

# Partnering Opportunity

Profile status : Published

## Research Development Request

### LC-GV-06-2020: URGENT partner sought for H2020 proposal - Ultra light aluminum-copper-graphene cables with high specific electrical performance

#### Summary

*An Italian University group located in Rome is looking for partners to participate in H2020 call LC-GV-06-2020. The aim of the project is to realize innovative aluminium cables electroplated with copper-graphene for use in the automotive sector. A feasibility study and the construction of a pilot plant are planned. The partner sought is a company that produces electric car motors in whose windings it is possible to test the innovative cables.*

Creation Date	19 March 2020
Last Update	19 March 2020
Expiration Date	07 April 2020
Reference	RDIT20200317002
Public Link	<a href="https://een.ec.europa.eu/tools/services/PRO/Profile/Detail/a5958051-638d-4f6f-a6d0-68590f0b03f3">https://een.ec.europa.eu/tools/services/PRO/Profile/Detail/a5958051-638d-4f6f-a6d0-68590f0b03f3</a>

#### Details

##### Description

The proposal is in the framework of the lightening in the automotive sector and in particular, in the production of electrical cables with specific electrical performance (per unit of volume and weight) higher than those in aluminium only.

It concerns product and process innovation. Aluminium electrical cables are characterized by low purchase costs (about 2.5 €/kg compared to 6.5 €/kg of copper, average quotation January 2020) and low specific weight (2.70

g/cm<sup>3</sup> against 8.96 g/cm<sup>3</sup> of copper). On the other hand, the main disadvantages of this material are fast oxidation and low electrical conductivity (0.0287 Ω mm<sup>2</sup>/m versus 0.0171 Ω mm<sup>2</sup>/m copper). This means that, having to ensure the same linear meter resistivity as copper cables, the adoption of aluminium leads to an increase in the resistant section of the cable. The result is however a cable that has a core weight of about half that of copper, but with a larger footprint. Moreover, the weldability of aluminium, compared to copper, presents considerable criticalities. These disadvantages effectively prevent the diffusion of aluminium cables.

The electro-deposition of the wires allow to create a protective coating that prevents oxidation of the aluminum. Furthermore, the use of graphene allows to significantly reduce the electrical resistance of the conductors (- 20%), making it possible to reduce the cable sections, with consequent lightening. A further advantage consists in making the wires easily crimpable, thanks to the external copper layer.

Recent studies, carried out by the Italian University group, on wire samples about one meter long showed how the electrical properties of aluminium wires and cables coated with the Electrochemical Deposition technique of Copper and Graphene (EDCG) In static conditions, they have improved significantly compared to uncoated aluminium cables. In order to verify the possibility of continuously depositing EDCG on aluminium wires and cables, a prototype laboratory equipment has been developed that has provided very promising results

The aim of the project is thus the creation of innovative aluminium cables electroplated with copper-graphene for use in the automotive sector. A feasibility study and the construction of a pilot plant is also planned.

The potential partner is a company that is involved in the production of electric car motors. The company will be involved in the validation process of the innovative cables.

The call's deadline is the 21st April 2020.

This partner request is open for receiving expressions of interest until the 7th April 2020.

## Stage of development

Proposal under development

## Keywords

### Technology

02007022	Conductive materials
03004004	Electrical Engineering/ Electrical Equipment
04001004	Transmission of electricity
09001004	Electrical Technology related to measurements
09003	Electronic measurement systems

### Market

03007002	Other measuring devices
08002002	Industrial measurement and sensing equipment
08002003	Process control equipment and systems

### NACE

Ref: RDIT20200317002

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## Network Contact

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### Issuing Partner

ZACHODNIOPOMORSKI UNIWERSYTET TECHNOLOGICZNY W SZCZECINIE

### Contact Person

Zebrowski Pawel

### Phone number

+48 91 449 43 64

### Email

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**Open for EOI:**     **Yes**

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## Dissemination

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### Relevant sector groups

Materials

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## Client

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### Type and Size of Organisation Behind the Profile

University

### Year Established

0

### Already Engaged in Trans-National Cooperation

Yes

### Languages Spoken

English

**Client Country**

Italy

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**Partner Sought**

**Type and Role of Partner Sought**

The partner sought is a company that produces electric car motors in whose windings it is possible to test the innovative cables.

The company will be involved in the validation process of the new cables by checking its technical requirements and wear tests.

**Type and Size of Partner Sought**

>500 MNE,SME 51-250,>500

**Type of Partnership Considered**

Research cooperation agreement

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**Program - Call**

**Framework Program**

H2020

**Call title and identifier**

Advanced light materials and their production processes for automotive applications

LC-GV-06-2020

Work program: Smart, green and integrated transport

**Submission and evaluation scheme**

Deadline Model : single-stage

Deadline: 21 April 2020 17:00:00 Brussels time

**Coordinator required**

No

**Deadline for EOI**

07 Apr 2020

**Deadline of the Call**

21 Apr 2020

## Attachments

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