

Researchers cut machinery fuel consumption by half

June 1 2011



Researchers at Aalto University in Finland have found a way to cut the amount of fuel consumed by non-road mobile machinery by half. This new technology captures energy, which up to now has been lost by the machinery when working, and uses it instead of fuel. The fuel consumption of construction and mining machines, agricultural machines and material handling machines is reduced significantly.

These heavy duty machines are operated for long periods of time, so by the end of the day [emissions](#) and [fuel consumption](#) have added up. Being able to target them is a significant improvement, says Professor Jussi Suomela, who is in charge of the project at Aalto University's HybLab research network in Finland.

The researchers have added an electric power transmission system into the machines. The machines then become hybrids with both combustion and electric engines. Similar technology has already proven successful in personal cars; however, hybrid cars only capture [energy](#) from wheels during deceleration, whereas work machines create most of the extra energy during work tasks. This energy has not been captured until now.

The researchers at the Finnish Aalto University are now analyzing the work cycles of different types of machinery in order to find out which work tasks allow energy to be captured. Deceleration and lowering a load are typical examples. This technology enables short-term energy storage, making it possible to store energy for later use during a peak in power demand. The electric transmission generates other side benefits such as better controllability, operator comfort, efficiency and more freedom in the machine structure.

The goal is to reduce fuel consumption and carbon dioxide emissions. Another benefit of hybridization is that it leads to lower operation costs as well. With electric power transmission, the machines may even be connected to normal wall sockets.

Electricity from the power grid is very cost-efficient and creates no local emissions. If the machine can be plugged in, that is usually the best option. The future is likely to make fuel cells available, too, says Suomela. And the benefits do not stop here: the [machines](#) are even able to release stored electrical energy back into the grid.

Provided by Aalto University

Citation: Researchers cut machinery fuel consumption by half (2011, June 1) retrieved 28 April 2024 from <https://phys.org/news/2011-06-machinery-fuel-consumption.html>

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