Smarter control of electric vehicle batteries

January 14 2010

Nanoelectronics technology is improving the way that batteries and motors in electric vehicles are controlled, giving them a longer range on each charge.

Electric vehicles are fitted with one or several electric motors driven by energy stored in large batteries that may consist of thousands of small cells. These high-capacity batteries give current models of electric cars a range of up to 200 kilometres.

The EU's E3Car project is studying how to utilise battery power as efficiently as possible in such vehicles. SINTEF Group, an independent research organisation in Scandinavia, is one of 33 participants in the project, which comprise vehicle manufacturers, automotive industry suppliers and research centres from all over Europe.

The project has taken up challenges on several fronts. Battery efficiency, higher energy density and power and energy control make up one group of topics. The infrastructure required for rapid charging or systematic change of battery is another. And smart dynamic sensor-based monitoring, where nanoelectronics can provide real-time control, is a third field of research.

"SINTEF's area is on the nanoelectronics side, and we are putting up expertise on energy conversion and voltage convertors," says project manager Ovidiu Vermesan of SINTEF ICT. Together with the Norwegian companies ElBil Norge and Think Global, the SINTEF project group is looking at power and energy control in what they call

the cars of the future.

The E3Car project is looking to use microprocessors, ligic circuits and sensors that will continuously monitor voltage, current and temperature in the battery pack. Measurements of this sort will allow certain operations to be cut out and the energy used to power others. If a sensor exceeds its permitted range, for example, the battery pack can be disconnected in a millisecond.

“The battery voltage needs to lie around what the motor requires - 200 - 400 volts. But we can convert vehicle motors to operate at a lower voltage (100V), which would mean less risk in the event of fire or traffic accidents,” says Vermesan.

E3Car is the Largest European research project on the development of nanotechnology for electric vehicles. The project is still in its very first phase, and is intended to run until 2012, with a total budget of € 44 million.

Provided by SINTEF

Citation: Smarter control of electric vehicle batteries (2010, January 14) retrieved 21 September 2024 from https://phys.org/news/2010-01-smarter-electric-vehicle-batteries.html