

K-VEC

ULTRAFAST AND DISTRIBUTED POWER CHARGE SYSTEM FOR HIGH PERFORMANCE ON-BOARD ENERGY STORAGE DEVICES

www.kvec.eu

K-VEC is a smart and cost-effective conductive fast charge system between a road infrastructure and an electric vehicle. The vehicle will be charged almost instantly through the road infrastructure integrated with a new charging technology, hence introducing the smart concept of carrying on-board only the necessary energy needed to reach the next bus stop.

This technology increases the potential range of the vehicle at the same time diminishing the weight of on-board storage systems and reducing the operative costs, that are the real bottleneck of the electrochemical battery powered Electric Vehicles. This project started from the observation that battery packs for electric vehicles remain expensive, heavy and failure prone component. These characteristics contribute massively to the unsatisfactory level of use in Europe of purely electric vehicles, despite their obvious environmental and potential economic advantages.

While research on batteries continues, these ones alone cannot solve the main problem of transportation. Such a research approach is mainly leading to incremental improvements which are unlikely to made electric vehicles comparable in range and weight to their conventional counterparts. "Fast switching" battery systems for vehicles have been proposed and tested, but these systems result mostly in the multiplication of the number of batteries (and their cost) per vehicle. Ultracapacitors are rugged, state of the art charge storage devices that, up until now, have not yet found widespread use in vehicles because of their still low energy density ratio and their relatively high cost.

Capacitors, however, have fundamental advantages over electrochemical charge storage systems (batteries) including life cycle (up to 1 million charging cycles without significant loss of efficiency) and the fact that charge and discharge can be very rapid. This allows ultracapacitor vehicles to have good "power on demand" characteristics but, also, allows for very fast charging, a challenge that batteries have sought to overcome by dramatically shortening their life or manually interchanging battery packs. It is this very fast charging ability that is the key of the K-VEC project: reducing cost and weight by smartly storing on board only the minimum amount

PROJECT DATA

Funding/€	Total cost/€	Duration
300.624	654.684	24 months

Partners	
	Sequoia Automation S.r.l., IT
	FEBO S.r.l., IT
	Bergische Universität Wuppertal, DE

of energy needed. Since ultracapacitors can be charged very rapidly, energy can be provided "on demand" by charging stations placed in any suitable location. This is a holistic approach to surface transportation that is based on "system thinking" rather than in trying to overcome specific hardware limitations. Such an approach is particularly well suited to public transportation where the regular stops for passengers (smart infrastructures) can become charging points for the ultracapacitors.

>> A "KEY"
E-VEHICLE <<

