

F-BRIC

Feasibility analysis and development of on-road charging solutions for future electric vehicles

Italian Test Site Charging Solutions: The SAET WPT system

A complete system for Dynamic Wireless Power Transfer (WPT) with high current and low voltage

Overview

In the SAET test location, a complete WPT solution is presented. The solution is complete and compact.

The power rectification and DC-line pre-charge is embedded inside the test location

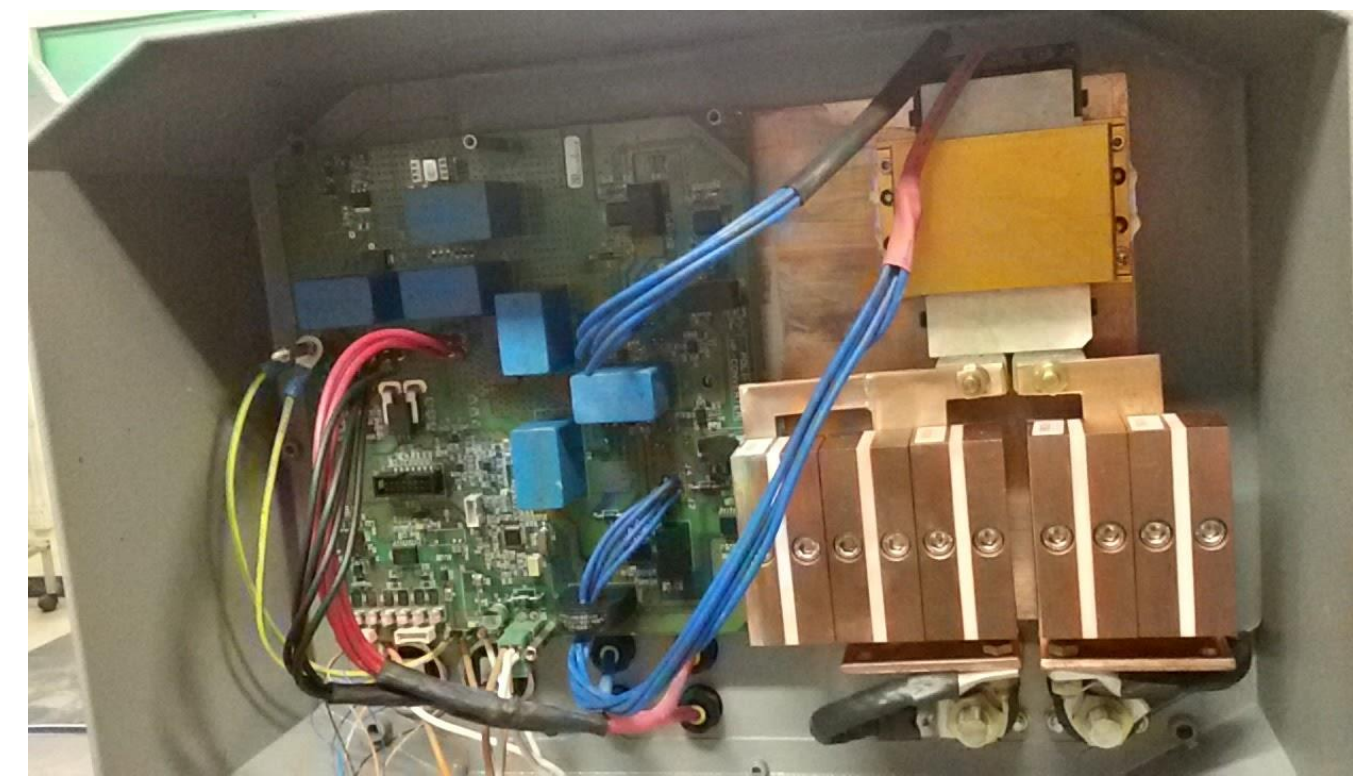
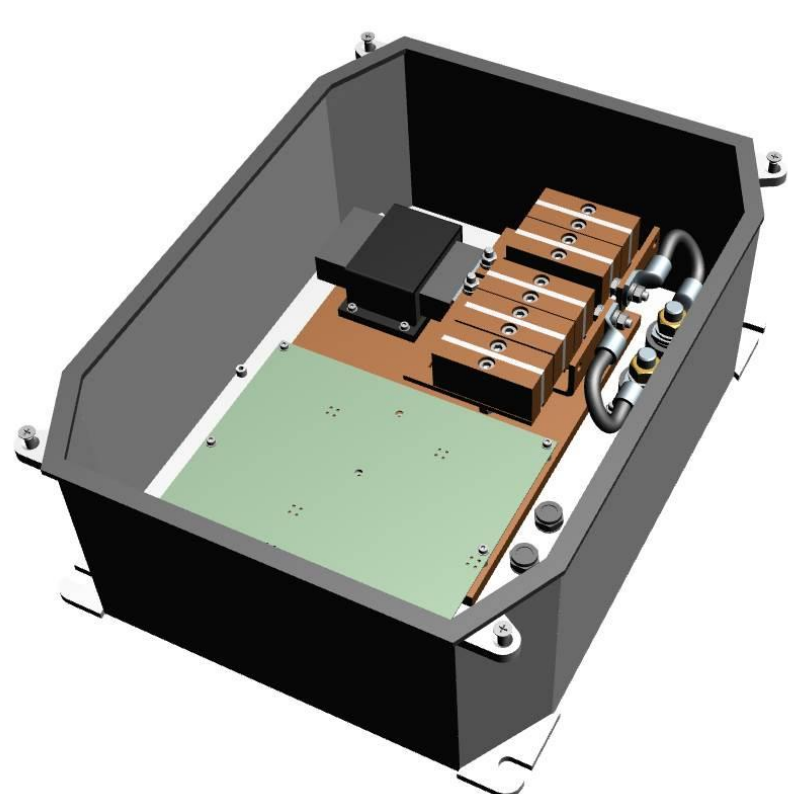
The overall communication and protection section is in the test location. It is composed of the same elements of the POLITO prototype: CSCU from TUB, CAN2WIFI from FCA-CRF and sbRIO from POLITO.

Objectives

- System tested in cold and hot conditions;
- Identification and plate recognition is identical to the POLITO solution and derived from the eCoFEV project;
- Coil embedment is easier with less ground coupling problems;
- Active cooling is not foreseen with 1 second max permanence at maximum power;
- The solution presents a reasonably high efficiency;
- Cost and weight can be improved.

Solutions

The solution proposed in the SAET test site operates completely at low voltage (below 1000Vpeak) and can be maintained in the most complex elements: the capacitors. The solution results demonstrate a step forwards mainly in the direction of simple implementation in ground. The power boxes are double insulated: inside the boxes a high frequency transformer is used requiring only one turn in the embedded coil. In the power room we have another transformer to elevate the voltage to 650Vdc (after rectification) and is very efficient. All boxes are in IP68 and are embedded in manholes.



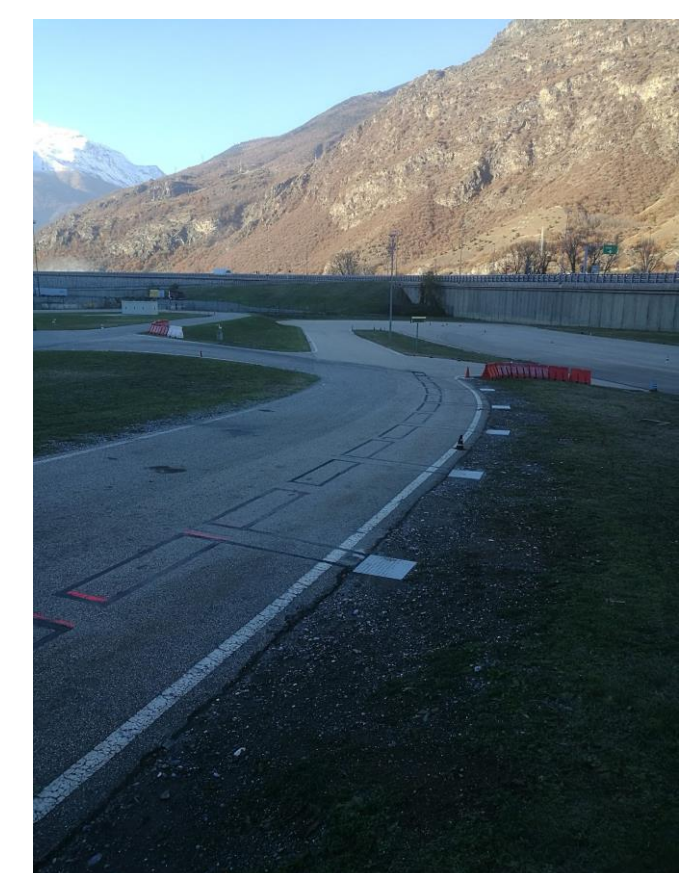
View of SAET charging lane and EV vehicle

Power box in the 3D rendering and in the final realization 22 boxes have been placed inside 11 manholes

Main outcomes

The system is complete.

- Communication and EVSE management have been implemented and are working reliably.
- The integration of the coils into the road have been simple and without any coupling problem.
- Power electronics above ground allows for maintenance including on the capacitor side, thus helping in a fine tuning.
- The solution is absolutely feasible and with significant high technology elements.



Final Event & Demonstration | 21-22 June 2018 Italy

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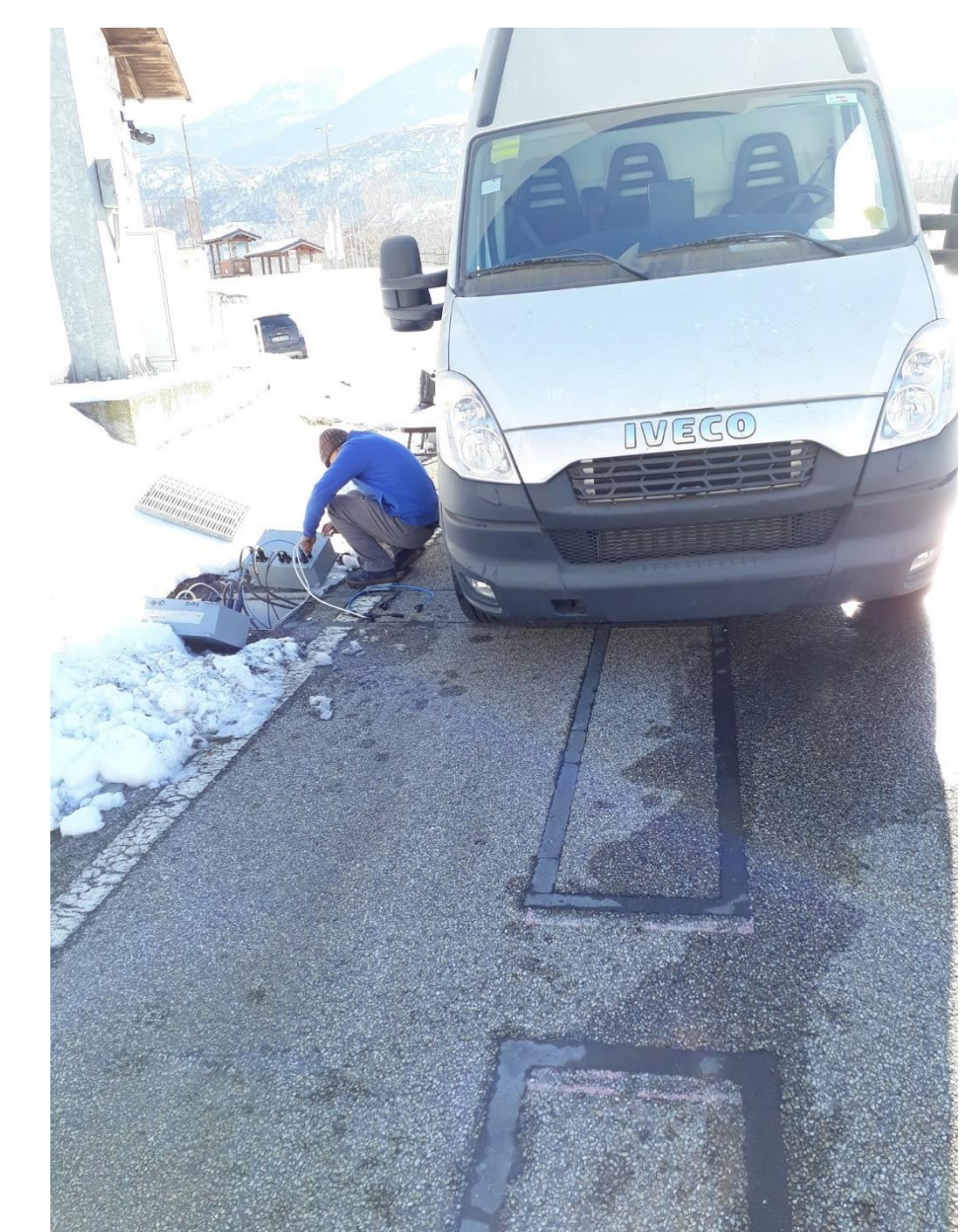
Consortium



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View of SAET charging lane and EV vehicle

Project facts



Duration: 48 M

DG / Unit: Research and Innovation

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Funding: 6.5 M€



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