Friday, 19 September, 2014

Could electric cars cause cancer? Like all electric devices, and indeed like all motor vehicles, they do produce electromagnetic fields. However, these fields are far too weak to give cause for concern, say EU-funded scientists at the end of a comprehensive research project.

Energy-efficient, environmentally friendly and blissfully quiet: electric vehicles rank prominently among the technologies that could combine to make transport more sustainable. In terms of air quality alone, those of us living and working in urban areas would certainly notice the difference. Public health would benefit, some say, whereas others worry about our growing exposure to electromagnetic fields. Would we simply be swapping smog for e-smog?

Based on comprehensive research conducted over the course of three years, the EM-Safety project has reached the conclusion that the electromagnetic fields (EMFs) in electric cars are well within the safety limits. The partners measured the fields generated in test vehicles and analysed their biological effects. They have also produced designs for a particularly powerful sensor and developed guidelines that can help car manufacturers to reduce magnetic exposure even further.

In-vehicle measurements
“In our project,” says project coordinator Andreas Vogl of Stiftelsen SINTEF, “we wanted to investigate EMFs in fully electric vehicles, see if there are reasons for concern and, if so, find ways to address them and introduce measures to reduce magnetic field exposure.”

To do so, the partners took measurements in 11 vehicles – 8 electric cars of different makes, 2 running on petrol and 1 with a diesel engine. Their data indicates that the exposures in electric cars, while slightly higher than those with internal combustion engines, remained far below the limits defined by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). The researchers reported maximum exposures amounting to 20% of the ICNIRP limits, compared to the 10% they observed in the three conventional cars.

These values relate to the exposure at foot height. Higher up, and therefore further away from the engine, the values are lower. The project reports that exposure levels nearer the head do not exceed 2% of the ICNIRP limits.

**In vitro experiments**

The partners also studied the biological effects of the EMFs observed in electric vehicles. One of their experiments focused on cardiac cells, to check if EMFs affect the electrical processes of the heart. Other tests looked into the fields’ effects on other types of healthy and cancerous cells.

“We used the magnetic field exposure in the frequency area observed in the electric cars, and from these cell studies we couldn’t see any negative effects,” says Vogl. More specifically, the partners conclude that there are no reasons to perceive the electromagnetic radiation observed in cars as potentially carcinogenic – in contrast to substances such as benzene or diesel exhaust fumes, which are known to cause cancer.

**In-depth knowledge**

While EM-Safety was not the first project of its kind, says Vogl, it was particularly comprehensive, covering a wide range of cars and combining the findings with biological knowledge and engineering guidance. The partners’ complementarity was crucial in this respect, with specialised, independent scientific institutions handling the measurements and biological experiments, and industrial partners contributing private sector expertise.

The project, says Vogl, has enabled all partners to refine their skills. They have applied their insights to the development of guidelines that will help car manufacturers to reduce electromagnetic exposure even further. The team has also developed a new sensor, which according to Vogl measures a broad frequency area of magnetic fields with particularly high resolution.

Insights from the project, says Vogl, are feeding into the development of a new standard for the assessment of electric, magnetic and electromagnetic fields associated with human exposure. And for several partners, the project has opened up new opportunities, such as a chance to contribute to the development of a new electric bus and the necessary charging stations, and the production of innovative components.

**See also:**
CORDIS [3]

**Project:**
EM safety and Hazards Mitigation by proper EV design

**Project Acronym:**
EM-SAFETY

**Project website:**