ETEC and Roush Industries are working to develop 100% hydrogen internal combustion engine (HICE) pickup trucks. Hydrogen ICE vehicles yield cleaner vehicles now and provide an introduction to the use of hydrogen fuel by supporting the development of hydrogen infrastructure technology.

**Vehicle Specifications**
- Base vehicle is a Chevrolet 1500HD equipped with a 4-door cab and room for five passengers.
- Hydrogen engine based on 6.0-liter GM V8 with electronic port fuel injection and a supercharger/wastegate system optimized to achieve sufficient power and torque.
- 160 horsepower and 300 ft-lb torque.
- 4-speed automatic transmission.
- 16.5 kg of hydrogen fuel stored; stored at a pressure of 350 bar (5,000 psi), in three 150-liter aluminum lined, carbon-fiber reinforced tanks.
- Driving range exceeds 550 km (340 mile).
- HICE conversion will yield significant reductions in vehicle emissions compared to the gasoline-powered base engine.
- HICE 10gpm NOx 5 gpm smoke state vs. baseline diesel engine; feed gas = tailpipe as no catalysts are used.

**HICE Engine Modifications**
- Integration of hydrogen pre-charger to intake manifold.
- Integration of large liquid-to-air intercooler.
- Integrated OEM fly-by-wire throttle body.
- Selection of spark plugs for operation in hydrogen combustion environment.

**HICE Engine Control Hardware and Software Integration Efforts**
- Complete removal of OEM powertrain control module (PCM).
- Selection and integration of appropriate aftermarket PCM.
- Development of engine control strategies for hydrogen lean-burn operation.
- Development of matching transmission control strategies.
- Implementation of J1939 communications to maintain seamless integration with existing OEM vehicle equipment.

**CARB and EPA Emissions Certification Process**
- Emissions development at Argonne National Lab 4-wheel chassis dyno with Gluton air scavenging capability.
- Targeted to meet NOx requirements for 2007 Tier II, Bin 7 standards.

**Production Status**
- Nine conversion vehicles are currently in production.
- One vehicle will participate in the Department of Energy’s Advance Vehicle Testing Activity (HICEV America test program).
- Eight vehicles were purchased by PowerTech Labs to support the Industrial Waste Hydrogen Utilization Project (WHUP) in British Columbia, Canada.
- WHUP will use recycled waste hydrogen to supply a network of refueling stations serving British Columbia’s Hydrogen Highway.
- Local universities will lease the HICE trucks from PowerTech Labs and operate them for a two year period.
- Additional vehicles will be evaluated on demand.