iMAUT

INNOVACIÓN · MOVILIDAD · AUTOMOCIÓN · TRANSPORTE

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The Origin
The Environment

The changes in the environment require a deep end-user understanding and a strong support to the industry

Aiming at **new economic sectors with high development potential** (biotechnologies, mobility, nanotechnology, …), the Technology Centers of the Valencian Community (Spain), grouped in the REDIT Network, developed in 2011 a strategic analysis to coordinate their **support actions for these emerging sectors**.

New collaborative and market-focused structures were created: the Business and Technological Innovation Units (**Unidades de Negocio e Innovación Tecnológica (UNiTs)**).

iMAUT is created as the Mobility, Automotive and means of Transport UNiT.

End users' new tendencies have an impact on the complete value chain

Mobility/ User

User tendencies

EC FP7
EC White Paper on Transport
EC Horizon 2020 (Challenge)
OPTI

OEMs / Tier1 suppliers

Technical requirements

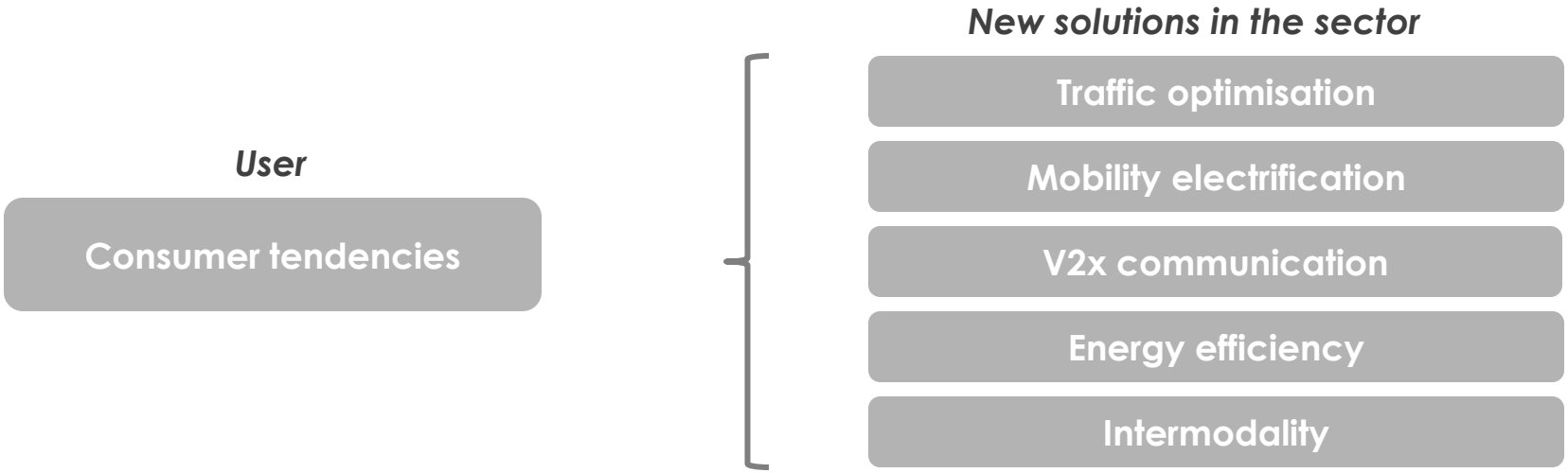
Increase in technological pressure

Auxiliary Industry

The following **end-user tendencies** have been detected:

- **Transit/Commuting time optimization**
- **Security and safety increase in transport**
- **Personalize/ Adapt the mean of transport**
- **Reduce environmental impact**
- **Improve comfort and accessibility**

Satisfying these consumer needs require developing **new solutions (services or products) in the sector.**

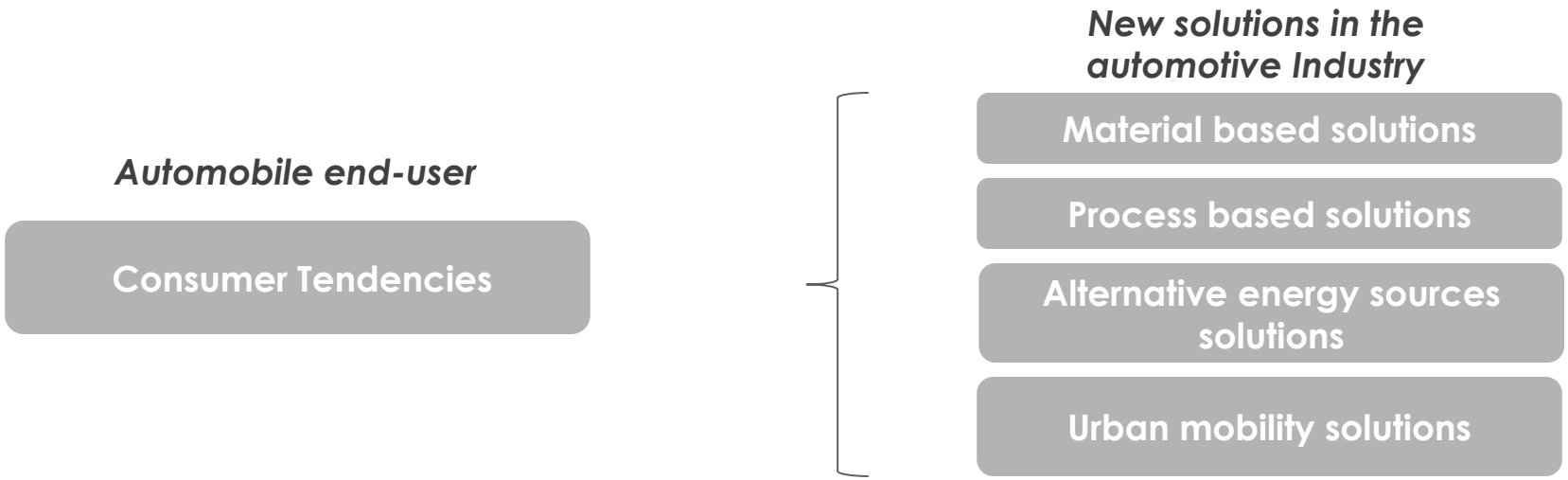


Technological needs of the Automotive sector

If we focus on the automotive sector, the following **end-user tendencies** have been detected :

- **Cost reduction**
- **Increase in functionalities**
- **Security and safety increase**
- **Environmental respect**

Satisfying these consumer needs require developing **new solutions (services or products) in the sector.**



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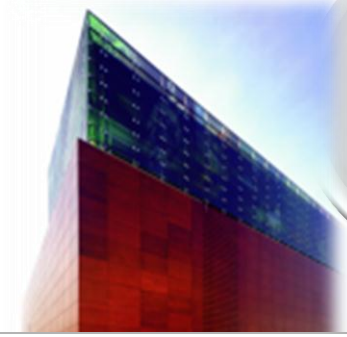
The structure
Knowledge and capacities

iMAUT is designed to support the industry in creating the solutions for tomorrow end-user needs

iMAUT: Strategic collaboration between 5 Technology Centers

AIMME
Metal-mechanics technology center

AIMPLAS
Plastics technology center



ITI
Computer Science technology center

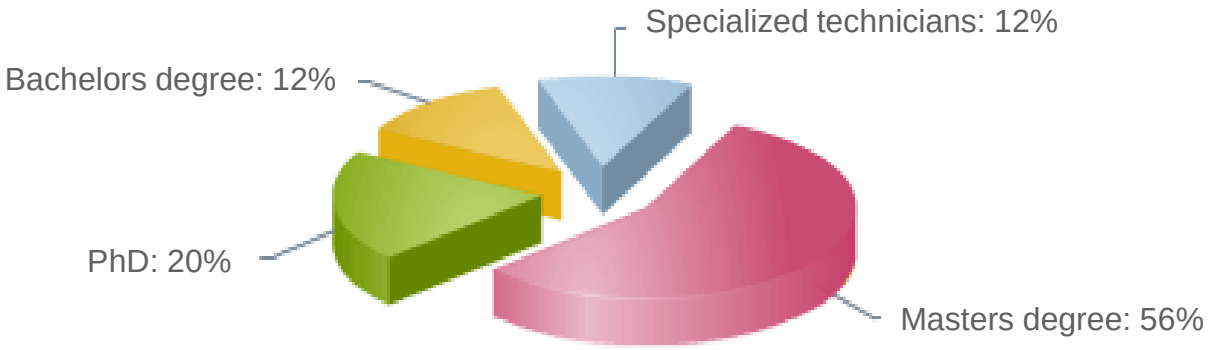
ITE
Energy technology center

IBV
Biomechanics Technology Center

iMAUT: Sharing knowledge and capacities

- The technology centers member of iMAUT have a **high number of experts** whose activity is focused on Research, Development and Innovation.

- They are **more than 600 specialists** with a high education profile as shown hereunder:



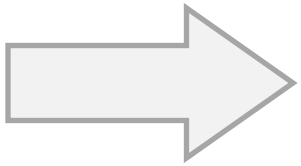
- The Innovation and Technology Centers associated to iMAUT have **specialized scientific-technical personnel**, with **solid infrastructures to support innovation** and with a **wide offer of services** focused on fulfilling the industries technological needs.

iMAUT R&D strategic lines

Having detected the industry's solutions to be developed, iMAUT has defined its R&D axis to match the companies' needs:

Industry solutions to be developed

- Traffic optimisation
- Mobility electrification
- V2x communication
- Energy efficiency
- Intermodality
- Material based solutions
- Process based solution
- Alternative energy sources solutions
- Urban mobility solutions



iMAUT R&D lines

- Advanced Vehicle
- Advanced Materials
- Advanced Processes
- People and Environment Characterization
- Intelligent Traffic Systems

iMAUT supports the complete value chain

Mobility/ User

User tendencies

OEMs / Tier1 suppliers

Technical requirements

Auxiliary Industry

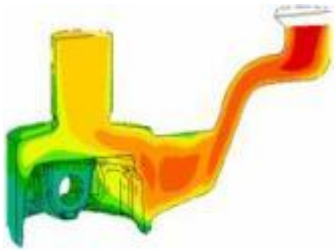
iMAUT support

- Requirements detection, Definition and implementation of new mobility models
- Development of new technological solutions (functionalities, materials, processes)
- Industrialisation
  Cost reduction
  Quality
  Process time reduction

- **Tailored R&D** for the industry:
  - Individual projects under contract.
  - Collaborative project in regional, national and European programs.
  - Pilots, demonstrative projects, feasibility analysis, laboratory.
- **Services**:
  - Technological assessment
  - ICT services
  - Product and Services design
  - Product and Services assessment and audit
  - Quality: physical/chemical/climatic/electric laboratories
  - Metrology and calibration
- **Training and Information**
  - Competitive intelligence
  - Technological Observatories
- **Presence** in major national and European platforms

iMAUT skills and capacities

Design and development



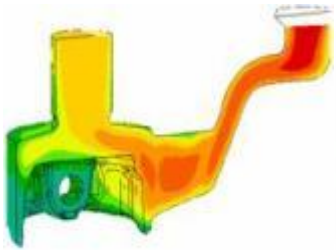
Transformation, Assembly and Logistics


Deployment and Use


Quality


iMAUT skills and capacities

Design and development



User oriented design

Perceived quality and emotional analysis

Product development

Prototyping

Rapid Manufacturing

Weight reduction

Homologation and certification

Embedded systems

Communication protocols

Design, development and deployment of communication and sensor networks

HMI development

3D digitalization

Biometric systems development (user recognition)

iMAUT skills and capacities

Transformation, Assembly and Logistics

Pilot plants

Process development

Process simulation

Surface treatments

Energy efficiency

Automatization and sensoring

Ergonomics in the workplace

Environmental engineering

Augmented reality systems

Production planning

Logistics optimization

Fleet monitoring

Demand analysis and forecast

Artificial vision

In-line Metrology and Inspection

iMAUT skills and capacities

Deployment and Use

- Use patterns analysis
- Perceived quality
- ICT platforms development
- V2X communication
- Driver and passengers monitoring
- Biometrics
- Infotainment systems development
- Transport Electrification
- Smartgrids development
- Environment analysis
- Products and services analysis and assessment
- Demand forecast
- Route/resources optimization
- Support to spin-offs and technology start-ups

iMAUT skills and capacities

Quality

ENAC certified laboratories

Physical-chemical laboratories

Mechanics laboratories

Surface treatments laboratories

Climate and ageing laboratories

Metrology and calibration

Software laboratory

Software testing

Electromagnetic Compatibility

Usability laboratory

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Some representative projects

Development of sleepiness warning signals based on user's reactions

Development

Identification of optimal sleepiness warnings based on the driver's physiological and behavioural reactions

Consortium

FICOSA

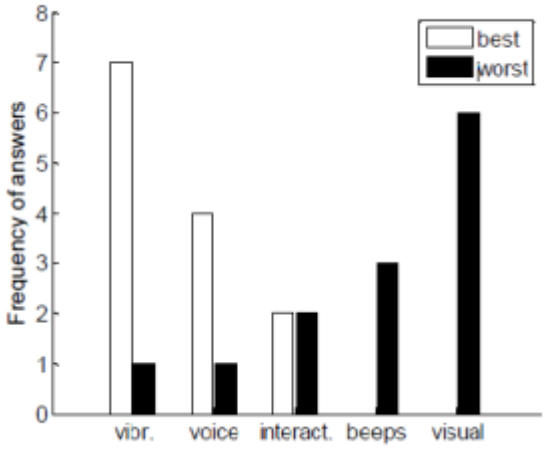
IBV

Objectives

Simulation of driving conditions that cause sleepiness

Detection of sleepiness status during driving

Generation and assessment on warnings and alerts against sleepiness



SMARTCOVER: sensor integration in plastic and textile parts

Project name

SMARTCOVER

Consortium

3 technological centers (including AIMPLAS)

Objectives

Developmnent of plastic parts for automobile with integrated sensoring functions through intelligent textile covering.

HMI assessment and development

Development

Several development and assessment projects on HMI and steering systems

Consortium

FICOSA and supplier companies

IBV

Objetcives

Dashboard and HMI assessment

Development of new steering systems for automobile through ergonomics optimization

Tramway control cabin design

Development

Design of the dashboard of a tramway control cabin

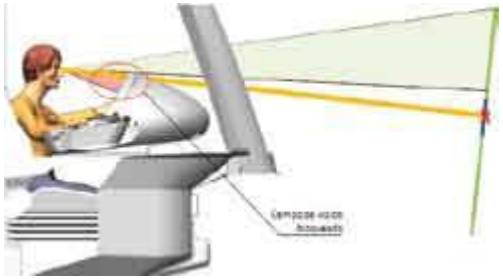
Consortium

ALSTOM
IBV

Objectives

Optimal design of the dashboard and the cabin of a tramway to improve:

- employee ergonomics
- driving safety and efficiency
- visibility from the driving position



Multiple-format number plate recognition through image treatment

Project name

ITI LPR (V2I Communication)

Consortium

ITI (internal development, proprietary technology)

Objectives

Off-the-shelf easy-to-integrate tool for diverse soft/hardware platforms for number plate recognition in open or closed environments, allowing different number plate configurations.

Automatic detection of occupancy level through image treatment

Project

Automatic Detection of High Occupancy Vehicles

Consortium

INDRA, CINTRA, ITI (among others).

Objectives

This project weas supported by the Sapnish Industry Ministry. The result is a detection and counting system for vehicle occupancy in highways and open environments, currently being exploited by INDRA.

V2i communication platform for urban mobility

Project

e.MOCIONATE (V2i forurban mobility)

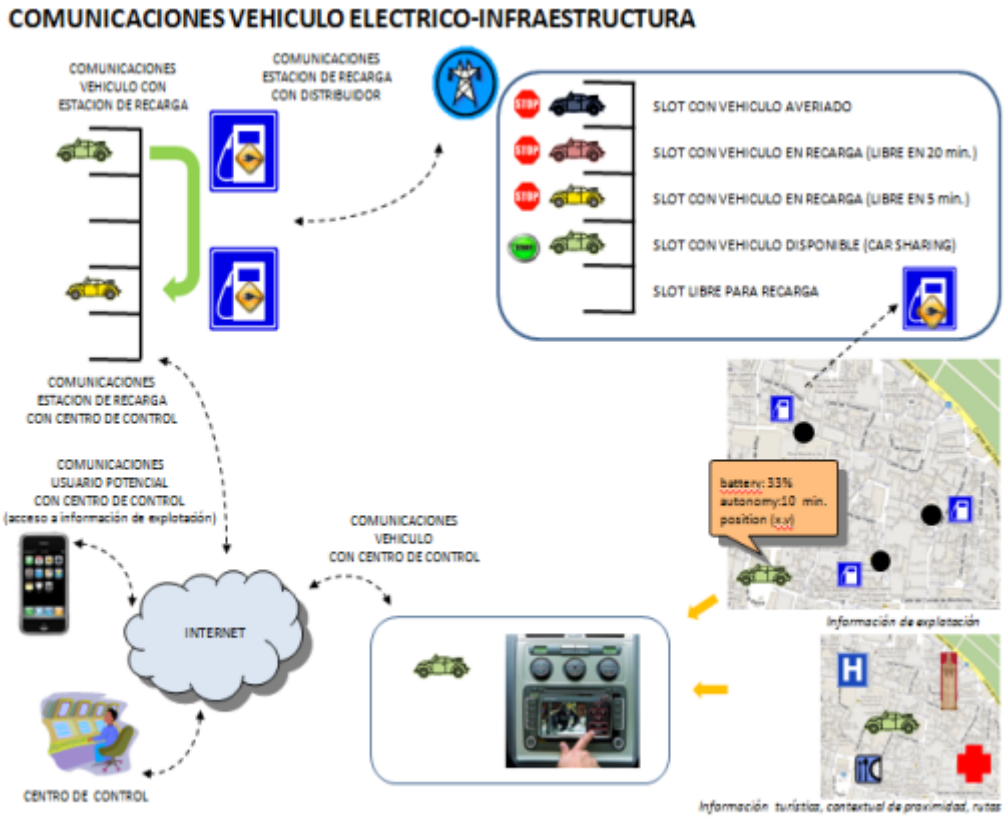
Consortium

- ITI
- ITE
- Prodevelop
- DISID
- SCOLAB
- MOVUS
- CPD
- NUTAI

Objectives

This project is currently being developed.

The goal is to create an ICT platform that integrates the vehicle, the user and the infrastructure in order to support efficient urban mobility.



Seat assessment: use patterns analysis and vibrations effect analysis

Desvelopment

Antropometric assessment of the seat usage and analysis of the effect of the vibrations on the passenger

Consortium

IBV - Industry

Objetctives

Main goal:

- Evaluate the usage patterns, through antropometric analysis of the passenger when using the seat.
- Analysis of the effect of the vibrations on the passenger through a simulation equipment

POLYCOND: Conductive nanocomposite application

Project

POLYCOND

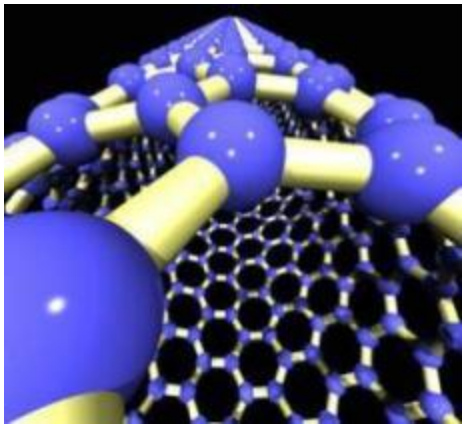
Consortium

5 countries
13 companies
4 industrial associations
3 technology centers (AIMPLAS among them)

Objectives

IP-SMEs project

Creation of a competitive advantage for the industry through the development of added value products by conductive nanoparticles application



Optimized cooling for foundry competitivity improvement

Project

COOLING CASTING

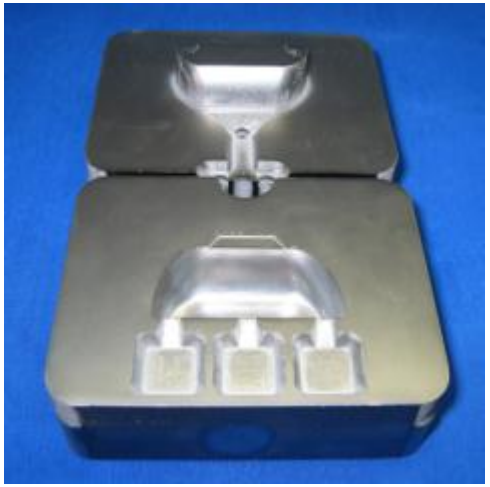
Consortium

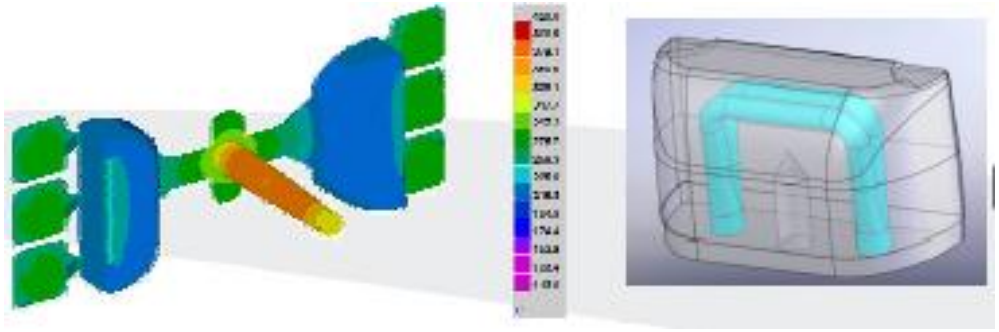
AIMME (internal project)

Objectives

Improvement in the metal parts foundry through integrated cooling conduit inserts manufacturing via Laser Cusing technollogy.

Results: 33% productivity improvement.





CODE: Resin curing optimization

Project

CODE

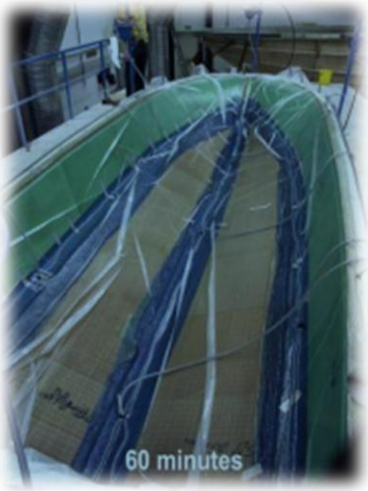
Consortium

3 countries
4 companies
2 technology centers (AIMPLAS among them)

Objectives

STREP european project.

Curing process optimisation, time reduction through microwave usage.



In-line dimensional control through 3D scanning technology

Project

ITI-I3D (Inspection and metrology)

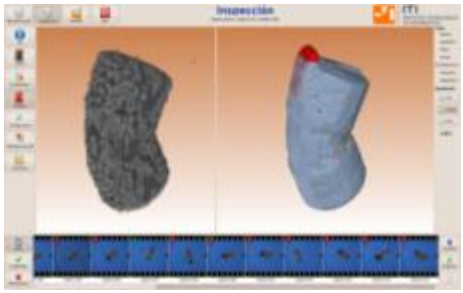
Consortium

ITI (Internal development)

Objectives

3D advanced industrial inspection:

- Adapted for variable 3D objects (different sizes and shapes)
- Dimensions, angles and surface control.
- No adaptation when changing the controlled part
- Scalable
- 2D and 3D measurement and surface control in all the faces/directions
- Free fall of the parts: low cost, low maintenance, total flexiblity
- Useful for 100% control in large productions of parts that have medium dimensional requirements



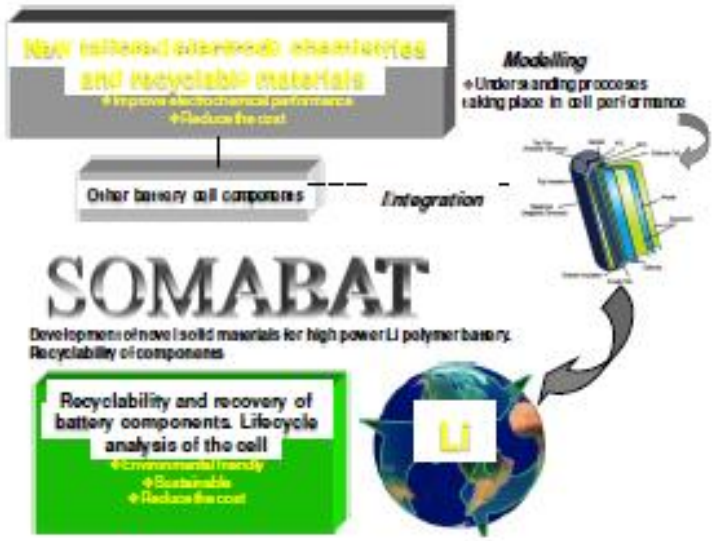
SOMABAT: Development of novel Solid Materials for high power Li polymer BATteries

Project

SOMABAT

Consortium

9 countries
13 members
7 companies
6 technology centers (ITE among them)



Objectives

- Development of new synthetic recyclable materials with controlable properties through new synthesis and transforming processes.
- Development of new battery management systems for the new developped materials.
- Li-polymer cells behaviour modelling.
- Battery and Li-polymer cells integration and testing.
- Recyclability and life-cycle aseessment for the battery parts

SOMABAT

URBAN CAR

Project

R&D for urban vehicles with low weight and consumption

Consortium

AIMPLAS / IBV

CRIA: CITV / DIE

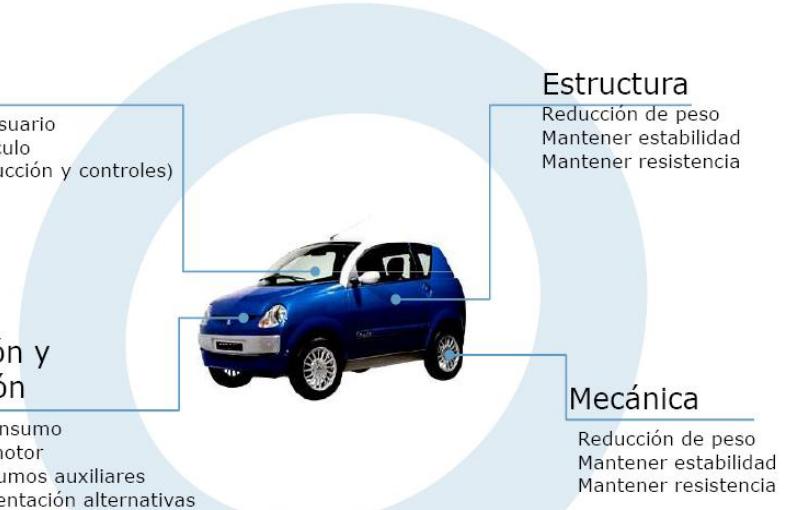
Objectivers

Main goal:

- Generate an user oriented urban concept car with reduced weight and low consumption.

Technical goals:

- Define user needs
- Reduce the weight without compromising safety
- Reduce as much as possible consumption and gas/particles emissions



ERTMS validation in High Speed Railroad (critical security system)

Project

Safety Critical System

Consortium

ITI , railroad and aeronautics companies

Objectives

ITI is checking and validating the ERTMS software for a new high-speed train. Being a safety critical system, the development and testing has to follow the EN-50128 regulation.

The software is an embedded system executed on a dedicated computer for critical systems (EVC:European Vital Computer).

Voice recognition based control systems

Project

PICK by VOICE (V2X communication and warehouse controls)

Consortium

- ITI
- Wood stockage companies

Objectives

- Control system based on voice recognition for unit picking in a warehouse.
- Incorporates user identiification through voice.

Additional information

- This technology can be applied in function control in a vehicle

Route optimization

Project

ROUTING MAPS (Logistics optimization)

Consortium

ITI (internal development)

Objectives

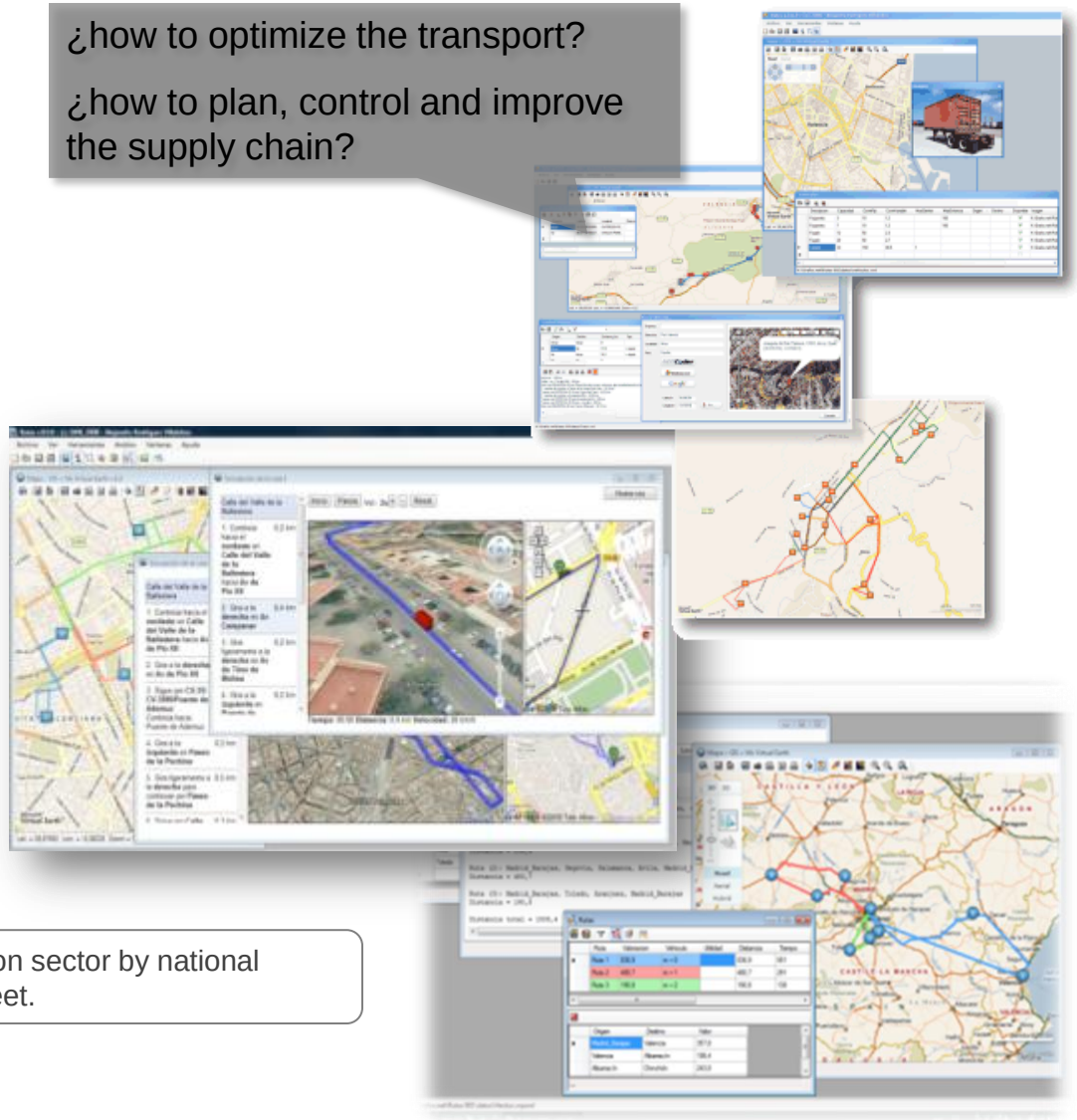
HFCVRP (Capacited Vehicle Routing Problem with Heterogeneous Fleet) optimization tool. Route optimization and related logistics data management

Additional information

This tool has been validated by being used in the distribution sector by national companies. It is also being used by local garbage trucks fleet.

¿how to optimize the transport?

¿how to plan, control and improve the supply chain?

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