

The French Test Site WPT Charging Solution

DEVELOPMENTS
AREA

An original Wireless Power Transfer (WPT) solution has been developed by Qualcomm CDMA Technologies GmbH, integrated and characterized by VEDECOM with the support of Renault and IFSTTAR

Overview /introduction

A reconfigurable experimental road was built to provide:

- Acceleration/deceleration portions enabling charge over a 100m section at speeds up to 100 km/h.
- Easy access to sub-road components for analysis and maintenance (central concrete trench concept suited for WPT solutions with control & power electronic integrated close to the coils below the road surface).

Partners involved



Objectives /methodology

- Define system specifications from FABRIC use cases.
- Verify DWPT prototype system performance and chosen car in laboratory conditions.
- Integrate the system to:
 - site adapted infrastructure;
 - chosen serial car (Kangoo II).
- Validate the complete system integration using common FABRIC methodology.
- Demonstrate the FABRIC use cases.
- Characterize system performance and limits.

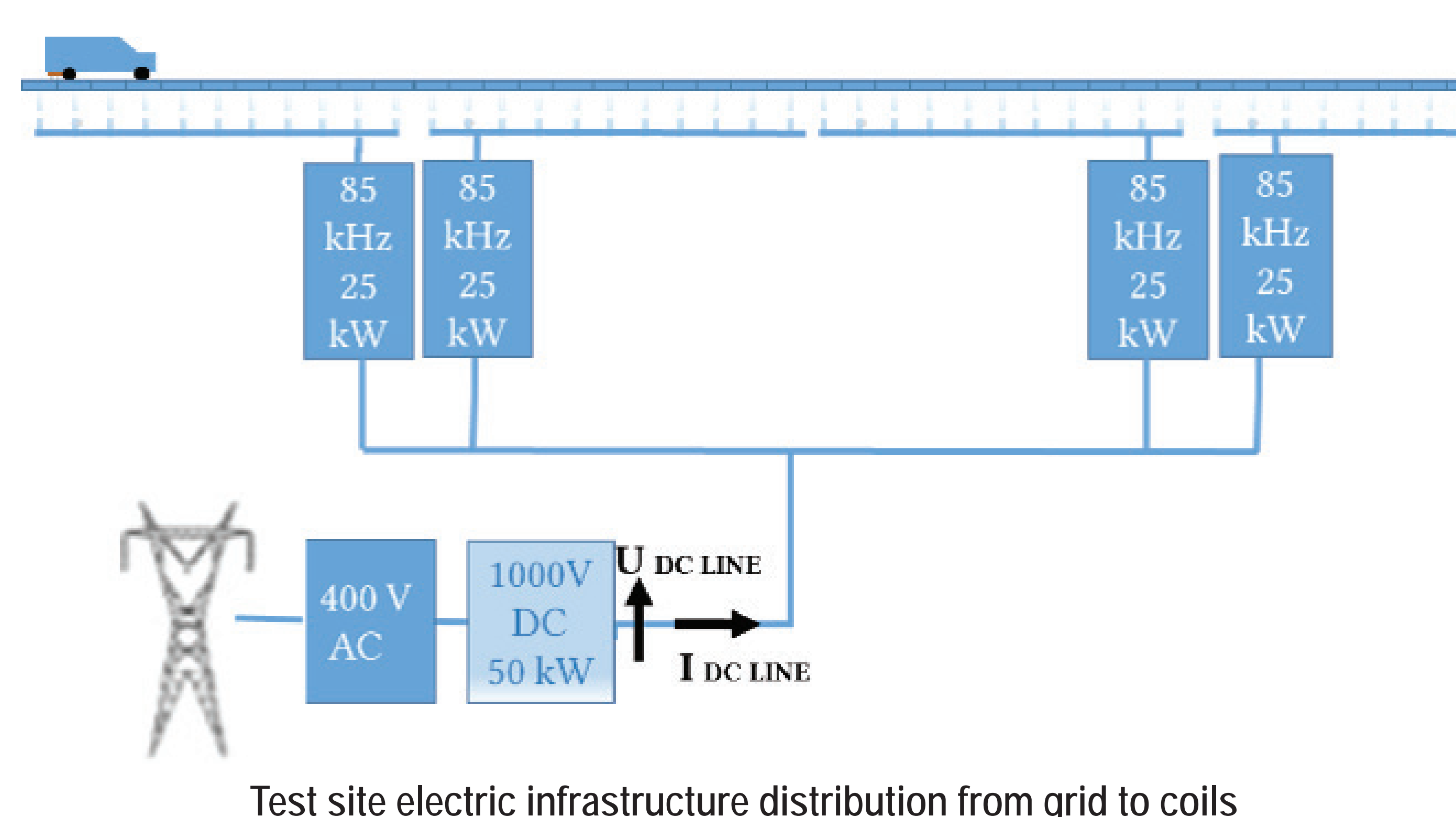


General view of Versailles- Satory experimental track in adapted test site

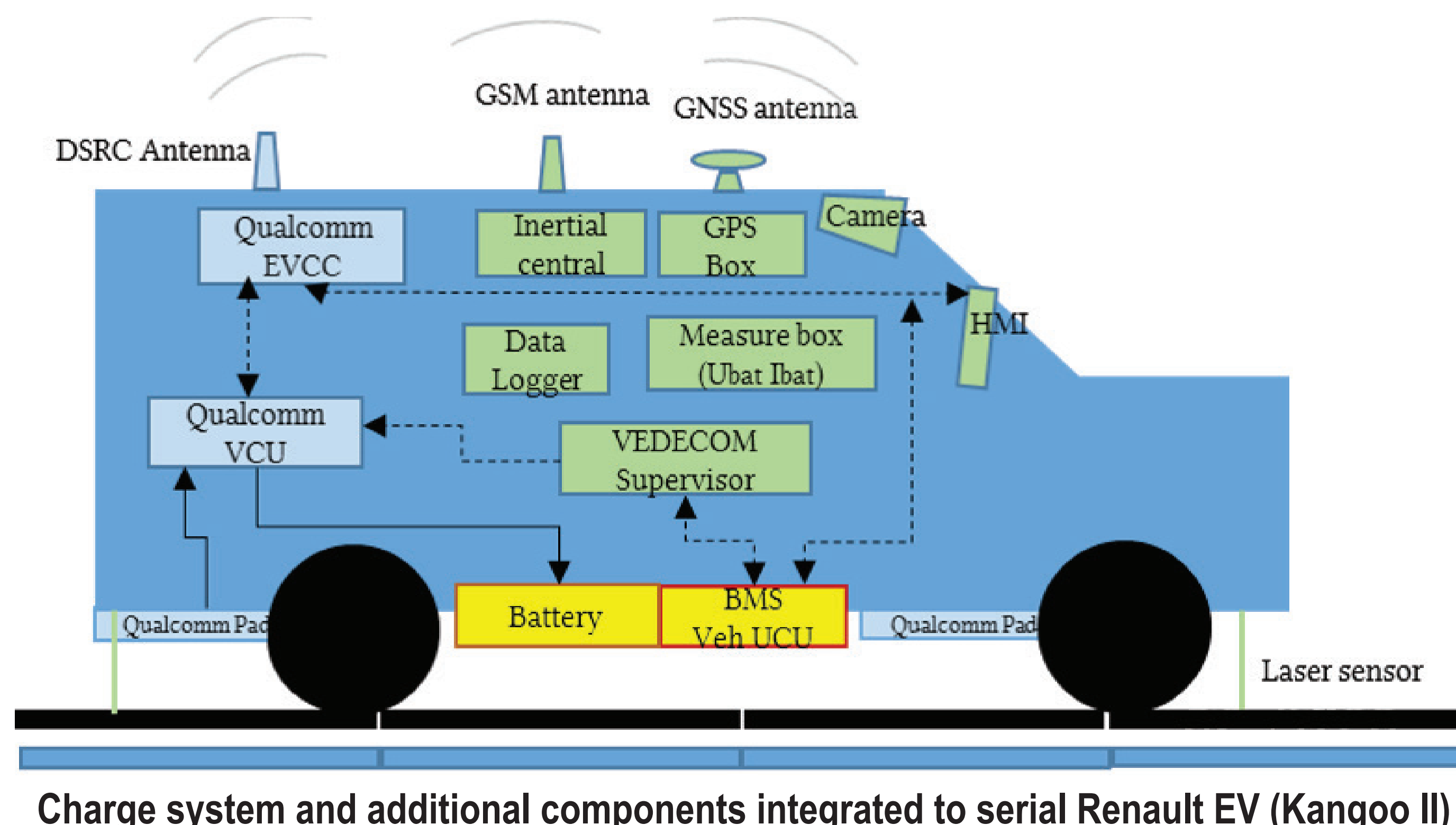
Prototype WPT solution and instrumentation activities etc.

The 400 V tri-phase Alternating Current (AC) is first converted into Direct Current (DC) then distributed to two pairs of roadside cabinets, each containing an inverter powering a 25 m section in AC at 85 kHz. The four 25 m sections are subdivided into elementary modules (BAN), which are sequentially activated when the car secondary coils are close enough.

A front camera detects the lane and provides the driver with a feedback indicator integrated in the Human Machine Interface (HMI) on his alignment performance. A Real Time Kinematic (RTK) GPS system enables the measurement of the misalignment in dynamic conditions. Intercoil variations can be measured through four laser sensors. Electric measurements are done at the battery input.



Test site electric infrastructure distribution from grid to coils



Charge system and additional components integrated to serial Renault EV (Kangoo II)

Achievements

Demonstrations of:

- 20 kW charging;
- Safe conditions (EM exposure) w/r ICNIRP 2010;
- 2 cars charge scenario;
- From stationary to 100 km/h;

System safety & performances assessed in real driving conditions:

- Charging performance (Energy efficiency, average power);
- EMF exposure
- Grid impact.



View of the 100 m experimental track equipped with the DWPT system & first integrated car prototype (delivered in Sept. 2016, left). View of the fully integrated & instrumented second car prototype (delivered in March 2017, right)



Final Event & Demonstration | 21-22 June 2018 Italy

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Consortium

Project facts

Duration: 48 M
DG / Unit: Research and Innovation
Budget: 9 M€
Funding: 6.5 M€

This project has received funding from the European Union's FP7 for research, technological development & demonstration under GA no 605405

