

Research & Development Request

H2020 - Researchers and manufacturers sought to co-develop "Post-lithium ion batteries for electric automotive applications"(Call: NMP - GV-2014)

Summary

A UK research institute with experience in the development of power harvesting is seeking partners to join an H2020 bid to create batteries for electric cars based on flow cell technology. They are seeking researchers with expertise in automotive safety and flow cell technology from across Europe. They are also seeking industrial partners to design and manufacture a novel automotive battery, and a large scale industrial end-user and automotive manufacturer. The consortium is not yet built.

Creation Date 04 March 2014
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Reference RDUK20140304002

Details

Description

Electric cars are gaining significant ground on their fossil fuel-powered alternatives as energy storage capacities increase and public confidence and acceptance grows. However, one big challenge remains that of 'range anxiety' and consumer fear that their electric vehicle will run out of energy before a suitable charging point can be found or before they can return home. This worry stems from the fact that electric vehicles powered by Li-ion (lithium-ion) batteries currently take hours to recharge, compared to fossil fuel-powered vehicles that take just a few minutes. If the energy required to drive an electric motor could be delivered and stored as quickly and easily as filling up with petrol or diesel then range anxiety would be overcome, removing another significant barrier to the wide-scale adoption of electric vehicles. Significant research has been undertaken in the development of Li-ion batteries with faster charging characteristics and higher energy storage capacities, but faster charging generally comes at the expense of battery life. Other research has focussed on the development of alternative battery technologies, but this research is generally at an early stage. The development of fuel cells is continuing and shows significant promise, but the operating conditions, cost and fragility of fuel cells for mobile applications remain major hurdles to overcome. Supercapacitors are also being investigated, but again research is at an early stage and energy storage capacity and cost are major issues here. It seems like rather than trying to develop new technology to solve the issue of range anxiety, faster progress might be made by technology transfer from other areas. Flow cells were developed as early as the 1950s, with much research work being undertaken by NASA in the 1970s. The most common forms are based on vanadium, as this type of cell only uses vanadium in its various oxidation states, making the system simpler. Flow cells are, in theory, not limited by size and could be made to any scale or dimension. One big advantage over Li-ion batteries or similar is that they don't have to be recharged in-situ; the electrolyte can be drained

and charged separately. The electrolyte is also not prone to degradation, meaning it can be discharged and recharged almost limitlessly and it can be stored without discharge for indefinite periods of time. It also has no charge memory. With this in mind, it is possible to imagine a situation where a vehicle driver can pull into a 'fuel station' at the side of the road, exchange their discharged vehicle electrolyte for fresh charged electrolyte and then drive on. The discharged electrolyte can be bulk charged at the fixed service station location using either grid or local, renewable electricity and used once fully recharged for filling up more vehicles. In this situation, the driver is only 'borrowing' the electrolyte and paying for the energy it contains. The aim of this bid is to work with researchers and industry partners to prototype, manufacture and test a new flow cell battery for use with electric vehicles. The consortium consists of one UK partner at present, an institute with considerable experience in bidding for and winning Framework Programme 7 bids. The UK research institute is part of a network of research-led organisations that develop technology solutions across Europe. They are seeking 6 possible partners: 1. A research partner with flow cell technology expertise 2. A research partner with automotive safety expertise 3. An automotive battery manufacturer (industry partner) 4. An industry partner working in automotive prototyping/design and build 5. An industry large scale production end user/integration specialist 6. A large enterprise automotive manufacturer (industry). The deadline for expressions of interest to this profile is 30 April 2014 and the deadline for the call is 7 October 2014.

Stage of Development

Concept stage

Keywords

Technology

002009002	Hybrid and Electric Vehicles
002009004	Road Vehicles
002009014	Electrical supply system
004001003	Storage of electricity, batteries

Market

006015	Energy for Transport
007006	Other Consumer Related (not elsewhere classified)

NACE

H.49.3.1	Urban and suburban passenger land transport
H.49.3.9	Other passenger land transport n.e.c.

Network Contact

Issuing Partner

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Client

Type and Size of Organisation Behind the Profile

R&D Institution

Year Established

0

Already Engaged in Trans-National Cooperation

Yes

Langages Spoken

English

Client Country

United Kingdom

Partner Sought

Type and Role of Partner Sought

- Type of partner sought: Research institutes/Industry - Specific area of activity of the partner: Flow cell technology/automotive battery design and manufacture - Task to be performed by the partner sought: To co-develop a prototype of a flow cell battery, test and manufacture the product.

Type of Partnership Considered

Research cooperation agreement