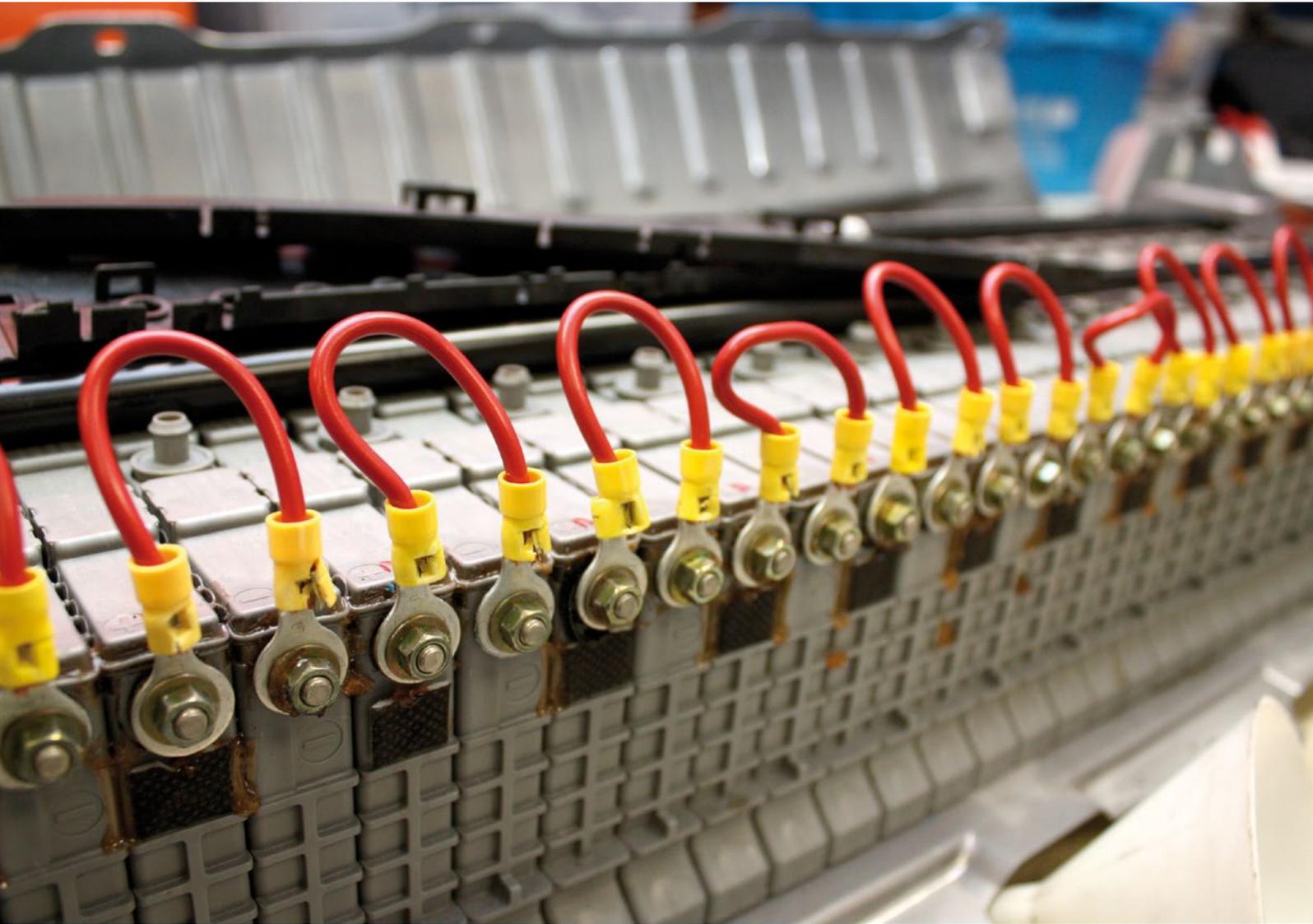


ABattReLife PROJECT

Designs strategies and technologies for maximizing
battery re-use and recycling



Pioneers in international business

The EU project Electromobility+ (EM+) is a contribution of eleven European countries and regions to the European Green Cars Initiative. The countries and regions involved are France, Germany, the Netherlands, Austria, Finland, Norway, Sweden, Denmark, Poland, Flanders (Belgium), and Piedmont (Italy). The initiative aims to create the long-term conditions required to roll out electric mobility in Europe by 2025. EM+ pools some twenty million euros contributed by the participating countries and regions and the EC's 7th Framework Programme. Nearly twenty research projects have been granted funding; one of them is ABattReLife. Koen Broess of DNV KEMA is the project's coordinator.



Electromobility+

ABattReLife is a consortium of more than ten organizations from three European countries, among them DNV KEMA, TNO, BMW, the Technical University of Munich, and the Troyes University of Technology in France. The project will run for thirty-six months, to the spring of 2015. "By then, we hope to have determined the best time to remove a battery from an electric car in order to maximize the value of its 'second-life' application," says Broess.

The research question Though the focus in ABattReLife is on electric vehicle batteries, the project's origins lie in the current rise of sustainable energy and the increasing interest in smart grids. "Our vision is that, with the rise of sustainable energy, supply and demand must be in harmony," Broess explains. "That is certainly the case for renewable energy sources, which can have an enormous impact on the electrical grid. One of the ways to ensure grid stability is to create opportunities to store sustainable energy. It's an exciting idea, not only for us, but for the automotive industry in particular."

Energy storage "Car manufacturers are building increasing numbers of electric cars and the battery packs that go with them. The battery packs are the limiting factor in how far those electric vehicles can drive. Over time, the battery capacity shrinks by 20 to 30 percent in electric cars, which is unacceptable to the user. At that point, the batteries are ready to be replaced for that specific application." But that doesn't mean a battery pack has reached the end of its useful life, Broess says. "And that's the basic idea behind ABattReLife: giving electric vehicle batteries a second life. One of the applications the consortium is currently eyeing is energy storage."

Broess believes car manufacturers will be able to kill two birds with one stone. "By increasing the economic value of the batteries, they not only earn money, but also save on costs. While lead-acid batteries still bring

in money when recycled because you can extract specific raw materials from them, it actually costs money to recycle lithium-ion batteries. All things considered, that's a challenge for the automotive industry."

Knowledge database ABattReLife's goals are ambitious: to design and implement a knowledge database on high-voltage traction battery deterioration, create a safe management structure for battery recycling, and develop strategies and technologies for battery re-use and recycling. "One of the challenges is analysing 'useless' batteries," says Broess. "You want to know not only what the average remaining capacity is, but also exactly which components of the lithium-ion batteries are still in great shape. Second, you want to know how long the batteries can perform in a second life. In short, you have to keep excellent records on what happens to the battery while it's in the car. How many kilometres it drove, how often it was charged, whether it was fast-charged, and so on." In October, DNV KEMA started initial testing of batteries on the module level; the universities in the consortium are analysing the batteries on the cell and molecular levels. "The tests will take approximately a year," Broess says, "after which the project will enter the next phase."

Broess is enthusiastic about the project's potential. "We definitely see opportunities to give electric vehicle batteries a second life. Though we don't yet know which specific market the product will end up in. ABattReLife will be a success if we manage to identify and model all the low-hanging fruit."

Source: E-Mobility Magazine, The Netherlands