



## Investor Release – January 10, 2018

### Empire Hydrogen Completes Smart Heating System

**Sidney, BC:** After several months of engineering development work, Empire Hydrogen Energy Systems is pleased to have completed the new smart heating system. Recent record breaking frigid weather across North America has made this development very timely.

Empire's engineering team faced several difficult challenges with regard to freezing temperatures, both when the truck is parked overnight and during normal operation:

- When the truck engine is off, Empire's electrolysis system shuts down and the KOH solution will freeze in temperatures below -6C. Empire has designed a two stage heating system;
  - If only truck battery power is available the system will heat and protect the cell stacks, the key component of Empire's system. When the engine is turned on, the system will heat all internal components until the KOH solution is sufficiently thawed for normal operation to resume.
  - If the driver is able to plug into AC power, the system will continuously heat the cell stacks, water reservoirs and hoses to allow for immediate operation when the truck is started.
- During normal truck operation our electrolysis system generates sufficient heat to maintain the KOH solution in liquid form. However condensation occurs as the warm hydrogen/oxygen gases pass into a long fuel line to the engine air intake. In the -35C temperatures of Northern Canada, this condensation might freeze and block the line. Empire has solved the problem by making use of a heated and insulated fuel line hose that has been custom built for our application.



This 2017 Western Star truck is operated by one of Empire's Beta Test Shareholders and has been a source of vital test data during its weekly run from the warmth and rain of Vancouver to the extreme cold of Edmonton.

All of these systems are operated by Empire's newly developed smart heater control. This independent micro controller continuously monitors ambient and cell stack temperatures. The available heater options (fuel line, cell stack or all components) are activated according to instructions if internal or external temperatures fall below -5C.

Empire is very excited to have solved a serious problem that has plagued the industry for many years. We plan to have the new smart heating system installed as a standard feature on all new units shipped.

For more information please contact Andrew Evans or Sven Tjelta at Empire Hydrogen at 778.426.0911.