rail - Diesel (CleanER-D) 2009-2013.
· Technologies for Synthesis, Recycling and Combustion of Metallic Nanoclusters as Future Transportation Fuels (COMETNANO) 2009-2012.
Participation in the Green Car Initiative is foreseen on topics related to optimisation of thermal engine development and integration as range extenders for advanced plug-in hybrids and electric vehicles, as well as on heavy duty vehicles based on internal combustion engines. Fields of expertise in these topics include engine combustion process optimisation, advanced fuel injection and turbocharging for engine downsizing and downspeeding, subsystems and integral engine control, and heat storage and recovery.

CRIA - Network Centre for Automotive Engineering of the Universidad Politécnica de Valencia

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Organisation profile

The RDT Network in Automotive Engineering (CRIA) of the Universidad Politécnica de Valencia (UPV) is a centre formed by seven Applied Research Groups with background in the automotive sector: Centro de Investigación de Ingeniería y Gestión de Producción (CIGIP), Centro de Investigación de Tecnología de Vehículos (CITV), Departamento de Ingeniería Electrónica (DIEO), Instituto Universitario de Automática e Informática Industrial (ai2), Instituto de Biomecánica de Valencia (IBV), Instituto de Tecnología de Materiales (ITM) y Grupo de Investigación en Reingeniería, Organización, trabajo en Grupo y Logística Empresarial (ROGLE).

The goals of the Network are: 1. Design and technological transfer in automobile sector; 2. Dissemination of scientific and technological knowledge; 3. Training of professionals; 4. Offer technological services and 5. Empowering research in automotive sector.

The activities developed in the Network are: Product development, Technological assessment, Testing and certification, Training and information and Scientific research, development and technological innovation.

Main Green Cars activities: Products and Projects

· Design and evaluation of service conditions of mechanical components
· Noise and vibrations analysis
· Vehicle dynamics and robotics
· Logistics and production systems design
· Design and Implementation of optimization models / Study of work
· Operations and processes design and improvement, planning and control
· Power electronics systems
· Traffic regulation and control systems
· Polymers recycling / Plastic waste recovery
· New materials design
· Diagnosis in-service materials, equipments and structures failures
· Functionality, ergonomics and usability / Emotional evaluation
· Study of the ergonomics conditions and design of the workplace
· Advanced Robotics / Design and development of real time systems
· Applications of computer vision in quality and process control
· User friendly inter-phases and application of virtual reality techniques and 3d-graphics
· Design and development of solutions for control and automation of processes

CSIC - Spanish National Research Council

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Details for each centre are provided within the text.

Organisation profile

CSIC (Agencia Estatal Consejo Superior de Investigaciones Cientificas) is the largest public multidisciplinary research organisation in Spain. Its mission is to promote, coordinate, develop, and disseminate multidisciplinary scientific and technological research in order to contribute to economic, social, and cultural development. It has considerable experience in both participating and managing R&D projects. Under the 6th Framework Programme, CSIC signed 403 contracts (37 as coordinators), and under FP7 more than 110 projects have already been signed.

Main Green Cars activities: Products and Projects

Instituto de Ciencia de Materiales de Madrid - ICMM (www.icmm.csic.es). Energy, Environment and Sustainable Technologies Department; José Manuel Amarilla (amarilla@icmm.csic.es)

· Synthesis of new materials with elevated electronic and/or ionic conductivity to be used in electrochemical devices for energy generation (fuel cells) and energy storage (batteries and supercapacitors): Synthesis of nano- and micro-size electrode materials, structural and morphological characterization (DRX, TEM, RMN, IR) and determination of the electrochemical properties.

· Projects: Electrode materials for Li-ion batteries and supercapacitors / Carbon monoliths-based electrodes / Application to supercapacitors and lithium-ion batteries / Nanomaterials from LiMn2O4 and their application / LiCrYMn2-YO4 (0<Y=1) nanoparticles for the development of high power Li-rechargeable batteries.

Instituto de Ciencia de Materiales de Barcelona - ICMAB (www.icmab.es).
Rosa Palacín (rosa.palacin@icmab.es)

· Research in both lithium and nickel battery materials following a global approach from materials preparation to characterization and testing / Development of new materials with improved performances (e.g. conversion reaction electrode materials such as oxides or nitrides) / High temperature electrochemistry and investigation of specific aspects of materials, either electrodes or electrolytes, that are in the commercial or pre-commercial stage in collaboration with industrial partners.

· Member of the ALISTORE-ERI, devoted to battery research (http://www.u-picardie.fr/alistore/).

Centro Nacional de Microelectrónica - CNM (www.cnm.es). Power Group;
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· Design modelling, simulation, fabrication and characterization of Si, SOI and SiC devices: Si power devices from low voltage high current VDMOS to high voltage devices such as IGBTs and MCTs (6 kV) / Development of lateral power devices on SOI and SOS using the experience previously acquired on LDMOS and LIGBT / Development of specific process steps for SiC and device prototypes (Schottky and PiN diodes, N-MOSFETs, vertical power MOSFET, vertical high voltage JFETs) / SiC sensors (MEMS, high temperature gas sensors, Hall effect sensors, biomedical needles) and GaN MOSFETs.

· ENIAC- E3Car project, in tasks related to: SiC technology improvements, SiC rectifiers and switches

design and fabrication; Electro-thermal and reliability characterisation. / National projects SPACESIC, THERMOS, GaSIC / EU Projects ESCAPEE, FLASIC, ATHIS, MANSIC / ESA projects CHPCA, HTBEPI.

Instituto de Automática Industrial - IAI (www.iai.csic.es).
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· Generation of new knowledge, both basic and applied, in the field of processes and systems automation and development of advanced strategies for measurement, inspection, control and operation.
· Projects: "Intelligent Control Architecture for the integration of a fuel cell in an energy autonomous vehicle" (2008-2009) / "Design and construction of a low cost, high efficiency new PEM fuel cell: Vehicle applications (2005-2008) / "Development of a hybrid architecture based on a PEM fuel cell for a light vehicle" (CEMUSA (FCC)-IAI-CSIC, 2005-2006).

Centre de Investigacio en Nanociencia i Nanotecnologia - CIN2 - (www.cin2.es). Laboratory of Nanostructured Materials for Photovoltaic Energy, Mónica Lira-Cantu (monica.lira@cin2.es).
· Synthesis of nanostructured materials for solar cells, specially dye sensitized and hybrid solar cell. These type of solar cells are being implemented on electric cars like Toyota Prius, as part of their sun roof. They are being used in a wide variety of application for solar cars, for example to cool down batteries, or to move an inside fan to cool the car it self. Their versatility permits their application also on car windows due to their transparency. In our laboratory we can synthesise materials (already known and new types), fabricate electrodes and ensemble complete solar cell devices. 4-5 patents related to the appli-cation of nanomaterials in solar cells.
· Research and Development of new nanostructured materials for Dye sensitized solar cells and Hybrid solar cells for hard or flexible substrates.

CTAG - Centro Tecnológico de Automoción de Galicia

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Organisation profile

CTAG (Centro Tecnológico de Automoción de Galicia) is a private, non-profit R&D technological automotive centre devoted to support the automotive industry in its research, development and innovation needs.

The fields of competence where CTAG concentrates its activities are: Integral Safety / Manufacturing Processes and New Materials / Environment / Electronics and ITS (Intelligent Transportation Systems) / HMI, Ergonomics and Comfort / Innovation Management.

Main Green Cars activities: Products and Projects

Energy storage systems, drive train and vehicle integration: Safety concepts and systems for power electronics / Electronic management of in-wheel motor solutions for electric vehicles / Testing and validation methods and strategies for green cars / EMI / EMC tests for electric and hybrid vehicles / Electronic control and management of power train and dynamics for electric vehicles / Methodologies for development and validation of HMI and functional algorithms using driving simulators / New HMI concepts for green driving / Electronic architecture for electric and hybrid vehicles.

Infrastructure, integration with the transport system: Development of intelligent infrastructure for electric vehicles / Impact assessment studies based on simulation, test-track testing and Field Operational Tests (FOTs).

Internal combustion engines, bio-fuels: Development and validation of exhaust gas recirculation systems / Biodiesel, bio-oils and catalytic converters.

Logistics, co-modality and ITS technologies: Electric vehicles fleet management / ITS systems and C2X solutions for energy efficiency and electric vehicles.

Materials and production technologies: Specific structural development associated with green vehicles / Use of UHS Steels with profiling techniques / Use of Composite carbon fibre with RTM technology / Bio Polymers and use of natural materials / Nanomaterials and smart materials / LEAN and flexible production / Modelling and virtual engineering / Quality control process optimization / Customization and smart vehicles series.

Some related projects:
· MOBI_one: Development, test and demonstration of new concepts for sustainable mobility, in cooperation con CEIIA (Portugal).
· Naturplas I & II: New materials based on natural resources for automotive applications.
· EU Projects (7th FP): EuroFOT, FREILOT, FOTnet, iCars Network.

CTC - Centro Tecnológico de Componentes

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Organisation profile

The Technological Centre of Components (CTC) is a private foundation in the regional public sector and a member of SODERCAN group, created in the year 2000 to serve the society and the industrial network. Its main objective is to contribute to the economic and social development of the region, helping the local companies to evaluate the technical feasibility of their ideas, as well as to technically execute their research, development and innovation projects as part of the science-technology-industry system.

CTC has its Management System certified according to the "Quality Management System", UNE EN-ISO 9001:2000 Standard, and the "Environmental Management System", UNE EN-ISO 14001:2004 Standard, since the year 2004 and 2005, respectively. The CTC operating model is based on business units focused on the market, adding value in each developed project, thanks to the specialization, expertise and efficient management of its professional team. Fields of Activity: Automotive, Aerospace, Nuclear Energy, Renewable Energy, Advanced Materials.

Main Green Cars activities: Products and Projects

Advanced materials area research lines are:
· Study and development of advanced phase change materials (PCM's) and its application to energy efficient systems.
· Development of new high performance composite and nanocomposite polymeric materials with, improved properties and/or functionalized, adding nanostructure materials, fillers and specific additives.

Automotive unit, example of project: Creation of a centre of excellence in Magnesium casting for automotive components:
· Best injection parameters of different Mg alloys research to find the best possible mechanical properties and corrosion and wear resistance of the components.
· Components design considering the special Mg characteristics reducing their thickness and injecting only one instead of the several components were needed before with other materials. In this way an important weight reduction is reached.

The Aerospace Unit focuses its research activity on the design and development of Control Systems for critical applications, involving integration of electronic control devices, sensors and actuators (electromechanical, hydraulic and others). The Unit is oriented to both, civil and military communication applications with the aim of product and system improvement. The main products and services offered are: Stabilized Platforms for a wide variety of purposes such as Satellite Communication on the Move, Low cost Inertial Navigation Systems, Attitude determination systems based on GNSS Antenna Arrays (GPS/GALILEO), and New GNSS applications.

CTM - Centre Tecnològic

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Organisation profile

CTM Centre Tecnològic is a non-profit private organisation. Its aim is to efficiently contribute to the improvement of competitiveness and to the technological development of companies by providing specialised services and carrying out R&D&I projects. The team at CTM Centre Tecnològic works for companies, entities and institutions in the fields of Energy, Materials Technology, Environmental Technology, Support to Innovation and Bioengineering.

The Energy Area has the objective of improving business competitiveness through research, testing, technology transfer and expertise within the field of Energy Efficiency. Energy Efficiency at CTM can be broken down into the following sections:
· Electrical Networks (Alternative and renewable energy, Microgrids, Materials & systems).
· Consumption optimisation (System monitoring).
· Load optimisation (Network quality, Reducing peak load, etc).

The Area of Materials Technologies also develop light and ultra resistant parts (UHSS, Al alloys, etc.) for car weight reduction, thus improving the energy consumption not only in terms of the cars´ global lifecycle but also in terms of energy running consumption, and moreover bringing about greater chassis stiffness and crashworthiness.

Main Green Cars activities: Products and Projects

Forma0: National Cenit Project which aims to develop new methods and materials capable of transforming Advanced High-Strength Steel materials. Within the project, CTM will develop new materials, new hot forming and cold forming processes and new coatings.
IntegrAuto: National Program of the Public-Private Cooperation. The main goal is to increase the added value in the components of the automotive industry by means of integration of functionality which will be obtained by the interconnections of innovative processes. The project is based on the experience of all the individual partners and using the key concept: integration of processes. The integration of processes uses the concept of working in a coordinated manner among all participants thus allowing advances that would not be possible working individually.
VERDE: National Cenit Project with SEAT, a Spanish car manufacturer, and the two of the biggest utilities from Spain, Endesa and Iberdrola. The main goals are to deal with an efficient use of energy transport, design control and safety strategies to recharge EVs, and to do research in batteries for intelligent infrastructures, electric motors, and connect it all with Smart Electrical Grids.
TailorTool: FP7 project which aims to develop a new generation of Functionally Graded Materials (FGM) with functionally graded thermal conductivity and wear resistance for hot stamping, forging and castingdies to enable controlled cooling in different regions of the die. Improving tool behaviour can optimise forming processes undergoing severe thermomechanical solicitations which are used to obtain high performance components. FGM are particularly appropriate for developing high performance tools since they allow this optimization through a graded variation of their properties.

EDERTEK

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Organisation profile

Edertek is the technology centre for MONDRAGON AUTOMOTIVE Chassis/Powertrain division. Its objective is research and development of new products, processes and materials.

It is currently carrying out activity in three areas:
· New product development of automotive components in iron and aluminium: We help our customers with collaborative product design as expert suppliers
· Research of new materials and processes: Our research projects cover all the different stages of the process but are mainly focussed on downsizing of the automotive components, new alloys and innovative processes.
· High & low pressure die casting technologies research: Pre-industrialisation area unique in Europe and equipped with the latest technologies for validating the ideas developed in a virtual environment.

Main Green Cars activities: Products and Projects

· Strategies and development of Chassis and Powertrain components of the EV.
· Weight reduction of Chassis and Powertrain components using Al and collapsible cores.
· Use of Nano-technologies to improve surface characteristics and improve functional performance of components &tooling.
· Reduction of Lead Time and Virtual industrialisation projects, with the objectives of getting :
· Smart & flexible manufacturing for cost efficiency, performance and robustness.
· Modelling and virtual engineering.
· Flexible production processes for customised products and small series.
· Efficiency and energy use in manufacturing processes

EUVE - European Virtual Engineering Foundation

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Organisation profile

European Virtual Engineering was founded on 1998. It is member of the Basque and Spanish networks for Science, Technology and Innovation. Its staff is composed of 60 people, including 3 PhD's and 47 University Master degrees. EUVE's turnover in 2007 was 3.5 M€.

EUVE's main activity is the RESEARCH AND DEVELOPMENT in Virtual Reality and image processing. And one of its strategic lines is their application on transport. Applications for Virtual engineering, image processing and simulation are:
· Virtual prototyping,
· Product development time and cost reduction,
· Crash test,
· Fluid simulation,
· Fire simulation,
· Product and process simulation. Traffic simulation
· Planning and visualization,
· Projects visualization on infrastructures, architecture, civil works,

EUVE has developed its own 3D motor on real time. Virtual reality permits the user to view and a three-dimensional environment from every angle, understanding all details and points of view.

The main lines for R&D are focused on models based on intelligent agents applied to transport, logistics and production planning. Main goal is the product and process virtual performance, in order to analyze, verify or visualize them before existing. Or predict them before happening.

EUVE focus its strategy for improving knowledge on Virtual Reality on four basic horizontal technologies: Computer graphics - Artificial Intelligence - Numeric modelling - Meteorological tools and sensors.

EUVE has made over 100 R&D projects including European FPV and FPVI and Spanish and Basque R&D programs on Industry, Science and Education, and infrastructures. Also, EUVE has developed over 400 projects for private companies. Over the last years, EUVE is presenting an average of 15 papers per year on scientific congresses and conferences.

Main Green Cars activities: Products and Projects

· Complex systems simulation. Experience on traffic simulation or production line simulation. Discrete event simulation. Module design of agents and events.
· Artificial Intelligence applied to logistics, infrastructure and transport (Multiagent based simulators with fuzzy logic algorithms).
· Use of standard and own-designed traffic simulators
· Traffic flow synthetic visualization.
· Data acquisition. Sensors. Image processing. Artificial vision, infrared, ultrasounds, laser trackers.

GID, Engineering Design Group

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Organisation profile

The Engineering Design Group (GID), belonging to the Universitat Jaume I of Castellon, establishing in 1997 with the aim of helping designers and engineers to achieve high efficiency in the design process and knowledge management.

As a research group in the area of engineering projects, GID provides alternative solutions to any company based on:
· Design Engineering
· Engineering Projects
· Ecodesign
· Risk Assessment
· Innovation

Since its inception GID has been intense research activity, highlighting: 21 article journal, 4 books, over 130 congress papers,7 doctoral thesis, over 45 Projects R&D funded entities in competitive calls public or private; related to ecodesign, life cycle assessment (LCA), innovation and knowledge management.

Main Green Cars activities: Products and Projects

Weight reduction:
· LIGHTCARBONCARS: Reducing the environmental impact of cars through structural lightening carbon composites based on low cost without compromising safety and comfort (Ministry of Education and Science, Spain).

New Materials:
· Development of new thermoplastic materials with high added value from waste and/or ground equipment in the electrical and electronics sector (AIMPLAS, Spain).
· Life Cycle Assessment of materials biocomposites as an alternative to conventional plastics (Ministry of Environment - IMPIVA, Spain).
· Life Cycle Assessment of new materials biocomposites (Project DOLFINA - AIMPLAS, Spain).

Innovation and knowledge management:
· FaBeS / Eco-Innova: integrated product ecoinnovation in knowledge-based SMEs (Ministry of Education and Science, Spain).

IBV - Instituto de Biomecánica de Valencia

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Organisation profile

The activities of the Institute of Biomechanics of Valencia (IBV) as University Institute go back to 1976 and it acquired its official complementary status of Non-profit Research Organization in November 1994 as an initiative of different public and private entities, and, in particular of the UPV and IMPIVA.

IBV is a technology center that studies the behaviour of the human body and its relationship with the products, environments and services. The IBV combines knowledge from biomechanics and ergonomics or engineering emotional and applied them to different areas to improve the competitiveness of the companies through the well-being of people. Its mission is to support OEM and TIER in RTD and product development related with user interaction.

IBV has knowledge about user needs and requirements and experience in: Human body behaviour analysis; Analysis of the interface between user and objects; Technologies and techniques of study in biomechanics.

Research lines: Safety: Human Machine Interfaces (HMI), User monitoring / Comfort: Seating, Interior spaces and components, People with special needs / Emotional Engineering: Kansei, Perceived Quality / Workplace: Workplace ergonomics, Adaptation to people with disabilities.

Laboratories: Dynamic comfort laboratory; Acoustic comfort laboratory; Virtual ergonomics. RAMSIS; Instrumental techniques of biomechanical analysis; Thermal comfort.

Main Green Cars activities: Products and Projects

IBV is nowadays involved in several RTD projects related with comfort in the automobile interior and collective transport with several multinational companies. Projects related with Green Cars:

· "R&D in urban vehicles of reduced weight and low consumption". IMIDIN/2008/46. IMPIVA. Generalitat Valenciana.

· "Research in materials and ecological processes in the automotive and mass transport sector". ININER/2008/60. Conselleria d'Indústria, Comerç i Innovació. Generalitat Valenciana.

· "Conception of a Methodology to relay Perceived Product Quality within the Supply Chain to enthuse customers". IMIDIC/2008/89. IMPIVA. Generalitat Valenciana. CORNET 4th-call. ERA-NET CORNET.

IDF Automoción - Design and Manufacturing Institute for Automotive Industry

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Organisation profile

The Institute is a non-profit research association promoted by some of the most important automotive industries of the region. The Institute constitutes a specialized technological center to conduct research within the industries which are mainly involved in the automotive sector, through national and international projects. In this sense, IDF is establishing itself as a recognised partner for carrying out R&D projects and awarding for business companies. In addition, the Institute hosts COMPO-Networking, an association of some of the most important European producers of polymer materials.

Main Green Cars activities: Products and Projects

Product Design: supports a wide range of services such as design management, auditing, and evaluation; assesses scenarios and also provides methodologies for creating new products and services, opportunity detections, modelling, prototypes and visual communication of the product. Extensive use of CAD/CAM/CIM systems is made for the design of new products.
Manufacturing: high-speed machining using robot arms (CAD/CAM/Robotics) as well as research in resin transfer moulding numerical simulation, monitoring and control for mould filling and resin cure; and manufacturing with thermoplastic matrix composites (GREEN-COMPOSITE).
Robotics and Automation: industrial solutions in terms of monitoring, diagnostics, control and communication systems, in addition to teleoperation and remote control systems, sensor fusion, smart sensors, etc. for mobile robots and vehicles.
New Energies: research area in opto-electronics specialises in the structural, electrical and optical characterisation of compound semiconductor materials for optoelectronic applications such as solar panels and photoemitting devices. The synthesis of fine nanostructured layers of binary and ternary is obtained by electrochemical techniques.
Information Technologies: knowledge management and information auditing, standardization and e-learning, multimedia development, user-friendly interfaces based on virtual reality; design and implementation of Human Machine Interfaces (HMI) including functionality, ergonomics and usability.
Projects: Solar and electric vehicles with driving facilities (PROMETEO Project 2009-2013); Car-body inspection systems based on artificial vision (PROFIT); Production process design using composites for car bodies (IMPIVA); Advanced design of moulds for resin transfer moulding (RTM) (MEC Project); CAD/CAM/Robotics for manufacturing large dimensional objects (IMPIVA); EGNOS Technology evaluation for civil transportation (MCIT); Design, synthesis and characterization of efficient solar materials (MCI); Hybrid solar cells by low temperature electrochemical techniques (AECI); Low-cost solar cells based on nanostructured semiconductors (IMPIVA); Agricultural vehicles control based on sensor fusion (MCIT); Design and manufacture of walking robots (MCIT); Driver training and assessment using interactive evaluation tools and reliable methodologies (European Project); Autonomous underwater inspection vehicles for oceanography (MCI).

IDIADA Automotive Technology

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Organisation profile

Applus+ IDIADA is a global partner to the automotive industry worldwide. We support our clients in their product development activities by providing design, engineering, testing and homologation services to fit their needs. Applus+ IDIADA headquarters and main technical centre is located 70km southwest of Barcelona. The company is also present in 15 countries to ensure clients will be given customized services providing complete solutions for product development projects world-wide.

Our assets are an international team of over 900 skilled and experienced engineers and technical experts specialized in automotive product development and first class state-of-the-art testing facilities including a modern comprehensive proving ground & leading-edge laboratories.

Main Green Cars activities: Products and Projects

Testing & Engineering: Extensive range of engineering and testing services in the fields of passive and active safety, powertrain, comfort, reliability, electronics and materials and processes. Applus IDIADA's expertise in both physical and virtual testing means maximum efficiency in cost and time. Its engineering solutions are driven by the ongoing pursuit of excellence and research in the best technology.

Proving ground: The most comprehensive independent in Europe. Highest level of customer support combined with first-class test tracks and fully-equipped confidential workshops.

Homologation: Applus+ IDIADA issues official certificates according to EC Directives and ECE Regulations within Europe, and is recognised internationally as an authorised technical service and consultant in regulations. Its fields of competence in the homologation sector include passenger cars & components, commercial vehicles and motorcycles & helmets.

Main Green Cars activities

· Highly energy-efficient ICT components and solutions.
· Integrated electric auxiliaries and on-board systems
· Smart storage integration.
· Advanced electric vehicle concepts.
· Development of standards, comprehensive safety assessment of vehicles and infrastructure, technology validation.

We are looking for partners for testing and engineering projects, research and development projects, homologation services and proving ground services.

IKERLAN-IK4

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Organisation profile

IKERLAN-IK4 is a private non-profit Technological Research Centre in the north of Spain. It is renowned for its capacity for innovation and comprehensive product development in smart mechatronic systems. It works closely together with regional companies to improve their competitiveness, by applying technological knowledge to the development of innovative products, as well as new tools and methodologies for implementation in design and production processes. It has a staff of more than 200 qualified researchers and engineers, with experience in interdisciplinary work and capable of tackling complex problems.

From its creation in 1974 in the fold of what is today Mondragon Corporation, Spain's 7th-largest industrial grouping, IKERLAN-IK4 has worked for companies from the machinery and capital goods, household appliance, electronics, automotive, railway transport and energy sectors. As a centre of excellence in technology transfer, more than 800 R&D projects in cooperation with companies developing new products and implementing customised systems in design and manufacturing processes have been completed.

Main Green Cars activities: Products and Projects

IKERLAN has strong R&D expertise in the following fields of relevance to the development of the full electrical vehicle:

· Power electronics and control systems: topologies and control strategies for convertors and electrical machines, robust modular design and modelling of power electronic systems.

· Electrical energy storage systems: electrochemical characterization and life time prediction of cells and modules, management systems for storage modules (batteries and supercaps), rapid and/or energy-efficient chargers, thermal management including characterization and modelling, smart grid connectivity, integration of renewable energy sources in (micro-)grids, packaging technology.

· Dependable embedded systems: robust and ultra-safe (SIL 4) real-time embedded systems, design for dependability, interoperability, re-usability/reconfigurability and energy-efficiency.

· Sensors and controls: design, modelling and simulation of complex mechatronics systems, noise and vibration, structural health monitoring, multivariate control.

· Design and Production processes: product-process-supply network structure design and alignment, mass customization business strategy, sustainable development, simulation & optimization decision support systems

Examples of relevant projects:

· "AVI-2015: Advanced power conversion systems for electrical traction applications", Spanish Industry Ministry funded research project. 2006-2009. (Spain's next generation high-speed trains).

· "Power electronic interface for an energy storage system oriented to railway traction applications", funded by the private company CAF. 2008-2009.

· "Ecotrans", Spanish Industry Ministry funded research project. 2008-2011. (Catenary-less urban light rail system).

INSIA - University Institute for Automobile Research

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Organisation profile

INSIA, the University Institute of Automobile Research is a centre belonging to Technical University of Madrid (UPM), part of the School of Industrial Engineers, and is integrated into the UPM's scientific and technological park. Located at the Campus Sur, it has 3,000 sqm of laboratory buildings with testing facilities and 1,700 sqm for R&D&i, teaching and administration. The centre has very highly qualified research workers, some academic and others under contract, with more than 20 years' experience in R&D&i activities related to the traffic accidents and vehicles safety, automobile industry, transportation sector and more recently to the transportation environmental impact.

The Institute has carried out relevant studies into accidentology, transport, passive safety in buses, coaches and industrial vehicles, biomechanics, intelligent systems and vehicle engineering. It is also authorised as the Official Laboratory for obtaining official approval according to several Regulations and Directives (buses and coaches, stability, tyres, seats, restraint systems) and Important Reforms.

One of our many objectives is to position ourselves as one of the point of reference R&D&i centres in the automobile industry sector, which carries out activities of:
· Research, development and innovation particularly orientated towards the safety and environmental impact of vehicles.
· To provide service and co-operate with business and public organisations in matters of the Institute's specialisation.
· To provide specialised post-graduate training.
· To be a communications and documentation channel within the sector.

Main Green Cars activities: Products and Projects

"Designing a light fuel cell-propelled hybrid vehicle": Project financed by the Ministerio de Educación y Ciencia. National R&D&i Plan.

"Design, modelling, production, characterisation and integration of a light electric hybrid vehicle in two cylinder capacity versions: thermal engine and fuel cell": Business project, financed by CEMUSA.

"Environmental evaluation of solid refuse collection vehicles". Business project, financed by FCC and with INSIA & FCC as participant bodies.

"Development of a methodology to analyse energy consumption and pollutant emissions produced by urban public passenger transport - Applied to the city of Madrid": Project funded by the Ministerio de Medio Ambiente - National R&D&i Plan.

Book: José María López Martínez "El medio ambiente y el automóvil. El reto del vehículo automóvil frente a la reducción global del CO2", CIE-DOSSAT; Madrid, 2007; ISBN: 978-84-96437-70-8.

INTA - Instituto Nacional de Técnica Aeroespacial

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Organisation profile

INTA is the Public Research Organization specialized in aerospace and vehicle research and technology development. Among its main functions it is worth mentioning: the acquisition, maintenance and continuous improvement of all those technologies that can be applied to the aerospace and surface transport field; Performing all types of tests to check, approve and certify materials, components equipment items, subsystems and systems that have an aerospace application; To provide technical assessment and services to official bodies and agencies, and also to industrial or technological companies; To act as a technological centre for the Ministries of Industry, Science and Defence.

Main Green Cars activities: Products and Projects

Transport Safety Technology and Vehicle Certification-Experimentation Centre: Tests, studies and certification of motors and vehicles performance with respect to atmospheric pollution, power and fuel consumption. Also Passive and active safety. European Type Certification. Spanish Type Certification. Certification exemptions. Individual certification. Significant reforms. Track tests. We also take part in Spanish, European and international legislation development forums. In recent years INTA has specialized in developing Intelligent Systems (ITS) designed to enhance passengers and pedestrians' safety. New technologies to avoid accidents, either through systems that act on the vehicle itself or can be used to reproduce, analyse and correct, a priori, future sources of road hazards. First-class facilities designed chiefly for this purpose. Its test tracks and simulators afford comprehensive solutions for enhancing road safety by contributing to the development, analysis and virtual and real testing of new devices. Biofuels testing and synthesis from vegetal oil.

Hydrogen and Fuel Cell Technology: Characterization, testing and integration of "PEM-type fuel-cells" in power systems and plants. Hydrogen production system, based on reforming of gasoil, ethanol, or with electrolyzers. Hydrogen storage systems, at high pressure or in metal hydrides. Experience in testing of phosphoric acid and alkaline fuel cells. Institutional representation on national and international committees (International Energy Agency). Development of hydrogen technology regulations and standards and their applications.

Products: Tests compliant with official standards. Pollution emission tests (CO, HC and NOx) on spark ignition or compression ignition engines, light and heavy vehicles, and on motorcycles and similar vehicles. Solid particle emission and fume opacity tests on compression ignition motors and vehicles. Comparative tests of devices and additives developed to improve pollution emissions in engines and vehicles. Tests to determine liquid fuel consumption and CO_2 emissions in passenger cars and light commercial vehicles. Tests to determine the characteristic curves in spark ignition or compression ignition engines, and in motorcycles and similar vehicles. Tests and inspections for Type Certifications of automobiles and trailers. Products in ITS as TCD (Tech-nological Co-Driver) and SAI (smart overtaking sys-tem). Design of "a la carte" certification programs, according to the characteristics of the product to be certified, the manufacturers' needs, etc.

ITA - Instituto Tecnológico de Aragón

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Organisation profile

ITA (Instituto Tecnológico de Aragón) is a public non-profit Technology Centre whose main objective is to promote competitiveness in the industrial sector and to support the growth of business sectors by means of the development, acquisition, adaptation, transfer and diffusion of innovative technologies in a multi-agent collaborative frame-work.The Research and Development Area of ITA is specialised in the following research areas:

· Applied Research in Materials: materials modelling for in-service behaviour, development of knowledge-based new materials.
· Applied Research in New Design Technologies: virtual prototyping, functional safety and mechatronics.
· Applied Research in Production, Logistics and Expert Systems.

Main Green Cars activities: Products and Projects

Research and development activities related to:
Model-based design, control and optimisation of energy flows in new vehicles for efficient management: energy consumption models, energy storage and transference device models, electronic control, duty cycles, management strategies. Modelling of vehicle dynamics, electrical architecture and thermal requirements.
Design and development of new components and systems:
· Power electronics for energy management systems: embedded power electronics, algorithms and control software, communications.
· Mechatronic systems design for keeping comfort, safety and driveability: virtual prototyping and application of multidomain and multiphysic modelling for efficiency, robustness, size, power-class, weight and cost in new electrified components and systems. Functional safety: electromagnetic compatibility, vibrations resistance and product functioning in aggressive environments. Evaluation procedures and tests.
· Design and integration of high dynamic and/or precision test stations including design of algorithms and control software and development of advanced electronic systems for monitoring, automation and communications.
Lightweight and multimaterial structures (steel, Al, composites, polymers):
· Advanced characterization and behaviour modelling, life prediction and materials failure analysis under service conditions.
· Structural calculation and modelling (FEM static/dynamic/crash analysis of metallic and composite vehicle bodies and parts).

Development of light multifunctional materials: modelling, design and manufacture of polymer matrix materials reinforced with nanoparticles.

Cooperative systems for efficient traffic management and safety: embedded systems, real-time communications and software. Usage of de decisional systems in advanced traveller information system, advanced traffic management systems, emergency management system and finally the travel time prediction.
Life Cycle Assessment, Life Cycle Cost and Life Cycle Management.

ITCL - Instituto Tecnológico de Castilla y León

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Organisation profile

The Castilla-Leon Institute of Technology (www.itcl.es) is a private non-profit foundation, whose objective is to contribute to the economic and social development of the region. Its aim is to support, promoting and facilitate the use of technology as a competitive tool for the business and public sector. ITCL has the engagement to integration in the science-technology-business system in the regional society. ITCL is a reference centre with respect to technology and R&D, including mobility and transport activities, development issues at the regional and national level.

ITCL is Founding Member of INTENEC, an R&D consortium of the Technological Centres of Castilla y León which is in the Technological Centres network of the Castilla y León Government and member of the Spanish Federation of Technological Innovation Entities (FEDIT). Moreover, ITCL is Collective Member of the Spanish Association for Quality (AEC) and the Spanish Standardisation Association (AENOR), Member of the Quality Management Club, Spanish Association of Non-Destructive Testing (AEND) and Cluster Association of Business Management Knowledge.

ITCL develops and supports to achieve a better dissemination and exploitation of R&D results in order to facilitate the transfer of knowledge to enterprises, especially SMEs in Castilla y León. ITCL has been involved in various European projects, such as Craft Pestisens, Craft Age, Craft Genosense, Innoman (European Innovation Manager), INTERREG III-A (PTI) and finally the next project Civitas II in Caravel Project and Hidrosolar (Life Project) joint to the city of Burgos.

Also, ITCL is involved in some Regional and National Projects to promote the mobility and transport in the Spanish cities, in concrete in the development of charging infrastructures and new services of mobility with electric vehicles (car sharing and electric bikes, principally).

Main Green Cars activities: Products and Projects

ITCL is interested in developing projects in the initiative Green Cars, principally, in the research and demonstration of public infrastructure for smart grid and charging equipment and his integration with the electricity users.

Another principal activity of the ITCL in this area is the monitoring, controlling and integration in the electronic of the vehicle with the transport system to favour the intermodality and the cooperation in different systems, infrastructures and communications.

Moreover, ITCL is interested in the demonstration projects in urban areas, vehicles and infrastructure to integrate and manage new services and market opportunities for electric vehicles.

ITE - Energy Technological Institute

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Organisation profile

The Energy Technological Institute, ITE, is a Center for Technological Investigation, orients its services, products and technological projects to companies and public organisms at national and international level. These projects belong to different sectors like energy, electrical, electronic and the communica-tions. The aim of the institution is the promotion of the scientific research and the technological development in the areas related before. We are working in several projects involves in: Smart Grids, Renewable Energies, New Carbon Materials for Energy Storage, Power Electronics, Automatic Control, Modelling and Simulation, Advanced Control Techniques, Artificial Intelligent Control (Neuronal Networks, Fuzzy, Data Mining, etc.), Electric Vehicle, New Distribution Networks, etc.

Laboratories: Electrical Safety, Calibration, Quality of Supply, Electromagnetic Compatibility, High Voltage, Legal Metrology, Electromagnetic Fields Measurement, Electronic Circuits Prototyping, Environment and Quality. Pilot Renewable Energies Plant with solar PV, thermal solar, wind and fuel cell systems integration.

Main Green Cars activities: Products and Projects

· Project EPV: New Efficient Urban Transport Power System based on the use of Electrical Vehicles integrated in the grid and powered by renewable energies.
· Methodology for optimal location of charge stations and the vehicle charge process. Regional project with Iberdrola and AVEN (Valencian Regional Energy Agency) as advisory organization.
· Project IMPIVA 2009. Design and evaluation of hybrid systems for stationary and transport applications: developments of supercapacitor batteries and fuel-cell batteries.
· Project IMPIVA 2008: Improvement of the dynamic behavior of electrical storage based on supercapacitors.
· Project MCIN 2009-2011: New concepts in energy storage for medium and large systems.
· Project MCIN 2005-2008. Smart Grids. Design of new control strategies in distributed generation systems.
· PSE Renewable Hydrogen SUB-PROJECT Nº 09: Systems integration of electrical energy generation based on fuel cells with renewable hydrogen (HYDROREV)
· Project IMPIVA 2005-2007: Generation of new systems of power storage based on nanotechnology techniques: carbon nano-structured.
· Design of automation and communication architectures for optimal integration between internal and external operation vehicle devices.
· Advanced modelling, simulation and control of vehicle behavior and its interaction with its surroundings, model grid and the Distributed Energy Resources. (Using DYMOLA and the Smart Electric Drives Library, Matlab, Power Factory, developments M.A.S.).
· Power Electronics and Battery Management Systems (control and charge).
· Nano-structured materials synthesis, modification and characterization for energy storage and synthesis of nanostructures carbon of controlled porosity and high electric conductivity.
· Carbon nano-foam preparation for catalysis and energy applications.
· Carbon nano-fibers for energy storage in batteries and supercapacitors.

ITENE - Packaging, Transport and Logistics Research Center

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Organisation profile

ITENE - Instituto Tecnológico del Embalaje, Transporte y Logística - is a Research Institute constituted in 1994 as a private non-profit Research centre integrated with businesses, entities and institutions related to Packaging, Transport and Logistics.

ITENE works for public and private companies and organisations on a national and European level. It is formed by a multidisciplinary team with more than 115 researchers and technical personnel and its facilities cover more than 5.000 m2 devoted to R&D&I.

The activities carried out at ITENE can be divided into three main lines: Project Development R+D+I; Provision of Technological Services; Promotion and Dissemination of Technology.

ITENE is one of the founders of the National Competence Centre in Integral Logistics: CNC-Logistics which is the Secretary Board of the Spanish Technology Platform in Integral Logistics: Logistop. Moreover ITENE is coordinating LOGIN-NET, the European Network of Logistics Institutes for the development and promotion of Comodality and Logistics.

Main Green Cars activities: Products and Projects

ITENE has considerable experience in regional, national and European research projects. Regarding logistics and comodality, ITENE is involved in the following regional, national and European R&D projects:

· **BESTLOG** Logistics Best Practice: Design of a quality system and benchmarking methodology to improve the logistics efficiency and performance. (VI FP "Sustainable development, global change and ecosystems").
· **U-STIR:** User Driven Stimulation of Radical New Technological Steps in Surface Transport. (VII FP TRANSPORT).
· **LIASON:** Strategies and initiatives for good management and good usabiLIty of the freight trAnSport connectIons towards a coOperative and inNovative business model.
· **HINTERPORT:** Promotion of Hinterland transport cooperative solutions for iNTEgrated operation of sea-inland PORTs (Marco Polo).
· **CASTLE:** Cooperation Among SMEs Toward Logistic Excellence (Interreg Programme).
· **MOBITRANS:** Innovation on information technologies for travellers to foster the sustainable urban mobility (funded by the Spanish Ministry of Public Works, coordinated by ITENE).
· **AUDITRANS:** R&D in Transport, Energy and Sustainable Mobility (funded by the Regional Government, coordinated by ITENE).
· **TIMI:** Intelligent intermodal transport for goods (funded by Spanish Ministry of Science and Innovation).
· **GLOBALOG:** Boosting Spanish business competitiveness through logistics as main strategic factor in a global environment (funded by Spanish Ministry of Science and Innovation).
· **INTERNODAL:** Analysis of the accessibility and efficiency improvements for intermodal operations and logistics platforms (funded by the Spanish Ministry of Public Works, coordinated by ITENE).

LAUPV - Automobile Laboratory of the Technical University of Valencia

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Organisation profile

The Automobile Laboratory is an institutional organization accredited by Regional and National Administrations to provide official certificates for modified, adapted, or historical vehicles, as well as evaluate special needs drivers for obtaining their driving license. Complementary activities provided to the automotive industry are postgraduate courses and R&D services in the fields of integrated safety and security for surface transport systems. Additional activities include the fields of logistics and intermodal transport, new transport and mobility concepts, high quality public transport, simulation, visualization, interaction and mixed realities, personal environments, safety technology, road transport technology, mechanical design, user centered design, active and passive safety of vehicles, simulation engineering and rehabilitation engineering.

Main Green Cars activities: Products and Projects

Participation in EU-funded projects:
· AUTOMOTIVATION 2000 - ADAPT. 96 A1610CVA.
· TRAINER. System for Driver Training and Assessment Using Interactive Evaluation Tools and Reliable Methodologies. 2000-RD.10024.
· CONSENSUS. Promoting CONSENSUS in assessing driving ability of PSN through common methodologies and normative tools. IST-2000-26456.
· IDEA. An Innovative Vocational Training Scheme for Assessing the Driving Ability of Elderly and Disabled. 2002-B/O2/B/P/PP-110.350.
· CONSENSUS II. Promoting CONSENSUS in assessing driving ability of PSN through common methodologies and normative tools. IST-2001-37092.
· ASK-IT. Ambient Intelligence System of Agents for Knowledge-based and Integrated Services for Mobility Impaired Users. IST-2003-511298.

Participation in national competitive funded projects:
· SEMAV III. Improvements in the SEMAV simulator for the functional evaluation of disabled drivers. IMSERSO (MINISTRY OF WORKLOAD AND SOCIAL AFFAIRES). National Program R+D.
· Improvements in the passive safety of adapted vehicles for disabled drivers. Ministry of Science and Education. National Research Program 2004-2007. Transports. Ref. TRA2005-08649/AUT. 2005-2008.
· Design of technical aids for the safe transportation of wheelchair users in M1-M2-M3 vehicles. Ministry of Workload and Social Affaires. IMSERSO. National Research Program 2004-2007. Ref. 54/05. 2005-2006.
· ASUCAR. Determination of safety and accessibility requirements for children trolleys transportation in public transport. Ministry of Science and Innovation. National Program TRACE. Ref. PET2008-0328-01. 2009-2011.

Participation in regional competitive funded projects:
· Design of scientific and technologic equipment for virtual reality environments. Enterprise, University and Science Council. Generalitat Valenciana. 2006.
· Viability analysis for the implementation of a pilot plant for adapted vehicles technical inspection. IMPIVA. Generalitat Valenciana. PCEV. 2007-2008.

LUREDERRA Technology Centre

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Organisation profile

LUREDERRA Technology Centre is a non-profit organisation created in June 1999 to perform and promote activities of research and technological development on behalf of the companies and economic agents, including further implementation at the production facilities of the companies them-selves. With a current technical staff of 40 highly-qualified people, it has been involved in more than 200 RTD projects.
LUREDERRA performs activities of applied research and technological development in the fields of:
· New materials: Nanotechnology (production, modification and use of mineral and synthetic Nanoparticles), Advanced materials including sensorised intelligent materials, Organic-inorganic interface design, Sophisticated polymers and polymer constructs in the pharmaceutical industry, Advanced processing of plastics and Advanced chemistry.
· Environment and energy technologies: Applications of the new advanced materials and nanoparticles in environmental process, Use of biomass for energy production, Development of optimised technologies for the reduction, recovering, recycling and reuse of different kind of wastes (organic and inorganic wastes), Development of catalysts for environmental processes.

Main Green Cars activities: Products and Projects

New materials: Development of advanced materials such as nanoparticles (simple, complex or doped oxides), production capacity up to 1kg/h; nanocomposites or advanced polymers for new propulsion systems, Nanoparticles for lithium ion batteries, hydrogen storage or for hydrogen fuel cells. / Development of advanced glasses with hydrophobic properties. / Nanomaterials and nanocomposites for the development of vehicle pieces with improved mechanical and flame-retarding properties. / Nanoparticles for the development of advanced catalysts for exhaust pipes, to decrease contaminant gases from the combustion. / Development of vehicle sensors using advanced conductive-gums. / Development of shock-absorbers using magneto-rheological or electro-rheological fluids. Development of conductor polymers.

Environment and energy technologies: Develop bio-diesel using animal fats and bio-butanol using ligno-cellulose, recycling of car windscreens.

· "ADVANCE-FSP". NMP3-SL-2009-228885 (FP7). Large scale production of tailored nano-oxides by advanced high-output, high-versatility flame spray pyrolysis.
· "NANORUB". COOP-CT2005-018003 (FP6). Customised nanocomposites based on rubber matrices for high demand applications.
· "FLARETPOL". NMP3-CT2005-516998. Development of an innovative, cost-effective technology to produce halogen-free, high-performance flame retarded polyolefins for automotive sector. (FP6).
· "PiIBE". Research project for the promotion of Biodiesel in Spain (CENIT).
· "PVB-VFU". 6.1-205/2005/3-A 398/2006/2-6.1 A422/2007/1-06.1. (MINISTERIO MEDIO AMBIENTE). Design and development of technology for the recycling of polyvinylbutyral (PVB) from laminated glass windshields from End-of-Life vehicles.
· "NANOCAV". PID-560410-2009-3 (MICINN). Development of an innovate system for automotive catalyst based on advanced nanoparticles .

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Organisation profile

Mondragon Goi Eskola Politeknikoa - MGEP (Mondragon University's Faculty of Engineering) is a cooperative integrated in MONDRAGON Corporation which is a business group made of more than 250 companies and entities that incorporates eleven Research & Development Centers and a private corporative University (Mondragon University). MGEP is an independent university, internally organised as mixed co-operative, non-profit organisation, and with a public service vocation. Located in the middle of the Basque Country, it began his academic activities in 1943 and, from the origins its mission has been to offer the best service to the society. Since several years MGEP has been involved in research and development activities, which have had a substantial growth during the last years.

Main Green Cars activities: Products and Projects

Main research lines applicable to Green Cars initiative:
· Advanced Processes for Transformation of Materials.
· Mechanical Behaviour and Product Design.
· New Materials and Advanced Technologies of Materials.
· Electrical Energy: Electronic Power Systems Applied to the Control Electrical Energy; Drive Systems Applied to Traction and the Generation of Electrical Energy.
· Information and Communications Technologies: Distributed Systems; Software Engineering; Telematics; Signal and Communications Theory.
· Organisation and Industrial Management.

Relevant projects:
· LIGHTCARBONCAR: Reduction of the environmental impact of vehicles by means of lightweight structures based on low cost carbon composites, without compromising safety and comfort (PSE 2007-2011, 20 partners, Project Total Budget 13.7 M€, coordinated by MGEP).
· INTEGRAUTO: Increase of the added value of automotive components by means of integrating functionalities through the interconnection of innovative processes (PSE 2008-2011, 20 partners, Project Total Budget 7.7 M€, coordinated by MGEP).
· MAUT_PROTVE: Development and knowledge of technologies oriented towards systems and components linked to the electric vehicles (Collaborative project with Mondragon Automoción 2009-2010, coordinated by MGEP).
· ZEUS (Zero Emission Urban Service - First Spanish EV): Answer to the technological challenges of the electric vehicle design, in terms of aspects of the cinematic chain, the chassis-body and the industrial design of the vehicle (SAIOTEK, coordinated by MGEP).
· SIMOVE: Development of an experimental platform for the regulation of an electric motor by means of a real time and failure tolerant control system and that fulfils the stringent requirements of the specification IEC 61508 (DFG 2009-20011 coordinated by MGEP).

PRODINTEC Foundation

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Organisation profile

PRODINTEC is an industry-driven Technology Centre created to boost the competitiveness of European companies by applying research and development activities to either product design or manufacturing processes.

There are 3 main areas of activity:
· **Industrial production:** mainly focused on the development of layer-by-layer manufacturing technologies, micromanufacturing, mechatronics, lean manufacturing methodologies and electromagnetic compatibility.
· **Industrial design:** technologies and methodologies for the improvement of product design. Rapid prototyping; reverse engineering; CAD, CAE and PLM training centre; systematisation of industrial design process.
· **R&D management:** Tools and services to carry out innovation activities in a systematized way. R&D Internationalization; project management; technology protection; technology surveillance; feasibility analysis project; technology auditing.

Main Green Cars activities: Products and Projects

LivingCAR project: A living lab for studying the effect of using electrical vehicles and their related infrastructure in a real life environment.
Role of PRODINTEC: Project coordinator.
Public-private consortium: Ayuntamiento de Gijón, Grupo Temper, Grupo Isastur, HC Energia (EDP Group), Banco Herrero (Sabadell Group), Autoridad Portuaria de Gijón, GAM, Fundacion PRODINTEC
Starting date: July 2009.

Open initiative for stimulating the use of electrical vehicles (EVs) by applying the living lab research methodology for innovation. The main objective is that Asturias (north of Spain) becomes a real-life laboratory for the implementation of EVs and the related infrastructure. Experiments started in Gijon, a medium size city with 280.000 inhabitants.

It is understood as a real demonstration platform for extracting crucial information about:

Technical issues:
· Technical advantages/disadvantages identification when using EVs and the related infrastructure in existent life operating conditions. Real impact measurement.
· To find new business opportunities (related to car design, grid management, intelligent billing, infrastructure communication, etc.).

Social issues:
· To identify the social barriers when using electrical vehicles by extracting data from the live experiments and by evaluating citizens' perception.
· To name and promote positive measurements, standards and new regulations.

REDITA, Red Tecnológica de Automoción (Automotive Technology Network)

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Organisation profile

REDITA is the Automotive Technology Network of the Valencia Region, consisting of 8 Technology Institutes that have developed state-of-the-art innovation for more than 20 years.

Our mission is to support the automotive suppliers' technological development acting as a coordinator between the R&D&I service portfolios of the REDITA Technology Institutes and the specific needs of the industry.

Our main asset is a team of 800 highly skilled experts, including over 100 PhDs and 400 University Degrees. REDITA R&D&I experience includes regional, national and European projects.

Main Green Cars activities: Products and Projects

Product: component design, materials research (weight reduction, use of recyclable and bio-materials; nanotechnologies to modify/improve material properties: anti-scratch, self cleaning, etc), rapid prototyping/manufacturing, life cycle analysis, HMIs and product emotional valuation.
Process: process automation/improvement; virtual engineering, increased reality systems; flexible production processes; new assembly and surface protection technologies; energy efficiency in manufacturing processes.
Energy: power electronics and battery management systems; nanostructured materials for energy storage; carbon nanofoam for catalysis and energy applications; carbon nanofibers for energy storage in batteries and supercapacitors.
Communications: communications safety and robustness, V2G, V2V and V2C interfaces, intermodality/interoperability, co-operative systems, traffic control systems, deployment of public infrastructure in parking areas.
Logistics: traceability and RFID systems, supply chain management, routes and loads optimization, warehouse and handling solutions, packaging solutions and transport condition simulation, comodality, ITS technologies.
Ergonomics: smart controls to manage requirements in driving performance and comfort.
Environment: environment correction, electric product life cycle analysis, energy efficiency.
REDITA main projects related to Green Cars include:
Regional Project EPV: New System of Efficient Urban Transport Power based on the use of EV integrated in the grid and powered by renewable energies. Methodology for optimal location of the charge stations and the vehicle charge process.
Regional Project: Design and evaluation of hybrid systems for stationary and transport applications: developments in supercapacitor and fuel-cell batteries.
Regional Project: Improvement of electrical storage based on supercapacitors.
National Project 2009-2011: New concepts in energy storage for medium and large systems.
National Project 2005-2008: Smart Grids. Design of control strategies in distributed generation.
Other relevant information:
Laboratories: Electrical Safety, Calibration, Electromagnetic Compatibility, High Voltage, Metrology, Electromagnetic Fields, Electronic Prototyping, Renewable Energies Pilot Plant.

TECNALIA

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Organisation profile

We are a private and independent, internationally known Technology Corporation created within the Basque technology environment. We include the following Technology Centres: Azti, Cidemco, European Software Institute (ESI), Fatronik, Inasmet, Labein, Neiker and Robotiker.

The TECNALIA Automotive Unit is becoming increasingly recognised as technological agent in the automotive sector and as a technological partner in a select number of its segments, thanks to its work aimed at satisfying the main requirements of the sector.

TECNALIA has fully integrated capacity from the energy generation to storage, as vehicle condition specs and development and also including new transportation modes and commonality and holds a strong position in relevant international organisations, to support strategy.

Main Green Cars activities: Products and Projects

Research & Development activities, related to:
· Product electronics.
· Advanced manufacturing systems (robotics, automatization, welding,..).
· Nanotechnology.
· Integrated systems.
· Communications.
· Infrastructure.
· Charging systems.
· Recycling.
· New Product development.

TECNOEBRO Association

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Organisation profile

TecnoEbro is a non-profit association founded by research institutions from Aragón to contribute to its social, economic and institutional development, offering technological solutions and specific training to improve the competitivity of companies. The goal of TecnoEbro is to provide any company with the combined technology and training offer coming from all its members in order to solve company needs of innovation and continuous improvement.

Main Green Cars activities: Products and Projects

Energy storage systems

· Hydrogen technologies: Production, separation and storage of this "energy vector" by non-conventional methods.
· Solid Oxide Fuel Cells.
· Optimal design of the storage system depending on the application.

Drive train

· Development of hydrocarbon traps for cold start.
· Optimization of biofuel processing and characterization of biofuels.
· Development of advanced catalysts for polymeric and direct methanol fuel cells.
· Electronic control of electrical motors.

Vehicle integration

· Lightweight and multimaterial structures.
· Design and development parts in plastic materials. Simulation of plastics converting technologies. Plastics processing by injection moulding, extrusion-blow-moulding.
· Microcellular foaming
· Development of multifunctional materials: modelling, design and manufacture of polymer matrix materials reinforced with nanoparticles.
· Nanotechnology applied to Green Cars (nanosensors, nanomaterials, coatings, catalysts, pollutants filters, alternative batteries for electric cars, recycling materials, nanoelectronics and sensors based on magnetoresistive nanocontacts).
· Active/passive safety (systems for active and passive safety. Accident analysis, simulation, investigation).
· Safety and robustness: Functional safety (electromagnetic compatibility, vibrations resistance and product functioning in aggressive environments).
· Biomechanical crash simulation and testing (computer modelling, impact testing).
· Driving simulation (several driving simulators for human factors analysis).
· Security and mobility (advanced control systems, security systems, human-machine interface, electricity and electronics).
· IST for the communicated vehicle (V2V, V2I, I2V)
· Advanced/smart control and energy management systems based on models of new vehicles (vehicle dynamics and power architecture).
· Design and integration of high dynamic and/or precision test stations including design of algorithms and control software and development of advanced electronic systems for monitoring, automation and

communications.
· Virtual factory: design and analysis of processes based on the application of advanced simulation technologies.

Infrastructure integration:
· Vehicle to Grid (V2G):
· Deployment of charging infrastructure: technologies of inductive charge of the batteries,
· Energy generation / distribution: technologies for integrating the car in the electrical grid considering it as an individual energy generation, consumption and storage system.

Electric car integrated with transport system
· Safety and intelligent vehicles.
· Control policies development in order to optimize the energy management.
· Life Cycle Assesment, Life Cycle Cost and Life Cycle Management.

Horizontal technological areas
· Microelectronics. ASIC design.
· Advanced metrology. Mechatronics.
· Rapid manufacturing.
· Supercomputing facilities.

TEKNIKER Foundation

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Organisation profile

TEKNIKER is a non-profit making research organisation that works a wide field of technologies related to manufacturing. At the end of 2008, TEKNIKER had 230 experienced researchers plus 25 trainees 21 of them hold PhDs' degrees in various specialist fields.

Technologically speaking, it is possible to group the different activities into four main blocks:
· Precision engineering and mechatronics: Design and manufacture of mechatronic products. Advanced calculation and simulation. Design and adjustment of controllers.
· Surface engineering: Lubrication, maintenance and reliability. Thin layer deposition (PVD) processes. Surface development and characterization. Surface microengineering and nanoengineering.
· Production and automation engineering: Production organisation and management. Smart systems: System integration, control and optimization, Artificial vision.
· Manufacturing technologies: Micro-manufacturing and ultra-precision technologies. Non conventional processes: ultrasounds and lasers. High-speed cutting.
Likewise, TEKNIKER has decided to specialise in eight major lines of technological research: Identification and control systems / Precision engineering / Electromagnetism and power accelerators / Surfaces / Maintenance and reliability / Smart systems / Advanced production technologies / Micro and nanotechnologies.

Main Green Cars activities: Products and Projects

Projects:
· Electronics for Intelligent transport.
· Intelligent perceptive systems for intelligent transport.
· Structural monitoring (sensor networks and power harvesting).
· New concepts for lightweight high-performance materials for body, structure and suspension in the new generation of cars. -KONAUTO.
· Knowledge-based Radical Innovation Surfacing for Tribology and Advanced Lubrication.-KRISTAL.
· High performance manufacturing for automotive sector- ECOCORNER.
· Advanced energy storage systems for transport and energy management SA2VE.

Products:
· Intelligent knots for context awareness.
· Localization system based on sensor networks.
· Electronics for engine control.
· Secure Car electric window.
· High autonomy Wireless data logger.
· Control platform for magnetic levitation.
· V2X of sensors networks.
· Production engineering Information system for a new assembly plant for a new car model.

UNEX - Power Electrical and Electronic Systems

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Organisation profile

PE&ES is an R+D+i Group of the University of Extremadura. The group started to work in the field of Power Quality participating in the Research Project ACCIONE, PIE 1342, carried on from 1990 to 1996. Since that year, it is participating in regional, national and European project calls, and collaborating with companies in technical projects. The group is currently composed of 10 members. The research Group has acquired in the last years a wide experience in power conditioner topologies, in control strategies and in track techniques for the converters connected to the grid, developing smart controllers. The objective of the Group in recent projects is the study of the converters used for connecting the distributed generators to the grid and their integration in the electric grid using energy storage systems, as well as the study of the power converters used for implementing the smart electric grid.

The main research topics are:
· Measure, evaluation and control systems for the electrical supply quality.
· Injection systems for the electrical supply of the energy produced by the generation installations based on renewable energies.
· Electrical and electronic mechanisms and the development of the associate software by the control of process and installations.
· Storage, adaptation and distribution of the electric energy in vehicle.
· Drive system / Electric propulsion in vehicle.

Main Green Cars activities: Products and Projects

The group participates in two subprojects of the Spanish Strategic and Singular National Project CITYELEC "Systems for the mobility electrification of the urban environment" funded by the Spanish Ministry of Science and Innovation (2009-2012):
· SP5: Storage, adaptation and distribution of the electric energy in vehicle.
· SP6: Drive system / Electric propulsion in vehicle.

UNIVERSITY OF VALLADOLID

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Organisation profile

The University of Valladolid, whose history can be traced back to the 13th century, has been the inspirational foundation for numerous other prestigious universities in Spain. It has at all times upheld its firm commitment to teaching and research and, while forging links with Europe and the Americas, has remained deeply committed to its home region of Castilla y León as well to the economic and social development of the society of which it forms part and ultimately aims to serve through its activities. Its four campuses -Valladolid, Palencia, Segovia and Soria-, offering over 100 degree courses, the numerous postgraduate and PhD courses, the renowned international relations, distinguished research centres, wide range of cultural and sports activities together with a rich architectural and archival heritage, provide a unique academic environment in line with the oldest universities in Europe whose history, through excellence and the ability to innovate, form part of. Researchers at the University of Valladolid carry out their activity in different research units: 59 departments, seven university institutes (LOU), nine university institutes of its own and six technology centres part-owned by the university. To perform their research work, state-of-the-art technology and equipment is available, as well as libraries with over 800 000 monographs and more than 16 000 current journals.

The University of Valladolid manages around 740 research projects financed through competitive public R+D+I calls (European, national or regional), and approximately 500 contracts and agreements aimed at the transfer of knowledge and technology, amounting to an average value of over fifteen million Euros per annum. Moreover, its researchers take part in almost 200 further projects and contracts managed by other institutions.

As a result of this research work, the University of Valladolid holds 57 patents and annually publishes around 800 articles in journals listed in the Science Citation Index SCI, around 250 books, and is present at many national and international congresses with over 1 900 papers and communications. Furthermore, an average of 140 doctoral theses are read at the university every year.

Main Green Cars activities: Products and Projects

· Analysis, Development and Benchmarking of Intelligent Transport Systems in Intermodal Environments (E 12/08, MICINN).
· Application of new techniques of improvement and quality warranty to lamb and pork industry using automatic traceability systems.
· ICT technologies applied to the development of advanced traceability systems to create and design new methodologies to improve wine quality.
· Application of ICT and advanced algorithms to improve the supply chain management and optimize logistics operations of textile sector and tailor-made suits.

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Organisation profile

Zaragoza Logistics Center (ZLC) is a research institute established in 2004 by the Government of Aragón in Spain in partnership with the Massachusetts Institute of Technology and the University of Zaragoza. The mission is to create in Zaragoza an international center of excellence for education and research in logistics and supply chain management that actively engages with industry and the public sector to develop and disseminate knowledge.

The ZLC is directly linked to the development of PLAZA - the largest logistics park in Europe. ZLC has partnered with the Center for Transportation and Logistics at MIT to form the MIT-Zaragoza International Logistics Program.

ZLC is one of the founders and host the headquarters of the National Centre of Excellence in Integral Logistics, CNC-LOGISTICA, which is the Secretary Board of the Spanish Technology Platform in Logistics, Intermodality and Mobility, Logistop.

Main Green Cars activities: Products and Projects

Our highlighted products, R&D projects and expertise in the field of Logistics and Comodality are the following.

· Secure Supply Chain Collaboration, Secure-SCM. Contract: FP7-213531. SecureSCM will realize secure computation protocols for collaborative Supply Chain Management applications guaranteeing privacy of sensible data. (www.securescm.org).

· Effective Green Supply-chain Management Technologies in the Competitive Economic Environment with Pollution Emission Trade System, Greensupplychain2009. Contract: FP7-253720. This project attempts to set up a scientific framework for the study of the economic and managerial impact of pollution emission trading systems. Its primary goal is to upgrade in innovate ways the decision-making technologies that enable emitters to identify risks and opportunities of versatile emission trading markets around the world, so as to maintain competitive edge and financial health.

· Boosting Spanish Business Competitiveness Through Logistics as Main Strategic Factor in a Global Environment, GLOBALOG. Co-funded by the Spanish Ministry of Science and Innovation (www.pse-globalog.com).

· Definition of a Spanish Network of Logistics Platforms, RELOG. Co-funded by the Spanish Ministry of Public Works.

· Analysis of the Accessibility and Efficiency Improvements for Intermodal Operations and Logistics Platforms, INTERNODAL. Co-funded by the Spanish Ministry of Public Works. (www.inter-nodal.com).

· Innovation on Information Technologies for Travellers to Foster the Sustainable Urban Mobility, MOBITRANS. Co-funded by the Spanish Ministry of Public Works.

Our main research interests within the Green Cars Initiative are: reduction of CO_2 emissions through optimized logistics, collaboration between different agents in the supply chain and comodallity; new concepts of urban distribution of goods and urban - interurban shipments associated to the implementation of the green cars initiative.

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Organisation profile

The Spanish Association for Standardization and Certification (AENOR) is the National Standardization Body and the reference certification body. In addition, in order to extend the culture of quality, AENOR is responsible every year for nearly 200 publishing projects, provides specialist training to more than 5,000 students and its Information and Documentation Centre receives over 40,000 queries. AENOR is based on an association of around 900 members, including the main professional bodies and the leading companies as well as individuals.

AENOR is the official body with legal responsibility for the development of standardization in Spain and is the national member of the European and international bodies ISO, IEC, CEN and CENELEC. The catalogue of AENOR standards, one of the most complete, exceeds 28.000 documents from virtually all sectors of socio-economic activity.

AENOR is the reference certifying organization in Spain and is ranked among the top ten in the world. Through certification, an independent body accredits that a particular organization complies with the requirements of a standard or other regulatory document. Certification is voluntary and helps to: Eliminate those costs that do not add to quality, for instance by eliminating unnecessary redundancies. Improve process awareness. Increase the engagement of personnel. Conveys a message of confidence to all targets. AENOR's marks, referring to both products and management systems, offer them that reassurance. AENOR has issued more than 100.000 certificates for systems and products in 60 countries. Apart from its 21 centers in Spain, AENOR has a permanent presence in 8 countries in Europe and America.

Main Green Cars activities: Products and Projects

As Standardization body, AENOR ensures the participation of Spanish industry in European and international bodies in which topics such as the Electric Vehicle, Smart Grids, Smart meters, Eco-design, Energy Efficiency, ICT & new technologies (such as nanotechnologies) specifications are being developed as international standards. AENOR has the infrastructure in place to support the transfer to the market, through the development of the necessary national, European or international standards, of the results from R&D&innovation projects.

AENOR has also experience in pre-standardization initiatives within R&D publicly funded projects, in order to explore new standardization needs in specific sectors and is currently actively participating in the following projects at national level:

· NanoSost.
· e-CID (Enlightened Critical Infrastructures Defense)
· FASYS (Absolutely healthy and safe Factory).

As international certification company, AENOR has large experience in conformity assessment in all fields, including the transport and automotive sectors.

Port Authority of Gijón

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Organisation profile

The Port Authority of Gijón (PAG) is one of the 28 Spanish Public port authorities, framed both in the National Development Ministry and the Regional Transport Administration. The city of Gijón has 300.000 inhabitants; it's an industrial and commercial place, with numerous manufacturing centres.

The PAG is a public entity, an administrative body which holds several industrial,, commercial and educational entities such as the Port of Gijón, Marina of Gijón, EBHI (European Bulk Handling Installation) Terminal for minerals handling, Lonja Gijón-Musel for fishing markets ,and the Gijón Port Institute, focused to promote quality, environment, safety & security and research issues inside the port community.

The Port of Gijón is an industrial installation distributed alongside of more than 10 km of coast and docks in the Bay of Gijón. It has 160 direct workers, sales for about € 40 millions and in 2007 it moved 21 million tons of industrial products, mainly steam coal, iron ore, steel products, chemicals, cement, clinker, oil, fertilizers, fish and others, for their main customers: ARCELOR-MITTAL, DUPONT, SARAS, HC-Energía, Union Fenosa, ENDESA, Cementos Tudela-Veguin.

There is an ongoing port expansion project 2004-2010 with an investment portfolio of € 3,300m to create a new 150 Ha terminal to duplicate the cargo handling capacity, related to the new cargoes: LNG, bio diesel and bio ethanol and an energetic pole of combined cycle electrical power plants.

Main Green Cars activities: Products and Projects

The Port Authority of Gijón is a team member of the "LivingCar" Project (A living lab for studying the effect of using electrical vehicles in a real life environment) directed by the Prodintec Foundation.

FP7 Green Cars and Leadership Opportunities in Spain

Elaborated by:

eu 2010.es

MINISTERIO DE CIENCIA E INNOVACIÓN

CDTI Centro para el Desarrollo Tecnológico Industrial

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Fondo Europeo de Desarrollo Regional

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