

# NH<sub>3</sub> THE ROAD AHEAD



# Icom's Global Presence



- - Manufacturing Plants
- - Distribution Centers

# ICOM North America



- Established its North American operations in 2004.
- New Headquarters and Assembly plant opened in 2008 in New Hudson, Michigan
- Assembles the Icom JTG system including: Toroidal tanks, Cylindrical Tanks, Fuels Rails and Hoses at the New Hudson Plant using a substantial percentage of domestic components.



# ICOM S.p.A in Cisterna di Latina



- Founded 26 years ago
- Invented and patented the toroidal LPG tank
- Holds numerous patents on alternative fuel systems
- Sold over 3 million LPG automotive tanks
- Sold over 100,000 JTG liquid propane systems
- ISO 9001 and ISO 14001 Certified
- Holds numerous EN67 certifications
- ASME certified
- Has distribution in 15 countries on 5 continents
- Tier I OEM supplier
- JTG® System approved to rigid Canadian -40° testing





# Applications



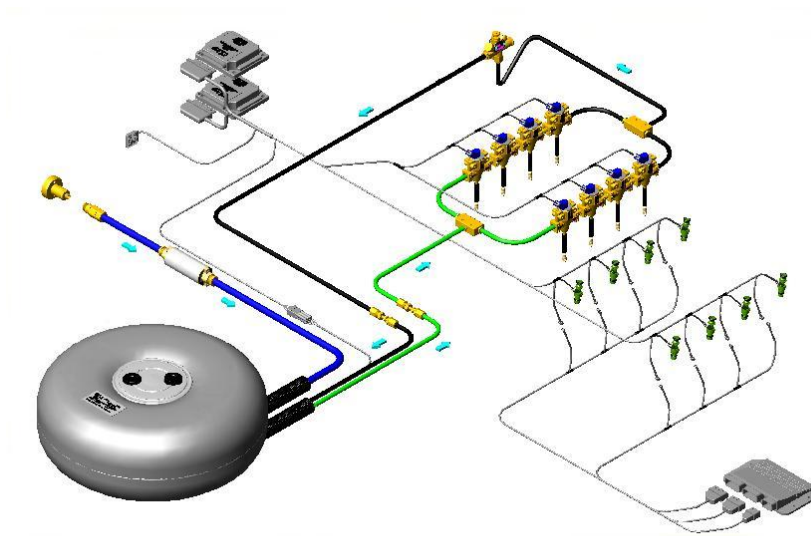
# Distributors



The ICOM JTG® Propane System is applicable to any multi-point injection vehicle including hybrids

# icom JTG<sup>®</sup>

Icom invented and patented the revolutionary JTG<sup>®</sup> liquid propane injection system and electronically-controlled LPG multivalve

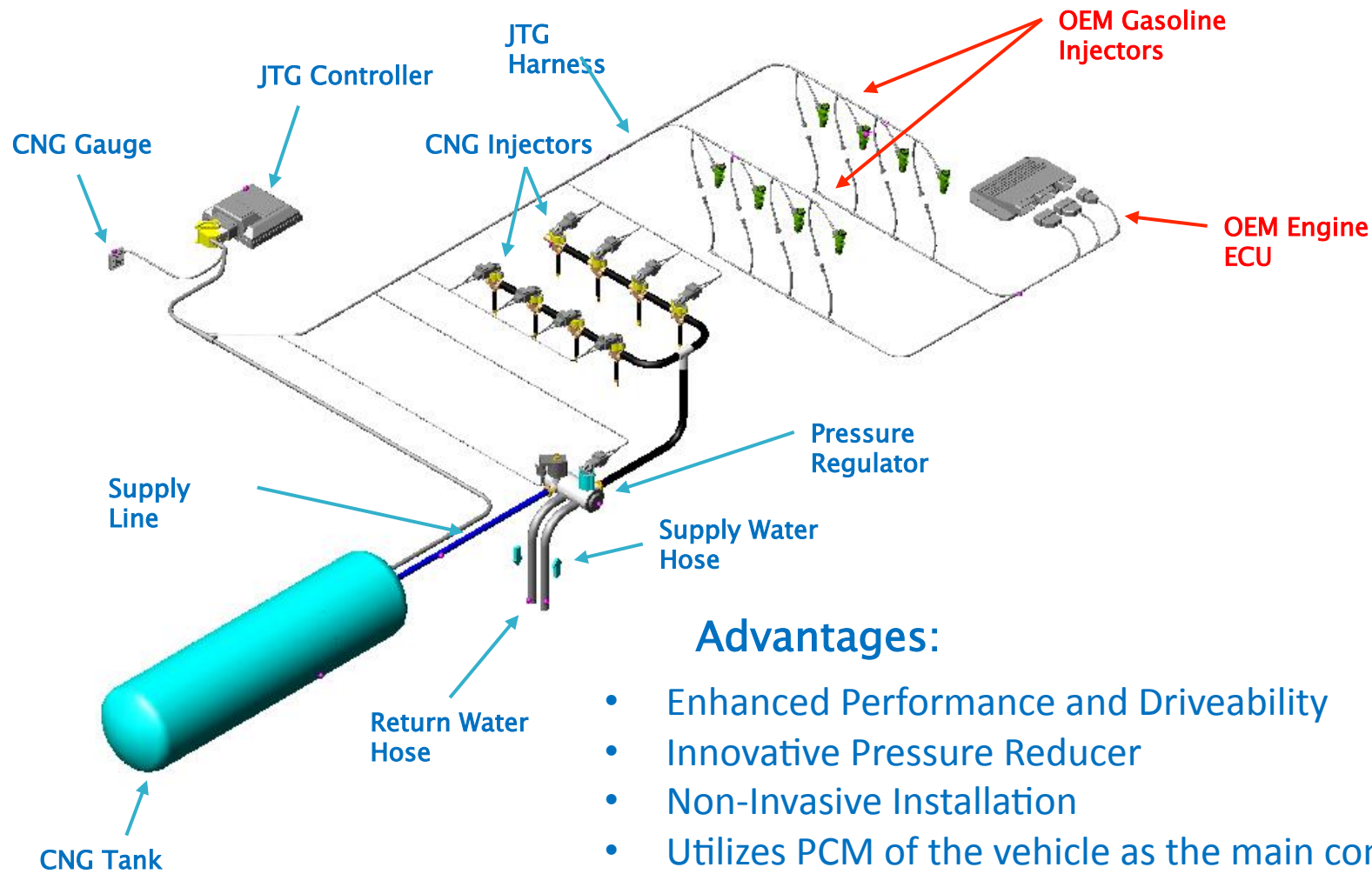


Liquid Propane Injection System

## JTG<sup>®</sup> System Advantages:

- 1) The JTG<sup>®</sup> system is 'plug and play' – the fuel tank, fuel rails and hoses are preassembled.
- 2) No need to alter OEM ECU in any way.
- 3) Propane injectors calibrated to match gasoline injectors in amount of energy delivered with fuel.
- 4) Complete standard OBDII factory diagnostics.
- 5) Propane injection system not affected by temperature changes.
- 6) No cutting, splicing nor soldering required – only three electrical connections needed to operate the JTG<sup>®</sup> system: two to the battery for power and one to the factory fuel injector wire harness

# Icom CNG system



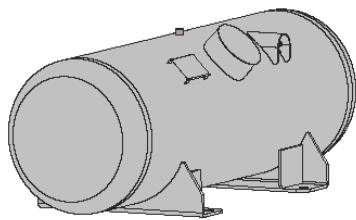
## Advantages:

- Enhanced Performance and Driveability
- Innovative Pressure Reducer
- Non-Invasive Installation
- Utilizes PCM of the vehicle as the main controller
- Reduced Emissions
- Reduced Maintenance

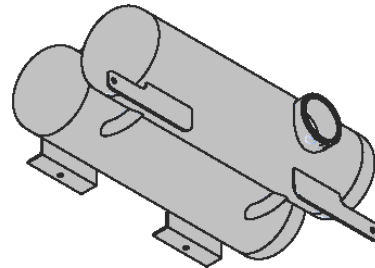


# Propane Tanks

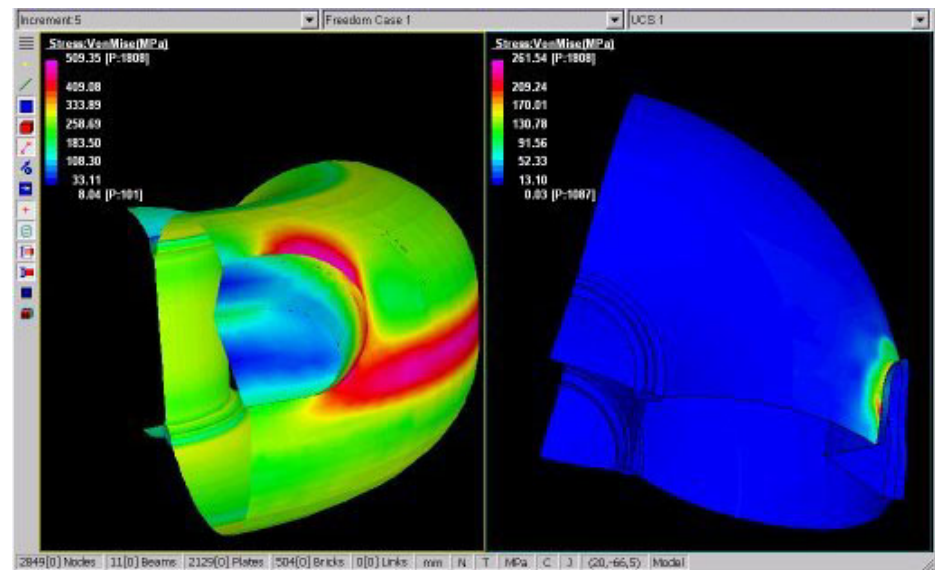
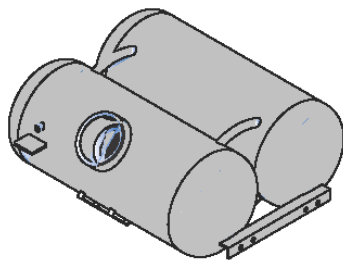
*The ICOM JTG® system can utilize virtually any propane vehicle tank including cylindrical, manifold and toroidal. All tanks include the ICOM patented recessed valves for the ultimate in protection and safety.*



IN-BED TANK SYSTEM



UNDER VEHICLE DOUBLE MANIFOLD  
TANK SYSTEMS



ICOM utilizes the most advanced technology and state-of-the-art tools to design its fuel systems and components.

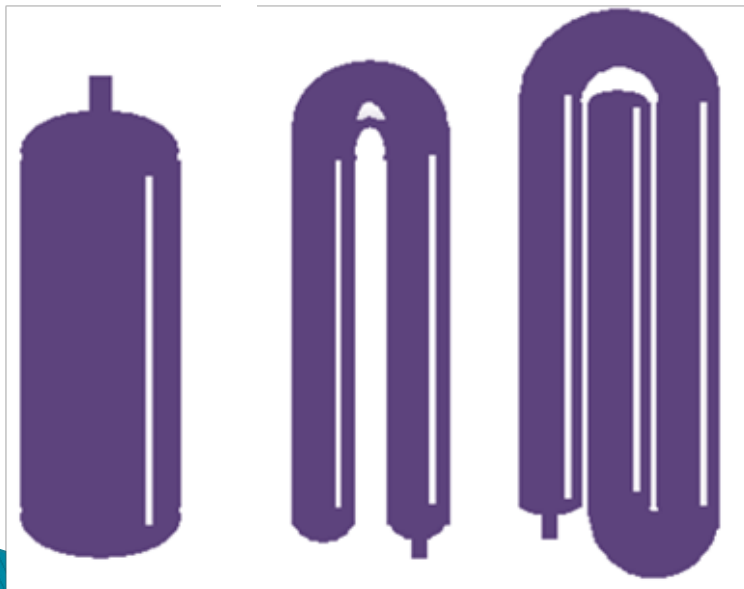
# CNG Tanks with Variable Geometry



## Icomet CNG Conformable Tanks

### Characteristics:

- 20% Lighter than Traditional Steel Tanks
- Can be Manufactured to Conformable Shapes
- Recessed Valve for Increased Safety
- Competitively Priced
- Enhanced Manufacturing Process



Icomet Patented

# Icom & NH<sub>3</sub>

- ▶ Icom JTG Liquid injection technology enables the broad use of NH<sub>3</sub> as an engine fuel
- ▶ Icom has applied JTG core technology and innovative Icom tanks to NH<sub>3</sub> with positive results
- ▶ Icom is in the process of developing various engine platforms utilizing NH<sub>3</sub>



# POTENTIAL NH<sub>3</sub> APPLICATIONS



## Agriculture

- Tractors
- Generators
- Irrigation Engines
- Farm Vehicles

# POTENTIAL NH<sub>3</sub> APPLICATIONS



Off-Road  
&  
Heavy Duty  
Equipment

Lawn &  
Garden

Construction  
Vehicles,  
Stationary  
Power &  
Equipment

Marine

# POTENTIAL NH<sub>3</sub> ON ROAD VEHICLE FLEETS



## GASOLINE

- Light Duty Vehicles
- Medium Duty Vehicles

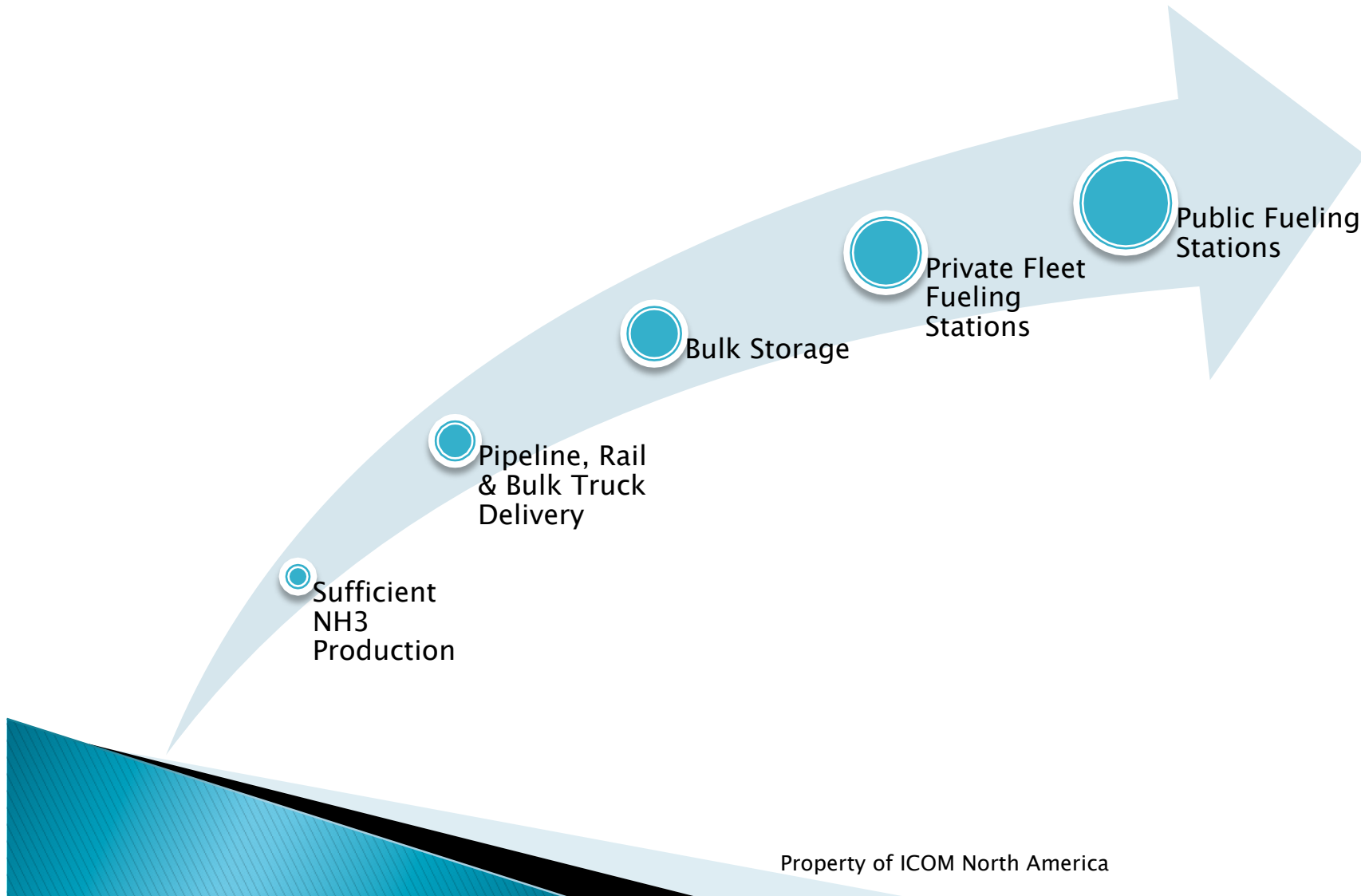


## DIESEL

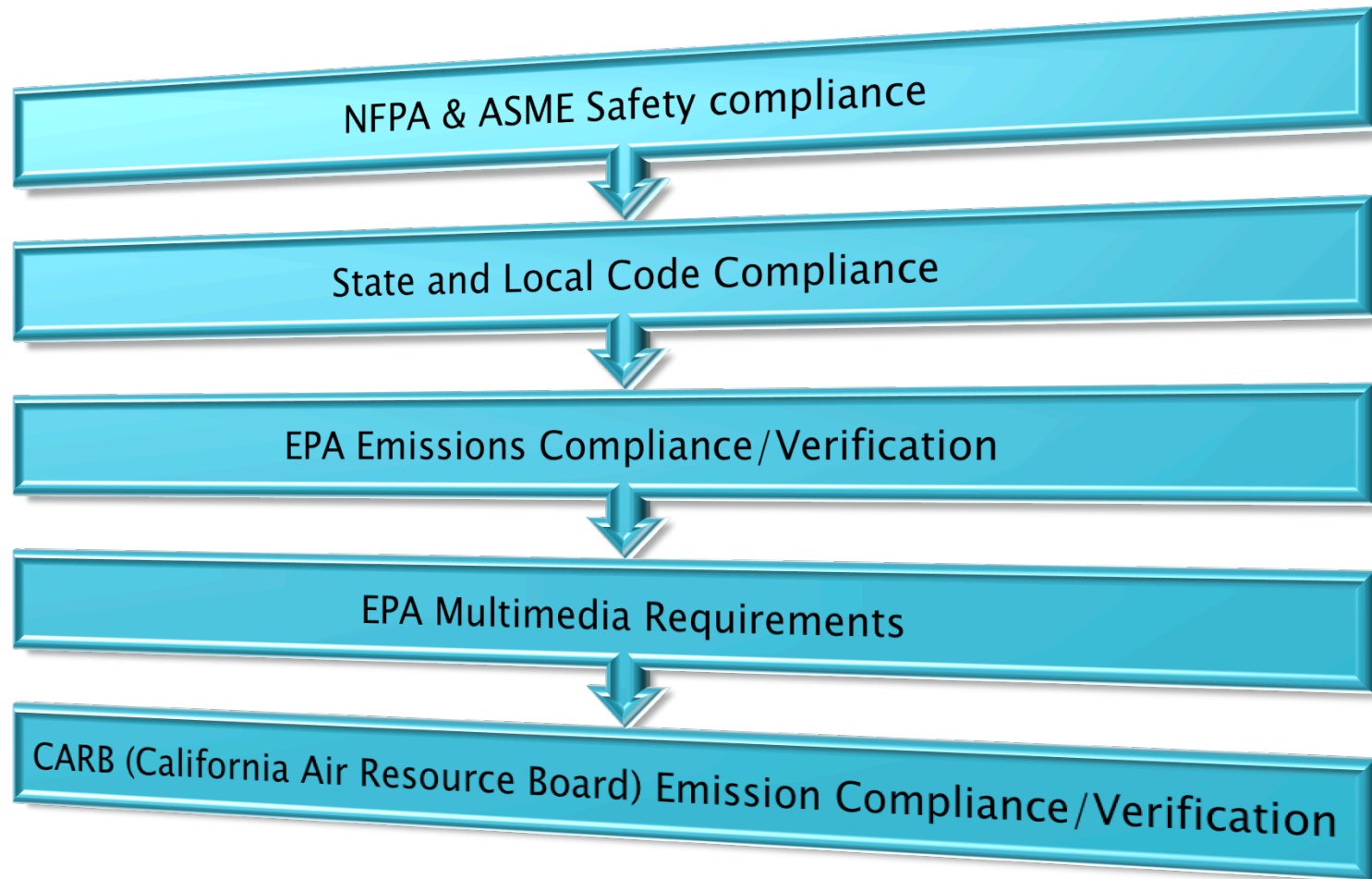
- Light Duty Vehicles
- Medium Duty Vehicles
- Heavy Duty Vehicles



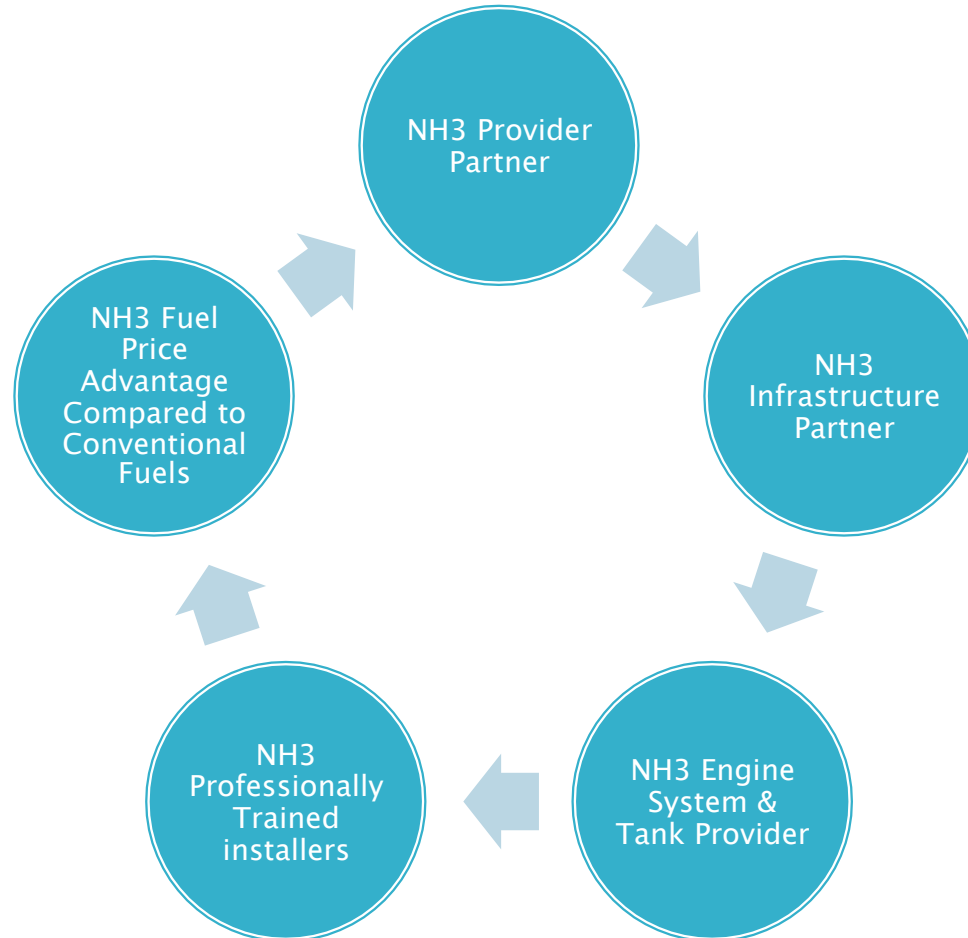
# NECESSARY FUELING INFRASTRUCTURE TO SUPPORT NH<sub>3</sub> ENGINE PLATFORMS



# COMPLIANCE & CERTIFICATION REQUIREMENTS FOR ENGINE APPLICATIONS



# THE TURNKEY APPROACH REQUIRED FOR THE LARGE SCALE USE OF NH<sub>3</sub> AS AN ENGINE FUEL





# ADVANTAGES OF NH<sub>3</sub> AS AN ENGINE FUEL

- ▶ No Greenhouse Gas Emissions Presenting Environmental & Economical Benefits
- ▶ Dramatically Reduced Tail Pipe Emissions
- ▶ Can be Produced from Green and Renewable Energy Sources
- ▶ Potentially Any Country Can Be Energy Self Sufficient



# *Thank You for your interest!*

With the proper use of alternative fuels, we can enjoy increased energy security, increased employment in an emerging sector, and decreased emissions.



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