

The Hybrid and Hydrogen Vehicle Research Laboratory (HHVRL) at the Penn State Larson Institute was established to support the transformation of vehicle power train technology from strict dependence on internal combustion engines and petroleum to alternative fuels and hybrid electric technologies. Our competency is performing vehicle system integration, control, and testing for feasibility and demonstration. The HHVRL pools resources and competencies to perform this research in partnership with other researchers, government entities, and private industry. Resources accessible through the HHVRL include:

- Vehicle controller integration and rapid prototyping;
- Alternative fueling stations for hydrogen, LNG, and CNG;
- Gaseous fuel systems and fuel injection integration;
- Vehicle fuel economy modeling and hardware in the loop (HIL) testing;
- Fuel economy and emissions testing and analysis;
- Battery, Fuel Cell, and ultra-capacitors testing;
- Vehicle test track and dynamometer facilities;
- Vehicle fabrication facilities; and
- Natural Gas, Fuel cell, and HEV vehicle test fleets.

Recent HHVRL projects include:

- CNG/Diesel dual fuel system integration for heavy trucks;
- Demonstration of an onboard hydrogen production module and hydrogen engine fueled with aluminum alloy and water;
- Modeling and HIL Testing of a military HEV battery system; and
- Development of a hydrogen bus, van, and car fleet for demonstration of an Air Products hydrogen fueling station;

Marcellus Shale related research interests include:

- Natural gas engine emissions reduction using on-board hydrogen enrichment system; and
- Conventional and hybrid vehicle CNG conversion impacts;

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