

The hybrid offensive

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(PhysOrg.com) -- Fraunhofer research engineers are busy converting a standard production gasoline-engine car into a hybrid. By doing so, they aim to demonstrate what hybrid technology can do, and prove that it can even be integrated in existing vehicle design concepts.

A car that consumes half as much fuel in the urban cycle – who could refuse that, given the price of fuel today?

Researchers at the Center for Automotive Power Electronics and Mechatronics ZKLM in Nürnberg have set out to prove that this is feasible by integrating modern hybrid technology in conventional gasoline- and diesel-fueled vehicles. The Center is a branch lab of the Fraunhofer Institute of Integrated Systems and Device Technology IISB. The researchers plan to create an open technology platform where it will be possible to present, test and optimize all systems required for hybridization, including their interaction under real environmental and operating conditions. The model they have chosen to work on is an Audi TT roadster.

“We are specialists in the design of power electronics systems that are so compact that they can be easily accommodated in the restricted space of a volume-production vehicle,” declares Dr. Martin März, who heads the ZKLM. Consequently, the new hybridization concept only requires minor modifications to the powertrain, unlike certain Japanese solutions already available on the market.

The main components are two electric motors installed in the center of

the rear axle and each driving one wheel. Otherwise, the familiar front-wheel drive has been retained, as in cars with standard internal combustion engines. This approach permits the integration of additional functions, such as a temporary all-wheel drive mode. Some of the “home-made” components that the developers intend to incorporate in the TT roadster include a voltage converter to control the flow of current from the storage battery to the drive system.

Hybrid technology offers many advantages. It reduces fuel consumption and provides a power source for stationary heating and cooling, active suspension, and a variety of plug-in electrical devices and appliances including notebook PCs, domestic vacuum cleaners, a full range of camping equipment, or professional power tools. But what does it cost to equip a car with hybrid technology?

According to März’s estimates, “It doesn’t cost much more than you would pay for optional premium leather seats.” The components being developed as part of the project, in addition to the power electronics for energy management and the electrical drive system, include an energy-storage module based on lithium-polymer batteries designed for onboard use in vehicles.

Provided by Fraunhofer-Gesellschaft

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