

Novel technology reaches 100-kW wireless power transfer for passenger vehicle

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ORNL researchers achieved the highest wireless power transfer level for a light-duty passenger vehicle when the team demonstrated a 100-kW wireless power transfer to an EV using ORNL's patented polyphase electromagnetic coupling coil. Credit: Credit: Genevieve Martin/ORNL, U.S. Dept. of Energy

A team of researchers at Oak Ridge National Laboratory has

demonstrated that a light-duty passenger electric vehicle can be wirelessly charged at 100-kW with 96% efficiency using polyphase electromagnetic coupling coils with rotating magnetic fields.

ORNL's patented system transferred power to a Hyundai Kona EV across a five-inch airgap using [electromagnetic fields](#), a process similar to the wireless charging of small consumer devices.

"We've achieved the highest power density in the world for a wireless charging system for this class of vehicle," ORNL's Omer Onar said. "Our technology reaches power densities 8–10 times higher than conventional coil technology and can increase battery charge state by 50% in under 20 minutes."

While researchers had previously achieved a 120-kW charge using conventional coil technology in benchtop lab testing, this marks a milestone achievement for vehicle integration using ORNL's polyphase coils.

The polyphase electromagnetic coupling coil's lightweight and small design allows for the highest power density within the smallest coils possible. Rotating magnetic fields generated by the [coil](#) phase windings boost the power.

"This is a breakthrough achievement and opens the door to fast and efficient wireless charging for passenger [electric vehicles](#)," Onar said.

Provided by Oak Ridge National Laboratory

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