Breakthrough Results with High-Power Laser Technology to Transform Electric Vehicles

The northern lights are shining extra-bright in Tampere Finland this month as a major step forward in amplifying the power of lasers was achieved.

The new Fiat e-500 under the northern lights of Tampere, Finland.

For the first time a laser using similar technology to the fibres that deliver broadband internet to homes has been able to generate enough power to cut through steel in seconds. With more than a trillion times the power of the sun and many times the power of existing technologies the laser generator, when used with ultrafast beam targeting can vaporise and weld metals at speeds greater than 1,000 km/hr.

The new laser processing systems will overcome the relatively long processing time which is a major shortcoming to the industrial implementation of Laser-machining solutions today. The development by Ampliconyx and Tampere University will be of special interest to the automotive sector aiming to reduce vehicle weight and accelerate battery production processes for new electric vehicles.

Nello Li Pira, the Head of Physical Analysis Department of Fiat Chrysler Automotive Research Centre in Turin said, "*These exciting results can make a major impact io electric vehicle production and the drive to reduce vehicle CO_2 emissions*".

Dr Maxim Odnoblyudov of Ampliconyx siad, "*We are very excited by these results which prove the unique capabilities of the technolgy which we plan to launch the first lower power products early in 2020*".

Dr Regina Gumenyuk, who leads the project said, "*It is rewarding to see these results based on technology orginiating from Tampere University and now a major step closer to reality*".

The results are an output from the PULSE research and innovation project funded the EU H2020 programme and made up of partners from six countries:

- United Kingdom (Aston University and Modus Research and Innovation Limited);
- Finland (AMPLICONYX OY);
- Germany (LUNOVU Gmbh and Hochschule Mittweida);
- Greece (Nanotypos OE, Foundation for Research and Technology HELLAS, and Prime Laser Technology);
- Italy (Centro Richerche Fiat SCPA and Onostampi SRL);
- Latvia (Ceram Optec Sia)

Funding

The PULSE project is an initiative of the Photonics Public Private Partnership, www.photonics21.org.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824996.

Horizon 2020 is the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market.

Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness.

Seen as a means to drive economic growth and create jobs, Horizon 2020 has the political backing of Europe's leaders and the Members of the European Parliament. They agreed that research is an investment in our future and so put it at the heart of the EU's blueprint for smart, sustainable and inclusive growth and jobs.

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