

Press Release

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Silent helpers for communities

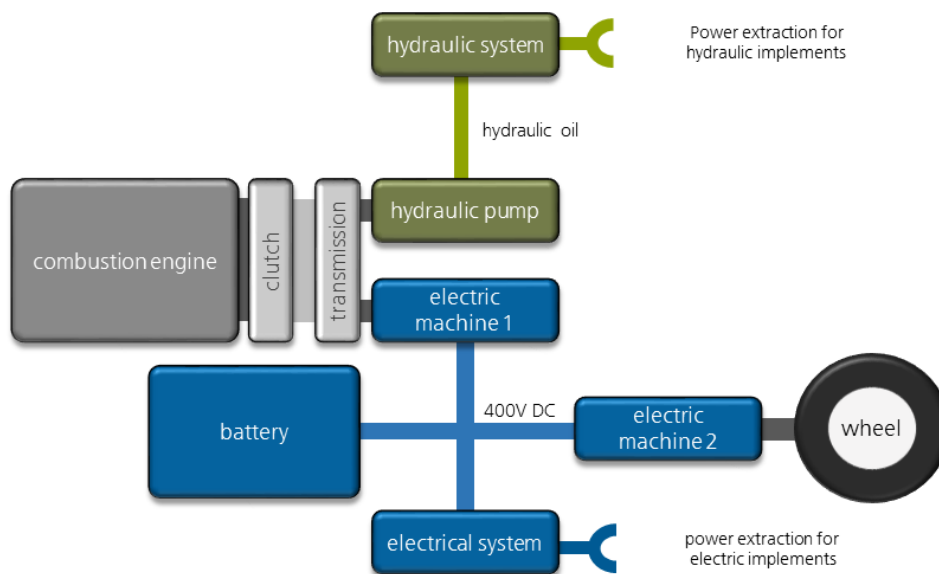
Everyone knows the situation: Sleep is virtually impossible when the roads are swept or the lawn is mowed in the early morning. HY²PE²R could be a revolutionary solution to this problem. The hybrid range extender was developed at the Fraunhofer IVI and will be exhibited for the first time at the International Motor Show (IAA) in Frankfurt.

Today, bikes, cars and even trucks are operated fully electrically. New battery generations with steadily increasing energy density and intelligent fast charging concepts are only two examples that underline how far the field of electromobility has already advanced. But what about the small, unremarkable commercial utility vehicles that sweep our roads every day, empty public trash cans and keep our sidewalks free of snow in the winter? The development of HY²PE²R represents a possible solution with great benefits for all citizens in times of increasing noise and air pollution in inner cities.

Within the scope of the Fraunhofer System Research for Electromobility (FSEM), a concept for the electrification of vehicles in this category was developed at the Fraunhofer IVI. The overall aims were to electrify the vehicles' propulsion systems and to explore options of integrating electric tools and implements while still being able to support conventional hydraulic components. Commercial utility vehicles can serve a wide range of purposes by attaching a multitude of different implements. These implements are sometimes only added to a single vehicle at a time and they might only be needed during a certain season. Dr. Frank Steinert, group leader at the Fraunhofer IVI, explains: »The big challenge for this project is to develop a range extender that is able to meet all these complex demands. The electrification will not substitute the hydraulic components, but rather it will allow for additional features and make the vehicles more efficient.«

HY²PE²R stands for Hydraulic Hybrid for Extended Electrical Range. It is a serial hybrid unit with both hydraulic and electric power extraction that fulfills all aforementioned demands. It contains a combustion engine that drives a generator and a hydraulic pump via a transmission with a clutch. Its multitude of possible operating modes is what makes the unit so interesting. The range extender uses intelligent control technology to detect the vehicle state instantly and will react autonomously while always running at an optimal operating point.

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Schematic layout of HY²PE²R with hybrid power extraction (© Fraunhofer IVI)

A rapid switch to electromobility would be difficult: commercial utility vehicles have an especially high energy demand due to their necessary flexibility and the large number of hydraulic implements. However, the hybrid approach is a valid solution for the gradual transition to emission-free options. Even today, it is already possible to clear our sidewalks from ice and snow in the early morning hours in a virtually noise- and pollution-free fashion.

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