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EUROPEAN COMMISSION

HORIZON 2020 PROGRAMME – TOPIC: Hybridisation of battery systems for stationary energy storage

Interoperable, modular and Smart hybrid energy STORage systeM for stationarY applications

GRANT AGREEMENT No. 963527

Deliverable Report

D3.4 – Report on performance and testing of the PE prototype

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Publishable summary

Two Power Electronic (PE) interfaces have been developed and prototyped, to interface the batteries developed in WP2 to the AC grid, controlled by the EMS as developed in WP4.

The first PE interface offers galvanic isolation and can be paralleled on the AC and DC side. Three of these PE interface prototypes were mounted in a 19" cabinet. A redesign was required to solve some issues, but the final prototype was successfully tested, for further integration in WP5 with the high-power battery.

The corresponding PE interface for the high-energy battery solution is composed of two different stages. The first one composed by an AC/DC power stage that generates a 720V bus that feeds the second power stage, a modular DC/DC converter divided in 4 outputs that can be modulated individually. Thus, the device is able to operate from a 400Vac source to a battery system in a voltage range of 200-390 Vdc.

This report describes the performance and testing of these prototypes based on the testing plan outlined in deliverable D1.3: Testing protocols overview. In particular, tests have been performed at board, module and converter levels including parallel operation of modules with successful operation for both Prodrive and Zigor prototypes. Prodrive's cabinet operates with overall input to output efficiency between 96 and 97% at the half-to-full power range and the grid current shows a THD below 1% in this same range. Similarly, Zigor's cabinet operates with overall input to output efficiency ranging from 95,4% to 97,2% in this range, with a grid current THD below 3,5% at full power.

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Project partners:

#	Partner short name	Partner Full Name
1	VUB	VRIJE UNIVERSITEIT BRUSSEL
2	PWD	POWERDALE
3	CEG	CEGASA ENERGIA S.L.U.
4	CEA	COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES
5	MGEP	MONDRAGON GOI ESKOLA POLITEKNIKOA JOSE MARIA ARIZMENDIARRIETA S COOP
6	ZIG	ZIGOR RESEARCH & DEVELOPMENT AIE
7	EDF	ELECTRICITE DE FRANCE
8	TNO	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO
9	PT	PRODRIVE TECHNOLOGIES BV
10	GW	GREENWAY INFRASTRUCTURE SRO
11	AIT	AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH
12	UNR	UNIRESEARCH BV

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