



Houston CleanCities  
Technologies Conference October 23-24, 2018

***Presented by:***

***Dudley Westlake***

***Autogas Fleet Development Specialist***

# ICOM Provides Liquid Propane Injection Systems



## **CLEANER AIR**

Reduced fleet operating costs

Fuel Savings, Less Maintenance



**REDUCE EMISSIONS  
BY UP TO 60%**

# Alternative Fuel Options *For Fleets:*

- *Propane Autogas*
  - *LPG=Propane=Autogas*
- *Natural Gas (CNG)*
- *Electric (ZEV)*
- *Electric Hybrid*





*For some more information on propane please visit the U.S. Department of Energy, Energy Efficiency and Renewable Energy website or contact your local American Lung Association office.*

### **What is Propane?**

Propane is liquefied petroleum gas that consists of propane, propylene, butane, and butylenes in various mixtures. In the United States, propane is the primary ingredient. Propane is a by-product of natural gas processing and petroleum refining and it is stored under moderate pressure to maintain its liquid state.

### **Why is Propane a Clean Air Choice?**

Propane vehicles produce less tailpipe emissions of virtually all pollutants associated with automobile vehicles that use gasoline or diesel. According to the U.S. Environmental Protection Agency, a typical four-horsepower gasoline lawnmower engine generates almost six times as much volatile organic compound (VOCs) per hour of use as a typical car. Converting small utility engines such as lawnmowers to burn propane can reduce emissions of ozone precursors by one third and increase fuel economy by 14 percent.

### **What are the other benefits of Propane?**

- Energy Security: the majority of propane used in the U.S. today is domestically produced.
- Cost: Propane costs less than gasoline and diesel fuel per gallon
- Availability: with numerous propane vehicles available and a national infrastructure of pipelines, processing facilities, and storage already exists for the efficient distribution of propane, the propane option is accessible to the masses.

### **American Lung Association of The Upper Midwest**

490 Concordia Avenue

St. Paul, MN 55103-2441

Phone: 651-227-8014

Fax: 651-227-5459

Email: [cleanairchoice@lungum.org](mailto:cleanairchoice@lungum.org)

# NATURAL GAS (CNG)

- ✓ *Often an acceptable ROI*
- ✓ *Low fuel costs from the pipeline (very costly compression)*
- ✓ *Many EPA certified systems available (not as deep or wide as Propane systems)*

***Conclusion:*** *Natural Gas (CNG) is an abundant Domestic Fuels Source and surely has earned its place in the USA's transportation sector.*

***Natural Gas vehicles make sense for certain fleets (such as Natural Gas Utility fleets, Waste management fleets and others including CLASS 8 trucks.***



# Electric (ZEV)

- ❑ ***ZEV = Zero Emission Vehicle***
- ❑ ***No Tailpipe Emission***
- ❑ ***Highest Cradle to Grave Emissions of all Fuels!***
- ❑ ***Dangerous Mining of Precious Metals Utilized in Lithium Batteries***
- ❑ ***High Proportion of Electric from Coal***
- ❑ ***Un-efficient Utilization of Natural Gas to Produce Electric***
- ❑ ***The US's Electrical Grid is Compromised & to move to the necessary upgrades is \$5 Trillion Dollars***

**Conclusion: Today, ZEV's best fits small cars. Poor value of dollars in and emissions out & Limited Infrastructure! Lots of focus on larger vehicles, long haul trucks but.....**



# Electric Hybrids

- ❑ *Often Extremely Expensive to upfit a Fleet Class 3 to Class 7 Vehicle With Electric Hybrid. Can be as much as \$150,000 per vehicle for a sub 100 mile range (Batteries)*
- ❑ *Electric Hybrids make the most sense when utilizing a Propane Autogas Engine: Increased Range, Reduced Emissions, Complete Alternative Fuel Vehicle and a Potential ROI.*
- ❑ *Dangerous Mining of Precious Metals Utilized in Lithium Batteries*
- ❑ *High Proportion of Electric from Coal*
- ❑ *Un-efficient Utilization of Natural Gas to Produce Electric*
- ❑ *The US's Electrical Grid is Compromised & to move to the necessary upgrades is \$5 Trillion Dollars*

***Conclusion: Electric Hybrids have potential for certain fleet sectors and vehicles especially when utilizing propane autogas engine.***

# Benefits of Utilizing Propane Autogas



\$\$\$

*Substantial fuel cost savings as compared to gasoline or diesel*



*Reduce emissions of toxins by up to 30-90% compared to gasoline*



*Domestic – Propane is produced in North America, with large reserves in the U.S. and Canada*

\$\$\$

*Lower maintenance cost*



*Greenhouse gas emissions are reduced approximately 20%*



*Maintains the torque, horsepower, and drivability you would feel in a gasoline vehicle*

*Courtesy of PERC*



**Propane Autogas** hits the sweet spot for most CLASS 2 to CLASS 7 vehicles  
(with CLASS 8 Trucks on their way soon!!!) in most fleet sectors.

- ✓ **Superior ROI!**
- ✓ **Maximized fuel range**
- ✓ **Fueling Infrastructure is reasonably priced & can be located almost anywhere!**
- ✓ **EPA Certified Systems availability is the widest and deepest of all the Alternative Fuels!**
- ✓ **Cradle to Grave emissions are among the best!**
- ✓ **Fuel supply partners are numerous & financially sound**

**PROPANE AUTOGAS IS THE BEST FUEL OF CHOICE!**



Property of ICOM North America

# ICOM JTG Propane Liquid Injection Systems



## VS. CNG Systems



### Cost

*Propane system installed is less expensive so the ROI is more beneficial & savings are increased*

### Performance

*Increased throttle response with superior power, torque, & drivability*

*No backfires & no acceleration lag with propane vehicles*

### Environment – Fueling Infrastructure

*Unlike CNG propane is not a greenhouse gas*

*Propane can be found more available in rural areas*

*Propane fuel costs & maintenance costs are less*

*Propane is more prevalent throughout the USA, Canada, & globally*

### Tanks

*LPG tanks are approximately 4x smaller than CNG tanks of the same useable gallonage*

*Propane utilizes more useable gallonage per tank*

*LPG tanks are usually lighter*

### Pressure

*Propane pressure is at 312psi maximum*

*CNG pressure is at 3600psi maximum*

### Facility

*Propane Vehicle system installation and service normally do not require any modifications to the existing building while CNG often requires substantial modifications at large costs*

*(please check NFPA 58 and NFPA 52 building requirements).*



Hundreds of Icom Fleet Success Stories Including:

## **Private SECTOR:**

- ***UPS***
- ***FEDEX Contractors***
- ***Metro Cars***
- ***Old Town Trolleys***
- ***Groomes Transportation***
- ***Super Shuttle***
- ***Yellow Cab companies***
- ***Eastern Propane***



# Icom Fleet Success Stories

## **PUBLIC SECTOR:**

- ***US National Park Services***
- ***WSDOT***
- ***Yale University***
- ***Numerous Para-Transit & Shuttle bus companies Around the country***
- ***Springfield Illinois Police Dept.***
- ***Columbus OH Airport Authority Shuttle Buses***
- ***Wyandotte County KS***
- ***City of Boston***
- ***City of Livonia MI***

# EPA Certifications

**The Icom JTG II system is EPA Certified for over 1,200 2009-2018 vehicle platforms including many Ford models.**

**The Total Solution for any Type of Fleet!**



E150  
E250  
E350



F150  
F250  
F350



F450 F550  
F550 F650  
F750



E450



Ford Taurus  
Lincoln MKZ



Ford Explorer  
Lincoln MKT



Lincoln Navigator  
Ford Expedition



Ford Transit



F53  
F59  
(Bakery, Linen,  
FedEx type  
box trucks)



*Please confirm with Icom engine family*  
Property of ICOM North America

# EPA Certifications

ICOM JTG Liquid Injection Bi-Fuel Propane System is EPA certified *for most 2010-2018 GMC and Chevrolet Light trucks and SUV's equipped with the 4.8L, 5.3L engine & 6.0L*



**Chevy Silverado  
GMC Sierra**



**Chevy Express  
GMC Savana**



**Chevy Tahoe  
GMC Yukon  
Chevy Suburban  
Chevy Avalanche**



*Available shortly*

**6.0L HD**



**Chevy Cutaway**



**6.0L 2500HD, 3500HD**



Property of ICOM North America

*Please confirm with Icom engine family*

# ACTUAL FLEET PROPANE AUTOGAS GALLONS USAGE ANNUALLY:

- **DATA PROCESING COMPANY - 15 BIFUEL PROPANE TRUCKS ESTIMATED ANNUAL PROPANE USAGE:**
  - **50,000 GALLONS, 5 YEARS INTO PROGRAM**
- **LARGE LIVERY COMPANY - SHUTTLES, BLACK CARS & YELLOW CABS OVER 500 BIFUEL PROPANE VEHICLES ESTIMATED ANNUAL PROPANE USAGE: 1 MILLION GALLONS PLUS, 6 YEARS IN**
- **LARGE GLOBAL PACKAGE DELIVERY COMPANY - APPROXIMATELY 2,000 MONOFUEL PROPANE TRUCKS IN THE USA & CANADA ESTIMATED ANNUAL PROPANE USAGE:**
  - **MILLIONS OF GALLONS ANNUALLY, 6 YEARS IN**



# ACTUAL FLEET PROPANE AUTOGAS GALLONS USAGE ANNUALLY:

4. **SMALL COUNTY PARA-TRANSIT AGENCY - 21 BIFUEL PROPANE SHUTTLE BUSES ESTIMATED ANNUAL PROPANE USAGE: 100,000 GALLONS, 4 YEARS IN**
  
5. **MUNICIPAL & POLICE FLEET - 50 BIFUEL PROPANE POLICE & 30 BIFUEL PROPANE MUNICIPAL VEHICLES ESTIMATED ANNUAL PROPANE USAGE: 200,000 GALLONS, 5 YEARS IN**
  
6. **TROLLEY & SHUTTLE COMPANY - HUNDREDS OF BIFUEL PROPANE TRUCKS ESTIMATE ANNUAL PROPANE USAGE: MILLIONS OF GALLONS, DECADES IN**





# ACTUAL FLEET PROPANE AUTOGAS GALLONS USAGE ANNUALLY:

7. Roadside Service Company – 10 BIFUEL PROPANE VEHICLES. 3 years in. Approximately 70,000 gallons of propane utilized annually.
  
8. Tow Truck Company – 8 BIFUEL PROPANE TOW TRUCKS. 2 years in. Approximately 112,000 gallons of propane utilized annually.
  
9. School Bus Fleet - 8 MONOFUEL PROPANE BUSES. Utilize 25,000 gallons of Propane annually. Usually go out to bid and get very competitive. Normally they have a White Fleet for additional Propane systems and Autogas gallons.



# Green Technology Solutions Team

## Complete Environmental Solutions:

- Broadest Propane Product Portfolio
- Best In-Class Patented Power, Emissions, Performance
- Turn-key Solutions – Training, Service, Support, Fuel



**ICOM**  
Vehicle  
Conversions

## Targets:

- Municipalities
- Schools & Colleges
- Airports
- Facilities Maintenance – Aramark
- Landscape Contractors & Dealers



**LEHR**  
Marine Engines



**ONYX**  
Floor Care  
Systems

**ENVIROGARD**  
Industrial Engine  
Conversions



# 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.*



**[www.icomnorthamerica.com](http://www.icomnorthamerica.com)**

**54790 Grand River Avenue New  
Hudson, MI. 48165**

***Feel free to contact us either by phone:***  
**(248) 573-4934 Main Office**  
**My cell: 760-518-7316**

***Or by email:***

**[dudley@icomnorthamerica.com](mailto:dudley@icomnorthamerica.com)**

