



# AUTOGAS ANSWERS

Your Fleet Fueling Needs

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# Propane Education & Research Council

- Authorized by the U.S. Congress.
- Funded by 5/10-cent per gallon assessment.
- Governed by 21-member industry board of directors.
  - 9 appointed by National Propane Gas Association.
  - 9 appointed by GPA Midstream.
  - 3 public members.
- 29 staff and 100+ Member Advisory Committee.









# Everyday, propane buses transport almost 1 million students across the U.S.

Over 18,300  
propane  
school buses  
are on the road



Carrying approximately  
1,118,700  
students/day

In the fleets of  
approximately




930 school  
districts, private  
schools and bus  
contractors

# The Lowest Total Cost-of-Ownership

- Complete lifecycle analysis.
- 3 F's: Fuel, Filters, and Fluids.
- Maintenance and repairs.
- Labor and wages.
- Fuel handling and storage.
- Garages and facilities
- Refueling infrastructure.





Non-toxic and a non-contaminant of  
air, soil, and water resources.



# 1980

- Diesel is a great fuel.
- Diesel engines last forever.
- No one cares about emissions.
- Propane buses are not available.





# 2019

- Diesel is an endangered fuel.
- Diesel engines breakdown a lot.
- Everyone cares about emissions.
- Propane buses are available from all of the major OEMs.

# Emissions Reduction

A Georgia State study says diesel school bus fumes drive down test scores



Source: July 18, 2019 Atlanta Journal-Constitution).

# Emissions Reduction

## Light-Duty Trucks



\*Assumed annual mileage: 11,400. Fuel economies based on 2016 AFLEET data.



# Emissions Reduction

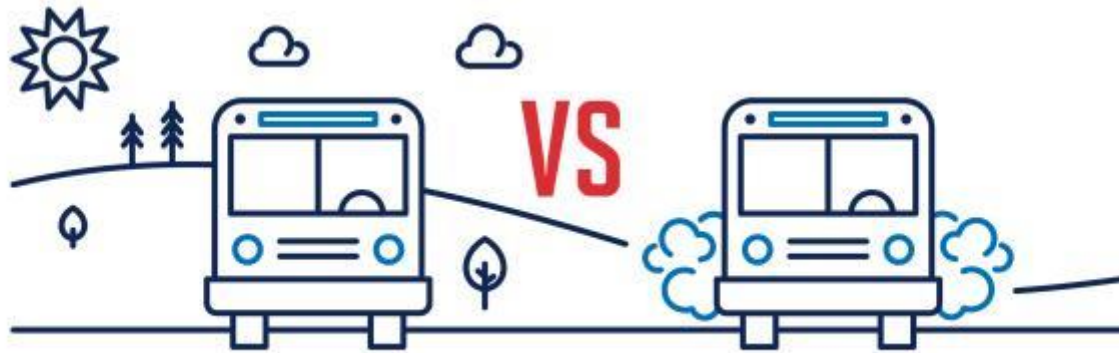
## Medium-Duty Trucks



\*Assumed annual mileage: 20,000. Fuel economy based on propane industry data.

# Emissions Reduction

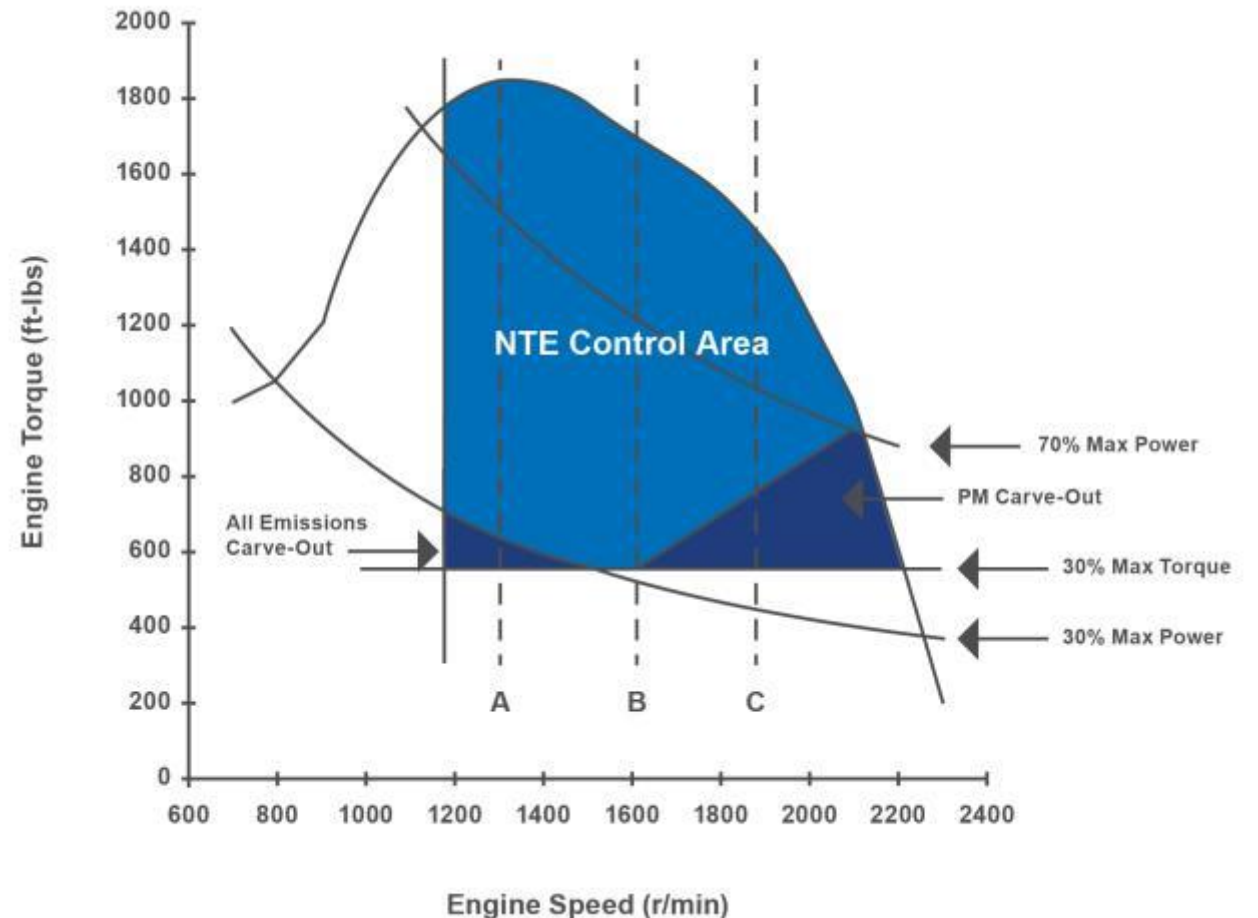
**96% NO<sub>x</sub> REDUCTION**  
VERSUS CLEAN DIESEL BUS



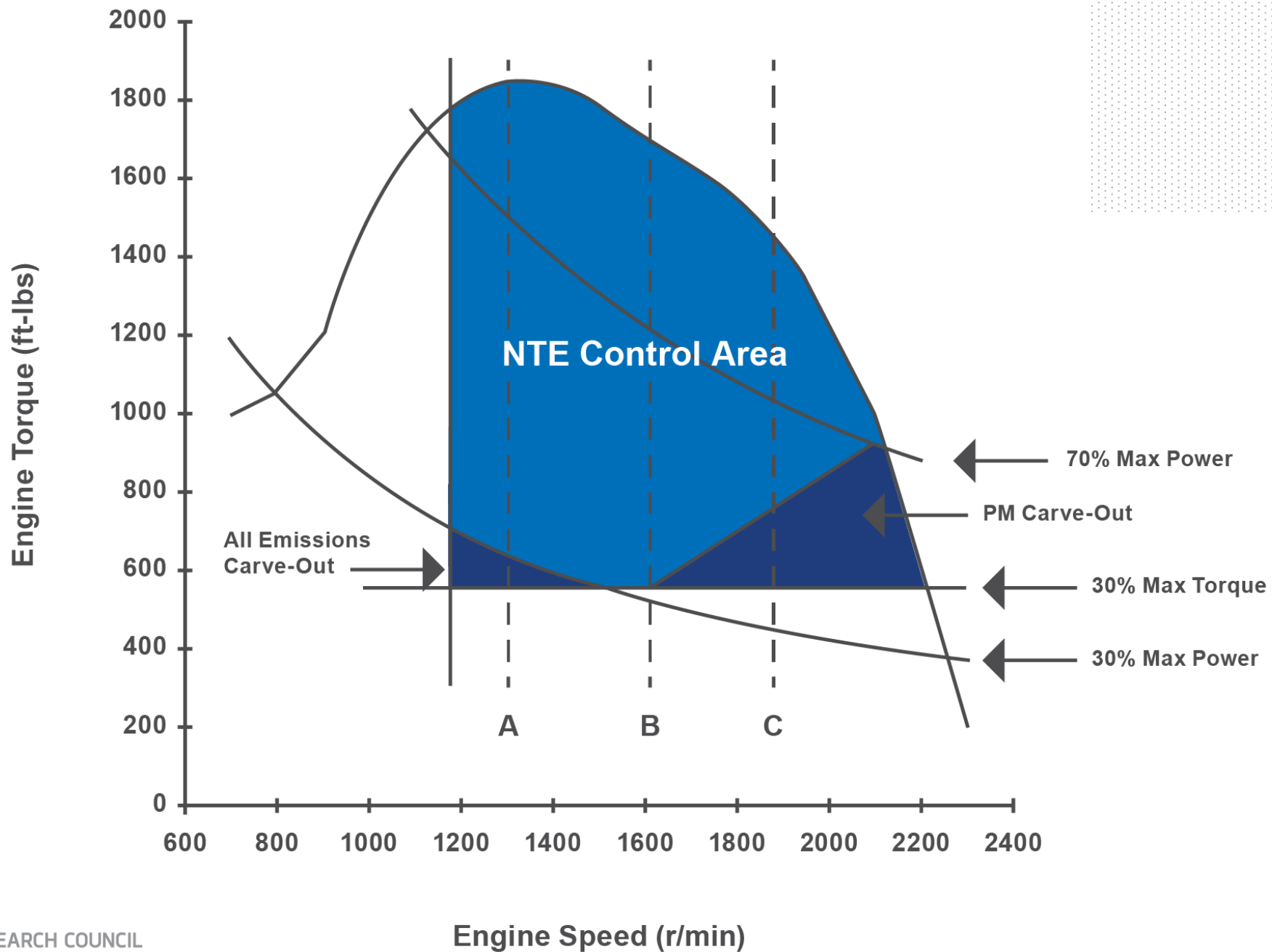
Source: 2018 West Virginia University study, comparing 2015 LPG Blue Bird School bus (6.8L, 10 Cylinder) with 2014 ultra-low sulfur diesel Blue Bird school bus (6.7L 6 cylinder).

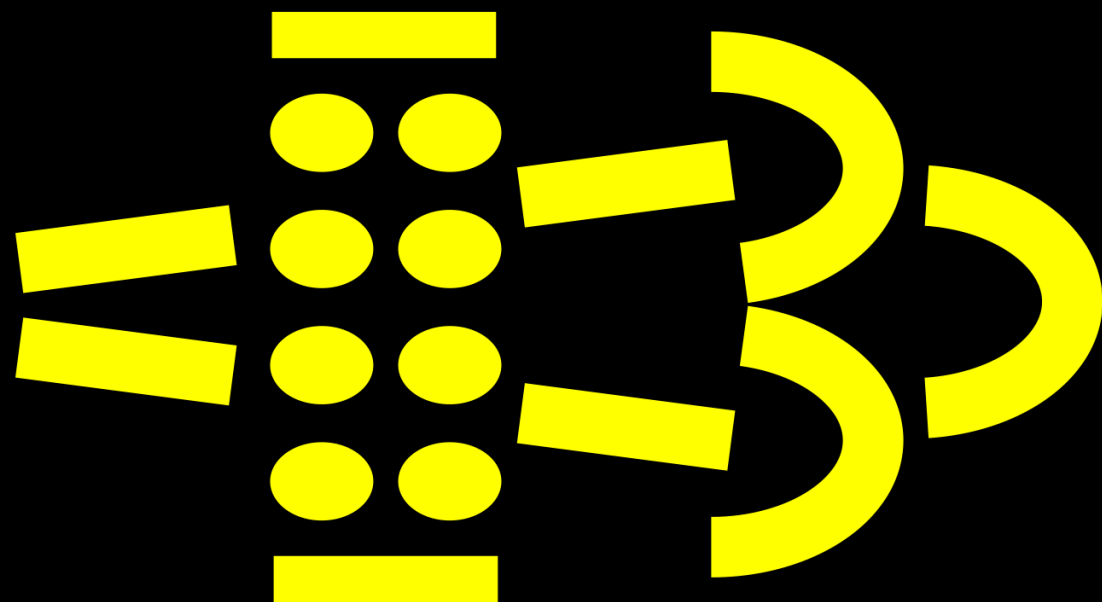
# Not-To-Exceed Control Area

- Diesels subject to Not-to-Exceed (NTE) limits during in-use testing.
- Outside the NTE Control Area, in-use emissions are essentially unregulated.
- Low engine speeds and loads are outside NTE area.
- NO<sub>x</sub> aftertreatment becomes ineffective when exhaust temperature is low.












# Why Propane Vehicles Work Great

- Propane is an excellent choice for Class 4-7 medium-duty trucks and buses.
  - Propane provides the lowest NOx in these classes.
  - Propane maintains NOx control under real-world conditions, even at low temperatures.
  - Propane improves the performance of direct injection engines.
  - The next generation of purpose-built propane engines will be class-leading.
- 





# Navigate Your Refueling Options

- Whether you have 10 fleet vehicles or 100, propane autogas has a refueling infrastructure option to fit your needs.
- Whichever setup you choose, you're sure to save money on total cost-of-ownership and keep your fleet efficient.

*Call your infrastructure provider for more information about any of these options, and your local propane retailer for information regarding fuel.*













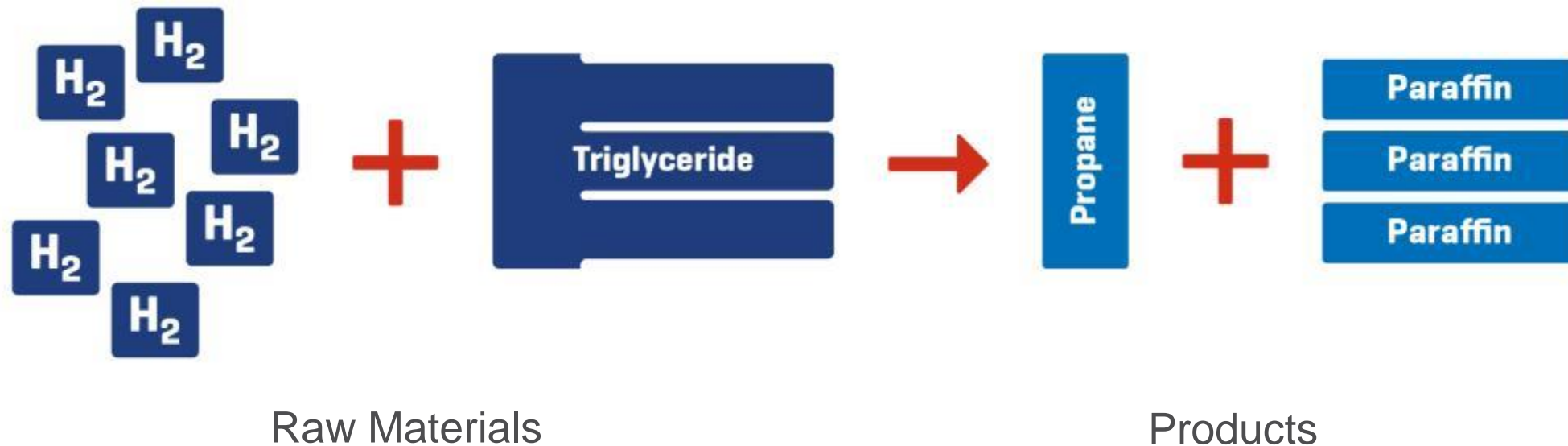






# How Do We Make Renewable Propane?

Renewable propane is **hydrocarbons** made from biological oils and fats (**triglycerides**) by **hydrotreating**.





# Reduce Maintenance Costs

- No ethanol issues.
- Longer shelf life.
- Reduced damage to equipment due to tainted fuel.
- Remove opportunities for accidental fuel-mixing.



# Be Green, Save Green

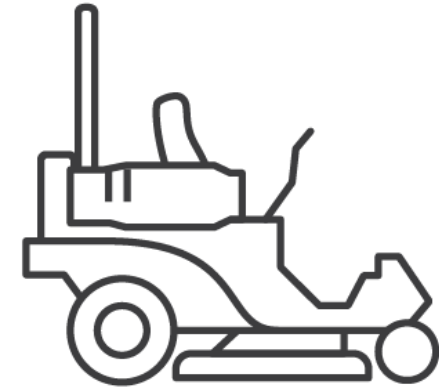
Reduced labor costs



Reduced emissions

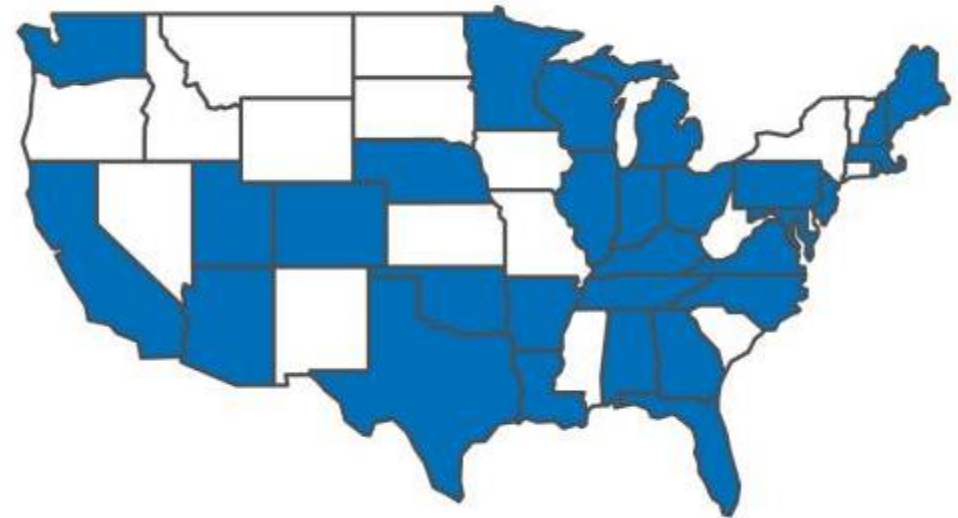


Reduced operating costs



# Work When Other Contractors are Restricted

- Ozone Action Days affect contractors' work in 35 states.
- Propane equipment is exempt from Ozone Action Days.



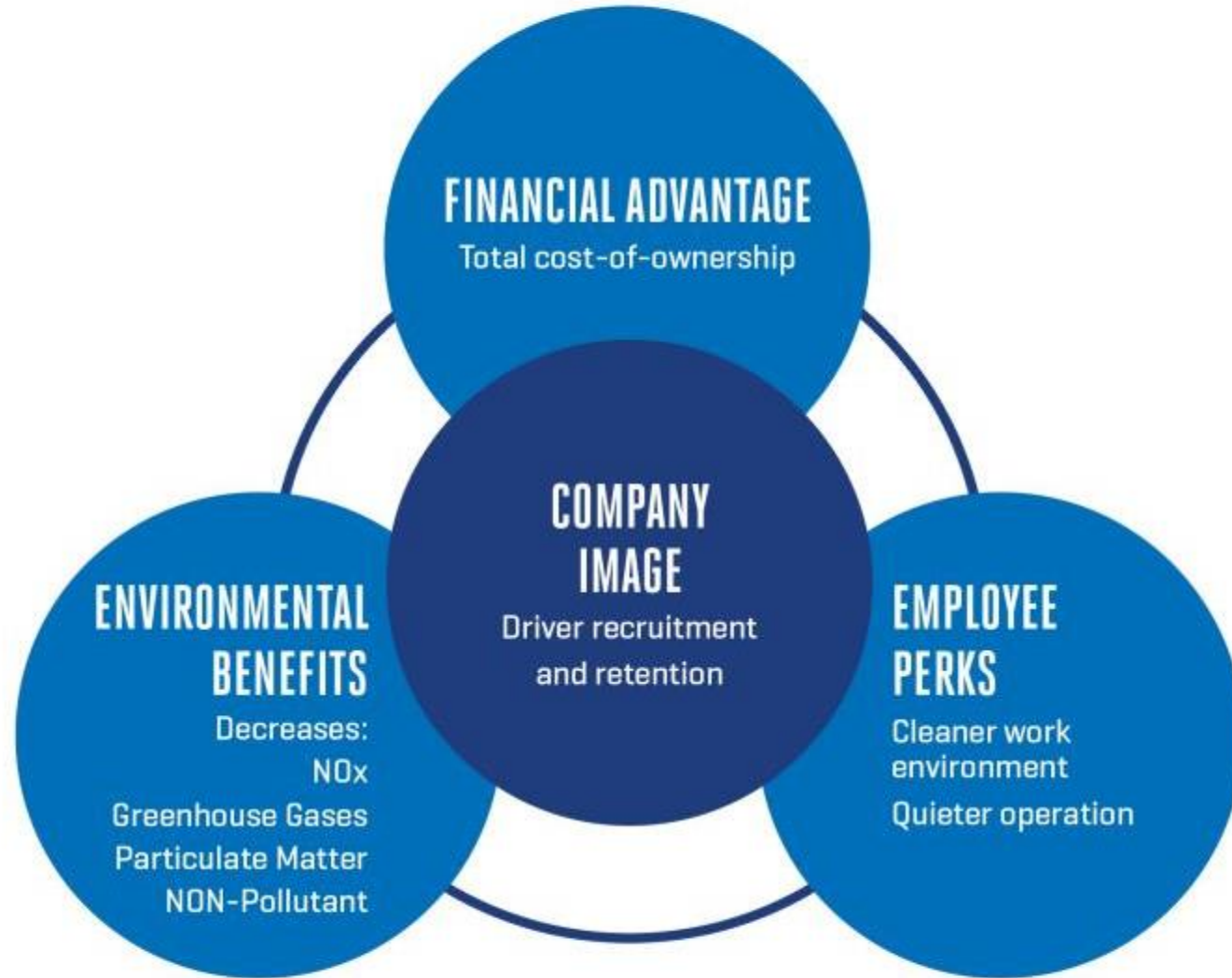
■ = Ozone Action State

# Who's Buying Propane?

- 40% of the contractors on Lawn & Landscape's Top 100 list currently use propane in their mower fleets.
  - Companies range from \$15M to \$2B in annual revenue.
  - Regional and national footprints.
- Notable propane fleets on that Top 100 list.







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