



Shell Eco-marathon 2006 Technical Innovation award 2006

First Prize - No. 201 Hochschule Offenburg, Germany

Electric in-wheel motor

Integration of the motor in the wheel of their fuel cell vehicle is an original creation likely to see further development in other electric vehicles. Its compact form, which includes the power electronics, is exceptionally efficient and eliminates free-wheeling. It took several attempts to design this electric "pancake" that is as compact as it is powerful. Built without iron or steel, there are no magnetic losses, and achieving the distance of 2,614 km Saturday validates the quality of this concept that has been perfectly realized.

Second prize – No. 10 ESSTIN Nancy, France

Optimisation of fuel cell

Because fuel cells off the shelf were too heavy or too powerful, the engineers of ESSTIN Nancy built its own, solving numerous technical problems, including the fabrication of graphite plates. The addition of super capacitors to the fuel cell improves its efficiency and acceleration. The invention significantly reduces the size and weight of the powertrain to the rear drive wheel. Steering is controlled by a low-friction push-pull ball-bearing cable.

Third prize - N° 204 Chemnitz University of Technology, Germany

Virtual accelerator and drive wheel

Two innovations attracted the jury to this fuel cell vehicle. The rear wheel pivots around a carefully defined virtual axis that provides both precision and stability in turns. The accelerator pedal made of a composite spring doesn't move; rather, it responds to pressure by deforming, sending a precise electrical signal to the control unit governing the electrical output of the fuel cell. Besides being technically cool, it provides remarkable precision because it doesn't jump around on rough roads. The concept is also good for saving fuel: pushing the "pedal to the metal" will quickly wear out the driver!

Special Mention N° 192 INSA de Lyon, France

Driving simulator for Nogaro course

While it doesn't concern the vehicle directly, this innovative machine improves its performance by training the driver. Powerful electronics present realistic graphics describing the course, permitting the driver to learn the curves, inclines and descents of the course and to explore different strategies. A new driver can become an expert at the European Shell Eco Marathon before ever visiting Nogaro. The simulator can be programmed with different powertrains, and even the 20km winds on Saturday. While INSA developed the simulator for itself, the team is very "fair play" and invited rival drivers to use it.

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