HORIZON 2020

Changing the electric-vehicle paradigm with green, long-lasting and fast recharge liquid batteries

Berichterstattung

Projektinformationen

Nessox

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Projektwebsite

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Projekt abgeschlossen

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Koordiniert durch
BETTERY SRL
Italy

Periodic Reporting for period 1 - Nessox (Changing the electric-vehicle paradigm with green, long-lasting and fast recharge liquid batteries)

Berichtszeitraum: 2019-01-01 bis 2019-06-30

Zusammenfassung vom Kontext und den Gesamtzielen des Projekts

Electric vehicles are poised to replace the high-polluting gasoline transport in the long term, pushed by national and international policies aimed at reducing greenhouse gas emissions. Europe, for instance, has set to completely cut fueled cars by 2050.

Nonetheless, market uptake of electric cars is still very low, less than 1% of automotive sales in 2016. Despite economic savings compared to fuel engines are proven by several studies, the adoption of electric vehicles is hindered by long recharging times (on average 4 hours) and still limited autonomy (maximum 300 km), due to the performances constraints of the Li-ion batteries, the state-of-art technology used in e-vehicles.

BETTERY is a high-tech start-up which designed and developed Nessox, a patented new generation of batteries able to overcome the limitations of current electric batteries and drastically improve the customer experience of e-drivers. Nessox's core innovation is based on applying the design of a class of flow batteries (Redox Flow Battery – RFB) to the functioning system of Li/O2 batteries. This enables Nessox to be the first liquid battery that provides electric vehicles with driving range comparable to petrol engines, and fast recharge by fill-up with “charged” liquid.

The success of NESSOX is poised to strongly increase the performance of Electric Vehicles, in particular for what concerns the distance traveled on a single charge, and the time required to recharge the battery. In particular it is forecasted at least an increase up to a factor 2 of travel range and a recharge time of few minutes, compared to the actual situation which requires hours.

The objective of the project includes the advancement in the design of the battery, starting from the engineering of the core battery cell. Moreover the project aims to assess the value chain around the product, with a special attention to the distribution chains which is considered the key toward the market success of NESSOX.

Arbeit, die ab Beginn des Projekts bis zum Ende des durch den Bericht erfassten Berichtszeitraums geleistet wurde, und die wichtigsten bis dahin erzielten Ergebnisse

During the Project different results, both technical and commercial were achieved. First the overall design of battery was reviewed, with special attention to the core battery cell. The new design was leaded by different interactions with stakeholders, and in particular with e-bike producers, which helped the team with technical requirenments and indications. An important advancement, for example, was on the cell, which was modified to obtain an improved nominal power from 3 to 100 mW.

Another important technical advancement was a design of a NESSOX charging station. This was achieved starting from a series of interview with fuel distributors to study all the key technical and regulatory requirenments for this kind of station. Then the team interacted with a global charging station producer to study a custom product able to work with the catholyte of NESSOX. Finally the technical characteristics of this product and the costs were studied.

Considering Business Feasibility, the team interacted with more than 15 stakeholders including: e-bike producers, e-car producers, battery producers, energy distributors and suppliers. This allowed to validate the business model and define price targets. The team completed a market analysis which includes the battery and the e-vehicle markets, with a special attention to the small e-vehicle. Moreover an analysis on market barriers and of competitors helped refine the business strategy of Bettery, including CBA, costs analysis and distribution strategy. The final highlight is a large business opportunity for the NESSOX technology in the e-vehicle market, which is poised to start from small e-vechiles like e-bikes, thanks to a potentially distrupting impact of NESSOX in this sector.

Fortschritte, die über den aktuellen Stand der Technik hinausgehen und voraussichtliche potenzielle Auswirkungen (einschließlich der bis dato erzielten sozioökonomischen Auswirkungen und weiter gefassten gesellschaftlichen Auswirkungen des Projekts)

Nessox is poised to complete the battery test during next year and start to be integrated into existing commercial product, thus to validate the system on field. Meanwhile the team intends to start a pilot installation of the NESSOX charging station on a selected site, in collaboration with a global fuel distributor, thus to validate the distribution model developed so far. The team intends to complete a series of certification to obtain the CE mark once the industrial design is assessed. Moreover the next phase of the project aims to negotiate commercial deals with e-vechicle producers to create production lines including the NESSOX battery, thus to start a first revenue stream which will support the continue R&D activity of the team, aimed to produce the first NESSOX battery for e-car.

BETTERY

Logo Bettery

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