

# Vision Industries Corp.



# Presentation Outline

- Vision Industries Solution
- Hydrogen
- Vehicle Solutions
- Vision Industries' Fueling Strategy
- Future Applications

# Vision has the Chicken & Egg

- Turnkey Fleet Operations
  - Plug-in electric, heavy duty class 8, zero emission trucks with Hydrogen fuel cells for range extension
  - Hydrogen supplied at 35% - 40% discount to diesel.
  - Hydrogen fueling at several locations at truck stops and fueling at fleet yards is also available.
  - Long term, fixed price hydrogen supply contract.

# Hydrogen is more cost effective than Diesel

- As a result of technological breakthroughs, we have passed an inflection point at which hydrogen is cheaper per mile than diesel as a transportation fuel
- Fuel cell technology operates at 52 to 58% energy efficiency which is a substantial gain over diesel-based combustion engines
  - Each Pound of hydrogen gets you as far as 1 gallon of diesel.
- Hydrogen costs are expected to stabilize at \$1.50 to \$2.75 per lb (they currently range from \$0.90 lb in Santa Monica to \$4.09 lb in Palm Springs)

# Why hydrogen?

- Offers several benefits over Diesel and Natural Gas
  - Cheaper per mile
  - ZERO greenhouse gas emissions
  - No noise pollution
  - No idling
  - Substantial Increase of Torque
  - Domestic and secure energy source
  - Renewable and non-depleting
  - Can be made from a wide variety of resources
- OEM adoption
  - All major OEMs will offer H<sub>2</sub> powered vehicles 2010-2015
- State and federal support available

# Alternative Vehicle Solutions

## Comparisons of Short Haul Trucks (Annual)

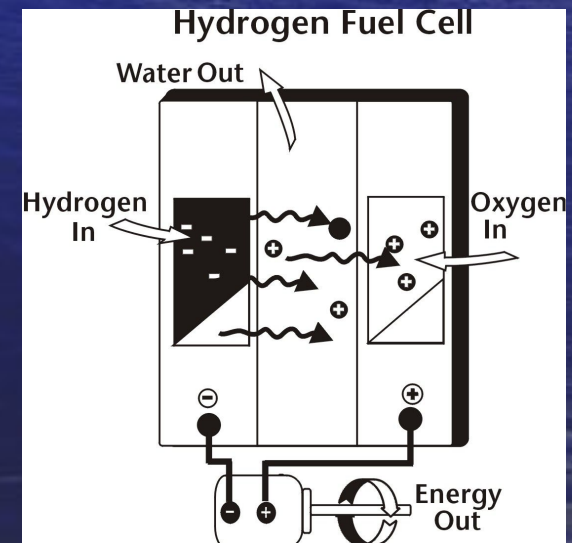
(City and Highway combined 50,000 miles per year)

	2007 Diesel	LNG	Vision Tyrano
Horsepower	450 peak	450 peak	402 continuous
Torque (foot/lbs)	1,350 peak	1,350 peak	3,200 available
Fuel	10,000 Gal.	16,700 Gal.	10,000 lbs
Particulates	12.37 lbs	4.6 lbs	0
NMHC	173 lbs	0	0
MHC	0	66.5 lbs	0
NO <sub>x</sub>	1,485 lbs	570 lbs	0
CO <sub>2</sub>	217,800 lbs	142,145 lbs	0
Noise Pollution	Yes	Yes	No

# Hydrogen power products

## What is a Hydrogen Fuel Cell?

- An electrochemical engine that converts hydrogen fuel and oxygen into electrical energy.
- A battery that runs on hydrogen fuel.
- Twice as efficient as gasoline internal combustion engine.
- No emissions (exhaust = H<sub>2</sub>O)
- Endgame for transportation industry



# Performance goes green

- 2010 Tyrano Kenworth



# Performance goes green

- 2009 Tyrano Freightliner



# Garbage Collection goes green

- Vision Industries Zero Emission Refuse Truck



# Attractiveness of transaction to truck owners and operators:

- Purchasing Hydrogen Powered Trucks
  - Federal tax credit of \$40,000
  - Individual State credits and subsidies
- Operating Hydrogen Powered Trucks
  - 35% to 40% per mile savings versus diesel
  - Increase power and performance over diesel
  - No exhaust
  - Very quiet operation
  - Regenerative braking allows use of "Jake Brake" within city limits
  - No oil changes
  - No coming home smelling of Diesel

# **Vision Industries Corp.**

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