

## Can ammonia be used as motor fuel?

Many Canadians first learned about anhydrous ammonia as a fuel in 2006 by watching "The

National's "Back to the Future", broadcast on November 6. NH<sub>3</sub> has already been many used times as a motor fuel:

- by the Belgians during WWII as a fuel to supplement their dwindling fuel supplies, see Ammonia
  - A Fuel for Motor Buses.
- by the US Army in the late 1960s as part of their Mobile Energy Depot program.
- by University of Michigan in their demonstration drive across America in 2007, see NH<sub>3</sub> Car.

As you can imagine, the logistics of transporting fuel to the frontlines of a war is extremely dangerous and costly so the US Army studied the possibility of manufacturing their own fuel in battle with the Mobile Energy Depot program. The Mobile Energy Depot concept relied on portable nuclear power to provide the electrical energy for manufacturing NH<sub>3</sub> motor fuel. Although the program was eventually mothballed because of the impracticality of bringing a nuclear reactor into battle and the cost of converting its military fleet to this fuel, the research proved that NH<sub>3</sub> was a viable motor fuel.

Greg Vezina developed this technology further in 1981 and built an ammonia-powered car and drove it from Saskatchewan to Ottawa, where he demonstrated it to Marc Lalonde (Minister of Energy) and Edward Schreyer (Governor General). Greg Vezina built the car because he believed that not only was ammonia the ideal carbon-free fuel, it was also the ideal energy currency.

In late 2012, UOIT approached Hydrofuel Inc. to become the commercialization partner for some of the hydrogen and ammonia technologies they have developed, including a recent patent on new engine technologies such as an Apparatus for using ammonia as a sustainable fuel, refrigerant and NO<sub>x</sub> reduction agent and a Marnoch

Heat Engine. We were listed as their partner in a successful grant application for a Transport

Canada Clean Rail Study about using ammonia in diesel locomotives and working to commercialize their ammonia motor fuel technology.

Since most people aren't familiar with NH<sub>3</sub> as a fuel and energy currency, let us offer the following links as an introduction:

- Iowa Energy Center: Ammonia as an alternate fuel
- NH<sub>3</sub> Fuel Association
- ASME: The Ammonia Economy

