



Fuel Cell Electric Vehicle Test Solutions

NH Research (NHR)
Enabling Electrification

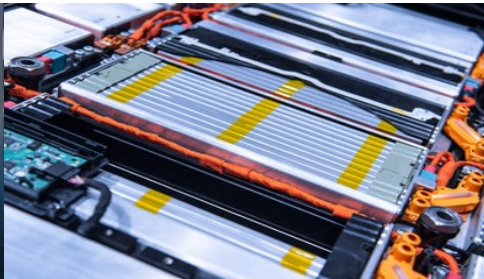


Enabling Electrification

NHR enables electrification by accelerating innovation, validation & functional test of today's & tomorrow's technologies

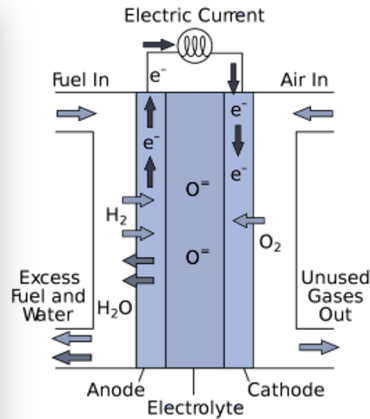
Backed by over 50 years of experience

- ✓ Best in class performance
- ✓ Ease of use
- ✓ Modular & scalable solutions
- ✓ Reduced testing time
- ✓ Improved safety
- ✓ Energy savings



Fuel Cell Test Solutions

**Flexible, Modular Hardware
AND Software**

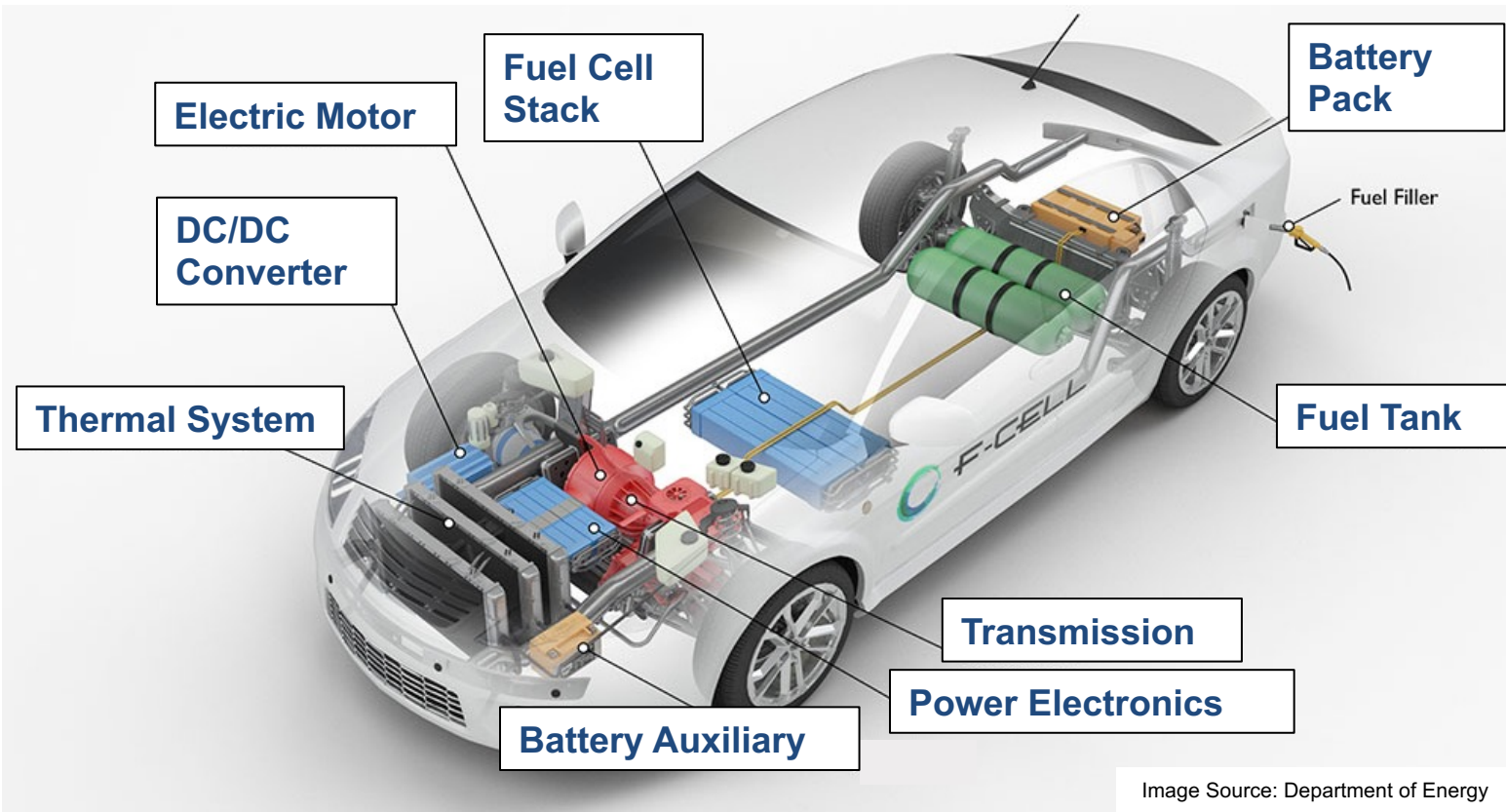


Benefits

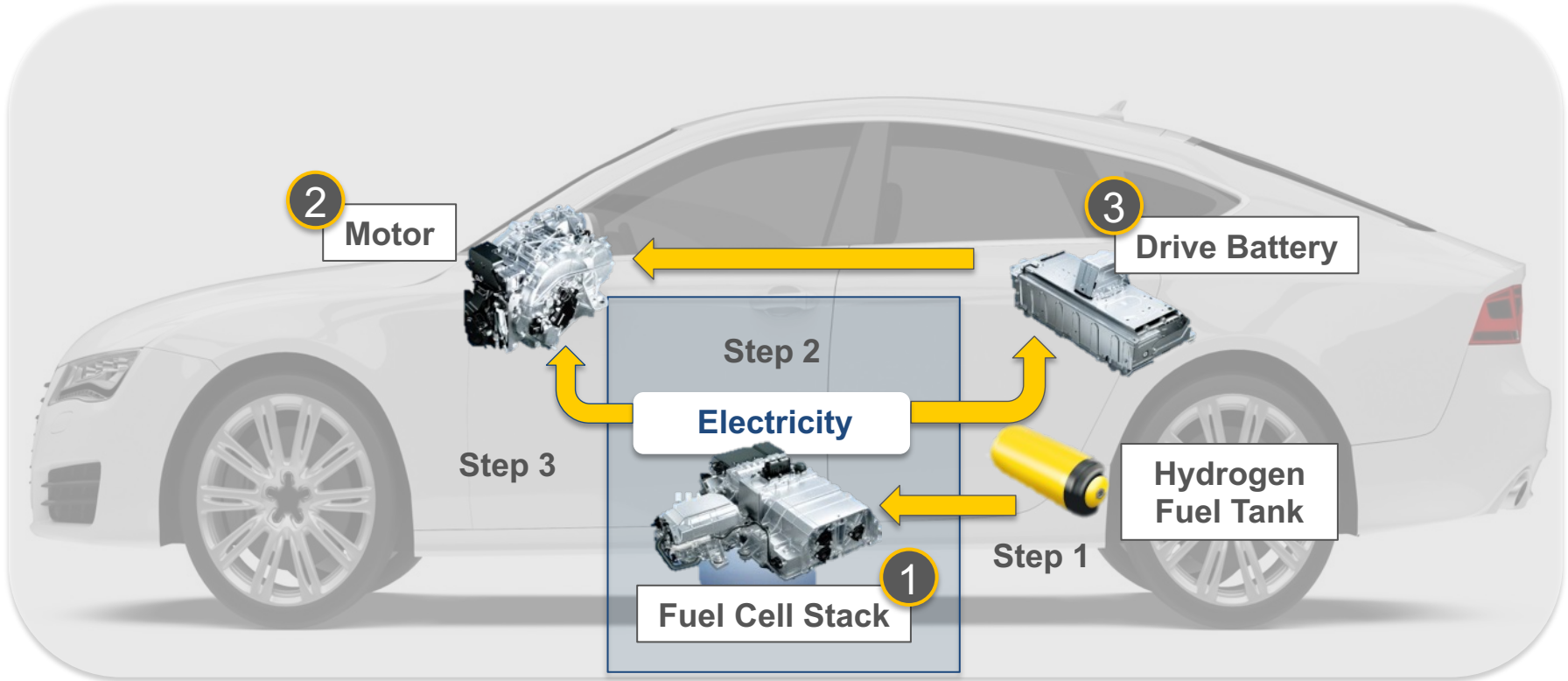
- ✓ Modular & Scalable Power
- ✓ Fast Response Time
- ✓ Reduced testing time
- ✓ Built-in Measurements
- ✓ Flexible & Easy Integration
- ✓ Multiple Layers of Safety

Fuel Cell Test Solutions for Today's & Tomorrow's Products

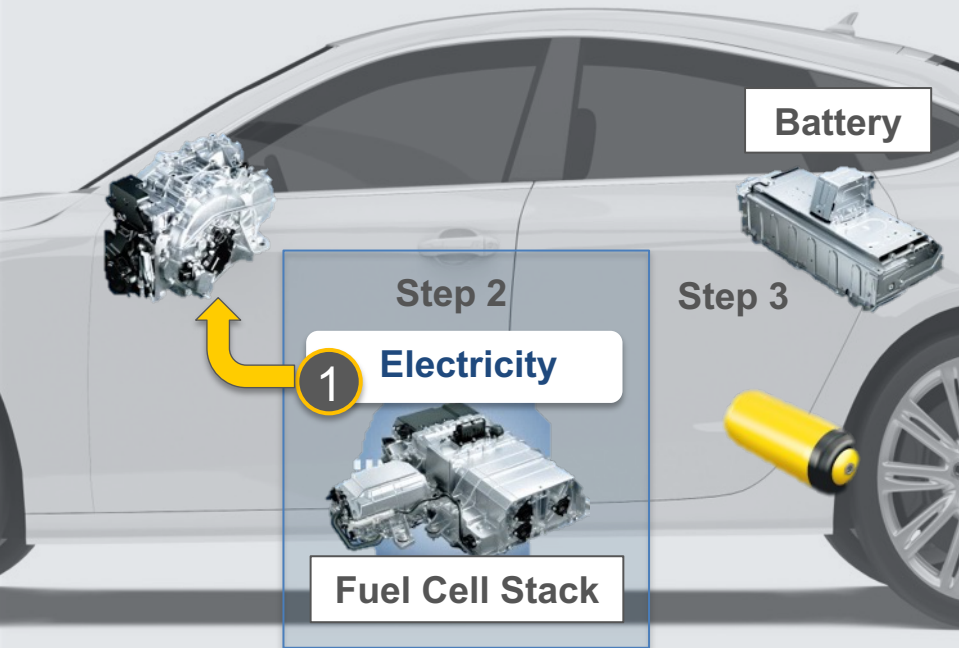
Fuel Cell Electric Vehicle Test Solutions



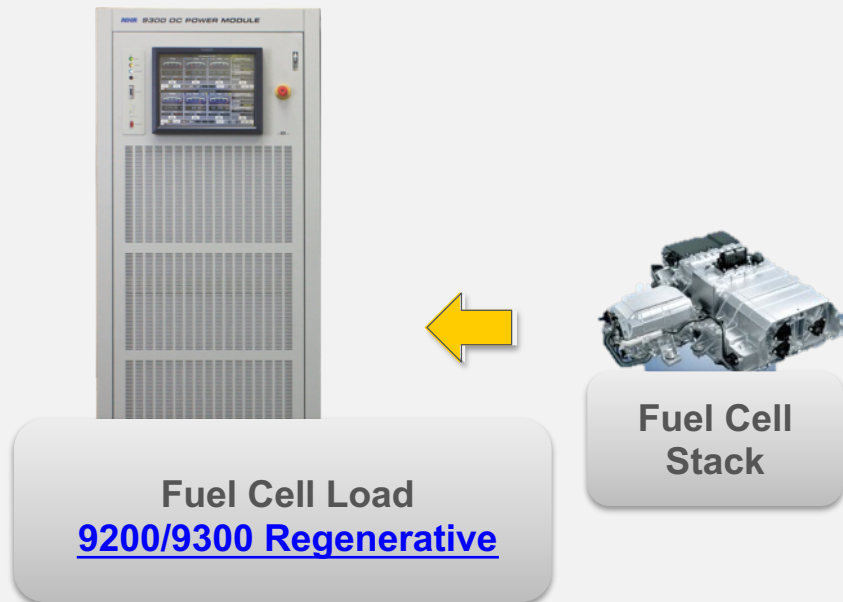
Fuel Cell Electric Vehicle Test Solutions



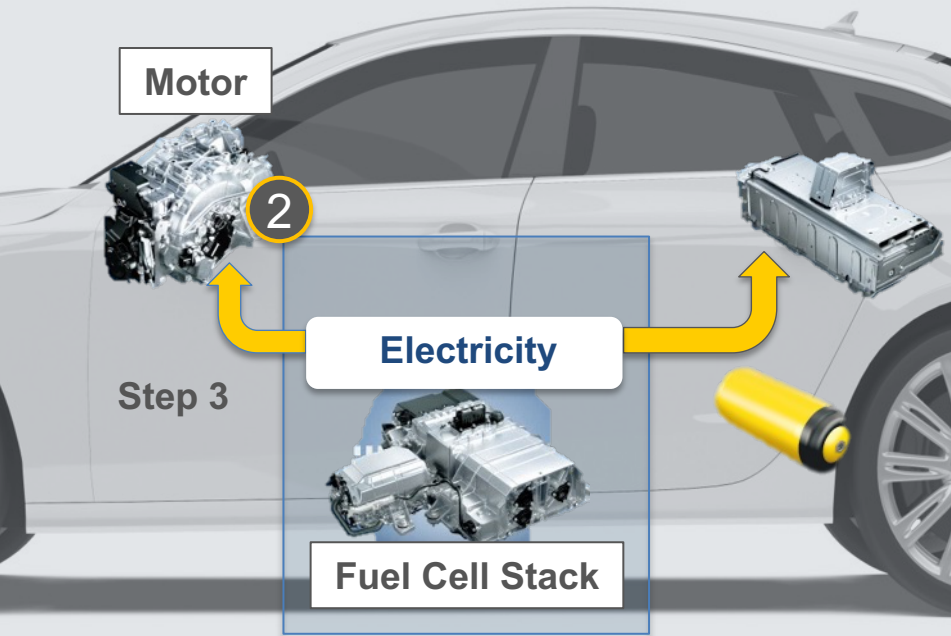
High Voltage Fuel Cells



Fuel Cell Testing



Fuel Cell Emulation



EV Powertrain



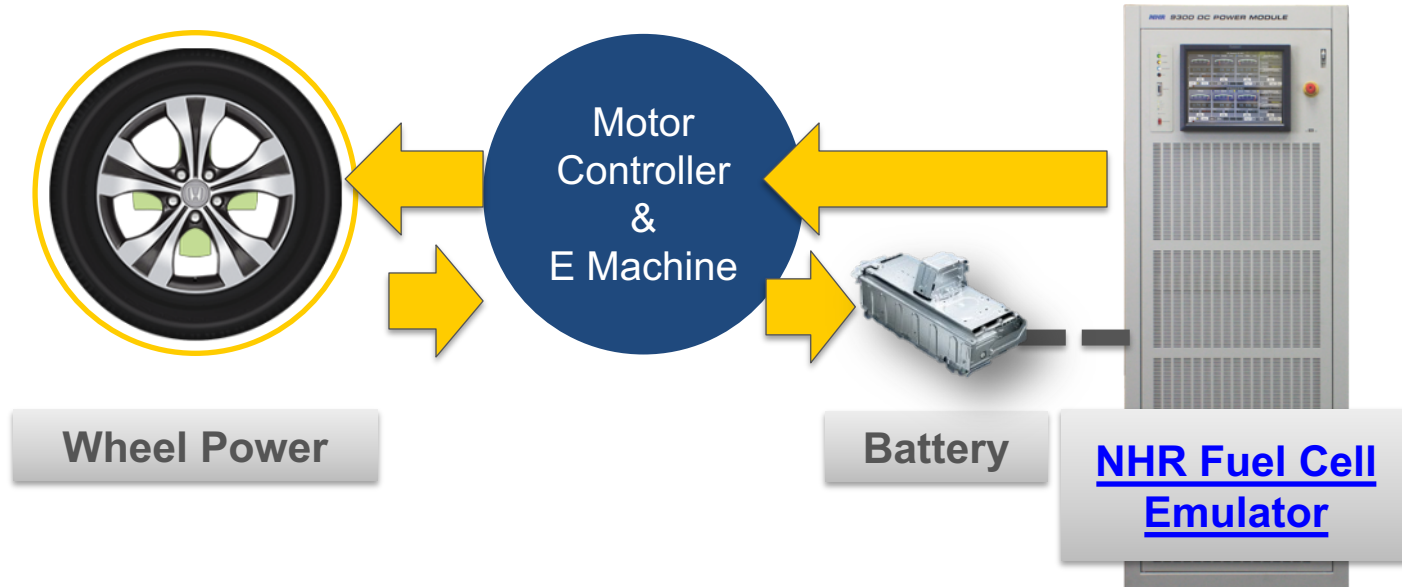
Motor

Inverter



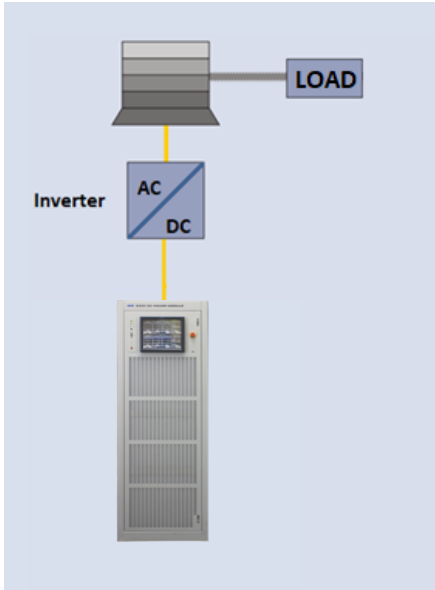
[9200/9300](#)
[Fuel Cell](#)
[Emulator](#)

Powertrain Testing with Fuel Cell Emulation

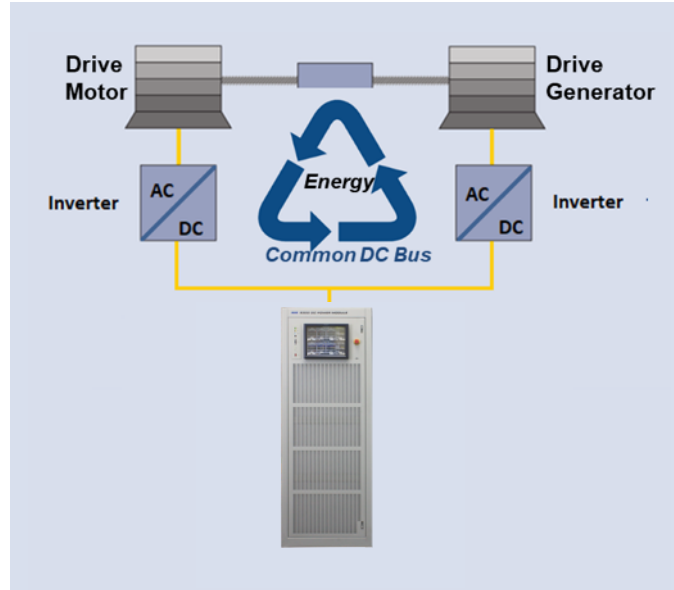


- Historically round-trip efficiency < 50%
- Improve motor / controller & new batteries → efficiency gains

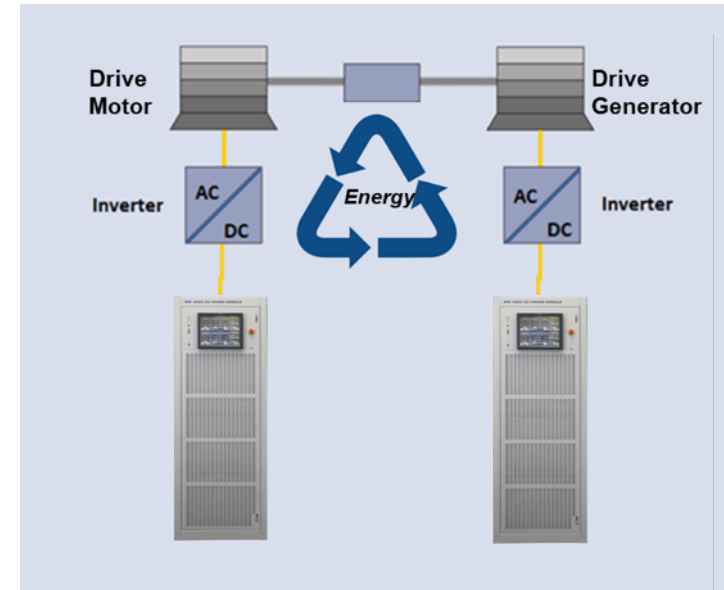
Powertrain Test Approaches



Single-ended DC Bus



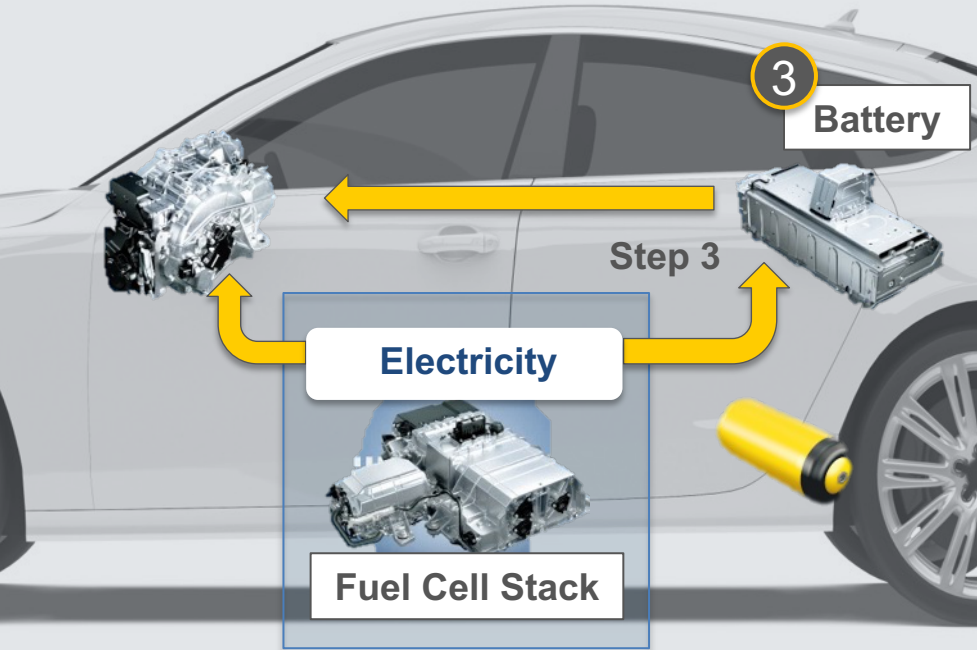
Common DC Bus



Isolated DC Bus

The **NHR Approach** accepts back EMF and prevents safety hazards. Isolated input and output paths eliminates single points of failure.

Fuel Cell Emulation



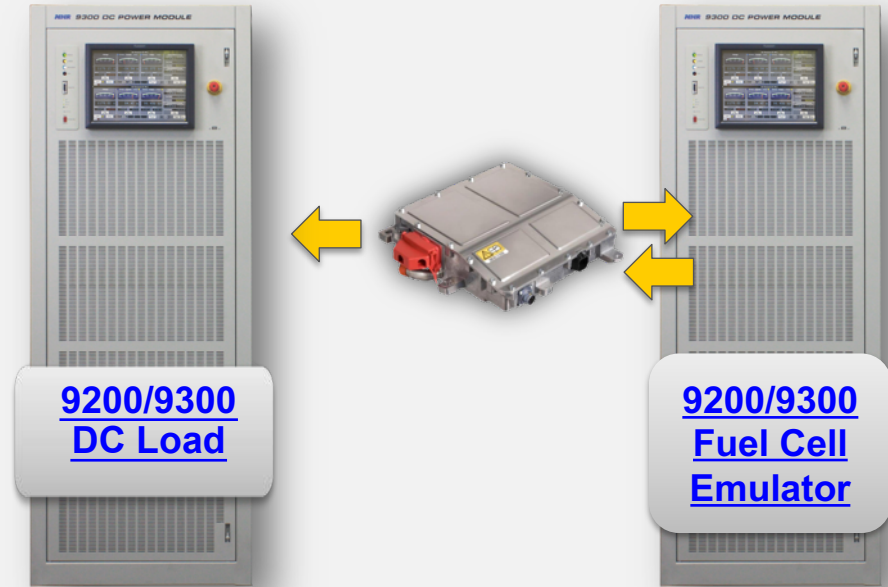
Battery Test



DC/DC
Converter

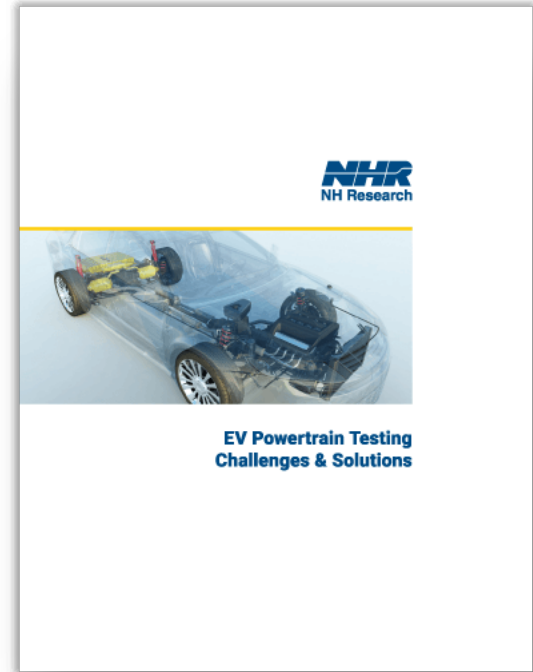
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Emulate Fuel Cells &
DC Busses (PV)



Access Resource Library

- [Download Application Notes](#)
 - [The Fundamentals of Battery Test](#)
 - [Electric Powertrain Testing Challenges & Solutions](#)
 - [Battery Emulation: Testing without Batteries](#)
- [On-Demand Webinars](#)
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