Propane as Mowing Equipment Fuel

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Propane Basics

- Hydrocarbon: C3H8
- May be referred to as liquid petroleum gas, or LP
- A gas at normal temperatures and pressures but becomes liquid at high pressures
- Byproduct of natural gas/oil refining processes
- Colorless and odorless; mercaptan added for safety
Propane Uses

- Home and water heating
- Grills, cooking, and refrigeration
- Farm/industry equipment power
- Vehicle and lawn equipment fuel
- Third most common vehicle fuel worldwide

Lawn Butler, Knoxville
Propane Benefits

- Safety: narrow range of flammability when compared with other petroleum products
- One of the lightest, simplest hydrocarbons in existence & one of the cleanest burning of all fossil fuels
- 90% domestically produced
- No threat to ground water, surface water, or soil if released

Photo courtesy of NREL
Started with two propane mowers in 2009 as part of a study with UTK
By 2014, had 15 mowers running on propane
Nearing total fleet conversion as of 2016
Currently: 18 propane mowers, both OEM and conversions
After reviewing many alternative fuels for mowing equipment, propane was the “clear winner”

Currently, 10 of 14 mowers run on propane

All new mower purchases will be OEM propane
City of Kingsport

- Began with propane for police fleet (state’s largest propane fleet)
- Added propane mowers later on
- Currently owns six SCAG Turf Tigers
City of Knoxville

- Started by converting two Gravely mowers to propane in 2014
- Recently purchased nine additional propane mowers
- Purchased for “cost reduction, improved services, and good environmental stewardship with the added bonus of using domestic fuel.”
Spearheaded by adjunct professor of mechanical engineering, Dr. Steven Wayne
Converted two mowers with funds from the university’s “Sustainable Campus Green Fee”
Also runs physical plant support vehicle on propane
Great Smoky Mountains National Park

- Converted five Gravely mowers through a grant (partnering with East TN Clean Fuels)
- Acquiring two more in near future
- All staff pleased with performance
Why are these companies using propane?

- **Lower operating costs**: Propane mowers cost less per hour to operate and the majority of fleets note less down time for maintenance.
- **Fewer emissions**: Propane has fewer carbon emissions than conventional fuels. Compared with gas, propane reduces GHG emissions by over 15% and CO by over 40%.
- **Easy on-site refueling**
- **Reduced fuel spills and theft**
- **Propane is suitable for any size fleet**
- **Quick ROI on conversions or upgrades**
Manufacturers with proven performance are offering propane models.

Conversion kits are available and can be installed in just a few hours.
Propane Education & Research Council (PERC) is offering a propane mower conversion incentive through April 30, 2016.

Incentive is for $1,000 per qualifying new mower purchase or $500 per qualifying mower conversion.

Visit www.propane.com/mowerincentive for more information.
Other Resources

- Propane mower calculator app available for Apple and Android
- For commercial landscaping information, visit www.propane.com/commercial-landscape
- More case studies and testimonials at www.propane.com
Thank you!

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Visit cleancities.energy.gov for more information about the U.S. DOE Clean Cities program.