At Icom North America
We Have One Of The Best and Most Positive Missions:

HELPING FLEETS TO ACHIEVE AS SEAMLESSLY AS POSSIBLE

First:
- CLEANER AIR -- Propane can reduce emissions by up to 60% & ZERO Particular matter

Second:
- DOMESTIC FUEL -- The USA and CANADA have abundant Propane and Natural Gas Resources!

Third:
- FLEET FUEL SAVINGS -- NO WARS!!! Energy Security

Fleets can often dramatically reduce their fuel costs by using propane autogas!

$\text{\$\$\$\$savings\$\$\$\$}$
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
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
Propane Autogas is Safe

Propane Autogas is a contained fuel source:

- No spillage
- No shrinkage
- No pilferage
- No contamination
- Non-toxic
This is Propane Autogas!!

Clean

Cost Effective

Conserves Resources

Common Sense

Commitment friendly

Domestic

Abundant

Affordable

Available

Propane Autogas is the viable alternative fuel
Conclusion: 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.

✓ ROI is the best!
✓ 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 CHOICE!
Hundreds of Icom Fleet Success Stories Including:

**PUBLIC SECTOR:**

- **US NATIONAL PARK SERVICES**
  - An Icom customer for 5 years with many contracts across the country

- **WSDOT**
  - An Icom customer for 3 years with hundreds of systems

- **YALE UNIVERSITY**
  - An Icom customer for 2 years with a couple dozen systems

- **Numerous Para-Transit & Shuttle bus companies Around the country**
  - With well OVER 1,000 systems as far back as 6 years

- **SPRINGFIELD ILLINOIS POLICE DEPT.**
  - An Icom customer for 5 years with approximately 80 systems, including 50 police vehicles

- **Columbus OH Airport Authority Shuttle Buses**
  - An Icom customer for 6 years with over 60 shuttle buses

- **Wyandotte County KS**
  - An Icom Customer for 5 years with approximately 80 systems

- **CITY OF BOSTON**
  - An Icom customer for 3 years with a few dozen vehicles

- **CITY OF LIVONIA MI**
  - An Icom customer for 4 years with dozens of vehicles

*All the above fleets and many others continue to add Icom systems each year!*
WORKING THE R.O.I. FOR THE PARA-TRANSIT SECTOR
(approximately)

1. Ford E450 w/6.8L V10 2 VALVE
   A. 40,000 Mi/yr with lots of idling
   B. 5.5 MPG avg.
   C. 7272 gallons per year avg.
   **D. $1.00 savings=$7,272/yr.**
   E. 18 month ROI w/o Funding
   F. 3.7 month ROI with 80/20

2. Ford T350 Transit 3.7L V6
   A. 40,000 Mi/yr. with lots of idling
   B. 10 MPG avg.
   C. 4000 gallons/yr. avg.
   **D. $1.00 savings=$4,000/year**
   E. 23 month ROI w/o Funding
   F. 4.7 month ROI with 80/20
Icom’s Global Presence

- Manufacturing Plants
- Distribution Centers

Property of ICOM North America
ICOM North America

• Established North American operations in 2004
• Headquarters and Assembly Plant in New Hudson, Michigan
• Icom systems utilize a substantial percentage of domestic components
• Icom systems are Safety tested & safe: NFPA 58 & DOT FMVSS303 compliant, Canadian CSA Certified to -40 degrees, E67/01 Certified, & Successfully Crash Tested & Altoona Tested
• Icom has the industry leading list of OVER 1,200 EPA CERTIFIED vehicle platforms and over 400 EPA Certificates
• Both Bifuel & Monofuel (Dedicated) Systems
Icom Systems and Technology in North America

Approximately:

- 30,000 Propane Liquid Injection Systems in use in North America utilizing Icom Technology
- Fleets enjoyed a huge fuel cost savings of over $1,500,000,000 to date
- *Estimated emissions reduction over 35% and Particulate Matter reduced to Zero!*
- **APPROACHING 1 BILLION GALLONS OF PROPANE AUTOGAS UTILIZED!**
- 900,000,000 gallons of gasoline and diesel displaced
- **7.5 Billion** miles driven safely!
- Icom is working hard with our partners and Dealers to place over **100,000 Icom systems** on the road in the next 5 years
Icom Innovations Driving the Industry

Icom systems are the Industry standard
JTG® MultiValve

The Advanced JTG Multivalve with Integrated Exclusive fully Encapsulated Fuel Pump

Developed and Patented by Icom for improved serviceability!!

- Utilizing the Icom Exclusive fully Encapsulated Pump which does not sit on the bottom of the tank attracting debris!
- No need to depressurize fuel tank to access fuel pump!
- Increased flow rate for fast filling
ICOM JTG® Liquid Injection

VS.

Vapor Propane Systems

OEM PROJECTS

Since Icom brought the Propane Liquid Injection technology to the US Market
In 2004 every OEM Propane Vehicle Platform is Propane Liquid Injection (School Buses, Shuttle Buses, Trucks, and Trolleys)

Power/Torque

Noticeable increase compared to gasoline vs. decrease for vapor
Increase due to cooling effect as propane evaporates, increasing air-propane mixture density. No such advantage for vapor systems.

Drivability

Better throttle response and no acceleration lag

Cold Start

Reliable in cold climates. Vapor systems are affected by ice blockages.

Valve Recession

Liquid Injection does not lead to excessive valve recession or engine failure as many vapor systems could.

Smell of Propane

Vapor systems often emit a strong propane odor due to leaky regulators that are utilized in vapor systems.
ICOM JTG II Liquid Injection Propane System

Advantages & FAQ's

The Icom JTG System injects propane as a liquid thus creating numerous attributes:

Substantial cooling of the intake charge
✓ Due to rapid evaporation of propane in the intake manifold, very similar to gasoline, helps efficiency, and power, by providing a cool dense fuel air charge.

System simplicity
✓ The system has no vaporizer. No vaporizer means no “heavy ends” to build up in the system, eliminating down time, and maintenance costs. No water hoses to cut into, no diaphragms to clean/adjust. The system “looks”, and acts, like a normal fuel injection system.

Cooling of the exhaust valve
✓ Due to the substantial cooling effect, the exhaust valve, seat, and combustion chamber receive some much needed cooling, reducing exhaust seat erosion, when compared to other vapor injection/carburetion systems.
Fuel Efficiency/Utilization

- Cooling the combustion chamber allows the engines computer to advance ignition timing creating more power, and more efficiency.

- Since the chamber is actually cooling the chamber and exhaust valve, valve recession is minimized compared to gasoline.

- Due to the complete vaporization of propane, more of the fuel is used to make power, not leaving carbon deposits behind in rings, contaminating oil, or generally “sooting” the engine.

Icom JTG Bifuel System starts up on gasoline

- Starting on gasoline retains the “cold start” program, which is perfect and is beneficial in retaining the use of gasoline as a “back up” fuel. Exercising the gasoline system every time the vehicle starts keeps the original fuel system in good working order, and keeps the fuel “fresh” in the gasoline tank.

- Starting on gasoline allows us to retain the factory PCM calibration, allowing the use of O.E. scan tools.

- Since both systems are very similar, and utilize the same PCM, and calibration, no specific Icom calibrations are needed.
Ease of Installation

✓ The Icom system is a modular system. The electronic control system is not vehicle specific, the same ICU will fit all engines

✓ Our patented collar allows for different configurations. If you have an externally mounted tank or an internally mounted tank, we can utilize the collar to vapor seal the system, or, as a normal valve guard/weather seal.

Simple to Maintain

✓ Removable pump assembly.
✓ Standardized connections, and fittings.
✓ You can use generic scan tools with Icom systems.

Patented collar is also a vapor seal

Faster R.O.I.

✓ The Icom JTG propane system utilizes all the inherent efficiencies and technology that the O.E.’s use in parallel with gasoline. In recent tests, the Icom JTG system produced 13.8 (propane), and 14.1 MPG on gasoline in a full sized Chevy truck.
ICOM DEALER, INSTALLATION, AND SERVICE CENTERS

Icom North America Plant
New Hudson, MI
In Process

PLUS OVER 400 FLEET SERVICE CENTERS NATIONALLY
**USA Autogas Specialists Coverage Area**

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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!

- Ford Transit
- Lincoln Navigator
- Ford Expedition
- Ford Explorer
- Lincoln MKZ
- Ford Taurus

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
Understanding & Utilizing
UPAS Group an Icom company

UPAS Group Main Focus:
• The Growth of Propane Autogas as an industry
• Promote and assist fleets & propane marketers with the following:
  • Autogas conversions, infrastructure, installations, fleet management, safety, regulations and changes as Propane Autogas expands

Utilize & expand its opportunities:

• One-Stop Shop for fleets
  • Fuel Source
  • Fuel Station
  • System installation & Service
  • Vehicle Up-fitter & Dealers
  • Grants & Rebates

As more members join UPAS
we create & expand new AUTOGAS OPPORTUNITIES!!
**Autogas Fleet Case Study**

Albemarle Regional Health Services d/b/a Inter-County Public Transportation Authority

- **SAVINGS** of OVER $200,000 TO DATE!!
- Dramatically reduced emissions
- Rapidly reaching 250,000 gallons of propane utilization
- Reduced vehicle maintenance costs

**IN PROCESS OF ADDING MORE ICOM PROPAKE POWERED VEHICLES TO THEIR FLEET!!!**

24 Ford 2011 to 2017 E350 and E450 shuttle buses, some with wheelchair lifts-Icom Bi-Fuel Propane systems
Autogas Fleet Case Study

Approximately:
250 Icom Propane Trolleys, Shuttles and Support Vehicles in many locations in the USA including:

Key West FL
St. Augustine FL
Arlington National Cemetery
Savannah GA

Icom Customer Since 2011
Adds on average 50 New Propane Vehicles per year

LOTS of IDLING
NO BLACK EXHAUST

MILLIONS OF GALLONS OF PROPANE UTILIZED ANNUALLY!!
Autogas Fleet Case Study

- Happy Icom customer since 2014
- 63 - Ford E250 and E350 Inmate driven work release farm/factory Passenger vans
- Annual average of 55,000 miles per vehicle @ 11MPG
- Average per gallon SAVINGS of $1.12 as compared to gasoline
- SAVINGS from project of Approximately $1 Million
- UTILIZED OVER 1 MILLION GALLONS OF AUTOGAS TO DATE!!
Autogas Fleet Case Study

Approximately

- Happy Icom customer since 2011
- OVER 300 vehicles with Icom system currently
- Utilized OVER 500 Icom systems in the last 7 years!
- Many-Many Millions gallons of propane Autogas utilized since 2007
- Vehicles endure 3 years of hard driving and LOTS of idling
- Lincoln Navigators, & Town Cars, Ford E450 Shuttle Buses, and Chevy Suburbans
Autogas Fleet Case Study

Icom Propane Systems are certified for and start and run well down to -40 degrees BRRRRRR!!!

STARTED WITH ICOM IN 2013

Over One Thousand Icom JTG Monofuel Systems across Canada

Utilizes Millions of gallons of propane annually and continues to grow year after year!!
The ICOM Dynamic Dual Fuel Engine System CNG/RNG/LNG And Diesel
(Powered By Ecomotive)

The Path Forward For Natural Gas Vehicles

ICOM Dynamic CNG Systems with case studies
d-gid® Diesel Dual Fuel Basic Knowledge

“Diesel Dual Fuel” refers to an engine working with Diesel and Natural Gas (CNG or LNG) simultaneously.

d-gid system allowing to fuel diesel engines with a mixture of diesel oil and natural gas (CNG compressed natural gas, LNG liquefied natural gas, Biomethane, Syngas, etc.), d-gid Control Unit determines the amount of diesel fuel injected and air/gas mixture dosage dynamically, modifying it in real time according to the feedback provided by the engine to guarantee perfect operational conditions.
Coming soon to the US
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

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