

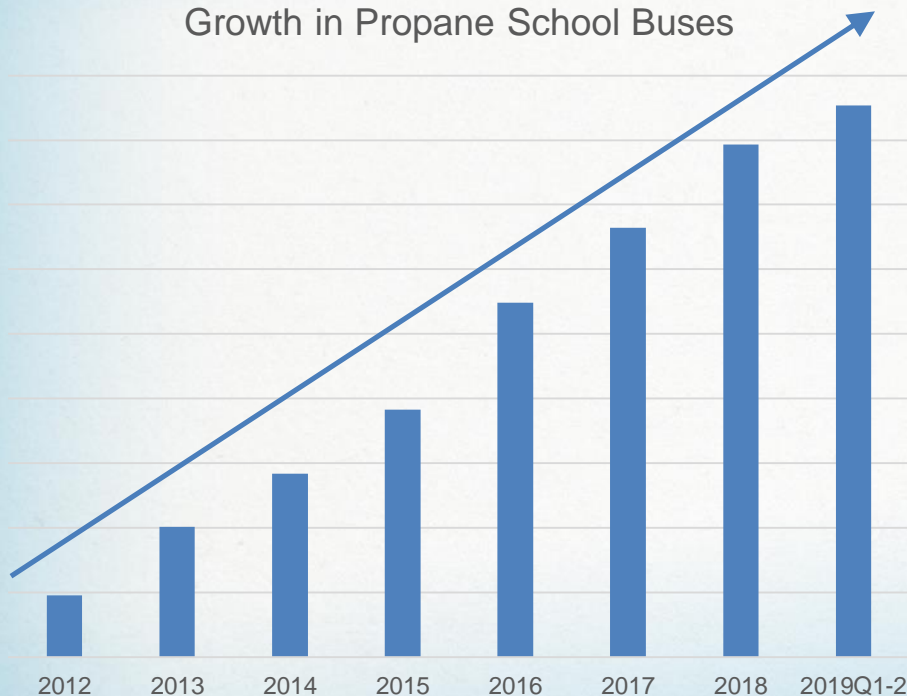


FUELING THE FUTURE



The propane school bus market is growing

Growth in Propane School Buses
































850% increase

approximate amount the propane school bus fleet has grown since 2012

Number of propane school buses is based on registered Type C buses from January 2012 through June 2019 from IHS-Polk data for new vehicle registrations and additional data from

Your Fuel Options

					
Ease of Adoption					
Energy Independence					
NOx Emissions					
Fuel Infrastructure					
Cost of Ownership					
Range					
Maintenance					
Scalable					
Cold Weather Operation					

Our Scorecard

OVER

20,000

VEHICLES ON
THE ROAD

ACCUMULATED
OVER

1B

BILLION MILES

OVER

900

SCHOOL
DISTRICTS

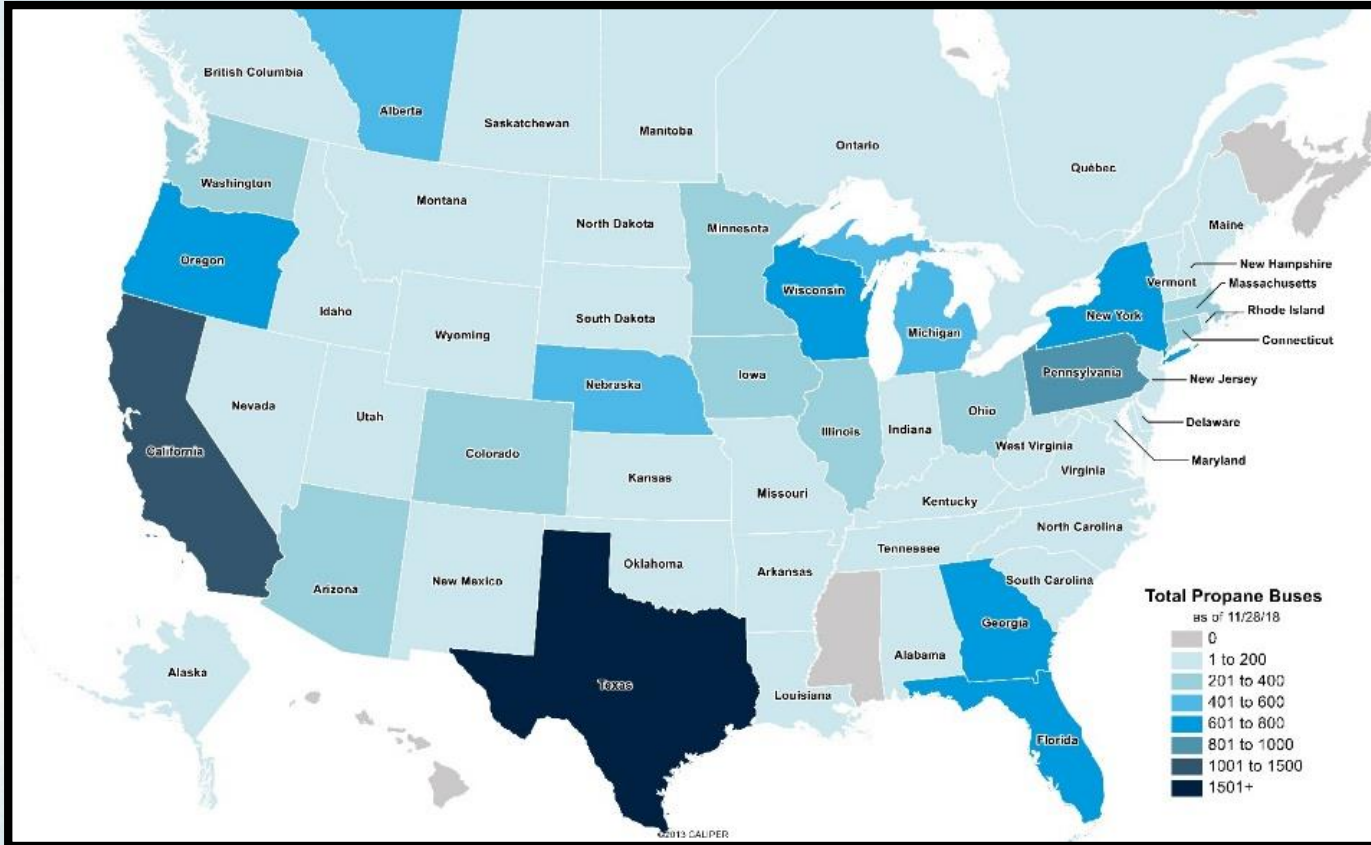


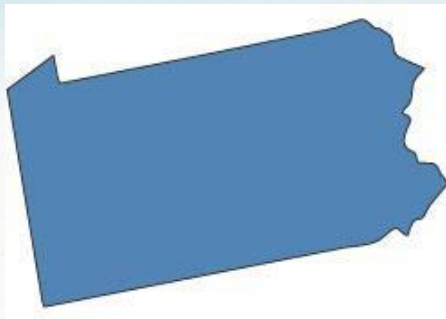
OVER
15,000
PROPANE
SCHOOL
BUSES



OVER
900
SCHOOL
DISTRICTS

Propane Deployments





OVER
970
SCHOOL
BUSES

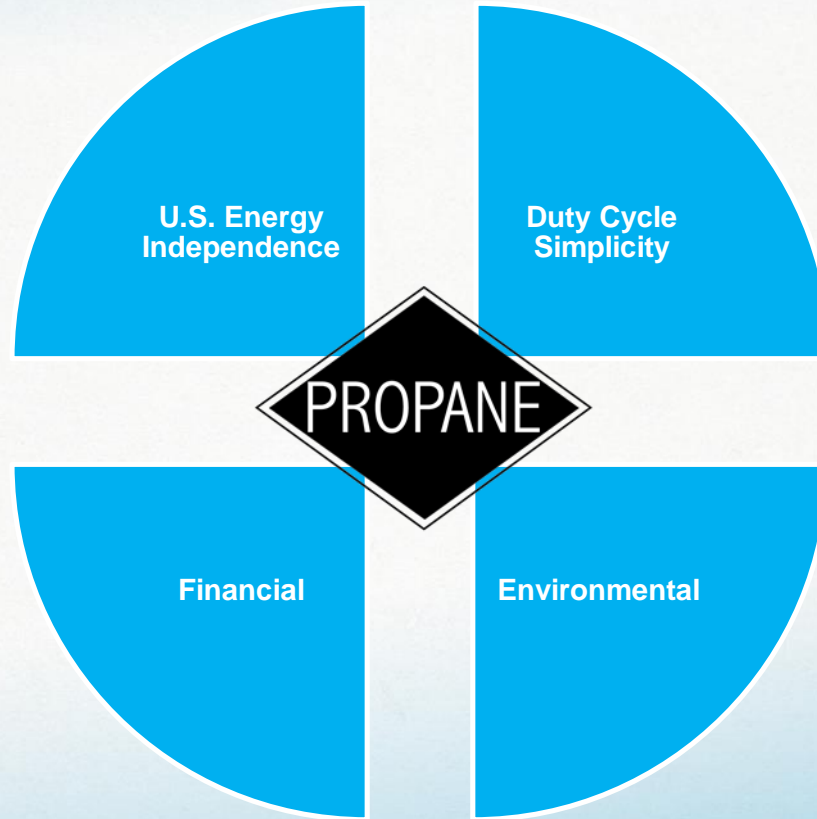


OVER
45
SCHOOL
DISTRICTS

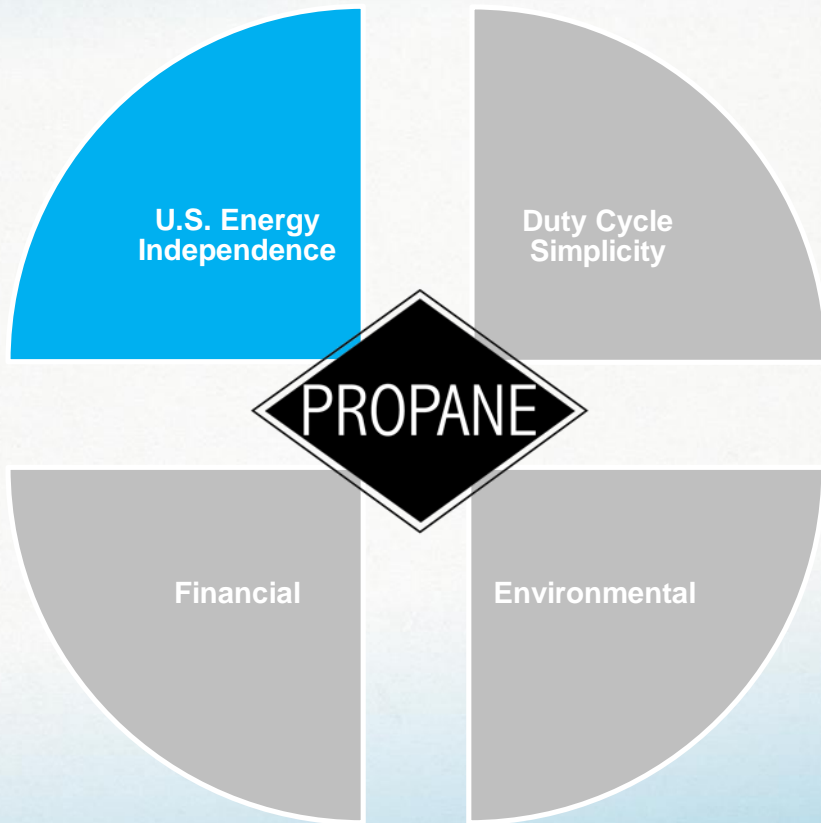
Deployments in Pennsylvania



Consideration Summary



Consideration Summary

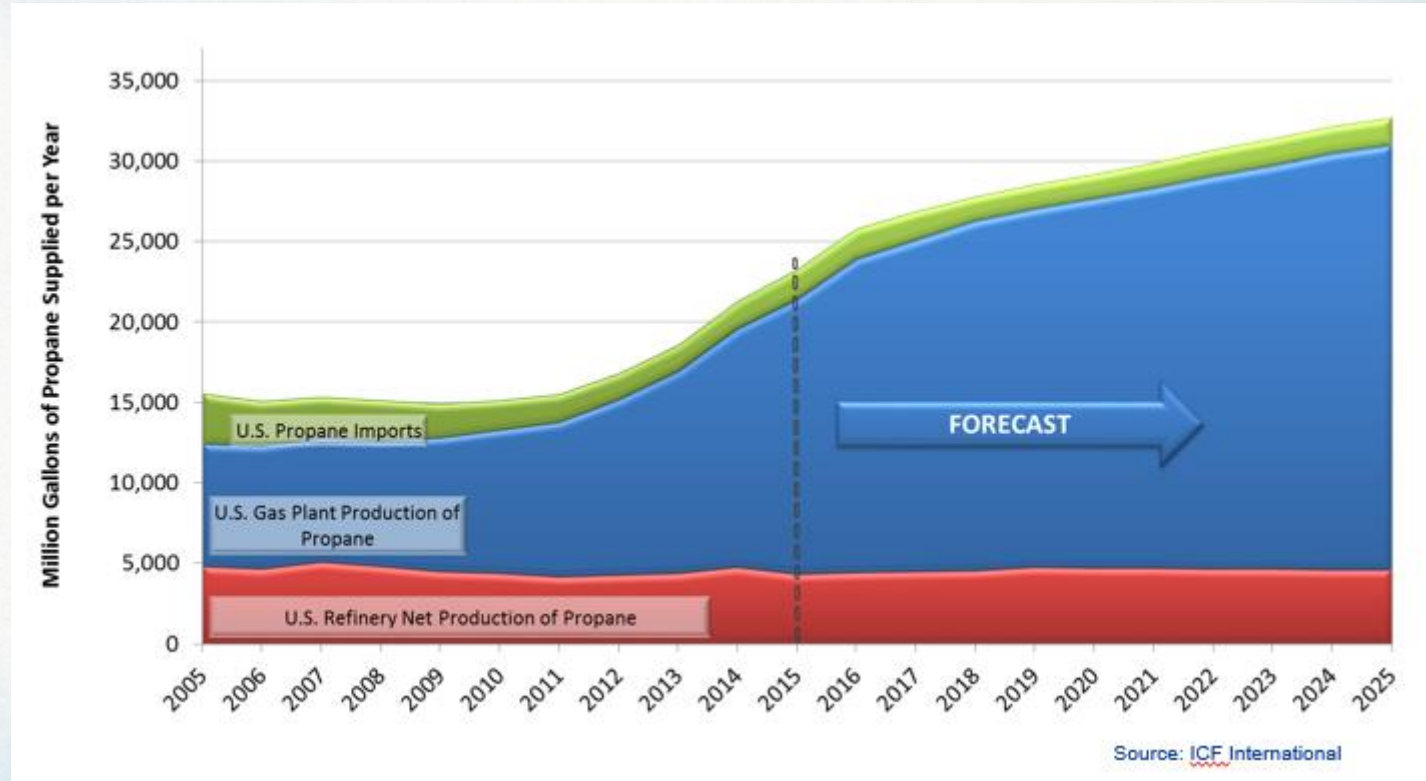




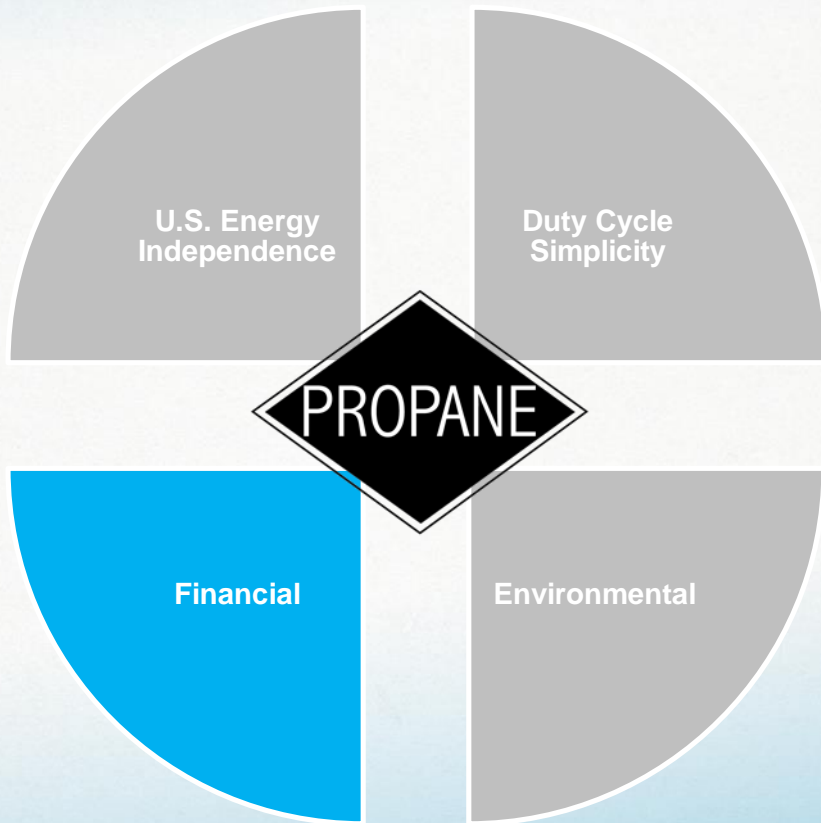
ENERGY INDEPENDENCE

U.S. Propane Supply Outlook

- Domestic
- Abundant
- Low and stable price forecasted



Consideration Summary





Preventative Maintenance



Ford V10
Gas and Propane
7 Quarts



Various Engines
Diesel
17 – 30 Quarts

Increased Inventory

- Gas and propane eliminate the need for DEF and the possibility of putting the wrong fluid in a tank



The Diesel We Know Today



Preventative Maintenance

Ford 6.8L V10

Part	Quantity	Price	Total	Total \$70.94
Element Air Cleaner	1	\$15.75	\$15.75	
Oil Spin On Filter	1	\$4.11	\$4.11	
Element, PSR, 510 Filter	1	\$24.90	\$24.90	
Mobil Special 5W-20	7	\$3.74	\$26.18	

Cummins ISB 6.7L

Part	Quantity	Price	Total	Total \$277.15
Oil Filter	1	\$13.75	\$13.75	
Fuel Spin-On Filter	1	\$37.90	\$37.90	
Power Steering Spin Filter	1	\$9.86	\$9.86	
Fuel Filter	1	\$20.53	\$20.53	
Allison Control Filter	1	\$8.49	\$8.49	
Mobil Fleet 15W-40	18	\$2.59	\$46.62	
Cleaner, Air Element	1	\$140.00	\$140.00	

Engine Components: Ford Roush

Ford 6.8L V10

Part	Quantity	Price	Total	
PCV Hoses (2)	1	\$43.68	\$43.68	Total \$3,348.04
Vapor Management Valve	1	\$65.00	\$65.00	
Gasket	1	\$5.99	\$5.99	
Injector Assembly	10	\$215.00	\$2,150.00	
Converter Assembly	1	\$910.00	\$910.00	
Spark Plugs	10	\$7.08	\$70.80	
O2 Sensors (all 3)	1	102.57	\$102.57	

Engine Components: Diesel

Cummins ISB 6.7L

Part	Quantity	Price	Total
NOx Sensor	1	\$480.00	\$480.00
NOx Sensor	1	\$560.00	\$560.00
Pressure Sensor	1	\$140.00	\$140.00
Doser Injector	1	\$290.00	\$290.00
Catalyst Assembly w/ DPF	1	\$10,554.11	\$10,554.11
Temperature Sensor	1	\$78.90	\$78.90
Temperature Sensor	2	\$84.90	\$169.80
Turbo	1	\$2,731.20	\$2,731.20
Injector	6	\$755.56	\$4,533.36
EGR Valve	1	\$590.15	\$590.15
EGR Cooler	1	\$923.72	\$923.72
			Total \$21,051.24

Full Engine Replacement

Ford 6.8L V10

Part	Price	Core	Total
Ford 6.8L Engine	\$7,194.85	\$900.00	\$8,094.85

Cummins ISB 6.7L

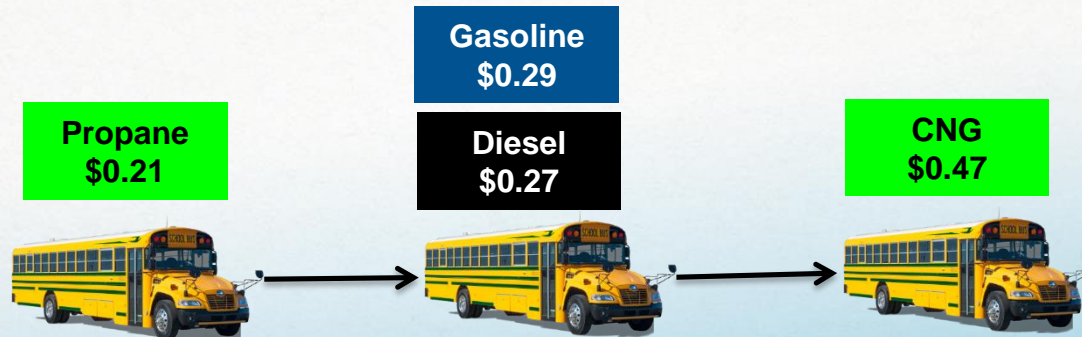
Part	Price	Shipping	Total
Cummins ISB 6.7L	\$18,521.98	\$400.00	\$18,921.98

Cost per Mile to Operate and Total Cost



TCO Inputs (Fuel and Preventative Maintenance Only)		
Fuel	Price / Gallon	MPG
Diesel	\$1.90	7.5
Gasoline	\$1.64	5.85
Propane	\$1.00	5
CNG	2.15 (GGE)	5.85

TOTAL COST OF OWNERSHIP	Diesel	Blue Bird Propane	Blue Bird Gasoline	Blue Bird C-CNG
Lifetime Operational Cost/Bus	\$124,888.69	\$115,752.91	\$122,848.07	\$182,570.51
Lifetime Savings/Bus		\$9,135.78	\$2,040.62	-\$57,681.82
Cost per Mile to Operate	\$0.27	\$0.21	\$0.29	\$0.47



Real World Savings

“15 Cents per Mile Savings on Average”



“34 Cents per Mile Savings on Average”



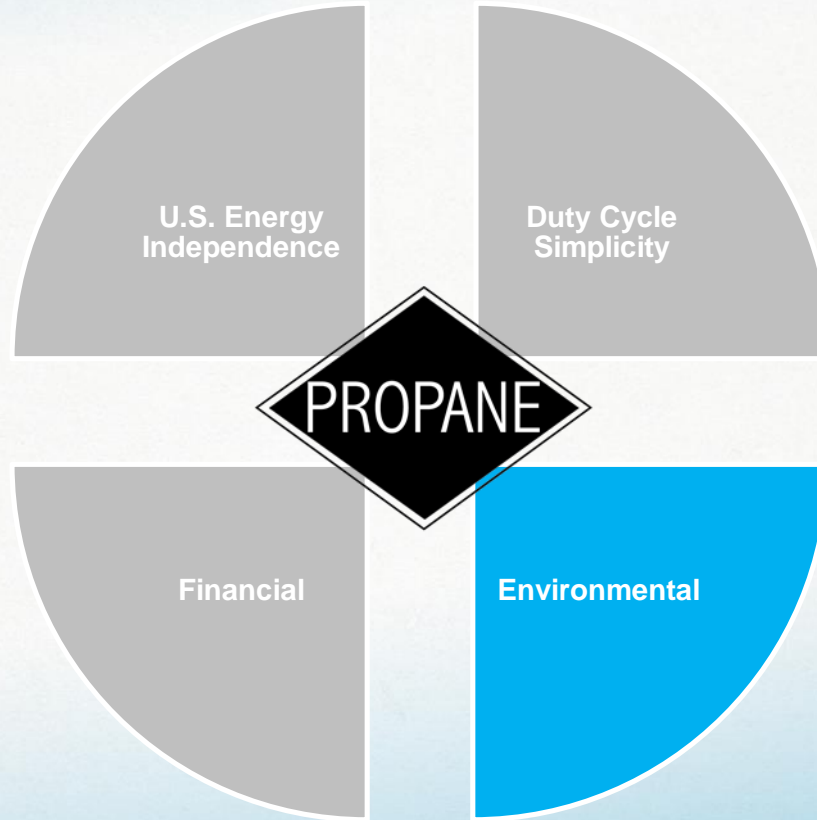
“Over \$7,000 per Bus Savings in First Year”



“80% Lower Fuel Costs”

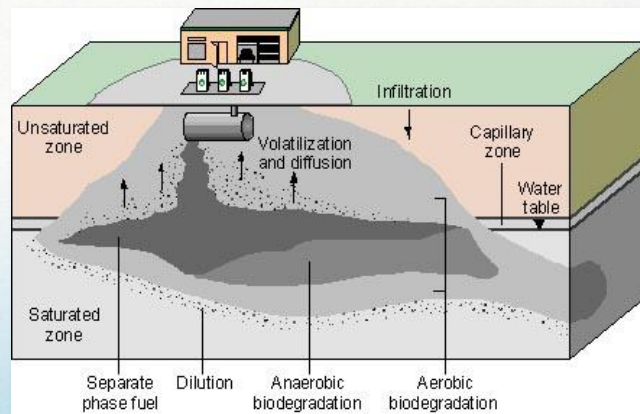


Consideration Summary



Environmentally Friendly Infrastructure

- Reduces long term risk of traditional fueling infrastructure (no risk to groundwater)
- Non-toxic and non-carcinogenic
- Low or no cost fueling stations
- Refueling speeds like diesel
 - 12 gallons per minute



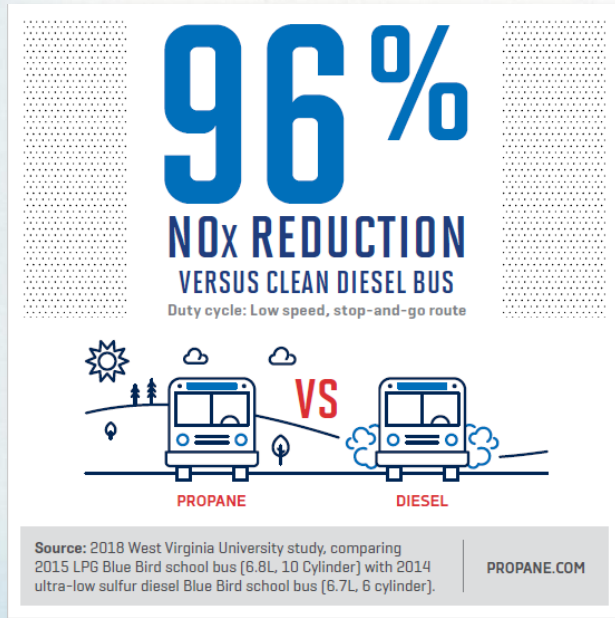
- Air Quality
 - NOx is a serious threat to human life, wildlife and the environment
- CARB (California Air Resources Board)
 - Established a mechanism for engine MFR's to pursue lower NOx certification than Federal requirement of 0.20 g/bhp-hr
 - 50% lower or 0.10
 - 75% lower or 0.05
 - 90% lower or 0.02



ROUSH Propane - Emissions

Emission Constituent	ROUSH Propane Certification Level	% Lower than EPA / CARB Standard
NOx (Nitrogen Oxides)	0.02	90%↓
HCHO (Formaldehyde)	0.001	90% ↓
PM (Particulate Matter)	0.002	80%↓
NMHC (Non-Methane Hydrocarbons)	0.06	57%↓
CO (Carbon Monoxide)	5.0	65%↓
Greenhouse Gas Emissions		
GHG Carbon Dioxide (CO ₂)	612	<1%↓
GHG Methane (CH ₄)	0.03	70%↓
GHG Nitrous Oxide (N ₂ O)	0.02	80%↓

Fuel	Propane (LPG)	Ultra-Low Sulfur Diesel
Vehicle	Blue Bird School Bus (6.8L, 10 Cylinder)	Blue Bird School Bus (6.7L, 6 Cylinder)
Model Year	2015	2014
Exhaust Aftertreatment	Three-Way Catalyst	Diesel Oxidation Catalyst, Diesel Particulate Filter, Selective Catalytic Reduction System



Noteworthy Results:

- 96% NO_x reduction
- >95% NO_x reduction
- >93% NO_x reduction
- >13% CO₂ reduction

LOW SCHOOL BUS EMISSIONS LINKED TO IMPROVED ACADEMIC PERFORMANCE



A first-of-its-kind 2019 study released by Georgia State University links low emission on school buses to improved academic performance.

The study found students who rode to school in alternative fuel buses like propane autogas had higher test scores in math and English compared to students who rode to school in diesel buses.

SAFETY

Tank Protection & Crash Testing

- Followed CMVSS 301.1 protocol
- 4,000 lbs @ 40 MPH
- Angled side and rear impact
- 220 PSI tank pressure
- No leakage or no pressure drop in 30 minute test



Alt Fuel Consideration Summary

- ✓ Simple and Robust Design
- ✓ No Duty Cycle Compromise
- ✓ Economical Operation
- ✓ Safe by Composition and Design
- ✓ Environmentally Responsible from Well to Wheels