PROJECT

OSTLER

Optimised storage integration for the electric car

Funding: European (7th RTD Framework Programme)
Duration: Jun 2011 - Nov 2014
Status: Complete with results
Total project cost: €4,014,680
EU contribution: €2,499,922

Call for proposal: FP7-SST-2010-RTD-1
CORDIS RCN: 99060

Background & policy context:

Present-day electric vehicles are typically designed by starting from an existing vehicle platform and designing a storage device (battery pack) to fit the constraints of the existing vehicle.

Objectives:

The OSTLER project is based on the concept of modular storage devices, around which an electric vehicle can be designed. The vehicle designer can select storage capacity to give range in electric vehicle mode (e.g. 20 km, 50 km, 100 km) in much the same way as current-generation vehicles are designed around different powertrain packages (e.g. 1.6 litre, 1.8 litre, 2.0 litre).

Methodology:

OSTLER will develop novel solutions for mechanical, thermal and electrical integration based around such a modular concept of storage-centric design. Furthermore, the project will investigate the implications if one or more of the storage packs is removable, and hence evaluate the feasibility of a removable concepts e.g. quick drop or user-changeable packs.

Parent Programmes:
FP7-TRANSPORT - Transport (Including Aeronautics) - Horizontal activities for implementation of the transport programme (TPT)

Institute type: Public institution
Institute name: The European Commission
Funding type: Public (EU)

Lead Organisation:

Mira Limited
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CV10 0TU
United Kingdom

Organisation Website: http://www.mira.co.uk
EU Contribution: €826,157
<table>
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<th>Partner Organisations:</th>
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| **Address:** | Wallentinsvagen 22  
447 83 Vargarda  
Sweden |
| **EU Contribution:** | €357,232 |
| **Politechnika Krakowska** |
| **Address:** | Warszawska  
31 155 Krakow  
Poland |
| **EU Contribution:** | €99,000 |
| **Centro Ricerche Fiat - Societa Consortile Per Azioni** |
| **Address:** | Strada Torino, 50  
10043 ORBASSANO (TO)  
Italy |
| **Organisation Website:** | [http://www.crf.it](http://www.crf.it) |
| **EU Contribution:** | €618,038 |
| **Rheinisch-Westfaelische Technische Hochschule Aachen** |
| **Address:** | Templergraben  
52062 Aachen  
Germany |
| **Organisation Website:** | [http://www.rwth-aachen.de](http://www.rwth-aachen.de) |
| **EU Contribution:** | €327,887 |
| **Valence Technology Inc** |
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Austin, 78727  
United States |
| **EU Contribution:** | €0 |
| **Fico Cables S.a** |
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| **EU Contribution:** | €208,720 |
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EU Contribution: €62,889

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Italy

EU Contribution: €0

Technologies:

- Electric vehicle batteries (and energy management)
- Modular battery design

Development phase: Research/Invention

Key Results:

Optimising removable batteries for electric cars

An EU initiative tested the feasibility of electric cars with modular batteries. Drivers wanting more power could just plug in another battery.

With the increase in demand for electric vehicles (EVs), manufacturers often adapt existing models to electric power. However, batteries are heavy, and modifying a normal car to battery power can pose numerous weight, drivability and other restraints.

The EU-funded http://www.ostlerproject.com/ (OSTLER) (Optimised storage integration for the electric car) project set out to develop new concepts for battery integration in cars. Overall, the goal was to investigate the feasibility of a modular, removable battery concept that complies with all pertinent automotive regulations.

Work began with an assessment of the requirements for integrated storage followed by crash worthiness testing and system integration.

The OSTLER team created smart concepts to protect battery packs in EVs. To do so, it investigated the effects of large battery packs on vehicle crashworthiness to determine the most vulnerable type of battery cell. A prototype battery pack was developed for this purpose and active and passive solutions were developed to protect it in a crash event. Dynamic simulations and physical tests showed the functionality of both systems. In particular the active solution consisting of an inflatable light textile structure demonstrated satisfactory performance and low weight.

Electrical and thermal system specifications and requirements for the main battery pack were defined. The team also introduced a demonstrator for removable battery packs and provided design guidelines for the model.

Project partners also delivered novel concepts for more efficient thermal and electrical integration. The electrical solution can support various battery sizes and applications. A demonstrator vehicle incorporating a battery pack was built and successfully tested.

In standardising an EV battery pack, OSTLER considered the mechanical, electrical and thermal interactions of the battery. By developing a modular, removable battery pack for vehicles, European businesses will be able to compete in the global EV market.
STRIA Roadmaps: electrification
Transport mode: Road transport
Transport sectors: Passenger transport
Transport policies: Environmental/Emissions aspects, Deployment planning/Financing/Market roll-out
Geo-spatial type: Other