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## **Turbo Power Systems** (“TPS” or the “Company”)

**Have you ever imagined connecting Railways, Electric Vehicles Chargers, Solar Photovoltaic Cells, Storage Systems and the Electricity Grid? Well.... TPS and its partners did it!**

The entire world is trying to develop more efficient, reliable and greener energy systems and, at the same time, cope with an increasing demand for power. In addition, the use of Renewable Energy Sources (RES) is increasing rapidly and, despite the positive impacts, the introduction of these new power flows on the grid is challenging under the current network configuration. To overcome this, the European Electricity Distribution Network Operators (DNOs) and Light-Railway networks are independently developing several programmes. Through these schemes, they are targeting electricity loss reductions, cost optimizations, grid stability control while upholding the demands of Electric Vehicles (EV), energy storage systems and prosumers.

Given this background, a new consortium has emerged to support the combination of all those needs in a project called E-LOBSTER. The name stands for “*Electric Losses Balancing through integrated Storage and power Electronics towards increased synergy between Railways and electricity distribution networks”. Within this consortium, TPS will once again collaborate with Newcastle University and 7 other members: RINA, Rail Safety and Standards Board (RSSB), The University of Birmingham, Lithium Balance, Metro de Madrid, Spanish Railways Foundation (FFE) and The International Association of Public Transport (UITP).*

This project intends to create an economically viable and easily replicable Transport-Grid Inter-Connection System that will establish synergies between three main players within the Energy and Transport sectors:

- Electrified urban transport networks (metro, trams, light railways etc.)
- Power distribution networks
- EV charging stations

Creating a connection between these players will enhance distribution grid stability through the inter-exchange of electricity and will lead to a much lower requirement for network reinforcements or upgrades. The enabler to deliver the objectives of the E-LOBSTER project is the use of smart Power Electronic Converters supplied by TPS. This solution will operate under an integrated Railway and Grid Management System which will optimize the capacity of both

networks by improving the exchange of electricity between them, while supporting local RES self-consumption.

TPS' role within this project will be to design, manufacture, deliver and test prototypes of Power Electronic Converters to facilitate resource sharing between the Electricity Distribution and Railway networks, aiming to achieve an integrated system.

E-LOBSTER will demonstrate the functionality of this new system in a real underground railway in Madrid. The railway would be connected to a local power distribution network with a high penetration of RES. The knowledge generated from the project will be further examined with the purpose of developing a superior design for a full-scale system, paving the way towards replication across the EU.

The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 774392.

**Dr. Nigel Jakeman, TPS Engineering & Business Development Director, commented:**

*"Another great success for TPS, enabling us to further build on the benefits of our family of Smart Grid Converters. On this occasion, we are using our awards-winning Power Electronic Converters in an application that can benefit both Distribution Network Operators and Rail Operators alike. Other projects where we have used our Smart Converters are **Renewable Traction Power** and **Flexible Urban Networks**. We're looking forward to working with our partners and demonstrating this truly novel and value adding system."*

For further information, please contact:

Nigel Jakeman, Engineering & Business Development Director

+44 (0) 191 482 9240 / [njakeman@turbopowersystems.com](mailto:njakeman@turbopowersystems.com)

Or

Ioana Briciu, Marketing Assistant

+44 (0) 191 482 9278 / [ibriciu@turbopowersystems.com](mailto:ibriciu@turbopowersystems.com)

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Turbo Power Systems (TPS) is an innovative and progressive company that specialises in the design and manufacture of high-speed electrical machines and integrated power electronics solutions for Energy, Industrial, Transportation and Defence sectors. TPS have the experience and capability to manufacture bespoke energy-efficient solutions to meet your challenging requirements, whilst offering high quality designs for varied customers across the globe.

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