



Liquid Propane Autogas

Product Introduction & Overview



August 13, 2013

What We're Known For



Enterprise Brand Portfolio



Roush Fenway Racing

Dominant NASCAR Sprint Cup racing team.



ROUSH Performance

Industry leading high performance vehicles.



ROUSH Life Sciences

Medical equipment design, manufacturing and engineering.



ROUSH Industries

OEM manufacturing, engineering, prototyping and design.

Wheel of Capability



Alt. Fuel Experience

- Compressed Natural Gas (CNG)

- Design of fuel system.
- Calibration.
- EPA and CARB certification.
- Vehicle integration.



- Electric

- Over 16,000 recharging stations built.
- Blink ECOtality contract with U.S. DOE.



- Hydrogen

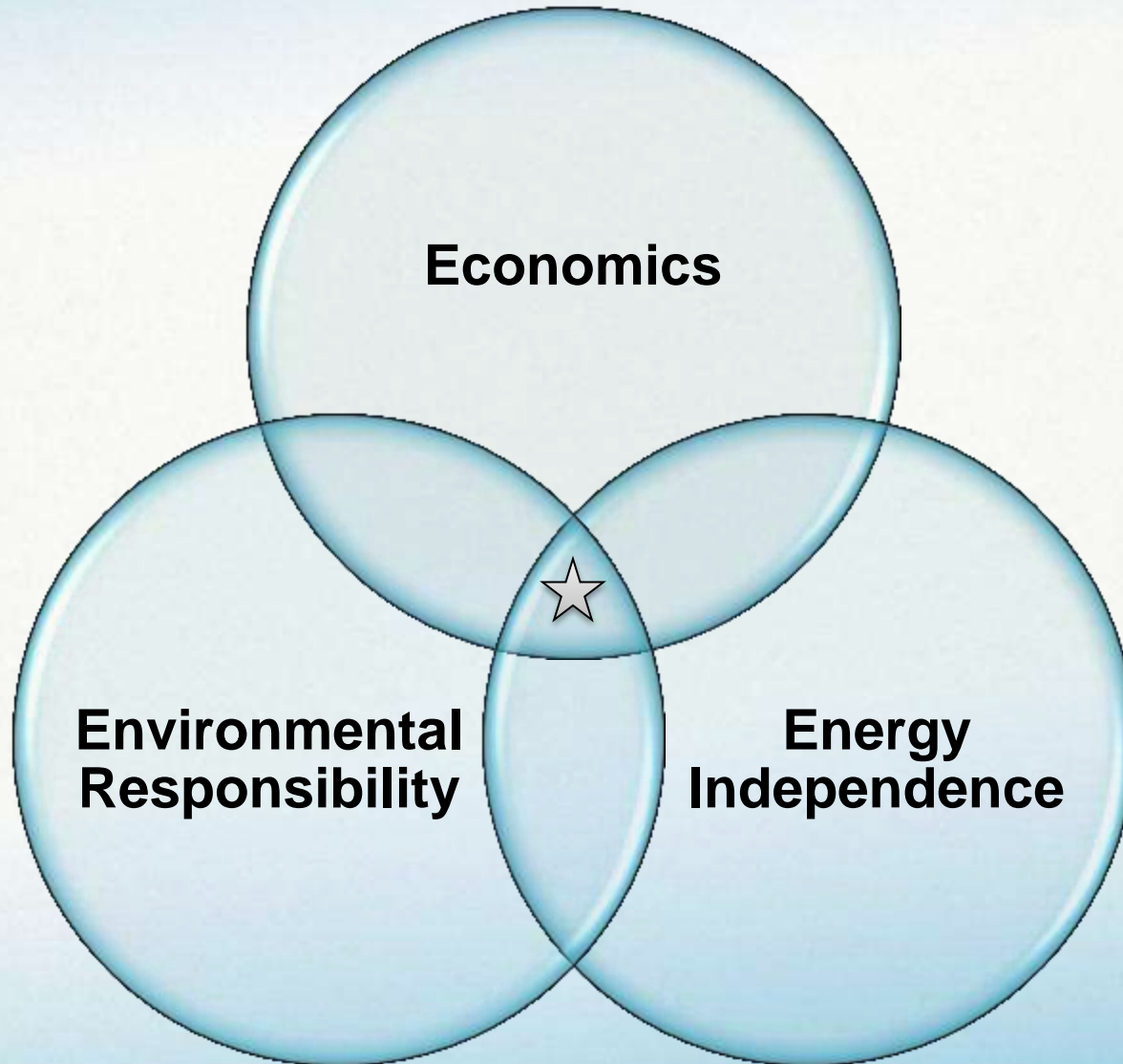
- 207.297 MPH (world land-speed record.)
- Vehicle design.
- Aerodynamics development.
- Vehicle fabrication.
- Propulsion system integration.





WHAT IS PROPANE AUTOGAS?

Economical. Clean. Domestic.



What is Propane Autogas?

▪ Clean:

- 24% reduction in Greenhouse Gas (GHG) emissions.
- 20% reduction in Nitrogen Oxide (NO_x) emissions.
- 60% reduction in Carbon Monoxide (CO) emissions.

▪ Domestic:

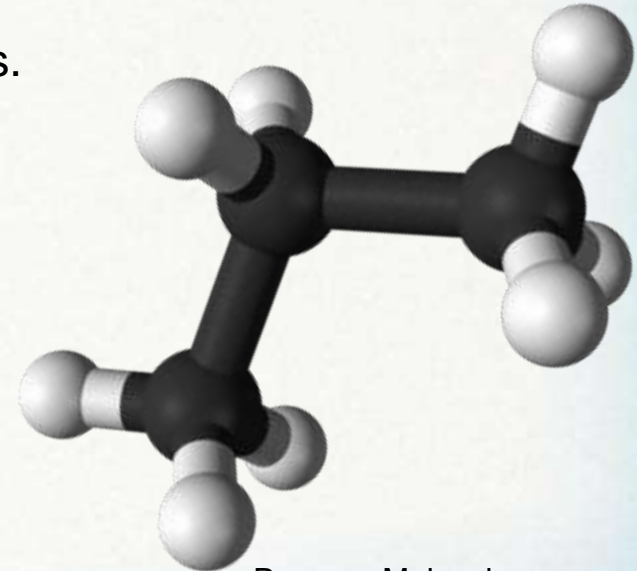
- 90% of propane used in U.S. comes from U.S.
- 7% of propane used in U.S. comes from Canada.

▪ Abundant:

- Most refueling infrastructure of any alternative fuel.
- Major natural gas shale found in northeast U.S.
- Powers over 17 million vehicles worldwide.

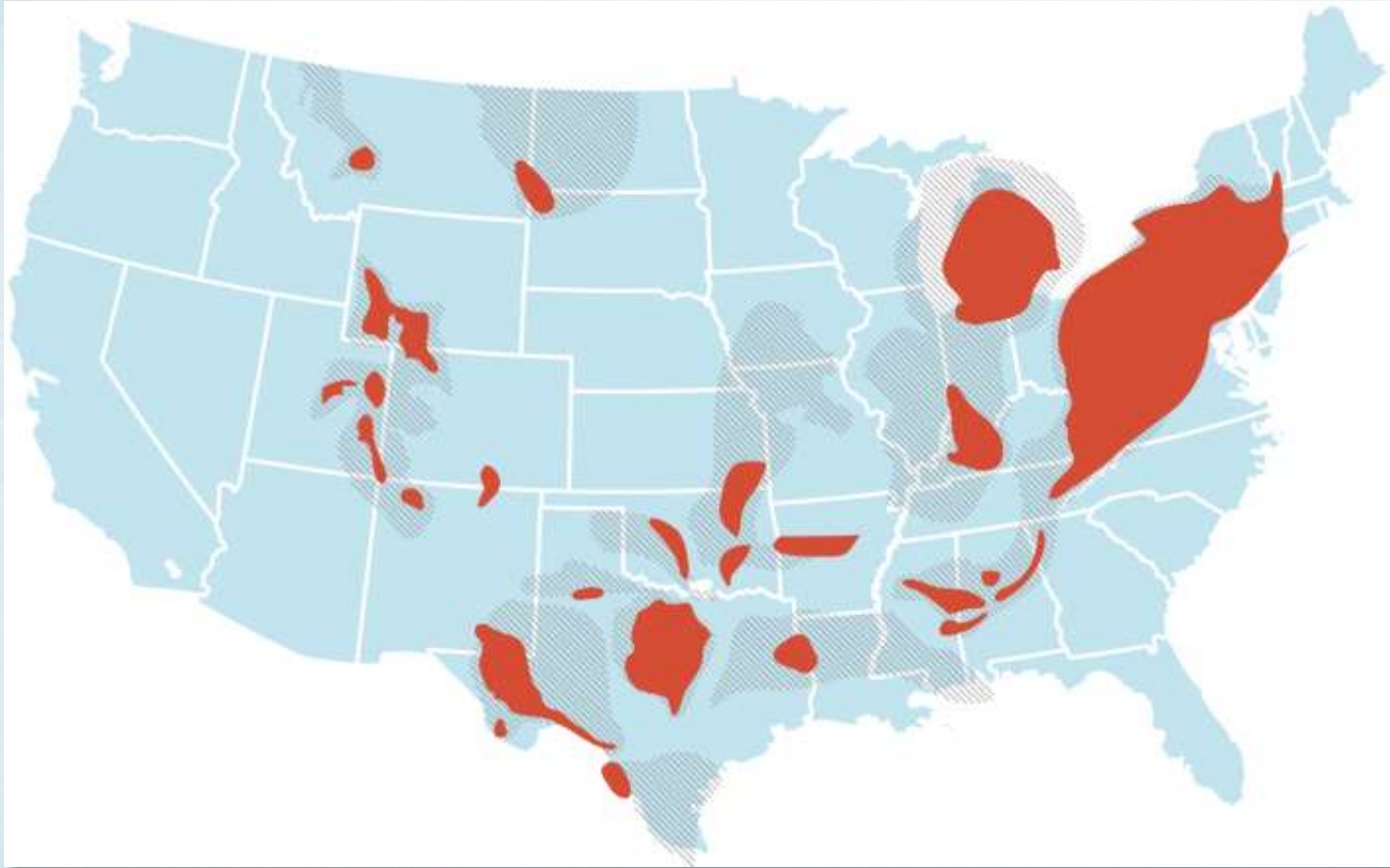
▪ Safe:

- Low pressure (~ 200 psi).
- Narrow flammability range.
- Fuel tanks are 20 times more puncture resistant than gasoline.





Propane Molecule
(C₃H₈)

Shale Map of U.S.



- Shale Gas Plays
- ▨ Basins

Country	Population	# Vehicles	# Vehicles / Citizen
	310,000,000	254,000,000	0.82
	1,300,000,000	85,000,000	0.07

If China's automotive adoption were ever to equal that of the U.S., there would be more than one billion (1,000,000,000) automobiles registered there.

“China to surpass US as top oil importer”

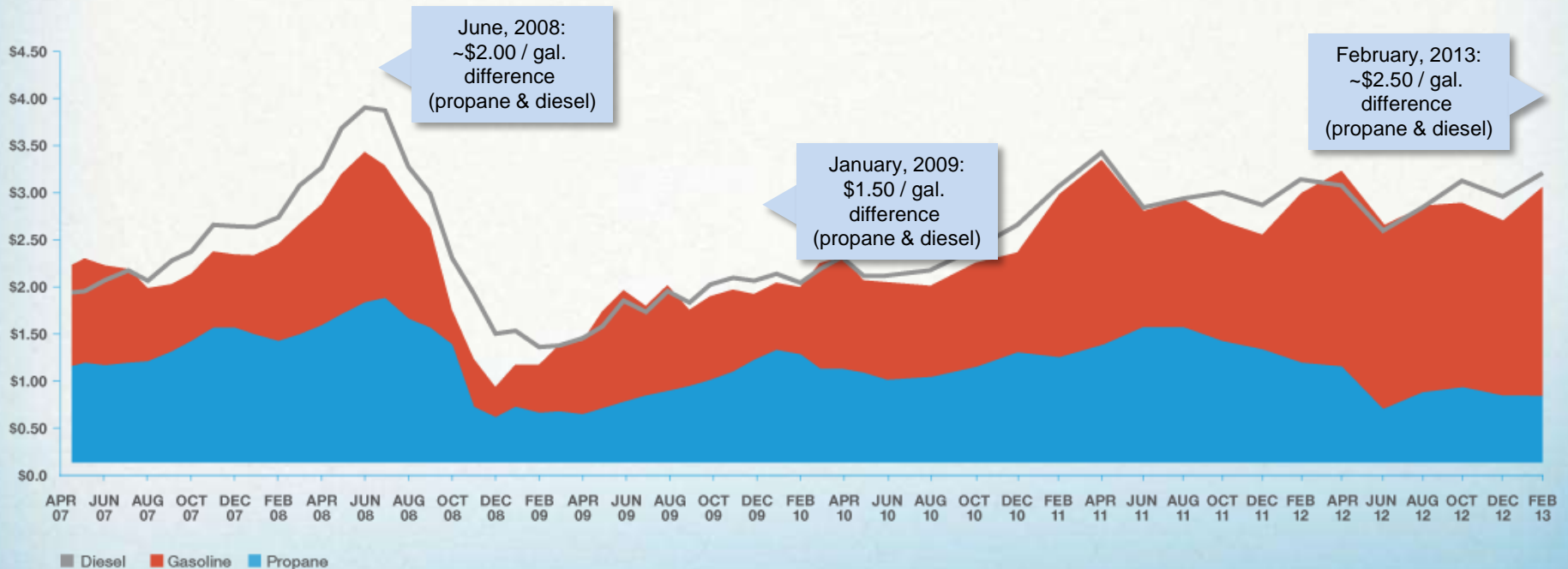
“China's liquid fuels use is expected to grow by 13% between 2011 and 2014 to more than 11 million barrels per day while U.S. demand hovers close to 18.7 million barrels per day, well below the peak U.S. consumption level of 20.8 million barrels per day in 2005,” EIA said in a [short report Friday](#).

Look for China to hold on to the top importer title once the lines cross, EIA said.

Story by Ben Geman....E2 Wire The Hill's Energy & Environmental Blog

Wholesale Price Comparison

- The price gap between propane and diesel continues to widen over time.



Source: Ferrellgas

Refueling Options

Public Propane Station

- Over 3,000 public stations nationally

Propane autogas fills at the same rate as gasoline and diesel (approximately 7-9 gallons per minute)

Private Infrastructure

- Infrastructure available for little to no cost to you.
- Lock in your fuel prices for a whole year!

On-site resupply via bobtail fill-up

24 hours / 7 days a week roadside assistance



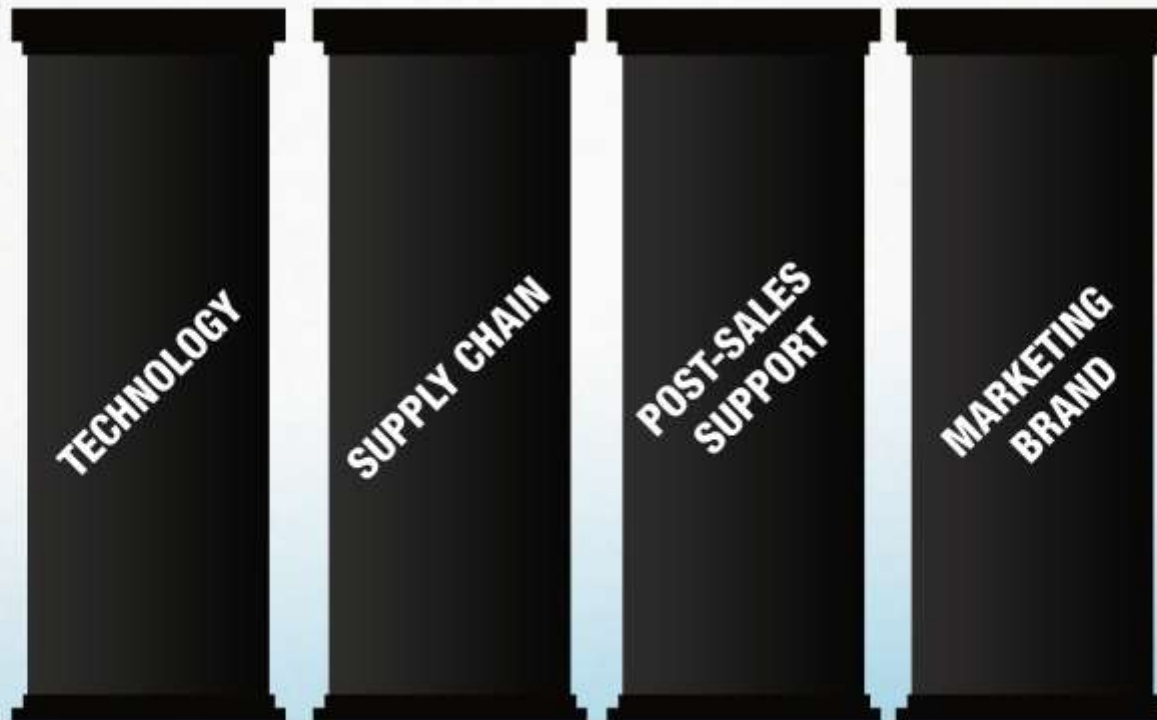
Our Foundation

7,700 Vehicles

will be sold through 2013

250M+ Gallons of Gasoline/Diesel

will be displaced throughout the life of those vehicles



New Manufacturing Facility





SYSTEM OVERVIEW

The Zero Compromise
Alternative Fuel Solution

Liquid Propane Autogas

- Light & medium duty Ford trucks & vans, school bus.
- Factory Ford warranty maintained.
- No loss of HP / torque / towing capacity.
- Serviceable with existing diagnostic equipment.
- EPA & CARB Certified.
- QVM Certified.



Ford F-250/350

Ford E-150/250/350/450

Ford F-450/550

Ford F-650

Blue Bird Vision

Micro Bird G5

Ford E-150 / E-250 / E-350

FRPCM

The Fuel Rail Pressure Control Module ensures consistent vehicle performance and power on-demand.

Fuel Rail

ROUSH CleanTech's signature blue anodized aluminum fuel rail is designed to operate under varying temperatures of liquid propane

Fuel Fill

Industry-standard valve designed allow for safe passage of liquid propane into the vehicle. Includes a check valve to prevent fuel leaks.

Fuel Tank

The liquid propane autogas fuel tank meets all ASME certification standards. It is made of ¼ inch thick steel, and is built and assembled in the USA.

Fuel Lines

Made of high-durability stainless steel to handle varying temperatures and pressures. They are designed to route through the factory line locations.

Fuel Injectors

Special fuel injectors are used to inject liquid propane into the cylinders for ignition.



PRODUCT OVERVIEW

Pickups | Vans & Wagons | Cutaway Vans
Chassis Cab | School Bus

Model Years

2009 - 2013

Engine Size

5.4L V8 (2V)

Applications

Extended or Regular

Cargo Van, Club Wagon.

All rear-axle configurations.

4-speed automatic transmission.

Fuel Tank Capacity

Mid-Ship: 25 gallons (usable)

In-Cab: 46 gallons (usable)

Technical Specifications

EPA and CARB approved.

GVWR: < 10,000 lbs.

Requires "91G" gaseous fuels prep. package.

Order Availability

Ford Ship Through.

Conversion Kits.

Ford E-150 / E-250 / E-350



Model Years

2009 - 2013

Engine Size

6.8L V10 (2V)

Applications

158" or 176" wheelbase.

Stretched chassis.

5-speed automatic transmission.

Fuel Tank Capacity

Aft-axle: 41 gallons (usable)

Technical Specifications

EPA and CARB approved.

GVWR: < 14,500 lbs.

Requires "91G" gaseous fuels prep. package.

Order Availability

Ford Ship Through.

Conversion Kits.

Ford E-450 Cutaway



Model Years

2013

Engine Size

6.8L V10 (2V)

Applications

158" or 176" wheelbase.

5-speed automatic transmission.

Fuel Tank Capacity

Aft-axle: 41 gallons (usable)

Technical Specifications

EPA and CARB approved.

GVWR: < 14,500 lbs.

Requires "91G" gaseous fuels prep. package.

Order Availability

Ford Ship Through.

Conversion Kits.

Ford E-450 Stripped Chassis



Model Years

2012 - 2013

Engine Size

6.2L V8 (3V)

Applications

4x2 or 4x4.

All bed configurations.

All body configurations (including chassis cab).

All rear axle configurations.

Fuel Tank Capacity

Under-bed*: 25 gallons (usable)

In-Bed: 38 gallons (usable)

Extended Range In-Bed: 46 gallons (usable)

Technical Specifications

EPA and CARB approved.

GVWR: < 13,300 lbs.

Requires "98F" gaseous fuels prep. package.

Order Availability

Ford Ship Through.

Conversion Kits.

Ford F-250 / F-350



Model Years

2012- 2013

Engine Size

6.8L V10 (3V)

Applications

All cab configurations.

All wheelbase configurations.

5-speed automatic transmission.

Fuel Tank Capacity

Aft-Cab*: 50 gallons (usable)

Extended Range: 67 gallons (usable)

Technical Specifications

EPA and CARB approved.

GVWR: < 16,500 – 19,500 lbs.

Requires "98G" gaseous fuels prep. package.

Order Availability

Shuttle: Q1, 2013 (distributed through GAS only).

Aft-Cab: Q3, 2013

Ford F-450 / F-550



Model Years

2012- 2013

Engine Size

6.8L V10 (3V)

Applications

All cab configurations.

All wheelbase configurations.

6-speed automatic transmission.

Fuel Tank Capacity

Skirted: 40 gallons (usable)

Non-Skirted: 80 gallons (usable)

Technical Specifications

EPA and CARB approved.

GVWR: < 30,000 lbs.

Requires "98G" gaseous fuels prep. package.

Order Availability

Q3, 2013

Ford F-650



Model Years

2013

Engine Size

6.8L V10 (3V)

Applications

All wheelbase configurations.

All rear-axle configurations.

5-speed automatic transmission.

Fuel Tank Capacity

Aft-axle: 67 gallons (usable)

Technical Specifications

EPA and CARB approved.

GVWR F-53: < 26,000 lbs.

GVWR F-59: < 22,000 lbs.

Requires "91G" gaseous fuels prep. package.

Order Availability

Available from Green Alternative Systems.

Ford F-53 / F-59 Stripped Chassis



ROUSH[®]
CLEANTECH

Coming Soon



Ford Transit
(3.7L V6)

800.59.ROUSH

ROUSHcleantech.com



SERVICE & WARRANTY

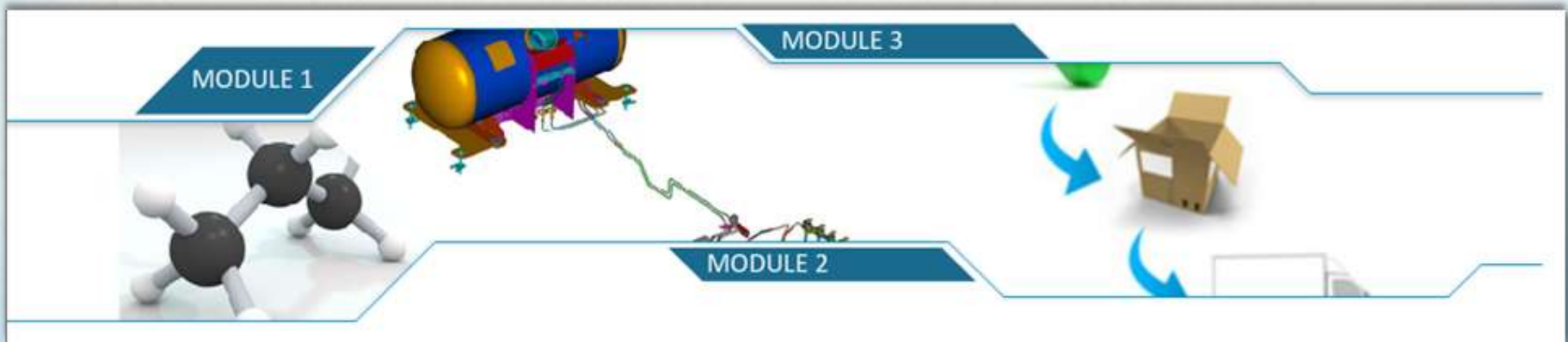
Training, Basic Coverage
and Special Tools

- National footprint:
 - Locations in every customer deployment area.
- Training program:
 - System overview.
 - Service diagnostics.
 - Repair procedures.
 - Warranty claim process.
 - Service manual review.
 - Contact information.
- Web-based training.



Service Program

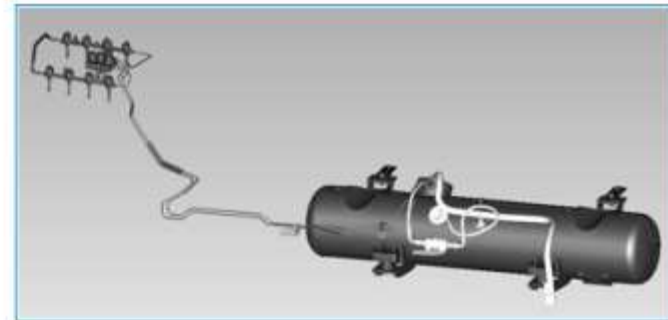
- Assists customers, dealers and service centers in the overall vehicle service and repair process:
 - Interactive web-based training program.
 - Service and diagnostic manuals.
 - Technical information videos.
 - Technical phone support.
 - Warranty claims resolution process.



Module 2 - ROUSH CleanTech Propane Autogas Fuel System Overview

Overview of Conversion Process

ROUSH CleanTech Propane Autogas Fuel System Components





RETURN ON INVESTMENT

A Positive Return,
Even Without Government Incentives

Savings Calculation

Ford E-150 / E-250 / E-350
2013 (5.4L V8)



Capital Costs	Gasoline (5.4L V8)	Propane (5.4L V8)	Savings (Costs)
Base Ford Vehicle Purchase Price	\$30,945.00	\$31,260.00	
ROUSH CleanTech Propane Conversion	\$0.00	\$11,300.00	
State or Federal Incentive (if applicable)	\$0.00	\$0.00	
Total Capital Savings (or Investment)	\$30,945.00	\$42,560.00	(\$11,615.00)
Operating Costs	Gasoline (5.4L V8)	Propane (5.4L V8)	Savings (Costs)
Total Vehicle Life (miles)	200,000	200,000	
Average Miles Per Gallon*	11.00	9.35	
Gallons of Fuel Over Lifetime	18,181.82	21,390.37	
Fuel Price (per gallon)**	\$3.85	\$1.90	
Fuel Tax Credit / Gallon	\$0.00	\$0.50	
Adjusted Fuel Price / Gallon	\$3.85	\$1.40	
Total Fuel Savings (or Costs)	\$70,000.00	\$29,946.52	\$40,053.48
Miscellaneous Costs	Gasoline (5.4L V8)	Propane (5.4L V8)	Savings (Costs)
Maintenance Rate (per mile)***	\$0.030	\$0.015	
Maintenance Costs	\$6,000.00	\$3,000.00	
Fuel Loss From Pilferage / Theft	\$0.00	\$0.00	
Total Misc. Savings (or Costs)	\$6,000.00	\$3,000.00	\$3,000.00

Gross Vehicle Lifetime Savings (Loss) \$43,053.48

Net Vehicle Lifetime Savings (Loss) \$31,438.48

Savings Calculation

Ford E-450
2013 (6.8L V10)



Capital Costs	Gasoline (6.8L V10)	Propane (6.8L V10)	Savings (Costs)
Base Ford Vehicle Purchase Price	\$32,035.00	\$32,350.00	
ROUSH CleanTech Propane Conversion	\$0.00	\$15,900.00	
State or Federal Incentive (if applicable)	\$0.00	\$0.00	
Total Capital Savings (or Investment)	\$32,035.00	\$48,250.00	(\$16,215.00)
Operating Costs	Gasoline (6.8L V10)	Propane (6.8L V10)	Savings (Costs)
Total Vehicle Life (miles)	200,000	200,000	
Average Miles Per Gallon*	9.00	7.65	
Gallons of Fuel Over Lifetime	22,222	26,144	
Fuel Price (per gallon)**	\$3.85	\$1.80	
Fuel Tax Credit / Gallon	\$0.00	\$0.50	
Adjusted Fuel Price / Gallon	\$3.85	\$1.30	
Total Fuel Savings (or Costs)	\$85,555.56	\$33,986.93	\$51,568.63
Miscellaneous Costs	Gasoline (6.8L V10)	Propane (6.8L V10)	Savings (Costs)
Maintenance Rate (per mile)***	\$0.030	\$0.015	
Maintenance Costs	\$6,000.00	\$3,000.00	
Fuel Loss From Pilferage / Theft	\$0.00	\$0.00	
Total Misc. Savings (or Costs)	\$6,000.00	\$3,000.00	\$3,000.00

Gross Vehicle Lifetime Savings (Loss) \$54,568.63

Net Vehicle Lifetime Savings (Loss) \$38,353.63

Emissions Calculation

Emissions Reductions	Gasoline	Propane	Difference
Total Vehicle Life (miles)	200,000	200,000	
Average Miles per Gallon	9.00	7.65	
Gallons of Fuel Used Over Life of Vehicle	22,222.22	26,143.79	(3,921.57)
Carbon Mass per Gallon Fuel (lb. / gal.)	5.10	3.47	
Mass of CO ₂ per Gallon Fuel (lb. / gal.)	18.70	12.72	
Total lbs. of CO₂ Produced During Vehicle Life	415,457.78	332,501.96	82,955.82

Fewer lbs. of CO₂ Produced Using Propane Autogas

82,956



Ford E-450
2013 (6.8L V10)



TESTIMONIALS:

Real-World Feedback From
Real-World Customers

Some of Our Customers



DISH Network Purchases 200

“These clean-burning propane autogas vehicles are better for our environment, our communities and operate more efficiently.”

- Erik Carlson, executive vice president of service and installation at DISH



Industry: Airport Transportation

Location: Phoenix, AZ

Vehicles: 75 Ford E-350 Passenger Vans

By The Numbers:

- 7,800 fewer gallons of gasoline / van / year.
- 300,000 fewer lbs of CO₂ / van.
- \$10,400 reduction in fuel costs / van / year.



“The switch to propane autogas was the smart thing to do. We are seeing tremendous fuel savings right now. Gas prices in Arizona are averaging \$3.65 / gallon [in mid-April, 2011]. Our drivers who are using public propane refueling infrastructure around Phoenix are paying \$2.20 per gallon.”

- **Ken Brooks**, National Purchasing Manager

Industry: Vertical Transportation

Location: Nation-wide.

Vehicles: Ford F-150 Pickup Trucks
Ford E-150 Cargo Vans

By The Numbers:

- **373,518** fewer lbs of CO₂ / year.
- **\$224,208** reduction in annual fuel costs in PHX.



"We are challenged in today's marketplace to go green," said Tom Armstrong, director of fleet at ThyssenKrupp Elevator. "We were determined to reduce our fuel consumption and find sustainable vehicles that worked for us. With all the alternative fuel choices available today, we needed a tool to effectively analyze and justify each fuel or alternative fuel vehicle type."

- **Tom Armstrong**, Director of Fleet

GO Airport Express

Industry: Airport Transportation
Location: Chicago, Illinois
Vehicles: 30 Ford E-350 Passenger Vans

By The Numbers:

- **10,000** fewer gallons of gasoline / van / year.
- **112,000** fewer lbs of CO₂ / van / year.
- **\$0.21** reduction in fuel costs / mile / van.



“Go Airport Express is pleased to use propane autogas to fuel its vans. Propane autogas lowers our operating costs, emits fewer pollutants and provides a great ride for our customers.”

- Robert Hann, VP of Marketing



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