

# ROUSH<sup>®</sup>

CLEANTECH



BLUE BIRD<sup>®</sup>

**ROUSH<sup>®</sup>**  
CLEANTECH



 MICRO BIRD  
by GIRARDIN

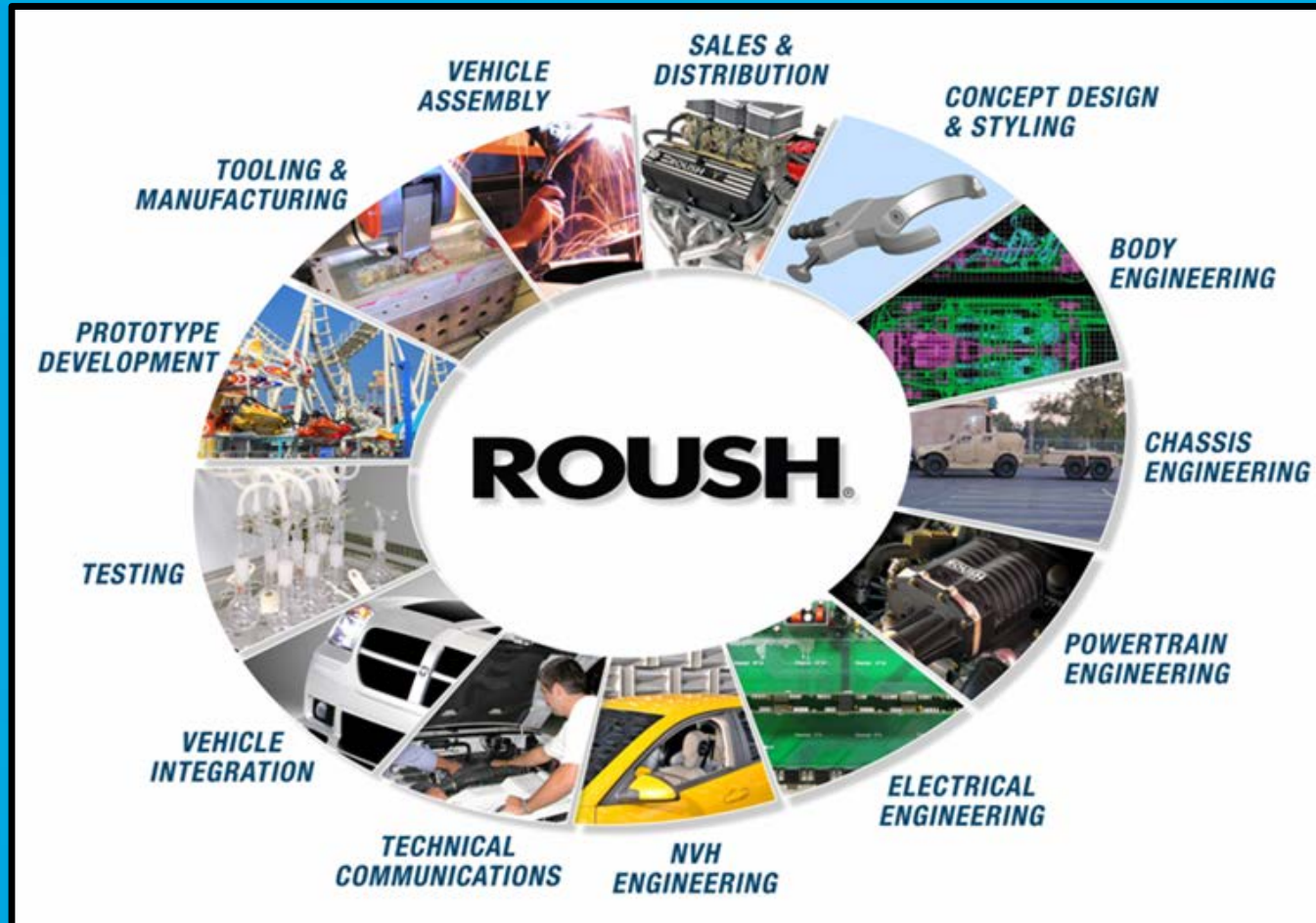


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[ROUSHcleantech.com](http://ROUSHcleantech.com)

# Corporate Overview

**ROUSH**  
CLEANTECH



**ROUSH FENWAY**  
RACING



**ROUSH**  
Life Sciences

**ROUSH**

Corporate Wheel of Capability

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# **A SOLUTION**

**Why Propane AutoGas for  
the School Bus Industry?**

# Why? Worlds Most Popular Alternative Fuel

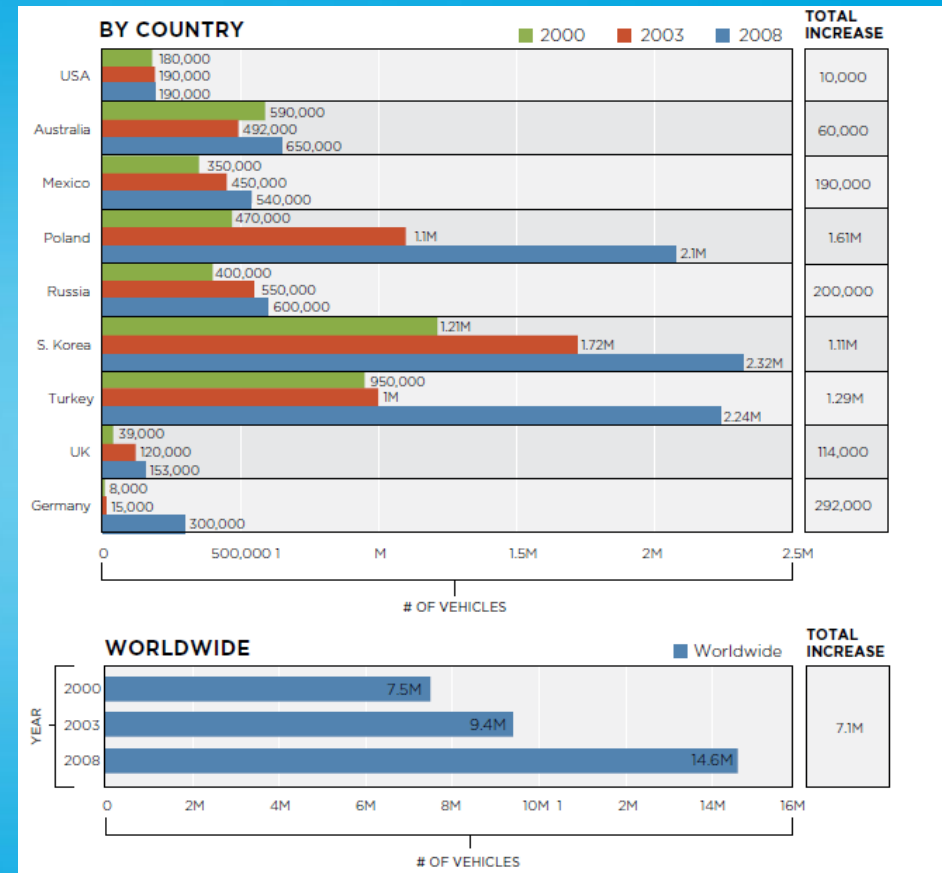


~270,000 propane vehicles in USA

~17M propane vehicles worldwide

Australia: Every third vehicle off Ford's assembly line is propane autogas powered

Turkey: More propane autogas sold last year than gasoline + diesel combined

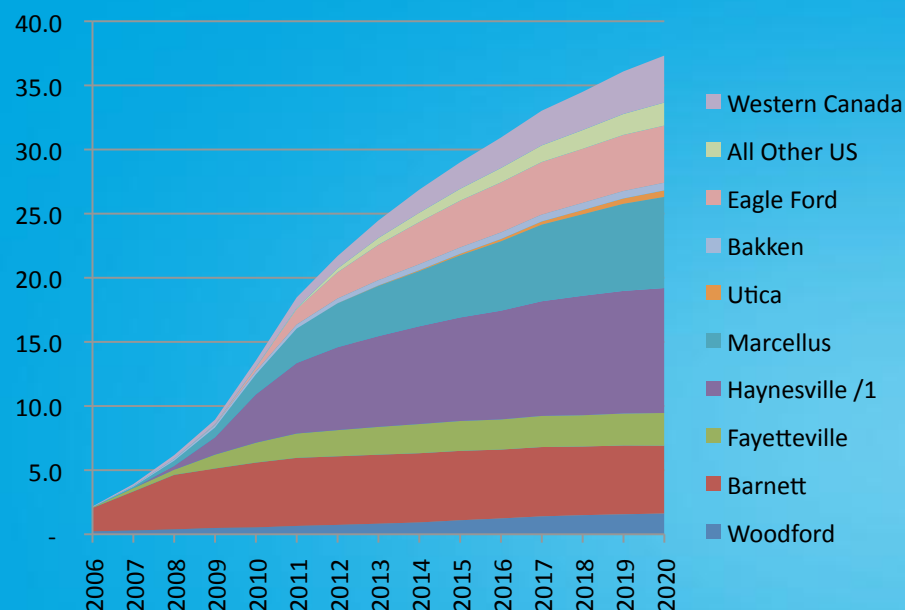


Source: World LP Gas Association, Autogas for America

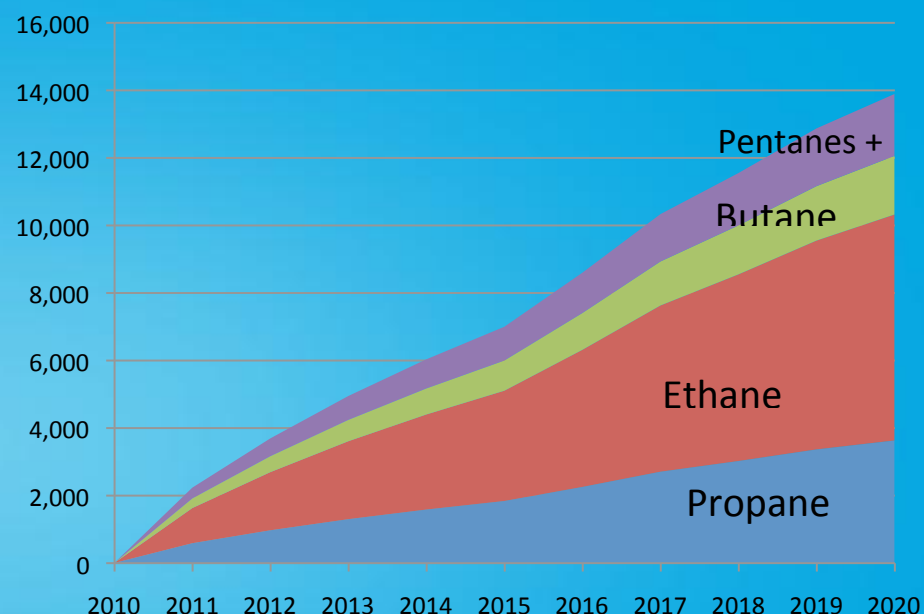
# Why? Viable & Domestically Produced



U.S. and Canada Shale Gas Production (Bcfd)



Increase in Natural Gas Liquids Production From U.S. and Canada Shale Gas (Million Gallons per year)

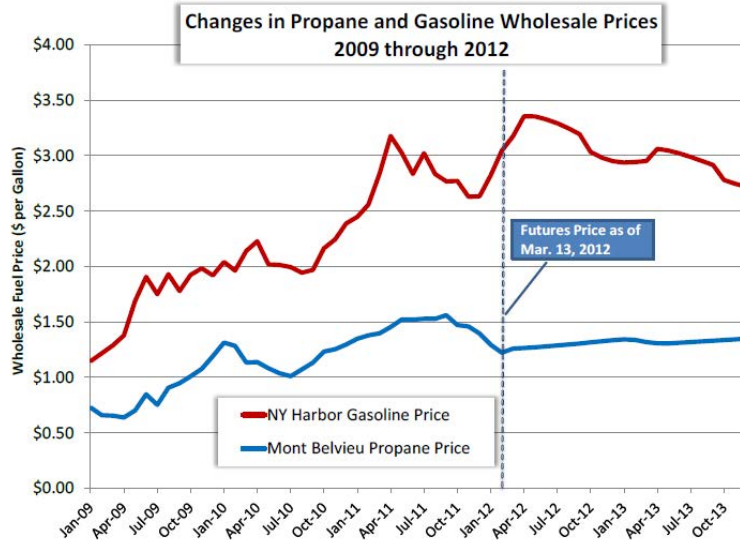


1/ Haynesville production includes production from other shales in the vicinity, e.g., the Bossier Shale

- Natural gas liquids production from shale gas is expected to increase by more than **6.9 Billion Gallons** per year between 2010 and 2015.
  - 1.8 billion gallons of new propane supply by 2015 and 3.6 billion gallons by 2020.
  - 3.3 billion gallons of new ethane supply by 2015 and 6.7 billion gallons of by 2020.
- Estimated increase of 17% between 2009 and 2020 from crude and 33% from natural gas

Source: ICF Consulting

# Why? Cheaper



Source: ICF Consulting

***"We're saving a total of 32 cents per mile with propane autogas."***

***"We needed these buses to perform without issue from the moment we got them, and they did. They've been reliable and inexpensive to operate."***

Ron Latko, Director of Transportation, Mesa Unified School District No. 4 in Phoenix, Arizona.

Dixie Pipeline Posted Prices

January 4, 2013

\$0.93 – Milner GA

[add freight, supplier fees, taxes]

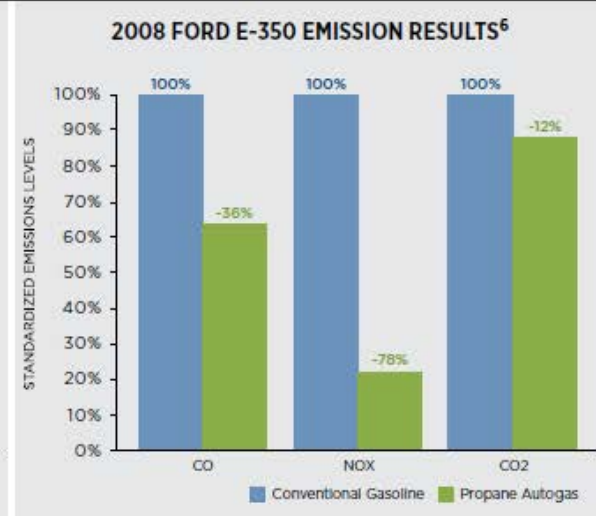
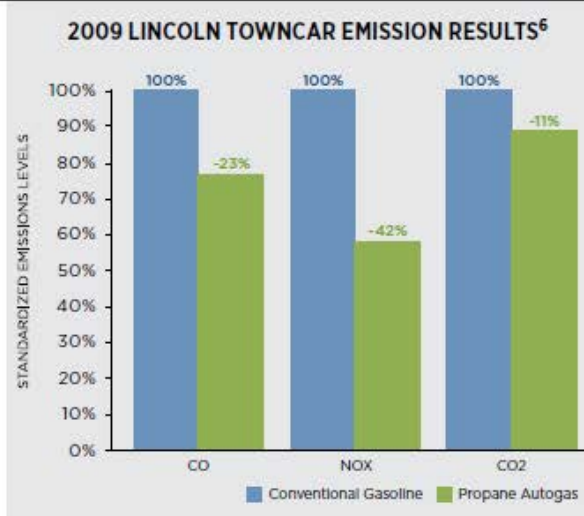
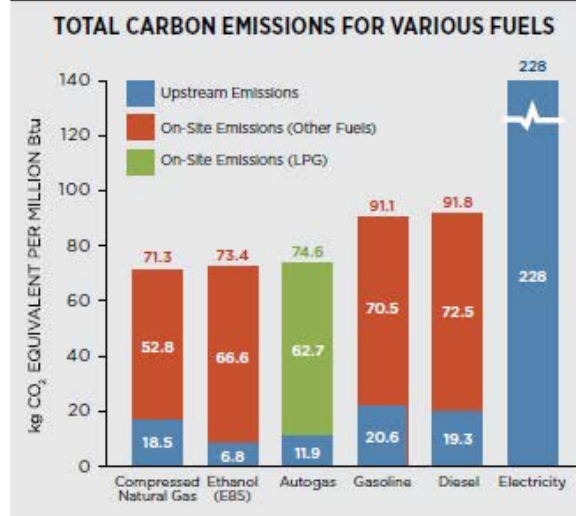
NEW: \$0.50/gge tax credit is back!



# Why? Cleaner



- 12% reduction in Carbon Dioxide (CO<sub>2</sub>) emissions
- 20% reduction in Nitrogen Oxide (NO<sub>x</sub>) emissions
- 60% reduction in Carbon Monoxide (CO) emissions
- 80% reduction in Particulate Matter (PM) emissions



<sup>1</sup> Propane Education and Research Council, Research and Development, <http://www.propanecouncil.org/ResandDev.aspx>

<sup>4</sup> Roush, Propane-Powered Vehicles, <http://www.roushperformance.com/propane.shtml>

<sup>5</sup> Based on DOE Argonne National Laboratory emissions benefit tool, [http://www.transportation.anl.gov/modeling\\_simulation/AirCred/](http://www.transportation.anl.gov/modeling_simulation/AirCred/)

<sup>6</sup> Roush, 2009 Lincoln & 2008 E-350 emissions compare LPG vs. GAS

Source: Autogas for America

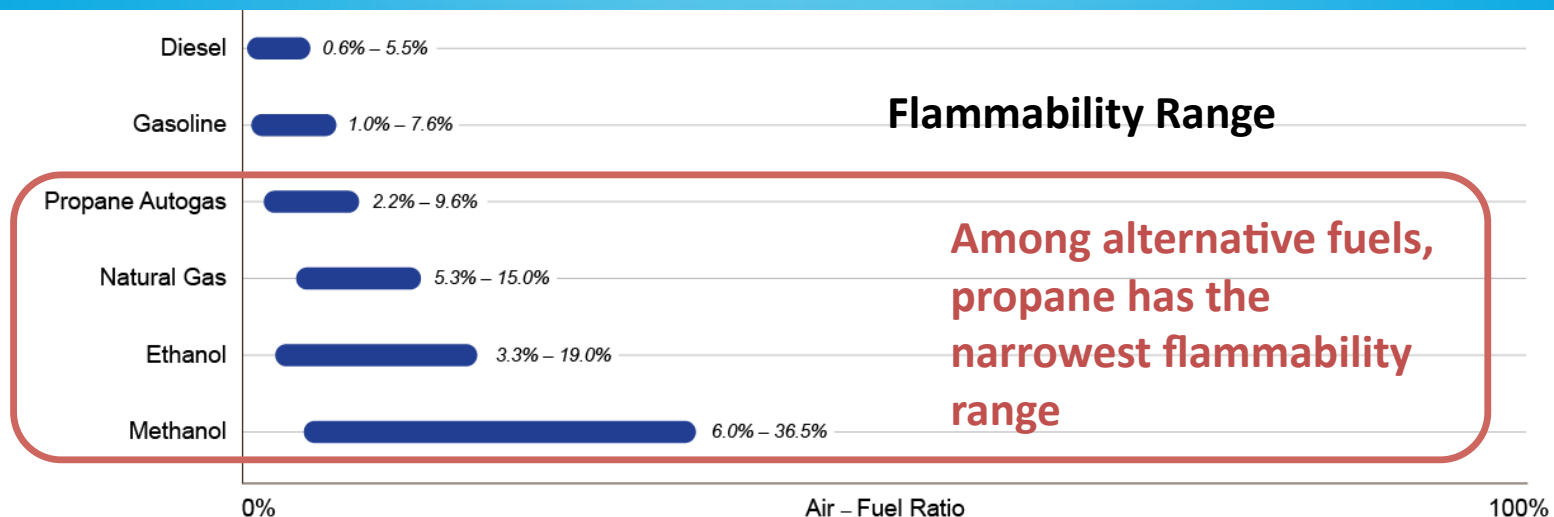
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# Why? Safe

## Safe & Non-Toxic

- Low pressure (~ 200 psig)
- Narrow flammability range
- Requires a higher temperature to ignite than gas/diesel
  - Autogas ignition temperature is 920-1020F v 495-536 for gasoline
- Does not puddle – vaporizes and dissipates into the air
  - Nontoxic, Nonpoisonous, Insoluble in water
- Cannot be accidentally ingested





# Why? Cheaper



## Safe & Non-Toxic

- Fuel tanks are 20 times more puncture resistant than gasoline
- Built-in safety devices and shut-off valves



16 Mounting Points  
Located Inside Frame Rails



- Meet strict set of rules and regulations



# Why? Product Line to Meet Diverse Fleet Needs

**ROUSH**  
CLEANTECH



Telecomm.



Food & Beverage



Government



Military



Propane



Transportation

**Ford F-250 / F-350**  
5.4L V8



**Ford E-150 / E-250 / E-350**  
5.4L V8



**Ford E-350 DRW**  
5.4L V8



**Ford E-450 DRW**  
6.8L V10



**Blue Bird Vision**  
6.8L V10  
(Available February, 2012)



**Ford F-250 / F-350**  
6.2L V8  
(Available Summer, 2012)



**Ford F-450 / F-550**  
6.8L V10  
(Available Q1, 2013)



**Ford F-650**  
6.8L V10  
(Available Q1, 2013)



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# Product Overview – Blue Bird Vision



## Blue Bird Vision

<b>Model Years:</b>	2012 - Newer
<b>Engine Size:</b>	6.8L V10 (3V)
<b>Tank Sizes:</b>	67 usable gallons
<b>Order Availability:</b>	Blue Bird Dealers
<b>Certification:</b>	EPA CARB
<b>Available:</b>	Now
<b>Warranty:</b>	5 year/100K miles



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# Class A Propane G5 by Micro Bird



## Ford E-450 DRW Cutaway

<b>Model Years:</b>	2009 – 2012
<b>Engine Size:</b>	6.8L V10
<b>Applications:</b>	Dual rear wheel cutaway 5-speed auto transmission
<b>Tank Sizes:</b>	Aft-Axle: 41 gallons
<b>Order Availability:</b>	Now
<b>Certification:</b>	EPA CARB



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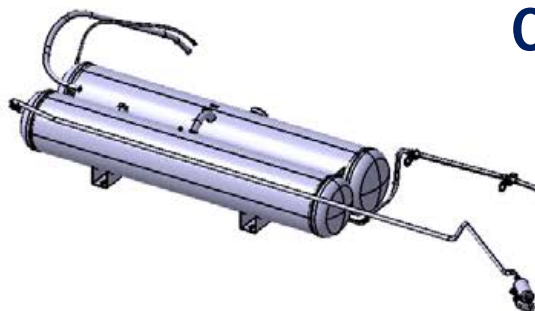
# Propane Fuel System – Simple Design



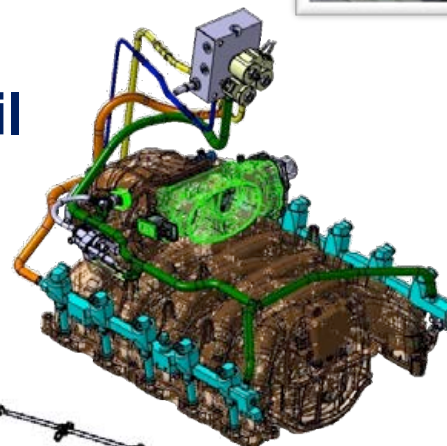
Propane Packaging & Design



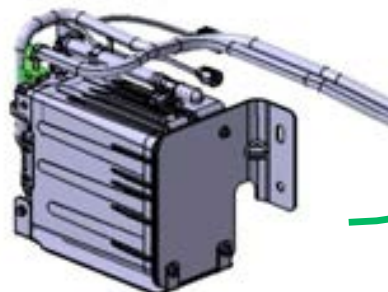
Fuel Container



Common Fuel Rail



Evaporative Canister



# Zero Compromise



## Warranty & Serviceability

- Ford warranty coverage goes unchanged
- Ford alt. fuel prep package
- Uses standard Ford diagnostic equipment

## Service Locations

- Ford dealers
- We train your mechanics to continue maintaining own vehicles

## Training Program

- On-site & Web-based

## Warranty Coverage

- In-house warranty staff
- Processes in place to manage claims

## Service Parts

- Available directly from ROUSH CleanTech



Ford Diagnostic Equipment



# **RETURN ON INVESTMENT:**

**A Positive Return, Even Without  
Government Incentives**

# Savings Calculator



## Assumptions:

- 71 passenger base bus, no options
- Propane bus up-charge based on current state contract
- MPG estimates for diesel and propane are based on customer feedback
- Propane fuel price is based on state contract pricing structure. School responsible for crash and electrical related to infrastructure installation.
- At least a 25% reduction in maintenance cost is assumed based upon customer feedback.

	71p Blue Bird ISB13 Diesel	Propane (6.8L V10)	Savings or (Cost) to Convert
<b>Capital Costs</b>			
Base Ford Vehicle Purchase Price	\$ 85,035.00		
<a href="#">Federal Alternative Motor Vehicle Tax Credit (propane only)</a>		\$ 92,035.00	
<b>Total Capital Savings or Investment to Convert:</b>	\$85,035.00	\$92,035.00	\$ (7,000.00)
<b>Operating Costs (fuel)</b>			
Total Vehicle Life (miles)	109,260	109,260	
Average Miles per Gallon	6.5	4.5	
Gallons of Fuel Used Over Life of Vehicle	16,809	24,280	
Fuel Price (per gallon)*	\$ 3.50	\$ 1.50	
+ Federal excise tax credit / gallon (propane only)	\$ -	\$ -	
+ Adjusted Fuel Price (per gallon)	\$ 3.50	\$ 1.50	
<b>Total Fuel Savings or Cost Over Life of Vehicle:</b>	\$ 58,832.31	\$ 36,420.00	\$ 22,412.31
<b>Operating Costs (misc.)</b>			
Maintenance Rate per mile (tune-ups, oil, engine life, etc.)**	\$ 0.045	\$ 0.034	
Maintenance Costs	\$ 4,916.70	\$ 3,687.53	
Fuel Loss from Spillage & Theft (\$100 per year)	\$0.00	\$0.00	
<b>Total Misc. Savings or Costs Over Life of Vehicle:</b>	\$4,916.70	\$3,687.53	\$ 1,229.18

Gross Vehicle Lifetime Savings or Loss: \$23,641.48

Net Vehicle Lifetime Savings or Loss: \$16,641.48

Number of Years Vehicle is in Use: 12

Number of Years to Break Even: 3.55



# Savings Calculator



Capital Costs	Gasoline (6.2L V8)	Propane (6.2L V8)	Savings (Costs)
Base Ford Vehicle Purchase Price	\$30,060.00	\$30,375.00	
ROUSH CleanTech Propane Conversion	\$0.00	\$10,350.00	
State or Federal Incentive (if applicable)	\$0.00	\$0.00	
<b>Total Capital Savings (or Investment)</b>	<b>\$30,060.00</b>	<b>\$40,725.00</b>	<b>(\$10,665.00)</b>
Operating Costs	Gasoline (6.2L V8)	Propane (6.2L V8)	Savings (Costs)
Total Vehicle Life (miles)	200,000	200,000	
Average Miles Per Gallon*	12.00	10.20	
Gallons of Fuel Over Lifetime	16,666.67	19,607.84	
Fuel Price (per gallon)**	\$3.25	\$1.50	
Fuel Tax Credit / Gallon	\$0.00	\$0.00	
Adjusted Fuel Price / Gallon	\$3.25	\$1.50	
<b>Total Fuel Savings (or Costs)</b>	<b>\$54,166.67</b>	<b>\$29,411.76</b>	<b>\$24,754.90</b>
Miscellaneous Costs	Gasoline (6.2L V8)	Propane (6.2L V8)	Savings (Costs)
Maintenance Rate (per mile)***	\$0.030	\$0.023	
Maintenance Costs	\$6,000.00	\$4,500.00	
Fuel Loss From Pilferage / Theft	\$0.00	\$0.00	
<b>Total Misc. Savings (or Costs)</b>	<b>\$6,000.00</b>	<b>\$4,500.00</b>	<b>\$1,500.00</b>
<b>Gross Vehicle Lifetime Savings (Loss)</b>			<b>\$26,254.90</b>
<b>Net Vehicle Lifetime Savings (Loss)</b>			<b>\$15,589.90</b>

How many years will the vehicle be used?	Number of years to break even:
4	1.6



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	\$10,950.00	
State or Federal Incentive (if applicable)	\$0.00	\$0.00	
<b>Total Capital Savings (or Investment)</b>	<b>\$30,945.00</b>	<b>\$42,210.00</b>	<b>(\$11,265.00)</b>
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)**	\$3.25	\$1.50	
Fuel Tax Credit / Gallon	\$0.00	\$0.00	
Adjusted Fuel Price / Gallon	\$3.25	\$1.50	
<b>Total Fuel Savings (or Costs)</b>	<b>\$59,090.91</b>	<b>\$32,085.56</b>	<b>\$27,005.35</b>
Miscellaneous Costs	Gasoline (5.4L V8)	Propane (5.4L V8)	Savings (Costs)
Maintenance Rate (per mile)***	\$0.030	\$0.023	
Maintenance Costs	\$6,000.00	\$4,500.00	
Fuel Loss From Pilferage / Theft	\$0.00	\$0.00	
<b>Total Misc. Savings (or Costs)</b>	<b>\$6,000.00</b>	<b>\$4,500.00</b>	<b>\$1,500.00</b>
<b>Gross Vehicle Lifetime Savings (Loss)</b>			<b>\$28,505.35</b>
<b>Net Vehicle Lifetime Savings (Loss)</b>			<b>\$17,240.35</b>

How many years will the vehicle be used?	Number of years to break even:
4	1.6



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# Emissions Calculator



Emissions Reductions	Gasoline	Propane	Difference
Total Vehicle Life (miles)	200,000	200,000	
Average Miles per Gallon	11.00	9.35	
Gallons of Fuel Used Over Life of Vehicle	18,181.82	21,390.37	(3,208.56)
Carbon Mass per Gallon Fuel (lb. / gal.)	5.10	3.47	
Mass of CO <sub>2</sub> per Gallon Fuel (lb. / gal.)	18.70	12.72	
Total lbs. of CO <sub>2</sub> Produced During Vehicle Life	339,920.00	272,047.06	67,872.94
Fewer lbs. of CO <sub>2</sub> Produced Using Propane Autogas			67,873

*Ford E-250 Cargo Van*





# **INCENTIVES:**

**Encouraging Adoption of Alternative Fuels**

# Virginia Encourages Alternative Fuel Conversion



www.dgs.state.va.us/OfficeofFleetManagementServices/AlternativeFuelMain/AlternativeFuel\_Propane/tabid/1254/Default.aspx

Department of General Services  
Commonwealth of Virginia

Management Services > Alternative Fuel Main > Alternative Fuel\_Propane

Contact Us | Search DGS

Agency Transportation Officer | Location | Contact | FAQ

**OFMS** | Office of Fleet Management Services

**Commonwealth's Alternative Fuel Program**

Contract Fuel Prices | FAQ's | Contact Numbers

**Propane Autogas**  
**Alliance AutoGas**

About Propane:

Propane, otherwise known as LPG, is commonly referred to as autogas when used in transportation applications. Propane is a byproduct of natural gas processing and petroleum refining. Propane has been used for years in the transportation industry because of the fuel's high octane rating making it an excellent candidate for spark-ignited internal combustion engines. Propane is stored under pressure in a liquid form. As the pressure is released, the liquid propane vaporizes and turns into the gas used for the combustion process.

For more information on the properties and benefits of propane visit the DOE Alternative Fuels Data Center.

OFMS Home  
VMCC  
Accidents, Vehicle Breakdowns and Maintenance  
Vehicle Justification Calculator  
Policies and Procedures  
State Motor Fuel Program  
Alternative Fuel Program  
Travel Planning and Enterprise Rental  
Forms and Resources  
Fleet Vehicle Sales  
Newsletters  
Code of Virginia

**E85**  
85% Ethanol  
www.E85Fuel.com

## More Information:

- <http://www.administration.virginia.gov/News/viewRelease.cfm?id=835>
- <http://www.governor.virginia.gov/PolicyOffice/ExecutiveOrders/viewEO.cfm?eo=36&pdf=yes>
- [www.governor.virginia.gov/docs/PPEA-SOA-SNR\\_2011-07-22.pdf](http://www.governor.virginia.gov/docs/PPEA-SOA-SNR_2011-07-22.pdf)
- <http://www.governor.virginia.gov/news/viewRelease.cfm?id=1446>

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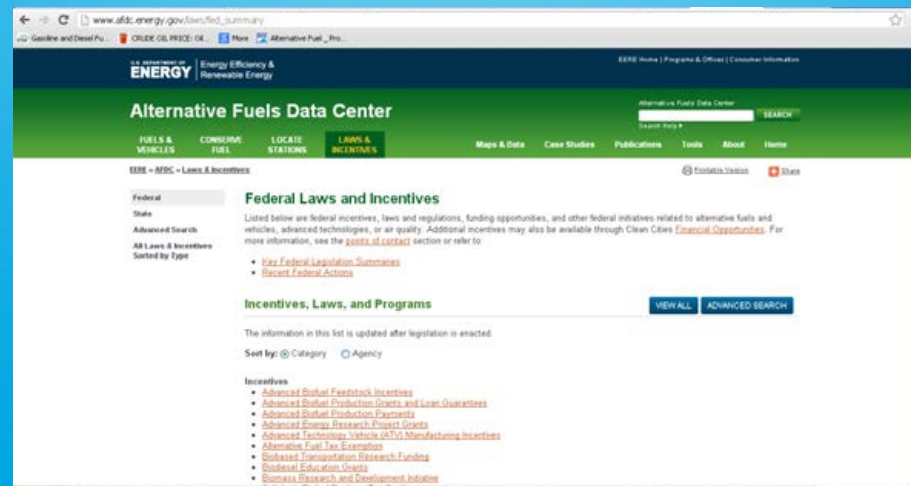


# Tax Incentives: Federal



## HR8 Extends Fuel Excise and Infrastructure Tax Credits

- Retroactive to Jan 1, 2012
- \$0.50/GGE for propane autogas
- \$30,000 per refueling infrastructure installation
- [www.AFDC.Energy.Gov](http://www.AFDC.Energy.Gov) : Click on “Laws & Incentives” or follow
- [http://www.afdc.energy.gov/laws/fed\\_summary](http://www.afdc.energy.gov/laws/fed_summary)



# Upcoming Funding Opportunities



## US EPA

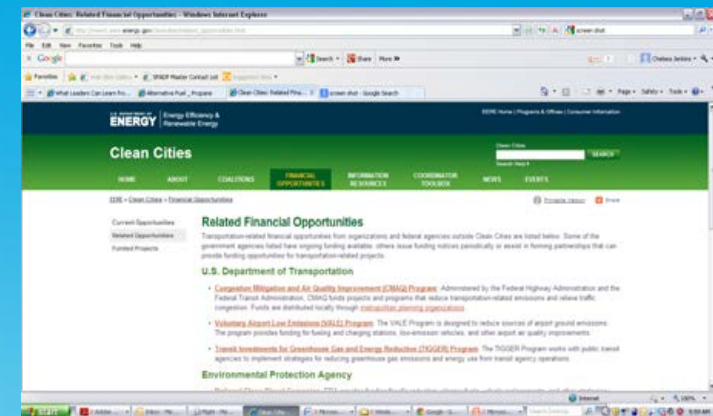
- National Clean Diesel Campaign

## US DOT

- CMAQ
- VALE
- TIGGER

## Useful Websites

- Grants.gov
- AFDC.Energy.Gov
- CleanCities.Energy.Gov
  - [http://www1.eere.energy.gov/cleancities/related\\_opportunities.html](http://www1.eere.energy.gov/cleancities/related_opportunities.html)





# **TESTIMONIALS:**

## **Real-World Feedback From Real-World Customers**

### Omaha Public Schools Choose Autogas

Student Transportation, Inc., Blue Bird and ROUSH CleanTech are partnering to bring over 400 propane powered school buses to Omaha.



Read More >>

Link:

[http://www.roushcleantech.com/  
content/student-transportation-inc-  
places-largest-propane-powered-  
school-bus-order-industry-history](http://www.roushcleantech.com/content/student-transportation-inc-places-largest-propane-powered-school-bus-order-industry-history)

### STUDENT TRANSPORTATION, INC. PLACES LARGEST PROPANE-POWERED SCHOOL BUS ORDER IN INDUSTRY HISTORY WITH ENVIRONMENTALLY-FRIENDLY BLUE BIRD VISION SCHOOL BUSES

Blue Bird to supply more than 400 school buses with ROUSH CleanTech propane autogas fuel systems to Student Transportation, Inc. for use in Omaha, Nebraska

OMAHA, Neb. (December 19, 2012) — Blue Bird and ROUSH CleanTech commend the Metropolitan Omaha Education Consortium and Student Transportation, Inc., (STI) for collaborating to deploy more than 400 [Blue Bird Propane-Powered Vision school buses](#). This contract will cost-effectively transport the students of Omaha while reducing exhaust emissions.



Serving Millard and Omaha Public Schools, the contract is the largest transportation agreement in STI's history. It is also the biggest single order to date of propane buses for Blue Bird, the leading provider of propane autogas powered school buses utilizing the industry-leading ROUSH CleanTech fuel system.

"We are thrilled that STI and Omaha Public Schools made the decision to move to propane autogas, making Omaha a greener city by [dramatically reducing the emissions](#) produced in transporting children to school each day," said Phil Horlock, president and CEO of Blue Bird Corporation. "This order — the single largest in the industry's history — shows Omaha's



# Case Study – Mesa County Schools



**Industry:** Student Transportation

**Location:** Mesa, AZ

**Vehicles:** 21 Micro Bird G5 Type A  
6 Blue Bird Propane Vision Type C  
1 F-250 Ford Pick-Up

**Fueling:** 18,000 gallon on-site refueling station  
2,000 gallon satellite on-site refueling station

## By The Numbers:

- \$5,667 in fuel savings/yr/bus
- \$.326 per mile reduction in operating costs
- \$1.31 / gal for propane autogas
- \$3.54 / gal for diesel
- 7,200 pounds carbon dioxide eliminated/bus/yr



# Case Study – Portland Oregon Schools



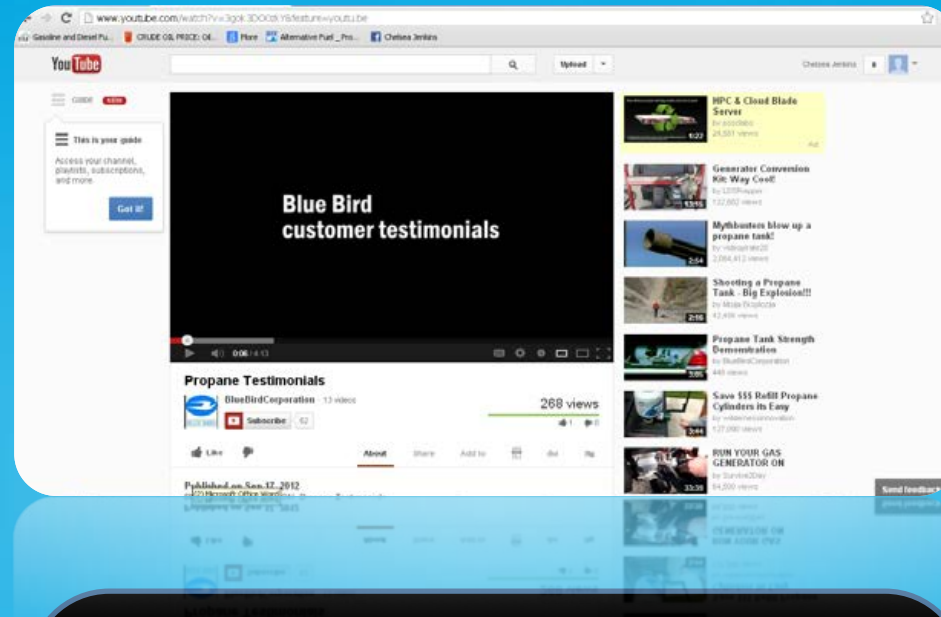
- Portland School District has used propane-autogas-fueled buses for more than 30 years
- Owns and operates about 75 buses
- In addition, *First Student* owns and operates a large fleet for the school district

“As you can imagine, when you operate as many fleet buses as we do in a large city like Portland, occasionally, accidents are going to happen. I’ve been here for six years and I don’t know of any propane autogas safety issues that we’ve ever encountered as the result of an accident. These buses and their fuel tanks are extremely durable.”

-- **Eric Stewart**, Fleet Service Coordinator  
Portland, Oregon Public School District



# Video Testimonials



**Blue Bird Customer Testimonials:**

<http://youtu.be/3gok3DO0zky>

# Customer Adoption







America is a net exporter of propane: 5 Billion Gallons/year



**BE THE CHANGE**

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**Chelsea Jenkins**  
Fleet Account Manager – Eastern Region

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